No. 2017-2139

IN THE UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

MAXON, LLC,

Plaintiff-Appellant,

v.

FUNAI CORPORATION, INC.,

Defendant-Appellee.

Appeal from the United States District Court
for the Northern District of Illinois, Case No. 1:16-cv-07685
The Honorable Gary Feinerman, Judge Presiding.

BRIEF OF PLAINTIFF-APPELLANT MAXON, LLC

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CERTIFICATE OF INTEREST

Pursuant to Federal Circuit Rule 47.4, counsel for Appellant Maxon, LLC certifies the following:

1. The full name of every party or amicus represented by me is:

Maxon, LLC

2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by me is:

N/A

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:

N/A

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court are:

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STATEMENT OF RELATED CASES

Pursuant to Federal Circuit Rules 28(a)(4) and 47.5, counsel for Appellant Maxon, LLC ("Maxon") states: (a) no other appeal in or from the same civil action in the trial court was previously before this or any other appellate court; and (b) no other case known to counsel to be pending in this or any other court will directly affect or be directly affected by this Court's decision in this consolidated appeal.

JURSIDICTIONAL STATEMENT

Jurisdiction in the District Court

This action arose under the patent laws of the United States, 35 U.S.C. §§ 101 *et seq*. Thus, the District Court had subject matter jurisdiction over this action under 28 U.S.C. §§ 1331 and 1338(a).

Jurisdiction in the Court of Appeals

The Court of Appeals has jurisdiction under 28 U.S.C. § 1295. Maxon seeks review of the District Court's holdings that Maxon's U.S. Patent Nos. 8,989,160; 7,489,671; 7,486,649; and 7,171,194 were invalid under 35 U.S.C. § 101 and the District Court's consequent grant of Funai Corporation Inc.'s ("Funai") motion to dismiss for failure to state a claim on May 23, 2017, which was a final judgment that disposed of the parties' claims. Maxon timely filed its notice of appeal on June 6, 2017.

STATEMENT OF THE ISSUE

At the turn of the century, more services were being delivered to consumers over wireless networks to a growing, diverse group of devices. Prior-art forms of service delivery failed to meet the market demand for user control of what service would be enjoyed on what device at what time.

The patents-in-suit claim a solution. By leveraging pre-existing computing components and ordering these components in a new way, the patent claims under review on this appeal reverse the prior-art flow of services. With the solution disclosed in these patent claims, now the user dictates to the service provider on what device the service will be enjoyed.

Because these claims specify the pre-existing computing components and how one must order them to achieve the result of decentralized, user-controlled service delivery, do the claims disclose "substantially more" than the abstract idea of decentralized, user-controlled service delivery?

STATEMENT OF THE CASE

Statement of the Facts

What follows are the well-pled facts—that is, a description of four exemplary patent claims alleged in the complaint, as well as Maxon's allegations regarding how these claims read on the accused devices (Sanyo TVs). Maxon also emphasizes portions of the specification that teach how a consumer may control

content on a device according to the invention.

U.S. Patent No. 8,989,160

Claim 8 of the '160 patent is to "[a]n audio-video device capable of sharing services with a plurality of other devices within a personal network . . . [,]" (Appx47), such as a smart TV capable of sharing the owner's Netflix service with other devices. (Dkt. 1 (Compl.) ¶ 9.) This TV has four parts: storage, input/output logic, a processor, and a transceiver.

The storage of claim 8 of the '160 patent houses a device ID, a username and password for access to the TV owner's personal network (e.g., Netflix), and a credential that unlocks a connection path between the TV and Netflix (*id.* ¶ 9(a)):

> a computer-readable medium having storage for a first address corresponding to the audio-video device, a second address corresponding to the personal network, and a third address corresponding to a service provider network . . . .

(Appx36, 14:34-39.) The written description details the device ID, network ID, and credential and how they are used to allow a consumer to control the content she views on the Sanyo TV. (*See, e.g.*, Appx32, 5:26-64, 6:62-64 ("[T]he ESN **220**, PNC **222** and the data payload **240** are communicated to the subscriber database **134** where the personal network profile is stored.").)

First, the service provider issues the devices a credential so that the service provider and the user devices may have two-way communication: "Yet another embodiment includes the service provider assigning a network device **110** a system

identification code (SID) **224**. . . . The network device **110** has data access to the system identification code **224**." (Appx32, 5:56-64.)

Second, the service provider has the capacity to authenticate and authorize its users (i.e., the owners of the TV) before provisioning the service (e.g., Netflix): "The device transmits a request to authentication logic operated by the service provider for access to some or all of the services available to the service provider's network . . . . Responsive to the request, the authentication logic authenticates the device's request for access and selectively makes available to or authorizes the device to use those services available from the service provider's network." (Appx31, 4:12-22.)

Third, the service provider issues a serial number unique to each device: "ESN **220** is assigned by a service provider and held in memory." (Appx31, 5:39-40.)

The input/output logic of claim 8 is in the TV so that the TV may receive instructions from its owner on whether she would like Netflix on the TV or not (Dkt. 1 (Compl.) ¶ 9(b)):

> input/output logic configured to receive from a user a desired change to a service capable of being provisioned to the audio-video device from at least one service available generally to the personal network . . . .

(Appx36, 14:40-43.) The input/output logic is taught in the specification as well. (*See, e.g.*, Appx33, 7:4-30 (". . . The user creates the payload **240** through

manipulation of the input output logic **208** associated with the network device **110**.. . . .”), *id.*, 7:31-56 (describing how a user may communicate desired change to the service provider after the TV is registered).)

The processor of claim 8’s TV prepares data that represents the TV owner’s choice (“I do or do not want Netflix on this TV”) (Dkt. 1 (Compl.) ¶ 9(c)):

> the processor programmed to prepare an inbound signaling word comprising at least the first address and payload data representing the desired change to the service capable of being provisioned to the audio-video device from the personal network . . . .

(Appx36, 14:44-50.) “The processor **204** can also be in data communication with display logic **206** and input/output logic **208**.” (Appx32, 5:17-20; *see also* Appx32, 6:7-9, Appx32-33, 6:31-7:30.)

The transceiver in claim 8’s TV communicates with Netflix about its owner’s decision to deactivate Netflix on the TV (Dkt. 1 (Compl.) ¶ 9(d)):

> the transceiver further receiving an outbound signaling word comprising the first address corresponding to the audio-video device and data indicating the desired change to the personal network, the outbound signaling word responsive to the desired change to the service capable of being provisioned to the audio-video device from the personal network.

(Appx47, 14:57-64.) The transmission of the directions to activate or deactivate a service is also taught in the specification. (*See, e.g.*, Appx43, 6:31-7:3 (“. . . Regardless of the means in which the ISW **310** is initiated, the result includes

transmission of the ISW **310**. In the illustrated example, the ISW **310** transmits from the personal network **104**, through the communications medium **120-124**, to the service provider's network **102**. The service provider's network **102** receives the transmission and logic (not shown) decodes the ISW **310** into its component data fields. . . .").)

U.S. Patent No. 7,489,671

Claim 6 of the '671 patent could also be a smart TV—this one set up with the ability to command changes within the Netflix servers. (Dkt. 1 (Compl.) ¶ 12.) The TV of claim 6 has three parts: storage, management logic, and a processor.

The storage of claim 6 of the '671 patent stores a device ID, as well as a username and password for access to the TV owner's personal network (e.g., Netflix) (Dkt. 1 (Compl.) ¶ 12(a)):

> a first computer-readable medium having stored thereon a first unique identifier that uniquely identifies the communications device within the communications network identified by the network number . . . .

(Appx53, 14:1-4; *see also, e.g.*, Appx48, 3:33-44; Appx48-49, 4:55-5:15.)

The management logic of claim 6 is in the TV so that the TV may dictate its owner's instructions on whether he would like Netflix on the TV or not (Dkt. 1 (Compl.) ¶ 12(b)):

> a management logic that manages a database containing routing information for an incoming communication directed at the communications network via the network

> number to be routed to a particular communications device within the communications network based on communications service content of the incoming communication, where the routing information relates the communications device to one or more communication services available to the communications network from a communications services provider by associating the first unique identifier that uniquely identifies the communications device to one or more communications services . . . .

(Appx53, 14:7-19; *see also, e.g.*, Appx49-50, 6:31-7:30.)

The processor of claim 6's TV controls the management logic so that the TV may associate itself as, for example, activated within the owner's Netflix account (Dkt. 1 (Compl.) ¶ 12(c)):

> a processor that controls the management logic to update the database to reflect the addition of the communications device to the communications network, to disassociate in the database the one or more communications services from a second communications device if the one or more communications services are determined to be connected in the database to the second communications device, and to connect in the database the one or more communications services to the communications device by relating in the database the unique identifier that uniquely identifies the communications device and the data representing the one or more communications services.

(Appx53, col. 14:20-32; *see also* Appx49, 5:17-20, *id.*, 6:7-9, Appx 49-50, 6:31-7:30.)

U.S. Patent No. 7,486,649

Claim 6 of the '649 patent could also be a smart TV; this one set up with the

ability to command changes within the Netflix servers. (Dkt. 1 (Compl.) ¶ 15.) The TV of claim 6 has three parts: storage, management logic, and a processor.

The storage of claim 6 of the '649 patent stores a device ID, as well as a username and password for access to the TV owner's personal network (e.g., Netflix) (Dkt. 1 (Compl.) ¶ 12(a)):

> a first computer-readable medium having stored thereon a first unique identifier that uniquely identifies the communications device within the personal network identified by the personal network number . . . .

(Appx71, 14:19-27; *see also*, *e.g.*, Appx66, 3:47-57, Appx66-67 4:57-5:26.)

The management logic of claim 6 is in the TV so that the TV may dictate its owner's instructions on whether he would like Netflix on the TV or not (Dkt. 1 (Compl.) ¶ 15(b)):

> a management logic that manages a database containing routing information for an incoming communication directed at the personal network via the personal network number to be routed to a particular communications device within the personal network based on communications service content of the incoming communication, where the routing information relates the communications device to one or more communication services available to the personal network from a communications services provider by associating the first unique identifier that uniquely identifies the communications device to one or more communications services . . . .

(Appx71, 14:28-41; *see also*, *e.g.*, Appx67-68, 6:31-7:30.)

The processor of claim 6's TV controls the management logic so that the TV

may associate itself as, for example, activated within the owner's Netflix account (Dkt. 1 (Compl.) ¶ 15(c)):

> a processor that controls the management logic to remove the communications device from the personal network including modifying the database to unrelate the one ore more communications services available to the personal network from the communications device and relate the one or more communications services available to the personal network to the second communications device by changing the database to disassociate the first unique identifier that uniquely identifies the communications device and the one or more communications services available to the personal network and associate the second unique identifier that uniquely identifies the second communications device with the one or more communications services available to the personal network."

(Appx71, 14:42-55; *see also*, *e.g.*, Appx67, 5:17-20, 6:7-9, Appx67-68, 6:31-7:30.)

U.S. Patent No. 7,171,194

Claim 8 of the '194 patent could also be a smart TV. (Dkt. 1 (Compl.) ¶ 18.) The TV of claim 8 has two parts: a user interface and logic in communication with the interface.

The TV of claim 8 includes a graphical user interface and hardware, software, and firmware that allow the TV to run applications such as Netflix (Dkt. 1 (Compl.) ¶ 18(a)):

> a user interface configured to enable a user to select a service available to but not associated with the device . . . .

(Appx89, 14:42-44; *see also* Appx85-86, 6:25-7:36.)

The logic in communication with the graphical user interface of claim 8 allows the TV to dictate its owner's instructions on whether she would like Netflix on the TV or not (Dkt. 1 (Compl.) ¶ 18(b)):

> logic in communication with the user interface configured to format a signaling word responsive to the user's selection, wherein the signaling word comprises a unique identifier that uniquely identifies the device among others sharing the common network address, and payload data configured to associate the service to the device via the unique identifier.

(*Id.*, Ex. D ('194 patent), col. 14:45-51; *see also, e.g.*, Appx84, 3:46-58, Appx85, 5:4-5:43.)

Procedural History

Maxon filed a complaint for patent infringement against Funai. (Dkt. No. 1.) Funai filed a motion to dismiss, arguing that Maxon failed to state a claim on which relief could be granted because the patent claims asserted were invalid under 35 U.S.C. § 101. (Dkt. No. 21.)

The District Court granted Funai's motion. The lower court analyzed "the elements of the contested claims both 'individually and as an ordered combination' to determine if an inventive concept lies within." (Appx7 (citing *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2355 (2014).)

The District Court then isolated each specific computing component claimed in the patents and held the component was not inventive. For example: "The

'computer-readable medium' element is not, by itself, inventive." (Appx8.)

The District Court came to the same conclusion with respect to the claim elements as an ordered combination. "[E]ach claim element represents a currently available generic computer technology, used in the way in which it is commonly used." (Appx11.)

Finally, the District Court distinguished two of this Court's cases—*Bascom Global Internet Servs. v. AT&T Mobility LLC*, 827 F.3d 1341 (Fed. Cir. 2016); *DDR Holdings, LLC v. Hotels.com L.P.*, 773 F.3d 1245 (Fed. Cir. 2014)—holding that Maxon's claims did not solve a problem unique to the technological world. (Appx14 ("[T]he problem (how to improve consumer control over services) is not unique to computers and the internet.").)

SUMMARY OF THE ARGUMENT

Maxon's claims are indeed directed to an abstract idea: decentralized service delivery controlled by the owner of a plurality of devices.

This Court has held over the past two years (*Amdocs* and *BASCOM*) that some claims directed to abstract ideas are still patent eligible. The Maxon claims under review fit this rule and therefore require the reversal of the District Court's order dismissing Maxon's complaint against Funai.

Maxon's claims do more than simply claim the idea of user-controlled delivery of service to a plurality of devices. The claims specify the service provider

assigning credentials to each device and user. The claims specify that each device has the capacity to dictate service delivery to the service provider. In this way, the Maxon claims specify a precise combination of previously-known computer components to reverse the flow of prior-art service delivery. Thereby, the Maxon claims use these previously known components to provide a solution to a problem that had arisen in the technological arts. Under this Court's decisions in *Amdocs* and *BASCOM*, the Maxon claims pass muster under step two of the *Alice* analysis.

The lower court incorrectly applied *Alice* and this Court's post-*Alice* precedent. For example, the District Court invalidated the Maxon patent claims because "each claim element represents a *currently* available generic computer technology, used in the way which it is commonly used." (Appx11 (emphasis added).) Most striking about that statement in the lower court opinion is that the statement would not even be correct if the court had been invalidating Maxon's claims under Sections 102 or 103. The court under Sections 101, 102, or 103 needs to analyze the claims according to the priority date (here 2003), not based on what the court perceives to be "currently available" 14 years later in 2017.

The District Court purported to conduct a Section 101 analysis, which was faulty in many other respects, including a complete failure to construe this limited record in Maxon's favor.

ARGUMENT

Standard of Review

The Court reviews a decision dismissing a complaint for failure to state a claim under the law of the regional circuit. *BASCOM*, 827 F.3d at 1347. The Seventh Circuit reviews a grant of a motion to dismiss under Rule 12(b)(6) de novo, *Firestone Fin. Corp. v. Meyer*, 796 F.3d 822, 825 (7th Cir. 2015), accepting well-pled facts as true. *Id.* at 827 ("These allegations are neither legal assertions nor conclusory statements reciting the elements of a cause of action. As such, they are entitled to a presumption of truth.").

This Court reviews the lower court's patent-ineligibility determination de novo. *BASCOM*, 827 F.3d at 1347; *DDR*, 773 F.3d at 1255.

I. MAXON'S PATENTS CLAIM "SUBSTANTIALLY MORE" THAN JUST AN ABSTRACT IDEA BECAUSE THE CLAIMS SPECIFY HOW TO USE GENERIC COMPUTING COMPONENTS IN A NOVEL WAY TO ENABLE USERS TO MANAGE THE DELIVERY OF SERVICES ON THEIR DEVICES.

A patent may be obtained for "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. § 101. The Supreme Court has long held, however, that laws of nature, natural phenomena, and abstract ideas are not patentable. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70 (2012).

The Supreme Court more recently identified a two-step analysis to

determine what claims are patent ineligible for claiming nothing more than an abstract idea. *Alice*, 134 S. Ct. at 2355. First, the court should determine whether the claims are directed to an abstract idea. *Id.* If yes, the court must examine the elements of each claim—individually and as an ordered combination—and assess whether the elements of the claim amount to "substantially more" than the abstract idea, transforming the claim into a patent-eligible application. *Id.*

A. The Claims Are Directed to the Abstract Idea of Decentralized, User-Controlled Service Delivery to a Plurality of Devices.

This Court recently taught as follows: "the first step in the *Alice* inquiry in this case asks whether the focus of the claims is on the specific asserted improvement in computer capabilities (i.e., the self-referential table for a computer database) or, instead, on a process that qualifies as an 'abstract idea' for which computers are invoked merely as a tool." *Enfish LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335-36 (Fed. Cir. 2016).

Applying *Enfish* here, the claims are directed to the idea of a user defining and managing what service will be enjoyed on which of the plurality of devices the user owns: "An audio-video device capable of sharing services with a plurality of other devices within a personal network . . . ." (Appx36, 14:31-34.)[1] The written

[1] '160, claim 8. The exemplary claims from the other patents-in-suit are also directed to the same abstract idea of decentralized, user-controlled service delivery to a plurality of devices. ('671, claim 6: "A communications device capable of sharing a network number with other communications devices in a

description explains, "Generally speaking, one embodiment of a system and method is provided to enable a user to define, control and operate a personal network of one way or bi-directional devices capable of accessing a service provider's network, receiving services, or both." (Appx31, 3:37-41.)

B. The Patents Claim "Substantially More" Than the Abstract Idea of Decentralized Service Delivery Because They Specify How Generic Computing Components Should Be Arranged in an Unconventional Manner to Achieve a Novel Result.

Over the last two years, this Court has found that claims that use generic computers to solve a challenge that arises in the technological arts pass step two of the *Alice* test. The Court should apply this rule here and reverse the District Court's dismissal of Maxon's complaint.

In *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288 (Fed. Cir. 2016), for example, the Court found that the claims were directed to the abstract idea of correlating two network accounting records to enhance a first record. *Id.* at 1299-1300. The Court, however, held the claims to be patent eligible because the claims offered a technological solution (enhancement of data in a distributed network) to a technological problem (massive data sets requiring massive databases):

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communications network[.]" (Appx53); ('649, claim 6: "A communications device that shares a personal network number with other communications devices within a personal network[.]" (Appx71); ('194, claim 8: "A device that is capable of sharing a common network address with other devices[.]" (Appx89).)

> The solution requires arguably generic components . . . . [h]owever the claim's enhancing limitation necessarily requires that these generic components operate in an unconventional manner to achieve an improvement in computer functionality.

Id. at 1300-01. The Court distinguished the claims in *Amdocs* from claims found to be patent ineligible in other cases because the *Amdocs* claims were tied to specific structure (e.g., network devices and gatherers), were narrowly drawn to a specific solution using generic computing components, and were purposefully arranged "to achieve a technological solution to a technological problem specific to computer networks." *Id.* at 1301.

Amdocs supports reversing the District Court here. The District Court applied what seemed to be a Section 102 analysis to the question of Section 101 patent eligibility: "[E]ach claim element represents a *currently* available generic computer technology, used in the way in which it is commonly used." (Appx11 (emphasis added).) The District Court had no basis to hold that the Maxon claims use computing components in a manner in which they are commonly used.

To be sure, on a motion to dismiss, the District Court should have read the claims and written description's teachings in Maxon's favor. For example, the patents describe that the service provider issues a "system identification code" to all network devices. (*See, e.g.*, Appx32, 5:56-64.) This allows network devices to communicate a user's authentication and authorization with a service provider.

(Appx31, 4:12-22.) The connection established between the service provider and the network device also allows the user to designate the services that the user wishes to enjoy on the device. (*Id*.)

As this Court held in *Amdocs*, Maxon's claims are patent eligible because the claims are tied to specific structure. (*Compare Amdocs*, 841 F.3d at 1301 ("network devices," "gatherers," "ISMs,") *with* Appx36, claim 8 ("computer-readable medium having storage for ESN, PNC, and SID," "input/output logic," "processor," "transceiver."). The claims here, as in *Amdocs*, are also narrowly tailored to a purposeful arrangement of generic computing components so as to offer a specific solution to a technological problem. (*See id.* ('160, claim 8); Appx53 ('671, claim 6); Appx71 ('649, claim 6); Appx89 ('194, claim 8).)

Similarly, in *BASCOM*, 827 F.3d at 1348, this Court held that the claims under review were directed to the abstract idea of filtering content. According to the Court, though, the claims contained an inventive concept and were held to be patent-eligible for purposes of a motion to dismiss because the claims combined previously known elements of the prior art to render a solution to a technological problem, thus claiming substantially more than mere filtering. *Id.* at 1350.

> The claims carve out a specific location for the filtering system (a remote ISP server) and require the filtering system to give user's the ability to customize filtering for their individual network accounts.

Id. at 1352. Similarly, here, the claims shift the location and order of generic

computing components to yield an inventive result. The Maxon claims open a two-way communication between the device and service provider and equip the device with all that the device needs to dictate service options to the service provider (i.e., storage, processor, logic, and transceiver). (*See, e.g.*, Appx32, 5:26-64, 6:62-64 ("[T]he ESN **220**, PNC **222** and the data payload **240** are communicated to the subscriber database **134** where the personal network profile is stored.").)

The District Court dismissed the complaint because the Maxon claims employed "current" technology as it is "commonly" used. (Appx11.) First, as discussed above, the District Court offers no support for this conclusion, doing the very opposite of construing the pleadings in Maxon's favor. Second, the District Court incorrectly applied a Section 102 or 103 analysis, as the lower court did in *BASCOM*: "The inventive concept inquiry requires more than recognizing that each claim element, by itself, was known in the art." *Id.* at 1350.

CONCLUSION

For the reasons stated above, Maxon respectfully requests that the Court reverse the District Court Order dismissing the complaint.

Date: August 8, 2017

/s/ Matthew M. Wawrzyn
Matthew M. Wawrzyn

Counsel for Plaintiff-Appellant
Maxon, LLC

CERTIFICATE OF SERVICE

I hereby certify that on August 8, 2017, an electronic copy of the foregoing Brief of Plaintiff-Appellant was filed with the Clerk of the Court for the United States Court of Appeals for the Federal Circuit by using the CM/ECF system and thereby causing a "Notice of Electronic Filing" to be served on all counsel of record.

/s/ Matthew M. Wawrzyn
Matthew M. Wawrzyn

CERTIFICATE OF COMPLIANCE

This brief complies with the type-volume limitation of Federal Rule of Appellate Procedure 32(a)(7)(B) and Federal Circuit Rule 32(b). The brief contains 4,076 words, excluding the parts of the brief exempted by Federal Rule of Appellate Procedure 32(a)(7)(B)(iii) and Federal Circuit Rule 32(b).

This brief complies with the typeface requirements of Federal Rule of Appellate Procedure 32(a)(5)(A) and the type style requirements of Federal Rule of Appellate Procedure 32(a)(6). The brief has been prepared in a proportionally spaced typeface using Microsoft Word 2010 in 14 point Times New Roman.

/s/ Matthew M. Wawrzyn
Matthew M. Wawrzyn

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UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

MAXON, LLC,	)	
	)	
Plaintiff,	)	16 C 7685
	)	
vs.	)	Judge Gary Feinerman
	)	
FUNAI CORPORATION, INC.,	)	
	)	
Defendant.	)	

MEMORANDUM OPINION AND ORDER

Maxon, LLC brought this suit against Funai Corporation, Inc., alleging infringement of four patents teaching electronic means of increasing user control over subscription entertainment content. Doc. 1. This suit has been coordinated for pretrial proceedings with four others brought by Maxon alleging infringement of the same patents. Doc. 13; *see Maxon, LLC v. LG Electronics U.S.A., Inc.*, 16 C 6840 (N.D. Ill. filed June 29, 2016); *Maxon, LLC v On Corp US, Inc.*, 16 C 6841 (N.D. Ill. filed June 29, 2016); *Maxon, LLC v. Panasonic Corp. of N. Am.*, 16 C 6843 (N.D. Ill. filed June 29, 2016); *Maxon, LLC v. Vizio, Inc.*, 16 C 6846 (N.D. Ill. filed June 29, 2016). Funai has moved to dismiss this suit under Federal Rule of Civil Procedure 12(b)(6) on the ground that the patents are invalid under 35 U.S.C. § 101, as interpreted by *Alice Corp. Pty. Ltd. v. CLS Bank International*, 134 S. Ct. 2347 (2014). Doc. 21. The motion is granted.

Background

In resolving a Rule 12(b)(6) motion, the court assumes the truth of the complaint's well-pleaded factual allegations, though not its legal conclusions. *See Zahn v. N. Am. Power & Gas, LLC*, 815 F.3d 1082, 1087 (7th Cir. 2016). The court must also consider "documents attached to the complaint, documents that are critical to the complaint and referred to in it, and information

that is subject to proper judicial notice," along with additional facts set forth in Maxon's brief opposing dismissal, so long as those additional facts "are consistent with the pleadings." *Phillips v. Prudential Ins. Co. of Am.*, 714 F.3d 1017, 1020 (7th Cir. 2013). The facts are set forth as favorably to Maxon as those materials allow. *See Pierce v. Zoetis*, 818 F.3d 274, 277 (7th Cir. 2016).

Maxon is the exclusive owner of the four asserted patents: U.S. Patents 8,989,160 ('160), 7,489,671 ('671), 7,486,649 ('649), and 7,171,194 ('194). Doc. 1 at ¶¶ 7, 10, 13, 16. The complaint identifies a representative claim for each patent. *Id*. at ¶¶ 9, 12, 15, 18. Maxon alleges that the claims are directed to technology supporting "Smart TVs," meaning televisions with the capacity to connect to the internet and interact with streaming services such as Netflix. *Ibid*. These are the four representative claims:

> '160 Claim 8: An audio-video device capable of sharing services with a plurality of other devices within a personal network, the audio-video device comprising:
>
> a *computer-readable medium* having storage for a first address corresponding to the audio-video device, a second address corresponding to the personal network, and a third address corresponding to a service provider network;
>
> input/output *logic* configured to receive from a user a desired change to a service capable of being provisioned to the audio-video device from at least one service available generally to the personal network;
>
> a *processor* in communication with the computer-readable medium and the input/output logic, the processor programmed to prepare an inbound signaling word comprising at least the first address and payload data representing the desired change to the service capable of being provisioned to the audio-video device from the personal network; and
>
> a *transceiver* providing the inbound signaling word to the service provider network where the service provider network comprises logic to process the inbound signaling word including modifying stored information in a subscriber database to effect the desired change to the service capable of being provisioned to the audio-video device from the personal network, the

transceiver further receiving an outbound signaling word comprising the first address corresponding to the audio-video device and data indicating the desired change to the personal network, the outbound signaling word responsive to the desired change to the service capable of being provisioned to the audio-video device from the personal network.

'671 Claim 6: A communications device capable of sharing a network number with other communications devices in a communications network, the communications device comprising:

a first *computer-readable medium* having stored thereon a first unique identifier that uniquely identifies the communications device within the communications network identified by the network number, where the first unique identifier that uniquely identifies the communications device is not a telephone number;

a management *logic* that manages a database containing routing information for an incoming communication directed at the communications network via the network number to be routed to a particular communications device within the communications network based on communications service content of the incoming communication, where the routing information relates the communications device to one or more communication services available to the communications network from a communications services provider by associating the first unique identifier that uniquely identifies the communications device to the one or more communication services; and

a *processor* that controls the management logic to update the database to reflect the addition of the communications device to the communications network, to disassociate in the database the one or more communications services from a second communications device if the one or more communication services are determined to be connected in the database to the second communications device, and to connect in the database the one or more communication services to the communications device by relating in the database the unique identifier that uniquely identifies the communications device and data representing the one or more communications services.

'649 Claim 6: A communications device that shares a personal network number with other communications devices within a personal network, the communications device comprising:

a first *computer-readable medium* having stored thereon a first unique identifier that uniquely identifies the communications device within the personal network identified by the personal network number, where a second communications device within the personal network comprises a second computer-readable medium having stored thereon a second unique identifier

that uniquely identifies the second communications device within the personal network identified by the personal network number;

a management *logic* that manages a database containing routing information for an incoming communication directed at the personal network via the personal network number to be routed to a particular communications device within the personal network based on communications service content of the incoming communication, where the routing information relates the communications device to one or more communication services available to the personal network from a communications services provider by associating the first unique identifier chat uniquely identifies the communications device to the one or more communication services available to the personal network from the communications services provider; and

a *processor* that controls the management logic to remove the communications device from the personal network including modifying the database to unrelate the one or more communication services available to the personal network from the communications device and relate the one or more communication services available to the personal network to the second communications device by changing the database to disassociate the first unique identifier that uniquely identifies the communications device and the one or more communication services available to the personal network and associate the second unique identifier that uniquely identifies the second communications device with the one or more communication services available to the personal network.

'194 Claim 8: A device that is capable of sharing a common network address with other devices, the device comprising:

a *user interface* configured to enable a user to select a service available to but not associated with the device; and

logic in communication with the user interface configured to format a signaling word responsive to the user's selection, wherein the signaling word comprises a unique identifier that uniquely identifies the device among others sharing the common network address, and payload data configured to associate the service to the device via the unique identifier.

Doc. 1-1 at 17 ¶ 8; Doc. 1-2 at 16 ¶ 6; Doc. 1-3 at 17 ¶ 6; Doc. 1-4 at 17 ¶ 8 (emphases added).

The claims can be described as containing the following elements: '160 Claim 8 includes (1) a computer-readable medium, (2) input/output logic, (3) a processor, and (4) a transceiver; '671

Claim 6 and '649 Claim 6 contain (1) a computer-readable medium, (2) management logic, and (3) a processor; and '194 Claim 8 contains a (1) a user interface and (2) communications logic.

Maxon alleges that Funai sells televisions that directly infringe on these claims. Doc. 1 at ¶¶ 9, 12, 15, 18. It seeks reasonable royalties and interest. *Id*. at 10-11.

Discussion

As noted, Funai contends that the Maxon patents are invalid under *Alice*. The Federal Circuit has made clear that an analysis of patent eligibility may focus on particular representative claims. *See Content Extraction and Transmission LLC v. Wells Fargo Bank, N.A.*, 776 F.3d 1343, 1348 (Fed. Cir. 2014) ("The district court … correctly determined that addressing each claim of the asserted patents was unnecessary … because all the claims are substantially similar and linked to the same abstract idea.") (internal quotation marks omitted). The only claims cited in Maxon's complaint are the four claims set forth above and discussed below, and Funai argues in its opening brief that those claims are representative. Doc. 21-1 at 7-8. Maxon does not respond to this contention, thus forfeiting the point. *See Affinity Labs of Tx., LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1256 n.1 (Fed. Cir. 2016) ("[T]he parties agreed at the hearing before the magistrate judge that claim 1 was representative. In light of that concession and Affinity's failure to present any meaningful argument for the distinctive significance of any claim limitations other than those included in claim 1, we treat claim 1 as representative of all the claims.") (internal quotation marks omitted); *G&S Holdings LLC v. Cont'l Cas. Co.*, 697 F.3d 534, 538 (7th Cir. 2012) ("We have repeatedly held that a party waives an argument by failing to make it before the district court. That is true whether it is an affirmative argument in support of a motion to dismiss or an argument establishing that dismissal is inappropriate.") (citations omitted).

Under 35 U.S.C. § 101, "[l]aws of nature, natural phenomena, and abstract ideas are not patentable." *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2116 (2013). Funai argues that Maxon's patents are directed to an abstract idea without an underlying inventive concept, and thus fail to claim patentable subject matter. Doc. 21-1 at 8-20. Under *Alice* and *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66 (2012), the patent eligibility inquiry has two steps. First, the court "determine[s] whether the claims at issue are directed to [an abstract idea]." *Alice*, 134 S. Ct. at 2355. If so, then the court considers the elements of each claim "both individually and as an ordered combination to determine whether the additional elements transform the nature of the claim into a patent-eligible application." *Ibid*. In the second step, the court searches for "an inventive concept—*i.e.*, an element or combination of elements that is sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the ineligible concept itself." *Ibid*. (internal quotation marks and brackets omitted).

I. *Alice* Step One

As noted, *Alice* step one requires the court to determine whether the claims are directed to an abstract concept. Because "[t]he Supreme Court has not established a definitive rule to determine what constitutes an 'abstract idea' sufficient to satisfy the first step of the *Mayo/Alice* inquiry," the appropriate analysis "compare[s] claims at issue to those claims already found to be directed to an abstract idea in previous cases." *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1334 (Fed. Cir. 2016). There is no need to conduct that analysis here because Maxon concedes that "the patent claims are directed to the abstract idea of reversing a trend of centralized service management, allowing the consumer to control through decentralized management the services

that the consumer chooses to enjoy across her various devices." Doc. 30 at 9. The court accordingly will proceed to *Alice* step two.

II. *Alice* Step Two

Alice step two requires the court to "determine whether the claims do significantly more than simply describe the abstract method." *Affinity Labs*, 838 F.3d at 1262 (brackets omitted). The court must "look to see whether there are any additional features in the claims that constitute an inventive concept, thereby rendering the claims eligible for patenting even if they are directed to an abstract idea," and those additional features "must be more than well-understood, routine, conventional activity." *Ibid*. (internal quotation marks omitted). As noted, the court considers the elements of the contested claims both "individually and as an ordered combination" to determine if an inventive concept lies within. *Alice*, 134 S. Ct. at 2355 (internal quotation marks omitted). Maxon contends that the representative claims, although directed at an abstract concept, nonetheless combine to create an inventive concept in that they teach *how* to achieve the result of decentralized service management. Doc. 30 at 10-14.

A. The Individual Elements of the Representative Claims

The court will begin with '160 Claim 8, the elements of which are illustrative. The claim has four elements: a "computer-readable medium"; "logic"; "a processor"; and a "transceiver." Each element is subject to limitations; for example, the claim is not for *any* computer-readable medium, but for one with storage for addresses of an audio-video device, a personal network, and a service provider network. Similarly, the logic must be capable of receiving a desired change in service from a user (*e.g.*, "add Netflix to this TV"). The processor must be able to communicate with the logic and the computer-readable medium to prepare a signal representing

the desired change in service. And, finally, the transceiver must send and receive signals to and from the service provider.

The "computer-readable medium" element is not, by itself, inventive. The '160 patent's specification defines "computer-readable medium" as "any non-transitory medium that participates directly or indirectly in providing signals, instructions and/or data to one or more processors for execution." Doc. 1-1 at 11. As examples, the specification offers media such as disks, magnetic tape, "any other optical medium," punch cards, "any other physical medium with patterns of holes," and "any other medium from which a computer, a processor or other electronic device can read." *Id*. at 11-12. The only specific attribute of the medium is storage for "addresses" that correspond to devices and networks. The specification defines the term "address" as "includ[ing] but … not limited to one or more network accessible addresses, device identifiers, telephone numbers, IP addresses, url and ftp locations, e-mail addresses, names, a distribution list including one or more addresses, network drive locations, postal addresses, account numbers or other types of addresses that can identify a desired destination or device." *Id*. at 11. Given the breadth of these definitions, the computer-readable medium cannot be described as inventive; in plain English, it could be described as "something that stores data that a computer can read." As *Alice* its progeny make clear, components used only for "basic [computer] functions" are not inventive, and information storage falls into this category. *Alice*, 134 S. Ct. at 2359; *see also Content Extraction*, 776 F.3d at 1345, 1348 (noting that the concept of "storing information" is not inventive).

Nor is the "logic" element inventive. The element is an "input/output logic" that can "receive from a user a desired change to a service capable of being provisioned to the audio-video device from at least one service available generally to the personal network." Doc. 1-1 at

17 ¶ 8. The specification defines "Logic" as including, but not limited to, "hardware, firmware, software and/or combinations of each to perform a function(s) or an action(s), and/or to cause a function or action from another component." Doc. 1-1 at 12. Thus, the logic element merely describes (again, rephrased in plain English) "some means of receiving a desired change in available services." It does not describe *how* this result is accomplished, only that it *is* accomplished. That is not inventive. *See Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1348 (Fed. Cir. 2015) ("[The claim at issue] contains no restriction on how the result is accomplished. The mechanism for maintaining the state is not described.").

The "processor" element must communicate with the first two elements—the computer-readable medium and the logic—in order to prepare a signal to be sent to the service provider indicating the desired change of service. Doc. 1-1 at 17 ¶ 8. That is not inventive. Because the specification does not define the processor, the court is left to conclude that it is a generic processor. The functions described in the processor element are likewise generic; it simply processes data to reach a result. The use of conventional processors to carry out conventional processing tasks is not inventive. *See Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1320 (Fed. Cir. 2016) (describing a patent claim that featured generic processing equipment as non-inventive); *In re TLI Commc'ns LLC Patent Litig.*, 823 F.3d 607, 614 (Fed. Cir. 2016) (holding that computer components carrying out "well-understood, routine, activities previously known to the industry" are not patentable) (brackets omitted).

The final claim element, the "transceiver," is not inventive, either. As with the processor, the specification does not define the transceiver, so the court assumes that it is generic. The claim describes the transceiver as both providing an inbound signal to the service provider network indicating a desired change of service, and receiving an outbound signal responsive to

the initial request. As with the other three elements, this, by itself, is not inventive; rather, it is merely a generic component performing its generic role, which in this case is sending and receiving signals. *See Mortg. Grader, Inc. v. First Choice Loan Servs.*, 811 F.3d 1314, 1325 (Fed. Cir. 2016) ("[S]ending information over [a] network is not even arguably inventive.") (internal quotation marks omitted); *buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350, 1355 (Fed. Cir. 2014) (same).

'194 Claim 8 differs slightly from '160 Claim 8; rather than claiming three or four elements (medium, logic, processor, transceiver), it instead claims only a "user interface" and "logic." The "user interface" is not defined, so again the court assumes that Maxon intends a generic user interface, with the only limitation being that it is "configured to enable a user to select a service available to but not associated with the device." Doc. 1-4 at 17 ¶ 8. That merely takes a generic piece of technology and describes a result well within its normal functions, which is not inventive. *See Intellectual Ventures I LLC v. Capital One Bank (USA)*, 792 F.3d 1363, 1370 (Fed. Cir. 2015) ("[An] interactive interface limitation is a generic computer element."). And the claim's "logic" element has the same flaws as the logic element of '160 Claim 8—it is defined in purely functional terms, and thus describes nothing more than achieving a result, without any limitation as to how the result is achieved.

In sum, the individual elements of '160 Claim 8 and '194 Claim 8 are not, by themselves, inventive. The same holds true for the individual elements of '671 Claim 6 and '649 Claim 6; although the claim language of each differs slightly from that of the '160 patent, the differences are immaterial and the relevant definitions are the same. *Compare* Doc. 1-2 at 10, 16 ¶ 6 ('671 patent) *and* Doc. 1-3 at 11, 17 ¶ 6 ('649 patent) *with* Doc. 1-1 at 11-12, 17 ¶ 8 ('160 patent). The

core problem remains that each element of the representative claims describes generic technology functioning in a generic manner, which is not inventive.

B. The Ordered Combination of Elements

Because none of the individual elements is inventive, the inventive concept must be found in an ordered combination of these elements, if it is to be found at all. Maxon contends that the ordered combination of elements is inventive because the claims, while directed to an abstract concept and using generic technology, nonetheless teach *how* to achieve the concept using that technology. Doc. 30 at 10-14. Maxon is incorrect.

As shown above, each claim element represents a currently available generic computer technology, used in the way in which it is commonly used. The computer-readable medium is essentially memory, operating as it typically does. The logic is defined purely in functional terms, making the element little more than "something that can do what it is asked to do." The processor processes, while the transceiver sends and receives signals.

'160 Claim 8 contains all four elements, in that order, which purport to amount to "[a]n audio-video device capable of sharing services with a plurality of other devices within a personal network." Doc. 1-1 at 17 ¶ 8. Translating the claim language into plain English, the invention consists of some kind of memory capable of identifying the device and the networks to which it is connected, the ability to take instructions from a user concerning the device's capabilities, a processor that can take those instructions and use them in connection with the stored identification data, and the ability to send and receive signals based on the processor's activities. That describes only the desired result—increased user control over services available to him or her—without describing any *inventive* way that the result is reached. The only method of reaching the result the patent teaches is, in essence, use of generic computer components for their

standard purposes to achieve the result. Nothing about the order of the elements, or the way they are combined, suggests inventiveness. *See Virginia Innovation Sciences Inc. v. Amazon.com, Inc.*, ___ F. Supp. 3d ___, 2017 WL 64147, *12-13 (E.D. Va. Jan. 5, 2017) (describing as non-inventive a claim that did no more than describe a result to be achieved using generic elements operating in their typical manner).

The same holds for '671 Claim 6 and '649 Claim 6. Those claims consist of a device comprising a computer-readable medium, management logic that directs a database containing routing information, and a processor controlling the logic to modify the database to add or remove devices from a network. Again, this amounts to a description of generic computer components reaching a functional result to achieve an abstract concept, without any suggestion that the interaction of the components is anything but conventional. The same is true of '194 Claim 8. The user interface and logic are generic components, and are combined in a very simple, standard way: the user interface allows a user to give instructions to a device, and the logic interprets those instructions. This is basic computer organization and functionality, which is not inventive. *See Intellectual Ventures*, 792 F.3d at 1370 (holding that a description of generic computing components with an instruction to do nothing more than "apply [the abstract concept] on a computer" does not confer patent eligibility).

This result comports with that reached in *Virginia Innovation Sciences Inc. v. Amazon.com, Inc.*, *supra*, which held that claims directed toward compression technology for converting video images on a mobile device screen to those appropriate for television are patent ineligible. 2017 WL 64147 at *12-13. One of the claims at issue in that case was:

> a means for processing the video signal to produce a converted video signal for use by the alternative display terminal, wherein processing by the means for processing the video signal includes converting the video signal from a compression format appropriate for the mobile terminal to a display format for

> the alternative display terminal that is different from the compression format, such that the converted video signal produced by the means for processing the video signal comprises a display format and a power level appropriate for driving the alternative display terminal.

Id. at *12 (brackets omitted). The court explained that "[t]he claim does not specify the power level or the conversion method, aside from the fact that the signal is compressed. … [T]he purportedly novel [invention] … describes an end[] that could be performed in any number of ways by a variety of devices." *Id*. at *13. The same is true here; the representative claims essentially describe a functional result, without any suggestion as to any inventive technological means of achieving that result. *See Internet Patents Corp.*, 790 F.3d at 1348 ("[The claim] contains no restriction on how the result is accomplished. The mechanism for [accomplishing the result] is not described, although this is stated to be the essential innovation.").

Maxon contends that three recent decisions support a finding of patent eligibility here: *Bascom Global Internet Services v. AT&T Mobility LLC*, 827 F.3d 1341 (Fed. Cir. 2016); *Enfish*, 822 F.3d at 1327; and *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245 (Fed. Cir. 2014). In each case, the Federal Circuit reversed a district court's decision that a particular patent was directed to patent ineligible subject matter. All three cases are distinguishable.

DDR Holdings addressed a patent directed toward a particular e-commerce system in which a website visitor clicking on an embedded advertisement is directed to a different website, with the "look and feel" of the first website, where she could purchase the advertised product. 773 F.3d at 1249-50. Noting that the patent's claims did not "merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the internet," but instead claimed solutions "necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks," *id*. at 1257, the Federal Circuit held that the claims were directed to something more than an abstract

concept. *Id*. at 1259. As the court explained, by "incorporat[ing] elements from multiple sources in order to solve a problem faced by websites on the Internet," the claims "amount[ed] to an inventive concept …, rendering the claims patent-eligible." *Ibid*. *DDR Holdings* thus addressed a situation where the concept itself was not abstract and where, in any event, the specific combination of claim elements resulted in an inventive solution to a problem specific to the internet. By contrast, for Maxon's patents, the concept is concededly abstract, and the problem (how to improve consumer control over services) is not unique to computers and the internet. *See Affinity Labs*, 838 F.3d at 1261-62 (distinguishing *DDR Holdings* on the ground that the claims in *DDR Holdings* were directed to a "novel" challenge rather than fundamental or longstanding principles and practices, and were directed to the solution of a technological problem improving computer/network functionality).

Enfish concerned a patent covering a "self-referential database," which taught a means of configuring data in a computerized table to improve searchability and organization. 822 F.3d at 1333, 1337. The district court held that the claims were directed toward "the [abstract] concept of organizing information using tabular formats." *Id*. at 1337. The Federal Circuit reversed, holding that this view of the claims did not consider their specificity and how they operated to improve computer functionality in practice. *Id*. at 1338. Reasoning that "the self-referential table recited in the claims on appeal is a specific type of data structure designed to improve the way a computer stores and retrieves data in memory," the court held that "the claims are directed to a specific implementation of a solution to a problem in the software arts … [and] are not directed to an abstract idea." *Id*. at 1339. Like *DDR Holdings*, then, *Enfish* upheld the validity of the challenged patent at *Alice* step one, not step two.

The claims in *Bascom* were directed to an abstract concept, filtering internet content, so the Federal Circuit had to reach *Alice* step two. 827 F.3d at 1349. The court held that although the limitations within the patent were "well-known generic computer components," they were combined in such a way as to be inventive. *Id*. at 1349-50. Specifically, while the filtering tool itself was not inventive, its *location* within the system described was inventive because it permitted a user to obtain "both the benefits of a filter on a local computer and the benefits of a filter on the ISP server." *Id*. at 1350.

The patent in *Bascom* described both a technical problem (a lack of customizability in internet filtering arising from where filtering technology was installed) and a technical solution to that problem (locating the filtering software at a point in the system that would allow greater customizability). *Ibid*. By contrast, the claims in Maxon's patents attempt to solve not a technical problem, but rather the broader conceptual problem of increasing user control over various services. And the proffered means of solving that problem is not the kind of technical solution taught by the patent in *Bascom*—using known computer components in an innovative way—but rather simply a suggestion that a user of services should be able to communicate with service providers using technological, not conventional, means.

Alice and its progeny stand for the proposition that a patent teaches patentable subject matter only if it offers a specific technical solution to a specific technical problem, not if it offers a sweeping recitation purporting to patent the concept of solving an abstract problem through generic technical means. *See Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1299 (Fed. Cir. 2016) (describing *Bascom* as distinguishing "ineligible abstract-idea-based solutions implemented with generic technical component in a conventional way" from "eligible technology-based solution[s] and software-based invention[s] that improve the performance of

the computer system itself") (internal quotation marks and brackets omitted); *Synopsis, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1152 (Fed. Cir. 2016) ("Unlike the claims in *DDR Holdings* and *Bascom*, the Asserted Claims do not introduce a technical advance or improvement."); *Virginia Innovation Sciences Inc.*, 2017 WL 64147, *15 (noting that in *Bascom*, "each one of the steps in the 'ordered combination' was specific, and their organization created a narrow solution to a computer-centric problem"). Despite their extensive verbiage, when stripped to their core, Maxon's patents fall on the wrong side of the line. They are directed to the abstract concept of increasing user control over services. They do not solve a specific technical problem in this field, but instead offer only the notion of using generic computer components for their generic purposes in order to achieve a result, without describing any inventive way that the result is achieved. This fails *Alice* step two, meaning that the patents claim patent-ineligible subject matter and are invalid under § 101. It necessarily follows that Maxon's infringement claims must be dismissed.

Conclusion

Funai's motion to dismiss is granted. Because the patents are directed at subject matter that is not patent eligible as a matter of law, leave to amend would be futile, so the dismissal is with prejudice. *See Snowcast Solutions, LLC v. Endurance Specialty Holdings, Ltd.*, 2016 WL 1161299, *6 (N.D. Ill. March 23, 2016).

May 23, 2017

United States District Judge

US008989160B1

(12) **United States Patent**
Marsico et al.

(10) **Patent No.: US 8,989,160 B1**
(45) **Date of Patent: *Mar. 24, 2015**

(54) **NETWORK DEVICE MANAGEMENT**

(75) Inventors: **Robert G. Marsico**, Las Vegas, NV (US); **Marilyn J. Marsico**, Las Vegas, NV (US); **Carl A. Steen**, North Barrington, IL (US); **Maxwell A. Marsico**, Las Vegas, NV (US)

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/403,572**

(22) Filed: **Feb. 23, 2012**

Related U.S. Application Data

(60) Continuation of application No. 12/186,158, filed on Aug. 5, 2008, now abandoned, which is a continuation of application No. 11/668,247, filed on Jan. 29, 2007, now Pat. No. 7,489,671, which is a division of application No. 10/778,443, filed on Feb. 13, 2004, now Pat. No. 7,171,194, said application No. 12/186,158 is a continuation of application No. 10/779,270, filed on Feb. 13, 2004, now Pat. No. 7,486,649.

(60) Provisional application No. 60/447,436, filed on Feb. 14, 2003.

(51) **Int. Cl.**
H04M 3/42 (2006.01)

(52) **U.S. Cl.**
USPC **370/338**; 370/352

(58) **Field of Classification Search**
None
See application file for complete search history.

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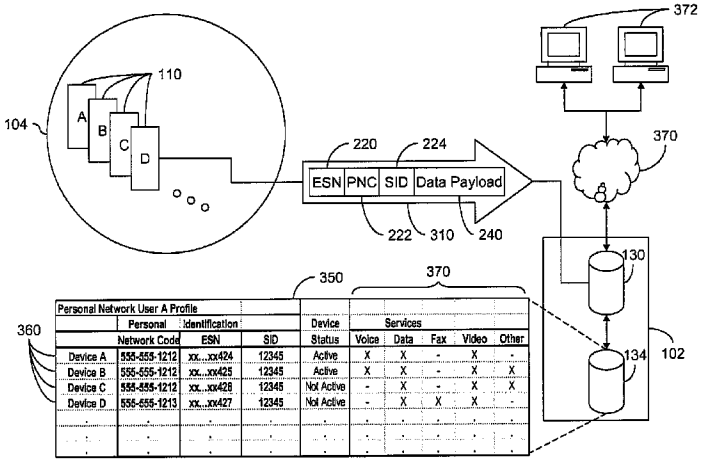
(57) **ABSTRACT**

A method is provided to dynamically interact with a plurality of enabled devices within a personal network. Individual ones of the devices are configured to interoperate with a service provider network and configure or alter services to individually identifiable devices.

18 Claims, 7 Drawing Sheets



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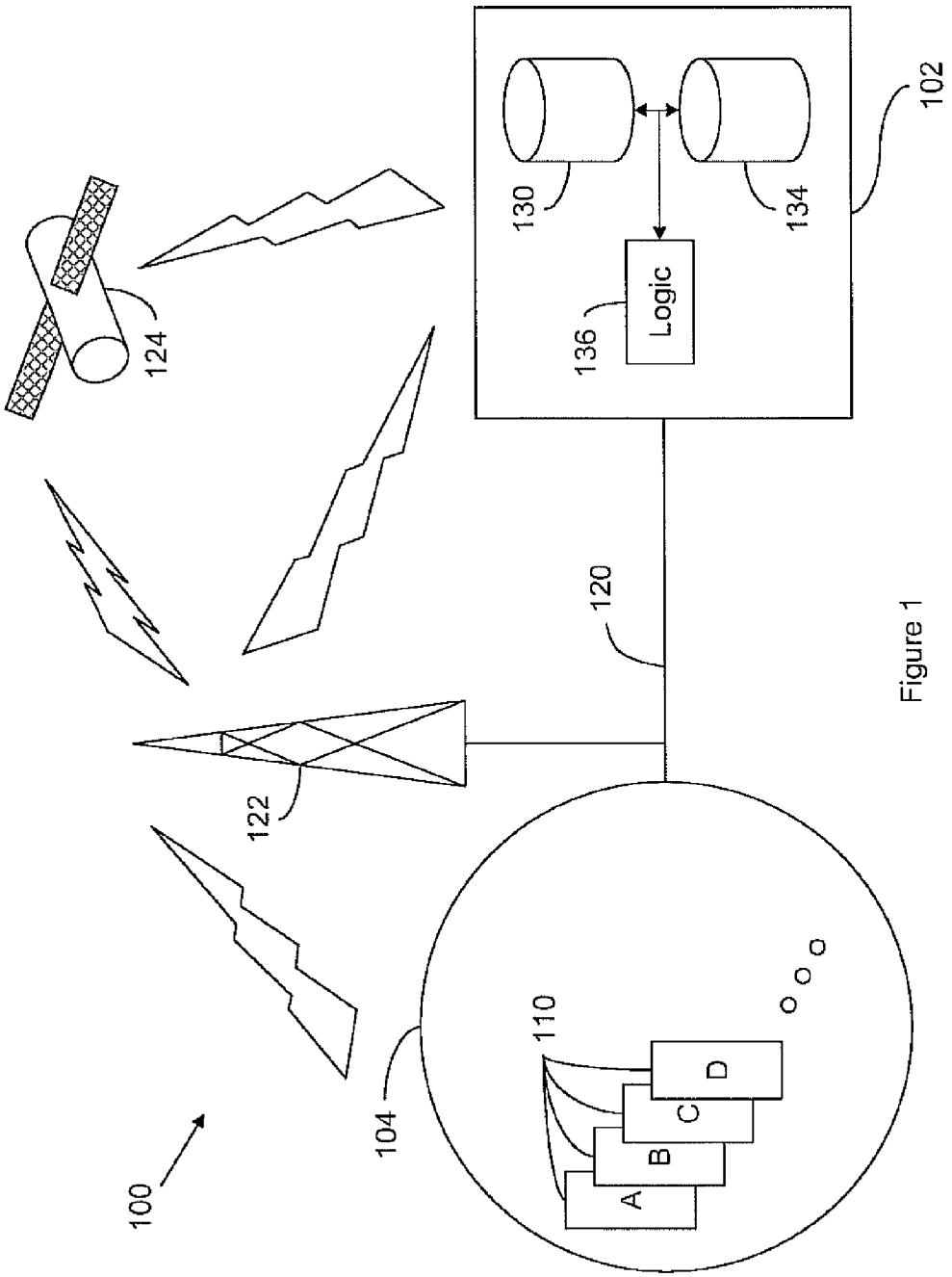

Figure 1

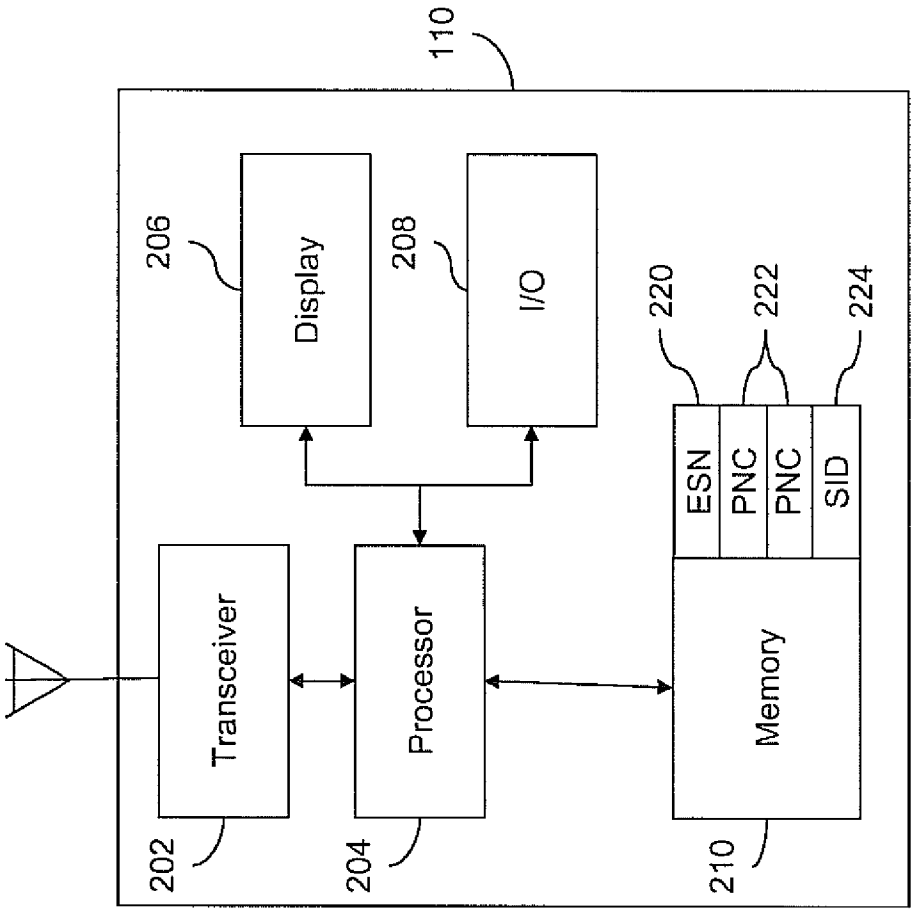
110
206
Display
208
I/O
220
222
224
ESN
PNC
PNC
SID
Transceiver
Processor
Memory
202
204
210

Figure 2

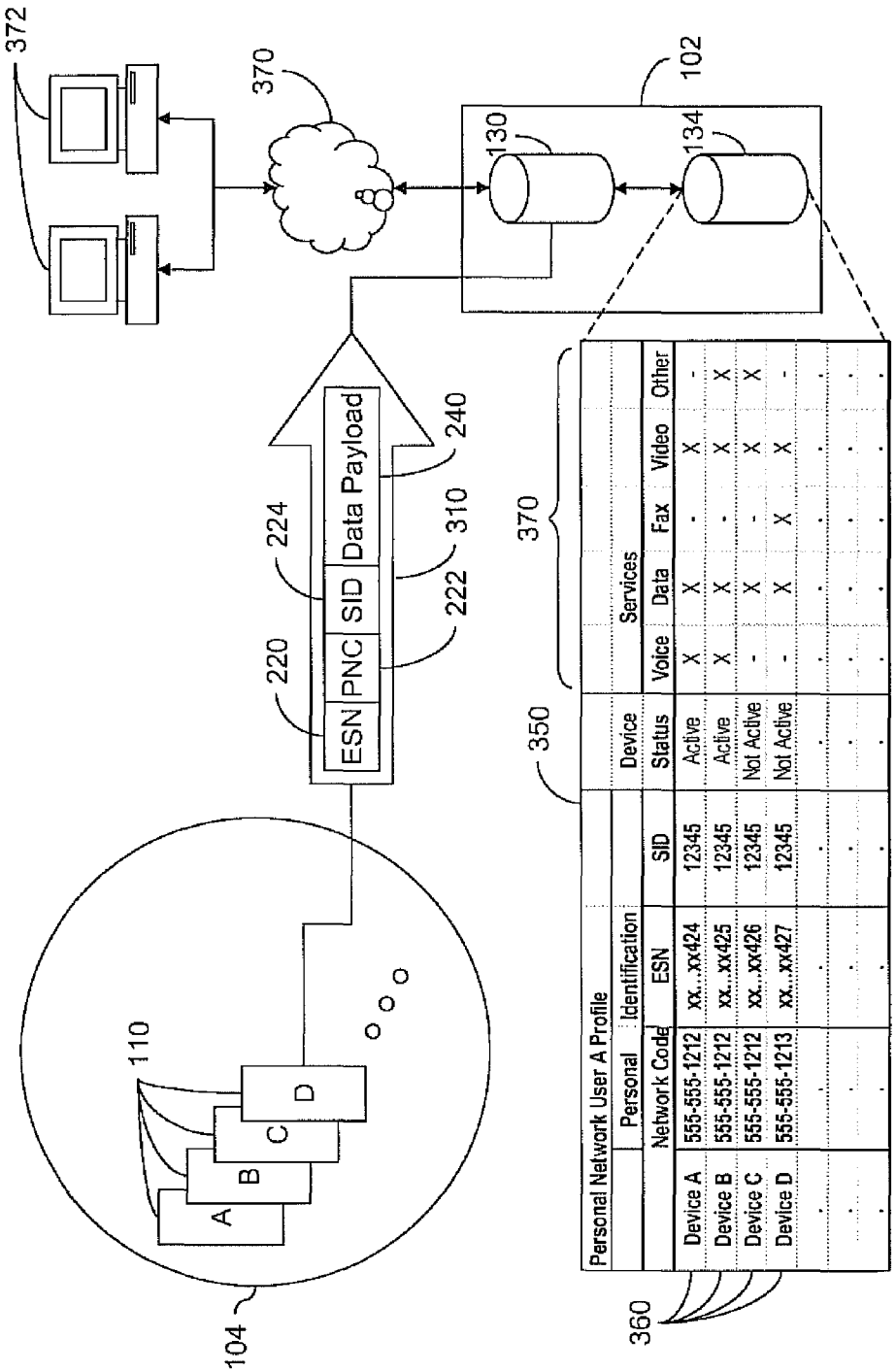
372
370
102
130
134
240
224
310
222
220
ESN
PNC
SID
Data Payload
110
A
B
C
D
104
350
370
360
Personal Network User A Profile
Personal Identification
Device
Services
Network Code
ESN
SID
Status
Voice
Data
Fax
Video
Other
Device A
555-555-1212
xx...xx424
12345
Active
X
X
-
X
-
Device B
555-555-1212
xx...xx425
12345
Active
X
X
-
X
X
Device C
555-555-1212
xx...xx426
12345
Not Active
-
X
-
X
X
Device D
555-555-1213
xx...xx427
12345
Not Active
-
X
X
X
-

Figure 3

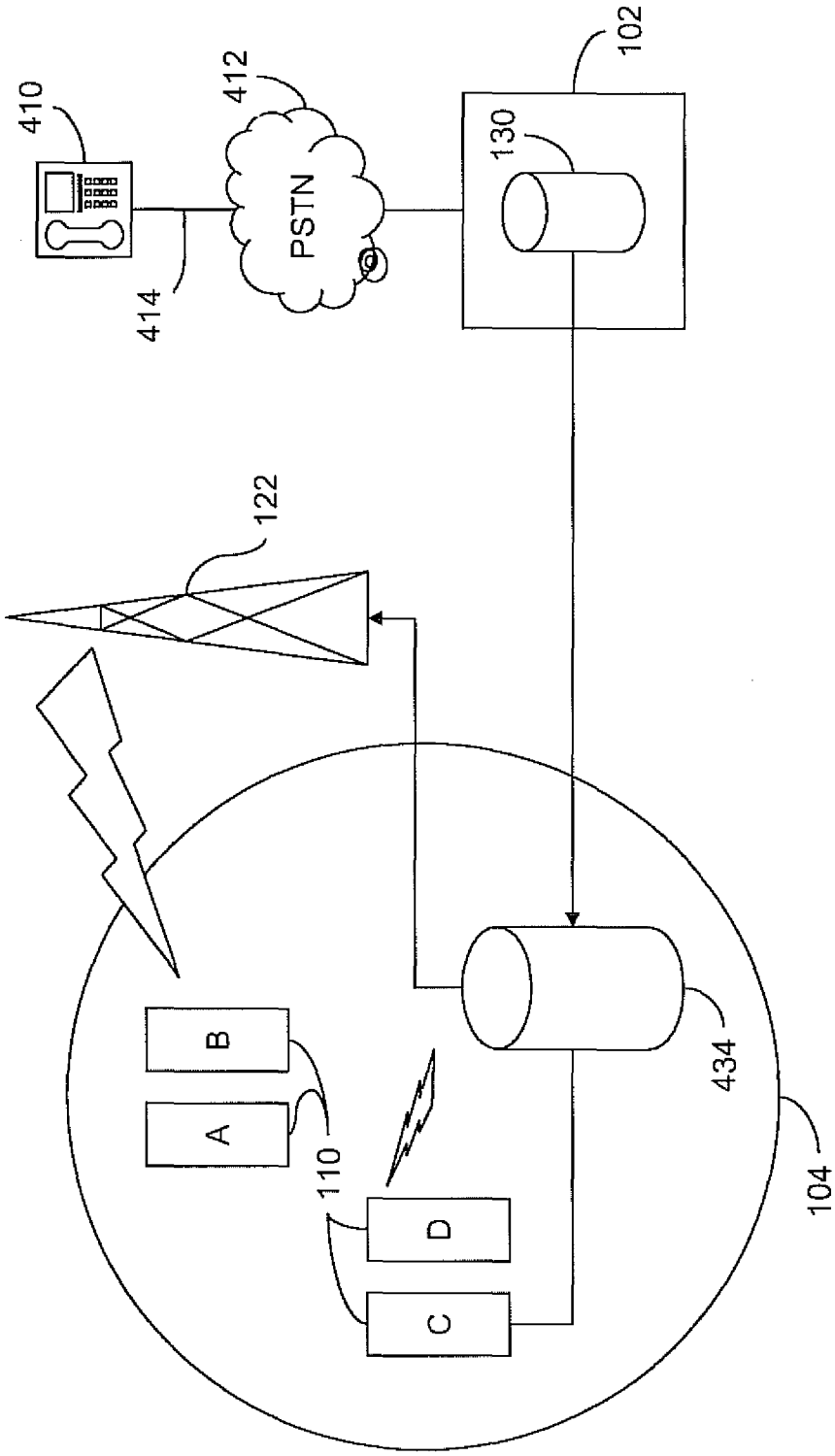

Figure 4

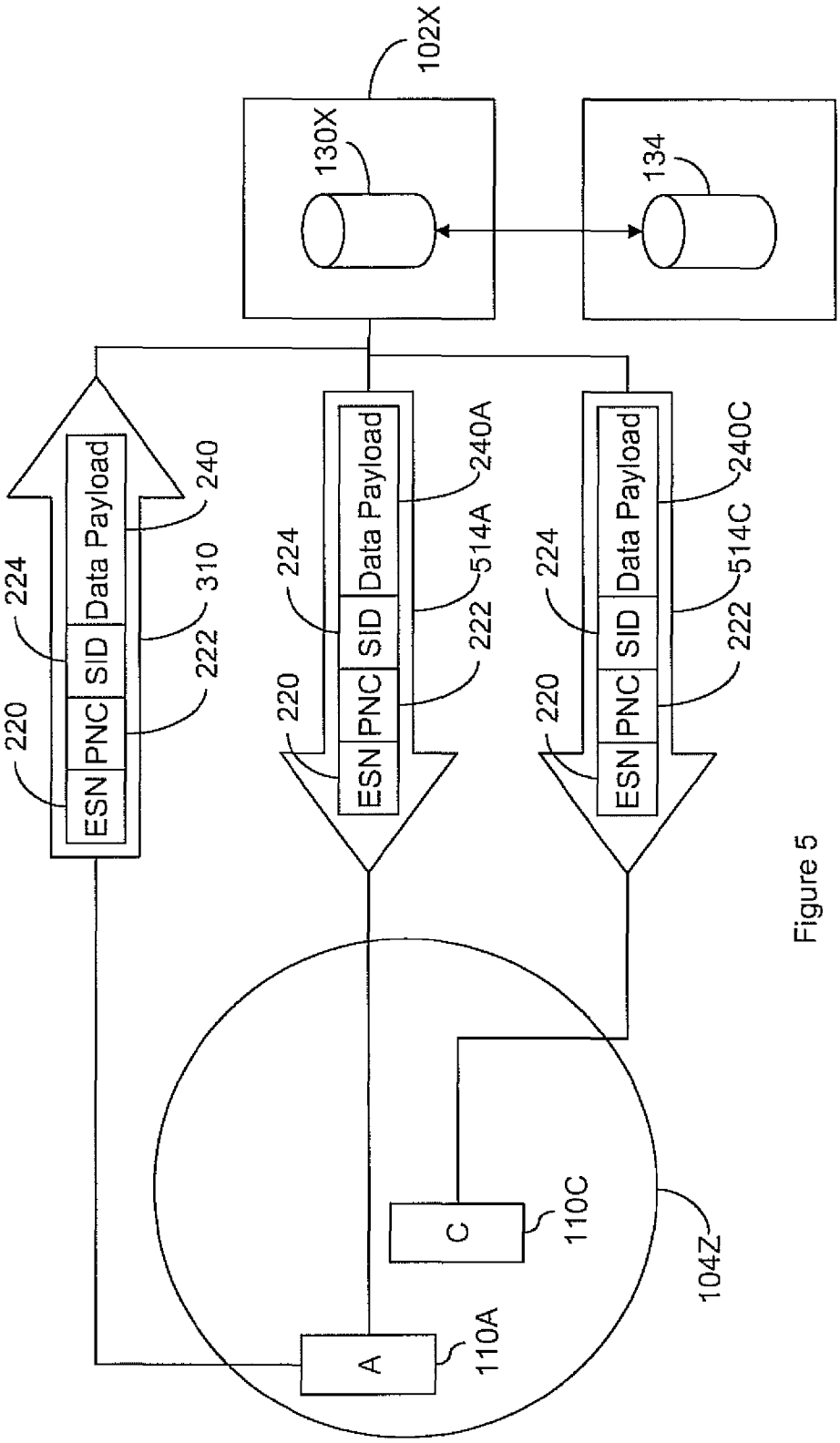
102X
130X
134
ESN
PNC
SID
Data Payload
220
222
224
240
310
240A
514A
240C
514C
A
110A
C
110C
104Z

Figure 5

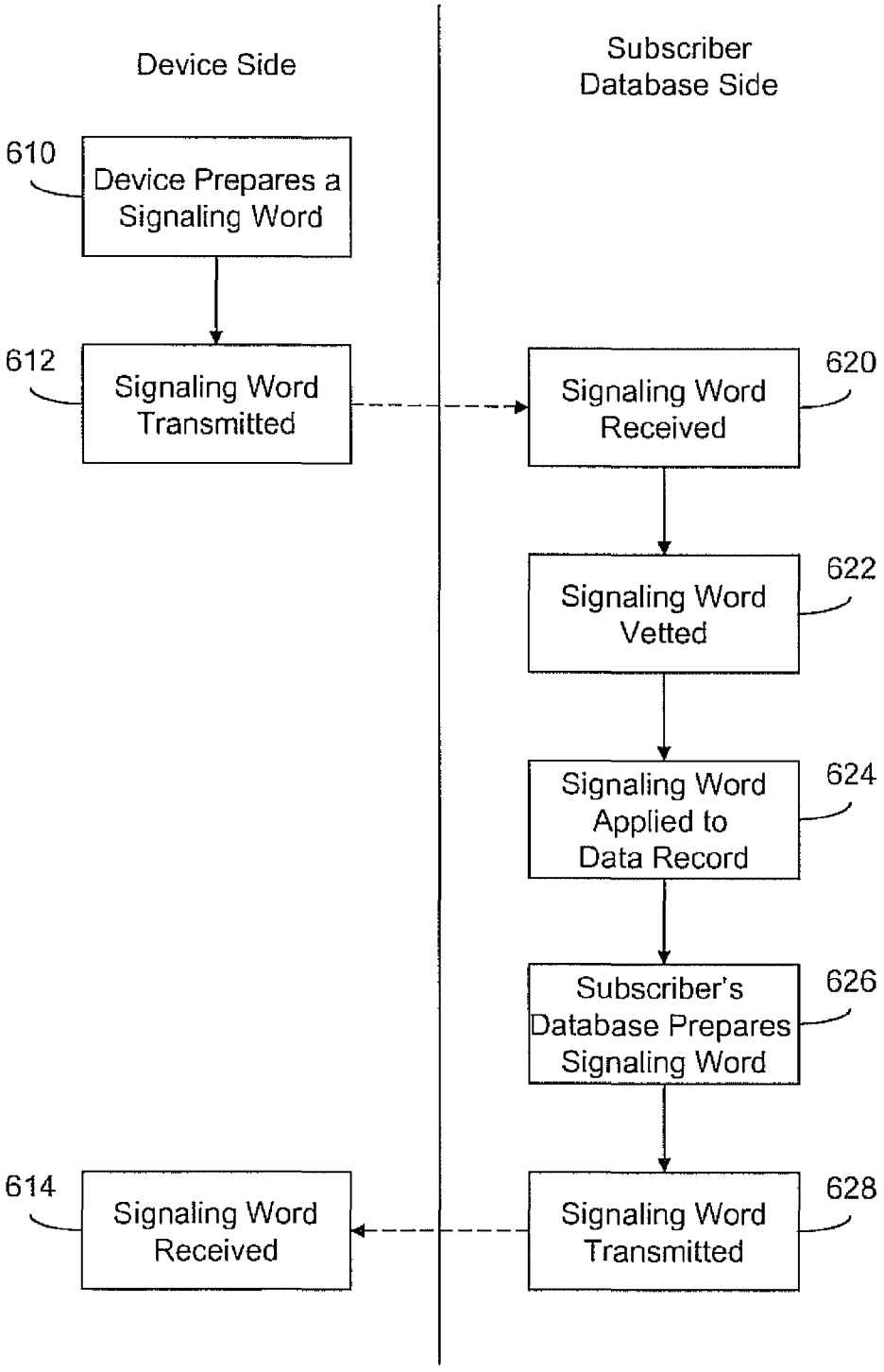
Device Side
Subscriber Database Side
610
Device Prepares a Signaling Word
612
Signaling Word Transmitted
620
Signaling Word Received
622
Signaling Word Vetted
624
Signaling Word Applied to Data Record
626
Subscriber's Database Prepares Signaling Word
628
Signaling Word Transmitted
614
Signaling Word Received

Figure 6

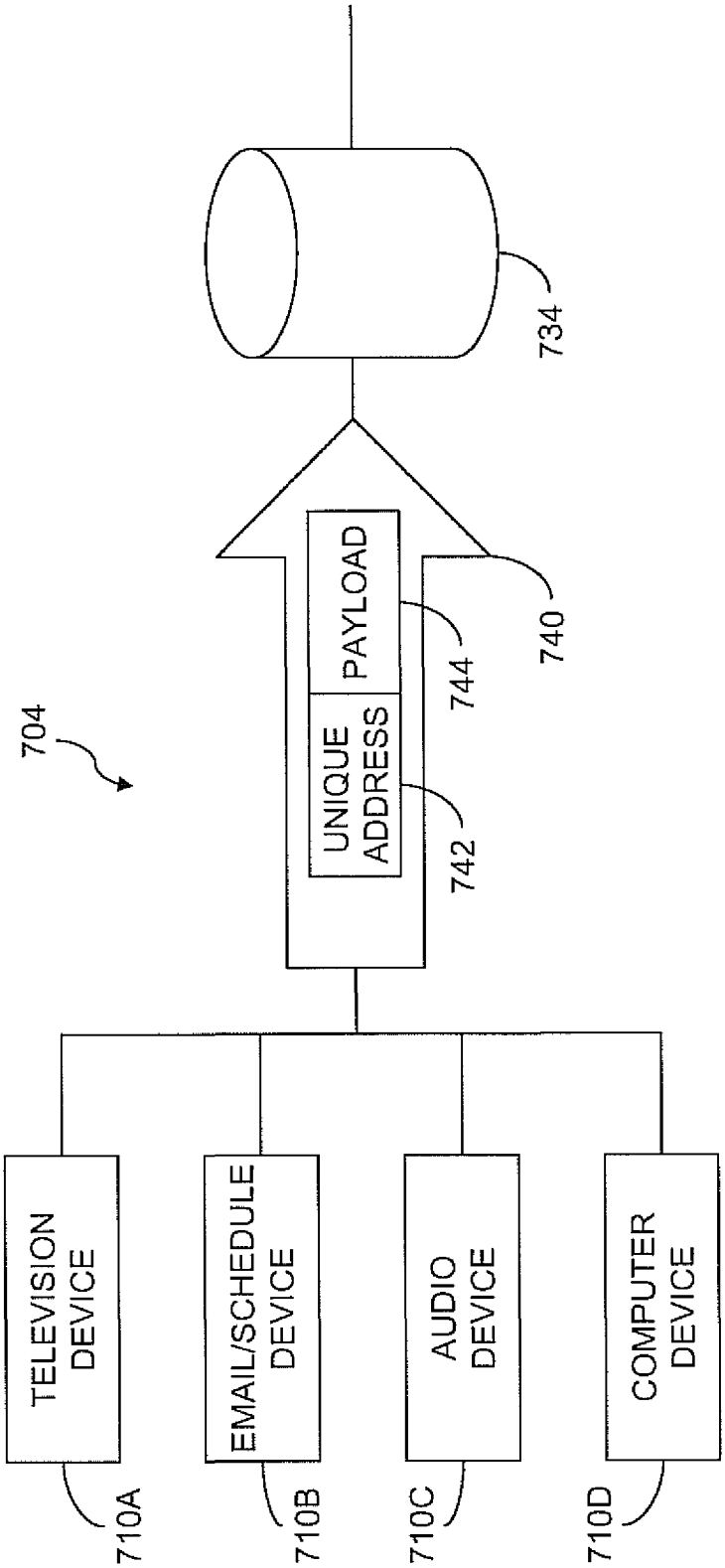
734
740
PAYLOAD
744
UNIQUE ADDRESS
742
704
TELEVISION DEVICE
EMAIL/SCHEDULE DEVICE
AUDIO DEVICE
COMPUTER DEVICE
710A
710B
710C
710D

Figure 7

NETWORK DEVICE MANAGEMENT

RELATED APPLICATIONS

This application is a continuation of and claims priority to application Ser. No. 12/186,158 filed Aug. 5, 2008, which is a continuation of application Ser. No. 10/626,343 filed Jul. 24, 2003, which claims the benefit of provisional application Ser. No. 60/447,436 filed Feb. 14, 2003, and all are incorporated herein by reference.

BACKGROUND

The present invention relates generally to network systems. It finds particular applicability in conjunction with communication based networks and will be described with particular reference thereto. It is to be appreciated however, that the invention finds further application in systems and devices where it is desirable to use a single address with a plurality of devices.

The first generations of wireless mobile phones were large in size and expensive to use. However, over time, technology has reduced the size of the mobile telephone and lowered its cost of use, thereby enhancing mobility and expanding usage. With each subsequent generation of technology, the size of the device has been reduced while the functionality and types of devices available have increased dramatically.

With the introduction of digital cellular telephones, laptop computers, multi-function personal handheld devices, one can now send email, surf the web, make telephone calls, receive and send instant/short messages, view personal calendars, video conference, and send pictures seamlessly and continuously while connected to one or more wireless or wireline communications networks.

However, as service providers and equipment manufacturers drove device/service integration, complex devices were created that attempted to be all things to all users. As the complexity of communication devices increased, it created user confusion and communication solutions that were not optimally designed for any one specific intended use. Miniature thumb-operated keyboards, tiny screens so small the content and images are compromised, hanging earpieces, amplified speakers, and dangling microphones are prevalent in such devices and are often also tethered to an automobile cigarette lighter. To further complicate device designs, communication appliances are being configured as information management devices, and information management devices are being configured as communication appliances. These combined functions have resulted in designs that are unable to do either comfortably. These communication solutions quickly become tedious and annoying to use since the miniaturization and application integration was achieved by compromising the needs of the user.

SUMMARY

In one embodiment, an increased number of communication devices used by end-users are provided. Particular devices are optimized for specific tasks and applications. Laptop computers, personal digital assistants, video telephones, small telephones for travel, and traditional sized phones for home or automobile use are designed and optimized for a specific use.

In another embodiment, a means to effectively manage devices is provided. The devices are enabled to communicate within and across a communications network. As service providers consolidate their networks in order to support multiple services (voice, video, data), it is increasingly common for end-users to subscribe to multiple services while utilizing multiple appliances on a service providers network.

In another embodiment, a method and system are provided that allow a communication services user to use and manage a personal network of devices that operates as a single account utilizing one or more telephone number(s) within a service provider's network. This enables a de-centralized means to provide subscriber driven network device management and service provisioning.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings which are incorporated in and constitute a part of the specification, embodiments are illustrated which, together with the detailed description given below, serve to describe exemplary embodiments. It will be appreciated that the illustrated boundaries of elements (e.g. boxes, groups of boxes, or other shapes) in the figures represent but exemplary boundaries. One of ordinary skill in the art will appreciate, for example, that one element may be designed as multiple elements or that multiple elements may be designed as one element. An element shown as an internal component of another element may be implemented as an external component and vice versa.

FIG. **1** is a system diagram illustrating an embodiment of a network.

FIG. **2** is a functional block diagram illustrating an embodiment of a network device.

FIG. **3** is a system diagram illustrating another embodiment of a network and an exemplary record from a computer-readable medium

FIG. **4** is a system diagram illustrating another embodiment of a network.

FIG. **5** is a system diagram illustrating one embodiment of a system for managing a network.

FIG. **6** illustrates one embodiment of a methodology for managing a network of devices.

FIG. **7** is a system diagram illustrating another embodiment of a network.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

The following description includes definitions of selected terms used throughout the disclosure. Both singular and plural forms of all terms fall within each meaning:

"Address", as used herein, includes but is not limited to one or more network accessible addresses, device identifiers, telephone numbers, IP addresses, url and ftp locations, e-mail addresses, names, a distribution list including one or more addresses, network drive locations, postal addresses, account numbers or other types of addresses that can identify a desired destination or device.

"Computer-readable medium", as used herein, refers to any non-transitory medium that participates directly or indirectly in providing signals, instructions and/or data to one or more processors for execution. Such a medium may take many forms, including but not limited to, non-volatile media, volatile media, and transmission media. Non-volatile media may include, for example, optical or magnetic disks. Volatile media may include dynamic memory. Transmission media may include coaxial cables, copper wire, and fiber optic cables. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, or any other magnetic medium, a CD-ROM, any other optical medium, punch cards, papertape, any other physical

medium with patterns of holes, a RAM, a PROM, an EPROM, a FLASHEPROM, any other memory chip or cartridge, or any other medium from which a computer, a processor or other electronic device can read.

"Logic", as used herein, includes but is not limited to hardware, firmware, software and/or combinations of each to perform a function(s) or an action(s), and/or to cause a function or action from another component. For example, based on a desired application or needs, logic may include a software controlled microprocessor, discrete logic such as an application specific integrated circuit (ASIC), a programmed logic device, memory device containing instructions, or the like.

"Signal", as used herein, includes but is not limited to one or more electrical signals, analog or digital signals, one or more computer or processor instructions, messages, a bit or bit stream, or other means that can be received, transmitted, and/or detected.

"Software", as used herein, includes but is not limited to one or more computer readable and/or executable instructions that cause a computer or other electronic device to perform functions, actions, and/or behave in a desired manner. The instructions may be embodied in various forms such as routines, algorithms, modules or programs including separate applications or code from dynamically linked libraries. Software may also be implemented in various forms such as a stand-alone program, a function call, a servlet, an applet, instructions stored in a memory, part of an operating system or other type of executable instructions. It will be appreciated by one of ordinary skill in the art that the form of software is dependent on, for example, requirements of a desired application, the environment it runs on, and/or the desires of a designer/programmer or the like.

"User", as used herein, includes but is not limited to one or more persons, software, computers or other devices, or combinations of these.

Generally speaking, one embodiment of a system and method is provided to enable a user to define, control and operate a personal network of one way or bi-directional devices capable of accessing a service provider's network, receiving services, or both. This can be accomplished by assembling a network of personal communications devices that may include transmitters, receivers or transceivers that share or can be configured to share the same address. The devices are configured to be compatible or selectively compatible with the service provider's network. In addition to assembling the network of personal communications devices, the user subscribes to one or more services made available by the service provider. Furthermore, the service provider's network uses a signaling protocol that allows for communications between device transceivers within the personal network and database units within the service provider's network.

In a simple exemplary network, a telephone service provider assigns a telephone number to a subscriber. In this simple network, the subscriber has multiple telephones, each used in different places and at different times. The subscriber registers each telephone including a unique serial number with the telephone service provider's database and a subscriber profile is created. The assigned "telephone number" actually refers to the subscriber profile identifying the subscriber's network. Each telephone occupies a record in the subscriber profile and is individually identifiable by the unique serial number. Once established, for example, a mobile telephone is selected to receive all incoming telephone calls. Once the subscriber returns home, the home phone replaces the mobile phone as the desired destination for all incoming calls (either automatically or through manual selection). In an embodiment, incoming signals such as calls, can be directed to the subscriber profile and a database dip can be configured to return the subscriber desired routing data to complete the call to a device. In an embodiment, outgoing signals such as calls, can be transmitted from a telephony enabled device over transmission medium to the subscriber's database, and/or to another device. Conveniently, charges associated with any of the devices in the subscriber's network can be aggregated onto a single bill.

In a more general embodiment, upon user initiation, a device communicates with a service provider's network. The device transmits a request to authentication logic operated by the service provider for access to some or all of the services available to the service provider's network, for example telephone services, text messaging services, video services and other services. Logic within the device can be configured to negotiate for access to services available from the service provider. Responsive to the request, the authentication logic authenticates the device's request for access and selectively makes available to or authorizes the device to use those services available from the service provider's network.

In another embodiment, the user initiates a request to modify or otherwise change the status of one or more devices within his personal network by modifying the service provider's database. The status of a device includes available services assigned to the device, and the device's registration on the network, for example, enabled or disabled from network participation. It will be appreciated that one device on the personal network can be configured to check or alter the status of that device, and/or other devices within the personal network. Moreover, device status can alternately be checked or configured via other mechanisms such as over the internet, through communication with a customer service feature and the like.

One embodiment of the network device management is illustrated in FIG. **1**. Network **100** includes a service provider network operations center **102**, a plurality of personal networks **104** (one shown) and, a plurality of personal network devices **110** (A-D shown). The network devices **110** communicate with the service provider's network **102** across one or more transmission mediums such as conventional wireline networks **120**, which include twisted pair, Hybrid Fiber Coaxial (HFC) fiber optics and the like; terrestrial wireless networks **122**; and satellite or other aloft networks **124**. The service provider's network **102** provides information such as communication services, voice, video, and/or data to personal networks **104** of network devices **110**. It should be appreciated that the service provider may directly provide all of the services, or may act as a distributor of other providers' services. It should be further appreciated that network devices **110** include a variety of portable, mobile, analog cellular or digital devices, video and audio equipment, desk-top computers and the like configurable to have discrete addresses identifiable from the common address.

The service provider's network **102** uses transceiver equipment (not shown) coupled with one or more of the transmission mediums **120-124** to communicate information, network control, and system resource management to and/or from the personal networks **104**. The service provider's network **102** includes computer-readable media such as database units that can be either centralized or distributed. Exemplary database units include an authentication and authorization database **130**, and a subscriber database **134**. Logic **136** is configured to process requests for access to network services accessing authentication and authorization database **130** and accessing or modifying stored information specific to each user, per-

sonal network **104**, and network device **110**. The subscriber database **134** is arranged to identify specific information regarding each user's personal network **104**, network devices **110** and authorized network services. In the illustration, each database unit is in data communication with and under the control of logic **136** associated with the service provider's network **102** but such centralized control can be readily decentralized or segregated into two or more distinct elements with no loss of functionality.

With reference to FIG. **2**, an embodiment of a network device **110** includes a transceiver **202** in communication with a logic that may take the form of processor **204**. The transceiver **202** may be configured to transmit, receive, or both signals including voice, video, and/or data transmissions formatted under several signaling protocols. While the transceiver **202** is illustrated connected to an antenna, wired connections are also envisioned for network devices **110**. The processor **204** can also be in data communication with display logic **206** and input/output logic **208**. A storage device medium **210** can be provided to store encryption algorithms, software programs, algorithms used to process signals and/or algorithms or logic used to implement communication controls and network system management. Storage device **210** can be configured with one or more computer-readable media or operably configured logic.

Additionally, the processor **204** is configured to access identification codes, such as the illustrated electronic serial number (ESN) **220**, personal network code (PNC) **222**, and system identification code (SID) **224**. As further discussed below, these identification codes **220**, **222**, **224** enable, device management and communication. For example, in one embodiment ESN **220** corresponds to a device **110**, PNC **222** corresponds to a personal network **104**, and SID **224** corresponds to a service provider's network **102**.

In one embodiment (ESN) **220** is generated from an individual device's hardware identification code. Typically, hardware identification codes are manufacturer assigned indicia which are unique to each network device. In another embodiment, ESN **220** is assigned by a service provider and held in memory. It should be appreciated that these identification codes need not be static, and can cycle or hop for example for security.

In another embodiment, each network device **110** stores or is assigned a personal network code (PNC) **222**. The personal network code **222** is preferably unique within the communication network **100** but may be common among the network devices **110** within a personal network **104**. As illustrated, each personal network **104** can have one or more personal network codes **222** corresponding to, for example, a single device belonging to more than one personal network such as in the case of a single home phone belonging to the personal networks of each occupant. The personal network code **222** may be a hexadecimal number or any address assigned by the user or the network service provider suitable to identify the personal network of devices.

Yet another embodiment includes the service provider assigning a network device **110** a system identification code (SID) **224**. This system identification code **224** can be unique to the service provider and can be assigned to all network devices **110** that operate within the network **100**. That is, the system identification code **224** is common to selected operable devices in the plurality of personal networks **104** in the overall network **100**. The network device **110** has data access to the system identification code **224**.

With reference now to FIG. **3**, operation of a system according to an embodiment of the present invention is illustrated. Personal network **104** comprises one or more network devices **110** subscribing to service(s) provided by or available through the service provider's network **102**. Each network device **110** is registered or registerable with the service provider network **102**. Registration of each network device **110** may be accomplished either remotely or locally using either manual or automated means. Registration of each network device **110** can include the creation or modification of data fields within subscriber database **134**, and authentication and authorization database **130**. Each user's personal network **104** is represented within the subscriber database **134** with a profile, for example, profile **350** including individual device records **360**. These individual device records are populated with fields identifying the device, the network, the like and also various services **370** available from the service provider's network. The authentication and authorization database **130** comprises fields for those identifiers associated with each device **110** registered, for example, the ESN **220** and PNC **222**. Once a user has registered and enabled a network device **110** on the service provider's network **102**, the network devices may communicate on, with, and through the communication network.

In another embodiment, the user can utilize one or more of the network devices **110** concurrently. Each device **110** can be used for one or more similar or different services **370** provided by the service provider. For example, in the telephone context, a device may be configured for audio services while another device may be configured for text-based services. Alternatively, a single device may be configured for both audio and text services. In yet another alternative, services may be segregated on an in-coming or out-going basis.

Initiated by the user or upon a triggering event, a network device **110** will signal the service provider's network **102** by sending an inbound signaling word (ISW) **310**. As further discussed below, the ISW **310** can be configured to manage devices **110** in the personal network **104** by registering devices or changing services **370** available to specific devices. In the illustrated embodiment, the ESN **220**, personal network code **222**, system identification code **224**, and data payload **240** comprise the ISW **310**, which is used to access the service provider's network **102**. The specific format of the ISW **310** is not integral to this invention. However, the ISW **310**, or communication link to the service provider's network **102**, includes a mechanism to identify the specific network **104** and a mechanism to communicate data.

A user can initiate a transmission in a variety of ways including, but not limited to: using an input device such as a keypad or keyboard, speaking into a microphone, pushing a button, using a pointing device, manipulating a joystick, using a dial or other type of mechanism, placing a device in a cradle, or other triggering mechanisms based on time, location, motion and the like. Regardless of the means in which the ISW **310** is initiated, the result includes transmission of the ISW **310**. In the illustrated example, the ISW **310** transmits from the personal network **104**, through the communications medium **120-124**, to the service provider's network **102**. The service provider's network **102** receives the transmission and logic (not shown) decodes the ISW **310** into its component data fields. The authentication and authorization database **130** is used to validate the received ISW **310** for access to the network resources including the personal network user profile **350**. Once authenticated, components of the ISW **310**, for example, the ESN **220**, PNC **222** and the data payload **240** are communicated to the subscriber database **134** where the personal network profile is stored. The logic used to control and manipulate the subscriber database **134** decodes the data payload **240** of the ISW **310**. Using the ESN **220** and PNC **222** (or other entries or combinations thereof) to

index to the correct personal network user profile **350** and the correct field **360** within the profile, the subscriber database **134** will then operate upon the data payload **240**.

In one embodiment, the data payload **240** is developed and specified by the user prior to initiating the ISW **310** transmission. The user creates the payload **240** through manipulation of the input output logic **208** associated with the network device **110**. Specific payload signals will vary amongst network devices **110** depending upon the capabilities of each device and the capabilities of the service provider's network **102**. However, in general, through the use of each network device **110**, the user can develop payload information to control and manage the services **370** available within his personal network **104**. Generally, this control occurs through the manipulation of personal network user profile **350** stored within the service provider's subscriber database **134**. Examples, of payload commands that can be developed and initiated by the user include, but are not limited to: on/off status command; on/off service selection commands; addition/deletion of services; addition/deletion of devices; addition/deletion of personal network codes; routing to and from specific devices **110** and the like. Essentially, the user dynamically defines, controls, manages and operates the services available to each network device **110** within his personal communications network **104**. Furthermore, since network devices **110** can share the same personal network code **222** (e.g. address, telephone number, and the like), the user has the ability to use different devices for different tasks either at the same or different times by manipulating the services profile for each device.

In another embodiment, a user initiates a request to modify or otherwise change the status of one or more devices **110** within his personal network **104** by modifying information in the service provider's network **102** with a particular data payload **240**. For example, after successful authentication, database manipulation to index to the appropriate personal network user profile **350** and the successful decode of the data payload, the subscriber database **134** is updated to incorporate the data payload **240**. During an update, the subscriber database **134** verifies, establishes, or changes status of the network device fields **360** within the profile as directed by the data payload. This updated personal network profile **350** is stored and becomes the profile that defines the personal network **104**, network devices **110** and/or the services available.

It is understood that the procedures described can be modified to include user-initiated manipulation of the personal network user profile **350** through means other than using a network device **110**. For example in another embodiment, a user accesses the service provider's subscriber database **134** through a public network such as the Internet **370** using a connecting device **372**. In one embodiment, the user authenticates, for example via a username/password algorithm. Once authenticated, the user's personal network user profile **350** can be modified by the user. Once complete, the user logs out of the database and the subscriber database **134** retains and implements any changes made to the profile.

With reference now to FIG. **4**, an alternate embodiment of personal network **104** configured as a distributed network includes a personal network logic **400** including distributed subscriber database **434**. The personal network logic **400** provides an interface between selected devices **110**C, **10**D and the service provider network **102**. To illustrate a routing example, a telephone call directed toward personal network **104** is received by the personal network logic **400**. The logic **400** receives the incoming signal, determines routing instructions from the distributed subscriber database **434**, and routes the call to the particular device (e.g., **110**C) where telephone signals (in this example) are to be received. In one embodiment the personal network logic **400** acts as a local switch directing data to particular devices within the personal network, for example inside of a home or office. Personal network logic **400** is in data communication with selected devices either via hardwiring or wireless links. In the event that a call is directed to a device not within direct communication with the personal network logic **400**, the call is redirected, for example, over telephone infrastructure **122** which completes the call to the designated call-receiving device, for example **110**B.

It can now be appreciated that the personal network logic **400** performs a proxy-like communications service between selected network devices that may or may not be configured to communicate directly with the communications network and the service provider network. As an example, a caller originating a telephone communication from device **410** connects through the public switched telephone network **412** to the service provider's network **102**. Access database **130** recognizes from incoming service data **414**, an inbound called number in this example, that the call is directed toward a personal network **104**. Personal network logic **400** receives the call and identifies an attribute from the service data **414** suitable to identify the service provided, here a telephone call. Such identification can occur by recognizing attributes of various services or by a coded prefix or other identifying data appended to the incoming service data **414**. After identifying the service, personal network logic **400** accesses the personal network profile **350** from distributed subscriber database **434** to identify the selected communication device setup to receive the service in the network. The call, in this example, is then directed to the desired communication device **110** based on the service attribute and the values in the personal network profile **350**. It can now be appreciated that the personal network switch **400** may also incorporate either partially or entirely all the database functions provided by the service provider network **102**. Moreover, while the call is illustrated as being routed through the subscriber's network **102**, under the illustrated system, the call may be routed directly to the personal network **104**.

It should be noted that although the service provider's network **102** has been discussed as including both the transmission network **120**, **122**, **124** and the databases **130**, **134**, this is not a requirement for the invention. Those skilled can appreciate that implementations exist in an environment where the access network provider is not the same as the application/services provider who operates, maintains and makes available services to users with personal networks and network devices. In such cases, one or more networks are used to obtain access to the personal network user profile for manipulation and management. Indeed, various services from multiple providers may be available through the service provider's network. For example video services may be provided from one provider, while voice services may be provided from another.

As an example of the above-described process, assume that a personal network Z consists of 3 personal network devices (A, B, C) each with a unique ESN and sharing the same personal network code (555-555-1212). Each of the three devices has been successfully registered and enabled for operation on service provider D's network. Below is an example of some possible attributes of each network device and a personal network user profile:

CHART 1

Service Provider D Subscriber Database
Personal Network Z User Profile

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	On	Enabled	Disabled	Disabled
Device B	Pers. Dig. Assistant	555-555-1212	DEF54321	On	Disabled	Enabled	Enabled
Device C	Video Telephone	555-555-1212	GHI12345	On	Disabled	Disabled	Disabled

Assume that the user who manages personal network Z would like to receive/send his video communications by utilizing his portable telephone (Device A) while on the road. Video service is currently not enabled on his portable phone. To enable his portable phone to receive/send video communications, the user will manipulate the menu selection utilizing the soft-keys on his portable telephone to select "enable video communications". Once selected, the portable telephone will transmit an ISW that will be received by the service provider D's network. Once received, the ISW will be decoded and the information sent to the authentication and authorization database. Assuming the network device and ISW successfully authenticate, the ISW will be delivered to the service providers subscriber database. The subscriber database will use components of the ISW such as the personal network code and the ESN, to index to the specific record in the personal network user Z profile. The subscriber database logic will then operate on the payload data included in the ISW received from personal network device A. In this instance, the payload data instructs the service provider subscriber database to change the personal network user Z profile, enabling Device A, the portable telephone, to receive/send video communications. Once changed, the subscriber database will save the modified version of the personal network user Z profile. The modified personal network user Z profile is shown below:

CHART 2

Service Provider D Subscriber Database
Personal Network Z User Profile (modified)

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	On	Enabled	Enabled	Disabled
Device B	Pers. Dig. Assistant	555-555-1212	DEF54321	On	Disabled	Enabled	Enabled
Device C	Video Telephone	555-555-1212	GHI12345	On	Disabled	Disabled	Disabled

FIG. **5** illustrates an additional embodiment for managing the personal network. Introduced in FIG. **5** is the concept of the Outbound Signaling Word (OSW) **514** that is incorporated in certain embodiments. The OSW is similar to the ISW explained above, with the exception that it represents data communication from the service provider's network **102** to the network device **110**, for example to transfer signals from the subscriber database **134** to network devices **110**.

Referring to FIG. **5**, assume that a personal network **104**Z consists of two personal network devices **110**A, **110**C each with a unique ESN and sharing the same personal network code (555-555-1212). Each device has been successfully registered and enabled for operation on service provider **102**X's network. Below is an example of some possible attributes of each network device and a personal network user profile:

CHART 3

Service Provider X Subscriber Database
Personal Network Z User Profile

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	On	Enabled	Disabled	Disabled
Device C	Mobile Telephone	555-555-1212	GHI12345	Off	Disabled	Disabled	Disabled

Assume that the user who manages personal network **104**Z is initially receiving and sending voice communications by utilizing portable telephone **110**A. At some point in time later, the user would prefer to use mobile telephone **110**C instead of portable telephone **110**A. To enable mobile telephone **110**C to receive/send voice communications, the user will manipulate a menu selection or other interface on either portable telephone **110**A or mobile telephone **110**C to select "swap profiles from one device to another". Assuming the command was sent from portable telephone **110**A, an ISW **310** is transmitted to the service provider network **102**X. Once received, the ISW will be decoded and the information authenticated with database **130**X. Assuming the portable telephone **110**A and the sent ISW **310** successfully authenticate, the ISW is delivered to the service provider's subscriber database **134** which is illustrated in an alternate configuration separate from service provider's network **102**X and authorization database **130**X. The subscriber database will use the personal network code **222** and the ESN **220**, included in the ISW **310** to index to a specific record in the personal network user Z profile (see e.g. charts **3**, **4**). The subscriber database logic will then operate on the payload data included in the ISW received from network device **110**A. In this instance, the payload data instructs the service provider subscriber database **134** to swap the personal network user Z profile of network device **110**A with that of network device **110**C, enabling the mobile telephone to receive/send audio communications and setting network device **110**A to "off" status. Once changed, the subscriber database will save the modified version of the personal network User Z profile. The modified personal network user Z profile is shown below:

CHART 4

Service Provider D Subscriber Database
Personal Network Z User Profile (modified)

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	Off	Disabled	Disabled	Disabled
Device C	Mobile Telephone	555-555-1212	GHI12345	On	Enabled	Disabled	Disabled

After the subscriber database **134** stores the new user profile to memory, an OSW **514**A, C is initiated to each of the network devices **110**A, **110**C effected by the previous ISW **310** database transaction. OSW **514**A is sent to network device **110**A and OSW **514**C is delivered to network device **110**C. For example, both OSW **514**A and OSW **514**C include a personal network code **222** identifying personal network **104**Z. OSW **514**A further includes ESN **220**A identifying device **110**A while OSW **514**C includes ESN **220**C identifying device **110**C. Each OSW **514** carries the respective data payload **240**A, C representing changes to each respective network device profiles representing the modifications to the user's personal network profile requested by the ISW **310**. Network device **110**A and **110**C respective logic will then operate on their received payload data included in each of the OSW's received from the subscriber database **134**. In this instance, the payload data provides device profile modifications reflective of the updated subscriber database initiated by the ISW. The final result enjoyed by the user is a mobile device enabled for voice communications and a portable device that is not.

A method is provided that enables a user to define, control and operate a personal network of devices within a service provider's communication system. In one embodiment, this is accomplished by assembling a network of personal communications devices incorporating transceivers that share the same address, customer account information, telephone number, billing information and are compatible with the service provider's communication system. In addition to assembling the network of personal communications devices, the user subscribes to one or more services made available by the service provider. Furthermore, service provider's network provides for a signaling protocol that allows for communications between device transceivers within the personal network and database units within the service provider's network. Thus, communications equipment manufacturers and service providers alike can deliver multiple services to a single user while allowing the user to utilize multiple devices at his convenience. Also provided is a process that enables the user to utilize more than one personal network device and a mechanism to actively manage his personal network devices and network services.

In yet another embodiment, individual ones of devices hand-off designated services in response to a triggering event. The triggering event can be user initiated, proximity based or otherwise. For example, when a mobile phone detects a home based phone and an automatic hand-off indicator is present, the home phone can be configured to send an ISW enabling itself for designated services and disabling the mobile phone. In another embodiment the mobile phone can be configured to send an ISW disabling itself for those designated services. Coordination between the two hand-shaking devices could occur over the personal network, over a local short range network such as Bluetooth, or 802.11 protocol networks and the like.

Referring now to FIG. **6**, a methodology implementable in software for managing a network of devices is illustrated. Upon a triggering event or user request, a device prepares a signaling word to implement a particular network device management configuration, (block **610**). The signaling word is transmitted or otherwise communicated to logic including the subscriber database, (block **612**). On the subscriber database side, the signaling word is received, (block **620**). Authentication logic authenticates, decodes, or otherwise verifies the received signaling word as proper, (block **622**). The payload is then applied to the appropriate data record or records identified by the signaling word, (block **624**). Responsive to success or failure to manage the personal network devices by application of the payload, a return signaling word is prepared, (block **626**). The signaling word is transmitted or otherwise communicated to logic including the devices within the personal device network, (block **628**). The signaling word is received on the device side, (block **614**). Upon receipt of the signaling word on the device side, the device can be configured to display a status report for the effected device or selected devices in the network. It can be appreciated that the methodology can be implemented as discussed above through managed network devices, other

network devices, or through mechanisms that access the subscriber database side via network external devices.

In yet another embodiment, the service provider **102** is located and maintained at the home or other place designated by a user. In this configuration, the databases and associated equipment can be associated uniquely with an individual user's network or scalable up to full service provider for multiple users. In the individual configuration, the service provider **102** is configured to adapt to legacy equipment such as twisted pair, other wireline telephony presently supplied to many consumers, cable, satellite or other communications means. Routing can be redirected back into the legacy equipment or alternately routed over a wireless network as desired.

With reference now to FIG. **7**, an embodiment illustrates distribution of additional services to individual devices in a personal network **704**. As illustrated, the personal network **704** includes television devices **710**A, personal mail and scheduling devices **710**B, audio devices **710**C, and computer devices **710**D. A record contained in distributed subscriber database **734** maintains a profile including desired routing for specific incoming signals. For example, an inbound signaling word **740** includes a unique network device identifier **742** and a payload **744** configured, for example, to create or update a record (not shown) directing incoming television or other motion picture signals toward television device **710**A. Other signaling words route music, radio and, in certain embodiments audio tracks of associated motion picture signals toward audio device **710**C, and match other services to other devices as desired by the subscriber. Those skilled in the art can now appreciate that multiple devices, for example multiple television devices, are configurable to receive a particular incoming signal.

While the present invention has been illustrated by the description of embodiments thereof, and while the embodiments have been described in considerable detail, it is not the intention of the applicants to restrict or in any way limit the scope of the appended claims to such detail. Additional advantages and modifications will readily appear to those skilled in the art. Therefore, the invention, in its broader aspects, is not limited to the specific details, the representative apparatus, and illustrative examples shown and described. Accordingly, departures may be made from such details without departing from the spirit or scope of the applicant's general inventive concept.

We claim:

1. A method of controlling services to an audio-video device in a personal network, the method comprising:

receiving an inbound signaling word comprising a unique identifier that uniquely identifies the audio-video device and payload data representing a change to the personal network, where the personal network is identified by an address and includes a plurality of devices each identified by a different address,

based on the payload data, identifying an audio-video service capable of being used by the audio-video device available to the personal network from at least one service provider responsive to satisfying the change;

effecting the change to the personal network making the identified audio-video service available to the audio-video device; and

sending a return signaling word comprising the unique identifier that uniquely identifies the audio-video device and data representative of the change to the personal network, the return signaling word responsive to the change to the personal network established by the effecting step.

2. The method of controlling services as set forth in claim **1**, where the effecting comprises updating a database containing data corresponding to the personal network, the database containing information usable to provide audio-video services available generally to the personal network to particular audio-video devices within the personal network and to reflect a registration status of audio-video devices in the personal network.

3. The method of controlling services as set forth in claim **1**, further comprising providing an audio-video service available to the personal network from at least one service provider to the audio-video device.

4. The method of controlling services as set forth in claim **1**, further comprising ceasing providing an audio-video service available to the personal network from at least one service provider to the audio-video device.

5. The method of controlling services as set forth in claim **1**, further comprising authenticating the received inbound signaling word.

6. The method of controlling services as set forth in claim **1**, where the audio-video device is selected from one of a television, a smart-phone, a computer, a digital cellular telephone and a multifunction personal handheld device.

7. The method of controlling services as set forth in claim **1**, further comprising preparing a return signaling word comprising (i) a unique identifier that uniquely identifies a second audio-video device that had the identified audio-video service available; and (ii) data representative of the change to the personal network.

8. An audio-video device capable of sharing services with a plurality of other devices within a personal network, the audio-video device comprising:

a computer-readable medium having storage for a first address corresponding to the audio-video device, a second address corresponding to the personal network, and a third address corresponding to a service provider network;

input/output logic configured to receive from a user a desired change to a service capable of being provisioned to the audio-video device from at least one service available generally to the personal network;

a processor in communication with the computer-readable medium and the input/output logic, the processor programmed to prepare an inbound signaling word comprising at least the first address and payload data representing the desired change to the service capable of being provisioned to the audio-video device from the personal network; and

a transceiver providing the inbound signaling word to the service provider network where the service provider network comprises logic to process the inbound signaling word including modifying stored information in a subscriber database to effect the desired change to the service capable of being provisioned to the audio-video device from the personal network, the transceiver further receiving an outbound signaling word comprising the first address corresponding to the audio-video device and data indicating the desired change to the personal network, the outbound signaling word responsive to the desired change to the service capable of being provisioned to the audio-video device from the personal network.

9. The audio-video device as set forth in claim **8** where the first address comprises a manufacturer assigned identification code unique to the audio-video device.

10. The audio-video device as set forth in claim 8 where the first address comprises a service provider assigned identification code unique to the audio-video device.

11. The audio-video device as set forth in claim 8 where the second address comprises an email address.

12. The audio-video device as set forth in claim 8 where the second address comprises an account number.

13. The audio-video device as set forth in claim 8 where the third address comprises an IP address, URL or ftp location.

14. The audio-video device as set forth in claim 8 where the third address comprises a location of the subscriber database.

15. A method of provisioning services to an audio-video device comprising:

delivering a computer program to the audio-video device, where the computer program includes instructions for the audio-video device to (i) receive from a user a desired change to a service capable of being provisioned to the audio-video device from at least one service available generally to a personal network, (ii) prepare an inbound signaling word comprising at least a first address corresponding to the audio-video device and payload data representing the desired change to the service capable of being provisioned to the audio-video device from the personal network, and (iii) send the inbound signaling word;

receiving the inbound signaling word;

determining from the inbound signaling word the desired change to the service capable of being provisioned to the audio-video device;

assigning an audio-video service, available to the personal network and responsive to the desired change, to the audio-video device;

sending a return signaling word comprising at least the first address corresponding to the audio-video device and data representative of the desired change to the personal network, the return signaling word indicating the assignment of the audio-video service to the audio-video device; and

providing the audio-video service to the audio-video device.

16. The method of provisioning services as set forth in claim 15, further comprising ceasing providing an audio-video service available to the personal network from at least one service provider to the audio-video device.

17. The method of provisioning services as set forth in claim 15, further comprising verifying the received inbound signaling word.

18. The method of provisioning services as set forth in claim 15, where the audio-video device is selected from one of a television, a smart-phone, a computer, a digital cellular telephone and a multifunction personal handheld device.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 8,989,160 B1
APPLICATION NO. : 13/403572
DATED : March 24, 2015
INVENTOR(S) : Robert G. Marsico et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title page, Item (60), delete the Related U.S. Application Data, and substitute the following:

--(60) Continuation of application No. 12/186,158, filed on August 5, 2008, now abandoned, which is a continuation of application No. 11/668,247, filed on January 29, 2007, now Patent No. 7,489,671, which is a divisional of application No. 10/778,443, filed on February 13, 2004, now Patent No. 7,171,194, which claims the benefit of application No. 60/447,436, filed February 14, 2003, now expired, and said continuation application No. 12/186,158, filed on August 5, 2008, now abandoned, is a continuation of application No. 10/779,270, filed on February 13, 2004, now Patent No. 7,486,649, which claims the benefit of application No. 60/447,436, filed February 14, 2003, now expired.--

Signed and Sealed this
Twenty-third Day of February, 2016

Michelle K. Lee

Michelle K. Lee
Director of the United States Patent and Trademark Office

US007489671B2

(12) **United States Patent**
Marsico et al.

(10) **Patent No.: US 7,489,671 B2**
(45) **Date of Patent: *Feb. 10, 2009**

(54) **TELEPHONE MANAGEMENT SYSTEM AND METHOD**

(76) Inventors: **Robert G. Marsico**, 8484 Turtle Creek Cir., Las Vegas, NV (US) 89113; **Marilyn J. Marsico**, 8484 Turtle Creek Cir., Las Vegas, NV (US) 89113; **Carl A. Steen**, 241 N. Indian Trail Rd., North Barrington, IL (US) 60010; **Maxwell A. Marsico**, 8484 Turtle Creek Cir., Las Vegas, NV (US) 89113

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **11/668,247**

(22) Filed: **Jan. 29, 2007**

(65) **Prior Publication Data**

US 2007/0189476 A1 Aug. 16, 2007

Related U.S. Application Data

(60) Division of application No. 10/778,443, filed on Feb. 13, 2004, now Pat. No. 7,171,194, which is a continuation-in-part of application No. 10/626,343, filed on Jul. 24, 2003, now abandoned.

(60) Provisional application No. 60/447,436, filed on Feb. 14, 2003.

(51) **Int. Cl.**
H04M 3/42 (2006.01)

(52) **U.S. Cl.** **370/338**; 370/352; 379/211.02

(58) **Field of Classification Search** ..... None
See application file for complete search history.

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U.S. PTO Office Action dated Jun. 29, 2007 relating to U.S. Appl. No. 10/626,343, 25 pgs.

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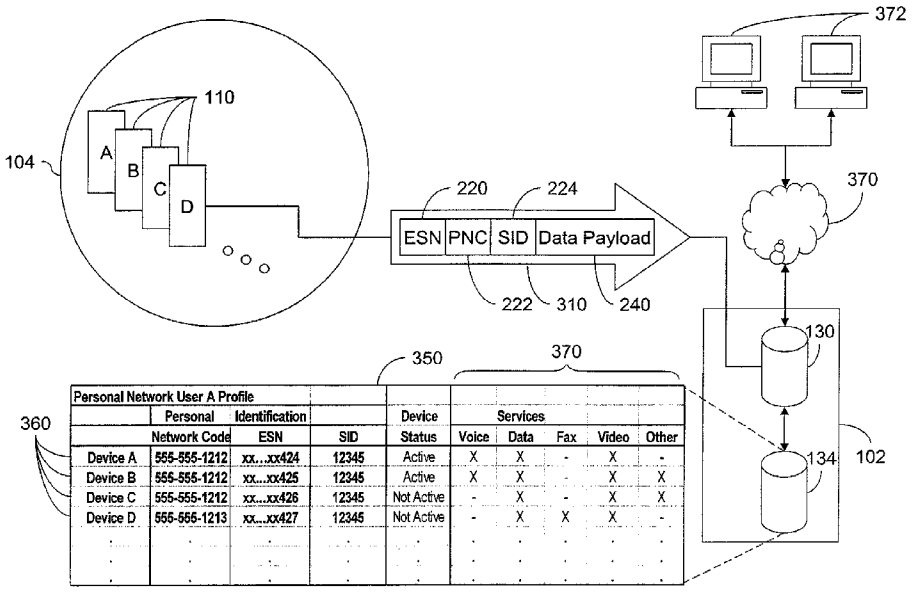
Primary Examiner—Wing F Chan
Assistant Examiner—Robert C Scheibel
(74) *Attorney, Agent, or Firm*—Benesch, Friedlander, Coplan & Aronoff LLP

(57) **ABSTRACT**

A method is provided to dynamically interact with a plurality of enabled devices within a personal network. Individual ones of the devices are configured to interoperate with a service provider network and configure or alter services to individually identifiable devices.

20 Claims, 7 Drawing Sheets



Personal Network User A Profile

	Personal Identification			Device	Services				
	Network Code	ESN	SID	Status	Voice	Data	Fax	Video	Other
Device A	555-555-1212	xx...xx424	12345	Active	X	X	-	X	-
Device B	555-555-1212	xx...xx425	12345	Active	X	X	-	X	X
Device C	555-555-1212	xx...xx426	12345	Not Active	-	X	-	X	X
Device D	555-555-1213	xx...xx427	12345	Not Active	-	X	X	X	-

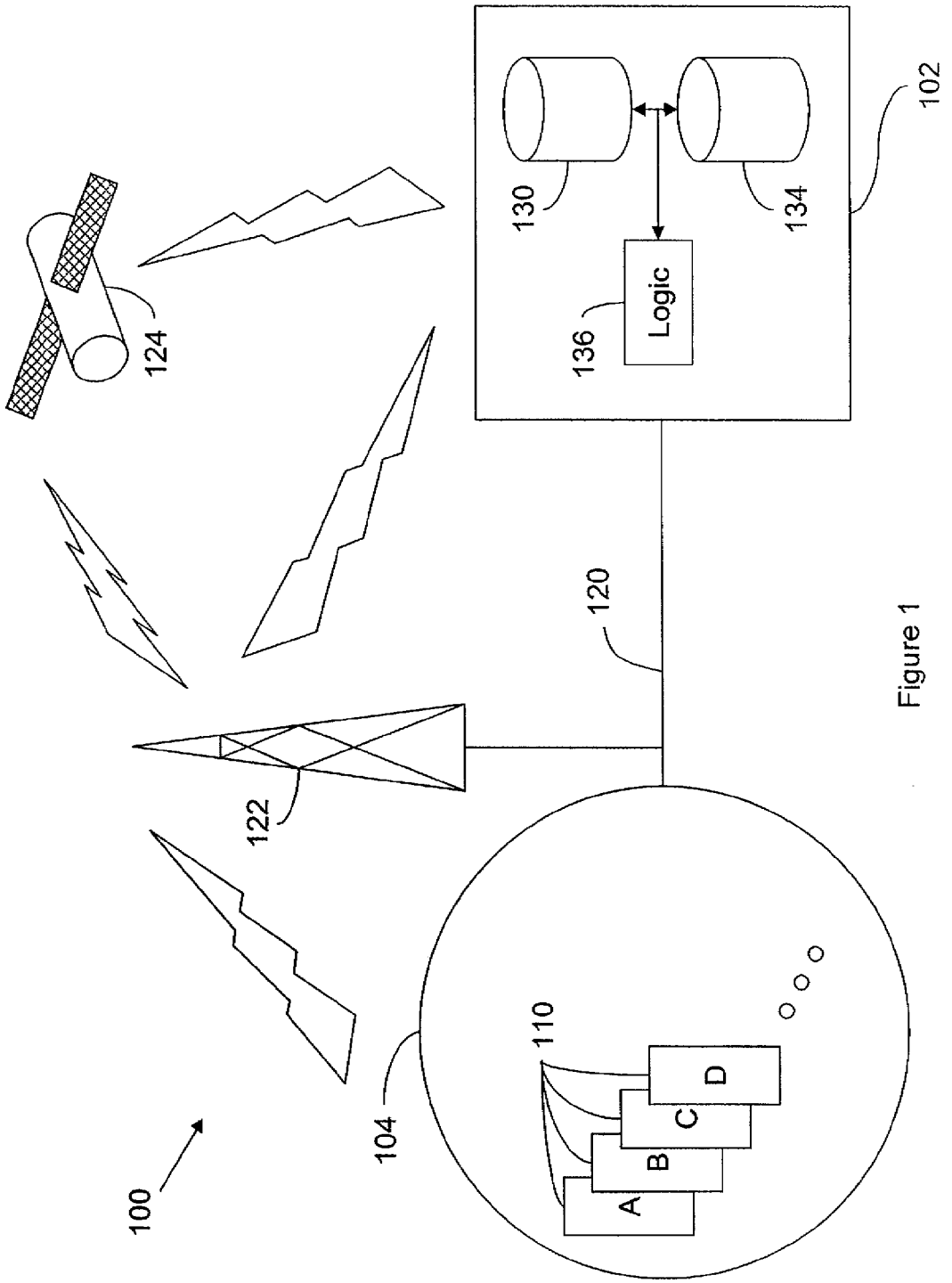


Figure 1

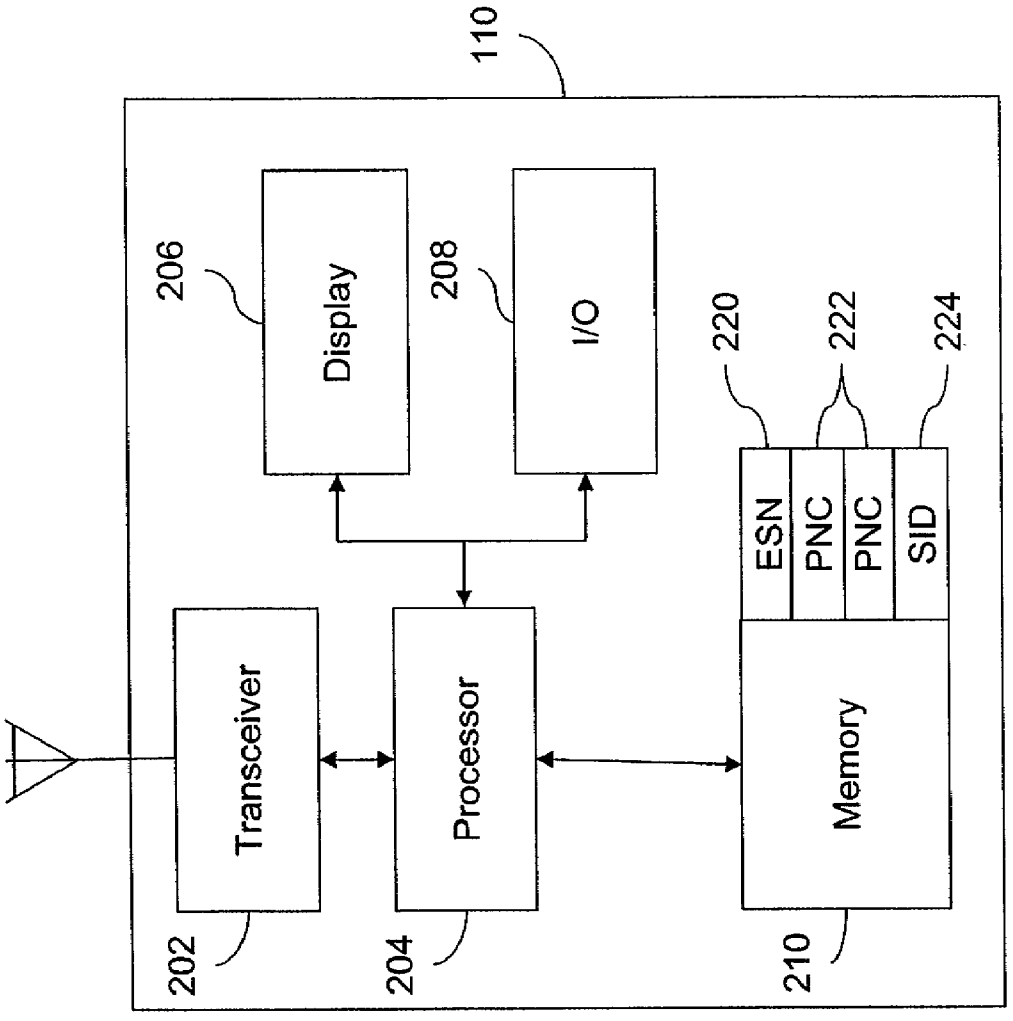
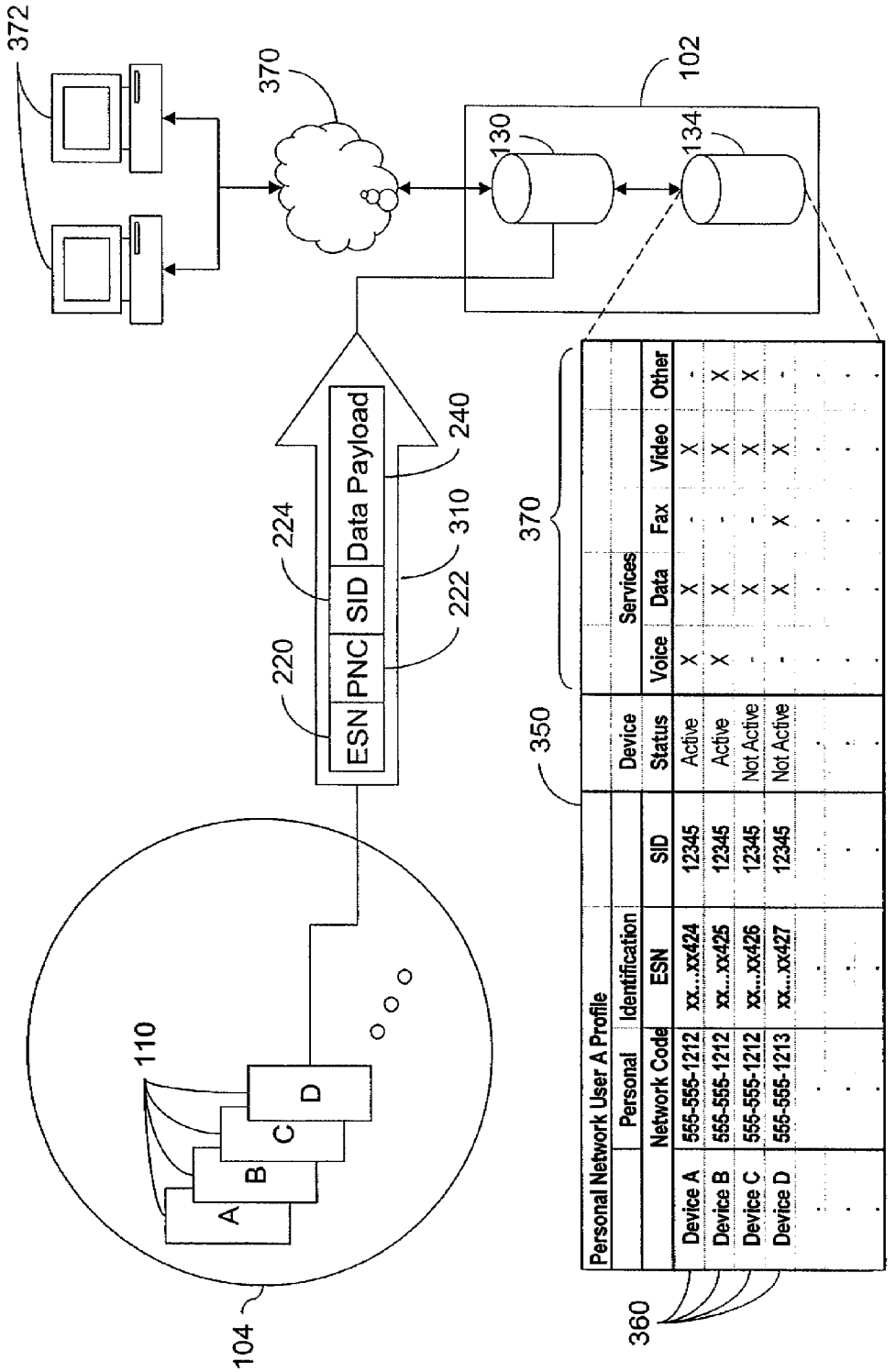

110
206
Display
208
I/O
220
222
224
ESN
PNC
PNC
SID
Transceiver
Processor
Memory
202
204
210

Figure 2


372
370
102
130
134
240
224
310
222
220
ESN
PNC
SID
Data Payload
110
A
B
C
D
104
360
350
370
Personal Network User A Profile
Personal Identification
Network Code
ESN
SID
Device Status
Services
Voice
Data
Fax
Video
Other
Device A
555-555-1212
xx...xx424
12345
Active
X
X
-
X
-
Device B
555-555-1212
xx...xx425
12345
Active
X
X
-
X
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Device C
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Not Active
-
X
X
X
-

Figure 3

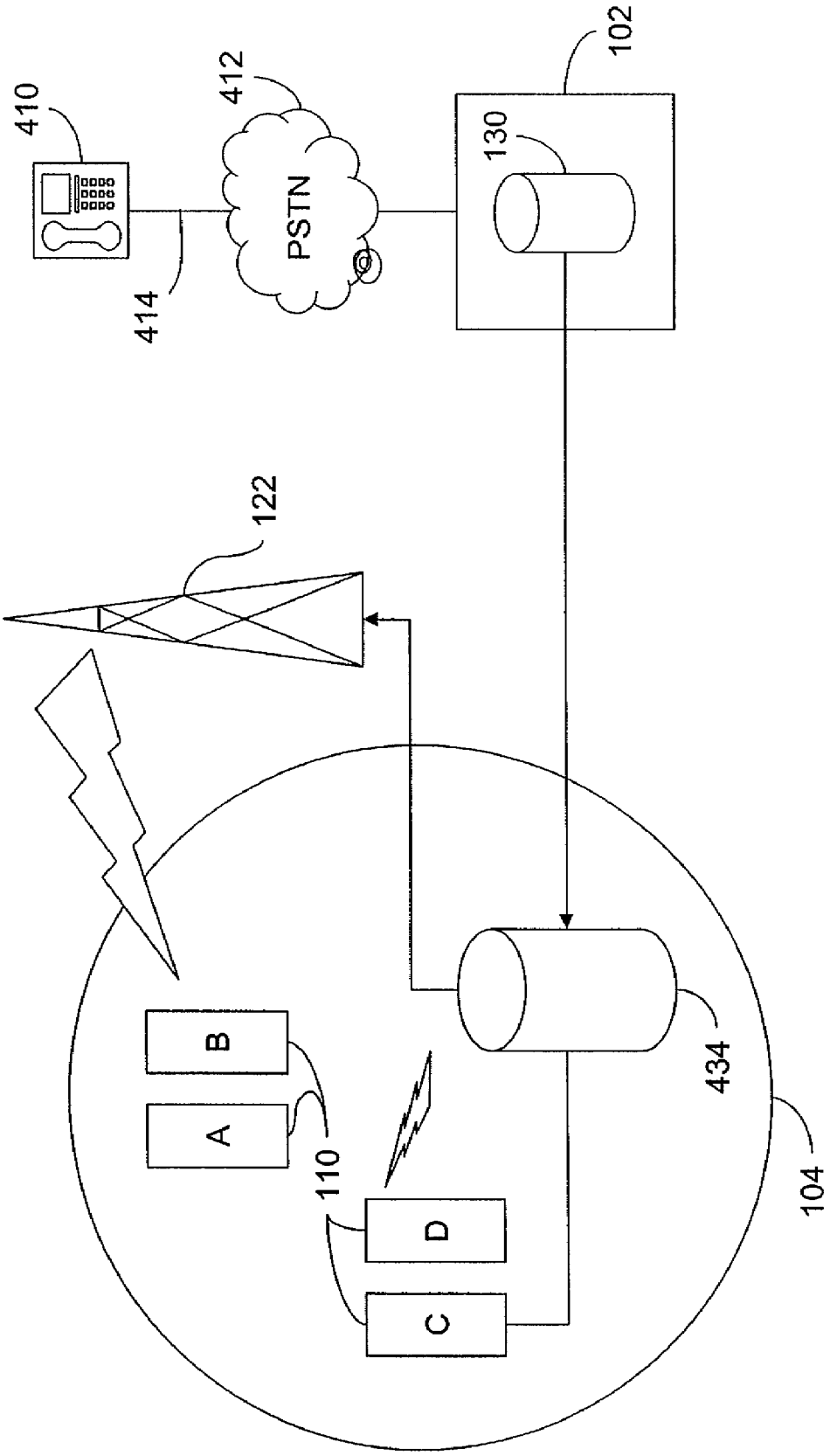

Figure 4

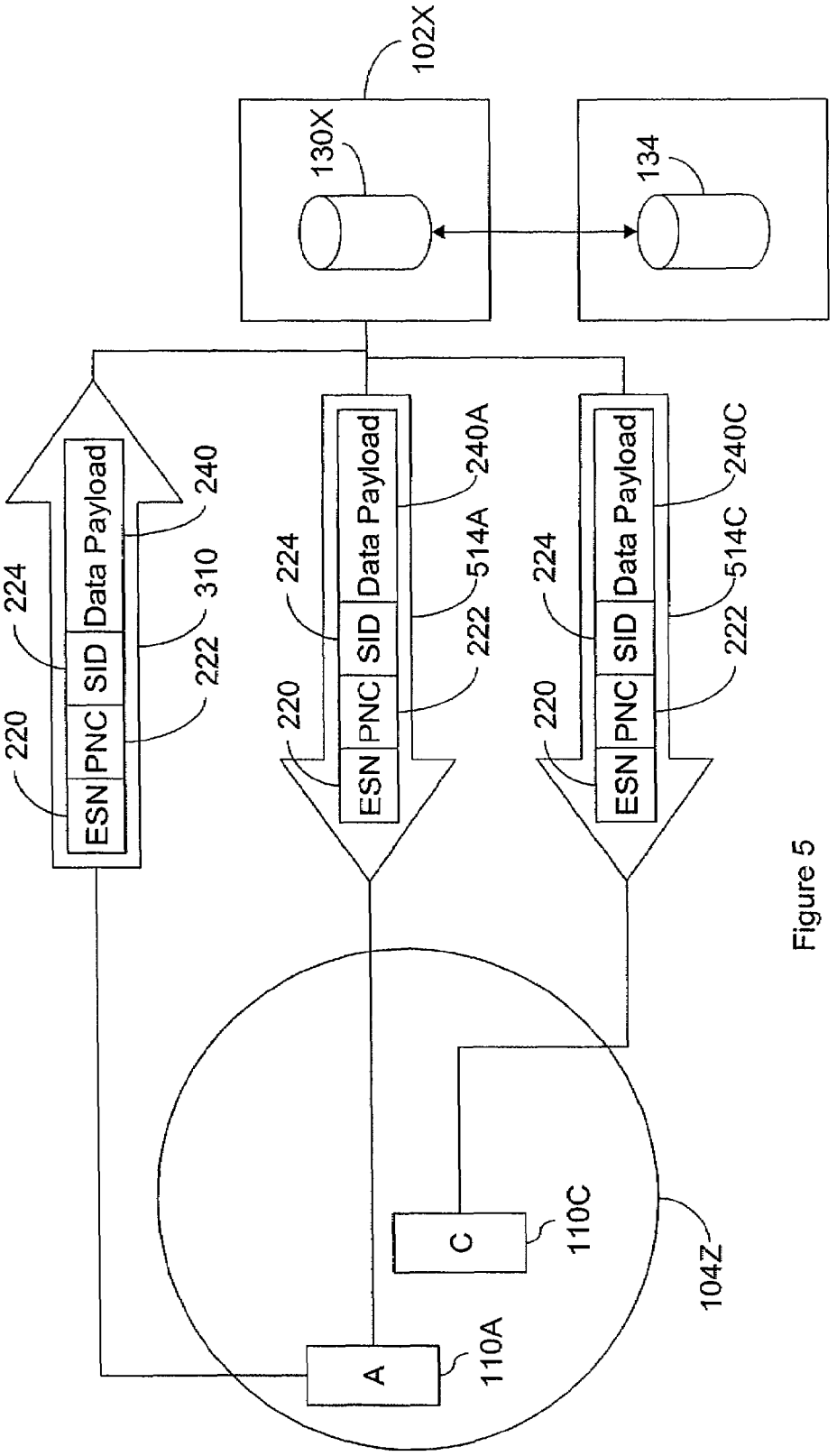
102X
130X
134
ESN
PNC
SID
Data Payload
220
222
224
310
240
514A
240A
514C
240C
A
110A
C
110C
104Z

Figure 5

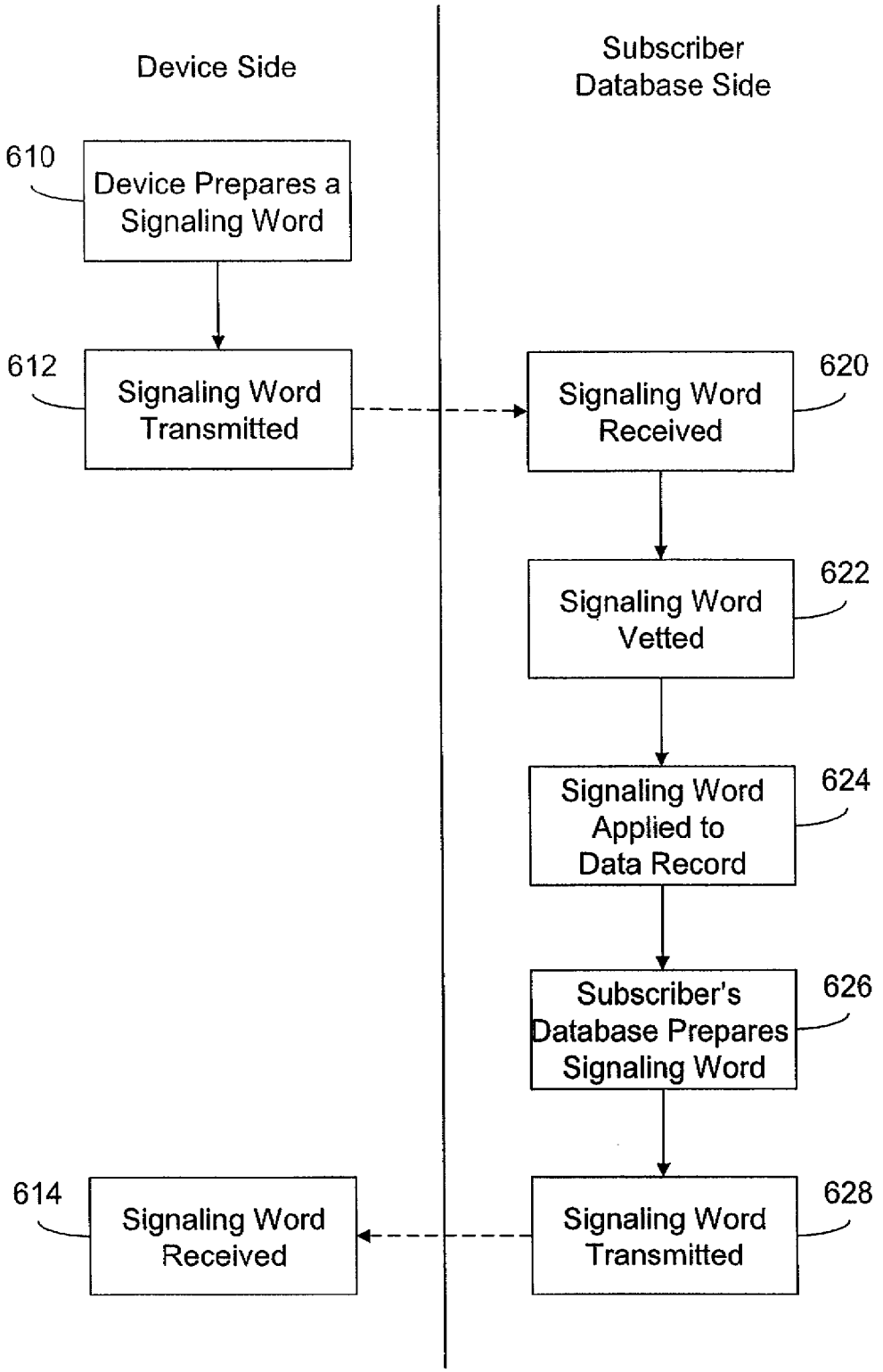
Device Side
Subscriber Database Side
610
Device Prepares a Signaling Word
612
Signaling Word Transmitted
620
Signaling Word Received
622
Signaling Word Vetted
624
Signaling Word Applied to Data Record
626
Subscriber's Database Prepares Signaling Word
628
Signaling Word Transmitted
614
Signaling Word Received

Figure 6

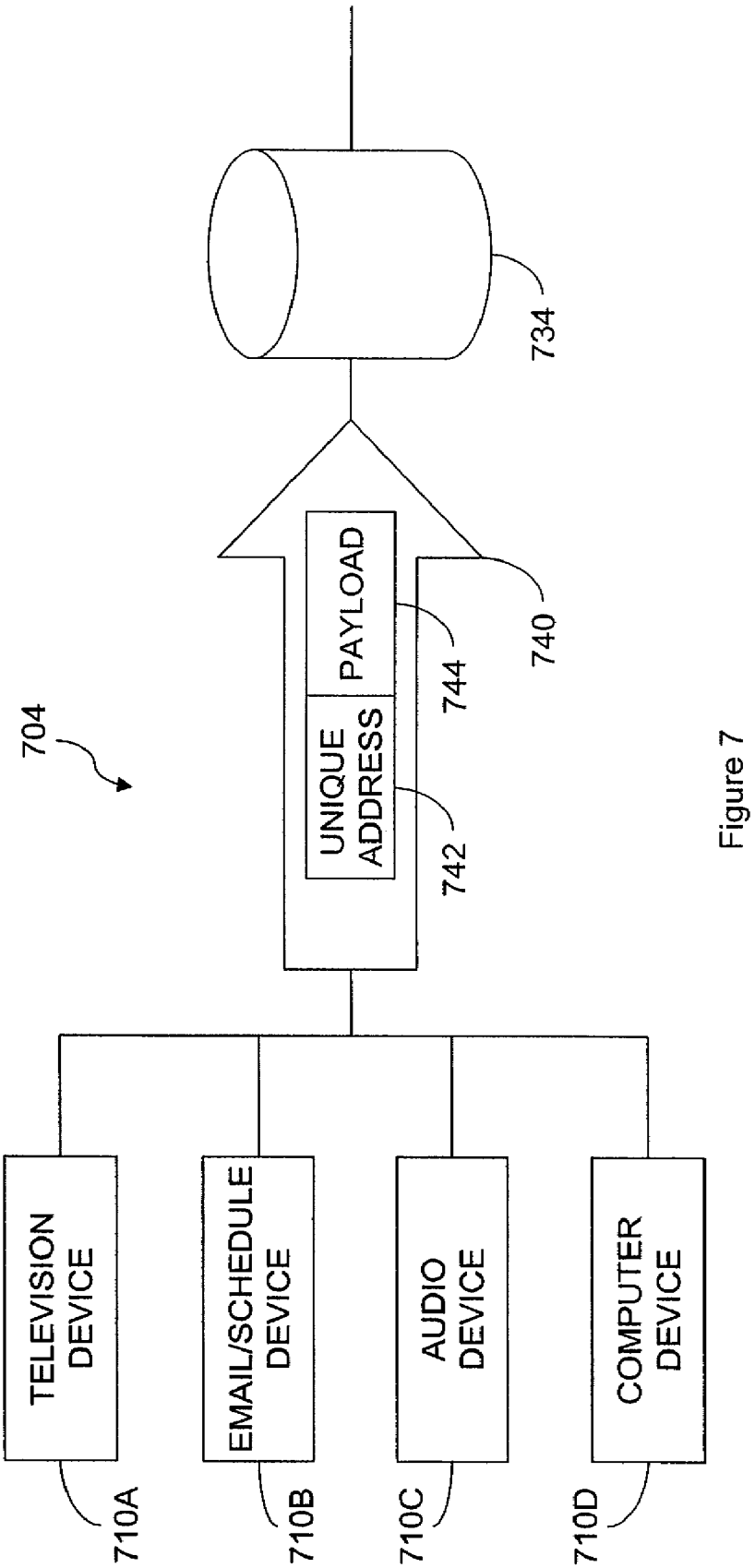
734
740
PAYLOAD
744
UNIQUE ADDRESS
742
704
TELEVISION DEVICE
EMAIL/SCHEDULE DEVICE
AUDIO DEVICE
COMPUTER DEVICE
710A
710B
710C
710D

Figure 7

TELEPHONE MANAGEMENT SYSTEM AND METHOD

CROSS-REFERENCE TO RELATED APPLICATION

This application is a divisional U.S. Continuation in patent application Ser. No. 10/778,443 filed on Feb. 13, 2004 now U.S. Pat. No. 7,171,194 of which is a continuation in part of U.S. patent application Ser. No. 10/626,343 filed Jul. 24, 2003, now abandoned, on which claims the benefit of U.S. Provisional Application Ser. No. 60/447,436 filed Feb. 14, 2003, all incorporated herein by reference.

BACKGROUND

The present invention relates generally to network systems. It finds particular applicability in conjunction with communication based networks and will be described with particular reference thereto. It is to be appreciated however, that the invention finds further application in systems and devices where it is desirable to use a single address with a plurality of devices.

The first generations of wireless mobile phones were large in size and expensive to use. However, over time, technology has reduced the size of the mobile telephone and lowered its cost of use, thereby enhancing mobility and expanding usage. With each subsequent generation of technology, the size of the device has been reduced while the functionality and types of devices available have increased dramatically.

With the introduction of digital cellular telephones, laptop computers, multi-function personal handheld devices, one can now send email, surf the web, make telephone calls, receive and send instant/short messages, view personal calendars, video conference, and send pictures seamlessly and continuously while connected to one or more wireless or wireline communications networks.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings which are incorporated in and constitute a part of the specification, embodiments are illustrated which, together with the detailed description given below, serve to describe exemplary embodiments. It will be appreciated that the illustrated boundaries of elements (e.g. boxes, groups of boxes, or other shapes) in the figures represent but exemplary boundaries. One of ordinary skill in the art will appreciate, for example, that one element may be designed as multiple elements or that multiple elements may be designed as one element. An element shown as an internal component of another element may be implemented as an external component and vice versa.

FIG. **1** is a system diagram illustrating an embodiment of a network.

FIG. **2** is a functional block diagram illustrating an embodiment of a network device.

FIG. **3** is a system diagram illustrating another embodiment of a network and an exemplary record from a computer-readable medium

FIG. **4** is a system diagram illustrating another embodiment of a network.

FIG. **5** is a system diagram illustrating one embodiment of a system for managing a network.

FIG. **6** illustrates one embodiment of a methodology for managing a network of devices.

FIG. **7** is a system diagram illustrating another embodiment of a network.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

The following description includes definitions of selected terms used throughout the disclosure. Both singular and plural forms of all terms fall within each meaning:

"Address", as used herein, includes but is not limited to one or more network accessible addresses, device identifiers, telephone numbers, IP addresses, url and ftp locations, e-mail addresses, names, a distribution list including one or more addresses, network drive locations, postal addresses, account numbers or other types of addresses that can identify a desired destination or device.

"Computer-readable medium", as used herein, refers to any medium that participates directly or indirectly in providing instructions and/or data to one or more processors for execution. Such a medium may take many forms, including but not limited to, non-volatile media, and volatile media. Non-volatile media may include, for example, optical or magnetic disks. Volatile media may include dynamic memory. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, or any other magnetic medium, a CD-ROM, any other optical medium, punch cards, papertape, any other physical medium with patterns of holes, a RAM, a PROM, an EPROM, a FLASH-EPROM, any other memory chip or cartridge, or any other medium from which a computer, a processor or other electronic device can read.

"Logic", as used herein, includes but is not limited to hardware, firmware, software and/or combinations of each to perform a function(s) or an action(s), and/or to cause a function or action from another component. For example, based on a desired application or needs, logic may include a software controlled microprocessor, discrete logic such as an application specific integrated circuit (ASIC), a programmed logic device, memory device containing instructions, or the like. Logic may also be fully embodied as software.

"Signal", as used herein, includes but is not limited to one or more electrical or optical signals, analog or digital signals, one or more computer or processor instructions, messages, a bit or bit stream, or other means that can be received, transmitted, and/or detected.

"Software", as used herein, includes but is not limited to one or more computer readable and/or executable instructions that cause a computer or other electronic device to perform functions, actions, and/or behave in a desired manner. The instructions may be embodied in various forms such as routines, algorithms, modules or programs including separate applications or code from dynamically linked libraries. Software may also be implemented in various forms such as a stand-alone program, a function call, a servlet, an applet, instructions stored in a memory, part of an operating system or other type of executable instructions. It will be appreciated by one of ordinary skill in the art that the form of software is dependent on, for example, requirements of a desired application, the environment it runs on, and/or the desires of a designer/programmer or the like.

"User", as used herein, includes but is not limited to one or more persons, software, computers or other devices, or combinations of these.

Generally speaking, one embodiment of a system and method is provided to enable a user to define, control and operate a personal network of one way or bi-directional devices capable of accessing a service provider's network, receiving services, or both. This can be accomplished by assembling a network of personal communications devices that may include transmitters, receivers or transceivers that

share or can be configured to share the same address. The devices are configured to be compatible or selectively compatible with the service provider's network. In addition to assembling the network of personal communications devices, the user subscribes to one or more services made available by the service provider. Furthermore, the service provider's network uses a signaling protocol that allows for communications between device transceivers within the personal network and database units within the service provider's network.

In a simple exemplary network, a telephone service provider assigns a telephone number to a subscriber. In this simple network, the subscriber has multiple telephones, each used in different places and at different times. The subscriber registers each telephone including a unique serial number with the telephone service provider's database and a subscriber profile is created. The assigned "telephone number" actually refers to the subscriber profile identifying the subscriber's network. Each telephone occupies a record in the subscriber profile and is individually identifiable by the unique serial number. Once established, for example, a mobile telephone is selected to receive all incoming telephone calls. Once the subscriber returns home, the home phone replaces the mobile phone as the desired destination for all incoming calls (either automatically or through manual selection). In an embodiment, incoming signals such as calls, can be directed to the subscriber profile and a database dip can be configured to return the subscriber desired routing data to complete the call to a device. In an embodiment, outgoing signals such as calls, can be transmitted from a telephony enabled device over transmission medium to the subscriber's database, and/or to another device. Conveniently, charges associated with any of the devices in the subscriber's network can be aggregated onto a single bill.

In a more general embodiment, upon user initiation, a device communicates with a service provider's network. The device transmits a request to authentication logic operated by the service provider for access to some or all of the services available to the service provider's network, for example telephone services, text messaging services, video services and other services. Logic within the device can be configured to negotiate for access to services available from the service provider. Responsive to the request, the authentication logic authenticates the device's request for access and selectively makes available to or authorizes the device to use those services available from the service provider's network.

In another embodiment, the user initiates a request to modify or otherwise change the status of one or more devices within his personal network by modifying the service provider's database. The status of a device includes available services assigned to the device, and the device's registration on the network, for example, enabled or disabled from network participation. It will be appreciated that one device on the personal network can be configured to check or alter the status of that device, and/or other devices within the personal network. Moreover, device status can alternately be checked or configured via other mechanisms such as over the internet, through communication with a customer service feature and the like.

One embodiment of the network device management is illustrated in FIG. **1**. Network **100** includes a service provider network operations center **102**, a plurality of personal networks **104** (one shown) and, a plurality of personal network devices **110** (A-D shown). The network devices **110** communicate with the service provider's network **102** across one or more transmission mediums such as conventional wireline networks **120**, which include twisted pair, Hybrid Fiber Coaxial (HFC) fiber optics and the like; terrestrial wireless networks **122**; and satellite or other aloft networks **124**. The service provider's network **102** provides information such as communication services, voice, video, and/or data to personal networks **104** of network devices **110**. It should be appreciated that the service provider may directly provide all of the services, or may act as a distributor of other providers' services. It should be further appreciated that network devices **110** include a variety of portable, mobile, analog cellular or digital devices, video and audio equipment, desk-top computers and the like configurable to have discrete addresses identifiable from the common address.

The service provider's network **102** uses transceiver equipment (not shown) coupled with one or more of the transmission mediums **120-124** to communicate information, network control, and system resource management to and/or from the personal networks **104**. The service provider's network **102** includes computer-readable media such as database units that can be either centralized or distributed. Exemplary database units include an authentication and authorization database **130**, and a subscriber database **134**. Logic **136** is configured to process requests for access to network services accessing authentication and authorization database **130** and accessing or modifying stored information specific to each user, personal network **104**, and network device **110**. The subscriber database **134** is arranged to identify specific information regarding each user's personal network **104**, network devices **110** and authorized network services. In the illustration, each database unit is in data communication with and under the control of logic **136** associated with the service provider's network **102** but such centralized control can be readily decentralized or segregated into two or more distinct elements with no loss of functionality.

With reference to FIG. **2**, an embodiment of a network device **110** includes a transceiver **202** in communication with a logic that may take the form of processor **204**. The transceiver **202** may be configured to transmit, receive, or both signals including voice, video, and/or data transmissions formatted under several signaling protocols. While the transceiver **202** is illustrated connected to an antenna, wired connections are also envisioned for network devices **110**. The processor **204** can also be in data communication with display logic **206** and input/output logic **208**. A storage device medium **210** can be provided to store encryption algorithms, software programs, algorithms used to process signals and/or algorithms or logic used to implement communication controls and network system management.

Additionally, the processor **204** is configured to access identification codes, such as the illustrated electronic serial number (ESN) **220**, personal network code (PNC) **222**, and system identification code (SID) **224**. As further discussed below, these identification codes **220**, **222**, **224** enable, device management and communication. For example, in one embodiment ESN **220** corresponds to a device **110**, PNC **222** corresponds to a personal network **104**, and SID **224** corresponds to a service provider's network **102**.

In one embodiment (ESN) **220** is generated from an individual device's hardware identification code. Typically, hardware identification codes are manufacturer assigned indicia which are unique to each network device. In another embodiment, ESN **220** is assigned by a service provider and held in memory. It should be appreciated that these identification codes need not be static, and can cycle or hop for example for security.

In another embodiment, each network device **110** stores or is assigned a personal network code (PNC) **222**. The personal network code **222** is preferably unique within the communication network **100** but may be common among the network devices **110** within a personal network **104**. As illustrated, each personal network **104** can have one or more personal

network codes **222** corresponding to, for example, a single device belonging to more than one personal network such as in the case of a single home phone belonging to the personal networks of each occupant. The personal network code **222** may be a hexadecimal number or any address assigned by the user or the network service provider suitable to identify the personal network of devices.

Yet another embodiment includes the service provider assigning a network device **110** a system identification code (SID) **224**. This system identification code **224** can be unique to the service provider and can be assigned to all network devices **110** that operate within the network **100**. That is, the system identification code **224** is common to selected operable devices in the plurality of personal networks **104** in the overall network **100**. The network device **110** has data access to the system identification code **224**.

With reference now to FIG. **3**, operation of a system according to an embodiment of the present invention is illustrated. Personal network **104** comprises one or more network devices **110** subscribing to service(s) provided by or available through the service provider's network **102**. Each network device **110** is registered or registerable with at least one personal network and with the service provider network **102**. Registration of each network device **110** may be accomplished either remotely or locally using either manual or automated means. Registration of each network device **110** can include the creation or modification of data fields within subscriber database **134**, and authentication and authorization database **130**. Each user's personal network **104** is represented within the subscriber database **134** with a profile, for example, profile **350** including individual device records **360**. These individual device records are populated with fields identifying the device, the network, and the like and also various services **370** available from the service provider's network. The authentication and authorization database **130** comprises fields for those identifiers associated with each device **110** registered, for example, the ESN **220** and PNC **222**. Once a user has registered and enabled a network device **110** on the service provider's network **102**, the network devices may communicate on, with, and through the communication network.

In another embodiment, the user can utilize one or more of the network devices **110** concurrently. Each device **110** can be used for one or more similar or different services **370** provided by the service provider. For example, in the telephone context, a device may be configured for audio services while another device may be configured for text-based services. Alternatively, a single device may be configured for both audio and text services. In yet another alternative, services may be segregated on an in-coming or out-going basis.

Initiated by the user or upon a triggering event, a network device **110** will signal the service provider's network **102** by sending an inbound signaling word (ISW) **310**. As further discussed below, the ISW **310** can be configured to manage devices **110** in the personal network **104** by registering devices or changing services **370** available to specific devices. In the illustrated embodiment, the ESN **220**, personal network code **222**, system identification code **224**, and data payload **240** comprise the ISW **310**, which is used to access the service provider's network **102**. The specific format of the ISW **310** is not integral to this invention. However, the ISW **310**, or communication link to the service provider's network **102**, includes a mechanism to identify the specific network **104** and a mechanism to communicate data.

A user can initiate a transmission in a variety of ways including, but not limited to: using an input device such as a keypad or keyboard, speaking into a microphone, pushing a button, using a pointing device, manipulating a joystick, using a dial or other type of mechanism, placing a device in a cradle, or other triggering mechanisms based on time, location, motion and the like. Regardless of the means in which the ISW **310** is initiated, the result includes transmission of the ISW **310**. In the illustrated example, the ISW **310** transmits from the personal network **104**, through the communications medium **120-124**, to the service provider's network **102**. The service provider's network **102** receives the transmission and logic (not shown) decodes the ISW **310** into its component data fields. The authentication and authorization database **130** is used to validate the received ISW **310** for access to the network resources including the personal network user profile **350**. Once authenticated, components of the ISW **310**, for example, the ESN **220**, PNC **222** and the data payload **240** are communicated to the subscriber database **134** where the personal network profile is stored. The logic used to control and manipulate the subscriber database **134** decodes the data payload **240** of the ISW **310**. Using the ESN **220** and PNC **222** (or other entries or combinations thereof) to index to the correct personal network user profile **350** and the correct field **360** within the profile, the subscriber database **134** will then operate upon the data payload **240**.

In one embodiment, the data payload **240** is developed and specified by the user prior to initiating the ISW **310** transmission. The user creates the payload **240** through manipulation of the input output logic **208** associated with the network device **110**. Specific payload signals will vary amongst network devices **110** depending upon the capabilities of each device and the capabilities of the service provider's network **102**. However, in general, through the use of each network device **110**, the user can develop payload information to control and manage the services **370** available within his personal network **104**. Generally, this control occurs through the manipulation of personal network user profile **350** stored within the service provider's subscriber database **134**. Examples, of payload commands that can be developed and initiated by the user include, but are not limited to: on/off status command; on/off service selection commands; addition/deletion of services; addition/deletion of devices; addition/deletion of personal network codes; routing to and from specific devices **110** and the like. Essentially, the user dynamically defines, controls, manages and operates the services available to each network device **110** within his personal communications network **104**. Furthermore, since network devices **110** can share the same personal network code **222** (e.g. address, telephone number, and the like), the user has the ability to use different devices for different tasks either at the same or different times by manipulating the services profile for each device.

In another embodiment, a user initiates a request to modify or otherwise change the status of one or more devices **110** within his personal network **104** by modifying information in the service provider's network **102** with a particular data payload **240**. For example, after successful authentication, database manipulation to index to the appropriate personal network user profile **350** and the successful decode of the data payload, the subscriber database **134** is updated to incorporate the data payload **240**. During an update, the subscriber database **134** verifies, establishes, or changes status of the network device fields **360** within the profile as directed by the data payload. This updated personal network profile **350** is stored and becomes the profile that defines the personal network **104**, network devices **110** and/or the services available.

It is understood that the procedures described can be modified to include user-initiated manipulation of the personal network user profile **350** through means other than using a network device **110**. For example in another embodiment, a user accesses the service provider's subscriber database **134** through a public network such as the Internet **370** using a

connecting device **372**. In one embodiment, the user authenticates, for example via a username/password algorithm. Once authenticated, the user's personal network user profile **350** can be modified by the user. Once complete, the user logs out of the database and the subscriber database **134** retains and implements any changes made to the profile.

With reference now to FIG. **4**, an alternate embodiment of personal network **104** configured as a distributed network includes a personal network logic **400** including distributed subscriber database **434**. The personal network logic **400** provides an interface between selected devices **110**C, **110**D and the service provider network **102**. To illustrate a routing example, a telephone call directed toward personal network **104** is received by the personal network logic **400**. The logic **400** receives the incoming signal, determines routing instructions from the distributed subscriber database **434**, and routes the call to the particular device (e.g., **110**C) where telephone signals (in this example) are to be received. In one embodiment the personal network logic **400** acts as a local switch directing data to particular devices within the personal network, for example inside of a home or office. Personal network logic **400** is in data communication with selected devices either via hardwiring or wireless links. In the event that a call is directed to a device not within direct communication with the personal network logic **400**, the call is redirected, for example, over telephone infrastructure **122** which completes the call to the designated call-receiving device, for example **110**B.

It can now be appreciated that the personal network logic **400** performs a proxy-like communications service between selected network devices that may or may not be configured to communicate directly with the communications network and the service provider network. As an example, a caller originating a telephone communication from device **410** connects through the public switched telephone network **412** to the service provider's network **102**. Access database **130** recognizes from incoming service data **414**, an inbound called number in this example, that the call is directed toward a personal network **104**. Personal network logic **400** receives the call and identifies an attribute from the service data **414** suitable to identify the service provided, here a telephone call. Such identification can occur by recognizing attributes of various services or by a coded prefix or other identifying data appended to the incoming service data **414**. After identifying the service, personal network logic **400** accesses the personal network profile **350** from distributed subscriber database **434** to identify the selected communication device setup to receive the service in the network. The call, in this example, is then directed to the desired communication device **110** based on the service attribute and the values in the personal network profile **350**. It can now be appreciated that the personal network switch **400** may also incorporate either partially or entirely all the database functions provided by the service provider network **102**. Moreover, while the call is illustrated as being routed through the subscriber's network **102**, under the illustrated system, the call may be routed directly to the personal network **104**.

It should be noted that although the service provider's network **102** has been discussed as including both the transmission network **120**, **122**, **124** and the databases **130**, **134**, this is not a requirement for the invention. Those skilled can appreciate that implementations exist in an environment where the access network provider is not the same as the application/services provider who operates, maintains and makes available services to users with personal networks and network devices. In such cases, one or more networks are used to obtain access to the personal network user profile for manipulation and management. Indeed, various services from multiple providers may be available through the service provider's network. For example video services may be provided from one provider, while voice services may be provided from another.

As an example of the above-described process, assume that a personal network Z consists of 3 personal network devices (A, B, C) each with a unique ESN and sharing the same personal network code (555-555-1212). Each of the three devices has been successfully registered and enabled for operation on service provider D's network. Below is an example of some possible attributes of each network device and a personal network user profile:

CHART 1

Service Provider D Subscriber Database Personal Network Z User Profile

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	On	Enabled	Disabled	Disabled
Device B	Pers. Dig. Assistant	555-555-1212	DEF54321	On	Disabled	Enabled	Enabled
Device C	Video Telephone	555-555-1212	GHI12345	On	Disabled	Disabled	Disabled

Assume that the user who manages personal network Z would like to receive/send his video communications by utilizing his portable telephone (Device A) while on the road. Video service is currently not enabled on his portable phone. To enable his portable phone to receive/send video communications, the user will manipulate the menu selection utilizing the soft-keys on his portable telephone to select "enable video communications". Once selected, the portable telephone will transmit an ISW that will be received by the service provider D's network. Once received, the ISW will be decoded and the information sent to the authentication and authorization database. Assuming the network device and ISW successfully authenticate, the ISW will be delivered to the service providers subscriber database. The subscriber database will use components of the ISW such as the personal network code and the ESN, to index to the specific record in the personal network user Z profile. The subscriber database logic will then operate on the payload data included in the ISW received from personal network device A. In this instance, the payload data instructs the service provider subscriber database to change the personal network user Z profile, enabling Device A, the portable telephone, to receive/send video communications. Once changed, the subscriber database will save the modified version of the personal network user Z profile. The modified personal network user Z profile is shown below:

CHART 2

Service Provider D Subscriber Database Personal Network Z User Profile (modified)

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	On	Enabled	Enabled	Disabled
Device B	Pers. Dig. Assistant	555-555-1212	DEF54321	On	Disabled	Enabled	Enabled
Device C	Video Telephone	555-555-1212	GHI12345	On	Disabled	Disabled	Disabled

FIG. **5** illustrates an additional embodiment for managing the personal network. Introduced in FIG. **5** is the concept of the Outbound Signaling Word (OSW) **514** that is incorporated in certain embodiments. The OSW is similar to the ISW explained above, with the exception that it represents data communication from the service provider's network **102** to the network device **110**, for example to transfer signals from the subscriber database **134** to network devices **110**.

Referring to FIG. **5**, assume that a personal network **104**Z consists of two personal network devices **111**A, **110**C each with a unique ESN and sharing the same personal network code (555-555-1212). Each device has been successfully registered and enabled for operation on service provider **102**X's network. Below is an example of some possible attributes of each network device and a personal network user profile:

CHART 3

Service Provider X Subscriber Database Personal Network Z User Profile

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	On	Enabled	Disabled	Disabled
Device C	Mobile Telephone	555-555-1212	GHI12345	Off	Disabled	Disabled	Disabled

Assume that the user who manages personal network **104**Z is initially receiving and sending voice communications by utilizing portable telephone **110**A. At some point in time later, the user would prefer to use mobile telephone **110**C instead of portable telephone **110**A. To enable mobile telephone **110**C to receive/send voice communications, the user will manipulate a menu selection or other interface on either portable telephone **110**A or mobile telephone **110**C to select "swap profiles from one device to another". Assuming the command was sent from portable telephone **110**A, an ISW **310** is transmitted to the service provider network **102**X. Once received, the ISW will be decoded and the information authenticated with database **130**X. Assuming the portable telephone **110**A and the sent ISW **310** successfully authenticate, the ISW is delivered to the service provider's subscriber database **134** which is illustrated in an alternate configuration separate from service provider's network **102**X and authorization database **130**X. The subscriber database will use the personal network code **222** and the ESN **220**, included in the ISW **310** to index to a specific record in the personal network user Z profile (see e.g. charts **3**, **4**). The subscriber database logic will then operate on the payload data included in the ISW received from network device **110**A. In this instance, the payload data instructs the service provider subscriber database **134** to swap the personal network user Z profile of network device **110**A with that of network device **110**C, enabling the mobile telephone to receive/send audio communications and setting network device **110**A to "off" status. Once changed, the subscriber database will save the modified version of the personal network User Z profile. The modified personal network user Z profile is shown below:

CHART 4

Service Provider D Subscriber Database Personal Network Z User Profile (modified)

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	Off	Disabled	Disabled	Disabled

CHART 4-continued

Service Provider D Subscriber Database Personal Network Z User Profile (modified)

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device C	Mobile Telephone	555-555-1212	GHI12345	On	Enabled	Disabled	Disabled

After the subscriber database **134** stores the new user profile to memory, an OSW **514**A, C is initiated to each of the network devices **110**A, **110**C effected by the previous ISW **310** database transaction. OSW **514**A is sent to network device **110**A and OSW **514**C is delivered to network device **110**C. For example, both OSW **514**A and OSW **514**C include a personal network code **222** identifying personal network **104**Z. OSW **514**A further includes ESN **220**A identifying device **110**A while OSW **514**C includes ESN **220**C identifying device **110**C. Each OSW **514** carries the respective data payload **240**A, C representing changes to each respective network device profiles representing the modifications to the user's personal network profile requested by the ISW **310**. Network device **110**A and **110**C respective logic will then operate on their received payload data included in each of the OSW's received from the subscriber database **134**. In this instance, the payload data provides device profile modifications reflective of the updated subscriber database initiated by the ISW. The final result enjoyed by the user is a mobile device enabled for voice communications and a portable device that is not.

A method is provided that enables a user to define, control and operate a personal network of devices within a service provider's communication system. In one embodiment, this is accomplished by assembling a network of personal communications devices incorporating transceivers that share the same address, customer account information, telephone number, billing information and are compatible with the service provider's communication system. In addition to assembling the network of personal communications devices, the user subscribes to one or more services made available by the service provider. Furthermore, service provider's network provides for a signaling protocol that allows for communications between device transceivers within the personal network and database units within the service provider's network. Thus, communications equipment manufacturers and service providers alike can deliver multiple services to a single user while allowing the user to utilize multiple devices at his convenience. Also provided is a process that enables the user to utilize more than one personal network device and a mechanism to actively manage his personal network devices and network services.

In yet another embodiment, individual ones of devices hand-off designated services in response to a triggering event. The triggering event can be user initiated, proximity based or otherwise. For example, when a mobile phone detects a home based phone and an automatic hand-off indicator is present, the home phone can be configured to send an ISW enabling itself for designated services and disabling the mobile phone. In another embodiment the mobile phone can be configured to send an ISW disabling itself for those designated services. Coordination between the two hand-shaking devices could occur over the personal network, over a local short range network such as Bluetooth, or 802.11 protocol networks and the like.

Referring now to FIG. **6**, a methodology implementable in software for managing a network of devices is illustrated. Upon a triggering event or user request, a device prepares a signaling word to implement a particular network device management configuration, (block **610**). The signaling word is transmitted or otherwise communicated to logic including the subscriber database, (block **612**). On the subscriber database side, the signaling word is received, (block **620**). Authentication logic authenticates, decodes, or otherwise verifies the received signaling word as proper, (block **622**). The payload is then applied to the appropriate data record or records identified by the signaling word, (block **624**). Responsive to success or failure to manage the personal network devices by application of the payload, a return signaling word is prepared, (block **626**). The signaling word is transmitted or otherwise communicated to logic including the devices within the personal device network, (block **628**). The signaling word is received on the device side, (block **614**). Upon receipt of the signaling word on the device side, the device can be configured to display a status report for the effected device or selected devices in the network. It can be appreciated that the methodology can be implemented as discussed above through managed network devices, other network devices, or through mechanisms that access the subscriber database side via network external devices.

In yet another embodiment, the service provider **102** is located and maintained at the home or other place designated by a user. In this configuration, the databases and associated equipment can be associated uniquely with an individual user's network or scalable up to fill service provider for multiple users. In the individual configuration, the service provider **102** is configured to adapt to legacy equipment such as twisted pair, other wireline telephony presently supplied to many consumers, cable, satellite or other communications means. Routing can be redirected back into the legacy equipment or alternately routed over a wireless network as desired.

With reference now to FIG. **7**, an embodiment illustrates distribution of additional services to individual devices in a personal network **704**. As illustrated, the personal network **704** includes television devices **710**A, personal mail and scheduling devices **710**B, audio devices **710**C, and computer devices **710**D. A record contained in distributed subscriber database **734** maintains a profile including desired routing for specific incoming signals. For example, an inbound signaling word **740** includes a unique network device identifier **742** and a payload **744** configured, for example, to create or update a record (not shown) directing incoming television or other motion picture signals toward television device **710**A. Other signaling words route music, radio and, in certain embodiments audio tracks of associated motion picture signals toward audio device **710**C, and match other services to other devices as desired by the subscriber. Those skilled in the art can now appreciate that multiple devices, for example multiple television devices, are configurable to receive a particular incoming signal.

While the present invention has been illustrated by the description of embodiments thereof, and while the embodiments have been described in considerable detail, it is not the intention of the applicants to restrict or in any way limit the scope of the appended claims to such detail. Additional advantages and modifications will readily appear to those skilled in the art. For example, concepts such as enabling subscribers of a service provider network with the ability to

dynamically manage services amongst his network of personal communication devices. With this, a subscriber can actively provision, activate/de-activate, manage and direct network provider services to each of his communications devices. Included is the ability for the subscriber to manage his services either through the communication devices themselves or through other means/networks such as the internet and a public Internet access point. Also included are means to manage and provision network services in a distributed, dynamic subscriber driven self-provisioning manner. This is in contrast to the legacy manner in which services have traditionally been provided to subscribers. The legacy services were provisioned in a centralized, static, service provider provisioned manner. Therefore, the invention, in its broader aspects, is not limited to the specific details, the representative apparatus, and illustrative examples shown and described. Accordingly, departures may be made from such details without departing from the spirit or scope of the applicant's general inventive concept.

We claim:

1. A method of removing a communications device from a communications network, the method comprising:

receiving from the communications device a request to leave the communications network, where the communications network is identified by a communications network identifier, the request comprising a unique identifier tat uniquely identifies the communications device and payload data indicating a change request, where the unique identifier that uniquely identifies the communications device is not a telephone number; and

updating a database containing data corresponding to the communications network, the database containing information usable to correlate communications services available generally to the communications network from at least one communications service provider to particular communications devices within the communications network, to reflect the removal of the communications device from the communications network, to decorrelate in the database one or more communication services from the communications device if the one or more communication services are determined to be connected in the database to the communications device, and to correlate in the database the one or more communications services to a second communications device by relating in the database a second unique identifier that uniquely identifies the second communications device and data representing the one or more communications services.

2. The method of claim **1** where the request further specifies a type of video services associated with the communications device.

3. The method of claim **1** where the request further specifies a type of data services associated with the communications device.

4. The method of claim **1** wherein the communications device is selected from the group consisting of a telephone, a cellular phone, a cordless phone, a laptop computer, a personal digital assistant, a video telephone, a mobile device, an analog cellular device, a digital device, a video device, and an audio device.

5. The method of claim **1** wherein the communication services comprise one or more of telephone services, text messaging services, video services, voice services, data services, music services and audio services.

6. A communications device capable of sharing a network number with other communications devices in a communications network, the communications device comprising:

a first computer-readable medium having stored thereon a first unique identifier that uniquely identifies the communications device within the communications network identified by the network number, where the first unique identifier that uniquely identifies the communications device is not a telephone number;

a management logic that manages a database containing routing information for an incoming communication directed at the communications network via the network number to be routed to a particular communications device within the communications network based on communications service content of the incoming communication, where the routing information relates the communications device to one or more communication services available to the communications network from a communications services provider by associating the first unique identifier that uniquely identifies the communications device to the one or more communication services; and

a processor that controls the management logic to update the database to reflect the addition of the communications device to the communications network, to disassociate in the database the one or more communications services from a second communications device if the one or more communication services are determined to be connected in the database to the second communications device, and to connect in the database the one or more communication services to the communications device by relating in the database the unique identifier that uniquely identifies the communications device and data representing the one or more communications services.

7. The communications device of claim **6** where the communications device is selected from the group consisting of a telephone, a cellular phone, a cordless phone, a computer, a personal digital assistant, a video telephone, a fax machine, a mobile device, an analog cellular device, a video device, and an audio device.

8. The communications device of claim **6** wherein the routing information relates the communications device to a type of audio services.

9. The communications device of claim **6** wherein the routing information relates the communications device to a type of video services.

10. The communications device of claim **6** wherein the routing information relates the communications device to a type of data services.

11. The communications device of claim **6** wherein the communication services comprise one or more of telephone services, text messaging services, video services, voice services, data services, music services and audio services.

12. A method of removing a telephone from a communications network, the method comprising:

receiving from the telephone a request to quit the communications network, where the communications network is identified by a network identifier, the request comprising a unique identifier that uniquely identifies the telephone and payload data indicating a change request, where the unique identifier that uniquely identifies the telephone is not a telephone number; and

updating a database containing data corresponding to the communications network, the database containing information usable to correlate communications services available generally to the communications network from at least one communications service provider to particular communications devices within the communications network, to reflect the removal of the tele-

phone from the communications network, to decorrelate in the database one or more communication services from the telephone if the one or more communication services are determined to be connected in the database to the telephone, and to correlate in the database the one or more communications services to a second communications device by relating in the database a second unique identifier that uniquely identifies the second communications device and data representing the one or more communications services.

13. The method of claim **12** where the request further specifies a type of video services associated with the telephone.

14. The method of claim **12** where the request further specifies a type of data services associated with the telephone.

15. The method of claim **12** wherein the communication services comprise one or more of telephone services, text messaging services, video services, voice services, data services, music services and audio services.

16. A telephone capable of sharing a network number with other devices in a network, the telephone comprising:

a first computer-readable medium having stored thereon a first unique identifier that uniquely identifies the telephone within the network, where the first unique identifier that uniquely identifies the telephone is not a telephone number;

a management logic that manages a database containing routing information for an incoming communication directed at the network via the network number to be routed to a particular communications device within the network based on communications service content of the incoming communication, where the routing information relates the telephone to one or more communication services available to the network from a communications services provider by associating the first unique identifier that uniquely identifies the telephone to the one or more communication services; and

a processor that controls the management logic to update the database to reflect the addition of the telephone to the network, to disassociate in the database the one or more communication services from a communications device if the one or more communication services are determined to be connected in the database to the communications device, and to connect in the database the one or more communication services to the telephone by relating in the database the unique identifier that uniquely identifies the telephone and data representing the one or more communications services.

17. The telephone of claim **16** wherein the routing information relates the telephone to a type of audio services.

18. The telephone of claim **16** wherein the routing information relates the telephone to a type of video services.

19. The telephone of claim **16** wherein the routing information relates the telephone to a type of data services.

20. The telephone of claim **16** wherein the communication services comprise one or more of telephone services, text messaging services, video services, voice services, data services, music services and audio services.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 7,489,671 B2
APPLICATION NO. : 11/668247
DATED : February 10, 2009
INVENTOR(S) : Robert G. Marsico et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title page, Item (60), delete the Related U.S. Application Data, and substitute the following:

--(60) Division of application No. 10/778,443, filed on Feb. 13, 2004, now Pat. No. 7,171,194.

(60) Provisional application No. 60/447,436, filed on Feb. 14, 2003, now expired.--

Signed and Sealed this
Nineteenth Day of August, 2014

Michelle K. Lee

Michelle K. Lee
Deputy Director of the United States Patent and Trademark Office

US007486649B2

(12) **United States Patent**
Marsico et al.

(10) **Patent No.: US 7,486,649 B2**
(45) **Date of Patent: *Feb. 3, 2009**

(54) **TELEPHONE MANAGEMENT SYSTEM AND METHOD**

(76) Inventors: **Robert G. Marsico**, 8484 Turtle Creek Cir., Las Vegas, NV (US) 89113; **Marilyn J. Marsico**, 8484 Turtle Creek Cir., Las Vegas, NV (US) 89113; **Carl A. Steen**, 241 N. Indian Trail Rd., North Barrington, IL (US) 60010; **Maxwell A. Marsico**, 8484 Turtle Creek Cir., Las Vegas, NV (US) 89113

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1038 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **10/779,270**

(22) Filed: **Feb. 13, 2004**

(65) **Prior Publication Data**

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Related U.S. Application Data

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(51) **Int. Cl.**
H04M 3/42 (2006.01)

(52) **U.S. Cl.** **370/338**; 370/352; 379/211.02

(58) **Field of Classification Search** ..... None
See application file for complete search history.

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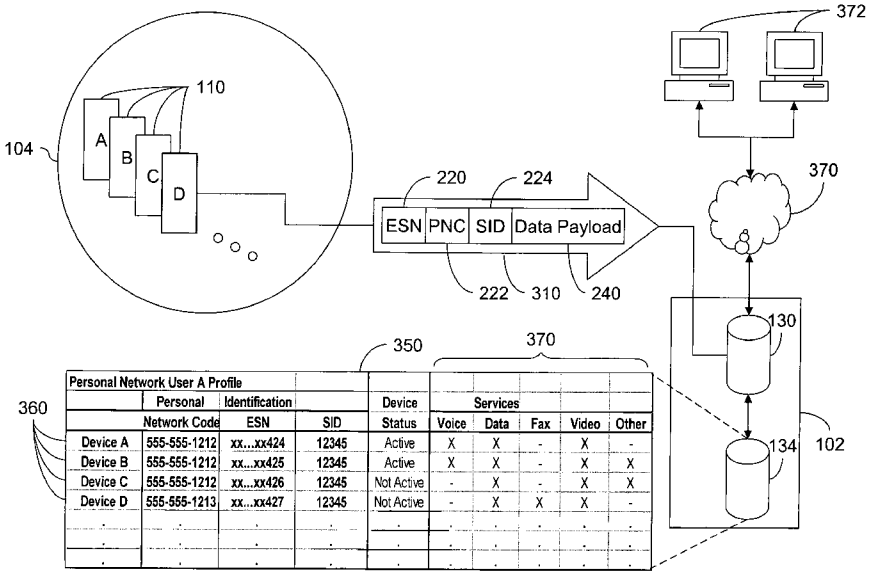
Primary Examiner—Wing F Chan
Assistant Examiner—Robert C Scheibel
(74) *Attorney, Agent, or Firm*—Benesch, Friedlander, Coplan & Aronoff, LLP

(57) **ABSTRACT**

A method is provided to manage multiple devices with a common network number. The method includes receiving a request from a first device having a network number. The request includes a first unique identifier that uniquely identifies the first device, a second unique identifier that uniquely identifies a second device, and payload data indicating a change request. The method includes assigning to the second device network services associated with the first device.

36 Claims, 7 Drawing Sheets



Personal Network User A Profile										
	Personal Identification			Device	Services				
	Network Code	ESN	SID	Status	Voice	Data	Fax	Video	Other
Device A	555-555-1212	xx...xx424	12345	Active	X	X	-	X	-
Device B	555-555-1212	xx...xx425	12345	Active	X	X	-	X	X
Device C	555-555-1212	xx...xx426	12345	Not Active	-	X	-	X	X
Device D	555-555-1213	xx...xx427	12345	Not Active	-	X	X	X	-

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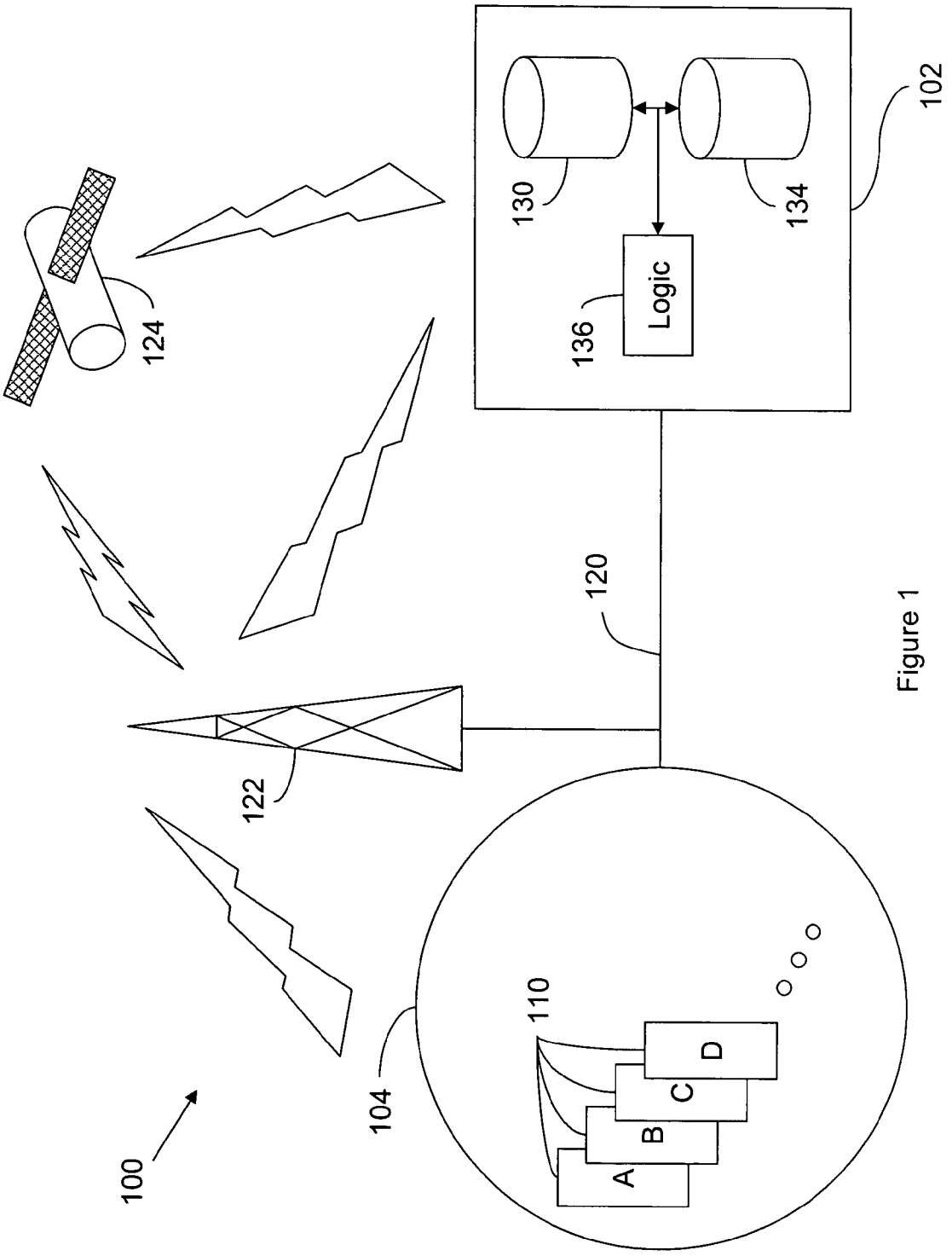

Figure 1

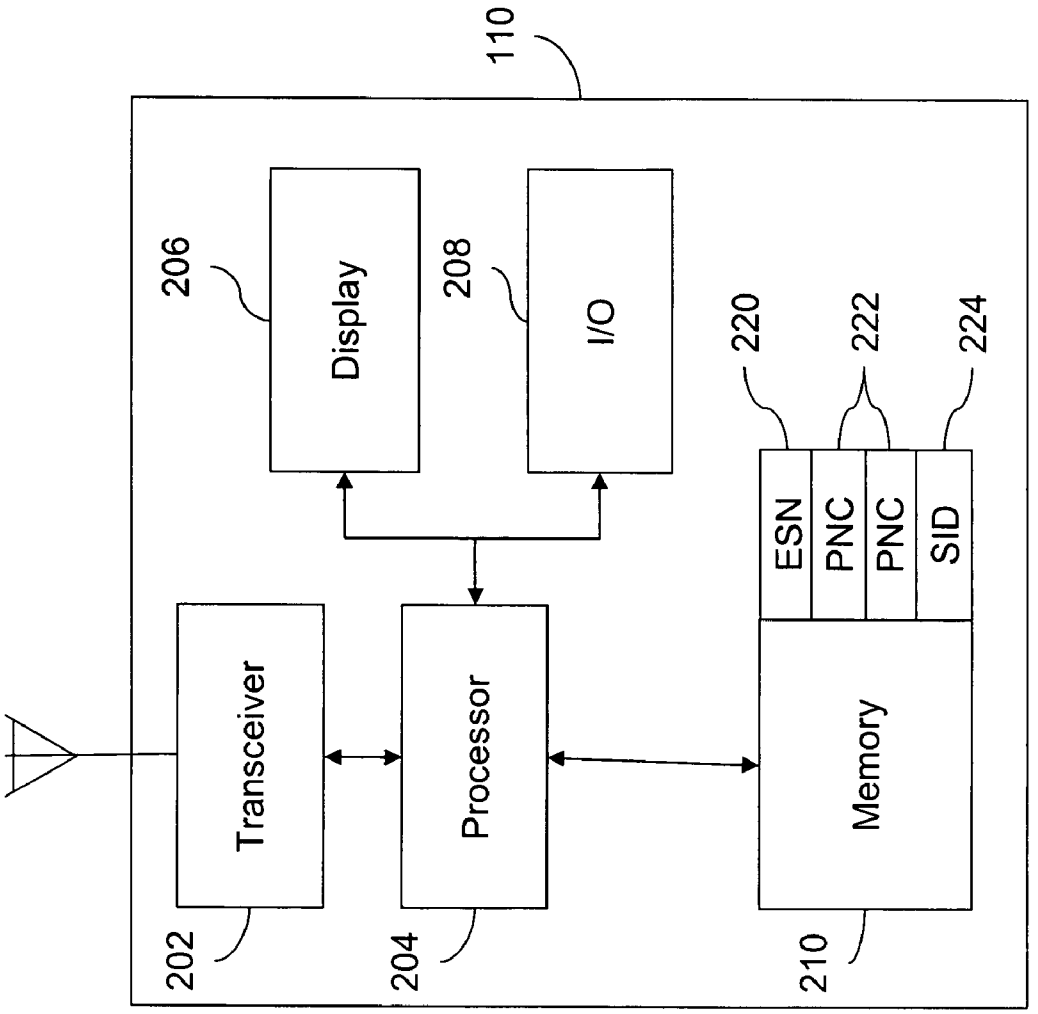
110
206
Display
208
I/O
220
222
224
ESN
PNC
PNC
SID
Transceiver
Processor
Memory
202
204
210

Figure 2

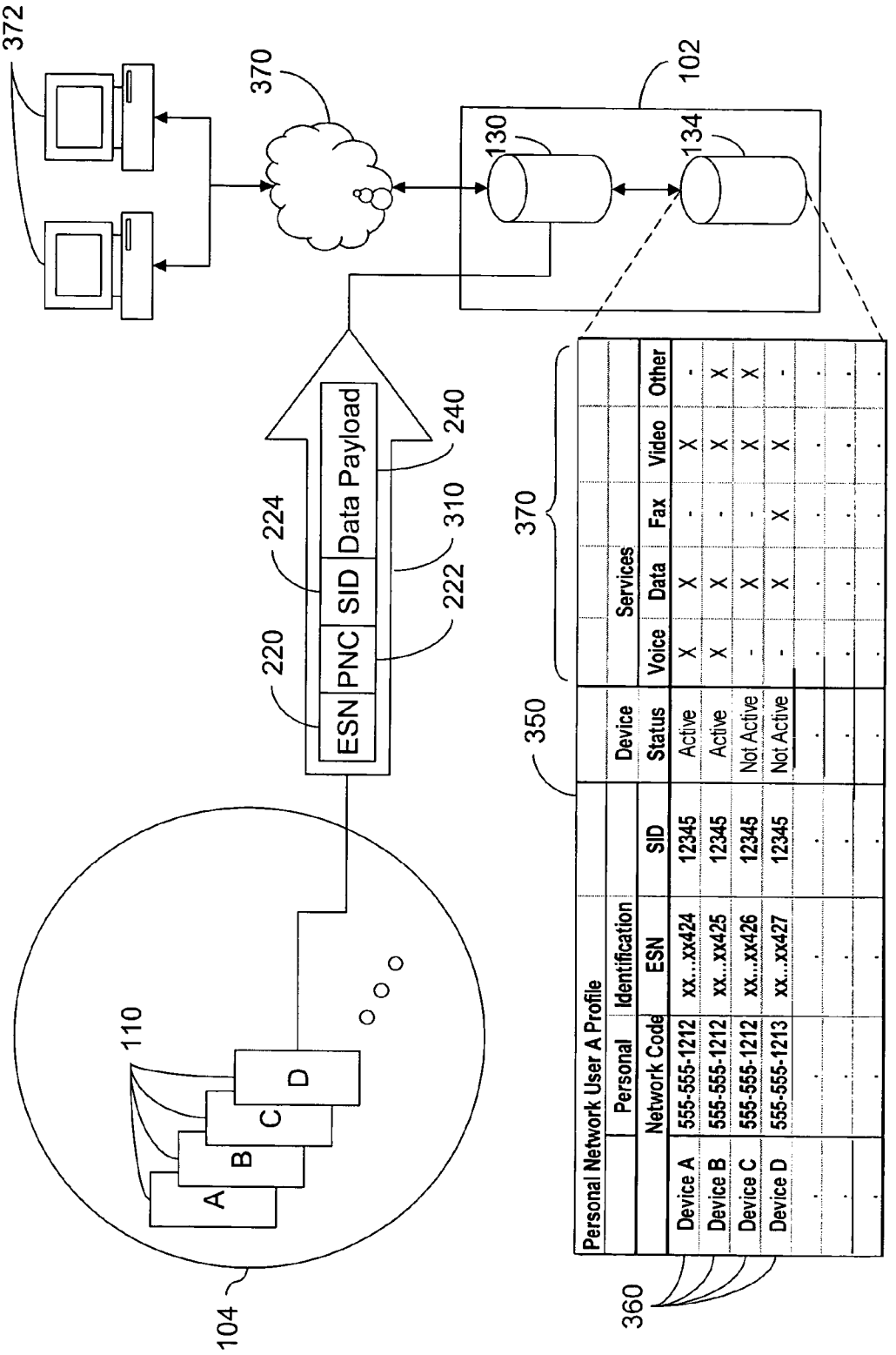
372
370
102
130
134
240
224
310
222
220
ESN
PNC
SID
Data Payload
110
A
B
C
D
104
350
370
360
Personal Network User A Profile
Personal Identification
Network Code
ESN
SID
Device Status
Services
Voice
Data
Fax
Video
Other
Device A
555-555-1212
xx...xx424
12345
Active
X
X
-
X
-
Device B
555-555-1212
xx...xx425
12345
Active
X
X
-
X
X
Device C
555-555-1212
xx...xx426
12345
Not Active
-
X
-
X
X
Device D
555-555-1213
xx...xx427
12345
Not Active
-
X
X
X
-

Figure 3

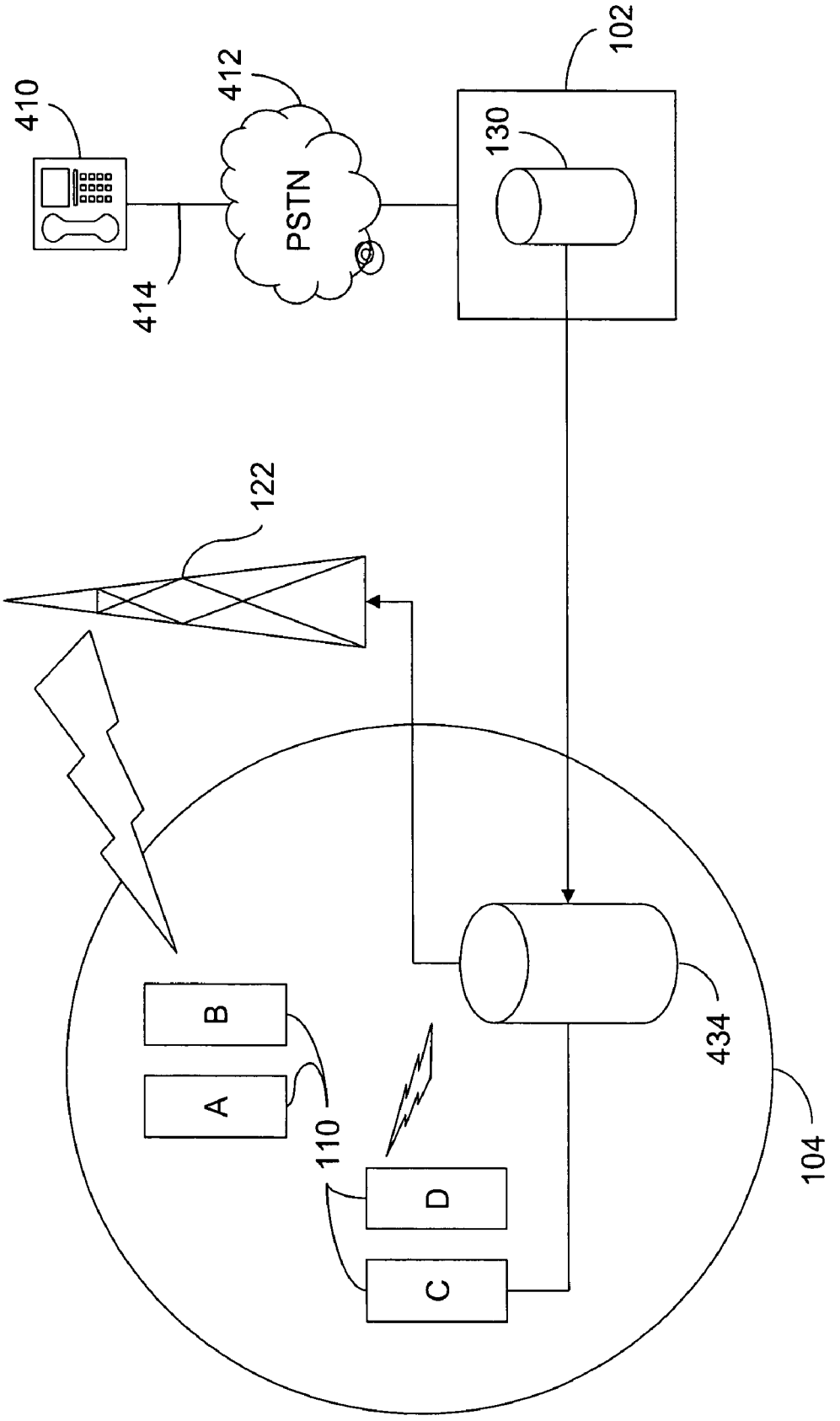

Figure 4

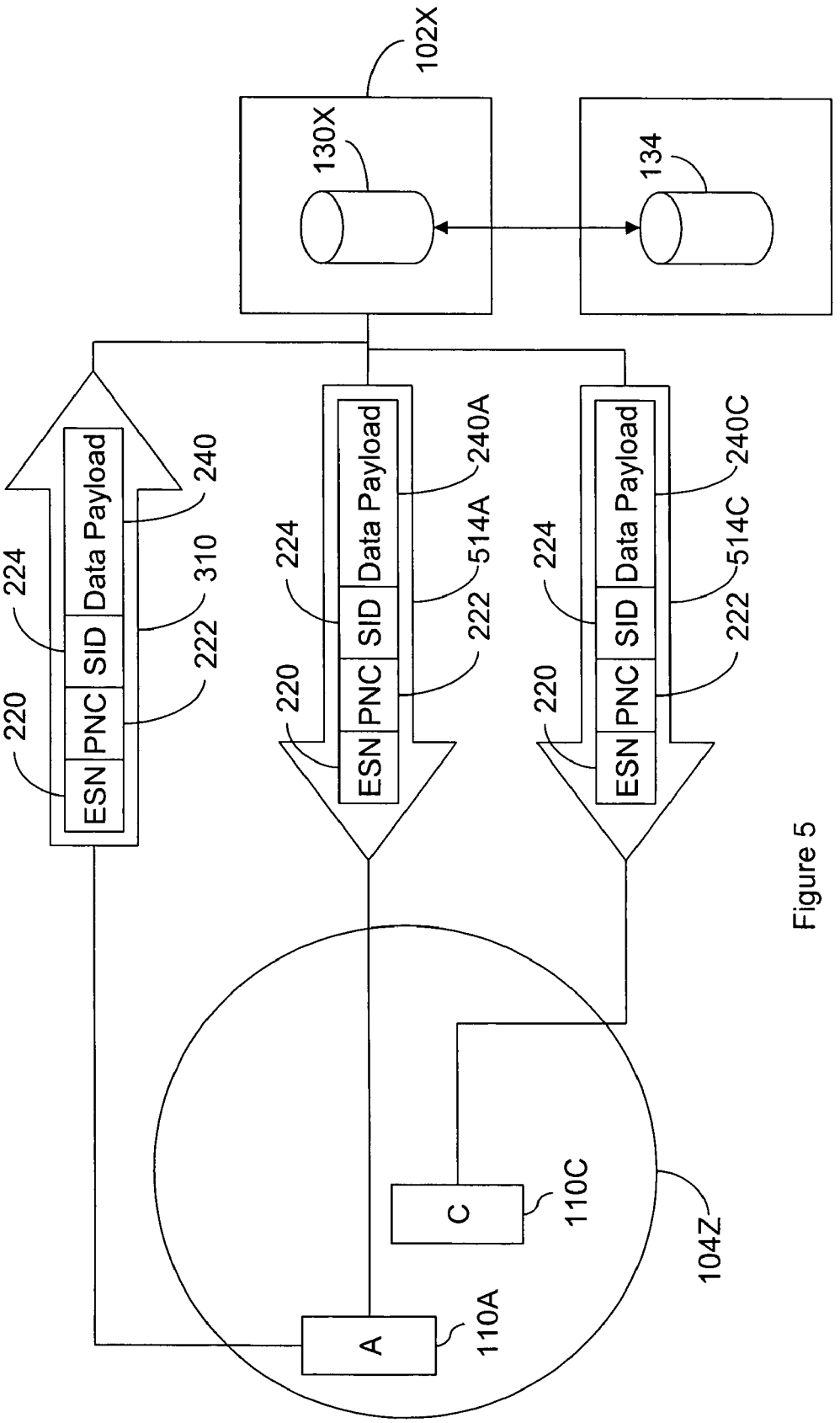
102X
130X
134
ESN
PNC
SID
Data Payload
220
224
222
310
240
240A
514A
240C
514C
A
110A
C
110C
104Z

Figure 5

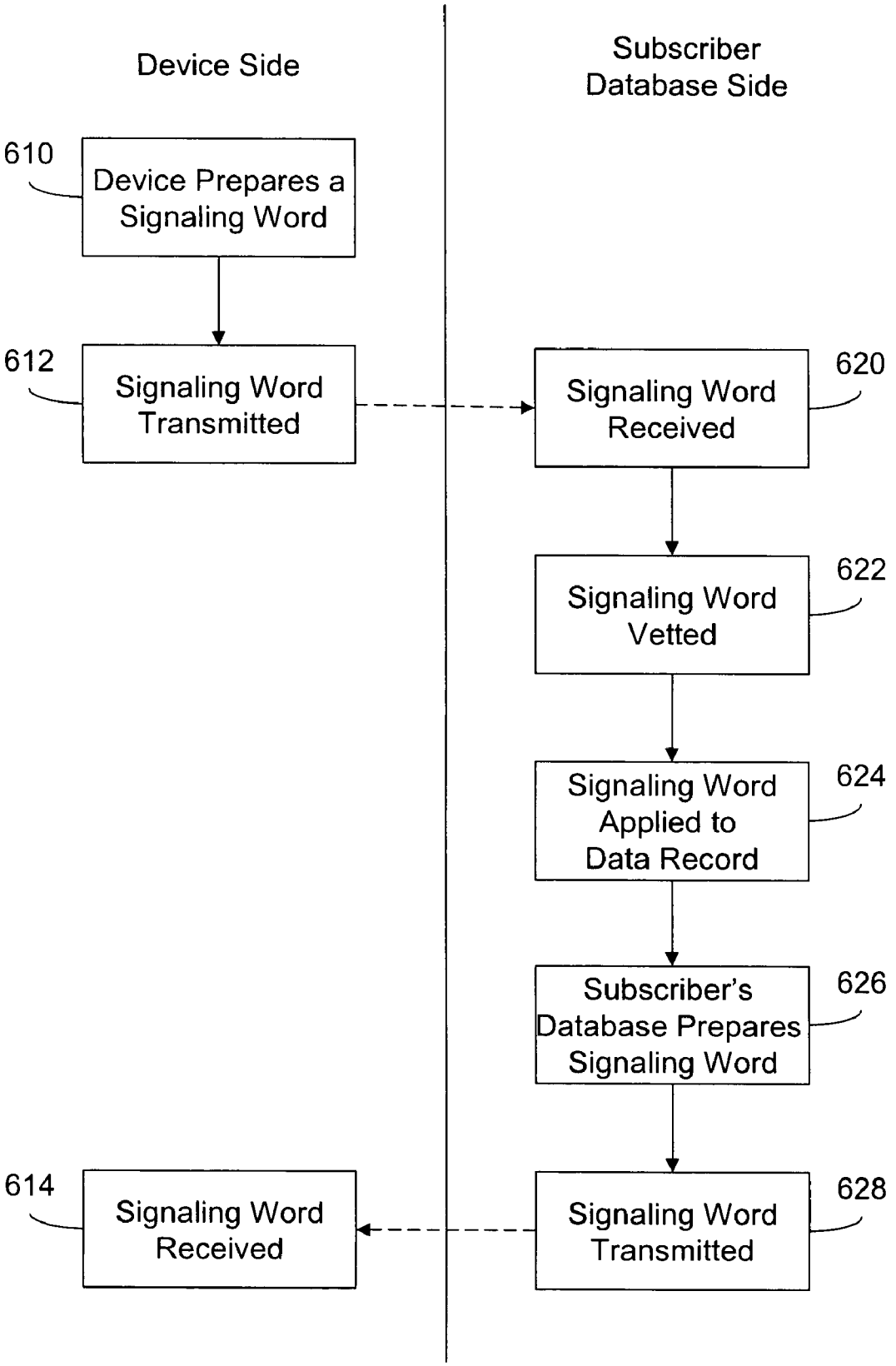
Device Side
Subscriber Database Side
610
Device Prepares a Signaling Word
612
Signaling Word Transmitted
620
Signaling Word Received
622
Signaling Word Vetted
624
Signaling Word Applied to Data Record
626
Subscriber's Database Prepares Signaling Word
628
Signaling Word Transmitted
614
Signaling Word Received

Figure 6

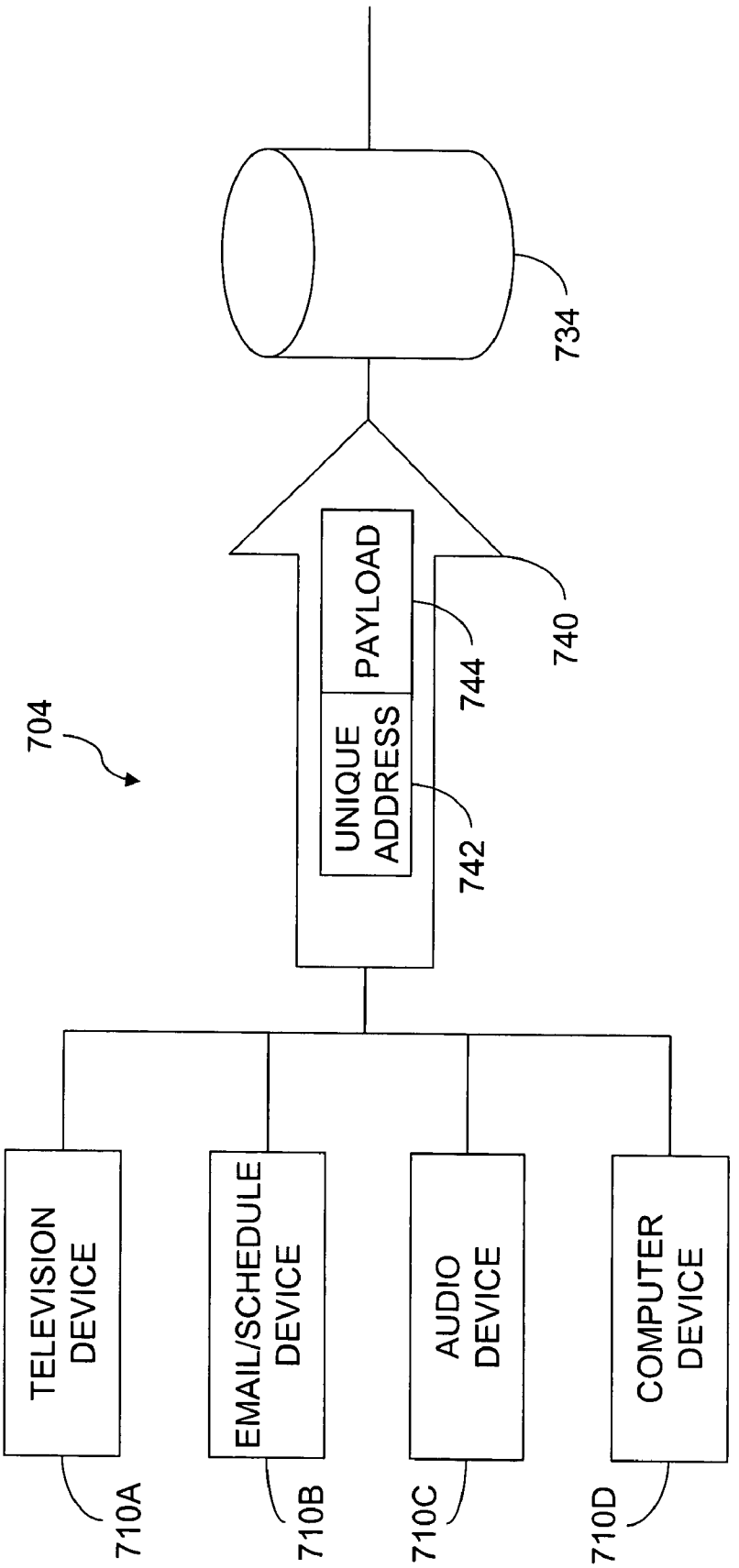
734
740
PAYLOAD
744
UNIQUE ADDRESS
742
704
TELEVISION DEVICE
EMAIL/SCHEDULE DEVICE
AUDIO DEVICE
COMPUTER DEVICE
710A
710B
710C
710D

Figure 7

TELEPHONE MANAGEMENT SYSTEM AND METHOD

RELATED APPLICATIONS

This non-provisional application claims the benefit of U.S. Provisional Application No. 60/447,436 filed Feb. 14, 2003 and U.S. patent application Ser. No. 10/626,343 filed Jul. 24, 2003 now abandoned, incorporated herein by reference.

BACKGROUND

The present invention relates generally to network systems. It finds particular applicability in conjunction with communication based networks and will be described with particular reference thereto. It is to be appreciated however, that the invention finds further application in systems and devices where it is desirable to use a single address with a plurality of devices.

The first generations of wireless mobile phones were large in size and expensive to use. However, over time, technology has reduced the size of the mobile telephone and lowered its cost of use, thereby enhancing mobility and expanding usage. With each subsequent generation of technology, the size of the device has been reduced while the functionality and types of devices available have increased dramatically.

With the introduction of digital cellular telephones, laptop computers, multi-function personal handheld devices, one can now send email, surf the web, make telephone calls, receive and send instant/short messages, view personal calendars, video conference, and send pictures seamlessly and continuously while connected to one or more wireless or wireline communications networks.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings which are incorporated in and constitute a part of the specification, embodiments are illustrated which, together with the detailed description given below, serve to describe exemplary embodiments. It will be appreciated that the illustrated boundaries of elements (e.g. boxes, groups of boxes, or other shapes) in the figures represent but exemplary boundaries. One of ordinary skill in the art will appreciate, for example, that one element may be designed as multiple elements or that multiple elements may be designed as one element. An element shown as an internal component of another element may be implemented as an external component and vice versa.

FIG. **1** is a system diagram illustrating an embodiment of a network.

FIG. **2** is a functional block diagram illustrating an embodiment of a network device.

FIG. **3** is a system diagram illustrating another embodiment of a network and an exemplary record from a computer-readable medium

FIG. **4** is a system diagram illustrating another embodiment of a network.

FIG. **5** is a system diagram illustrating one embodiment of a system for managing a network.

FIG. **6** illustrates one embodiment of a methodology for managing a network of devices.

FIG. **7** is a system diagram illustrating another embodiment of a network.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

The following description includes definitions of selected terms used throughout the disclosure. Both singular and plural forms of all terms fall within each meaning:

"Address", as used herein, includes but is not limited to one or more network accessible addresses, device identifiers, telephone numbers, IP addresses, url and ftp locations, e-mail addresses, names, a distribution list including one or more addresses, network drive locations, postal addresses, account numbers or other types of addresses that can identify a desired destination or device.

"Computer-readable medium", as used herein, refers to any medium that participates directly or indirectly in providing instructions and/or data to one or more processors for execution. Such a medium may take many forms, including but not limited to, non-volatile media, and volatile media. Non-volatile media may include, for example, optical or magnetic disks. Volatile media may include dynamic memory. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, or any other magnetic medium, a CD-ROM, any other optical medium, punch cards, papertape, any other physical medium with patterns of holes, a RAM, a PROM, an EPROM, a FLASH-EPROM, any other memory chip or cartridge, or any other medium from which a computer, a processor or other electronic device can read.

"Image forming device", as used herein, includes a printer, copier, an all-in-one product, a multifunctional peripheral, a display or other device that can form an image onto display media. The image forming device can include various types of imaging mechanisms based on, for example, technologies such as ink jet, piezoelectric, thermal printing, laser printing, digital imaging, impact printing, cathode ray tube, LCD, plasma display or other available technologies.

"Logic", as used herein, includes but is not limited to hardware, firmware, software and/or combinations of each to perform a function(s) or an action(s), and/or to cause a function or action from another component. For example, based on a desired application or needs, logic may include a software controlled microprocessor, discrete logic such as an application specific integrated circuit (ASIC), a programmed logic device, memory device containing instructions, or the like. Logic may also be fully embodied as software.

"Signal", as used herein, includes but is not limited to one or more electrical or optical signals, analog or digital signals, one or more computer or processor instructions, messages, a bit or bit stream, or other means that can be received, transmitted, and/or detected.

"Software", as used herein, includes but is not limited to one or more computer readable and/or executable instructions that cause a computer or other electronic device to perform functions, actions, and/or behave in a desired manner. The instructions may be embodied in various forms such as routines, algorithms, modules or programs including separate applications or code from dynamically linked libraries. Software may also be implemented in various forms such as a stand-alone program, a function call, a servlet, an applet, instructions stored in a memory, part of an operating system or other type of executable instructions. It will be appreciated by one of ordinary skill in the art that the form of software is dependent on, for example, requirements of a desired appli-

cation, the environment it runs on, and/or the desires of a designer/programmer or the like.

"User", as used herein, includes but is not limited to one or more persons, software, computers or other devices, or combinations of these.

Generally speaking, one embodiment of a system and method is provided to enable a user to define, control and operate a personal network of one way or bi-directional devices capable of accessing a service provider's network, receiving services, or both. This can be accomplished by assembling a network of personal communications devices that may include transmitters, receivers or transceivers that share or can be configured to share the same address. The devices are configured to be compatible or selectively compatible with the service provider's network. In addition to assembling the network of personal communications devices, the user subscribes to one or more services made available by the service provider. Furthermore, the service provider's network uses a signaling protocol that allows for communications between device transceivers within the personal network and database units within the service provider's network.

In a simple exemplary network, a telephone service provider assigns a telephone number to a subscriber. In this simple network, the subscriber has multiple telephones, each used in different places and at different times. The subscriber registers each telephone including a unique serial number with the telephone service provider's database and a subscriber profile is created. The assigned "telephone number" actually refers to the subscriber profile identifying the subscriber's network. Each telephone occupies a record in the subscriber profile and is individually identifiable by the unique serial number. Once established, for example, a mobile telephone is selected to receive all incoming telephone calls. Once the subscriber returns home, the home phone replaces the mobile phone as the desired destination for all incoming calls (either automatically or through manual selection). In an embodiment, incoming signals such as calls, can be directed to the subscriber profile and a database dip can be configured to return the subscriber desired routing data to complete the call to a device. In an embodiment, outgoing signals such as calls, can be transmitted from a telephony enabled device over transmission medium to the subscriber's database, and/or to another device. Conveniently, charges associated with any of the devices in the subscriber's network can be aggregated onto a single bill.

In a more general embodiment, upon user initiation, a device communicates with a service provider's network. The device transmits a request to authentication logic operated by the service provider for access to some or all of the services available to the service provider's network, for example telephone services, text messaging services, video services and other services. Logic within the device can be configured to negotiate for access to services available from the service provider. Responsive to the request, the authentication logic authenticates the device's request for access and selectively makes available to or authorizes the device to use those services available from the service provider's network.

In another embodiment, the user initiates a request to modify or otherwise change the status of one or more devices within his personal network by modifying the service provider's database. The status of a device includes available services assigned to the device, and the device's registration on the network, for example, enabled or disabled from network participation. It will be appreciated that one device on the personal network can be configured to check or alter the status of that device, and/or other devices within the personal network. Moreover, device status can alternately be checked or configured via other mechanisms such as over the internet, through communication with a customer service feature and the like.

One embodiment of the network device management is illustrated in FIG. **1**. Network **100** includes a service provider network operations center **102**, a plurality of personal networks **104** (one shown) and, a plurality of personal network devices **110** (A-D shown). The network devices **110** communicate with the service provider's network **102** across one or more transmission mediums such as conventional wireline networks **120**, which include twisted pair, Hybrid Fiber Coaxial (HFC) fiber optics and the like; terrestrial wireless networks **122**; and satellite or other aloft networks **124**. The service provider's network **102** provides information such as communication services, voice, video, and/or data to personal networks **104** of network devices **110**. It should be appreciated that the service provider may directly provide all of the services, or may act as a distributor of other providers' services. It should be further appreciated that network devices **110** include a variety of portable, mobile, analog cellular or digital devices, video and audio equipment, desk-top computers and the like configurable to have discrete addresses identifiable from the common address.

The service provider's network **102** uses transceiver equipment (not shown) coupled with one or more of the transmission mediums **120-124** to communicate information, network control, and system resource management to and/or from the personal networks **104**. The service provider's network **102** includes computer-readable media such as database units that can be either centralized or distributed. Exemplary database units include an authentication and authorization database **130**, and a subscriber database **134**. Logic **136** is configured to process requests for access to network services accessing authentication and authorization database **130** and accessing or modifying stored information specific to each user, personal network **104**, and network device **110**. The subscriber database **134** is arranged to identify specific information regarding each user's personal network **104**, network devices **110** and authorized network services. In the illustration, each database unit is in data communication with and under the control of logic **136** associated with the service provider's network **102** but such centralized control can be readily decentralized or segregated into two or more distinct elements with no loss of functionality.

With reference to FIG. **2**, an embodiment of a network device **110** includes a transceiver **202** in communication with a logic that may take the form of processor **204**. The transceiver **202** may be configured to transmit, receive, or both signals including voice, video, and/or data transmissions formatted under several signaling protocols. While the transceiver **202** is illustrated connected to an antenna, wired connections are also envisioned for network devices **110**. The processor **204** can also be in data communication with display logic **206** and input/output logic **208**. A storage device medium **210** can be provided to store encryption algorithms, software programs, algorithms used to process signals and/or algorithms or logic used to implement communication controls and network system management.

Additionally, the processor **204** is configured to access identification codes, such as the illustrated electronic serial number (ESN) **220**, personal network code (PNC) **222**, and system identification code (SID) **224**. As further discussed below, these identification codes **220**, **222**, **224** enable, device management and communication. For example, in one embodiment ESN **220** corresponds to a device **110**, PNC **222** corresponds to a personal network **104**, and SID **224** corresponds to a service provider's network **102**.

In one embodiment (ESN) **220** is generated from an individual device's hardware identification code. Typically, hardware identification codes are manufacturer assigned indicia

which are unique to each network device. In another embodiment, ESN **220** is assigned by a service provider and held in memory. It should be appreciated that these identification codes need not be static, and can cycle or hop for example for security.

In another embodiment, each network device **110** stores or is assigned a personal network code (PNC) **222**. The personal network code **222** is preferably unique within the communication network **100** but may be common among the network devices **110** within a personal network **104**. As illustrated, each personal network **104** can have one or more personal network codes **222** corresponding to, for example, a single device belonging to more than one personal network such as in the case of a single home phone belonging to the personal networks of each occupant. The personal network code **222** may be a hexadecimal number or any address assigned by the user or the network service provider suitable to identify the personal network of devices.

Yet another embodiment includes the service provider assigning a network device **110** a system identification code (SID) **224**. This system identification code **224** can be unique to the service provider and can be assigned to all network devices **110** that operate within the network **100**. That is, the system identification code **224** is common to selected operable devices in the plurality of personal networks **104** in the overall network **100**. The network device **110** has data access to the system identification code **224**.

With reference now to FIG. **3**, operation of a system according to an embodiment of the present invention is illustrated. Personal network **104** comprises one or more network devices **110** subscribing to service(s) provided by or available through the service provider's network **102**. Each network device **110** is registered or registerable with at least one personal network and with the service provider network **102**. Registration of each network device **110** may be accomplished either remotely or locally using either manual or automated means. Registration of each network device **110** can include the creation or modification of data fields within subscriber database **134**, and authentication and authorization database **130**. Each user's personal network **104** is represented within the subscriber database **134** with a profile, for example, profile **350** including individual device records **360**. These individual device records are populated with fields identifying the device, the network, and the like and also various services **370** available from the service provider's network. The authentication and authorization database **130** comprises fields for those identifiers associated with each device **110** registered, for example, the ESN **220** and PNC **222**. Once a user has registered and enabled a network device **110** on the service provider's network **102**, the network devices may communicate on, with, and through the communication network.

In another embodiment, the user can utilize one or more of the network devices **110** concurrently. Each device **110** can be used for one or more similar or different services **370** provided by the service provider. For example, in the telephone context, a device may be configured for audio services while another device may be configured for text-based services, or the first device may be configured for voice services different than the voice services of the second device. In the video context, for example, a device may be configured for one type of video services while another device may be configured for a different type of video services. In another example, in the image context, a device may be configured for one type of image services while another device may be configured for a different type of image services. Alternatively, a single device may be configured for both audio and text services, or any other number of services simultaneously. In yet another alternative, services may be segregated on an in-coming or outgoing basis.

Initiated by the user or upon a triggering event, a network device **110** will signal the service provider's network **102** by sending an inbound signaling word (ISW) **310**. As further discussed below, the ISW **310** can be configured to manage devices **110** in the personal network **104** by registering devices or changing services **370** available to specific devices. In the illustrated embodiment, the ESN **220**, personal network code **222**, system identification code **224**, and data payload **240** comprise the ISW **310**, which is used to access the service provider's network **102**. The specific format of the ISW **310** is not integral to this invention. However, the ISW **310**, or communication link to the service provider's network **102**, includes a mechanism to identify the specific network **104** and a mechanism to communicate data.

A user can initiate a transmission in a variety of ways including, but not limited to: using an input device such as a keypad or keyboard, speaking into a microphone, pushing a button, using a pointing device, manipulating a joystick, using a dial or other type of mechanism, placing a device in a cradle, or other triggering mechanisms based on time, location, motion and the like. Regardless of the means in which the ISW **310** is initiated, the result includes transmission of the ISW **310**. In the illustrated example, the ISW **310** transmits from the personal network **104**, through the communications medium **120-124**, to the service provider's network **102**. The service provider's network **102** receives the transmission and logic (not shown) decodes the ISW **310** into its component data fields. The authentication and authorization database **130** is used to validate the received ISW **310** for access to the network resources including the personal network user profile **350**. Once authenticated, components of the ISW **310**, for example, the ESN **220**, PNC **222** and the data payload **240** are communicated to the subscriber database **134** where the personal network profile is stored. The logic used to control and manipulate the subscriber database **134** decodes the data payload **240** of the ISW **310**. Using the ESN **220** and PNC **222** (or other entries or combinations thereof) to index to the correct personal network user profile **350** and the correct field **360** within the profile, the subscriber database **134** will then operate upon the data payload **240**.

In one embodiment, the data payload **240** is developed and specified by the user prior to initiating the ISW **310** transmission. The user creates the payload **240** through manipulation of the input output logic **208** associated with the network device **110**. Specific payload signals will vary amongst network devices **110** depending upon the capabilities of each device and the capabilities of the service provider's network **102**. However, in general, through the use of each network device **110**, the user can develop payload information to control and manage the services **370** available within his personal network **104**. Generally, this control occurs through the manipulation of personal network user profile **350** stored within the service provider's subscriber database **134**. Examples, of payload commands that can be developed and initiated by the user include, but are not limited to: on/off status command; on/off service selection commands; addition/deletion of services; addition/deletion of devices; addition/deletion of personal network codes; routing to and from specific devices **110** and the like. Essentially, the user dynamically defines, controls, manages and operates the services available to each network device **110** within his personal communications network **104**. Furthermore, since network devices **110** can share the same personal network code **222** (e.g. address, telephone number, and the like), the user has the ability to use different devices for different tasks either at the same or different times by manipulating the services profile for each device.

In another embodiment, a user initiates a request to modify or otherwise change the status of one or more devices **110** within his personal network **104** by modifying information in

the service provider's network **102** with a particular data payload **240**. For example, after successful authentication, database manipulation to index to the appropriate personal network user profile **350** and the successful decode of the data payload, the subscriber database **134** is updated to incorporate the data payload **240**. During an update, the subscriber database **134** verifies, establishes, or changes status of the network device fields **360** within the profile as directed by the data payload. This updated personal network profile **350** is stored and becomes the profile that defines the personal network **104**, network devices **110** and/or the services available.

It is understood that the procedures described can be modified to include user-initiated manipulation of the personal network user profile **350** through means other than using a network device **110**. For example in another embodiment, a user accesses the service provider's subscriber database **134** through a public network such as the Internet **370** using a connecting device **372**. In one embodiment, the user authenticates, for example via a username/password algorithm. Once authenticated, the user's personal network user profile **350** can be modified by the user. Once complete, the user logs out of the database and the subscriber database **134** retains and implements any changes made to the profile.

With reference now to FIG. **4**, an alternate embodiment of personal network **104** configured as a distributed network includes a personal network logic **400** including distributed subscriber database **434**. The personal network logic **400** provides an interface between selected devices **110**C, **110**D and the service provider network **102**. To illustrate a routing example, a telephone call directed toward personal network **104** is received by the personal network logic **400**. The logic **400** receives the incoming signal, determines routing instructions from the distributed subscriber database **434**, and routes the call to the particular device (e.g., **110**C) where telephone signals (in this example) are to be received. In one embodiment the personal network logic **400** acts as a local switch directing data to particular devices within the personal network, for example inside of a home or office. Personal network logic **400** is in data communication with selected devices either via hardwiring or wireless links. In the event that a call is directed to a device not within direct communication with the personal network logic **400**, the call is redirected, for example, over telephone infrastructure **122** which completes the call to the designated call-receiving device, for example **110**B.

It can now be appreciated that the personal network logic **400** performs a proxy-like communications service between selected network devices that may or may not be configured to communicate directly with the communications network and the service provider network. As an example, a caller originating a telephone communication from device **410** connects through the public switched telephone network **412** to the service provider's network **102**. Access database **130** recognizes from incoming service data **414**, an inbound called number in this example, that the call is directed toward a personal network **104**. Personal network logic **400** receives the call and identifies an attribute from the service data **414** suitable to identify the service provided, here a telephone call. Such identification can occur by recognizing attributes of various services or by a coded prefix or other identifying data appended to the incoming service data **414**. After identifying the service, personal network logic **400** accesses the personal network profile **350** from distributed subscriber database **434** to identify the selected communication device setup to receive the service in the network. The call, in this example, is then directed to the desired communication device **110** based on the service attribute and the values in the personal network profile **350**. It can now be appreciated that the personal network switch **400** may also incorporate either partially or entirely all the database functions provided by the service provider network **102**. Moreover, while the call is illustrated as being routed through the subscriber's network **102**, under the illustrated system, the call may be routed directly to the personal network **104**.

It should be noted that although the service provider's network **102** has been discussed as including both the transmission network **120**, **122**, **124** and the databases **130**, **134**, this is not a requirement for the invention. Those skilled can appreciate that implementations exist in an environment where the access network provider is not the same as the application/services provider who operates, maintains and makes available services to users with personal networks and network devices. In such cases, one or more networks are used to obtain access to the personal network user profile for manipulation and management. Indeed, various services from multiple providers may be available through the service provider's network. For example video services may be provided from one provider, while voice services may be provided from another.

As an example of the above-described process, assume that a personal network Z consists of **3** personal network devices (A, B, C) each with a unique ESN and sharing the same personal network code (555-555-1212). Each of the three devices has been successfully registered and enabled for operation on service provider D's network. Below is an example of some possible attributes of each network device and a personal network user profile:

CHART 1

Service Provider D Subscriber Database
Personal Network Z User Profile

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	On	Enabled	Disabled	Disabled
Device B	Pers. Dig. Assistant	555-555-1212	DEF54321	On	Disabled	Enabled	Enabled
Device C	Video Telephone	555-555-1212	GHI12345	On	Disabled	Disabled	Disabled

Assume that the user who manages personal network Z would like to receive/send his video communications by utilizing his portable telephone (Device A) while on the road. Video service is currently not enabled on his portable phone. To enable his portable phone to receive/send video communications, the user will manipulate the menu selection utilizing the soft-keys on his portable telephone to select "enable video communications". Once selected, the portable telephone will transmit an ISW that will be received by the

service provider D's network. Once received, the ISW will be decoded and the information sent to the authentication and authorization database. Assuming the network device and ISW successfully authenticate, the ISW will be delivered to the service providers subscriber database. The subscriber database will use components of the ISW such as the personal network code and the ESN, to index to the specific record in the personal network user Z profile. The subscriber database logic will then operate on the payload data included in the ISW received from personal network device A. In this instance, the payload data instructs the service provider subscriber database to change the personal network user Z profile, enabling Device A, the portable telephone, to receive/send video communications. Once changed, the subscriber database will save the modified version of the personal network user Z profile. The modified personal network user Z profile is shown below:

CHART 2

Service Provider D Subscriber Database
Personal Network Z User Profile (modified)

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	On	Enabled	Enabled	Disabled
Device B	Pers. Dig. Assistant	555-555-1212	DEF54321	On	Disabled	Enabled	Enabled
Device C	Video Telephone	555-555-1212	GHI12345	On	Disabled	Disabled	Disabled

FIG. **5** illustrates an additional embodiment for managing the personal network. Introduced in FIG. **5** is the concept of the Outbound Signaling Word (OSW) **514** that is incorporated in certain embodiments. The OSW is similar to the ISW explained above, with the exception that it represents data communication from the service provider's network **102** to the network device **110**, for example to transfer signals from the subscriber database **134** to network devices **110**.

Referring to FIG. **5**, assume that a personal network **104**Z consists of two personal network devices **110**A, **110**C each with a unique ESN and sharing the same personal network code (555-555-1212). Each device has been successfully registered and enabled for operation on service provider **102**X's network. Below is an example of some possible attributes of each network device and a personal network user profile:

CHART 3

Service Provider X Subscriber Database
Personal Network Z User Profile

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	On	Enabled	Disabled	Disabled
Device C	Mobile Telephone	555-555-1212	GHI12345	Off	Disabled	Disabled	Disabled

Assume that the user who manages personal network **104**Z is initially receiving and sending voice communications by utilizing portable telephone **110**A. At some point in time later, the user would prefer to use mobile telephone **110**C instead of portable telephone **110**A. To enable mobile telephone **110**C to receive/send voice communications, the user will manipulate a menu selection or other interface on either portable telephone **110**A or mobile telephone **110**C to select "swap profiles from one device to another". Assuming the command was sent from portable telephone **110**A, an ISW **310** is transmitted to the service provider network **102**X. Once received, the ISW will be decoded and the information authenticated with database **130**X. Assuming the portable telephone **110**A and the sent ISW **310** successfully authenticate, the ISW is delivered to the service provider's subscriber database **134** which is illustrated in an alternate configuration separate from service provider's network **102**X and authorization database **130**X. The subscriber database will use the personal network code **222** and the ESN **220**, included in the ISW **310** to index to a specific record in the personal network user Z profile (see e.g. charts **3**, **4**). The subscriber database logic will then operate on the payload data included in the ISW received from network device **110**A. In this instance, the payload data instructs the service provider subscriber database **134** to swap the personal network user Z profile of network device **110**A with that of network device **110**C, enabling the mobile telephone to receive/send audio communications and setting network device **110**A to "off" status. Once changed, the subscriber database will save the modified version of the personal network User Z profile. The modified personal network user Z profile is shown below:

CHART 4

Service Provider D Subscriber Database
Personal Network Z User Profile (modified)

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	Off	Disabled	Disabled	Disabled
Device C	Mobile Telephone	555-555-1212	GHI12345	On	Enabled	Disabled	Disabled

After the subscriber database **134** stores the new user profile to memory, an OSW **514**A, C is initiated to each of the network devices **110**A, **110**C effected by the previous ISW **310** database transaction. OSW **514**A is sent to network device **110**A and OSW **514**C is delivered to network device **110**C. For example, both OSW **514**A and OSW **514**C include a personal network code **222** identifying personal network **104**Z. OSW **514**A further includes ESN **220**A identifying device **110**A while OSW **514**C includes ESN **220**C identifying device **110**C. Each OSW **514** carries the respective data payload **240**A, C representing changes to each respective network device profiles representing the modifications to the user's personal network profile requested by the ISW **310**. Network device **110**A and **110**C respective logic will then operate on their received payload data included in each of the OSW's received from the subscriber database **134**. In this instance, the payload data provides device profile modifications reflective of the updated subscriber database initiated by the ISW. The final result enjoyed by the user is a mobile device enabled for voice communications and a portable device that is not.

A method is provided that enables a user to define, control and operate a personal network of devices within a service provider's communication system. In one embodiment, this is accomplished by assembling a network of personal communications devices incorporating transceivers that share the same address, customer account information, telephone number, billing information and are compatible with the service provider's communication system. In addition to assembling the network of personal communications devices, the user subscribes to one or more services made available by the service provider. Furthermore, service provider's network provides for a signaling protocol that allows for communications between device transceivers within the personal network and database units within the service provider's network. Thus, communications equipment manufacturers and service providers alike can deliver multiple services to a single user while allowing the user to utilize multiple devices at his convenience. Also provided is a process that enables the user to utilize more than one personal network device and a mechanism to actively manage his personal network devices and network services.

In yet another embodiment, individual ones of devices hand-off designated services in response to a triggering event. The triggering event can be user initiated, proximity based or otherwise. For example, when a mobile phone detects a home based phone and an automatic hand-off indicator is present, the home phone can be configured to send an ISW enabling itself for designated services and disabling the mobile phone. In another embodiment the mobile phone can be configured to send an ISW disabling itself for those designated services. Coordination between the two hand-shaking devices could occur over the personal network, over a local short range network such as Bluetooth, or 802.11 protocol networks and the like.

Referring now to FIG. **6**, a methodology implementable in software for managing a network of devices is illustrated. Upon a triggering event or user request, a device prepares a signaling word to implement a particular network device management configuration, (block **610**). The signaling word is transmitted or otherwise communicated to logic including the subscriber database, (block **612**). On the subscriber database side, the signaling word is received, (block **620**). Authentication logic authenticates, decodes, or otherwise verifies the received signaling word as proper, (block **622**). The payload is then applied to the appropriate data record or records identified by the signaling word, (block **624**). Responsive to success or failure to manage the personal network devices by application of the payload, a return signaling word is prepared, (block **626**). The signaling word is transmitted or otherwise communicated to logic including the devices within the personal device network, (block **628**). The signaling word is received on the device side, (block **614**). Upon receipt of the signaling word on the device side, the device can be configured to display a status report for the effected device or selected devices in the network. It can be appreciated that the methodology can be implemented as discussed above through managed network devices, other network devices, or through mechanisms that access the subscriber database side via network external devices.

In yet another embodiment, the service provider **102** is located and maintained at the home or other place designated by a user. In this configuration, the databases and associated equipment can be associated uniquely with an individual user's network or scalable up to full service provider for multiple users. In the individual configuration, the service provider **102** is configured to adapt to legacy equipment such as twisted pair, other wireline telephony presently supplied to many consumers, cable, satellite or other communications means. Routing can be redirected back into the legacy equipment or alternately routed over a wireless network as desired.

With reference now to FIG. **7**, an embodiment illustrates distribution of additional services to individual devices in a personal network **704**. As illustrated, the personal network **704** includes television devices **710**A, personal mail and scheduling devices **710**B, audio devices **710**C, and computer devices **710**D. A record contained in distributed subscriber database **734** maintains a profile including desired routing for specific incoming signals. For example, an inbound signaling word **740** includes a unique network device identifier **742** and a payload **744** configured, for example, to create or update a record (not shown) directing incoming television or other motion picture signals toward television device **710**A. Other signaling words route music, radio and, in certain embodiments audio tracks of associated motion picture signals

toward audio device **710**C, and match other services to other devices as desired by the subscriber. Those skilled in the art can now appreciate that multiple devices, for example multiple television devices, are configurable to receive a particular incoming signal.

While the present invention has been illustrated by the description of embodiments thereof, and while the embodiments have been described in considerable detail, it is not the intention of the applicants to restrict or in any way limit the scope of the appended claims to such detail. Additional advantages and modifications will readily appear to those skilled in the art. For example, concepts such as enabling subscribers of a service provider network with the ability to dynamically manage services amongst his network of personal communication devices. With this, a subscriber can actively provision, activate/de-activate, manage and direct network provider services to each of his communications devices. Included is the ability for the subscriber to manage his services either through the communication devices themselves or through other means/networks such as the internet and a public Internet access point. Also included are means to manage and provision network services in a distributed, dynamic subscriber driven self-provisioning manner. This is in contrast to the legacy manner in which services have traditionally been provided to subscribers. The legacy services were provisioned in a centralized, static, service provider provisioned manner. Therefore, the invention, in its broader aspects, is not limited to the specific details, the representative apparatus, and illustrative examples shown and described. Accordingly, departures may be made from such details without departing from the spirit or scope of the applicant's general inventive concept.

We claim:

1. A method of adding a communications device to a personal communications network, the method comprising:

receiving from the communications device a request to join the personal communications network, where the personal communications network is identified by a personal communications network number, the request comprising a unique identifier that uniquely identifies the communications device and payload data indicating a change request;

determining one or more communications services available to the personal communications network from at least one communications service provider, the one or more communications services capable of being used by the communications device; and

updating a database containing data corresponding to the personal communications network, the database containing information usable to provide communications services available generally to the personal communications network to particular communications devices within the personal communications network, to reflect the addition of the communications device to the personal communications network, to disconnect in the database the one or more communication services from a second communications device if the one or more communication services are determined to be connected in the database to the second communications device, and to connect in the database the one or more communication services to the communications device by relating in the database the unique identifier that uniquely identifies the communications device and data representing the one or more communications services, where the unique identifier that uniquely identifies the communications device is not a telephone number.

2. The method of claim **1** where the request further specifies a type of video services associated with the communications device.

3. The method of claim **1** where the request further specifies that a type of video services associated with the communications device are different than a type of video services associated with the second communications device.

4. The method of claim **1** where the request further specifies a type of data services associated with the communications device.

5. The method of claim **1** where the request further specifies that a type of data services associated with the communications device are different than a type of data services associated with the second communications device.

6. A communications device that shares a personal network number with other communications devices within a personal network, the communications device comprising:

a first computer-readable medium having stored thereon a first unique identifier that uniquely identifies the communications device within the personal network identified by the personal network number, where a second communications device within the personal network comprises a second computer-readable medium having stored thereon a second unique identifier that uniquely identifies the second communications device within the personal network identified by the personal network number;

a management logic that manages a database containing routing information for an incoming communication directed at the personal network via the personal network number to be routed to a particular communications device within the personal network based on communications service content of the incoming communication, where the routing information relates the communications device to one or more communication services available to the personal network from a communications services provider by associating the first unique identifier chat uniquely identifies the communications device to the one or more communication services available to the personal network from the communications services provider; and

a processor that controls the management logic to remove the communications device from the personal network including modifying the database to unrelate the one or more communication services available to the personal network from the communications device and relate the one or more communication services available to the personal network to the second communications device by changing the database to disassociate the first unique identifier that uniquely identifies the communications device and the one or more communication services available to the personal network and associate the second unique identifier that uniquely identifies the second communications device with the one or more communication services available to the personal network.

7. The communications device of claim **6** where the communications device is selected from the group consisting of a telephone, a cellular phone, a cordless phone, a computer, a personal digital assistant, a video telephone, a fax machine, a mobile device, an analog cellular device, a video device, and an audio device.

8. The communications device of claim **6** wherein the routing information relates the communications device to a type of audio services.

9. The communications device of claim **6** wherein the routing information relates the communications device to a type of video services.

10. The communications device of claim 6 wherein the routing information relates the communications device to a type of data services.

11. The communications device of claim 6 wherein the communication services comprise one or more of telephone services, text messaging services, video services, voice services, data services, music services and audio services.

12. The method of claim 1 wherein the communications device is selected from the group consisting of a telephone, a cellular phone, a cordless phone, a laptop computer, a personal digital assistant, a video telephone, a mobile device, an analog cellular device, a digital device, a video device, and an audio device.

13. The method of claim 1 wherein the communication services comprise one or more of telephone services, text messaging services, video services, voice services, data services, music services and audio services.

14. A method of adding a telephone to a communications network, the method comprising:

receiving from the telephone a request to join the communications network, where the communications network is identified by a communications network identifier, the request comprising a unique identifier that uniquely identifies the telephone and payload data indicating a change request;

determining one or more communications services available to the communications network from at least one communications service provider, the one or more communications services capable of being used by the telephone; and

updating a database containing data corresponding to the communications network, the database containing information usable to correlate communications services available generally to the communications network to particular communications devices within the communications network, to reflect the addition of the telephone to the communications network, to decorrelate in the database the one or more communication services from a second communications device if the one or more communication services are determined to be correlated in the database to the second communications device, and to correlate in the database the one or more communication services to the telephone by relating in the database the unique identifier that uniquely identifies the telephone and data representing the one or more communications services, where the unique identifier that uniquely identifies the telephone is not a telephone number.

15. The method of claim 14 where the request further specifies a type of video services associated with the telephone.

16. The method of claim 14 where the request further specifies that a type of video services associated with the telephone are different than a type of video services associated with the second communications device.

17. The method of claim 14 where the request further specifies a type of data services associated with the telephone.

18. The method of claim 14 where the request further specifies that a type of data services associated with the telephone are different than a type of data services associated with the second communications device.

19. The method of claim 14 wherein the communication services comprise one or more of telephone services, text messaging services, video services, voice services, data services, music services and audio services.

20. A method of adding a personal digital assistant (PDA) to a communications network, the method comprising:

receiving from the personal digital assistant (PDA) a request to join the communications network, where the communications network is identified by a communications network identifier, the request comprising a unique identifier that uniquely identifies the personal digital assistant (PDA) and payload data indicating a change request;

determining one or more communications services available to the communications network from at least one communications service provider, the one or more communications services capable of being used by the personal digital assistant (PDA); and

updating a database containing data corresponding to the communications network, the database containing information usable to correlate communications services available generally to the communications network to particular communications devices within the communications network, to reflect the addition of the personal digital assistant (PDA) to the communications network, to decorrelate in the database the one or more communication services from a second communications device if the one or more communication services are determined to be correlated in the database to the second communications device, and to correlate in the database the one or more communication services to the personal digital assistant (PDA) by relating in the database the unique identifier that uniquely identifies the personal digital assistant (PDA) and data representing the one or more communications services, where the unique identifier that uniquely identifies the personal digital assistant (PDA) is not a telephone number.

21. The method of claim 20 where the request further specifies a type of video services associated with the personal digital assistant (PDA).

22. The method of claim 20 where the request further specifies that a type of video services associated with the personal digital assistant (PDA) are different than a type of video services associated with the second communications device.

23. The method of claim 20 where the request further specifies a type of data services associated with the personal digital assistant (PDA).

24. The method of claim 20 where the request further specifies that a type of data services associated with the personal digital assistant (PDA) are different than a type of data services associated with the second communications device.

25. The method of claim 20 wherein the communication services comprise one or more of telephone services, text messaging services, video services, voice services, data services, music services and audio services.

26. A telephone that shares a network number with other communications devices within a network, the telephone comprising:

a first computer-readable medium having stored thereon a first unique identifier that uniquely identifies the telephone within the network identified by the network number;

a management logic that manages a database containing routing information for an incoming communication directed at the network via the network number to be routed to a particular communications device within the network based on communications service content of the incoming communication, where the routing information relates the telephone to one or more communication services available to the network from a communications services provider by associating the first unique identifier that uniquely identifies the telephone to

the one or more communication services available to the network from the communications services provider; and

a processor that controls the management logic to remove the telephone from the network including modifying the database to unrelate the one or more communication services available to the network from the telephone and relate the one or more communication services available to the network to a second communications device by changing the database to disassociate the first unique identifier that uniquely identifies the telephone and the one or more communication services available to the network and associate a second unique identifier that uniquely identifies the second communications device with the one or more communication services available to the network.

27. The telephone of claim **26** where the telephone is selected from the group consisting of a cellular phone, a cordless phone, a video telephone, and a mobile phone.

28. The telephone of claim **26** wherein the routing information relates the telephone to a type of audio services.

29. The telephone of claim **26** wherein the routing information relates the telephone to a type of video services.

30. The telephone of claim **26** wherein the routing information relates the telephone to a type of data services.

31. The telephone of claim **26** wherein the communication services comprise one or more of telephone services, text messaging services, video services, voice services, data services, music services and audio services.

32. A personal digital assistant (PDA) that shares a network number with other communications devices within a network, the personal digital assistant (PDA) comprising:

a first computer-readable medium having stored thereon a first unique identifier that uniquely identifies the personal digital assistant (PDA) within the network identified by the network number;

a management logic that manages a database containing routing information for an incoming communication directed at the network via the network number to be routed to a particular communications device within the network based on communications service content of the incoming communication, where the routing information relates the personal digital assistant (PDA) to one or more communication services available to the network from a communications services provider by associating the first unique identifier that uniquely identifies the personal digital assistant (PDA) to the one or more communication services available to the network from the communications services provider; and

a processor that controls the management logic to remove the personal digital assistant (PDA) from the network including modifying the database to unrelate the one or more communication services available to the network from the personal digital assistant (PDA) and relate the one or more communication services available to the network to a second communications device by changing the database to disassociate the first unique identifier that uniquely identifies the personal digital assistant (PDA) and the one or more communication services available to the network and associate a second unique identifier that uniquely identifies the second communications device with the one or more communication services available to the network.

33. The personal digital assistant (PDA) of claim **32** wherein the routing information relates the personal digital assistant (PDA) to a type of audio services.

34. The personal digital assistant (PDA) of claim **32** wherein the routing information relates the personal digital assistant (PDA) to a type of video services.

35. The personal digital assistant (PDA) of claim **32** wherein the routing information relates the personal digital assistant (PDA) to a type of data services.

36. The personal digital assistant (PDA) of claim **32** wherein the communication services comprise one or more of telephone services, text messaging services, video services, voice services, data services, music services and audio services.

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Marsico et al.

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(54) **NETWORK DEVICE MANAGEMENT**

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(52) **U.S. Cl.** **455/418**; 455/420; 455/414.1; 370/392; 370/351

(58) **Field of Classification Search** 455/518, 455/519, 415, 417, 509, 403, 558, 419, 557, 455/418, 420, 414.1; 379/201.01, 207.02, 379/211.02; 370/329, 535, 392, 351
See application file for complete search history.

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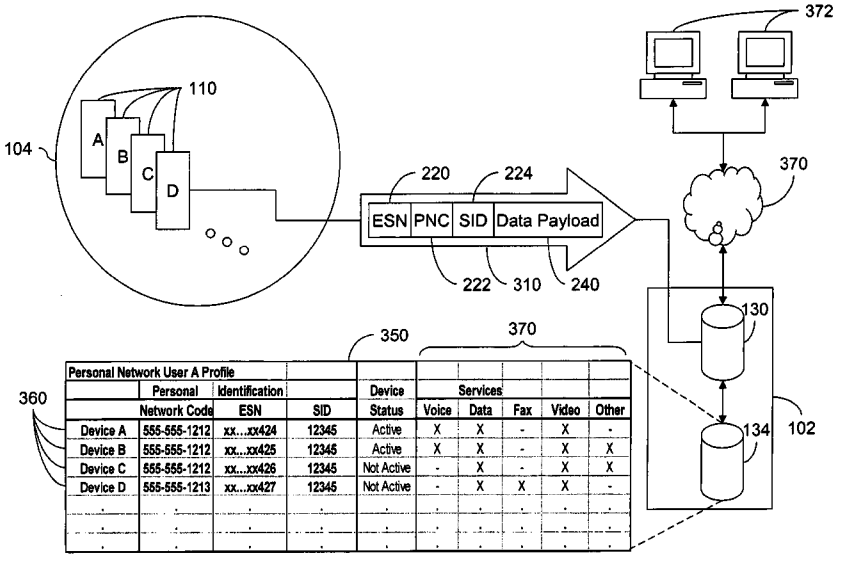
(57) **ABSTRACT**

A method is provided to dynamically interact with a plurality of enabled devices within a personal network. Individual ones of the devices are configured to interoperate with a service provider network and configure or alter services to individually identifiable devices.

12 Claims, 7 Drawing Sheets



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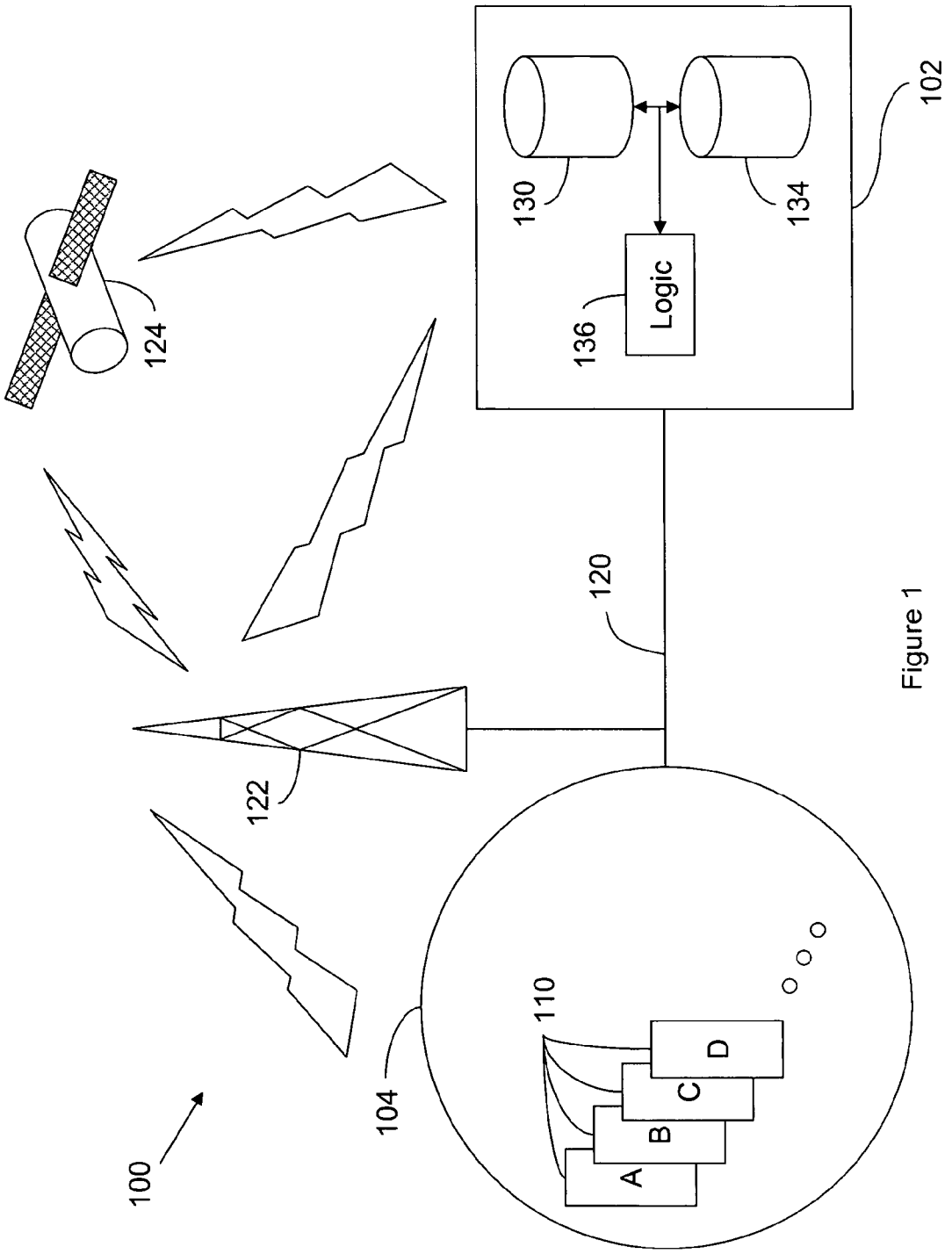

Figure 1

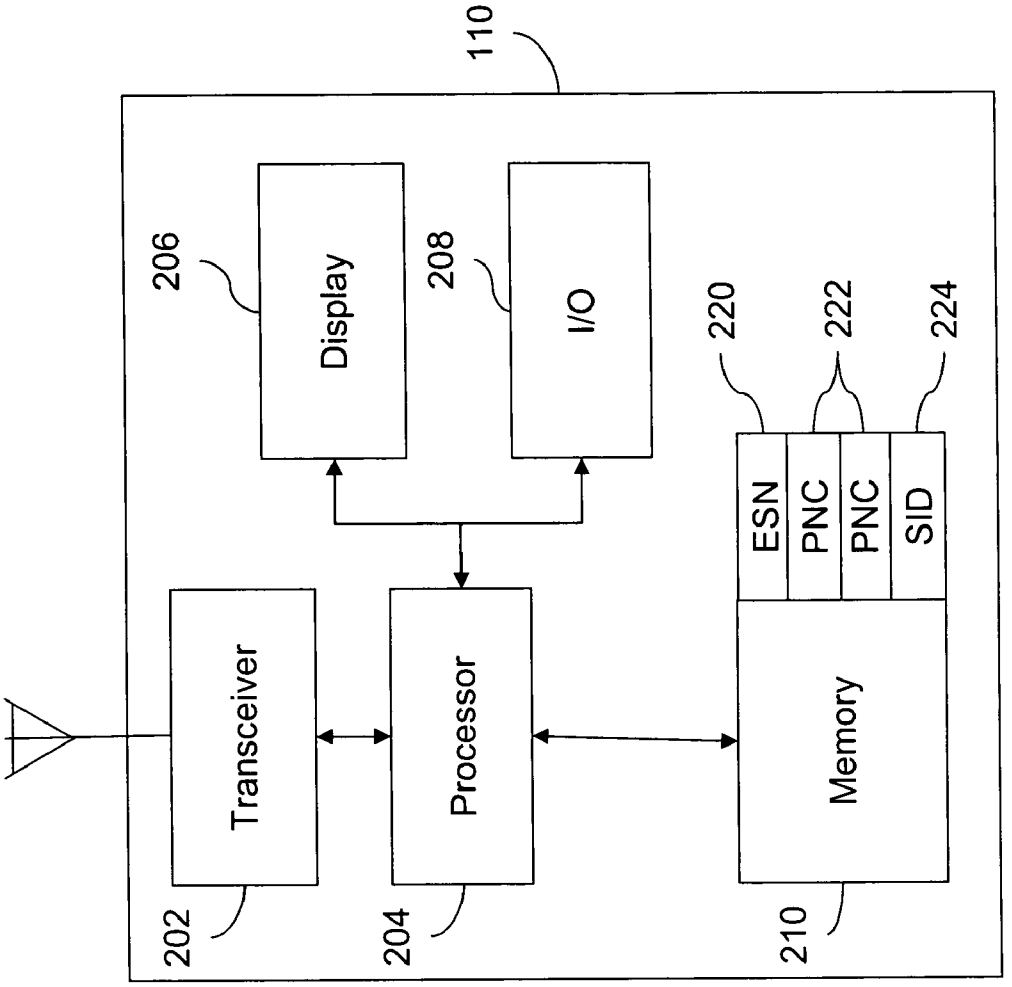
110
206
Display
208
I/O
220
222
224
ESN
PNC
PNC
SID
Transceiver
Processor
Memory
202
204
210

Figure 2

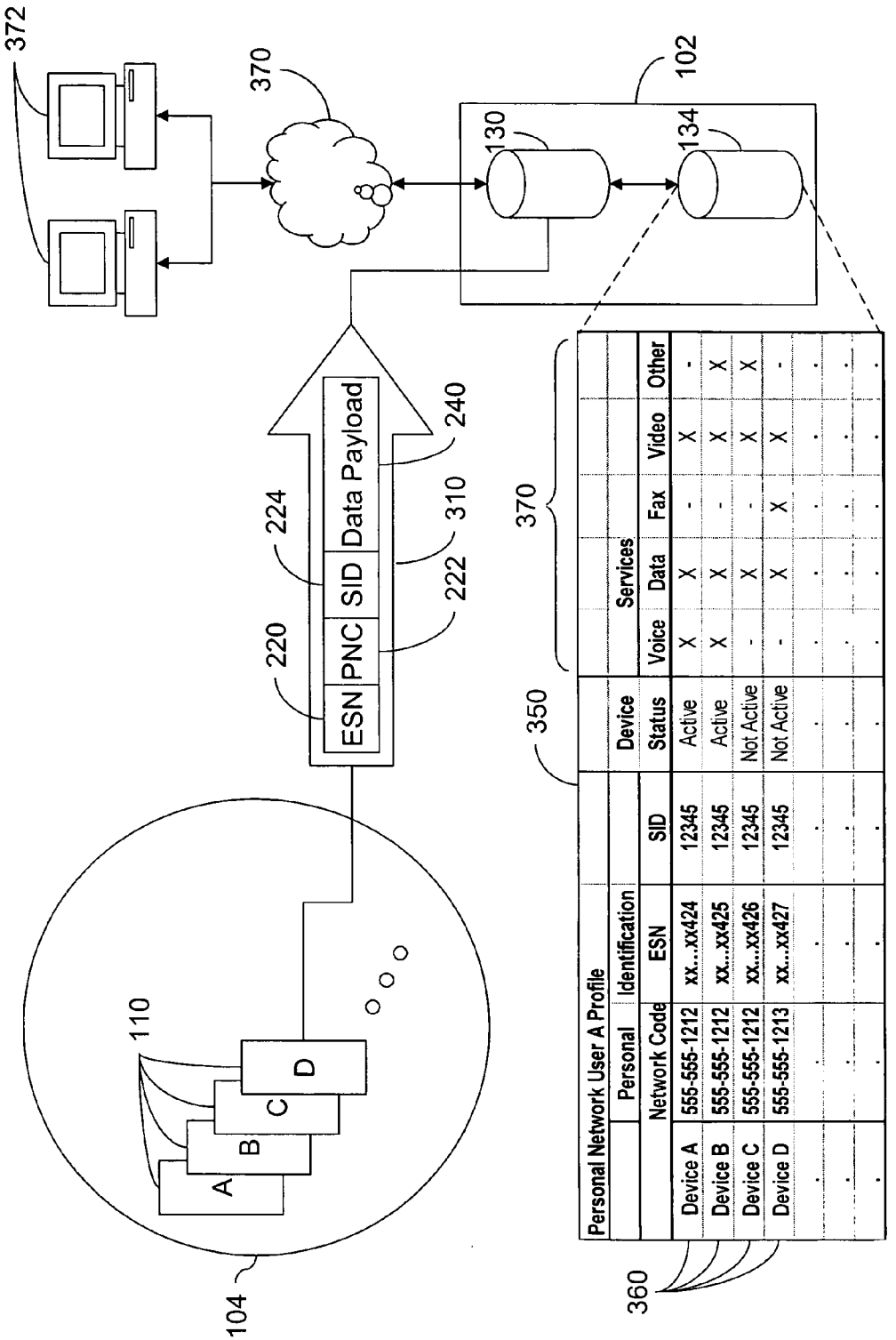
372
370
102
130
134
240
224
310
222
220
ESN
PNC
SID
Data Payload
110
A
B
C
D
104
350
370
360
Personal Network User A Profile
Personal Identification
Network Code
ESN
SID
Device Status
Services
Voice
Data
Fax
Video
Other
Device A
555-555-1212
xx...xx424
12345
Active
X
X
-
X
-
Device B
555-555-1212
xx...xx425
12345
Active
X
X
-
X
X
Device C
555-555-1212
xx...xx426
12345
Not Active
-
X
-
X
X
Device D
555-555-1213
xx...xx427
12345
Not Active
-
X
X
X
-

Figure 3

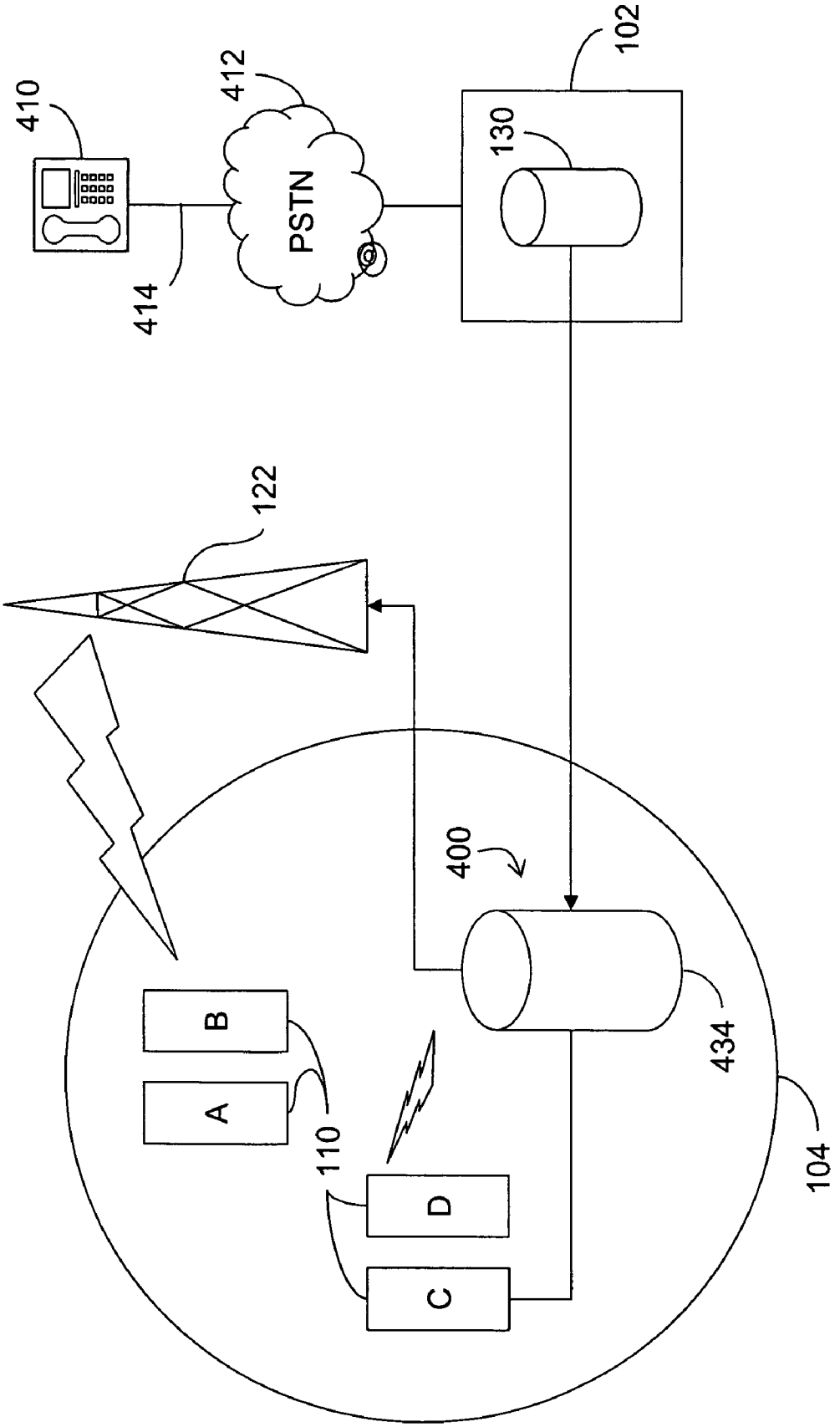

Figure 4

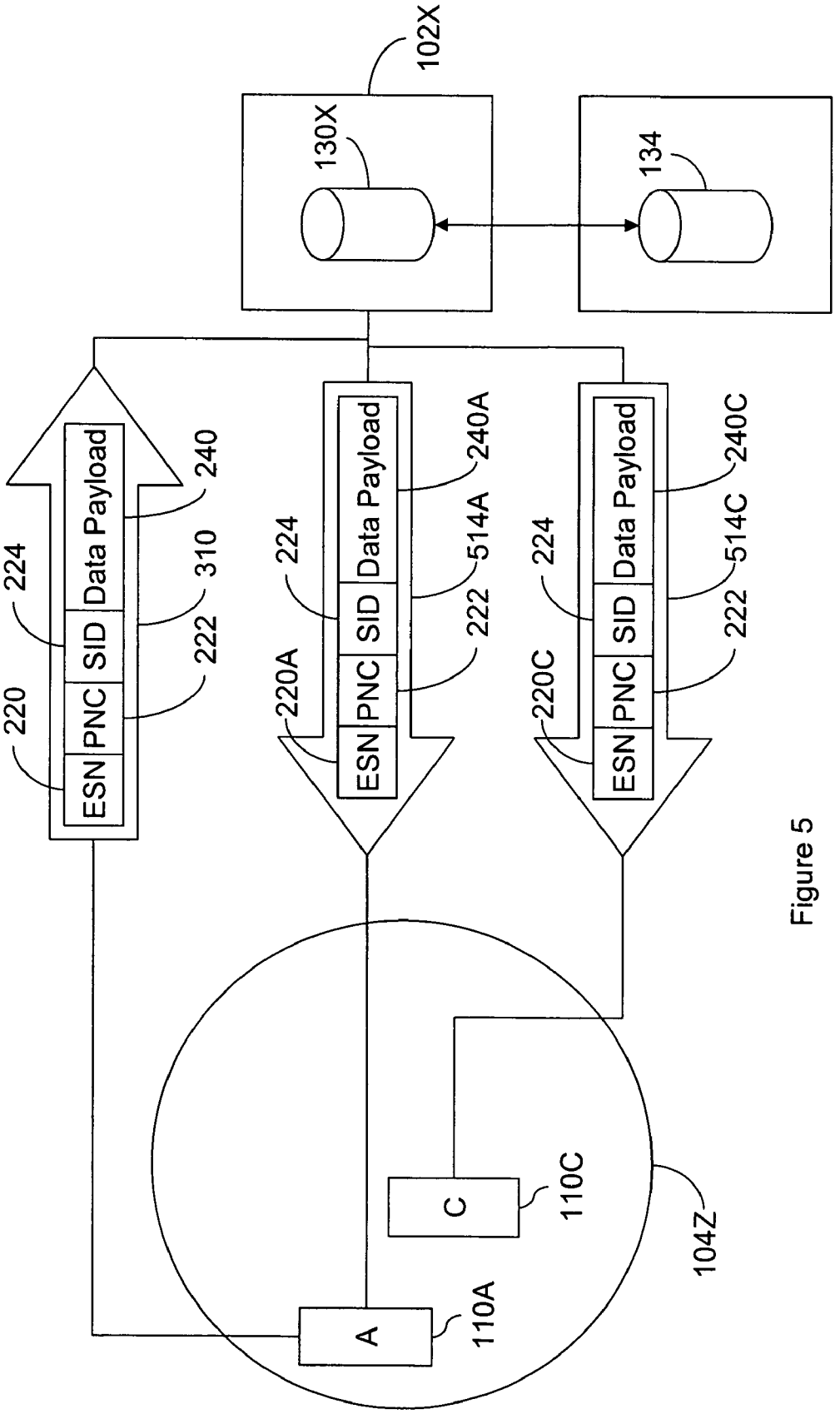
102X
130X
134
ESN
PNC
SID
Data Payload
220
224
222
310
240
220A
514A
240A
220C
514C
240C
A
110A
C
110C
104Z

Figure 5

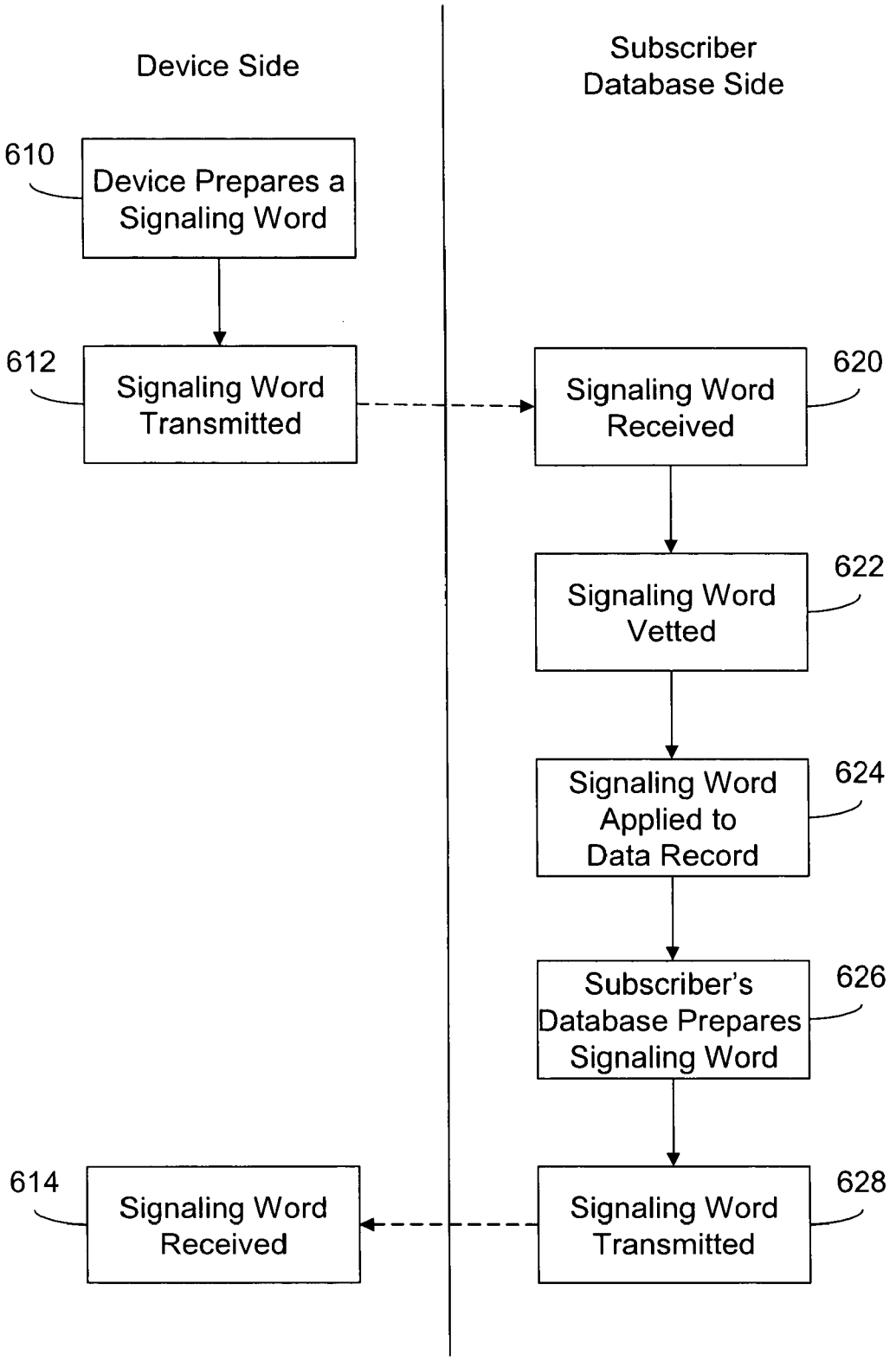
Device Side
Subscriber Database Side
610
Device Prepares a Signaling Word
612
Signaling Word Transmitted
620
Signaling Word Received
622
Signaling Word Vetted
624
Signaling Word Applied to Data Record
626
Subscriber's Database Prepares Signaling Word
628
Signaling Word Transmitted
614
Signaling Word Received

Figure 6

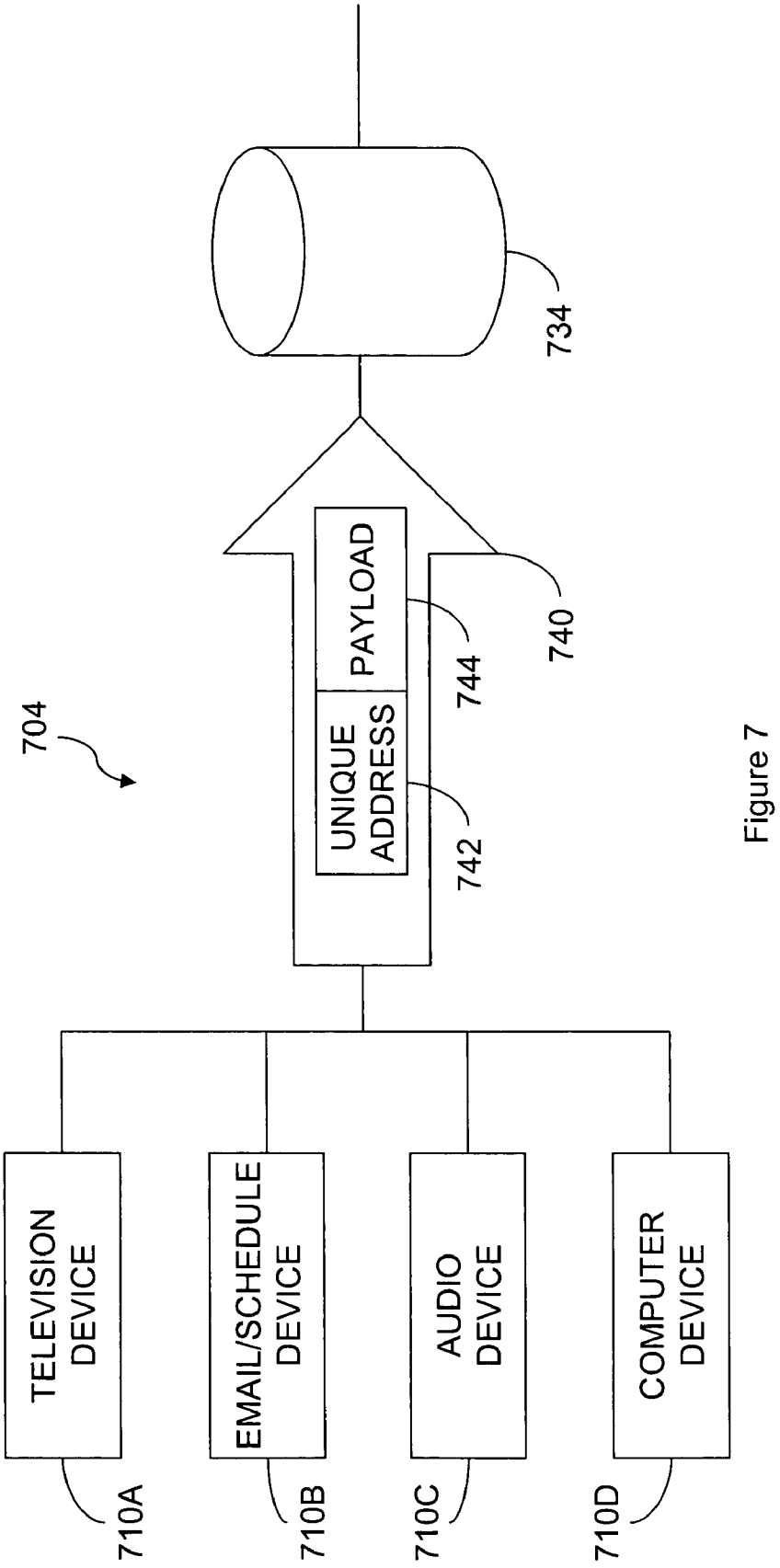
734
740
PAYLOAD
744
UNIQUE ADDRESS
742
704
TELEVISION DEVICE
EMAIL/SCHEDULE DEVICE
AUDIO DEVICE
COMPUTER DEVICE
710A
710B
710C
710D

Figure 7

NETWORK DEVICE MANAGEMENT

RELATED APPLICATIONS

This non-provisional application claims the benefit of U.S. Provisional Application No. 60/447,436 filed Feb. 14, 2003 and U.S. patent application Ser. No. 10/626,343 filed Jul. 24, 2003 incorporated herein by reference.

BACKGROUND

The present invention relates generally to network systems. It finds particular applicability in conjunction with communication based networks and will be described with particular reference thereto. It is to be appreciated however, that the invention finds further application in systems and devices where it is desirable to use a single address with a plurality of devices.

The first generations of wireless mobile phones were large in size and expensive to use. However, over time, technology has reduced the size of the mobile telephone and lowered its cost of use, thereby enhancing mobility and expanding usage. With each subsequent generation of technology, the size of the device has been reduced while the functionality and types of devices available have increased dramatically.

With the introduction of digital cellular telephones, laptop computers, multifunction personal handheld devices, one can now send email, surf the web, make telephone calls, receive and send instant/short messages, view personal calendars, video conference, and send pictures seamlessly and continuously while connected to one or more wireless or wireline communications networks.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings which are incorporated in and constitute a part of the specification, embodiments are illustrated which, together with the detailed description given below, serve to describe exemplary embodiments. It will be appreciated that the illustrated boundaries of elements (e.g. boxes, groups of boxes, or other shapes) in the figures represent but exemplary boundaries. One of ordinary skill in the art will appreciate, for example, that one element may be designed as multiple elements or that multiple elements may be designed as one element. An element shown as an internal component of another element may be implemented as an external component and vice versa.

FIG. **1** is a system diagram illustrating an embodiment of a network.

FIG. **2** is a functional block diagram illustrating an embodiment of a network device.

FIG. **3** is a system diagram illustrating another embodiment of a network and an exemplary record from a computer-readable medium

FIG. **4** is a system diagram illustrating another embodiment of a network.

FIG. **5** is a system diagram illustrating one embodiment of a system for managing a network.

FIG. **6** illustrates one embodiment of a methodology for managing a network of devices.

FIG. **7** is a system diagram illustrating another embodiment of a network.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

The following description includes definitions of selected terms used throughout the disclosure. Both singular and plural forms of all terms fall within each meaning:

"Address", as used herein, includes but is not limited to one or more network accessible addresses, device identifiers, telephone numbers, IP addresses, url and ftp locations, e-mail addresses, names, a distribution list including one or more addresses, network drive locations, postal addresses, account numbers or other types of addresses that can identify a desired destination or device.

"Computer-readable medium", as used herein, refers to any medium that participates directly or indirectly in providing signals, instructions and/or data to one or more processors for execution. Such a medium may take many forms, including but not limited to, non-volatile media, volatile media, and transmission media. Non-volatile media may include, for example, optical or magnetic disks. Volatile media may include dynamic memory. Transmission media may include coaxial cables, copper wire, and fiber optic cables. Transmission media can also take the form of acoustic or light waves, such as those generated during radio-wave and infra-red data communications, or take the form of one or more groups of signals. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, or any other magnetic medium, a CD-ROM, any other optical medium, punch cards, papertape, any other physical medium with patterns of holes, a RAM, a PROM, an EPROM, a FLASHEPROM, any other memory chip or cartridge, a carrier wave/pulse, or any other medium from which a computer, a processor or other electronic device can read.

"Logic", as used herein, includes but is not limited to hardware, firmware, software and/or combinations of each to perform a function(s) or an action(s), and/or to cause a function or action from another component. For example, based on a desired application or needs, logic may include a software controlled microprocessor, discrete logic such as an application specific integrated circuit (ASIC), a programmed logic device, memory device containing instructions, or the like. Logic may also be fully embodied as software.

"Signal", as used herein, includes but is not limited to one or more electrical or optical signals, analog or digital signals, one or more computer or processor instructions, messages, a bit or bit stream, or other means that can be received, transmitted, and/or detected.

"Software", as used herein, includes but is not limited to one or more computer readable and/or executable instructions that cause a computer or other electronic device to perform functions, actions, and/or behave in a desired manner. The instructions may be embodied in various forms such as routines, algorithms, modules or programs including separate applications or code from dynamically linked libraries. Software may also be implemented in various forms such as a stand-alone program, a function call, a servlet, an applet, instructions stored in a memory, part of an operating system or other type of executable instructions. It will be appreciated by one of ordinary skill in the art that the form of software is dependent on, for example, requirements of a desired application, the environment it runs on, and/or the desires of a designer/programmer or the like.

"User", as used herein, includes but is not limited to one or more persons, software, computers or other devices, or combinations of these.

Generally speaking, one embodiment of a system and method is provided to enable a user to define, control and operate a personal network of one way or bidirectional devices capable of accessing a service provider's network, receiving services, or both. This can be accomplished by assembling a network of personal communications devices that may include transmitters, receivers or transceivers that share or can be configured to share the same address. The devices are configured to be compatible or selectively compatible with the service provider's network. In addition to assembling the network of personal communications devices, the user subscribes to one or more services made available by the service provider. Furthermore, the service provider's network uses a signaling protocol that allows for communications between device transceivers within the personal network and database units within the service provider's network.

In a simple exemplary network, a telephone service provider assigns a telephone number to a subscriber. In this simple network, the subscriber has multiple telephones, each used in different places and at different times. The subscriber registers each telephone including a unique serial number with the telephone service provider's database and a subscriber profile is created. The assigned "telephone number" actually refers to the subscriber profile identifying the subscriber's network. Each telephone occupies a record in the subscriber profile and is individually identifiable by the unique serial number. Once established, for example, a mobile telephone is selected to receive all incoming telephone calls. Once the subscriber returns home, the home phone replaces the mobile phone as the desired destination for all incoming calls (either automatically or through manual selection). In an embodiment, incoming signals such as calls, can be directed to the subscriber profile and a database dip can be configured to return the subscriber desired routing data to complete the call to a device. In an embodiment, outgoing signals such as calls, can be transmitted from a telephony enabled device over transmission medium to the subscriber's database, and/or to another device. Conveniently, charges associated with any of the devices in the subscriber's network can be aggregated onto a single bill.

In a more general embodiment, upon user initiation, a device communicates with a service provider's network. The device transmits a request to authentication logic operated by the service provider for access to some or all of the services available to the service provider's network, for example telephone services, text messaging services, video services and other services. Logic within the device can be configured to negotiate for access to services available from the service provider. Responsive to the request, the authentication logic authenticates the device's request for access and selectively makes available to or authorizes the device to use those services available from the service provider's network.

In another embodiment, the user initiates a request to modify or otherwise change the status of one or more devices within his personal network by modifying the service provider's database. The status of a device includes available services assigned to the device, and the device's registration on the network, for example, enabled or disabled from network participation. It will be appreciated that one device on the personal network can be configured to check

or alter the status of that device, and/or other devices within the personal network. Moreover, device status can alternately be checked or configured via other mechanisms such as over the internet, through communication with a customer service feature and the like.

One embodiment of the network device management is illustrated in FIG. **1**. Network **100** includes a service provider network operations center **102**, a plurality of personal networks **104** (one shown) and, a plurality of personal network devices **110** (A-D shown). The network devices **110** communicate with the service provider's network **102** across one or more transmission mediums such as conventional wireline networks **120**, which include twisted pair, Hybrid Fiber Coaxial (HFC) fiber optics and the like; terrestrial wireless networks **122**; and satellite or other aloft networks **124**. The service provider's network **102** provides information such as communication services, voice, video, and/or data to personal networks **104** of network devices **110**. It should be appreciated that the service provider may directly provide all of the services, or may act as a distributor of other providers' services. It should be further appreciated that network devices **110** include a variety of portable, mobile, analog cellular or digital devices, video and audio equipment, desk-top computers and the like configurable to have discrete addresses identifiable from the common address.

The service provider's network **102** uses transceiver equipment (not shown) coupled with one or more of the transmission mediums **120–124** to communicate information, network control, and system resource management to and/or from the personal networks **104**. The service provider's network **102** includes computer-readable media such as database units that can be either centralized or distributed. Exemplary database units include an authentication and authorization database **130**, and a subscriber database **134**. Logic **136** is configured to process requests for access to network services accessing authentication and authorization database **130** and accessing or modifying stored information specific to each user, personal network **104**, and network device **110**. The subscriber database **134** is arranged to identify specific information regarding each user's personal network **104**, network devices **110** and authorized network services. In the illustration, each database unit is in data communication with and under the control of logic **136** associated with the service provider's network **102** but such centralized control be readily decentralized or segregated into two or more distinct elements with no loss of functionality.

With reference to FIG. **2**, an embodiment of a network device **110** includes a transceiver **202** in communication with a logic that may take the form of processor **204**. The transceiver **202** may be configured to transmit, receive, or both signals including voice, video, and/or data transmissions formatted under several signaling protocols. While the transceiver **202** is illustrated connected to an antenna, wired connections are also envisioned for network devices **110**. The processor **204** can also be in data communication with display logic **206** and input/output logic **208**. A storage device medium **210** can be provided to store encryption algorithms, software programs, algorithms used to process signals and/or algorithms or logic used to implement com-

munication controls and network system management. Storage device **210** can be configured with one or more computer-readable media or operably configured logic.

Additionally, the processor **204** is configured to access identification codes, such as the illustrated electronic serial number (ESN) **220**, personal network code (PNC) **222**, and system identification code (SID) **224**. As further discussed below, these identification codes **220**, **222**, **224** enable, device management and communication. For example, in one embodiment ESN **220** corresponds to a device **110**, PNC **222** corresponds to a personal network **104**, and SID **224** corresponds to a service provider's network **102**.

In one embodiment (ESN) **220** is generated from an individual device's hardware identification code. Typically, hardware identification codes are manufacturer assigned indicia which are unique to each network device. In another embodiment, ESN **220** is assigned by a service provider and held in memory. It should be appreciated that these identification codes need not be static, and can cycle or hop for example for security.

In another embodiment, each network device **110** stores or is assigned a personal network code (PNC) **222**. The personal network code **222** is preferably unique within the communication network **100** but may be common among the network devices **110** within a personal network **104**. As illustrated, each personal network **104** can have one or more personal network codes **222** corresponding to, for example, a single device belonging to more than one personal network such as in the case of a single home phone belonging to the personal networks of each occupant. The personal network code **222** may be a hexadecimal number or any address assigned by the user or the network service provider suitable to identify the personal network of devices.

Yet another embodiment includes the service provider assigning a network device **110** a system identification code (SID) **224**. This system identification code **224** can be unique to the service provider and can be assigned to all network devices **110** that operate within the network **100**. That is, the system identification code **224** is common to selected operable devices in the plurality of personal networks **104** in the overall network **100**. The network device **110** has data access to the system identification code **224**.

With reference now to FIG. **3**, operation of a system according to an embodiment of the present invention is illustrated. Personal network **104** comprises one or more network devices **110** subscribing to service(s) provided by or available through the service provider's network **102**. Each network device **110** is registered or registerable with at least one personal network and with the service provider network **102**. Registration of each network device **110** may be accomplished either remotely or locally using either manual or automated means. Registration of each network device **110** can include the creation or modification of data fields within subscriber database **134**, and authentication and authorization database **130**. Each user's personal network **104** is represented within the subscriber database **134** with a profile, for example, profile **350** including individual device records **360**. These individual device records are populated with fields identifying the device, the network, and the like and also various services **370** available from the service provider's network. The authentication and authorization database **130** comprises fields for those identifiers associated with each device **110** registered, for example, the ESN **220** and PNC **222**. Once a user has registered and enabled a network device **110** on the service provider's network **102**, the network devices may communicate on, with, and through the communication network.

In another embodiment, the user can utilize one or more of the network devices **110** concurrently. Each device **110** can be used for one or more similar or different services **370** provided by the service provider. For example, in the telephone context, a device may be configured for audio services while another device may be configured for text-based services. Alternatively, a single device may be configured for both audio and text services. In yet another alternative, services may be segregated on an in-coming or out-going basis.

Initiated by the user or upon a triggering event, a network device **110** will signal the service provider's network **102** by sending an inbound signaling word (ISW) **310**. As further discussed below, the ISW **310** can be configured to manage devices **110** in the personal network **104** by registering devices or changing services **370** available to specific devices. In the illustrated embodiment, the ESN **220**, personal network code **222**, system identification code **224**, and data payload **240** comprise the ISW **310**, which is used to access the service provider's network **102**. The specific format of the ISW **310** is not integral to this invention. However, the ISW **310**, or communication link to the service provider's network **102**, includes a mechanism to identify the specific network **104** and a mechanism to communicate data.

A user can initiate a transmission in a variety of ways including, but not limited to: using an input device such as a keypad or keyboard, speaking into a microphone, pushing a button, using a pointing device, manipulating a joystick, using a dial or other type of mechanism, placing a device in a cradle, or other triggering mechanisms based on time, location, motion and the like. Regardless of the means in which the ISW **310** is initiated, the result includes transmission of the ISW **310**. In the illustrated example, the ISW **310** transmits from the personal network **104**, through the communications medium **120≠124**, to the service provider's network **102**. The service provider's network **102** receives the transmission and logic (not shown) decodes the ISW **310** into its component data fields. The authentication and authorization database **130** is used to validate the received ISW **310** for access to the network resources including the personal network user profile **350**. Once authenticated, components of the ISW **310**, for example, the ESN **220**, PNC **222** and the data payload **240** are communicated to the database **134** where the personal network profile is stored. The logic used to control and manipulate the subscriber database **134** decodes the data payload **240** of the ISW **310**. Using the ESN **220** and PNC **222** (or other entries or combinations thereof) to index to the correct personal network user profile **350** and the correct field **360** within the profile, the subscriber database **134** will then operate upon the data payload **240**.

In one embodiment, the data payload **240** is developed and specified by the user prior to initiating the ISW **310** transmission. The user creates the payload **240** through manipulation of the input output logic **208** associated with the network device **110**. Specific payload signals will vary amongst network devices **110** depending upon the capabilities of each device and the capabilities of the service provider's network **102**. However, in general, through the use of each network device **110**, the user can develop payload information to control and manage the services **370** available within his personal network **104**. Generally, this control occurs through the manipulation of personal network user profile **350** stored within the service provider's subscriber database **134**. Examples, of payload commands that can be developed and initiated by the user include, but are not limited to: on/off status command; on/off service selection commands; addition/deletion of services; addition/deletion of devices; addition/deletion of personal network

codes; routing to and from specific devices **110** and the like. Essentially, the user dynamically defines, controls, manages and operates the services available to each network device **110** within his personal communications network **104**. Furthermore, since network devices **110** can share the same personal network code **222** (e.g. address, telephone number, and the like), the user has the ability to use different devices for different tasks either at the same or different times by manipulating the services profile for each device.

In another embodiment, a user initiates a request to modify or otherwise change the status of one or more devices **110** within his personal network **104** by modifying information in the service provider's network **102** with a particular data payload **240**. For example, after successful authentication, database manipulation to index to the appropriate personal network user profile **350** and the successful decode of the data payload, the subscriber database **134** is updated to incorporate the data payload **240**. During an update, the subscriber database **134** verifies, establishes, or changes status of the network device fields **360** within the profile as directed by the data payload. This updated personal network profile **350** is stored and becomes the profile that defines the personal network **104**, network devices **110** and/or the services available.

It is understood that the procedures described can be modified to include user-initiated manipulation of the personal network user profile **350** through means other than using a network device **110**. For example in another embodiment, a user accesses the service provider's subscriber database **134** through a public network such as the Internet **370** using a connecting device **372**. In one embodiment, the user authenticates, for example via a username/password algorithm. Once authenticated, the user's personal network user profile **350** can be modified by the user. Once complete, the user logs out of the database and the subscriber database **134** retains and implements any changes made to the profile.

With reference now to FIG. **4**, an alternate embodiment of personal network **104** configured as a distributed network includes a personal network logic **400** including distributed subscriber database **434**. The personal network logic **400** provides an interface between selected devices **110**C, **110**D and the service provider network **102**. To illustrate a routing example, a telephone call directed toward personal network **104** is received by the personal network logic **400**. The logic **400** receives the incoming signal, determines routing instructions from the distributed subscriber database **434**, and routes the call to the particular device (e.g., **110**C) where telephone signals (in this example) are to be received. In one embodiment the personal network logic **400** acts as a local switch directing data to particular devices within the personal network, for example inside of a home or office. Personal network logic **400** is in data communication with selected devices either via hardwiring or wireless links. In the event that a call is directed to a device not within direct communication with the personal network logic **400**, the call is redirected, for example, over telephone infrastructure **122** which completes the call to the designated call-receiving device, for example **110**B.

It can now be appreciated that the personal network logic **400** performs a proxy-like communications service between selected network devices that may or may not be configured to communicate directly with the communications network and the service provider network. As an example, a caller originating a telephone communication from device **410** connects through the public switched telephone network **412** to the service provider's network **102**. Access database **130** recognizes from incoming service data **414**, an inbound called number in this example, that the call is directed toward a personal network **104**. Personal network logic **400** receives the call and identifies an attribute from the service data **414** suitable to identify the service provided, here a telephone call. Such identification can occur by recognizing attributes of various services or by a coded prefix or other identifying data appended to the incoming service data **414**. After identifying the service, personal network logic **400** accesses the personal network profile **350** from distributed subscriber database **434** to identify the selected communication device setup to receive the service in the network. The call, in this example, is then directed to the desired communication device **110** based on the service attribute and the values in the personal network profile **350**. It can now be appreciated that the personal network switch **400** may also incorporate either partially or entirely all the database functions provided by the service provider network **102**. Moreover, while the call is illustrated as being routed through the subscriber's network **102**, under the illustrated system, the call may be routed directly to the personal network **104**.

It should be noted that although the service provider's network **102** has been discussed as including both the transmission network **120**, **122**, **124** and the databases **130**, **134**, this is not a requirement for the invention. Those skilled can appreciate that implementations exist in an environment where the access network provider is not the same as the application/services provider who operates, maintains and makes available services to users with personal networks and network devices. In such cases, one or more networks are used to obtain access to the personal network user profile for manipulation and management. Indeed, various services from multiple providers may be available through the service provider's network. For example video services may be provided from one provider, while voice services may be provided from another.

As an example of the above-described process, assume that a personal network Z consists of 3 personal network devices (A, B, C) each with a unique ESN and sharing the same personal network code (555-555-1212). Each of the three devices has been successfully registered and enabled for operation on service provider D's network. Below is an example of some possible attributes of each network device and a personal network user profile:

CHART 1

		Service Provider D Subscriber Database Personal Network Z User Profile					
Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	On	Enabled	Disabled	Disabled

CHART 1-continued

Service Provider D Subscriber Database
Personal Network Z User Profile

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device B	Pers. Dig. Assistant	555-555-1212	DEF54321	On	Disabled	Enabled	Enabled
Device C	Video Telephone	555-555-1212	GHI12345	On	Disabled	Disabled	Disabled

Assume that the user who manages personal network Z would like to receive/send his video communications by utilizing his portable telephone (Device A) while on the road. Video service is currently not enabled on his portable phone. To enable his portable phone to receive/send video communications, the user will manipulate the menu selection utilizing the soft-keys on his portable telephone to select "enable video communications". Once selected, the portable telephone will transmit an ISW that will be received by the service provider D's network. Once received, the ISW will be decoded and the information sent to the authentication and authorization database. Assuming the network device and ISW successfully authenticate, the ISW will be delivered to the service providers subscriber database. The subscriber database will use components of the ISW such as the personal network code and the ESN, to index to the specific record in the personal network user Z profile. The subscriber database logic will then operate on the payload data included in the ISW received from personal network device A. In this instance, the payload data instructs the service provider subscriber database to change the personal network user Z profile, enabling Device A, the portable telephone, to receive/send video communications. Once changed, the subscriber database save the modified version of the personal network user Z profile. The modified personal network user Z profile is shown below:

CHART 2

Service Provider D Subscriber Database
Personal Network Z User Profile (modified)

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	On	Enabled	Enabled	Disabled
Device B	Pers. Dig. Assistant	555-555-1212	DEF54321	On	Disabled	Enabled	Enabled
Device C	Video Telephone	555-555-1212	GHI12345	On	Disabled	Disabled	Disabled

FIG. **5** illustrates an additional embodiment for managing the personal network. Introduced in FIG. **5** is the concept of the Outbound Signaling Word (OSW) **514** that is incorporated in certain embodiments. The OSW is similar to the ISW explained above, with the exception that it represents data communication from the service provider's network **102** to the network device **110**, for example to transfer signals from the subscriber database **134** to network devices **110**.

Referring to FIG. **5**, assume that a personal network **104**Z consists of two personal network devices **110**A, **110**C each with a unique ESN and sharing the same personal network code (555-555-1212). Each device has been successfully registered and enabled for operation on service provider **102**X's network. Below is an example of some possible attributes of each network device and a personal network user profile:

CHART 3

Service Provider X Subscriber Database
Personal Network Z User Profile

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	On	Enabled	Disabled	Disabled
Device C	Mobile Telephone	555-555-1212	GHI12345	Off	Disabled	Disabled	Disabled

Assume that the user who manages personal network **104**Z is initially receiving and sending voice communications by utilizing portable telephone **110**A. At some point in time later, the user would prefer to use mobile telephone **110**C instead of portable telephone **110**A. To enable mobile telephone **110**C to receive/send voice communications, the user will manipulate a menu selection or other interface on either portable telephone **110**A or mobile telephone **110**C to select "swap profiles from one device to another". Assuming the command was sent from portable telephone **110**A, an ISW **310** is transmitted to the service provider network **102**X. Once received, the ISW will be decoded and the information authenticated with database **130**X. Assuming the portable telephone **110**A and the sent ISW **310** successfully authenticate, the ISW is delivered to the service provider's subscriber database **134** which is illustrated in an alternate configuration separate from service provider's network **102**X and authorization database **130**X. The subscriber database will use the personal network code **222** and the ESN **220**, included in the ISW **310** to index to a specific record in the personal network user Z profile (see e.g. charts **3**, **4**). The subscriber database logic will then operate on the payload data included in the ISW received from network device **110**A. In this instance, the payload data instructs the service provider subscriber database **134** to swap the personal network user Z profile of network device **110**A with that of network device **110**C, enabling the mobile telephone to receive/send audio communications and setting network device **110**A to "off" status. Once changed, the subscriber database will save the modified version of the personal network User Z profile. The modified personal network user Z profile is shown below:

CHART 4

Service Provider D Subscriber Database
Personal Network Z User Profile (modified)

Device	Type	Personal Network Code	Device ESN	Device Status	Voice Service	Video Service	Data Service
Device A	Portable Telephone	555-555-1212	ABC12345	Off	Disabled	Disabled	Disabled
Device C	Mobile Telephone	555-555-1212	GHI12345	On	Enabled	Disabled	Disabled

After the subscriber database **134** stores the new user profile to memory, an OSW **514**A, C is initiated to each of the network devices **110**A, **110**C effected by the previous ISW **310** database transaction. OSW **514**A is sent to network device **110**A and OSW **514**C is delivered to network device **110**C. For example, both OSW **514**A and OSW **514**C include a personal network code **222** identifying personal network **104**Z. OSW **514**A further includes ESN **220**A identifying device **110**A while OSW **514**C includes ESN **220**C identifying device **110**C. Each OSW **514** carries the respective data payload **240**A, C representing changes to each respective network device profiles representing the modifications to the user's personal network profile requested by the ISW **310**. Network device **110**A and **110**C respective logic will then operate on their received payload data included in each of the OSW's received from the subscriber database **134**. In this instance, the payload data provides device profile modifications reflective of the updated subscriber database initiated by the ISW. The final result enjoyed by the user is a mobile device enabled for voice communications and a portable device that is not.

A method is provided that enables a user to define, control and operate a personal network of devices within a service provider's communication system. In one embodiment, this is accomplished by assembling a network of personal communications devices incorporating transceivers that share the same address, customer account information, telephone number, billing information and are compatible with the service provider's communication system. In addition to assembling the network of personal communications devices, the user subscribes to one or more services made available by the service provider. Furthermore, service provider's network provides for a signaling protocol that allows for communications between device transceivers within the personal network and database units within the service provider's network. Thus, communications equipment manufacturers and service providers alike can deliver multiple services to a single user while allowing the user to utilize multiple devices at his convenience. Also provided is a process that enables the user to utilize more than one personal network device and a mechanism to actively manage his personal network devices and network services.

In yet another embodiment, individual ones of devices hand-off designated services in response to a triggering event. The triggering event can be user initiated, proximity based or otherwise. For example, when a mobile phone detects a home based phone and an automatic hand-off indicator is present, the home phone can be configured to send an ISW enabling itself for designated services and disabling the mobile phone. In another embodiment the mobile phone can be configured to send an ISW disabling itself for those designated services. Coordination between the two hand-shaking devices could occur over the personal network, over a local short range network such as Bluetooth, or 802.11 protocol networks and the like.

Referring now to FIG. **6**, a methodology implementable in software for managing a network of devices is illustrated. Upon a triggering event or user request, a device prepares a signaling word to implement a particular network device management configuration, (block **610**). The signaling word is transmitted or otherwise communicated to logic including the subscriber database, (block **612**). On the subscriber database side, the signaling word is received, (block **620**). Authentication logic authenticates, decodes, or otherwise verifies the received signaling word as proper, (block **622**). The payload is then applied to the appropriate data record or records identified by the signaling word, (block **624**). Responsive to success or failure to manage the personal network devices by application of the payload, a return signaling word is prepared, (block **626**). The signaling word is transmitted or otherwise communicated to logic including the devices within the personal device network, (block **628**). The signaling word is received on the device side, (block **614**). Upon receipt of the signaling word on the device side,

the device can be configured to display a status report for the effected device or selected devices in the network. It can be appreciated that the methodology can be implemented as discussed above through managed network devices, other network devices, or through mechanisms that access the subscriber database side via network external devices.

In yet another embodiment, the service provider **102** is located and maintained at the home or other place designated by a user. In this configuration, the databases and associated equipment can be associated uniquely with an individual user's network or up to full service provider for multiple users. In the individual configuration, the service provider **102** is configured to adapt to legacy equipment such as twisted pair, other wireline telephony presently supplied to many consumers, cable, satellite or other communications means. Routing can be redirected back into the legacy equipment or alternately routed over a wireless network as desired.

With reference now to FIG. **7**, an embodiment illustrates distribution of additional services to individual devices in a personal network **704**. As illustrated, the personal network **704** includes television devices **710**A, personal mail and scheduling devices **710**B, audio devices **710**C, and computer devices **710**D. A record contained in distributed subscriber database **734** maintains a profile including desired routing for specific incoming signals. For example, an inbound signaling word **740** includes a unique network device identifier **742** and a payload **744** configured, for example, to create or update a record (not shown) directing incoming television or other motion picture signals toward television device **710**A. Other signaling words route music, radio and, in certain embodiments audio tracks of associated motion picture signals toward audio device **710**C, and match other services to other devices as desired by the subscriber. Those skilled in the art can now appreciate that multiple devices, for example multiple television devices, are configurable to receive a particular incoming signal.

While the present invention has been illustrated by the description of embodiments thereof, and while the embodiments have been described in considerable detail, it is not the intention of the applicants to restrict or in any way limit the scope of the appended claims to such detail. Additional advantages and modifications will readily appear to those skilled in the art. For example, concepts such as enabling subscribers of a service provider network with the ability to dynamically manage services amongst his network of personal communication devices. With this, a subscriber can actively provision, activate/de-activate, manage and direct network provider services to each of his communications devices. Included is the ability for the subscriber to manage his services either through the communication devices themselves or through other means/networks such as the internet and a public Internet access point. Also included are means to manage and provision network services in a distributed, dynamic subscriber self-provisioning manner. This is in contrast to the legacy manner in which services have traditionally been provided to subscribers. The legacy services were provisioned in a centralized, static, service provider provisioned manner. Therefore, the invention, in its broader aspects, is not limited to the specific details, the representative apparatus, and illustrative examples shown and described. Accordingly, departures may be made from such details without departing from the spirit or scope of the applicant's general inventive concept.

We claim:

1. A telephone that is capable of sharing a common phone number with other telephones, the telephone comprising:

a computer-readable medium comprising a unique identifier that uniquely identifies a telephone that has a telephone number associated therewith, wherein the unique identifier is not the telephone number; and

logic in data communication with the computer-readable medium configured to format a signaling word, wherein the signaling word comprises payload data representative of a change request to assign a service associated with the telephone number to the telephone.

2. The telephone of claim **1** wherein the unique identifier is an electronic serial number associated with the telephone.

3. The telephone of claim **1** further comprising a user interface in communication with the logic configured to enable a user to specify the service to be associated to each device that shares the common network number.

4. The telephone of claim **1** wherein the service is selected from the group consisting of data service, voice service, video service, image service and combinations thereof.

5. A method of linking a common phone number with a telephone, the method comprising:

receiving a signaling word from a telephone wherein the signaling word comprises the common phone number, a unique identifier that uniquely identifies the telephone, and payload data requesting a service be available to the telephone; and

linking the common phone number to the telephone such that the service associated with the common phone number is available to the telephone.

6. The method of claim **5** further comprising in response to the linking, providing the service to the telephone.

7. The method of claim **5** further comprising in response to the linking, providing the service from the telephone.

8. A device that is capable of sharing a common network address with other devices, the device comprising:

a user interface configured to enable a user to select a service available to but not associated with the device; and

logic in communication with the user interface configured to format a signaling word responsive to the user's selection, wherein the signaling word comprises a unique identifier that uniquely identifies the device among others sharing the common network address, and payload data configured to associate the service to the device via the unique identifier.

9. The device of claim **8**, further comprising a computer-readable medium comprising the unique identifier, wherein the unique identifier is not the common network address.

10. A telephone that is capable of sharing a common phone number with other telephones, the telephone comprising:

a computer-readable medium comprising a unique identifier that uniquely identifies the telephone wherein the unique identifier is not a telephone number;

a user interface wherein a user is capable of specifying a change request that assigns to the telephone a phone number shared with another telephone; and

logic configured to format a signaling word wherein the signaling word comprises the first unique identifier and payload data representative of the change request.

11. A method of linking a common phone number with a telephone, the method comprising:

receiving a signaling word from a telephone wherein the signaling word comprises the common phone number, a unique identifier that uniquely identifies the telephone, and payload data requesting a service be available to the telephone;

in response to the receiving, correlating the common phone number to the telephone such that a service associated with the common phone number may be made available to the telephone; and

based on the correlating, routing signals directed to the common phone number to the telephone.

12. The method as set forth in claim **11**, where the signals comprise a telephone call directed to the common phone number, the method further comprising establishing data communication without caller input other than dialing the common phone number.

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