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(54) **SYSTEM AND METHOD FOR MONITORING ACTIVITIES OF CHILDREN USING A PIGGY BANK**

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G07D 11/60	(2019.01)
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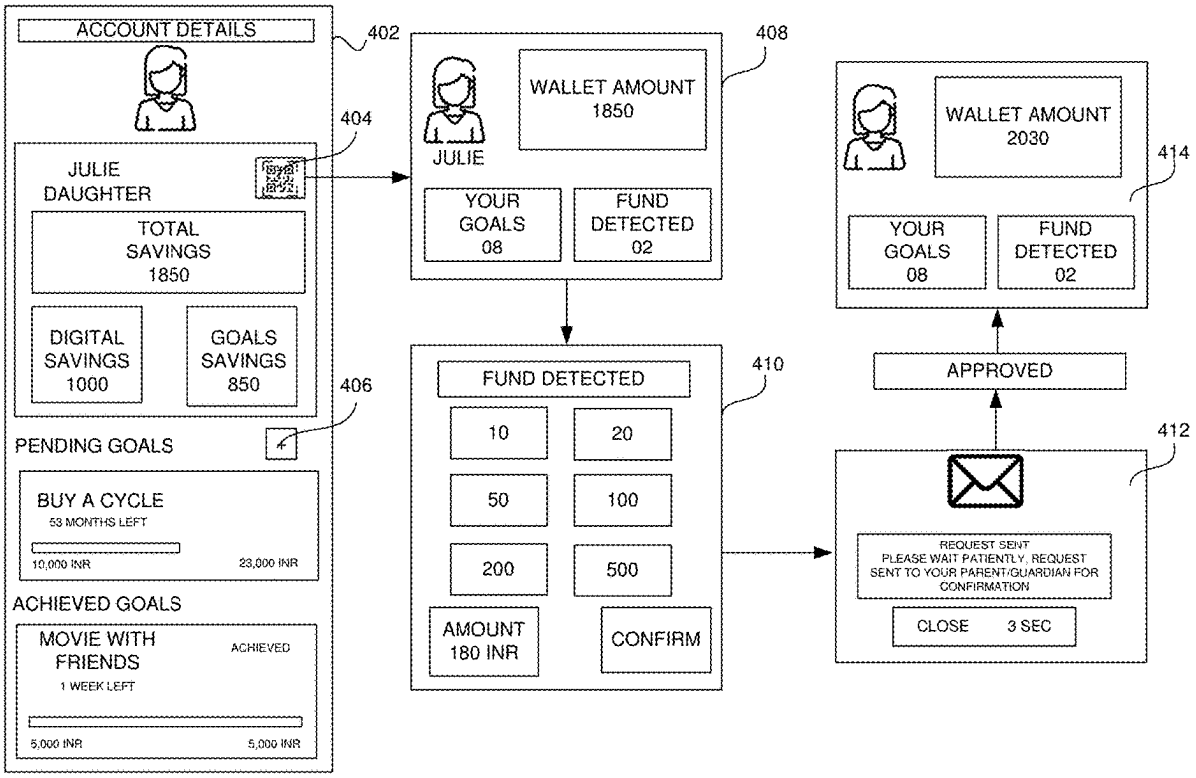
(57) **ABSTRACT**

A system for monitoring activities of children using an intelligent piggy bank is provided. The system **100** includes piggy bank **102** associated with child, a server **104**, and user device **106** associated with parent/guardian. The piggy bank **102** (i) detects, using sensor unit **110**, deposition of currency, when currency is inserted by child; (ii) activates, by micro-controller **118**, relay switch **112** and motor **114** to receive currency; (iii) calculates, amount of currency; (iv) generates currency deposit request by including amount of currency in structured deposit request, when child submits first approval request through interactive display **116**; (v) communicates currency deposit request to user device **106** through server **104**, where user device **106** receives currency deposit request and enables parent/guardian to approve currency deposit request; and (vi) credits currency into piggy bank by updating balance of piggy bank **102**, when the currency deposit request is approved by the parent/guardian.



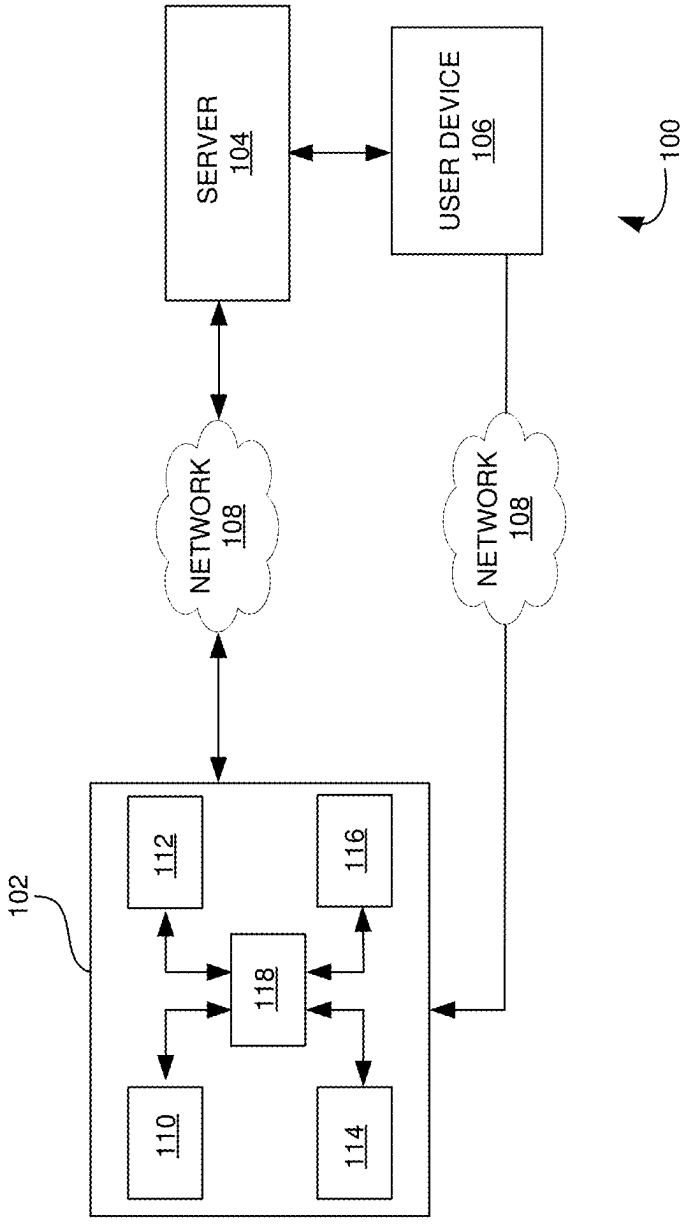

SERVER
104
USER DEVICE
106
100
NETWORK
108
NETWORK
108
102
112
116
118
110
114

FIG. 1

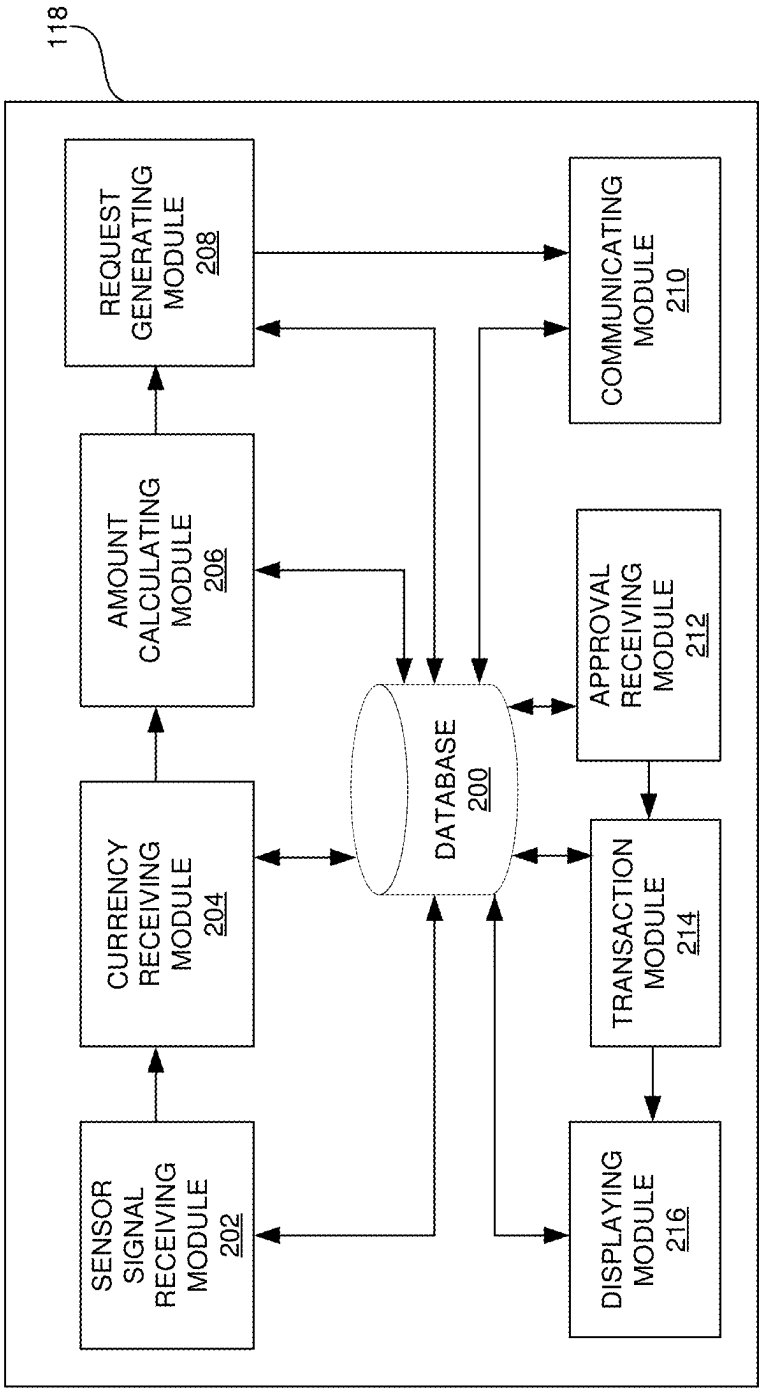

118
REQUEST GENERATING MODULE 208
COMMUNICATING MODULE 210
AMOUNT CALCULATING MODULE 206
APPROVAL RECEIVING MODULE 212
DATABASE 200
CURRENCY RECEIVING MODULE 204
TRANSACTION MODULE 214
SENSOR SIGNAL RECEIVING MODULE 202
DISPLAYING MODULE 216

FIG. 2

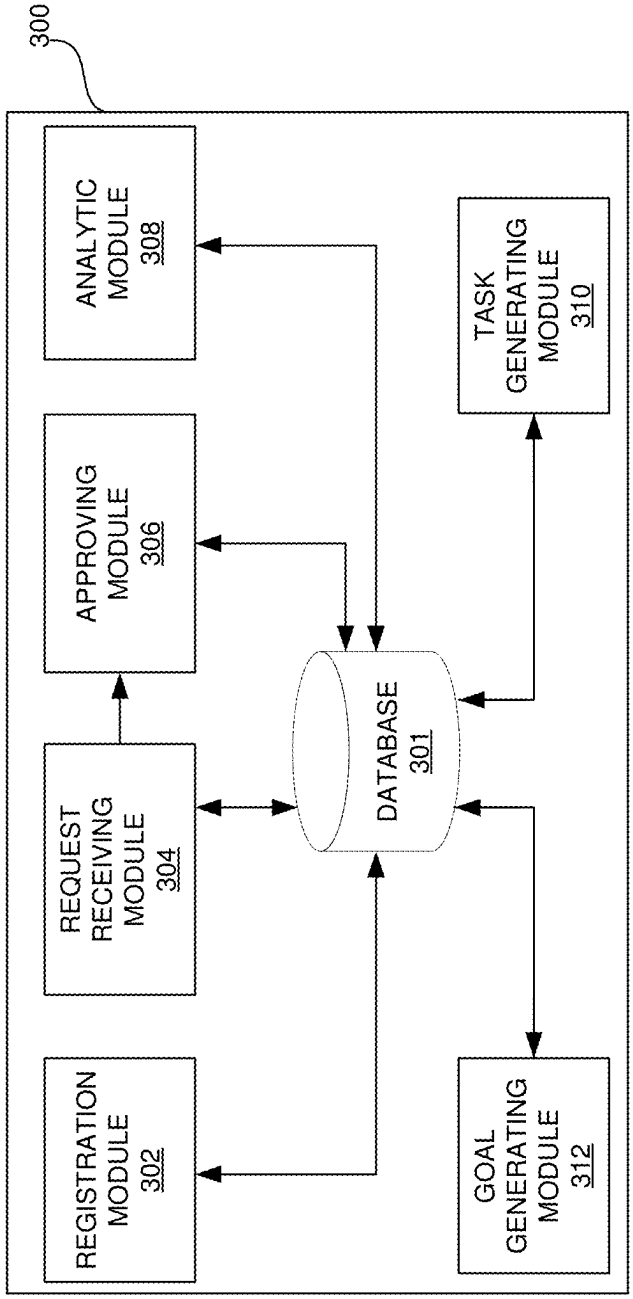

300
ANALYTIC MODULE 308
APPROVING MODULE 306
REQUEST RECEIVING MODULE 304
REGISTRATION MODULE 302
DATABASE 301
TASK GENERATING MODULE 310
GOAL GENERATING MODULE 312

FIG. 3

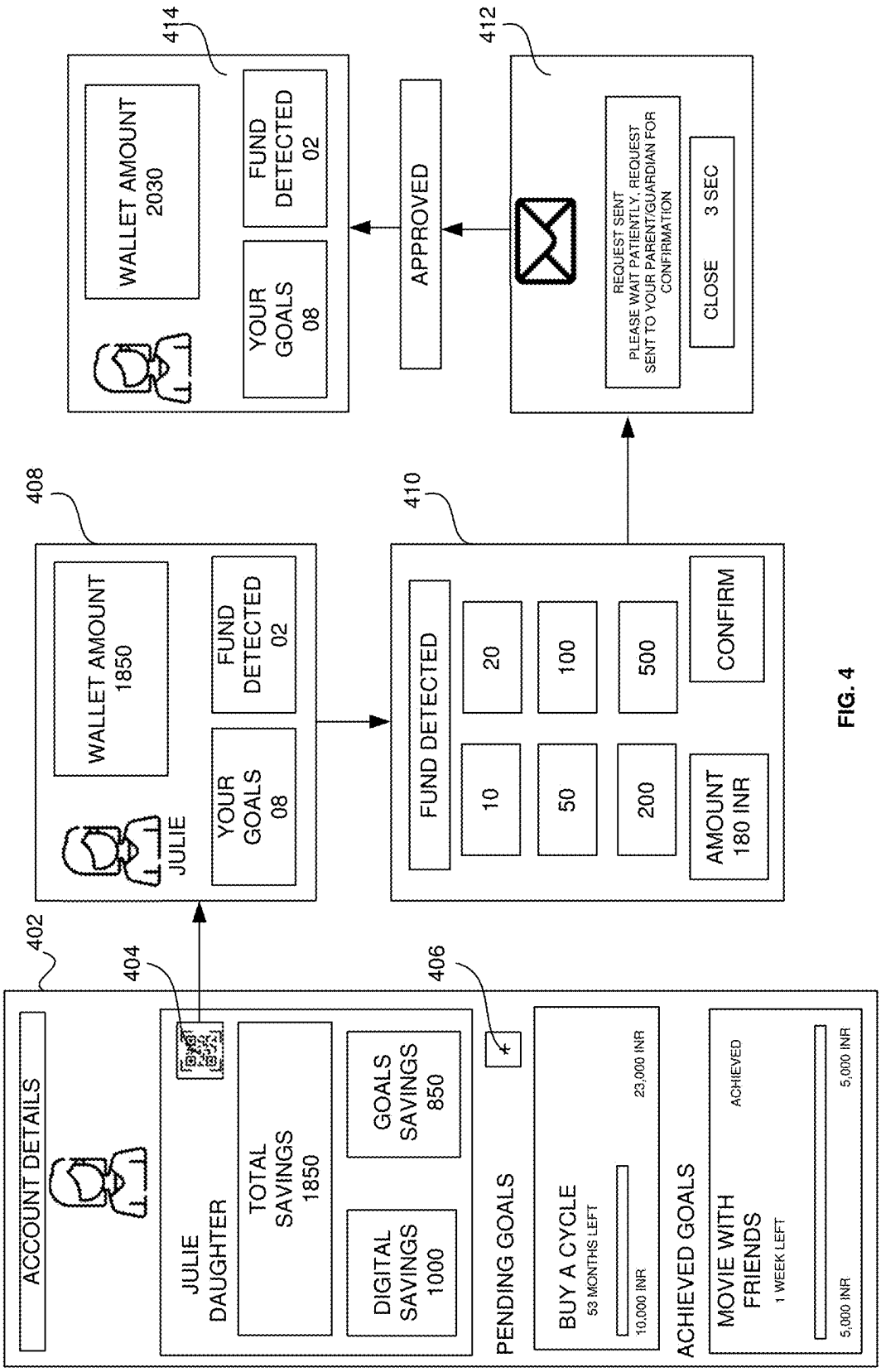

402
ACCOUNT DETAILS
404
JULIE
DAUGHTER
TOTAL SAVINGS 1850
DIGITAL SAVINGS 1000
GOALS SAVINGS 850
406
PENDING GOALS
BUY A CYCLE
53 MONTHS LEFT
10,000 INR
23,000 INR
ACHIEVED GOALS
MOVIE WITH FRIENDS
1 WEEK LEFT
ACHIEVED
5,000 INR
5,000 INR
408
WALLET AMOUNT 1850
JULIE
YOUR GOALS 08
FUND DETECTED 02
410
FUND DETECTED
10
20
50
100
200
500
AMOUNT 180 INR
CONFIRM
412
REQUEST SENT
PLEASE WAIT PATIENTLY, REQUEST SENT TO YOUR PARENT/GUARDIAN FOR CONFIRMATION
CLOSE 3 SEC
APPROVED
414
WALLET AMOUNT 2030
YOUR GOALS 08
FUND DETECTED 02

FIG. 4

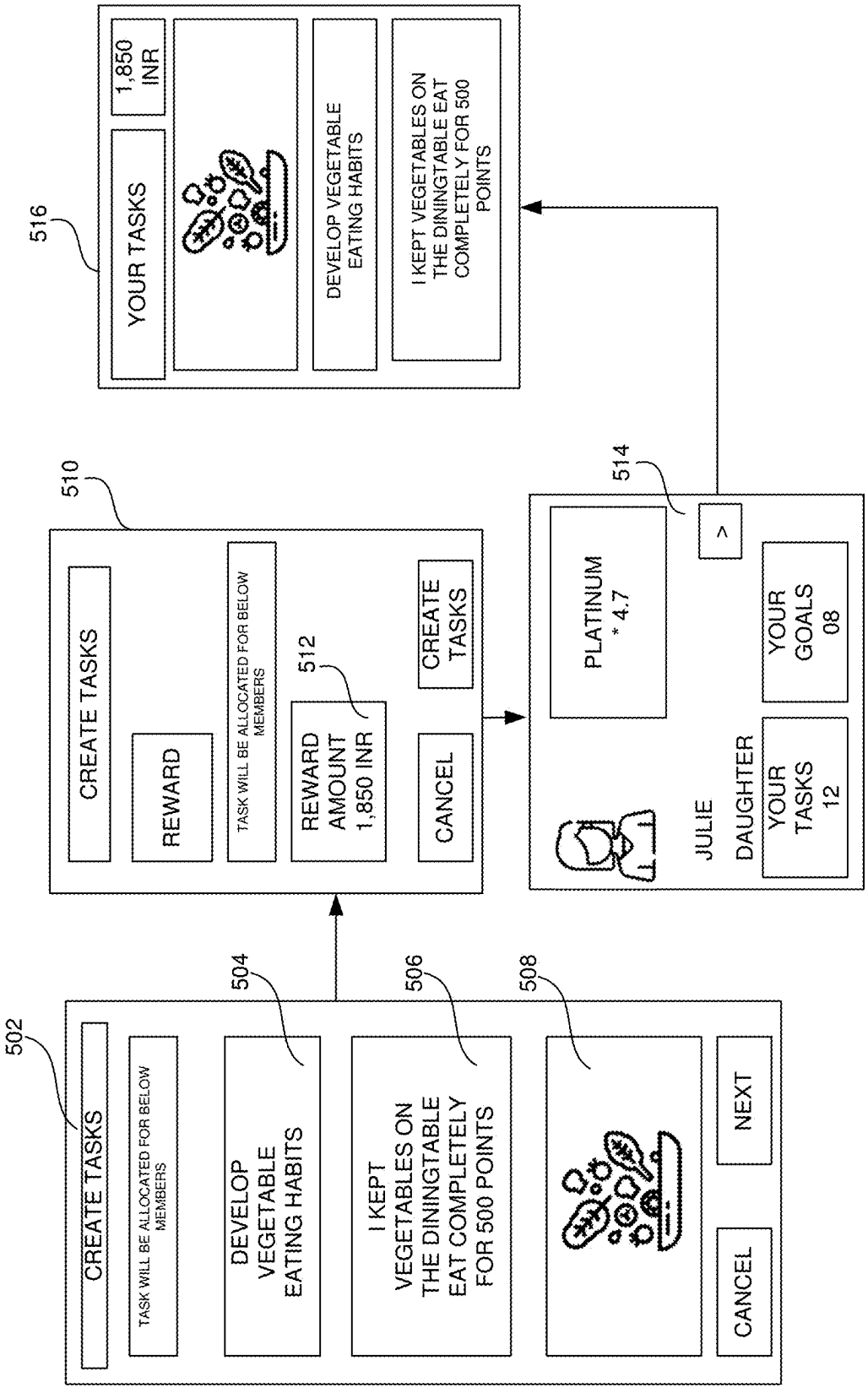

502
CREATE TASKS
TASK WILL BE ALLOCATED FOR BELOW MEMBERS
504
DEVELOP VEGETABLE EATING HABITS
506
I KEPT VEGETABLES ON THE DININGTABLE EAT COMPLETELY FOR 500 POINTS
508
CANCEL
NEXT
510
CREATE TASKS
REWARD
TASK WILL BE ALLOCATED FOR BELOW MEMBERS
512
REWARD AMOUNT 1,850 INR
CANCEL
CREATE TASKS
514
PLATINUM * 4.7
>
JULIE
DAUGHTER
YOUR TASKS 12
YOUR GOALS 08
516
YOUR TASKS
1,850 INR
DEVELOP VEGETABLE EATING HABITS
I KEPT VEGETABLES ON THE DININGTABLE EAT COMPLETELY FOR 500 POINTS

FIG. 5

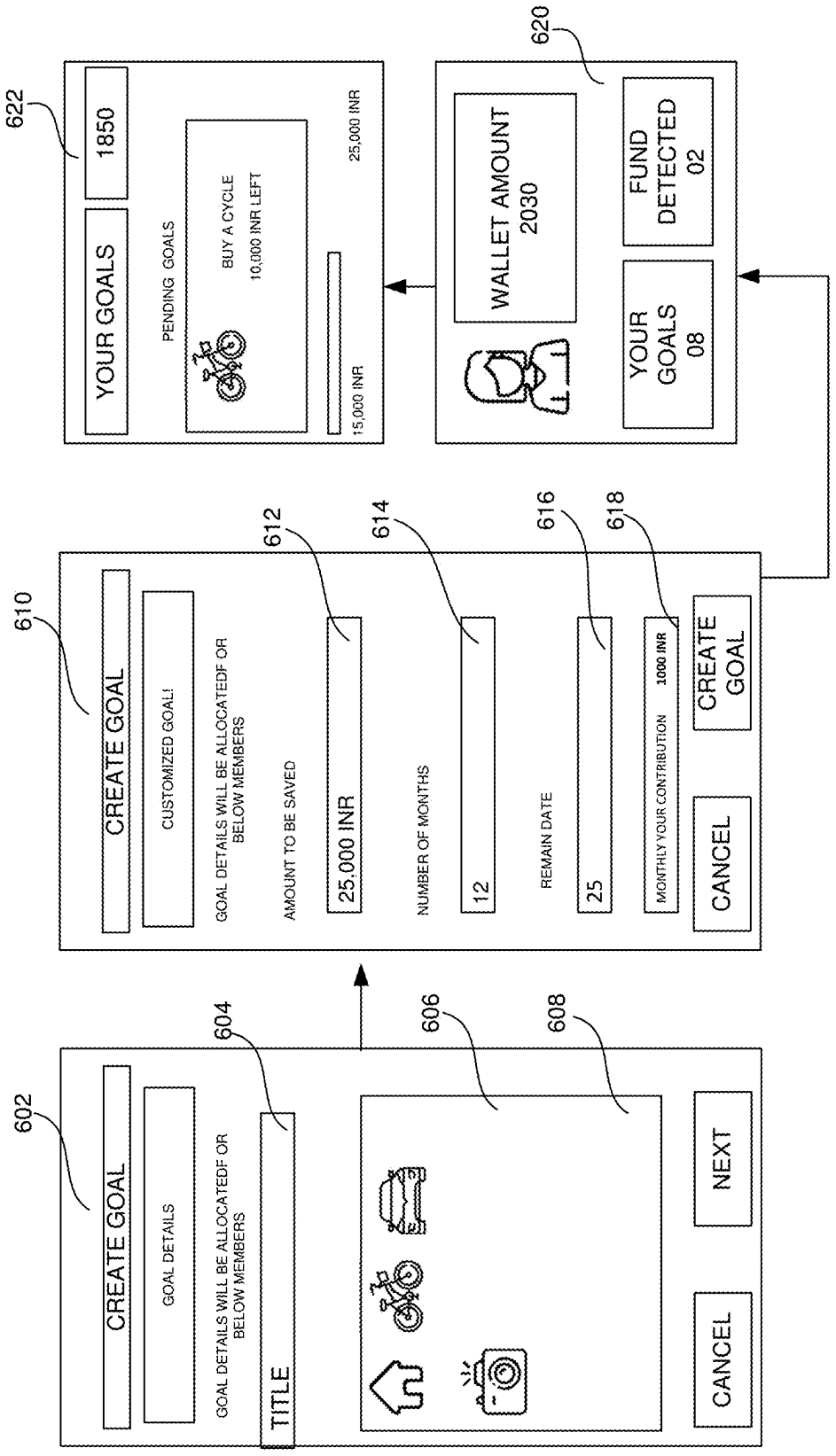

602
CREATE GOAL
GOAL DETAILS
GOAL DETAILS WILL BE ALLOCATEDF OR BELOW MEMBERS
604
TITLE
606
608
CANCEL
NEXT
610
CREATE GOAL
CUSTOMIZED GOAL!
GOAL DETAILS WILL BE ALLOCATEDF OR BELOW MEMBERS
612
AMOUNT TO BE SAVED
25,000 INR
614
NUMBER OF MONTHS
12
616
REMAIN DATE
25
618
MONTHLY YOUR CONTRIBUTION 1000 INR
CANCEL
CREATE GOAL
620
WALLET AMOUNT 2030
YOUR GOALS 08
FUND DETECTED 02
622
YOUR GOALS
1850
PENDING GOALS
BUY A CYCLE
10,000 INR LEFT
15,000 INR
25,000 INR

FIG. 6

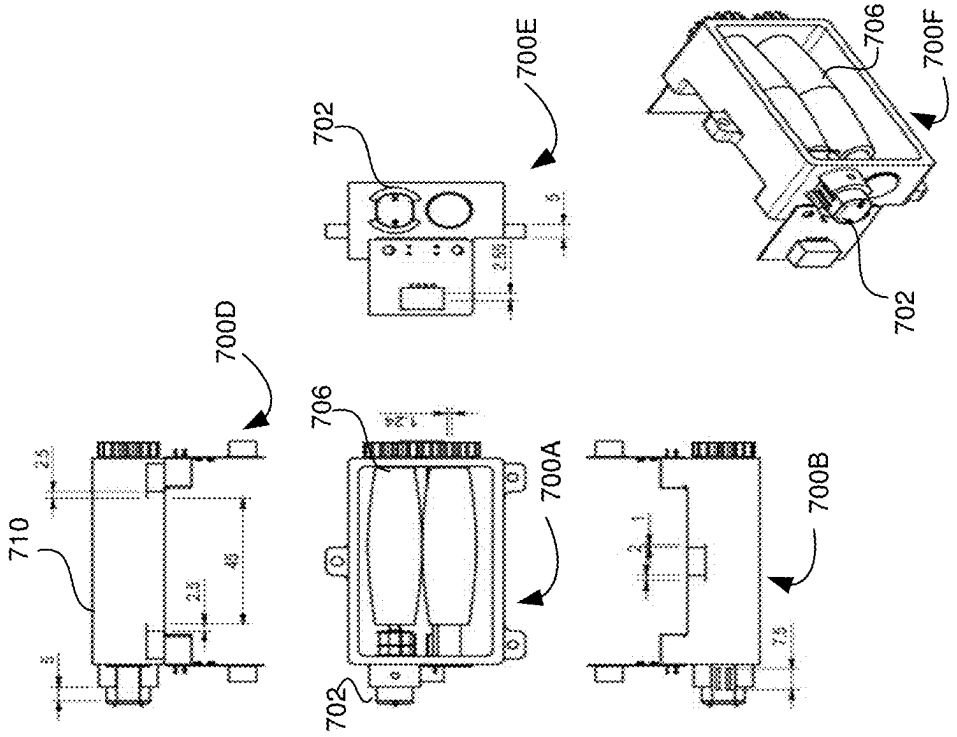

700E
702
706
700F
700D
706
710
700A
700B
702
708
700C

FIG. 7B

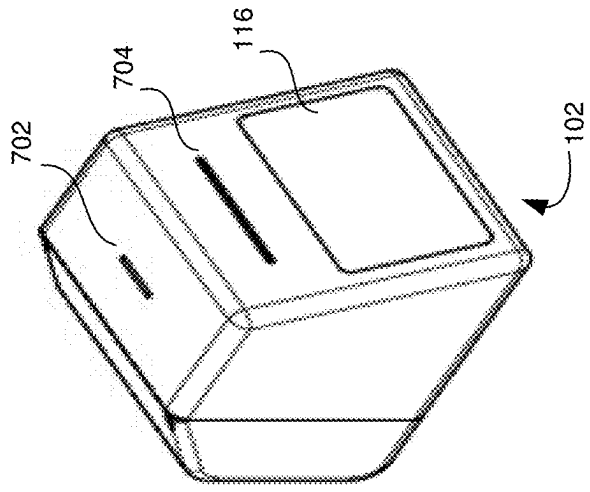

116
704
702
102

FIG. 7A

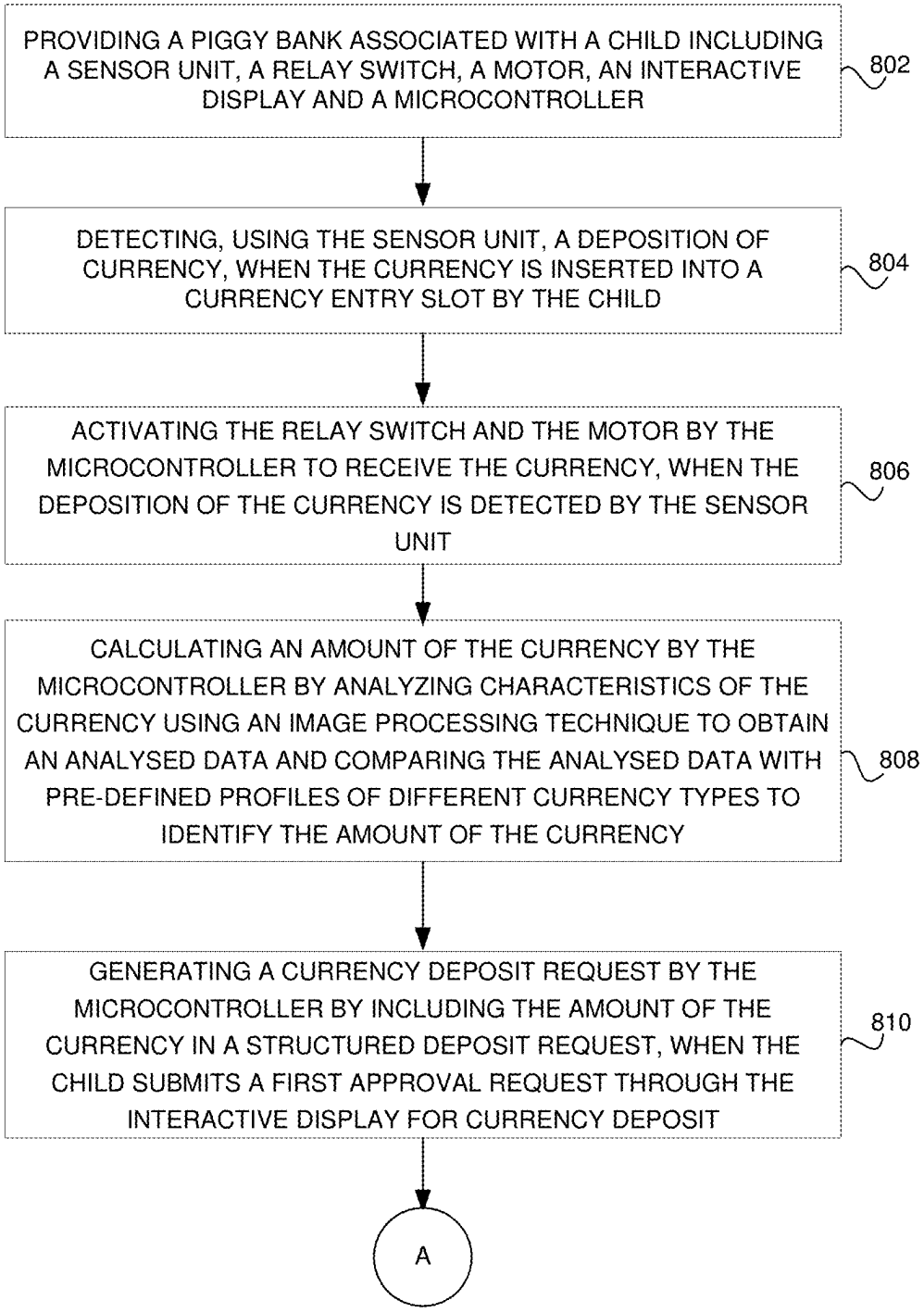

PROVIDING A PIGGY BANK ASSOCIATED WITH A CHILD INCLUDING A SENSOR UNIT, A RELAY SWITCH, A MOTOR, AN INTERACTIVE DISPLAY AND A MICROCONTROLLER
802
DETECTING, USING THE SENSOR UNIT, A DEPOSITION OF CURRENCY, WHEN THE CURRENCY IS INSERTED INTO A CURRENCY ENTRY SLOT BY THE CHILD
804
ACTIVATING THE RELAY SWITCH AND THE MOTOR BY THE MICROCONTROLLER TO RECEIVE THE CURRENCY, WHEN THE DEPOSITION OF THE CURRENCY IS DETECTED BY THE SENSOR UNIT
806
CALCULATING AN AMOUNT OF THE CURRENCY BY THE MICROCONTROLLER BY ANALYZING CHARACTERISTICS OF THE CURRENCY USING AN IMAGE PROCESSING TECHNIQUE TO OBTAIN AN ANALYSED DATA AND COMPARING THE ANALYSED DATA WITH PRE-DEFINED PROFILES OF DIFFERENT CURRENCY TYPES TO IDENTIFY THE AMOUNT OF THE CURRENCY
808
GENERATING A CURRENCY DEPOSIT REQUEST BY THE MICROCONTROLLER BY INCLUDING THE AMOUNT OF THE CURRENCY IN A STRUCTURED DEPOSIT REQUEST, WHEN THE CHILD SUBMITS A FIRST APPROVAL REQUEST THROUGH THE INTERACTIVE DISPLAY FOR CURRENCY DEPOSIT
810
A

FIG. 8A

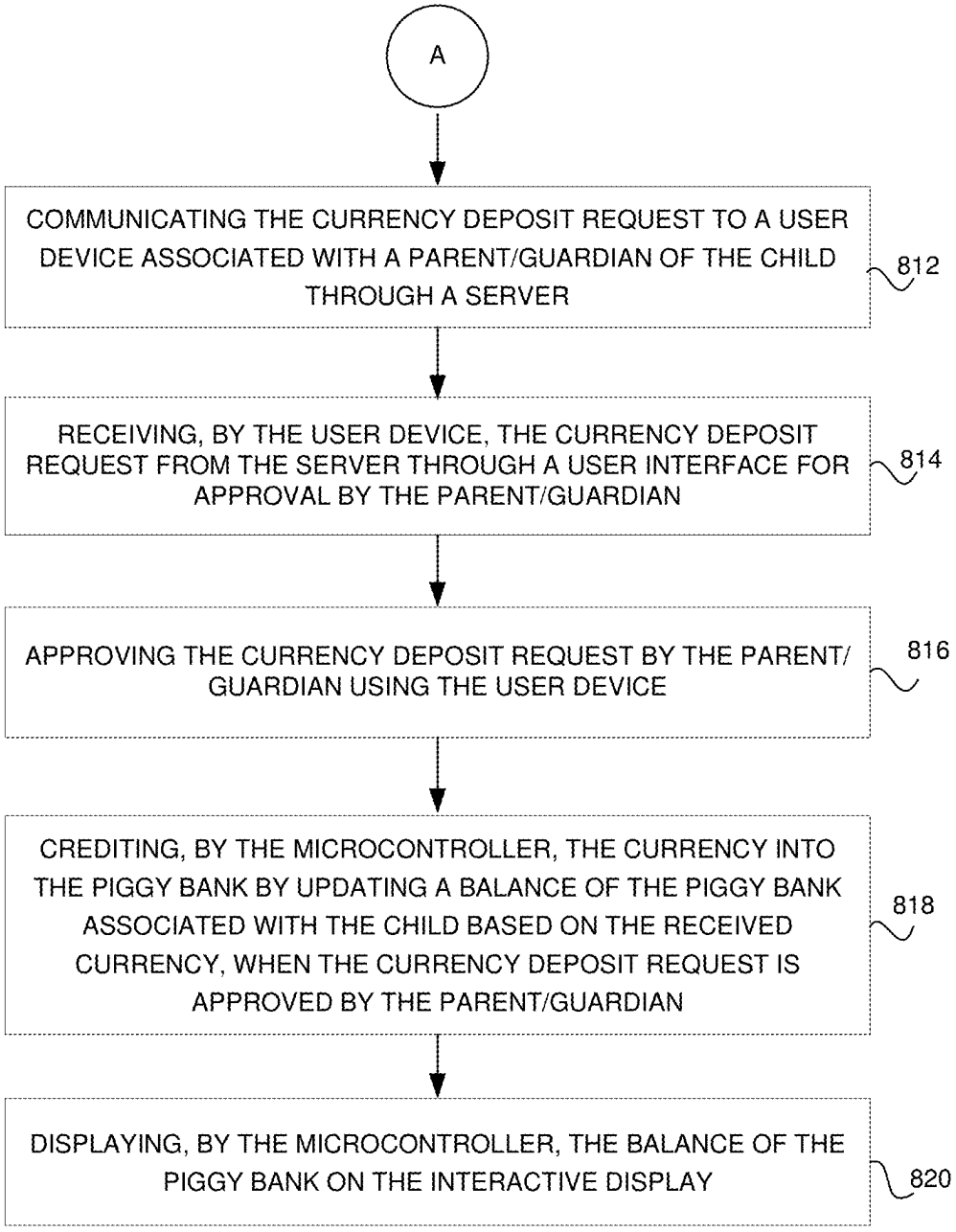

A
COMMUNICATING THE CURRENCY DEPOSIT REQUEST TO A USER DEVICE ASSOCIATED WITH A PARENT/GUARDIAN OF THE CHILD THROUGH A SERVER
812
RECEIVING, BY THE USER DEVICE, THE CURRENCY DEPOSIT REQUEST FROM THE SERVER THROUGH A USER INTERFACE FOR APPROVAL BY THE PARENT/GUARDIAN
814
APPROVING THE CURRENCY DEPOSIT REQUEST BY THE PARENT/GUARDIAN USING THE USER DEVICE
816
CREDITING, BY THE MICROCONTROLLER, THE CURRENCY INTO THE PIGGY BANK BY UPDATING A BALANCE OF THE PIGGY BANK ASSOCIATED WITH THE CHILD BASED ON THE RECEIVED CURRENCY, WHEN THE CURRENCY DEPOSIT REQUEST IS APPROVED BY THE PARENT/GUARDIAN
818
DISPLAYING, BY THE MICROCONTROLLER, THE BALANCE OF THE PIGGY BANK ON THE INTERACTIVE DISPLAY
820

FIG. 8B

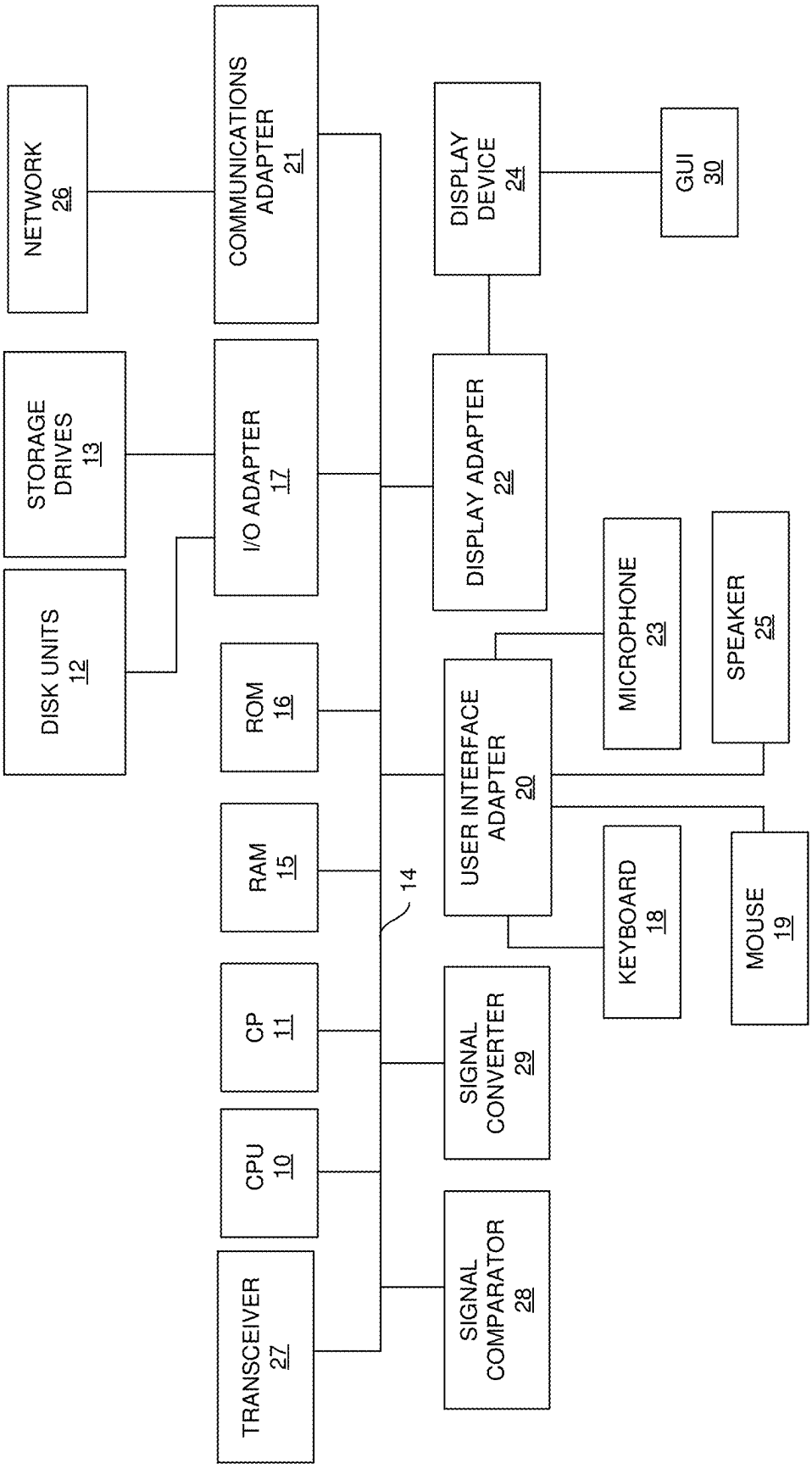

NETWORK 26
COMMUNICATIONS ADAPTER 21
DISPLAY DEVICE 24
GUI 30
STORAGE DRIVES 13
I/O ADAPTER 17
DISPLAY ADAPTER 22
DISK UNITS 12
ROM 16
MICROPHONE 23
SPEAKER 25
USER INTERFACE ADAPTER 20
RAM 15
14
KEYBOARD 18
MOUSE 19
CP 11
SIGNAL CONVERTER 29
CPU 10
TRANSCEIVER 27
SIGNAL COMPARATOR 28

FIG. 9

SYSTEM AND METHOD FOR MONITORING ACTIVITIES OF CHILDREN USING A PIGGY BANK

BACKGROUND

Technical Field

[0001] The embodiments herein generally relate to promoting financial education in children, more particularly to a system and method for monitoring activities of children to foster financial management skills in children using a piggy bank. This system and method serve as an effective tool for teaching children about the importance of saving, budgeting, and financial responsibility from an early age.

Description of the Related Art

[0002] Financial management skills are crucial for individuals and organizations to effectively manage their financial resources and make informed decisions. The financial management skills include budgeting, financial planning, cash flow management, risk management, and financial analysis.

[0003] Lack of financial management skills may result in various consequences, both in a short term and a long term. Common issues associated with the lack of financial management skills are impulse spending, inadequate savings habits, poor budgeting skills, inability to set and achieve financial goals and strained relationships. Further, a lack of financial education can contribute to financial stress in adulthood. Individuals who haven't learned proper money management skills may struggle with debt, living pay check to pay check, and financial insecurity. Individuals who haven't acquired financial management skills may become dependent on others for financial support. This dependence can limit their independence and autonomy. A lack of financial skills may result in missed opportunities for wealth-building activities such as investing. Understanding how to make money work for them is crucial for long-term financial success. Introducing financial education to children early by providing practical examples, and encouraging responsible money habits can help children develop the skills needed for a financially secure future.

[0004] There are some existing money management applications proposed to impart financial skills in children that primarily focus on tracking expenses or allowances, providing limited educational content about broader financial concepts such as budgeting, saving, and investing. Some of the existing applications may have tie-ins with commercial products or services. Parents should be cautious about exposing their children to potential advertising or commercial influences within the application. Combining the use of money management applications with practical, real-world experiences can provide a more comprehensive and well-rounded financial education for children. Regular communication and involvement from parents remain crucial for effective learning.

[0005] Accordingly, there remains a need for a system and method to foster financial literacy, promote responsible behaviour, and encourage technological proficiency among children, thereby benefiting both parents, kids and society as a whole.

SUMMARY

[0006] In view of a foregoing, an embodiment herein provides a system for monitoring activities of children to foster financial management skills. The system includes a piggy bank that is associated with a child and is configured to: (i) detect, using a sensor unit, a deposition of currency, when the currency is inserted by the child into a currency entry slot, where the currency includes at least one of coins or banknotes; (ii) activate, by a microcontroller, a relay switch and a motor to receive the currency, when the deposition of the currency is detected by the sensor unit; (iii) calculate, by the microcontroller, an amount of the currency by analyzing characteristics of the currency using an image processing technique to obtain analysed data and comparing the analysed data with predefined profiles of different currency types to identify the amount of the currency; (iv) generate, by the microcontroller, a currency deposit request by including the amount of the currency in a structured deposit request, when the child submits a first approval request through an interactive display for currency deposit; (v) communicate, by the microcontroller, the currency deposit request to a user device associated with a parent/guardian of the child through a server, where the user device receives the currency deposit request from the server through a user interface and enables the parent/guardian to approve the currency deposit request; (vi) credit, by the microcontroller, the currency into the piggy bank by updating a balance of the piggy bank associated with the child based on the received currency, when the currency deposit request is approved by the parent/guardian, thereby monitoring the saving activity of the children to foster financial management skills in children.

[0007] In some embodiments, the piggy bank is configured to generate a currency withdrawal request by the microcontroller when the child submits a second approval request through the interactive display for currency withdrawal.

[0008] In some embodiments, the microcontroller is configured to send a control signal to the relay switch, which deactivates a lock mechanism for a storage space of the currency to access the currency when the currency withdrawal request is approved by the parent/guardian.

[0009] In some embodiments, the microcontroller displays the status of denial on the interactive display, if the parent/guardian denies the currency deposit request or currency withdrawal request.

[0010] In some embodiments, the user interface associated with the user device enables the parent/guardian to create at least one task with a timeline for completion and a corresponding reward, where the at least one task is displayed in the interactive display of the piggy bank as pending tasks.

[0011] In some embodiments, the user interface associated with the user device is configured to track savings of the child over a period of time and enable the parent/guardian to create at least one goal with a timeline for achieving the goal and monthly contribution of the child to achieve the goal, where the at least one goal is displayed in the interactive display of the piggy bank as pending goals.

[0012] In some embodiments, the piggy bank includes a chip card inserting functionality that enables secure transactions, fund additions, and balance inquiries, and a fingerprint sensor that enables the parent/guardian to lock and unlock the piggy bank using a fingerprint.

[0013] In one aspect, a method for monitoring saving activity of children to foster financial management skills in children is provided. The method includes (i) providing a piggy bank that is associated with a child, where the piggy bank includes a sensor unit, a relay switch, a motor, an interactive display, and a microcontroller; (ii) detecting, using a sensor unit, a deposition of currency when the currency is inserted by the child into a currency entry slot, where the currency includes at least one of coins or banknotes; (iii) activating, by a microcontroller, a relay switch and a motor to receive the currency, when the deposition of the currency is detected by the sensor unit; (iv) calculating, by the microcontroller, an amount of the currency by analyzing characteristics of the currency using an image processing technique to obtain analysed data and comparing the analysed data with predefined profiles of different currency types to identify the amount of the currency; (v) generating, by the microcontroller, a currency deposit request by including the amount of the currency in a structured deposit request when the child submits a first approval request through an interactive display for currency deposit; (vi) communicating, by the microcontroller, the currency deposit request to a user device associated with a parent/guardian of the child through a server; (vii) receiving, by the user device, the currency deposit request from the server through a user interface for approval by the parent/guardian, where the user device enables the parent/guardian to approve the currency deposit request; (viii) crediting, by the microcontroller, the currency into the piggy bank by updating a balance of the piggy bank associated with the child based on the received currency, when the currency deposit request is approved by the parent/guardian, thereby monitoring the saving activity of the children to foster financial management skills in children.

[0014] In some embodiments, the method includes (a) generating a currency withdrawal request by the microcontroller by including an amount of currency to be withdrawn in a structured withdrawal request, when the child submits a second approval request through the interactive display for currency withdrawal; (b) transmitting the currency withdrawal request to the user device for approval; (c) allowing the child to withdraw the currency from the piggy bank using the microcontroller by controlling the relay switch and the motor, when the currency withdrawal request is approved by the parent/guardian through the user interface; and (d) updating the balance of the piggy bank by the microcontroller based on the withdrawn currency.

[0015] In some embodiments, the relay switch activates or deactivates a lock mechanism by the microcontroller by allowing or cutting off power to the motor to access a storage space of the piggy bank.

[0016] The system of the present disclosure improves the saving habits of children daily as well as goal-based savings which teaches children about the value of money. By tracking their savings and setting financial goals, children can develop a better understanding of money management, which can have long-term benefits for their financial well-being as adults. The system has the potential to foster financial literacy, promote responsible behaviour, and encourage technological proficiency among children, thereby benefiting both parents, kids and society as a whole. The system helps children to include financial concepts and their value in their younger stage. Parents and children can move towards a digital economy which is most popular nowadays.

[0017] The system makes parents set goals for their children and make them active and engaged in useful work. Through the system, the children learn to earn, save, and invest within their parent's control. Since approval is required from parents for money withdrawal, this system comes as a secured one.

[0018] These and other aspects of the embodiments herein will be better appreciated and understood when considered in conjunction with the following description and the accompanying drawings. It should be understood, however, that the following descriptions, while indicating preferred embodiments and numerous specific details thereof, are given by way of illustration and not of limitation. Many changes and modifications may be made within the scope of the embodiments herein without departing from the spirit thereof, and the embodiments herein include all such modifications.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The embodiments herein will be better understood from the following detailed description with reference to the drawings, in which:

[0020] FIG. **1** illustrates a system monitoring activities of children to foster financial management skills according to some embodiments herein;

[0021] FIG. **2** is a block diagram that illustrates modules associated with a microcontroller of FIG. **1** according to some embodiments herein;

[0022] FIG. **3** is a block diagram that illustrates modules associated with a user interface of user device of FIG. **1** according to some embodiments herein;

[0023] FIG. **4** illustrates exemplary user interfaces of that display monitoring of saving activity of child according to some embodiments herein;

[0024] FIG. **5** illustrates exemplary user interfaces that show creating tasks for a child by a parent/guardian according to some embodiments herein;

[0025] FIG. **6** illustrates exemplary user interfaces that show creating goals for a child by a parent/guardian according to some embodiments herein;

[0026] FIG. **7**A is an exemplary view of a piggy bank of FIG. **1** according to some embodiments herein;

[0027] FIG. **7**B is an exemplary view that illustrates different views of a piggy bank of FIG. **1** according to some embodiments herein;

[0028] FIGS. **8**A-**8**B are flow diagrams that illustrates a method monitoring saving activity of children to foster financial management skills using a system of FIG. **1** according to some embodiments herein; and

[0029] FIG. **9** is a schematic diagram of a computer architecture in accordance with the embodiments herein.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0030] The embodiments herein and the various features and advantageous details thereof are explained more fully with reference to the non-limiting embodiments that are illustrated in the accompanying drawings and detailed in the following description. Descriptions of well-known components and processing techniques are omitted so as to not

unnecessarily obscure the embodiments herein. The examples used herein are intended merely to facilitate an understanding of ways in which the embodiments herein may be practiced and to further enable those of skill in the art to practice the embodiments herein. Accordingly, the examples should not be construed as limiting the scope of the embodiments herein.

[0031] As mentioned, there remains a need for a system and method to foster financial literacy, promote responsible behaviour, and encourage technological proficiency among children, thereby benefiting both parents, kids and society as a whole. Embodiments herein achieve this by proposing a system and method for monitoring saving activity of children to foster financial management skills in children. Referring now to the drawings, and more particularly to FIGS. **1** through **9**, where similar reference characters denote corresponding features consistently throughout the figure, preferred embodiments are shown.

[0032] FIG. **1** illustrates a system **100** monitoring activities of children to foster financial management skills according to some embodiments herein. The system **100** includes a piggy bank **102**, a server **104**, a user device **106** and a network **108**. The piggy bank **102** includes a sensor unit **110**, a relay switch **112**, a motor **114**, an interactive display **116** and a microcontroller **118**.

[0033] The piggy bank **102** may be associated with a child and is configured to detect a deposition of currency using the sensor unit **110**, when the currency is inserted by the child. The currency may be at least one of coins or banknotes. The sensor unit **110** may be positioned near the currency entry slot. The sensor unit **110** may be at least one of infra-red (IR) sensor, optical sensor, weight sensor, capacitive sensor, or magnetic sensor. In some embodiments, the sensor unit **110** is infra-red (IR) sensor. The IR sensor is configured to emit an infrared beam across the currency entry slot or passage. When the currency is inserted, the beam gets interruption which is detected by the IR sensor. The currency entry slot may include one or more slots. The piggy bank **102** may include a first currency entry slot for receiving coins and a second currency entry slot for receiving banknotes.

[0034] The piggy bank **102** is further configured to activate the relay switch **112** and the motor **114** to receive the currency using the microcontroller **118**, when the deposition of the currency is detected by the sensor unit **110**. The microcontroller **118** may be a Raspberry Pi four microcontroller. The microcontroller **118** acts as a brain of the piggy bank **102** and handles input, data storage, and various other functionalities. The relay switch **112** is configured to create a mechanism that opens or closes the piggy bank **102** based on specified digital inputs, ensuring controlled access to the stored currency in the storage space. The relay switch **112** may be configured to control the storage space electronically with a lock mechanism. Upon receiving a signal from the sensor unit **110**, the microcontroller **118** activates the relay switch **112**, which serves as an electronic switch to control the motor **114**. The relay switch **112** may activate or deactivate the lock mechanism by allowing or cutting off power to the motor **114** as needed. The motor **114** is configured to pull the currency into the piggy bank **102** and stores in the storage space. For coins, the motor **114** may rotate a sorting mechanism, open a trapdoor, or move an arm. For banknotes, the motor **114** may engage rollers or a conveyor to pull the banknotes. Once the currency is received, the relay switch **112** activates the lock mechanism by allowing power to the motor **114**, which moves a latch, or locking arm into place to secure the storage space. The relay switch **112** cuts off power, keeping the lock engaged.

[0035] The piggy bank **102** is further configured to calculate an amount of the currency using the microcontroller **118**. The microcontroller **118** may analyze characteristics of the currency using an image processing technique to obtain an analysed data and comparing the analysed data with pre-defined profiles of different currency types to identify the amount of the currency. The analysed data may include diameter, thickness, color, edge pattern, embossed markings, serial number, denomination value, size, color pattern, and security features (e.g., watermarks).

[0036] The piggy bank **102** is further configured to generate a currency deposit request using the microcontroller **118**, when the child submits a first approval request through the interactive display **116** for currency deposit. The first approval request refers to the child's action of initiating a currency deposit. The microcontroller **118** implements an input mechanism to interact with the piggy bank **102** through the interactive display **116**. The interactive display **116** may be an LCD screen with or without keypad, or a LED screen with or without keypad. The microcontroller **118** may include or add the amount of the currency that is received in a structured deposit request to generate the currency deposit request, when the child submits the first approval request through the interactive display **116** for currency deposit. The structured deposit request may include deposit type (coin or banknote), amount, timestamp (date and time of the deposit request), user ID (if the piggy bank supports multiple users), and approval status (pending or approved).

[0037] The piggy bank **102** with its microcontroller **118** is further configured to communicate the currency deposit request to the user device **106** through the server **104**. The user device **106** may be associated with a parent/guardian of the child and may be a handheld device, a mobile phone, a Personal Digital Assistant (PDA), a tablet, a music player, a computer, a laptop, an electronic notebook or a Smartphone. The server **104** is communicatively connected with the piggy bank **102** and the user device **106** through the network **108** to manage savings. In some embodiments, the network **108** is wired. In some embodiments, the network **108** is a wireless network based on at least one Wi-Fi, wireless Ethernet, or Bluetooth. In some embodiments, the network **108** is a combination of a wired network and a wireless network. In some embodiments, the network **108** is the Internet.

[0038] The server **104** may present a user interface on the user device **106** associated with the parent/guardian. The user interface may be a mobile application or a web application. For mobile applications, the user interface involves one or more design and layout of elements on a smartphone or tablet screen. The user interface may include visual components including buttons, icons, menus, and the overall arrangement of information. For web applications, the user interface may extend to the one or more design and layout of elements within a web browser. The one or more design and layout of elements include navigation menus, buttons, forms, and the overall visual presentation of information. The server **104** may be a cloud, mobile phone, or computer. The server **104** may allow users (for example, parents) to create and track personal accounts and sub-accounts linked to the piggy bank **102** through the user interface.

[0039] The parent/guardian creates an account through the user interface by registering with their mobile number. The parent/guardian is required to provide their name, nick name (optional) and generate a PIN to create the account by agreeing with the service terms and conditions. The parent/guardian logs in to their account using their mobile number and PIN. The parent/guardian creates a member by providing the details including name, nickname (optional), date of birth, gender and relationship type. The created members are added under the family members of the parent/guardian. For example, a person can add his wife, and children as family members. The account details of the children include total savings amount, digital savings, goals savings, pending goals, and achieved goals. The user interface may include an option to facilitate scanning a QR code associated with the piggy bank **102** of the child. The parent/guardian scans the QR code associated with the piggy bank **102** and gets connected to the piggy bank **102**.

[0040] The user device **106** is configured to receive the currency deposit request from the server **104** through the user interface and enables the parent/guardian to approve the currency deposit request. Once approved by the parent/guardian through the user interface, the currency can be deposited to the piggy bank **102**. The microcontroller **118** is configured to credit the currency into the piggy bank **102** by updating a balance of the piggy bank **102** associated with the child based on the received currency, when the currency deposit request is approved by the parent/guardian. The balance of the piggy bank **102** is displayed on the interactive display **116**. The microcontroller **118** may also display messages or other relevant information along with the current balance for the child and parent/guardian to track the funds/currency in the piggy bank **102**.

[0041] Similar to currency deposit request, the piggy bank **102** is further configured to generate a currency withdrawal request by the microcontroller **118**, when the child submits a second approval request through the interactive display **116** for currency withdrawal. The second approval request refers to the child's action of initiating a currency withdrawal. The currency withdrawal request may also be transmitted to the user device **106** for the approval. Once approved by the parent/guardian through the user interface, the currency can be withdrawn from the piggy bank **102**. The relay switch **112** may be configured to control a physical access to the stored currency in the storage space. In some embodiments, the microcontroller **118** is configured to send a control signal to the relay switch **112**, which deactivates the lock mechanism for the storage space of the currency to access the currency, when the currency withdrawal request is approved by the parent/guardian. After withdrawal, the microcontroller **118** may update the balance of the piggy bank **102** based on the withdrawal currency, and display the balance on the interactive display **116**.

[0042] If the parent/guardian denies the currency deposit request or currency withdrawal request, the status of denial is displayed on the interactive display **116** by the microcontroller **118**. Thus, the system **100** monitors the saving activity of the children, thereby fostering their financial management skills.

[0043] In some embodiments, the user device **106** associated with the parent/guardian is configured to track savings of the child over a period of time and aids to set financial goals for the child based on the savings through the user interface. The user interface associated with the user device **106** enables the parent/guardian to create at least one task and allocate the at least one task to the children who are added as the family members. The task may be created by providing a task title, and task description. A relevant image may be added to the task. For example, the task may be related to encouraging vegetable-eating habits in the children. The parent/guardian may create a timeline for completing the task and may include a reward for the completion of the task. The created tasks are added to the task list of the children and displayed in the interactive display **116** of the piggy bank **102** as pending tasks.

[0044] The user interface associated with the user device **106** further enables the parent/guardian to create at least one goal and allocate the at least one goal to the children who are added as the family members. The goal may be created by providing a goal title, a timeline for achieving the goal and monthly contribution of the child to achieve the goal. A relevant image may be added to the goal. The user interface also provides goal details including the monthly contribution with respect to date. For example, the goal may be related to buying a bicycle. The created goals are added to the goal list of the children and displayed in the interactive display **116** of the piggy bank **102** as pending goals.

[0045] In some embodiments, the piggy bank **102** includes a fingerprint sensor. The parent/guardian can lock and unlock the piggy bank **102** using a fingerprint. In some embodiments, the piggy bank **102** includes a chip card inserting functionality. A debit card or any relevant card may be inserted for all the day-to-day transactions and can be used to add funds and check balances. The piggy bank **102** may be attached to any external device such as a TV or a mobile display. The piggy bank **102** may be provided with an in-build app store that facilitates downloading and facilitating apps like YouTube or games. By using QR code display options, anyone can scan and send or pay money to the account linked with the piggy bank **102** directly.

[0046] In some embodiments, the piggy bank **102** supports product-to-application connectivity, enabling communication between the piggy bank **102** and a mobile application for monitoring and approvals. The piggy bank **102** may include a low-end connectivity mode, where the piggy bank **102** connects to a basic mobile application solely for transaction approvals by the parent/guardian.

[0047] In some embodiments, the piggy bank **102** includes a music system and is integrated with audio output and lights to provide interactive feedback when currency is deposited or withdrawn. In some embodiments, the piggy bank **102** is equipped with USB charging functionality, allowing convenient recharging of its internal power source. In some embodiments, the system **100** includes a digital wallet for savings, allowing virtual transactions and balance tracking through the user device **106**. In some embodiments, the server **104** initiates savings directly into bank accounts associated with the parent or guardian, helping to transfer the deposited amount into real savings accounts. This ensures secure and structured financial management for the child's savings.

[0048] In some embodiments, children can learn about financial concepts such as counting currency, identifying denominations, and basic investment principles through the interactive display **116**, thereby turning financial education into a fun and engaging experience. The interactive display **116** may have a virtual currency counting game where children practice adding or subtracting coins and banknotes,

helping them learn the value of different denominations. The interactive display **116** may show images or simulations of different coins and bills, and children can match them with the correct values. For example, the piggy bank **102** may prompt the child to select a coin of a certain value to deposit, helping them learn the differences between them. The interactive display **116** may introduce simple games or challenges where children make virtual investments or save for goals. This may include visualizing how savings grow over time, or learning about concepts like interest or budgeting. Thus, the system **100** makes learning about money interactive and engaging by incorporating fun challenges, games, and visual aids.

[0049] FIG. **2** is a block diagram that illustrates modules associated with a microcontroller **118** of FIG. **1** according to some embodiments herein. A piggy bank **102** includes the microcontroller **118** and a first database **200**. The first database **200** stores one or more modules and sequences of instructions, which when executed by the microcontroller **118** causes monitoring of a saving activity of child. The one or more modules include a sensor signal receiving module **202**, a currency receiving module **204**, an amount calculating module **206**, a request generating module **208**, a communicating module **210**, an approval receiving module **212**, a transaction module **214**, and a displaying module **216**.

[0050] The sensor signal receiving module **202** receives a signal associated with a deposition of currency from a sensor unit **110** when the sensor unit **110** detects changes caused by the insertion of the currency.

[0051] The currency receiving module **204** activates a relay switch **112** and a motor **114** to receive the currency, when the signal associated with the deposition of the currency is received at the sensor signal receiving module **202**. The currency receiving module **204** controls the relay switch **112** that activates or deactivates a lock mechanism by allowing or cutting off power to the motor **114** as needed. The relay switch **112** in turn controls the motor **114** that pulls the currency into the piggy bank **102** and stores in a storage space.

[0052] The amount calculating module **206** calculates an amount of the currency that is received at the currency receiving module **204**. The amount calculating module **206** analyzes one or more characteristics of the currency to obtain analysed data. The amount calculating module **206** may use an image processing technique to obtain the analysed data. The analysed data may include diameter, thickness, color, edge pattern, embossed markings, serial number, denomination value, size, color pattern, and security features (e.g., watermarks). The amount calculating module **206** further compares the analysed data with pre-defined profiles of different currency types to identify the amount of the currency.

[0053] The request generating module **208** generates a currency deposit request, when the child submits a first approval request through an interactive display **116** for currency deposit. The request generating module **208** adds the amount of the currency in a structured deposit request to generate the currency deposit request. The request generating module **208** also generates a currency withdrawal request, when the child submits a second approval request through the interactive display **116** for currency withdrawal.

[0054] The communicating module **210** communicates at least one of the currency deposit request or the currency withdrawal request to a user device **106** through a server **104** to get approval for the currency deposit or currency withdrawal by the child from a parent/guardian. The approval receiving module **212** receives the approval for the currency deposit or currency withdrawal from the user device **106** to credit or withdraw the currency into or from the piggy bank **102**.

[0055] The transaction module **214** credits the currency into the piggy bank **102**, when the approval for the currency deposit is received at the approval receiving module **212**. The transaction module **214** updates a balance of the piggy bank **102** based on the credited currency and stores in the first database **200**. The transaction module **214** allows the child to withdraw the currency from the piggy bank **102**, when the approval for the currency withdrawal is received at the approval receiving module **212**. The transaction module **214** sends a control signal to the relay switch **112**, which deactivates the lock mechanism for the storage space of the currency to access the currency, when the currency withdrawal request is approved by the parent/guardian. After withdrawal, the transaction module **214** updates the balance of the piggy bank **102** based on the withdrawn currency. The transaction module **214** may update the balance by incrementing a variable or update the first database **200** to reflect the balance.

[0056] The displaying module **216** displays the balance on the interactive display **116** of the piggy bank **102**. The displaying module **216** further displays messages related to the status of approval and the amount deposited or withdrawn on the interactive display **116**.

[0057] FIG. **3** is a block diagram that illustrates modules associated with a user interface **300** of user device **106** of FIG. **1** according to some embodiments herein. The user device **106** associated with the parent/guardian includes a second database **301** and accesses the user interface **300** provided by a server **104**. The second database **301** stores data and configurations used by one or more modules. These modules, when executed via the user interface, facilitate monitoring a saving activity of children to foster financial management skills in children. The one or more modules include a registration module **302**, a request receiving module **304**, an approving module **306**, an analytic module **308**, a task generating module **310**, and a goal generating module **312**.

[0058] The registration module **302** enables a parent/guardian (users) to create an account by registering with a mobile number. The parent/guardian may provide name, nick name (optional) and generate a PIN to create the account by agreeing with the service terms and conditions. The parent/guardian logs in to the account using the mobile number and PIN. The registration module **302** further enables the parent/guardian to create a member by providing the details including name, nickname (optional), date of birth, gender and relationship type. The created members are added under the family members of the parent/guardian.

[0059] The request receiving module **304** receives a currency deposit request or a currency withdrawal request from a piggy bank **102**, when a child raises a first approval request with the piggy bank **102** for currency deposit or a second approval request for currency withdrawal. The approving module **306** enables the parent/guardian to approve the currency deposit request or currency withdrawal request and sends the approval status to the piggy bank **102**.

[0060] The analytic module **316** tracks the savings of the child over a period of time and helps to set financial goals

for the child based on the savings. The task generating module **312** enables the parent/guardian to create at least one task with a timeline for completion and a corresponding reward. The goal generating module **314** enables the parent/guardian to create at least one goal with a timeline for achieving the goal and monthly contribution of the child to achieve the goal. The at least one task or goal may be displayed in the interactive display **116** of the piggy bank **102** as pending tasks/goals.

[0061] FIG. **4** illustrates exemplary user interfaces of that display monitoring of saving activity of child according to some embodiments herein. The exemplary user interfaces are displayed on an interactive display **116** of the piggy bank **102**. A user interface **402** shows account details of the child (for example, Julie). The parent/guardian scans a Quick Response (QR) code **404** associated with the piggy bank **102** of the child using a user device **106**. On successful linking of the user device **106** with the piggy bank **102** of the child, the parent/guardian is presented with a user interface **408** that shows the account details of the child including the current wallet amount. A user interface **410** shows currency detected in piggy bank **102**, if the currency is detected by a sensor unit **110** of the piggy bank **102**. An interactive display **116** shows a message **412** to the child that a request for the currency deposit has been sent to the parent/guardian and awaiting confirmation. The parent/guardian approves the request by clicking the confirm button on the user interface **410**. The updated amount is shown in the account details of the child at user interface **414**.

[0062] FIG. **5** illustrates exemplary user interfaces that show creating tasks for a child by a parent/guardian according to some embodiments herein. Interface **502** includes a title of a task **504**, the description of the task **506**, and an image relevant to the task **508**. Interface **510** shows a reward amount **512** allocated for completing the task by the child. The interactive display **116** presents an interface **514** showing the total number of tasks and the description of the pending task is displayed on the interface **516**.

[0063] FIG. **6** illustrates exemplary user interfaces that show creating goals for a child by a parent/guardian according to some embodiments herein. The parent/guardian creates goals using a user interface **602**. The goals may be created by providing a goal title **604** and a relevant image **606**. A user interface **610** facilitates the parent/guardian to provide the amount to be saved **612** for the goals, the number of months allocated for completion of the goal **614**, and the date to remain the deposit of currency into the piggy bank **102**. The parent/guardian can provide a monthly contribution **618** for the created goal. The created goal is added to the goal list of the children as shown in interface **620** and displayed as pending goals as sown in interface **622** in an interactive display **116** of the piggy bank **102**.

[0064] FIG. **7**A is an exemplary view of a piggy bank **102** of FIG. **1** according to some embodiments herein. An outer shell of the piggy bank **102** is shown in FIG. **7**A. As shown in FIG. **7**A, the piggy bank **102** includes a first currency entry slot **702**A through which a child inserts the coins and a second currency entry slot **700**B through which the child inserts the banknotes. The piggy bank **102** further includes an interactive display **116** that enables the users (child and parent) to interact with the piggy bank **102** while performing saving activity.

[0065] FIG. **7**B is an exemplary view that illustrates different views of a piggy bank **102** of FIG. **1** according to some embodiments herein. **700**A shows a top view, **700**B shows a bottom view, **700**C shows a front view, **700**D shows a left side view, **700**E shows a right side view, and **700**F shows isometric view of the piggy bank **102**. The piggy bank includes a currency entry slot **702**, one or more rollers **706**, a gear mechanism **708** associated with a motor **114**, and a housing **710**. The housing **710** houses all the mechanisms of currency movement. The rollers **706**, and the gear mechanism **708** are associated with the motor **114** and are configured to pull the currency when a child inserts the currency into the currency entry slot **702**.

[0066] FIGS. **8**A-**8**B are flow diagrams that illustrates a method monitoring saving activity of children to foster financial management skills using a system **100** of FIG. **1** according to some embodiments herein. At step **802**, a piggy bank **102** associated with a child including a sensor unit **110**, a relay switch **112**, a motor **114**, an interactive display **116** and a microcontroller **118** is provided. At step **804**, a deposition of currency is detected using the sensor unit **110**, when the currency is inserted into a currency entry slot by the child. At step **806**, the relay switch **112** and the motor **114** are activated by the microcontroller **118** to receive the currency, when the deposition of the currency is detected by the sensor unit **110**. At step **808**, an amount of the currency is calculated by the microcontroller **118** by analyzing characteristics of the currency using an image processing technique to obtain an analysed data and comparing the analysed data with pre-defined profiles of different currency types to identify the amount of the currency. At step **810**, a currency deposit request is generated by the microcontroller **118** by including the amount of the currency in a structured deposit request, when the child submits a first approval request through the interactive display **116** for currency deposit. At step **812**, the currency deposit request is communicated to a user device **106** associated with a parent/guardian of the child through a server **104**. At step **814**, the user device **106** receives the currency deposit request from the server **104** through a user interface for approval by the parent/guardian. At step **816**, the currency deposit request is approved by the parent/guardian using the user device **106**. At step **818**, the currency is credited into the piggy bank **102** by the microcontroller **118** by updating a balance of the piggy bank **102** associated with the child based on the received currency, when the currency deposit request is approved by the parent/guardian. At step **820**, the balance of the piggy bank **102** is displayed by the microcontroller **118** on the interactive display **116**.

[0067] In some embodiments, the method includes (i) generating a currency withdrawal request by the microcontroller **118** by including an amount of currency to be withdrawn in a structured withdrawal request, when the child submits a second approval request through the interactive display **116** for currency withdrawal; (ii) transmitting the currency withdrawal request to the user device **106** for the approval; (iii) allowing the child to withdraw the currency from the piggy bank **102** using the microcontroller **118** by controlling the relay switch **112** and the motor **114**, when the currency withdrawal request is approved by the parent/guardian through the user interface; and (iv) updating the balance of the piggy bank **102** by the microcontroller **118** based on the withdrawn currency.

[0068] If the parent/guardian denies the currency deposit request or currency withdrawal request, the status of denial is displayed on the interactive display **116**.

[0069] The system **100** allows children to engage with other users or participate in financial challenges or competitions, which can create a supportive and collaborative environment where children can learn from one another and develop a sense of community responsibility. The system **100** provides learning on financial planning where the parents can also impart basic financial planning skills to their children, such as distinguishing between needs and wants, making informed spending decisions, and understanding the concept of financial security. The system **100** allows parents to actively participate in their children's financial education, which strengthens the parent-child relationship and foster a sense of responsibility and accountability in the child. The system **100** provides a sense of accomplishment and motivation, teaching them the value of perseverance and discipline in reaching their objectives. The system **100** provides technological proficiency to children where they can become more proficient with technology, gaining valuable skills that are becoming increasingly essential in the digital era.

[0070] The system **100** provides an easy way to save money daily without having to look for currency notes and coins. The system **100** provides easy access to the child's bank account and their money makes the kids accountable. Parents will be worry-free as they have set aside money for their child's future. Parents and grandparents can transfer their money knowledge easily to the next generation. Early adoption of the system can improve children's habits that ensure their strong financial future.

[0071] A representative hardware environment for practising the embodiments herein is depicted in FIG. **9**, with reference to FIGS. **1** through **8**. This schematic drawing illustrates a hardware configuration of a server **104**/computer system in accordance with the embodiments herein. The server **104**/computer includes at least one processing device **10** and a cryptographic processor **11**. The special-purpose CPU **10** and the cryptographic processor (CP) **11** may be interconnected via system bus **14** to various devices such as a random access memory (RAM) **15**, read-only memory (ROM) **16**, and an input/output (I/O) adapter **17**. The I/O adapter **17** can connect to peripheral devices, such as disk units **12** and tape drives **13**, or other program storage devices that are readable by the system. The server **104**/computer can read the inventive instructions on the program storage devices and follow these instructions to execute the methodology of the embodiments herein. The server **104**/computer system further includes a user interface adapter **20** that connects a keyboard **18**, mouse **19**, speaker **25**, microphone **23**, and/or other user interface devices such as a touch screen device (not shown) to the bus **14** to gather user input. Additionally, a communication adapter **21** connects the bus **14** to a data processing network **26**, and a display adapter **22** connects the bus **14** to a display device **24**, which provides a graphical user interface (GUI) **30** of the output data in accordance with the embodiments herein, or which may be embodied as an output device such as a monitor, printer, or transmitter, for example. Further, a transceiver **27**, a signal comparator **28**, and a signal converter **29** may be connected with the bus **14** for processing, transmission, receipt, comparison, and conversion of electric or electronic signals.

[0072] The foregoing description of the specific embodiments will so fully reveal the general nature of the embodiments herein that others can, by applying current knowledge, readily modify and/or adapt for various applications without departing from the generic concept, and, therefore, such adaptations and modifications should be comprehended within the meaning and range of equivalents of the disclosed embodiments. It is to be understood that the phraseology or terminology employed herein is for the purpose of de-scription and not of limitation. Therefore, while the embodiments herein have been de-scribed in terms of preferred embodiments, those skilled in the art will recognize that the embodiments herein can be practiced with modification within the spirit and scope of the appended claims.

What claimed is:

1. A system for monitoring activities of children to foster financial management skills in children, wherein the system comprising:

a piggy bank that is associated with a child and is configured to:

detect, using a sensor unit, a deposition of currency, when the currency is inserted by the child into a currency entry slot, wherein the currency comprises at least one of coins or banknotes;

activate, by a microcontroller, a relay switch and a motor to receive the currency, when the deposition of the currency is detected by the sensor unit;

calculate, by the microcontroller, an amount of the currency by analyzing characteristics of the currency using an image processing technique to obtain an analysed data and comparing the analysed data with pre-defined profiles of different currency types to identify the amount of the currency;

characterized in that,

generate, by the microcontroller, a currency deposit request by including the amount of the currency in a structured deposit request, when the child submits a first approval request through an interactive display for currency deposit;

communicate, by the microcontroller, the currency deposit request to a user device associated with a parent/guardian of the child through a server, wherein the user device receives the currency deposit request from the server through a user interface and enables the parent/guardian to approve the currency deposit request; and

credit, by the microcontroller, the currency into the piggy bank by updating a balance of the piggy bank associated with the child based on the received currency, when the currency deposit request is approved by the parent/guardian, thereby monitoring the activities of the children to foster financial management skills in children.

2. The system of claim **1**, wherein the piggy bank is configured to generate a currency withdrawal request by the microcontroller, when the child submits a second approval request through the interactive display for currency withdrawal.

3. The system of claim **2**, wherein the microcontroller is configured to send a control signal to the relay switch which deactivates a lock mechanism for a storage space of the currency to access the currency, when the currency withdrawal request is approved by the parent/guardian.

4. The system of claim **1**, wherein the microcontroller displays the status of denial on the interactive display, if the parent/guardian denies the currency deposit request or currency withdrawal request.

5. The system of claim **1**, wherein the user interface associated with the user device enables the parent/guardian to create at least one task with a timeline for completion and a corresponding reward, wherein the at least one task is displayed in the interactive display of the piggy bank as pending tasks.

6. The system of claim **1**, wherein the user interface associated with the user device is configured to track savings of the child over a period of time and enable the parent/guardian to create at least one goal with a timeline for achieving the goal and monthly contribution of the child to achieve the goal, wherein the at least one goal is displayed in the interactive display of the piggy bank as pending goals.

7. The system of claim **1**, wherein the piggy bank comprises a chip card inserting functionality that enables secure transactions, fund additions, and balance inquiries and a fingerprint sensor that enables the parent/guardian to lock and unlock the piggy bank using a fingerprint.

8. A method for monitoring activities of children to foster financial management skills, wherein the method comprising:

providing a piggy bank that is associated with a child, wherein the piggy bank comprises a sensor unit, a relay switch, a motor, an interactive display and a microcontroller;

detecting, using a sensor unit, a deposition of currency, when the currency is inserted by the child into a currency entry slot, wherein the currency comprises at least one of coins or banknotes;

activating, by a microcontroller, a relay switch and a motor to receive the currency, when the deposition of the currency is detected by the sensor unit;

calculating, by the microcontroller, an amount of the currency by analyzing characteristics of the currency using an image processing technique to obtain an analysed data and comparing the analysed data with pre-defined profiles of different currency types to identify the amount of the currency;

characterized in that,

generating, by the microcontroller, a currency deposit request by including the amount of the currency in a structured deposit request, when the child submits a first approval request through an interactive display for currency deposit;

communicating, by the microcontroller, the currency deposit request to a user device associated with a parent/guardian of the child through a server;

receiving, by the user device, the currency deposit request from the server through a user interface for approval by the parent/guardian, wherein the user device enables the parent/guardian to approve the currency deposit request; and

crediting, by the microcontroller, the currency into the piggy bank by updating a balance of the piggy bank associated with the child based on the received currency, when the currency deposit request is approved by the parent/guardian, thereby monitoring the saving activity of the children to foster financial management skills in children.

9. The method of claim **8**, wherein the method comprises

(i) generating a currency withdrawal request by the microcontroller by including an amount of currency to be withdrawn in a structured withdrawal request, when the child submits a second approval request through the interactive display for currency withdrawal;

(ii) transmitting the currency withdrawal request to the user device for the approval;

(iii) allowing the child to withdraw the currency from the piggy bank using the microcontroller by controlling the relay switch and the motor, when the currency withdrawal request is approved by the parent/guardian through the user interface; and

(iv) updating the balance of the piggy bank by the microcontroller based on the withdrawn currency.

10. The method of claim **8**, wherein the relay switch activates or deactivates a lock mechanism by the microcontroller by allowing or cutting off power to the motor to access a storage space of the piggy bank.

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