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(54) **METHODS FOR TRIGGERING USER EQUIPMENT TO MONITOR PAGING MESSAGE, USER EQUIPMENTS, BASE STATIONS AND STORAGE MEDIUM**

VERFAHREN ZUR AUSLÖSUNG VON BENUTZERGERÄTEN ZUR ÜBERWACHUNG VON  
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PROCÉDÉS POUR COMMANDER À UN ÉQUIPEMENT D'UTILISATEUR DE SURVEILLER UN  
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(73) Proprietor: **GUANGDONG OPPO MOBILE  
TELECOMMUNICATIONS  
CORP., LTD.  
Wusha, Chang'an  
Dongguan,  
Guangdong 523860 (CN)**

(72) Inventors:  
• **ZHANG, Zhi  
Dongguan  
Guangdong 523860 (CN)**  
• **SHI, Zhihua  
Dongguan  
Guangdong 523860 (CN)**

(74) Representative: **Manitz Finsterwald  
Patent- und Rechtsanwaltspartnerschaft mbB  
Martin-Greif-Strasse 1  
80336 München (DE)**

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**EP 3 566 505 B1**

## Description

### TECHNICAL FIELD

**[0001]** The present disclosure generally relates to the field of communications, and in particular, to methods for triggering a user equipment (UE) to monitor a paging message, UEs, base stations and storage medium.

### BACKGROUND

**[0002]** In Long Term Evolution (LTE) system, a paging message is indicated in physical downlink control channel (PDCCH) and transmitted in physical downlink shared channel (PDSCH). A UE in an idle mode will listen to PDCCH/PDSCH according to a calculated time instance (i.e., paging occasion, abbreviated as PO), no matter there are actual paging messages or not. Because PDCCH/PDSCH is on the whole downlink bandwidth, when a UE listens PDCCH/PDSCH, some power is wasted because the paging message is only sent sometime.

**[0003]** The information disclosed in the background is only configured to enhance an understanding to the background of the present disclosure, and thus may include information not forming a conventional art known by those skilled in the art.

**[0004]** ERICSSON: "Paging Mechanism in E-UTRAN", 3GPP DRAFT; R2-062128, 3GPP, MOBILE COMPETENCE CENTER; 650, ROUTE DES LUCIOLES; F-06921 SOPHIA-ANTIPOLIS CEDEX; France, vol. RAN WG2, no. Tallinn; 20060823, 23 August 2006 (2006-08-23), XP 050131748, discloses two paging channels: paging indication channel (PICH) and paging channel (PCH) carrying actual paging message, where the paging indication related information can be multiplexed on L1/L2 control information, the control information can comprise of UE group ID and indication of radio resources to be used for the corresponding paging message, all the UEs in idle mode will monitor the L1/L2 control information, but only the UEs which receive paging as indicated by the paging indicator, shall read the corresponding paging messages.

**[0005]** US2014/302855A1 sets forth methods and devices for communication between mobile devices and base stations with active and dormant states. In an embodiment, a base station transmits system information during an active state of the base station with at least one system-information message. The at least one system-information message includes a SystemInformationBlockType1 ("SIB1") message with a first update-indicator field. The base station selects an update value that indicates whether the system information has changed since a previous transmission of a previous SIB1 message. The base station transmits at least one dormant-state message during a dormant state of the base station with the selected update value in a second update-indicator field of the at least one dormant-state message.

## SUMMARY

**[0006]** In order to solve the problem in related technology, the present disclosure provides methods for triggering a UE to monitor a paging message, UEs, base stations and storage medium, which may reduce power consumption. The invention is defined by the independent claims 1, 6, 11 and 12.

**[0007]** In a first aspect of the disclosure, there is provided a method for triggering a UE to monitor a paging message in LTE system, the method including: acquiring, by the UE, a correspondence between the UE and a time-frequency resource, where a trigger message for the UE is located, of a broadcast channel, where the trigger message is configured for triggering listening to the paging message for the UE and is sent via the broadcast channel, and where there is a latency between the trigger message and the paging message in a time domain; receiving, by the UE, the trigger message from a base station via the time-frequency resource of the broadcast channel according to the correspondence; and in a case where the trigger message indicates that the UE needs to be triggered, triggering, by the UE, listening to the paging message for the UE; where the acquiring, by the UE, a correspondence between the UE and a time-frequency resource, where a trigger message for the UE is located, of a broadcast channel includes: determining the correspondence between the UE and the time-frequency resource, where the trigger message for the UE is located, of the broadcast channel according to a first correspondence between a paging occasion and an identifier of the UE or an identifier of a group of UEs from the base station, and a second correspondence between the paging occasion and the time-frequency resource of the broadcast channel from the base station.

**[0008]** In a second aspect of the disclosure, there is provided a UE, including: a first acquisition module, configured to acquire a correspondence between the UE and a time-frequency resource, where the trigger message for the UE is located, of a broadcast channel, where the trigger message is configured for triggering listening to the paging message for the UE and is sent via the broadcast channel, and where there is a latency between the trigger message and the paging message in a time domain; a receiving module, configured to receive the trigger message from a base station via the time-frequency resource of the broadcast channel according to the correspondence; and a triggering module, configured to trigger listening to the paging message for the UE in a case where the trigger message indicates that the UE needs to be triggered; where the correspondence between the UE and the time-frequency resource, where the trigger message for the UE is located, of the broadcast channel is determined according to a first correspondence between a paging occasion and an identifier of the UE or an identifier of a group of UEs from the base station, and a second correspondence between the paging occasion and the time-frequency resource of the broadcast chan-

nel from the base station.

**[0009]** In a third aspect of the disclosure, there is provided a base station, including: an acquisition module, configured to acquire a correspondence between the UE and a time-frequency resource, where a trigger message for the UE is located, of a broadcast channel; and a first sending module, configured to send the trigger message, which is configured for triggering listening to a paging message for the UE and is sent via the broadcast channel, to the UE via the time-frequency resource of the broadcast channel according to the correspondence, where there is a latency between the trigger message and the paging message in a time domain, the trigger message is received by the UE, and the paging message for the UE is triggered to be listened to in a case where the trigger message indicates that the UE needs to be triggered; where the acquisition module is further configured to determine the correspondence between the UE and the time-frequency resource, where the trigger message for the UE is located, of the broadcast channel according to a first correspondence between a paging occasion and an identifier of the UE or an identifier of a group of UEs from the base station, and a second correspondence between the paging occasion and the time-frequency resource of the broadcast channel from the base station.

**[0010]** In a fourth aspect of the disclosure, there is provided a method for triggering a UE to monitor a paging message, carried out in a base station, in LTE system, the method including: acquiring a correspondence between the UE and a time-frequency resource, where a trigger message for the UE is located, of a broadcast channel; and sending the trigger message, which is configured for triggering listening to the paging message for the UE and is sent via the broadcast channel, to the UE via the time-frequency resource of the broadcast channel according to the correspondence, where there is a latency between the trigger message and the paging message in a time domain, the trigger message is received by the UE, and the paging message for the UE is triggered to be listened to in a case where the trigger message indicates that the UE needs to be triggered; where the acquiring (S202) a correspondence between the UE and a time-frequency resource, where a trigger message for the UE is located, of a broadcast channel includes: determining the correspondence between the UE and the time-frequency resource, where the trigger message for the UE is located, of the broadcast channel according to a first correspondence between a paging occasion and an identifier of the UE or an identifier of a group of UEs from the base station, and a second correspondence between the paging occasion and the time-frequency resource of the broadcast channel from the base station.

**[0011]** The technical solutions provided by the embodiment of the present disclosure may achieve the following beneficial effects.

**[0012]** According to at least some embodiments of the present disclosure, before a base station sends a paging

message to a UE, the base station will send a trigger message to UE. This trigger message is sent in broadcast channel with bandwidth less than the carrier bandwidth. Once a UE receives this trigger message, this UE will start to monitor downlink control and data channel. Through this mechanism, a UE needs not to monitor downlink control and data channel for a possible paging message so that power saving can be achieved.

**[0013]** It is to be understood that the above general descriptions and detailed descriptions below are only exemplary and explanatory and not intended to limit the present disclosure.

## BRIEF DESCRIPTION OF DRAWINGS

**[0014]** The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments consistent with the present disclosure and, together with the specification, serve to explain the principles of the present disclosure.

FIG. 1 is a flow chart illustrating a method for triggering a UE to monitor a paging message, carried out in the UE, according to an embodiment of the present disclosure.

FIG. 2 is a flow chart illustrating a method for triggering a UE to monitor a paging message, carried out in a base station, according to an embodiment of the present disclosure.

FIG. 3 is a flow chart illustrating a method for triggering a UE to monitor a paging message, carried out in the UE and a base station, according to an example of the present disclosure.

FIG. 4 is a block diagram illustrating a UE according to an embodiment of the present disclosure.

FIG. 5 is a block diagram illustrating a UE according to another embodiment of the present disclosure.

FIG. 6 is a block diagram illustrating a base station according to an embodiment of the present disclosure.

FIG. 7 is a block diagram illustrating a base station according to an example of the present disclosure.

FIG. 8 is a block diagram illustrating a base station according to another example of the present disclosure.

FIG. 9 is a block diagram illustrating a system including a UE and a base station according to an example of the present disclosure.

FIG. 10 is a block diagram illustrating a UE according to an example of the present disclosure.

FIG. 11 is a block diagram illustrating a base station according to an example of the present disclosure.

## DETAILED DESCRIPTION

**[0015]** Exemplary implementations will now be described more comprehensively with reference to the accompanying drawings. However, the exemplary imple-

mentations may be implemented in various forms, but should not be understood to be limited to examples elaborated herein. Instead, providing these implementations enables the present disclosure to convey the concept of the exemplary implementations to those skilled in the art more comprehensively and completely. The accompanying drawings only schematic diagrammatize the present disclosure, and may not be drawn to scale. The same accompanying drawing reference signs in the drawings represent the same or similar parts, so that repeated descriptions about them are eliminated.

**[0016]** In addition, the described characteristics, structures or features may be combined to one or more implementations in any proper manner. In descriptions made below, many specific details are provided for completely understanding the implementations of the present disclosure. However, those skilled in the art realize that the technical solutions of the present disclosure may be practiced with one or more of the specified details eliminated, or another method, component, device, step and the like may be adopted. Under other conditions, a known structure, method, device, implementation, material or operation is not shown or described in detail so as to avoid distraction and obscuring of each aspect of the present disclosure.

**[0017]** Some block diagrams shown in the accompanying drawings are functional entities, and are not required to physically or logically correspond to independent entities. These functional entities may be implemented in a software form, or these functional entities may be implemented in one or more hardware modules or integrated circuits, or these functional entities may be implemented in different networks and/or processor devices and/or microcontroller devices.

**[0018]** FIG. 1 is a flow chart illustrating a method for triggering a UE to monitor a paging message, carried out in the UE, according to an embodiment of the present disclosure.

**[0019]** As illustrated in FIG. 1, the method is carried out in a UE and the method includes the following operations.

**[0020]** In S102, a correspondence between the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel is acquired by the UE.

**[0021]** In an example, the correspondence may be semi-static configured. The UE may acquire an identifier of the UE from the base station. That is, the base station may assign an identifier to the UE, and may send the identifier to the UE. In an example, when the UE accesses a base station, the base station may assign an identifier to the UE and send the identifier to the UE. Accordingly, the UE may receive the identifier from the base station. In another example, the identifier may be assigned by the base station in response to a request from the UE. The UE may send a request to the base station for assigning an identifier of the UE, and then the UE may receive an identifier, assigned by the base station in re-

sponse to the request, of the UE from the base station.

**[0022]** In case where a UE receives an identifier assigned by a base station, the UE may also acquire valid time and/or geographical area from the base station. Here, the valid time may indicate a time period during which the identifier is valid for the UE to derive the paging trigger message of the UE, and the geographical area may indicate an area, such as a tracking area (TA) or some cell, in which the identifier is valid. When the valid time has elapsed and /or the UE is outside of the valid geographical area, a base station may assign a new identifier to the UE or the UE can request a new identifier from the base station.

**[0023]** In case where a UE receives an identifier assigned by a base station, because the identifier is assigned by a base station, the base station may manage the UE more efficiently, and the paging trigger message may be more efficient. This also can avoid mapping multiple UEs into the same bit of the same message.

**[0024]** In an example, the correspondence may be a correspondence between a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel and one of: a unique identifier inherent to the UE, a unique identifier inherent to a subscriber of the UE, and a combination thereof. In other words, the identifier is not assigned by the base station, and instead the identifier is inherent to the UE or inherent to the subscriber of the UE. When a UE registers with a base station, the UE may report a unique identifier inherent to the UE, a unique identifier inherent to a subscriber of the UE, or a combination thereof to the base station. In an example, the unique identifier inherent to the subscriber of the UE may be an identifier inherent to the subscriber identity module (SIM) of the UE. However, the unique identifier inherent to the subscriber of the UE may be any identifier that indicates the subscriber of the UE, for example, an identifier inherent to embedded SIM (eSIM) of the UE.

**[0025]** The UE may acquire a correspondence between the identifier of the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel from the base station. In other words, the correspondence is between the identifier of the UE and the time-frequency resource.

**[0026]** In an embodiment, the correspondence between the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel is determined according to a first correspondence between occasion and an identifier of the UE or an identifier of a group of UEs from the base station, and a second correspondence between the occasion and a time-frequency resource of a broadcast channel from the base station.

**[0027]** In a related art, the UE may listen to a paging message according to a calculated instance (i.e., paging occasion). The paging occasion may be a time-frequency occasion. However, there may be no paging message sent in the paging occasion, and thus some power is wasted because paging messages are only sent some-

times.

**[0028]** In an embodiment of the present disclosure, however, a first correspondence between occasion and an identifier of the UE or an identifier of a group of UEs and a second correspondence between the occasion and a time-frequency resource of a broadcast channel are provided. Accordingly, the correspondence between the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel is determined according to the first correspondence and the second correspondence. In other words, a UE will not listen to a paging message at the paging occasion, and instead, a UE may listen to a trigger message at a predetermined time-frequency resource that is linked to the paging occasion. When the trigger message indicates that the UE needs to be triggered, the UE will be triggered to listen to a paging message. When there is no trigger message at a predetermined time-frequency resource that is linked to the paging occasion, the UE will not be triggered to listen to a paging message. Since a trigger message is sent via a broadcast channel, which has bandwidth less than the carrier bandwidth, power may be saved.

**[0029]** In an embodiment, a base station may send a correspondence between the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel to a UE through broadcasting, such as a system information block (SIB). Accordingly, the UE may receive the correspondence through broadcasting, such as SIB. In other words, the time and frequency resource for the potential multiple paging trigger messages can be known to UE through broadcasting, such SIB.

**[0030]** In S104, the UE receives the trigger message from a base station via a time-frequency resource of a broadcast channel according to the correspondence.

**[0031]** In an embodiment, each trigger message may be configured for triggering a UE, a group of UEs or a plurality of groups of UEs.

**[0032]** In case where each trigger message is configured for triggering a UE, the whole trigger message indicates which UE will be triggered for monitoring a paging message.

**[0033]** In case where each trigger message is configured for triggering a group of UEs, the trigger message may contain multiple bits. For example, the trigger message may contain 20 bits, and each bit corresponds to a UE. For example, a certain bit in the trigger message may indicate that a certain UE will be triggered to monitor a paging message. For example, a value "1" of a certain bit may indicate a certain UE will be triggered. In one example, a value "0" of a certain bit may indicate a certain UE will be triggered.

**[0034]** However, it is to be understood that the bits contained in a trigger message may be more or less than 20 bits, for example, depending on the number of UEs in the cell of a base station. It is also to be understood that two or more bits may, as a whole, indicates that a certain UE will be triggered to monitor a paging message. For

example, a certain pair of bits may indicate a certain UE will be triggered. For example, values "0" and "0" of a certain pair of bits may indicate a certain UE will be triggered according to a predetermine rule. In one example, other values of the bits may indicate a certain UE will be triggered.

**[0035]** In case where each trigger message is configured for triggering a plurality of groups of UEs, the trigger message may contain multiple bits, and a certain number of bits may correspond to a group of UEs. For example, each bit may correspond to a group of UEs.

**[0036]** In such a case, UEs may be divided into a plurality of groups.

**[0037]** For example, UEs may be divided into groups according to the identifiers of the UEs. For example, when certain bit or bits of the identifier of the UEs is/are the same, the UEs will be divided into the same group, for example, by the base station, or according to a standard. In an example, when a UE registers with a base station for the first time, the UE may report a unique identifier inherent to the UE, a unique identifier inherent to a subscriber of the UE, or a combination thereof to the base station. In one embodiment, the base station may assign an identifier to the UE positively or in response to a request from the UE. In some embodiments, the UEs may be divided into a plurality of groups according other predetermined rules if appropriate.

**[0038]** In an embodiment, a plurality of trigger messages may be carried in a time-frequency resource. In such a case, there may be multiple paging trigger messages in the pre-configured/semi-static configured time-frequency resource, and each paging trigger message may correspond to a UE, a group of UEs or a plurality of UE groups.

**[0039]** In case where each trigger message corresponds to a group of UE, there are for example 20 bits in each trigger message, and there are for example 3 trigger messages carried in a time-frequency resource. In such a case, UE 1-UE 20 are in paging trigger message1; UE 21-UE 40 are in paging trigger message2; and UE 41 -UE 60 are in paging trigger message3. It is to be understood that there may be more or less bits than 20 bits in each trigger message, and that there may be more or less trigger messages than 3 trigger messages carried in a time-frequency resource.

**[0040]** In case where each trigger message corresponds to a plurality of UE groups, the trigger message may contain for example 20 bits, and each bit corresponds to for example a group of UEs. For example, a certain bit in the trigger message may indicate that a certain group of UEs will be triggered to monitor a paging message. For example, a value "1" of a certain bit may indicate a certain group of UEs will be triggered. In one example, a value "0" of a certain bit may indicate a certain group of UEs will be triggered. For example, UE group 1-UE group 20 are in a first paging trigger message; UE group 21-UE group 40 are in a second paging trigger message; and UE group 41~UE group 60 are in a third

paging trigger message. It is to be understood that there may be more or less bits than 20 bits in each trigger message, and that there may be more or less trigger messages than 3 trigger messages carried in a time-frequency resource.

**[0041]** However, it is to be understood that the bits contained in a trigger message may be more or less than 20 bits, for example, depending on the number of UEs in the cell of the base station. It is also to be understood that two or more bits may, as a whole, indicate that a certain group of UEs will be triggered to monitor a paging message. For example, a certain pair of bits may indicate a certain group of UEs will be triggered. For example, values "0" and "0" of a certain pair of bits may indicate a certain group of UEs will be triggered.

**[0042]** In S106, the UE triggers the monitoring of the paging message for the UE.

**[0043]** Once a UE reading the said message and found the UE is triggered, the UE will start to monitor PDCCH/PDSCH for actual paging message. Through this way, UE can avoid unnecessary listening to PDCCH/PDSCH, so as to achieve power saving effect.

**[0044]** FIG. 2 is a flow chart illustrating a method for triggering a UE to monitor a paging message, carried out in a base station, according to an embodiment of the present disclosure.

**[0045]** As illustrated in FIG. 2, the method is carried out in a base station and the method includes the following operations.

**[0046]** In S202, a base station acquires a correspondence between the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel.

**[0047]** In an example, the base station may acquire a pre-configured correspondence between the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel. In other words, the correspondence is not configured or determined by the base station, and instead the correspondence is pre-configured or pre-determined, for example, according to a standard, or a pre-determined rule.

**[0048]** In an example, the base station may configure a correspondence between the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel to acquire the correspondence. In other words, the base station per se configures the correspondence. In an embodiment, the method may further include sending the correspondence to the UE.

**[0049]** In S204, the base station sends a trigger message, which is configured for triggering monitoring of the paging message for the UE, to the UE via a time-frequency resource of a broadcast channel according to the correspondence.

**[0050]** In an example, the method may further include assigning an identifier to the UE. In such a case, the base station may configure a correspondence between the identifier of the UE and the time-frequency resource, where a trigger message for the UE locates, of a broad-

cast channel. In other words, the correspondence is between an identifier and a time-frequency resource.

**[0051]** In an example, when a UE accesses a base station, the base station may assign an identifier to the UE. In another example, a base station may receive a request for assigning an identifier from the UE, and in response to the request, the base station may assign an identifier to the UE.

**[0052]** In an example, the correspondence is a correspondence between a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel and one of: a unique identifier inherent to the UE, a unique identifier inherent to a subscriber of the UE, and a combination thereof.

**[0053]** In an embodiment, a plurality of trigger messages may be carried in a time-frequency resource.

**[0054]** In an embodiment, each trigger message is configured for triggering, a UE, a group of UEs or a plurality of groups of UEs.

**[0055]** In an embodiment, the correspondence between the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel is determined according to a first correspondence between occasion and an identifier of the UE or an identifier of a group of UEs from the base station, and a second correspondence between the occasion and a time-frequency resource of a broadcast channel from the base station.

**[0056]** The descriptions made with reference to FIG. 1 may be also applied to the method illustrated in FIG. 2, and detailed descriptions are omitted here for clarity.

**[0057]** FIG. 3 is a flow chart illustrating a method for triggering a UE to monitor a paging message, carried out in the UE and a base station, according to an example of the present disclosure.

**[0058]** As illustrated in FIG. 3, the method is performed at both the UE and the base station, and the method may include the following operations.

**[0059]** In S302, a base station acquires a correspondence between the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel, the trigger message being configured for triggering monitoring of the paging message for the UE.

**[0060]** In S304, the UE acquires the correspondence.

**[0061]** In S306, the base station sends a trigger message to the UE via a time-frequency resource of a broadcast channel according to the correspondence.

**[0062]** In S308, the UE receives the trigger message from the base station via a time-frequency resource of a broadcast channel according to the correspondence.

**[0063]** In S310, the UE triggers the monitoring of the paging message for the UE.

**[0064]** In an example, the method may further include assigning, by the base station, an identifier to the UE; and acquiring, by the UE, the identifier from the base station. In such a case, the correspondence is a correspondence between the identifier of the UE and a time-frequency resource, where a trigger message for the UE

locates, of a broadcast channel from the base station.

**[0065]** In an example, when a UE accesses the base station, the UE may receive an identifier, assigned by the base station, of the UE from the base station. In another example, the UE may send a request to the base station for assigning an identifier of the UE, and then the UE may receive an identifier, assigned by the base station in response to the request, of the UE from the base station.

**[0066]** In an example, the correspondence may be a correspondence between a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel and one of: a unique identifier inherent to the UE, a unique identifier inherent to a subscriber of the UE, and a combination thereof.

**[0067]** In an example, multiple trigger messages may be carried in a time-frequency resource.

**[0068]** In an example, each trigger message may be configured for triggering a UE, a group of UEs or a plurality of groups of UEs.

**[0069]** In an example, the correspondence between the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel may be determined according to a first correspondence between occasion and an identifier of the UE or an identifier of a group of UEs from the base station, and a second correspondence between the occasion and a time-frequency resource of a broadcast channel from the base station.

**[0070]** The descriptions made with reference to FIG. 1 may be also applied to the method illustrated in FIG. 3, and detailed descriptions are omitted here for clarity.

**[0071]** FIG. 4 is a block diagram illustrating a UE according to an embodiment of the present disclosure.

**[0072]** As illustrated in FIG. 4, the UE includes a first acquisition module 402, a receiving module 404, and a triggering module 406.

**[0073]** The first acquisition module 402 is configured to acquire a correspondence between the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel.

**[0074]** The receiving module 404 is configured to receive the trigger message from a base station via a time-frequency resource of a broadcast channel according to the correspondence.

**[0075]** The triggering module 406 is configured to trigger monitoring of the paging message for the UE.

**[0076]** FIG. 5 is a block diagram illustrating a UE according to another embodiment of the present disclosure.

**[0077]** As illustrated in FIG. 5, in addition to a first acquisition module 402, a receiving module 404, and a triggering module 406, the UE include a second acquisition module 408. The second acquisition module 408 may be configured to acquire an identifier of the UE from the base station. In such a case, the first acquisition module 402 may be configured to acquire a correspondence between the identifier of the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel from the base station.

**[0078]** In an example, the second acquisition module 408 may be configured to: when the UE accesses the base station, receive an identifier, assigned by the base station, of the UE from the base station.

**[0079]** In another embodiment, the second acquisition module 408 may be configured to send a request to the base station for assigning an identifier of the UE, and to receive an identifier, assigned by the base station in response to the request, of the UE from the base station.

**[0080]** In an example, the correspondence is a correspondence between a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel and one of: a unique identifier inherent to the UE, a unique identifier inherent to a subscriber of the UE, and a combination thereof.

**[0081]** In an embodiment, multiple trigger messages are carried in a time-frequency resource.

**[0082]** In an embodiment, each trigger message is configured for triggering a UE, a group of UEs or a plurality of groups of UEs.

**[0083]** In an embodiment, the correspondence between the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel is determined according to a first correspondence between occasion and an identifier of the UE or an identifier of a group of UEs from the base station, and a second correspondence between the occasion and a time-frequency resource of a broadcast channel from the base station.

**[0084]** The descriptions made with reference to FIGs. 1-3 may be also applied to the UE illustrated in FIGs. 4 and 5, and detailed descriptions are omitted here for clarity.

**[0085]** FIG. 6 is a block diagram illustrating a base station according to an embodiment of the present disclosure.

**[0086]** As illustrated in FIG. 6, the base station includes an acquisition module 602 and a first sending module 604.

**[0087]** The acquisition module 602 is configured to acquire a correspondence between the UE and a time-frequency resource, where the trigger message for the UE locates, of a broadcast channel.

**[0088]** The first sending module 604 is configured to send a trigger message, which is configured for triggering monitoring of the paging message for the UE, to the UE via a time-frequency resource of a broadcast channel according to the correspondence.

**[0089]** In an example, the acquisition module may be configured to: acquire a pre-configured correspondence between the UE and a time-frequency resource, where the trigger message for the UE locates, of a broadcast channel.

**[0090]** In an example, the acquisition module may be configured to configure a correspondence between the UE and a time-frequency resource, where the trigger message for the UE locates, of a broadcast channel.

**[0091]** FIG. 7 is a block diagram illustrating a base sta-

tion 600' according to an example of the present disclosure.

**[0092]** As illustrated in FIG. 7, in addition to an acquisition module 602 and a first sending module 604, the base station 600' may further include a second sending module 606. The second sending module 606 may be configured to send the correspondence to the UE.

**[0093]** FIG. 8 is a block diagram illustrating a base station 600" according to another example of the present disclosure.

**[0094]** As illustrated in FIG. 8, in addition to an acquisition module 602, a first sending module 604 and a second sending module 606, the base station 600" may further include an assigning module 608 configured to assign an identifier to the UE.

**[0095]** The assigning module 608 may be configured to: configure a correspondence between the identifier of the UE and the time-frequency resource, where the trigger message for the UE locates, of a broadcast channel.

**[0096]** In an example, the assigning module 608 may be configured to: when the UE accesses the base station, assign an identifier to the UE.

**[0097]** In an example, the assigning module 608 may be configured to receive a request for assigning an identifier from the UE, and in response to the request, assign an identifier to the UE.

**[0098]** In an example, the correspondence may be a correspondence between a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel and one of: a unique identifier inherent to the UE, a unique identifier inherent to a subscriber of the UE, and a combination thereof.

**[0099]** In an example, a plurality of trigger messages may be carried in a time-frequency resource.

**[0100]** In an example, each trigger message may be configured for triggering, a UE, a group of UEs or a plurality of groups of UEs.

**[0101]** The descriptions made with reference to FIGs. 1-3 may be also applied to the base station illustrated in FIGs. 6-8, and detailed descriptions are omitted here for clarity.

**[0102]** In an embodiment, the correspondence between the UE and a time-frequency resource, where a trigger message for the UE locates, of a broadcast channel is determined according to a first correspondence between occasion and an identifier of the UE or an identifier of a group of UEs from the base station, and a second correspondence between the occasion and a time-frequency resource of a broadcast channel from the base station.

**[0103]** FIG. 9 is a block diagram illustrating a system including a UE and a base station according to an example of the present disclosure.

**[0104]** As illustrated in FIG. 9, the system includes a UE and a base station.

**[0105]** The UE may be a UE as illustrated in any one of FIG. 4, 5 or 10, or any UE that can perform the method as illustrated in FIG. 1. The base station may be a base

station as illustrated in any one of FIG. 6, 7, 8 or 11, or any base station that can perform the method as illustrated in FIG. 2.

**[0106]** It is to be noted that the first acquisition module 402, the second acquisition module 406 and the receiving module 404 both may be implemented by a receiver, and the triggering module 406 may be implemented by a processor. As illustrated in FIG. 10, a UE 1000 may include a processor 1002, a receiver 1004, a sender 1006 and a memory 1008. Here, the memory 1008 may be configured to store instructions executed by the processor 1002 and the like.

**[0107]** Each component in the UE 1000 is together through a bus system 1010. Here, the bus system 1010 includes a data bus, and further includes a power bus, a control bus and a state signal bus.

**[0108]** The UE 400 illustrated in FIG. 4, the UE 400' illustrated in FIG. 5 or the UE 1000 illustrated in FIG. 10 may implement various processes implemented in the embodiments illustrated in FIG. 1, which will not be elaborated herein to avoid repetition.

**[0109]** It is to be noted that the method embodiments of the disclosure may be applied to a processor or implemented by the processor. The processor may be an integrated circuit chip with a signal processing capability. In an implementation process, each step of the method embodiments may be completed by an integrated logical circuit of hardware in the processor or an instruction in a software form. The processor may be a universal processor, a Digital Signal Processor (DSP), an Application Specific Integrated Circuit (ASIC), a Field Programmable Gate Array (FPGA) or another programmable logical device, discrete gate or transistor logical device and discrete hardware component. Each method, step and logical block diagram disclosed in the embodiments of the disclosure may be implemented or executed. The universal processor may be a microprocessor or the processor may also be any conventional processor and the like. The steps of the methods disclosed in conjunction with the embodiments of the disclosure may be directly embodied to be executed and completed by a hardware decoding processor or executed and completed by a combination of hardware and software modules in the decoding processor. The software module may be located in a mature storage medium in this field such as a Random Access Memory (RAM), a flash memory, a Read-Only Memory (ROM), a Programmable ROM (PROM) or Electrically Erasable PROM (EEPROM) and a register. The storage medium is located in a memory, and the processor reads information in the memory, and completes the steps of the methods in conjunction with hardware.

**[0110]** It can be understood that the memory in the example of the disclosure may be a volatile memory or a nonvolatile memory, or may include both the volatile and nonvolatile memories, wherein the nonvolatile memory may be a ROM, a PROM, an Erasable PROM (EPROM), an EEPROM or a flash memory. The volatile



memory may be a RAM, and is used as an external high-speed cache. It is exemplarily but unlimitedly described that RAMs in various forms may be adopted, such as a Static RAM (SRAM), a Dynamic RAM (DRAM), a Synchronous DRAM (SDRAM), a Double Data Rate SDRAM (DDRSDRAM), an Enhanced SDRAM (ESDRAM), a Synchlink DRAM (SLDRAM) and a Direct Rambus RAM (DR RAM). It is to be noted that the memory of a system and method described in the disclosure is intended to include, but not limited to, memories of these and any other proper types.

**[0111]** It is to be noted that, in the example of the disclosure, the acquisition module 602 may be implemented by a receiver, the first sending module 604 and the second sending module 606 may be implemented by a sender, and the assigning module 608 may be implemented by a processor.

**[0112]** As illustrated in FIG. 11, a base station 1100 may include a processor 1102, a receiver 1104, a sender 1106 and a memory 1108. Here, the memory 1108 may be configured to store instructions executed by the processor 1102 and the like.

**[0113]** Each component in the base station 1100 is together through a bus system 1110. Here, the bus system 1110 includes a data bus, and further includes a power bus, a control bus and a state signal bus.

**[0114]** The base stations illustrated in FIGs. 6-8 or the base station 1100 illustrated in FIG. 11 may implement various processes implemented in the embodiments illustrated in FIG. 2, which will not be elaborated herein to avoid repetition.

**[0115]** In an example, there is provided a non-transitory computer-readable storage medium having stored therein computer-readable instructions that, when executed by a processor of a user equipment, causes the user equipment to perform a method for triggering a UE to monitor a paging message as described above.

**[0116]** In an example, there is provided a non-transitory computer-readable storage medium having stored therein computer-readable instructions that, when executed by a processor of a base station, causes the base station to perform a method for triggering a UE to monitor a paging message as described above.

**[0117]** Those skilled in the art may understand that the units and algorithm steps of each example described in conjunction with the embodiments disclosed in the disclosure may be implemented by electronic hardware or a combination of computer software and the electronic hardware. Whether these functions are executed in a hardware or software manner depends on specific applications and design constraints of the technical solution. Those skilled in the art may realize the described functions for each specific application by virtue of different methods.

**[0118]** Those skilled in the art may clearly understand that specific working processes of the system, device and unit described above may refer to the corresponding processes in the method embodiment for convenient and

brief description and will not be elaborated herein.

**[0119]** In some embodiments provided by the disclosure, it is to be understood that the disclosed system, device and method may be implemented in another manner. The device embodiment described above is only schematic, and for example, division of the units is only logic function division, and other division manners may be adopted during practical implementation. For example, multiple units or components may be combined or integrated into another system, or some characteristics may be neglected or not executed. In addition, coupling or direct coupling or communication connection between each displayed or discussed component may be indirect coupling or communication connection, implemented through some interfaces, of the device or the units, and may be electrical and mechanical or adopt other forms.

**[0120]** The units described as separate parts may or may not be physically separated, and parts displayed as units may or may not be physical units, and namely may be located in the same place, or may also be distributed to multiple network units. Part or all of the units may be selected to achieve the purpose of the solutions of the embodiments according to a practical requirement.

**[0121]** In addition, each function unit in each embodiment of the disclosure may be integrated into a processing unit, each unit may also exist independently, and two or more than two unit may also be integrated into a unit.

**[0122]** When being implemented in form of software function unit and sold or used as an independent product, the function may also be stored in a computer-readable storage medium. Based on such an understanding, the technical solutions of the disclosure substantially or parts making contributions to a conventional art may be embodied in form of software product, and the computer software product is stored in a storage medium, including a plurality of instructions configured to enable a piece of computer equipment (which may be a personal computer, a server, network equipment or the like) to execute all or part of the steps of the method in each embodiment of the disclosure. The abovementioned storage medium includes: various media capable of storing program codes such as a U disk, a mobile hard disk, a ROM, a RAM, a magnetic disk or an optical disk

## Claims

1. A method for triggering a user equipment, UE, to monitor a paging message in long term evolution, LTE, system, **characterized in that** the method comprises:

acquiring (S102), by the UE, a correspondence between the UE and a time-frequency resource, where a trigger message for the UE is located, of a broadcast channel, wherein the trigger message is configured for triggering listening to the paging message for the UE and is sent via the

- broadcast channel, and wherein there is a latency between the trigger message and the paging message in a time domain;  
receiving (S104), by the UE, the trigger message from a base station via the time-frequency resource of the broadcast channel according to the correspondence; and  
in a case where the trigger message indicates that the UE needs to be triggered, triggering (S106), by the UE, listening to the paging message for the UE;  
wherein the acquiring (S102), by the UE, a correspondence between the UE and a time-frequency resource, where a trigger message for the UE is located, of a broadcast channel comprises:  
determining the correspondence between the UE and the time-frequency resource, where the trigger message for the UE is located, of the broadcast channel according to a first correspondence between a paging occasion and an identifier of the UE or an identifier of a group of UEs from the base station, and a second correspondence between the paging occasion and the time-frequency resource of the broadcast channel from the base station.
2. The method as claimed in claim 1, further comprising: acquiring, by the UE, the identifier of the UE from the base station;  
wherein the acquiring (S102), by the UE, a correspondence between the UE and a time-frequency resource, where a trigger message for the UE is located, of a broadcast channel comprises:  
acquiring, by the UE, a correspondence between the identifier of the UE and the time-frequency resource, where the trigger message for the UE is located, of the broadcast channel from the base station.
3. The method as claimed in claim 2, wherein the acquiring, by the UE, the identifier of the UE from the base station comprises:  
sending, by the UE, a request to the base station for assigning the identifier of the UE; and receiving, by the UE, the identifier of the UE, assigned by the base station in response to the request, from the base station.
4. The method as claimed in any one of claims 1-3, wherein a plurality of trigger messages are carried in the time-frequency resource.
5. The method as claimed in any one of claims 1-4, wherein each trigger message is configured for triggering a UE, a group of UEs or a plurality of groups
- of UEs.
6. A user equipment, UE, **characterized in that** the UE comprises:  
a first acquisition module (402), configured to acquire a correspondence between the UE and a time-frequency resource, wherein the trigger message for the UE is located, of a broadcast channel, wherein the trigger message is configured for triggering listening to a paging message for the UE and is sent via the broadcast channel, and wherein there is a latency between the trigger message and the paging message in a time domain;  
a receiving module (404), configured to receive the trigger message from a base station via the time-frequency resource of the broadcast channel according to the correspondence; and  
a triggering module (406), configured to trigger listening to the paging message for the UE in a case where the trigger message indicates that the UE needs to be triggered;  
wherein the correspondence between the UE and the time-frequency resource, where the trigger message for the UE is located, of the broadcast channel is determined according to a first correspondence between a paging occasion and an identifier of the UE or an identifier of a group of UEs from the base station, and a second correspondence between the paging occasion and the time-frequency resource of the broadcast channel from the base station.
7. The UE as claimed in claim 6, further comprising: a second acquisition module (408), configured to acquire the identifier of the UE from the base station, and wherein the first acquisition module (402) is configured to acquire a correspondence between the identifier of the UE and the time-frequency resource, wherein the trigger message for the UE is located, of the broadcast channel from the base station.
8. The UE as claimed in claim 7, wherein the second acquisition module (408) is configured to:  
send a request to the base station for assigning the identifier of the UE; and receive the identifier of the UE, assigned by the base station in response to the request, from the base station.
9. The UE as claimed in any one of claims 6-8, wherein a plurality of trigger messages are carried in the time-frequency resource.
10. The UE as claimed in any one of claims 6-9, wherein each trigger message is configured for triggering a UE, a group of UEs or a plurality of groups of UEs.

11. A base station, **characterized in that** the base station comprises:

an acquisition module (602), configured to acquire a correspondence between the UE and a time-frequency resource, where a trigger message for the UE is located, of a broadcast channel; and  
 a first sending module (604), configured to send the trigger message, which is configured for triggering listening to a paging message for the UE and is sent via the broadcast channel, to the UE via the time-frequency resource of the broadcast channel according to the correspondence, wherein there is a latency between the trigger message and the paging message in a time domain, the trigger message is received by the UE, and the paging message for the UE is triggered to be listened to in a case where the trigger message indicates that the UE needs to be triggered; wherein the acquisition module (602) is further configured to determine the correspondence between the UE and the time-frequency resource, where the trigger message for the UE is located, of the broadcast channel according to a first correspondence between a paging occasion and an identifier of the UE or an identifier of a group of UEs from the base station, and a second correspondence between the paging occasion and the time-frequency resource of the broadcast channel from the base station.

12. A method for triggering a user equipment, UE, to monitor a paging message, carried out in a base station, in long term evolution, LTE, system, **characterized in that** the method comprises:

acquiring (S202) a correspondence between the UE and a time-frequency resource, where a trigger message for the UE is located, of a broadcast channel; and  
 sending (S204) the trigger message, which is configured for triggering listening to the paging message for the UE and is sent via the broadcast channel, to the UE via the time-frequency resource of the broadcast channel according to the correspondence, wherein there is a latency between the trigger message and the paging message in a time domain, the trigger message is received by the UE, and the paging message for the UE is triggered to be listened to in a case where the trigger message indicates that the UE needs to be triggered;  
 wherein the acquiring (S202) a correspondence between the UE and a time-frequency resource, where a trigger message for the UE is located, of a broadcast channel comprises:  
 determining the correspondence between the

UE and the time-frequency resource, where the trigger message for the UE is located, of the broadcast channel according to a first correspondence between a paging occasion and an identifier of the UE or an identifier of a group of UEs from the base station, and a second correspondence between the paging occasion and the time-frequency resource of the broadcast channel from the base station.

13. The method as claimed in claim 12, further comprising:  
 sending the correspondence to the UE.
14. The method as claimed in claim 12, wherein a plurality of trigger messages are carried in a time-frequency resource.
15. The method as claimed in claim 12, wherein each trigger message is configured for triggering, a UE, a group of UEs or a plurality of groups of UEs.

#### Patentansprüche

1. Verfahren zum Auslösen eines Anwendergeräts, UE, um eine Funkrufnachricht in einem System der langfristigen Entwicklung, LTE, zu überwachen, **dadurch gekennzeichnet, dass** das Verfahren Folgendes umfasst:

Erfassen (S102) durch das UE einer Übereinstimmung zwischen dem UE und einem Zeit-Frequenz-Betriebsmittel, wo sich eine Auslösernachricht für das UE befindet, eines Rundsendekanals, wobei die Auslösernachricht konfiguriert ist, das Hören der Funkrufnachricht für das UE auszulösen, und über den Rundsendekanal gesendet wird, und wobei es eine Latenzzeit zwischen der Auslösernachricht und der Funkrufnachricht in einem Zeitbereich gibt;  
 Empfangen (S104) durch das UE der Auslösernachricht von einer Basisstation über das Zeit-Frequenz-Betriebsmittel des Rundsendekanals gemäß der Übereinstimmung; und  
 in einem Fall, in dem die Auslösernachricht angibt, dass das UE ausgelöst werden muss, Auslösen (S106) durch das UE des Hörens der Funkrufnachricht für das UE;  
 wobei das Erfassen (S102) durch das UE einer Übereinstimmung zwischen dem UE und einem Zeit-Frequenz-Betriebsmittel, wo sich eine Auslösernachricht für das UE befindet, eines Rundsendekanals Folgendes umfasst:  
 Bestimmen der Übereinstimmung zwischen dem UE und dem Zeit-Frequenz-Betriebsmittel, wo sich die Auslösernachricht für das UE befin-

- det, des Rundsendekanals gemäß einer ersten Übereinstimmung zwischen einer Funkrufgelegenheit und einer Kennung des UE oder einer Kennung einer Gruppe von UEs von der Basisstation und einer zweiten Übereinstimmung zwischen der Funkrufgelegenheit und dem Zeit-Frequenz-Betriebsmittel des Rundsendekanals von der Basisstation.
2. Verfahren nach Anspruch 1, das ferner Folgendes umfasst: Erfassen durch das UE der Kennung des UE von der Basisstation;
- wobei das Erfassen (S102) durch das UE einer Übereinstimmung zwischen dem UE und einem Zeit-Frequenz-Betriebsmittel, wo sich eine Auslösernachricht für das UE befindet, eines Rundsendekanals Folgendes umfasst:  
Erfassen durch das UE einer Übereinstimmung zwischen der Kennung des UE und dem Zeit-Frequenz-Betriebsmittel, wo sich die Auslösernachricht für das UE befindet, des Rundsendekanals von der Basisstation.
3. Verfahren nach Anspruch 2, wobei das Erfassen durch das UE der Kennung des UE von der Basisstation Folgendes umfasst:  
Senden durch das UE einer Anforderung an die Basisstation zum Zuweisen der Kennung des UE; und Empfangen durch das UE der Kennung des UE, die in Reaktion auf die Anforderung durch die Basisstation zugewiesen wird, von der Basisstation.
4. Verfahren nach einem der Ansprüche 1-3, wobei in dem Zeit-Frequenz-Betriebsmittel mehrere Auslösernachrichten geführt werden.
5. Verfahren nach einem der Ansprüche 1-4, wobei jede Auslösernachricht konfiguriert ist, ein UE, eine Gruppe von UEs oder mehrere Gruppen von UEs auszulösen.
6. Anwendergerät, UE, **dadurch gekennzeichnet, dass** das UE Folgendes umfasst:  
ein erstes Erfassungsmodul (402), das konfiguriert ist, eine Übereinstimmung zwischen dem UE und einem Zeit-Frequenz-Betriebsmittel, wo sich die Auslösernachricht für das UE befindet, eines Rundsendekanals zu erfassen, wobei die Auslösernachricht konfiguriert ist, das Hören einer Funkrufnachricht für das UE auszulösen, und über den Rundsendekanal gesendet wird, und wobei es eine Latenzzeit zwischen der Auslösernachricht und der Funkrufnachricht in einem Zeitbereich gibt;  
ein Empfangsmodul (404), das konfiguriert ist, die Auslösernachricht von einer Basisstation
- über das Zeit-Frequenz-Betriebsmittel des Rundsendekanals gemäß der Übereinstimmung zu empfangen; und  
ein Auslösemodul (406), das konfiguriert ist, in einem Fall, in dem die Auslösernachricht angibt, dass das UE ausgelöst werden muss, das Hören der Funkrufnachricht für das UE auszulösen; wobei die Übereinstimmung zwischen dem UE und dem Zeit-Frequenz-Betriebsmittel, wo sich die Auslösernachricht für das UE befindet, des Rundsendekanals gemäß einer ersten Übereinstimmung zwischen einer Funkrufgelegenheit und einer Kennung des UE oder einer Kennung einer Gruppe von UEs von der Basisstation und einer zweiten Übereinstimmung zwischen der Funkrufgelegenheit und dem Zeit-Frequenz-Betriebsmittel des Rundsendekanals von der Basisstation bestimmt wird.
7. UE nach Anspruch 6, das ferner Folgendes umfasst:  
ein zweites Erfassungsmodul (408), das konfiguriert ist, die Kennung des UE von der Basisstation zu erfassen, und wobei das erste Erfassungsmodul (402) konfiguriert ist, eine Übereinstimmung zwischen der Kennung des UE und dem Zeit-Frequenz-Betriebsmittel, wo sich die Auslösernachricht für das UE befindet, des Rundsendekanals von der Basisstation zu erfassen.
8. UE nach Anspruch 7, wobei das zweite Erfassungsmodul (408) konfiguriert ist:  
eine Anforderung zum Zuweisen der Kennung des UE an die Basisstation zu senden; und die Kennung des UE, die durch die Basisstation in Reaktion auf die Anforderung zugewiesen wird, von der Basisstation zu empfangen.
9. UE nach einem der Ansprüche 6-8, wobei in dem Zeit-Frequenz-Betriebsmittel mehrere Auslösernachrichten geführt werden.
10. UE nach einem der Ansprüche 6-9, wobei jede Auslösernachricht konfiguriert ist, ein UE, eine Gruppe von UEs oder mehrere Gruppen von UEs auszulösen.
11. Basisstation, **dadurch gekennzeichnet, dass** die Basisstation Folgendes umfasst:  
ein Erfassungsmodul (602), das konfiguriert ist, eine Übereinstimmung zwischen dem UE und einem Zeit-Frequenz-Betriebsmittel, wo sich eine Auslösernachricht für das UE befindet, eines Rundsendekanals zu erfassen; und  
ein erstes Sendemodul (604), das konfiguriert ist, die Auslösernachricht, die konfiguriert ist,

- das Hören der Funkrufnachricht für das UE auszulösen, und über den Rundsendekanal gesendet wird, über das Zeit-Frequenz-Betriebsmittel des Rundsendekanals gemäß der Übereinstimmung an das UE zu senden, wobei es eine Latenzzeit zwischen der Auslösernachricht und der Funkrufnachricht in einem Zeitbereich gibt, die Auslösernachricht durch das UE empfangen wird und in einem Fall, in dem die Auslösernachricht angibt, dass das UE ausgelöst werden muss, ausgelöst wird, dass die Funkrufnachricht für das UE gehört wird;
- wobei das Erfassungsmodul (602) ferner konfiguriert ist, die Übereinstimmung zwischen dem UE und dem Zeit-Frequenz-Betriebsmittel, wo sich die Auslösernachricht für das UE befindet, des Rundsendekanals gemäß einer ersten Übereinstimmung zwischen einer Funkrufgelegenheit und einer Kennung des UE oder einer Kennung einer Gruppe von UEs von der Basisstation und einer zweiten Übereinstimmung zwischen der Funkrufgelegenheit und dem Zeit-Frequenz-Betriebsmittel des Rundsendekanals von der Basisstation zu bestimmen.
12. Verfahren zum Auslösen eines Anwendergeräts, UE, um eine Funkrufnachricht zu überwachen, das in einer Basisstation eines Systems der langfristigen Entwicklung, LTE, ausgeführt wird, **dadurch gekennzeichnet, dass** das Verfahren Folgendes umfasst:
- Erfassen (S202) einer Übereinstimmung zwischen dem UE und einem Zeit-Frequenz-Betriebsmittel, wo sich die Auslösernachricht für das UE befindet, eines Rundsendekanals; und Senden (S204) der Auslösernachricht, die konfiguriert ist, das Hören der Funkrufnachricht für das UE auszulösen, und über den Rundsendekanal gesendet wird, über das Zeit-Frequenz-Betriebsmittel des Rundsendekanals gemäß der Übereinstimmung an das UE, wobei es eine Latenzzeit zwischen der Auslösernachricht und der Funkrufnachricht in einem Zeitbereich gibt, die Auslösernachricht durch das UE empfangen wird und in einem Fall, in dem die Auslösernachricht angibt, dass das UE ausgelöst werden muss, ausgelöst wird, dass die Funkrufnachricht für das UE gehört wird;
- wobei das Erfassen (S202) einer Übereinstimmung zwischen dem UE und einem Zeit-Frequenz-Betriebsmittel, wo sich die Auslösernachricht für das UE befindet, eines Rundsendekanals Folgendes umfasst:
- Bestimmen der Übereinstimmung zwischen dem UE und dem Zeit-Frequenz-Betriebsmittel, wo sich die Auslösernachricht für das UE befindet, des Rundsendekanals gemäß einer ersten

Übereinstimmung zwischen einer Funkrufgelegenheit und einer Kennung des UE oder einer Kennung einer Gruppe von UEs von der Basisstation und einer zweiten Übereinstimmung zwischen der Funkrufgelegenheit und dem Zeit-Frequenz-Betriebsmittel des Rundsendekanals von der Basisstation.

13. Verfahren nach Anspruch 12, das ferner Folgendes umfasst:
- Senden der Übereinstimmung an das UE.
14. Verfahren nach Anspruch 12, wobei in einem Zeit-Frequenz-Betriebsmittel mehrere Auslösernachrichten geführt werden.
15. Verfahren nach Anspruch 12, wobei jede Auslösernachricht konfiguriert ist, ein UE, eine Gruppe von UEs oder mehrere Gruppen von UEs auszulösen.

### Revendications

1. Procédé de déclenchement de la surveillance par un équipement d'utilisateur, UE, d'un message de recherche dans un système à technologie d'évolution à long terme, LTE, **caractérisé en ce que le procédé comprend :**

l'acquisition (S102), par l'UE, d'une correspondance entre l'UE et une ressource temps-fréquence, dans laquelle se trouve un message déclencheur pour l'UE, d'un canal de diffusion, dans lequel le message déclencheur est configuré pour déclencher l'écoute du message de recherche pour l'UE et est envoyé par le biais du canal de diffusion, et dans lequel il existe un délai entre le message déclencheur et le message de recherche dans un domaine temporel ; la réception (S104), par l'UE, du message déclencheur depuis une station de base par le biais de la ressource temps-fréquence du canal de diffusion conformément à la correspondance ; et

dans un cas dans lequel le message déclencheur indique que l'UE doit être déclenché, le déclenchement (S106), par l'UE, de l'écoute du message de recherche pour l'UE ;

dans lequel l'acquisition (S102), par l'UE, d'une correspondance entre l'UE et une ressource temps-fréquence, dans laquelle se trouve un message déclencheur pour l'UE, d'un canal de diffusion comprend :

la détermination de la correspondance entre l'UE et la ressource temps-fréquence, dans laquelle se trouve le message déclencheur pour l'UE, du canal de diffusion conformément à une première correspondance entre une occasion

- de recherche et un identifiant de l'UE ou un identifiant d'un groupe d'UE depuis la station de base, et à une seconde correspondance entre l'occasion de recherche et la ressource temps-fréquence du canal de diffusion depuis la station de base. 5
2. Procédé selon la revendication 1, comprenant en outre : l'acquisition, par l'UE, de l'identifiant de l'UE depuis la station de base ; 10
- dans lequel l'acquisition (S102), par l'UE, d'une correspondance entre l'UE et une ressource temps-fréquence, dans laquelle se trouve un message déclencheur pour l'UE, d'un canal de diffusion comprend : 15
- l'acquisition, par l'UE, d'une correspondance entre l'identifiant de l'UE et la ressource temps-fréquence, dans laquelle se trouve le message déclencheur pour l'UE, du canal de diffusion depuis la station de base. 20
3. Procédé selon la revendication 2, dans lequel l'acquisition, par l'UE, de l'identifiant de l'UE depuis la station de base comprend : 25
- l'envoi, par l'UE, d'une demande à la station de base pour l'attribution de l'identifiant de l'UE ; et la réception, par l'UE, de l'identifiant de l'UE attribué par la station de base en réponse à la demande, depuis la station de base. 30
4. Procédé selon l'une quelconque des revendications 1 à 3, dans lequel une pluralité de messages déclencheurs sont transportés dans la ressource temps-fréquence. 35
5. Procédé selon l'une quelconque des revendications 1 à 4, dans lequel chaque message déclencheur est configuré pour déclencher un UE, un groupe d'UE ou une pluralité de groupes d'UE. 40
6. Equipement d'utilisateur, UE, **caractérisé en ce que** l'UE comprend :
- un premier module d'acquisition (402), configuré pour acquérir une correspondance entre l'UE et une ressource temps-fréquence, dans laquelle se trouve le message déclencheur pour l'UE, d'un canal de diffusion, dans lequel le message déclencheur est configuré pour déclencher l'écoute d'un message de recherche pour l'UE et est envoyé par le biais du canal de diffusion, et dans lequel il existe un délai entre le message déclencheur et le message de recherche dans un domaine temporel ; 50
- un module de réception (404), configuré pour recevoir le message déclencheur depuis une station de base par le biais de la ressource 55
- temps-fréquence du canal de diffusion conformément à la correspondance ; et
- un module de déclenchement (406), configuré pour déclencher l'écoute du message de recherche pour l'UE dans un cas dans lequel le message déclencheur indique que l'UE doit être déclenché ;
- dans lequel la correspondance entre l'UE et la ressource temps-fréquence, dans laquelle se trouve le message déclencheur pour l'UE, du canal de diffusion est déterminée conformément à une première correspondance entre une occasion de recherche et un identifiant de l'UE ou un identifiant d'un groupe d'UE depuis la station de base, et à une seconde correspondance entre l'occasion de recherche et la ressource temps-fréquence du canal de diffusion depuis la station de base.
7. UE selon la revendication 6, comprenant en outre : un second module d'acquisition (408), configuré pour acquérir l'identifiant de l'UE depuis la station de base, et dans lequel le premier module d'acquisition (402) est configuré pour acquérir une correspondance entre l'identifiant de l'UE et la ressource temps-fréquence, dans laquelle se trouve le message déclencheur pour l'UE, du canal de diffusion depuis la station de base.
8. UE selon la revendication 7, dans lequel le second module d'acquisition (408) est configuré pour : envoyer une demande à la station de base pour attribuer l'identifiant de l'UE ; et recevoir l'identifiant de l'UE attribué par la station de base en réponse à la demande, depuis la station de base.
9. UE selon l'une quelconque des revendications 6 à 8, dans lequel une pluralité de messages déclencheurs sont transportés dans la ressource temps-fréquence.
10. UE selon l'une quelconque des revendications 6 à 9, dans lequel chaque message déclencheur est configuré pour déclencher un UE, un groupe d'UE ou une pluralité de groupes d'UE.
11. Station de base, **caractérisée en ce que** la station de base comprend :
- un module d'acquisition (602), configuré pour acquérir une correspondance entre l'UE et une ressource temps-fréquence, dans laquelle se trouve le message déclencheur pour l'UE, d'un canal de diffusion ; et
- un premier module d'envoi (604), configuré pour envoyer le message déclencheur, qui est configuré pour déclencher l'écoute d'un message de recherche pour l'UE et est envoyé par le biais

du canal de diffusion, à l'UE par le biais de la ressource temps-fréquence du canal de diffusion conformément à la correspondance, dans laquelle il existe un délai entre le message déclencheur et le message de recherche dans un domaine temporel, le message déclencheur est reçu par l'UE, et le message de recherche pour l'UE est déclenché pour être écouté dans un cas dans lequel le message déclencheur indique que l'UE doit être déclenché ; dans laquelle le module d'acquisition (602) est en outre configuré pour déterminer la correspondance entre l'UE et la ressource temps-fréquence, dans laquelle se trouve le message déclencheur pour l'UE, du canal de diffusion conformément à une première correspondance entre une occasion de recherche et un identifiant de l'UE ou un identifiant d'un groupe d'UE depuis la station de base, et à une seconde correspondance entre l'occasion de recherche et la ressource temps-fréquence du canal de diffusion depuis la station de base.

12. Procédé de déclenchement d'un équipement d'utilisateur, UE, pour surveiller un message de recherche transporté dans une station de base, dans un système à technologie d'évolution à long terme, LTE, **caractérisé en ce que** le procédé comprend :

l'acquisition (S202) par l'UE, d'une correspondance entre l'UE et une ressource temps-fréquence, dans laquelle se trouve un message déclencheur pour l'UE, d'un canal de diffusion ; et l'envoi (S204) du message déclencheur, qui est configuré pour déclencher l'écoute du message de recherche pour l'UE et est envoyé par le biais du canal de diffusion, à l'UE par le biais de la ressource temps-fréquence du canal de diffusion conformément à la correspondance, dans lequel il existe un délai entre le message déclencheur et le message de recherche dans un domaine temporel, le message déclencheur est reçu par l'UE, et le message de recherche pour l'UE est déclenché pour être écouté dans un cas dans lequel le message déclencheur indique que l'UE doit être déclenché ; dans lequel l'acquisition (S202) d'une correspondance entre l'UE et une ressource temps-fréquence, dans laquelle se trouve un message déclencheur pour l'UE, d'un canal de diffusion comprend : la détermination de la correspondance entre l'UE et la ressource temps-fréquence, dans laquelle se trouve le message déclencheur pour l'UE, du canal de diffusion conformément à une première correspondance entre une occasion de recherche et un identifiant de l'UE ou un iden-

tifiant d'un groupe d'UE depuis la station de base, et à une seconde correspondance entre l'occasion de recherche et la ressource temps-fréquence du canal de diffusion depuis la station de base.

13. Procédé selon la revendication 12, comprenant en outre : l'envoi de la correspondance à l'UE.
14. Procédé selon la revendication 12, dans lequel une pluralité de messages déclencheurs sont transportés dans la ressource temps-fréquence.
15. Procédé selon la revendication 12, dans lequel chaque message déclencheur est configuré pour déclencher un UE, un groupe d'UE ou une pluralité de groupes d'UE.

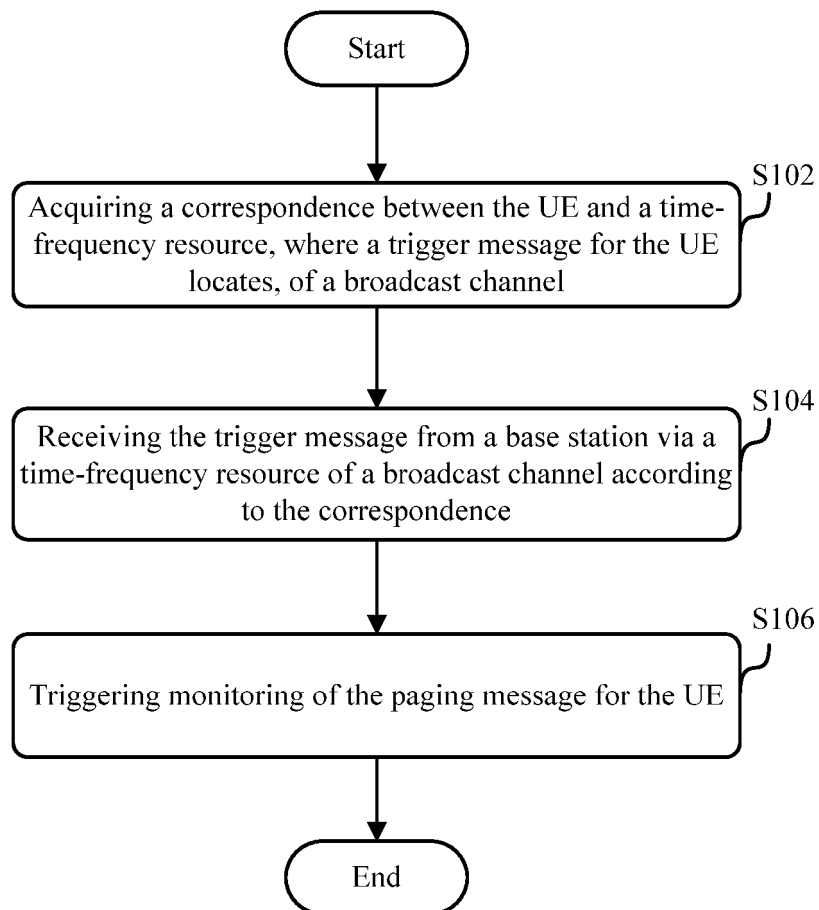


FIG. 1



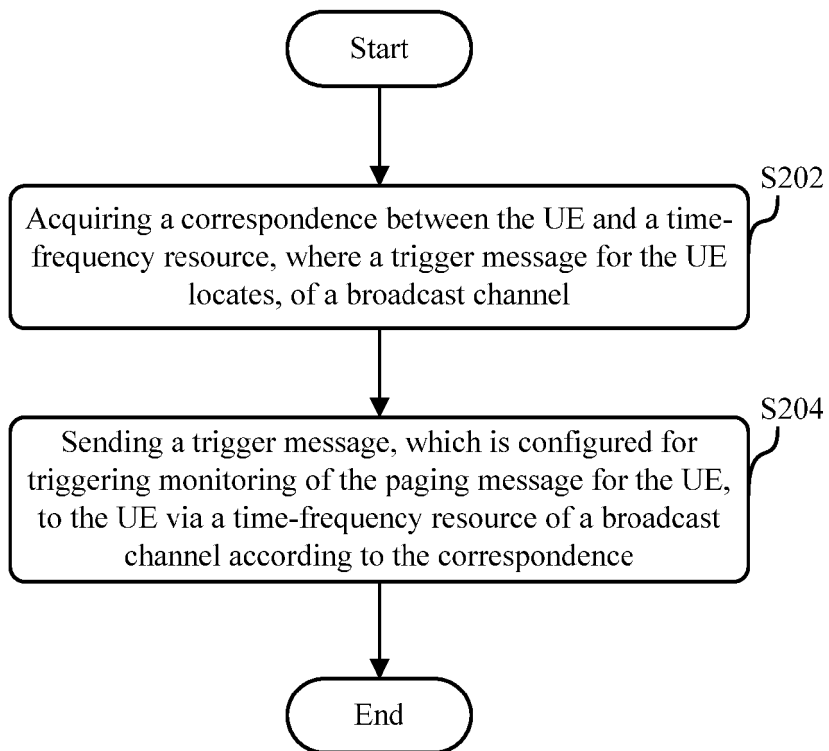


FIG. 2

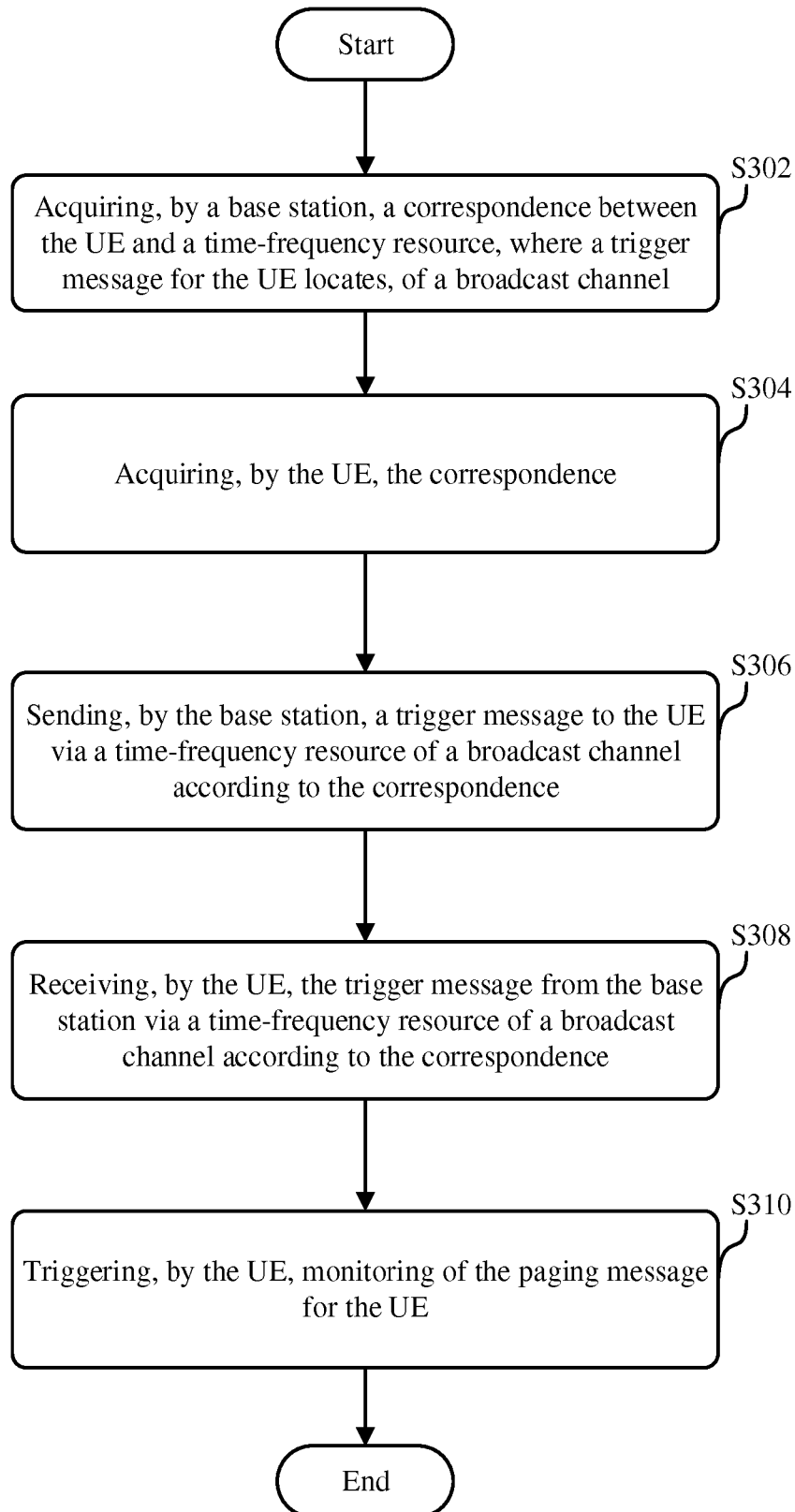


FIG. 3

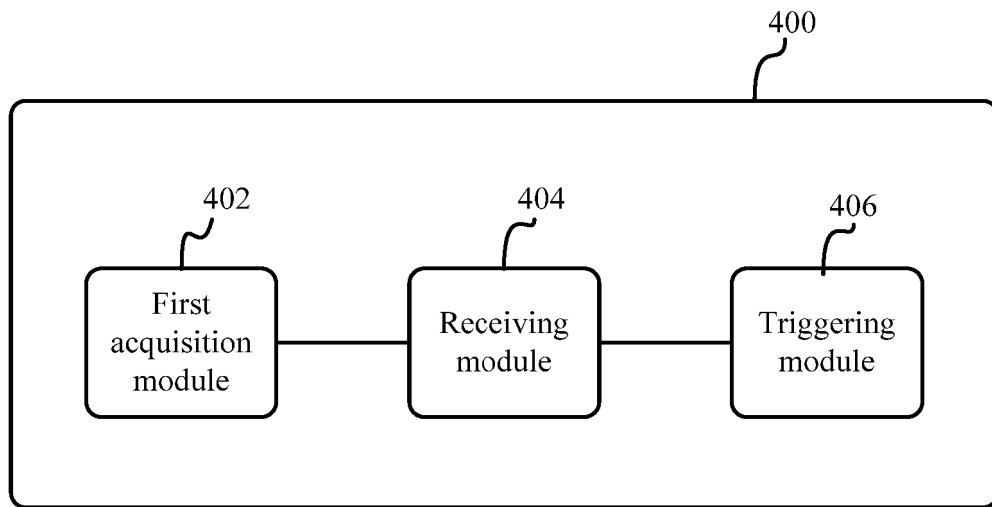


FIG. 4

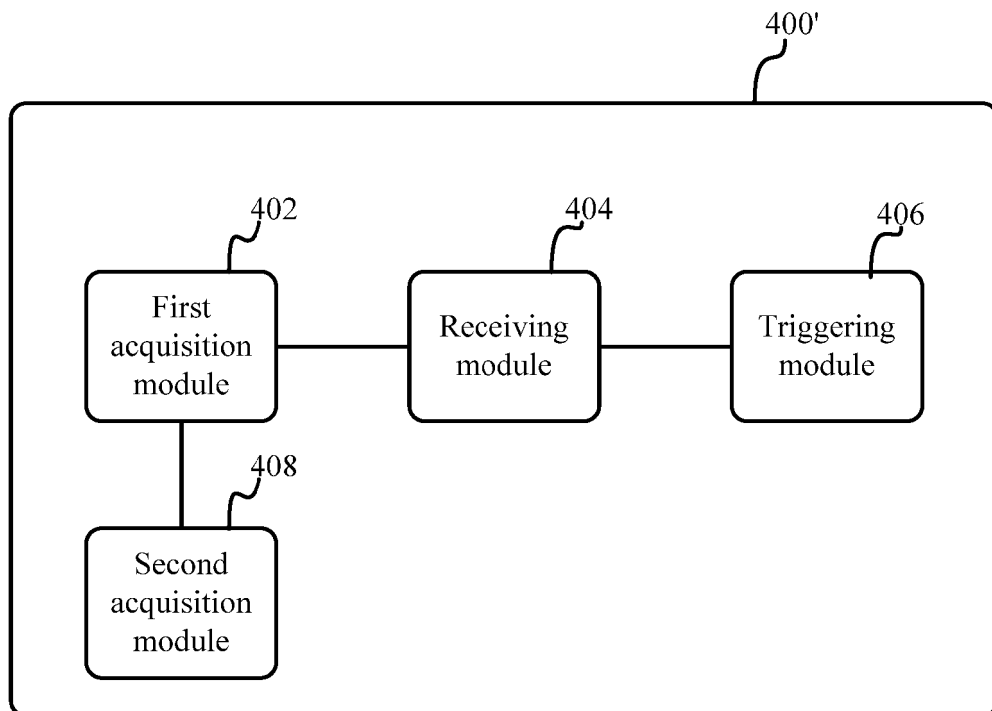


FIG. 5

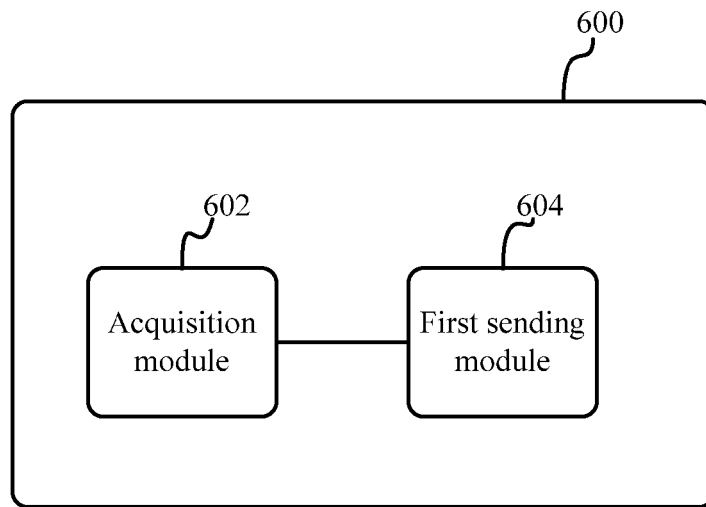


FIG. 6

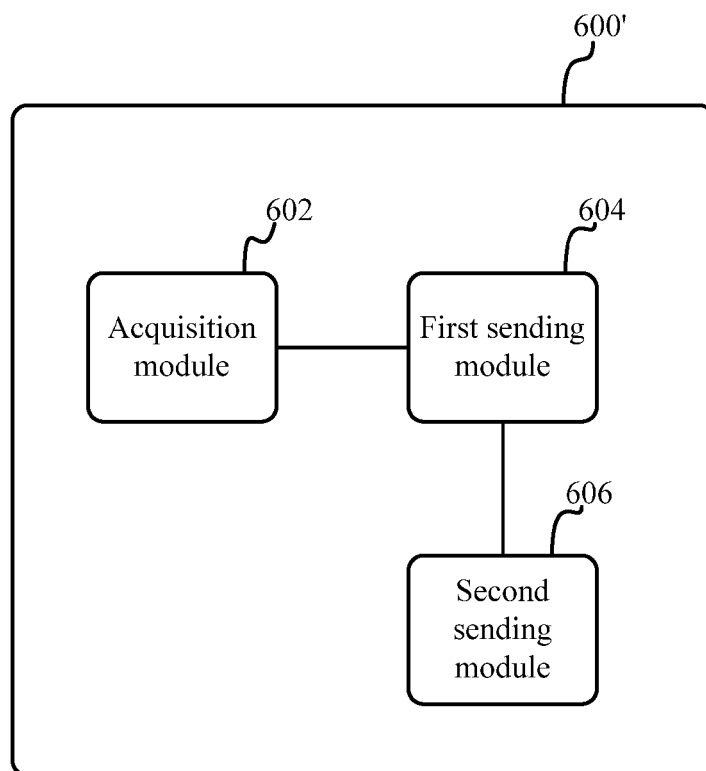


FIG. 7

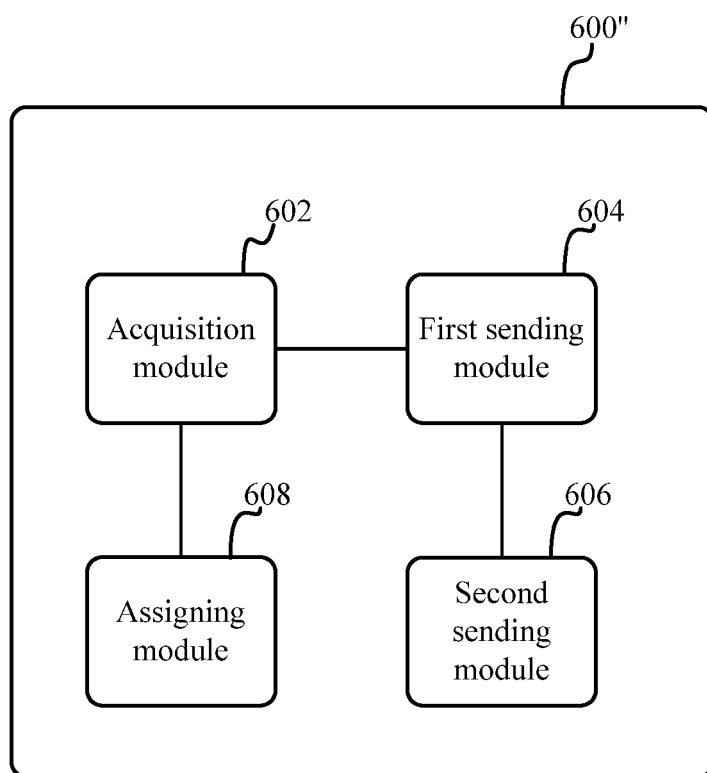


FIG. 8

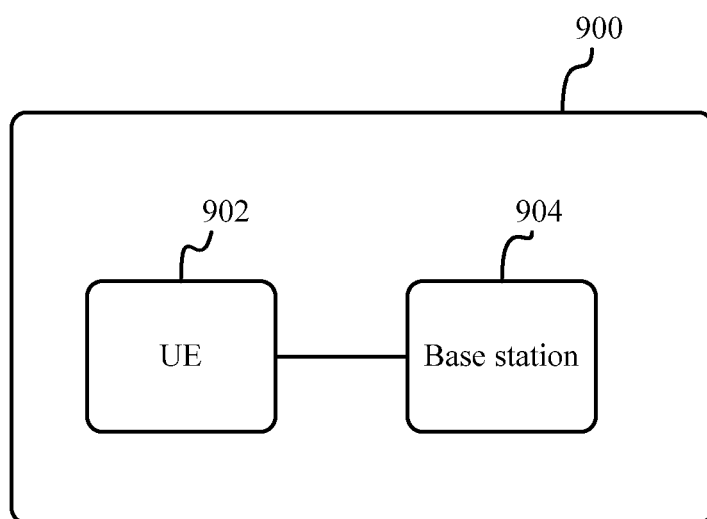


FIG. 9

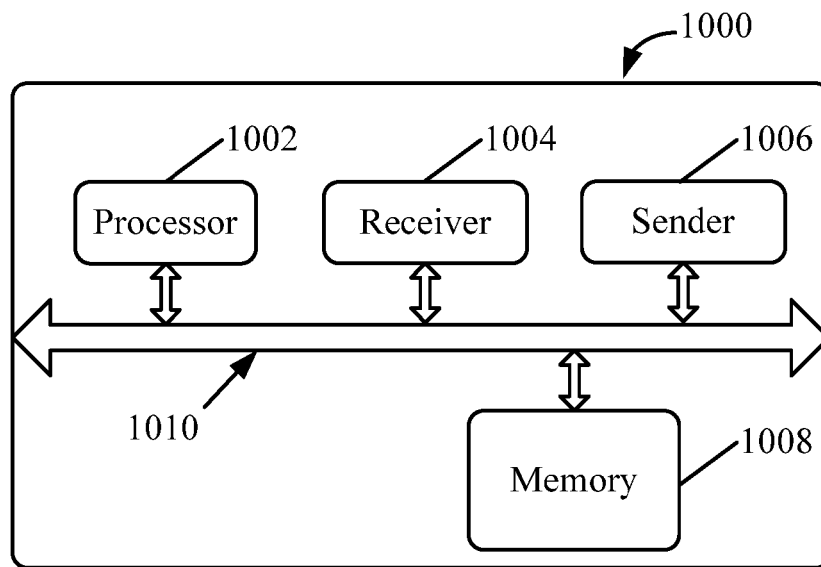


FIG. 10

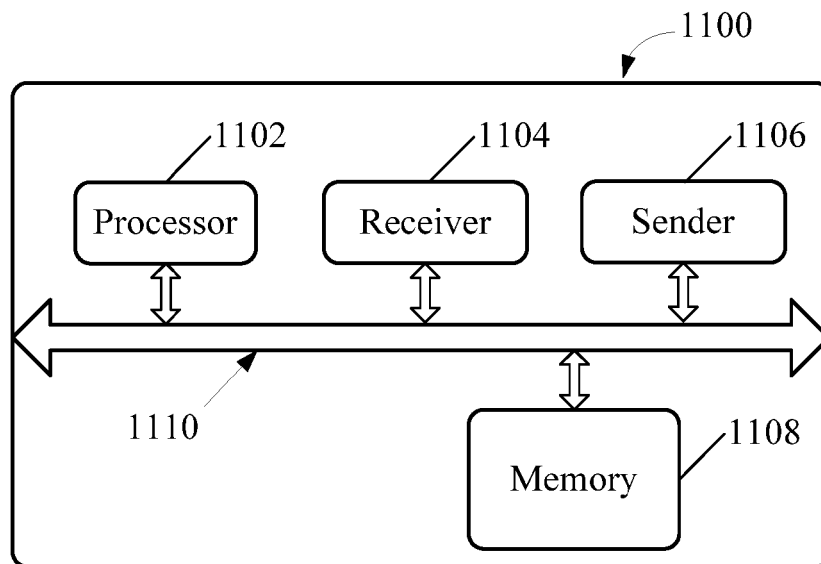


FIG. 11

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- US 2014302855 A1 [0005]

**Non-patent literature cited in the description**

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