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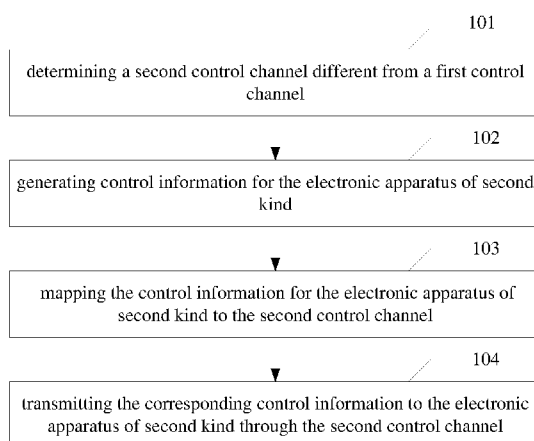


Fig. 1

(57) **Abstract:** This disclosure discloses an information processing method, a base station, an electronic apparatus and a system, the method includes: acquiring control information for an electronic apparatus of second kind, and the electronic apparatus of second kind is different to a electronic apparatus of first kind, and the bandwidth supported by the electronic apparatus of first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first bandwidth; mapping the control information for the electronic apparatus of second kind to a second control channel, and the second control channel is different to a first control channel which is used for providing control information for the electronic apparatus of first kind; and transmitting the control information to the electronic apparatus of second kind through the second control channel.



INFORMATION PROCESSING METHOD, BASE STATION, ELECTRONIC APPARATUS AND SYSTEM

TECHNICAL FIELD

5 **[0001]** This disclosure relates to management technology in communication field, and particularly to an information processing method, a base station, an electronic apparatus and a system.

BACKGROUND

10 **[0002]** With appearance of more kinds of electronic apparatus. The band width supported by some new electronic apparatus is relatively small since the usage of these new electronic apparatus is different from that of conventional electronic apparatus. For example, they may be a machine type communication (MTC) terminal with a band width of 1.4MHz. If
15 information from a physical downlink control channel by current method, it may encounter the problems of a higher searching complexity in a wide bandwidth and result in higher performance requirement and higher power consumption of these electronic apparatus.

SUMMARY

20 **[0003]** The embodiments provide an information processing method, a base station, an electronic apparatus and a system.

[0004] The technical solutions of the embodiments are implemented as follows:

The embodiments provide an information processing method includes: acquiring control information for an electronic apparatus of second kind, and the electronic apparatus of second
25 kind is different from a electronic apparatus of first kind, and the bandwidth supported by the electronic apparatus of first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first bandwidth; mapping the control information for the electronic apparatus of second kind to a second control channel; and the second control channel is
30 different from a first control channel which is used for providing control information for the

electronic apparatus of first kind, and transmitting the control information to the electronic apparatus of second kind through the second control channel.

[0005] In the above-described solution, the method further includes: acquiring resource management information for the electronic apparatus of second kind, wherein, the resource management information is used for indicating a location of resource of the second control information; mapping the resource management information to a broadcast channel; and transmitting the resource management information to the electronic apparatus of second kind through the broadcast channel.

[0006] In the above-described solution, the second control channel includes: control channel resource elements of preset number; correspondingly, mapping the control information for the electronic apparatus of second kind to the second control channel includes: determining a first number of the control channel resource elements required by carrying the control information for the electronic apparatus of second kind; mapping the control information for the electronic apparatus of second kind to the second control channel including the control channel resource elements of the first number.

[0007] In the above-described solution, determining the first number of the control channel resource elements required by carrying the control information with respect of the electronic apparatus of second kind includes: acquiring channel quality indication information transmitted from the electronic apparatus of second kind; and determining the first number of the control channel resource elements required by carrying the control information for the electronic apparatus of second kind based on the channel quality indication information.

[0008] In the above-described solution, acquiring the control information for the electronic apparatus of second kind includes: treating at least one piece of information of paging information, system information block, random access response information, downlink control information corresponding to the electronic apparatus of second kind as the control information with respect to the electronic apparatus of second kind.

[0009] The embodiments provide an information processing method applied in an electronic apparatus which is an electronic apparatus of second kind different from an electronic apparatus of first kind, and the bandwidth supported by the electronic apparatus of

first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first bandwidth, and the method includes: accessing to a second control channel, wherein, the second control channel is different from a first control channel, and the first control channel is used for providing control information for the electronic apparatus of first kind, and the second control channel is used for providing control information for the electronic apparatus of second kind; and acquiring control information from the second control channel.

[0010] In the above-described solution, the method further includes: acquiring resource management information for the electronic apparatus of second kind from a broadcast channel, wherein, the resource management information is used for indicating a location of resource of the second control information; and accessing to corresponding resource according to the resource management information.

[0011] In the above-described solution, acquiring control information from the second control channel includes: determining channel quality indication information based on received reference signal; determining a first number of control channel resource elements according to the channel quality indication information; and parsing to obtain the control information from the second control channel based on the first number of the control channel resource elements.

[0012] In the above-described solution, after acquiring control information from the second control channel, the method includes: parsing to obtain at least one piece of the following information from the control information: paging information, system information block, random access response information and downlink control information corresponding to the electronic apparatus of second kind.

[0013] The embodiments further provide a base station, and the base station includes: an information acquiring unit for acquiring control information for an electronic apparatus of second kind, and the electronic apparatus of second kind is different from a electronic apparatus of first kind, and the bandwidth supported by the electronic apparatus of first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first bandwidth; a processing unit for mapping the control information for the electronic apparatus of second

kind to the second control channel, and the second control channel is different from a first control channel which is used for providing control information for the electronic apparatus of first kind; and a communication unit for transmitting the control information to the electronic apparatus of second kind through the second control channel.

5 **[0014]** In the above-described solution, the information acquiring unit is further used for acquiring resource management information for the electronic apparatus of second kind, wherein, the resource management information is used for indicating a location of resource of the second control information; the processing unit is further used for mapping the resource management information to a broadcast channel; and the communication unit is further used
10 for transmitting the resource management information to the electronic apparatus of second kind through the broadcast channel.

[0015] In the above-described solution, the second control channel includes: control channel resource elements of preset number; correspondingly, the processing unit is specifically used for determining a first number of the control channel resource elements
15 required by carrying the control information for the electronic apparatus of second kind and mapping the control information for the electronic apparatus of second kind to the second control channel including the control channel resource elements of the first number.

[0016] In the above-described solution, the processing unit is used specifically for acquiring channel quality indication information transmitted by the electronic apparatus of
20 second kind, and determining the first number of the control channel resource elements required by carrying the control information for the electronic apparatus of second kind based on the channel quality indication information.

[0017] In the above-described solution, the information acquiring unit is specifically used for treating at least one piece of information of paging information, system information
25 block, random access response information and downlink control information corresponding to the electronic apparatus of second kind as the control information with respect to the electronic apparatus of second kind.

[0018] The embodiments further provide an electronic apparatus which is an electronic apparatus of second kind different from an electronic apparatus of first kind, and ,
30 and the second control channel is different from a first control channel which is used for

providing control information for the electronic apparatus of first kind, and the electronic apparatus includes: a communication unit for accessing to a second control channel, wherein, the second control channel is different from a first control channel, and the first control channel is used for providing control information for the electronic apparatus of first kind, and the second control channel is used for providing control information for the electronic apparatus of second kind; and an information processing unit for acquiring control information from the second control channel.

[0019] In the above-described solution, the information processing unit is further used for acquiring resource management information for the electronic apparatus of second kind from a broadcast channel, wherein, the resource management information is used for indicating a location of resource of the second control information and accessing to corresponding resource according to the resource management information.

[0020] In the above-described solution, the communication unit is specifically used for determining channel quality indication information based on received reference signal; correspondingly, the information processing unit is specifically used for determining a first number of control channel resource elements according to the channel quality indication information, and parsing to obtain the control information from the second control channel based on the first number of the control channel resource elements.

[0021] In the above-described solution, the information processing unit is specifically used for parsing to obtain at least one piece of the following information from the control information: paging information, system information block, random access response information and downlink control information corresponding to the electronic apparatus of second kind.

[0022] The embodiments further provide an information processing system including: a base station for acquiring control information for the electronic apparatus of second kind, and the electronic apparatus of second kind is different from a electronic apparatus of first kind, and the bandwidth supported by the electronic apparatus of first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first bandwidth; mapping the control information for an electronic apparatus of second kind to a second control channel, and the

second control channel is different from a first control channel which is used for providing control information for the electronic apparatus of first kind; and transmitting the control information to the electronic apparatus of second kind through the second control channel; and an electronic apparatus for accessing to the second control channel and acquiring control
5 information from the second control channel.

[0023] The information processing method, the base station, the electronic apparatus and the system provided by this disclosure can determine the second control channel for the electronic apparatus of second kind specifically, and map the control information for the electronic apparatus of second kind to the second control channel and transmit the control
10 information to the electronic apparatus of second kind. Thus, the electronic apparatus of second kind supporting less band width can search the control information from the second control channel, so as to reduce the searching complexity of the electronic apparatus of second kind, and in turn reduce a power consumption and latency of the electronic apparatus of second kind, and can be compatible to the original broadcast channel.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] Fig. 1 is schematic diagram of a flow of an information processing method at a base station side of the embodiments;

[0025] Fig. 2 is a schematic diagram of a flow of indicating resource position through
20 broadcast channels of the embodiments;

[0026] Fig. 3 is a schematic diagram of an allocation of resource of the embodiments;

[0027] Fig. 4 is a schematic diagram of division of the broadcast channels of the embodiments;

[0028] Fig. 5 is a schematic diagram of a flow of an information processing method at
25 an electronic apparatus side of the embodiments;

[0029] Fig. 6 is a schematic diagram of a flow of acquiring the allocation of resource at the electronic apparatus side of the embodiments;

[0030] Fig. 7 is a schematic diagram of a flow of parsing control information of the embodiments;

[0031] Fig. 8 is a schematic diagram of searching CCE directions at the time of
30

parsing the control information of the embodiments;

[0032] Fig. 9 is a detailed flow of parsing the control information of the embodiments;

[0033] Fig. 10 is a schematic diagram of a constituent structure of a base station of the embodiments;

[0034] Fig. 11 is a schematic diagram of a constituent structure of an electronic apparatus of the embodiments; and

[0035] Fig. 12 is a schematic diagram of a constitution of an information processing system of the embodiments.

DETAILED DESCRIPTION

[0036] It will be readily understood that the components of the embodiments, as generally described and illustrated in the figures herein, may be arranged and designed in a wide variety of different configurations in addition to the described example embodiments. Thus, the following more detailed description of the example embodiments, as represented in the figures, is not intended to limit the scope of the embodiments, as claimed, but is merely representative of example embodiments.

[0037] Reference throughout this specification to “one embodiment” or “an embodiment” (or the like) means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment. Thus, the appearance of the phrases “in one embodiment” or “in an embodiment” or the like in various places throughout this specification are not necessarily all referring to the same embodiment.

[0038] Furthermore, the described features, structures, or characteristics may be combined in any suitable manner in one or more embodiments. In the following description, numerous specific details are provided to give a thorough understanding of embodiments. One skilled in the relevant art will recognize, however, that the various embodiments can be practiced without one or more of the specific details, or with other methods, components, materials, et cetera. In other instances, well known structures, materials, or operations are not shown or described in detail to avoid obfuscation.

[0039] First embodiment

[0040] The embodiment provides an information processing method applied in a base station, and as shown in Fig. 1, the method includes:

[0041] Step 101: determining a second control channel different from a first control channel, wherein, the first control channel is used for providing control information for an electronic apparatus of first kind, and the second control channel is used for providing control information for an electronic apparatus of second kind, and the bandwidth supported by the electronic apparatus of first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first bandwidth;

[0042] Step 102: generating control information for the electronic apparatus of the second kind;

[0043] Step 103: mapping the control information for the electronic apparatus of second kind to the second control channel;

[0044] Step 104: transmitting the corresponding control information to the electronic apparatus of second kind through the second control channel.

[0045] Here, the first control channel may be a physical downlink control channel (PDCCH) for mainly carrying information for scheduling and other control purpose, which may specifically include information of transmission format, allocation of resource, uplink scheduling permission, power control and uplink retransmission information or the like. In PDCCH, symbols constitute resource element group (RE Group, REG) and control channel element (CCE). Wherein, one CCE contains nine REGs.

[0046] In the present embodiment, the electronic apparatus of first kind may be a common mobile terminal, and the first bandwidth may be 20M, and generally, the electronic apparatus of first kind may support a communication bandwidth of 1.4M, 5M, 10M, 15M and 20M or the like. The electronic apparatus of second kind may be a machine type communication (MTC) terminal, and correspondingly, the second bandwidth may be 1.4M.

[0047] It can be seen that, by adopting the above-described scheme, the control information for the electronic apparatus of second kind can be mapped to the second control channel and the control information can be transmitted to the electronic apparatus of second

kind. Thus, the electronic apparatus of second kind supporting less bandwidth can search control information from the second control channel, so as to reduce the searching complexity of the electronic apparatus of second kind, and in turn reduce a power consumption and latency of the electronic apparatus of second kind.

5 [0048] As a further example, the location of the resources occupied by the second control channel can be indicated by the broadcast channel, as shown in Fig. 2 specifically, it includes:

[0049] Step 201: generating resource management information for the electronic apparatus of second kind, wherein, the resource management information is used for
10 indicating the location of resource of the second control information, wherein the second control information means the control information for the electronic apparatus of the second kind;

[0050] Step 202: mapping the resource management information to the broadcast channel;

15 [0051] Step 203: transmitting the resource management information to the electronic apparatus of second kind through the broadcast channel.

[0052] Wherein, the location of resource position of the second control information may be: locations of symbols with same frequency domain and different time domain with respect to each location of resource for the electronic apparatus of second kind. For example,
20 as shown in Fig. 3, the location of resource of the second control information may be set at the fourth, the fifth and the sixth symbol, which is in same frequency domain and in previous one time slot in time domain with respect to a resource 31 for the electronic apparatus of second kind. It assumes that the resource 31 for the electronic apparatus of second kind is located at the second time slot in a subframe 0, then the second control information is located
25 at the fourth, the fifth and the sixth symbol in the first time slot of the subframe 0.

[0053] For example, the broadcast channels can be divided into a broadcast channel of first kind and a broadcast channel of second kind, wherein, the broadcast channel of first kind is used for providing system information for at least N electronic apparatus of first kind, and the broadcast channel of second kind is used for providing the resource management
30 information for M electronic apparatus of second kind.

[0054] The broadcast channel of first kind may be a physical broadcast channel (PBCH) for mainly carrying system information, that is, master information block (MIB), which is updated every 40ms and retransmitted every 10ms. In the time domain, the PBCH is transmitted in time slot 1 of subframe 0, and in the frequency domain, the PBCH occupies a frequency bandwidth of 1.25M.

[0055] The broadcast channel of second kind may occupy same band width as the PBCH in the frequency domain, and is transmitted at a location occupying different symbols from PBCH in time slot 1 of subframe 0 in the time domain.

[0056] Fig. 4 presents a divisional relationship in the time domain and the frequency domain of the broadcast channel of first kind and the broadcast channel of second kind, the broadcast channel of second kind may occupy last three symbols in time slot 1 in the time domain and occupy the center of the band in the frequency domain. Fig. 4 presents 12 RBs of a central frequency band in two time slots of one subframe. The first four symbols in the time domain in 6 RBs in the second time slot are used for carrying the broadcast channel of first kind, The last three symbols in the time domain in the 6 RBs in the second time slot are used for carrying broadcast channel of second kind, wherein, resources elements occupied by the broadcast channel of second kind are 214 REs.

[0057] It can be seen that, by adopting the above-described solution, the control information for the second kind of electronic apparatus can be mapped to the second control channel and the control information can be transmitted to the second kind of electronic apparatus. Thus, the second kind of electronic apparatus supporting less bandwidth can search control information from the second control channel, so as to reduce the searching complexity of the second kind of electronic apparatus, and in turn reduce a power consumption and latency of the second kind of electronic apparatus, and can be compatible to the original broadcast channel.

[0058] As a further example, the second control channel in the present embodiment may include: preset number of resources elements for the control channel.

[0059] Correspondingly, mapping the control information for the second kind of electronic apparatus to the second control channel may include: determining a first number of the control channel resources elements required by carrying the control information for the

electronic apparatus of second kind; and mapping the control information for the electronic apparatus of second kind to the second control channel including the control channel resources elements of the first number.

[0060] Wherein, manners of determining the first number of the control channel resources elements required by carrying the control information for the electronic apparatus of second kind may have the following two kinds.

[0061] First manner: setting according to a preset rule by the base station. For example, initial values of the first number of the control channel resources elements may be set as 1, and the first number may be adjusted to 2 after receiving information of erroneous receipt feedback by the electronic apparatus of second kind.

[0062] Second manner: acquiring channel quality indication information transmitted by the electronic apparatus of second kind, and determining the first number of the control channel resources elements required by carrying the control information for the electronic apparatus of second kind based on the channel quality indication information.

[0063] Wherein, the first number of the control channel resource (CCE) may refer to a polymerization degree of the CCE. The quality indication information (CQI) may be information feedback by the electronic apparatus of second kind according to status of receiving the reference signal. If the electronic apparatus of second kind starts to decode that of higher CQI level (better corresponding downlink channel) by adopting lower polymerization degree of CCE according to current calculated CQI information, times of blind decode can be reduced.

[0064] It can be seen that, by adopting the above-described solution, the control information for the electronic apparatus of second kind can be mapped to the second control channel and the control information can be transmitted to the electronic apparatus of second kind. Thus, the electronic apparatus of second kind supporting less band width can search control information from the second control channel, so as to reduce the searching complexity of the electronic apparatus of second kind, and in turn reduce a power consumption and latency of the electronic apparatus of second kind.

[0065] As a further example, in the present embodiment, generating the control information for the electronic apparatus of second kind includes: treating at least one piece of

information of paging information, system information block, random access response information, downlink control information corresponding to the electronic apparatus of second kind as the control information for the electronic apparatus of second kind.

[0066] The downlink control information corresponding to the electronic apparatus of second kind can be used to provide specific control information for each different electronic apparatus of second kind to obtain position information of other channels corresponding thereto.

[0067] The system information block can be used to search system information block (SIB) 1 and control information corresponding to SIB2.

[0068] Random access response information can be used to indicate an allocation of resource in an uplink of the electronic apparatus of second kind accessed randomly.

[0069] Paging information can be used to indicate an identification list of the electronic apparatus of second kind paged by the base station; since the length of the paging information is relatively small, the paging information no longer needs to be mapped to a physical downlink shared channel (PDSCH) in the present embodiment, so as to be able to avoid the electronic apparatus of second kind searching the paging information in the PDSCH once more, thus, the power consumption of the electronic apparatus of second kind can be further reduced.

[0070] It should be noted that, it is generally necessary to determine the information of the first number of the control channel resources elements is downlink control information corresponding to each of the electronic apparatus of second kind according to the channel quality indication information of the electronic apparatus of second kind, and other several kinds of information is generally transmitted by using fixed number of the control channel resources elements.

[0071] It can be seen that, by adopting the above-described scheme, the control information for the electronic apparatus of second kind can be mapped to the second control channel and the control information can be transmitted to the electronic apparatus of second kind. Thus, the electronic apparatus of second kind supporting less band width can search control information from the second control channel, so as to reduce the searching complexity of the electronic apparatus of second kind, and in turn reduce a power

consumption and latency of the electronic apparatus of second kind, and can be compatible to the original broadcast channel.

[0072] Second embodiment

5 **[0073]** The embodiment provides an information processing method applied in an electronic apparatus which is an electronic apparatus of second kind different from an electronic apparatus of first kind, and the bandwidth supported by the electronic apparatus of first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first
10 bandwidth, and as shown in Fig. 5, the method includes:

[0074] Step 501: accessing to a second control channel, wherein, the second control channel is different from a first control channel, and the first control channel is used for providing control information for the electronic apparatus of first kind, and the second control channel is used for providing control information for the electronic apparatus of second kind;

15 **[0075]** Step 502: acquiring corresponding control information from the second control channel.

[0076] In the present embodiment, the electronic apparatus of first kind may be a common mobile terminal, and the first band width may be 20M, and generally, the electronic apparatus of first kind may support a communication band width of 1.4M, 5M, 10M, 15M
20 and 20M or the like.

[0077] The electronic apparatus of second kind may be a machine type communication (MTC) terminal, and correspondingly, the second band width only can be 1.4M.

[0078] It can be seen that, by adopting the above-described scheme, the control
25 information for the electronic apparatus of second kind can be mapped to the second control channel and the control information can be transmitted to the electronic apparatus of second kind. Thus, the electronic apparatus of second kind supporting less band width can search control information from the second control channel, so as to reduce the searching complexity of the electronic apparatus of second kind, and in turn reduce a power
30 consumption of the electronic apparatus of second kind.

[0079] As a further example, in the present embodiment, location of resource at which the second control channel is acquired from the broadcast channel, and as shown in Fig. 6, the method further includes:

[0080] Step 601: acquiring resource management information for the electronic apparatus of second kind from a broadcast channel, wherein, the resource management information is used for indicating a location of resource of the second control information;

[0081] Step 602: accessing to corresponding resource according to the resource management information.

[0082] Wherein, locations of resource of the second control information may be:

locations of symbols with same frequency domain and different time domain with respect to each resource position for the second kind of electronic apparatus. For example, as shown in Fig. 3, the resource position of the second control information may be set at the fourth, the fifth and the sixth symbol, which is in same frequency domain and in previous one time slot in time domain with respect to a resource 31 for the electronic apparatus of second kind. It assumes that the resource 31 for the electronic apparatus of second kind is located at the second time slot in subframe 0, then the second control information is located at the fourth, the fifth and the sixth symbol in first time slot of subframe 0.

[0083] For example, the broadcast channels can be divided into a broadcast channel of first kind and a broadcast channel of second kind, wherein, the broadcast channel of first kind is used for providing system information for at least N electronic apparatus of first kind, and the broadcast channel of second kind is used for providing the resource management information for M electronic apparatus of second kind.

[0084] The broadcast channel of first kind may be a physical broadcast channel (PBCH) for mainly carrying system information, that is, master information block (MIB), which is updated every 40ms and retransmitted every 10ms. In the time domain, the PBCH is transmitted in time slot 1 of subframe 0, and in the frequency domain, the PBCH occupies a frequency bandwidth of 1.25M.

[0085] The broadcast channel of second kind may occupy same band width as the PBCH in the frequency domain, and is transmitted at a location occupying different symbols from the PBCH in time slot 1 of subframe 0 in the time domain.

[0086] Fig. 4 presents a divisional relationship in the time domain and the frequency domain of the broadcast channel of first kind and the broadcast channel of second kind, the broadcast channel of second kind may occupy last three symbols in time slot 1 in the time domain and occupy the center of the band in the frequency domain. Fig. 4 presents 12 RBs in a central frequency band in two time slots of one subframe. The first four symbols in the time domain in 6 RBs in the second time slot are used for carrying the broadcast channel of first kind. The last three symbols in the time domain in the 6 RBs in the second time slot are used for carrying broadcast channel of second kind, wherein, resources elements occupied by the broadcast channel of second kind are 214 REs.

[0087] It can be seen that, by adopting the above-described solution, the control information for the electronic apparatus of second kind can be mapped to the second control channel and the control information can be transmitted to the electronic apparatus of second kind. Thus, the electronic apparatus of second kind supporting less band width can search control information from the second control channel, so as to reduce the searching complexity of the electronic apparatus of second kind, and in turn reduce a power consumption and latency of the electronic apparatus of second kind, and can be compatible to the original broadcast channel.

[0088] As a further example, in the present embodiment, acquiring corresponding control information from the second control channel, as shown in Fig. 7, can include:

[0089] Step 701: determining channel quality indication information based on received reference signal;

[0090] Step 702: determining a first number of the control channel resources elements according to the channel quality indication information;

[0091] Step 703: parsing to obtain the control information from the second control channel based on the first number of the control channel resources elements.

[0092] Determining channel quality indication information based on received reference signal may be: after receiving reference signal (RS) by the electronic apparatus of second kind, determining received power of reference signal according to the RS, and in turn determining channel quality indication information according to the received power of reference signal.

[0093] By using the above-described method, the electronic apparatus of the second kind can determine the first number of the control channel resources elements according to currently calculated channel quality indication information, and in turn parse the control information according to the determined first number. The first number of the control channel resources elements may be a polymerization degree of CCE.

[0094] For example, after acquiring the corresponding control information from the second control channel, the method includes: parsing to obtain at least one information of the following from the control information: paging information, system information block, random access response information and downlink control information corresponding to the electronic apparatus of the second kind.

[0095] Further, a procedure of parsing the control information is described in combination with determining the first number of the control channel resources elements according to the channel quality indication information by the electronic apparatus of second kind.

[0096] It assumes that resources of the control channel are in units of CCE, and the channel quality indication information is CQI, search directions in time domain and frequency domain of the control information can be shown in Fig. 8, that is, a direction in the time domain from early to late in time, and a direction in the frequency domain from high to low in frequency.

[0097] It should be noted that, information of the first number of the control channel resources elements generally is determined to be downlink control information corresponding to each of the electronic apparatus of second kind according to the channel quality indication information of the electronic apparatus of second kind, and other several kinds of information is transmitted by using fixed number of the control channel resources elements generally. Number of the control channel resources elements for each kind of information can be shown as following table:

Control information	the first number of the control channel	Times of blind detection
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	resources elements	
The downlink control information corresponding to the electronic apparatus of second kind	1	6
	2	3
System information block	2	3
Random access response information	2	3
Paging information	4	1

[0098] It can be seen from the table that, at the time of adopting different first numbers of the control channel resources elements, times of blind detection with respect to the control channel of the electronic apparatus of second kind are different.

5 **[0099]** Hereinafter, a flow is explained in combination with Fig. 9 by taking parsing the downlink control information corresponding to the electronic apparatus of second kind as example.

[00100] Step 901: acquiring CQI by the electronic apparatus of second kind firstly.

[00101] Step 902: deciding whether the CQI is larger than a threshold, wherein, the
10 threshold can be set as a matter of experience, for example, can be set as 8, i.e., $CQI > 8$, which illustrates that a quality of the downlink channel of a UE is good, a polymerization degree is 1, and the efficiency is high; otherwise, it illustrates that the quality of the downlink channel of the UE is not so good, the polymerization degree is 2, and it can be transmitted by using an encoding mode of lower code rate, which ensures that the UE can receive
15 information of the PDCCH correctly. If the CQI is larger than the threshold, step 903 is executed; otherwise, step 906 is executed.

[00102] Step 903: setting an extracting pointer to extract a single CCE to decode according to search directions.

[00103] Step 904: checking the extracted CCE by using a scrambling code itself to
20 decide whether the checking is successful, if it is successful, it determines that the control information (DCI) is acquired successfully, and a processing flow ends; otherwise, step 905 is

executed.

[00104] Step 905: deciding whether the current extracting pointer has already pointed to end of the second control channel, and if the current extracting pointer has already pointed to the end of the second control channel, it determines that acquisition of the DCI fails, and the processing flow ends; otherwise, it returns to step 903.

[00105] Step 906: setting the extracting pointer to extract two CCEs to decode according to search directions.

[00106] Step 907: checking the extracted two CCEs by using a scrambling code itself to decide whether the checking is successful, if it is successful, it determines that the control information (DCI) is acquired successfully, and the processing flow ends; otherwise, step 908 is executed.

[00107] Step 908: deciding whether the current extracting pointer has already pointed to the end of the second control channel, and if the current extracting pointer has already pointed to the end of the second control channel, it determines that the acquisition of the DCI fails, and the processing flow ends; otherwise, it returns to step 906.

[00108] Only a method of parsing the downlink control information corresponding to the electronic apparatus of second kind is provided above, however, it can understand that methods of parsing the system information block, the random access response information and the paging information are same as the above methods, except a step of checking using the scrambling code itself is removed.

[00109] It can be seen that, by adopting the above-described solution, the control information for the electronic apparatus of second kind can be mapped to the second control channel and the control information can be transmitted to the electronic apparatus of second kind. Thus, the electronic apparatus of second kind supporting less band width can search control information from the second control channel, so as to reduce the searching complexity of the electronic apparatus of second kind, and in turn reduce a power consumption and latency of the electronic apparatus of second kind, and can be compatible to the original broadcast channel.

[00110] Third embodiment

[00111] The embodiment provides a base station, and as shown in Fig. 10, the base station includes: a setting unit 1001 for determining a second control channel different from a first control channel, wherein, the first control channel is used for providing control information for an electronic apparatus of first kind, and the second control channel is used for providing control information for an electronic apparatus of second kind, and the bandwidth supported by the electronic apparatus of first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first bandwidth; an information generating unit 1002 for generating control information for the electronic apparatus of second kind; a processing unit 1003 for mapping the control information for the electronic apparatus of second kind to the second control channel; a communication unit 1004 for transmitting the corresponding control information to the electronic apparatus of second kind through the second control channel.

[00112] Here, the first control channel may be a physical downlink control channel (PDCCH) for mainly carrying information for scheduling and other control purpose, which may specifically include information of transmission format, allocation of resource, uplink scheduling permission, power control and uplink retransmission or the like. In PDCCH, symbols constitute resource element group (RE Group, REG) and control channel element (CCE). Wherein, one CCE contains nine REGs.

[00113] In the present embodiment, the electronic apparatus of first kind may be a common mobile terminal, and the first band width may be 20M, and generally, the electronic apparatus of first kind may support a communication band width of 1.4M, 5M, 10M, 15M and 20M or the like. The electronic apparatus of second kind may be a machine type communication (MTC) terminal, and correspondingly, the second band width may be 1.4M.

[00114] It can be seen that, by adopting the above-described solution, the control information for the electronic apparatus of second kind can be mapped to the second control channel and the control information can be transmitted to the electronic apparatus of second kind. Thus, the electronic apparatus of second kind supporting less band width can search control information from the second control channel, so as to reduce the searching complexity of the electronic apparatus of second kind, and in turn reduce a power

consumption and latency of the electronic apparatus of second kind.

[00115] As a further example, the information generating unit is further used for generating resource management information for the electronic apparatus of second kind, wherein, the resource management information is used for indicating the location of resource
5 of the second control information, wherein the second control information means the control information for the electronic apparatus of the second kind.

[00116] The processing unit is further used for mapping the resource management information to a broadcast channel.

[00117] The communication unit is further used for transmitting the resource
10 management information to the electronic apparatus of second kind through the broadcast channel.

[00118] Wherein, the locations of resource of the second control information may be: locations of symbols with same frequency domain and different time domain with respect to each location of resource for the second kind of electronic apparatus; for example, as shown
15 in Fig. 3, the location of resource of the second control information may be set at the fourth, the fifth and the sixth symbol, which is in same frequency domain and in previous one time slot in time domain with respect to a resource 31 for the electronic apparatus of second kind. It assumes that the resource 31 for the electronic apparatus of second kind is located at the second time slot in subframe 0, then the second control information is located at the fourth,
20 the fifth and the sixth symbol in the first time slot of subframe 0.

[00119] For example, the broadcast channels can be divided into a broadcast channel of first kind and a broadcast channel of second kind, wherein, the broadcast channel of first kind is used for providing system information for at least N electronic apparatus of first kind, and the broadcast channel of second kind is used for providing the resource management
25 information for M electronic apparatus of second kind.

[00120] The broadcast channel of first kind may be a physical broadcast channel (PBCH) for mainly carrying system information, that is, master information block (MIB), which is updated every 40ms and retransmitted every 10ms. In the time domain, the PBCH is transmitted in time slot 1 of subframe 0, and in the frequency domain, the PBCH occupies a
30 frequency bandwidth of 1.25M.

[00121] The broadcast channel of second kind may occupy same band width as the PBCH in frequency domain, and is transmitted at a location occupying different symbols from the PBCH in time slot 1 of subframe 0 in the time domain.

[00122] Fig. 4 presents a divisional relationship in the time domain and the frequency domain of the broadcast channel of first kind and the broadcast channel of second kind, the broadcast channel of second kind may occupy last three symbols in time slot 1 in the time domain and occupy the center of the band in the frequency domain. Fig. 4 presents 12 RBs in a central frequency band in two time slots of one subframe. The first four symbols in the time domain in 6 RBs in the second time slot are used for carrying the broadcast channel of first kind. The last three symbols in the time domain in the 6 RBs in the second time slot are used for carrying broadcast channel of second kind, wherein, resources elements occupied by the broadcast channel of second kind are 214 REs.

[00123] It can be seen that, by adopting the above-described solution, the control information for the electronic apparatus of second kind can be mapped to the second control channel and the control information can be transmitted to the electronic apparatus of second kind. Thus, the electronic apparatus of second kind supporting less band width can search control information from the second control channel, so as to reduce the searching complexity of the electronic apparatus of second kind, and in turn reduce a power consumption and latency of the electronic apparatus of second kind, and can be compatible to the original broadcast channel.

[00124] As a further example, the second control channel may include: control channel resources elements of preset number.

[00125] Correspondingly, the processing unit is specifically used for determining a first number of the control channel resources units required by carrying the control information for the electronic apparatus of second kind and mapping the control information for the electronic apparatus of second kind to the second control channel including the control channel resources units of the first number.

[00126] Wherein, manners of determining the first number of the control channel resources elements required by carrying the control information for the electronic apparatus of second kind may have the following two kinds.

[00127] First manner: setting according to a preset rule by the base station. For example, initial values of the first number of the control channel resources elements may be set to 1, and the first number may be adjusted to 2 after receiving information of erroneous receipt feedback by the electronic apparatus of second kind.

5 [00128] Second manner: the processing unit is specifically used for acquiring channel quality indication information transmitted by the electronic apparatus of second kind, and determining the first number of the control channel resources units required by carrying the control information for the electronic apparatus of second kind based on the channel quality indication information.

10 [00129] Wherein, the first number of the control channel resource (CCE) may refer to a polymerization degree of the CCE. The quality indication information (CQI) may be information feedback by the electronic apparatus of second kind according to status of receiving the reference signal. If the electronic apparatus of second kind starts to decode that of higher CQI level (better corresponding downlink channel) by adopting lower
15 polymerization degree of CCE according to current calculated CQI information, times of blind decode can be reduced.

[00130] It can be seen that, by adopting the above-described solution, the control information for the electronic apparatus of second kind can be mapped to the second control channel and the control information can be transmitted to the electronic apparatus of second
20 kind. Thus, the electronic apparatus of second kind supporting less band width can search control information from the second control channel, so as to reduce the searching complexity of the electronic apparatus of second kind, and in turn reduce a power consumption and latency of the electronic apparatus of second kind, and can be compatible to the original broadcast channel.

25 [00131] As a further example, the information generating unit is specifically used for treating at least one piece of information of paging information, system information block, random access response information and downlink control information corresponding to the electronic apparatus of second kind as the control information for the electronic apparatus of second kind.

30 [00132] The downlink control information corresponding to the electronic apparatus of

second kind can be used to provide specific control information for each of different electronic apparatus of second kind to obtain position information of other channels corresponding thereto.

[00133] The system information block can be used to search system information block (SIB) 1 and control information corresponding to SIB2.

[00134] Random access response information can be used to indicate the allocation of resource in an uplink of the electronic apparatus of second kind accessed randomly.

[00135] The paging information can be used to indicate an identification list of the electronic apparatus of second kind paged by the base station; since a length of the paging information is relatively small, the paging information no longer needs to be mapped to a physical downlink shared channel, so as to be able to avoid the electronic apparatus of second kind searching the paging information in the PDSCH once more, thus, the power consumption of the electronic apparatus of second kind can be further reduced.

[00136] It should be noted that, generally, it is necessary to determine information of the first number of the control channel resources elements to be downlink control information corresponding to each of the electronic apparatus of second kind according to the channel quality indication information of the electronic apparatus of second kind, and other several kinds of information is transmitted by using fixed number of the control channel resources elements generally.

[00137] It can be seen that, by adopting the above-described solution, the control information for the electronic apparatus of second kind can be mapped to the second control channel and the control information can be transmitted to the electronic apparatus of second kind. Thus, the electronic apparatus of second kind supporting less band width can search the control information from the second control channel, so as to reduce the searching complexity of the electronic apparatus of second kind, and in turn reduce a power consumption and latency of the electronic apparatus of second kind, and can be compatible to the original broadcast channel.

[00138] Fourth embodiment

[00139] The embodiment further provides an electronic apparatus which is an

electronic apparatus of second kind different from an electronic apparatus of first kind, and the bandwidth supported by the electronic apparatus of first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first bandwidth, and as show in Fig. 11,

5 the electronic apparatus includes: a communication unit 1101 for accessing to a second control channel, wherein, the second control channel is different from a first control channel, and the first control channel is used for providing control information for the electronic apparatus of first kind, and the second control channel is used for providing control information for the electronic apparatus of second kind; an information processing unit 1102
10 for acquiring corresponding control information from the second control channel.

[00140] In the present embodiment, the electronic apparatus of first kind may be a common mobile terminal, and the first band width may be 20M, and generally, the electronic apparatus of first kind may support a communication band width of 1.4M, 5M, 10M, 15M and 20M or the like.

15 **[00141]** The electronic apparatus of second kind may be a machine type communication (MTC) terminal, and correspondingly, the second band width only can be 1.4M.

[00142] It can be seen that, by adopting the above-described solution, it can determine the second control channel for the electronic apparatus of second kind specifically, and map
20 the control information for the electronic apparatus of second kind to the second control channel and transmit the control information to the electronic apparatus of second kind. Thus, the electronic apparatus of second kind with less band width is only required to search the control information from the second control channel, so as to reduce a searching complexity of the electronic apparatus of second kind, and in turn reduce a power consumption of the
25 electronic apparatus of second kind.

[00143] As a further example, the information processing unit is further used for acquiring resource management information for the electronic apparatus of second kind from a broadcast channel, wherein, the resource management information is used for indicating location of resource of the second control information and accessing to corresponding
30 resource according to the resource management information.

[00144] Wherein, locations of resource of the second control information may be: locations of symbols with same frequency domain and different time domain with respect to each location of resource for the electronic apparatus of second kind; for example, as shown in Fig. 3, the location of resource of the second control information may be set at the fourth, the fifth and the sixth symbol, which is in same frequency domain and in previous one time slot in time domain with respect to a resource 31 for the electronic apparatus of second kind. It assumes that the resource 31 for the electronic apparatus of second kind is located at the second time slot in subframe 0, then the second control information is located at the fourth, the fifth and the sixth symbol in the first time slot of subframe 0.

[00145] For example, the broadcast channels can be divided into broadcast channels of first kind and broadcast channels of second kind, wherein, the broadcast channels of first kind are used for providing system information for at least N electronic apparatus of first kind, and the broadcast channels of second kind are used for providing the resource management information for M electronic apparatus of second kind.

[00146] The broadcast channel of first kind may be a physical broadcast channel (PBCH) for mainly carrying system information, that is, a master information block (MIB), which is updated every 40ms and retransmitted every 10ms. In the time domain, the PBCH is transmitted in time slot 1 of subframe 0, and in the frequency domain, the PBCH occupies a frequency bandwidth of 1.25M.

[00147] The broadcast channels of second kind may occupy same band width as the PBCH in the frequency domain, and is transmitted at a location occupying different symbols from the PBCH in time slot 1 of subframe 0 in the time domain.

[00148] Fig. 4 presents a divisional relationship in the time domain and the frequency domain of the broadcast channels of first kind and the broadcast channels of second kind, the broadcast channels of second kind may occupy last three symbols in time slot 1 in the time domain and occupy a location in the center of the band in the frequency domain. Fig. 4 presents 12 RBs in a central frequency band in two time slots of one subframe. The first four symbols in the time domain in 6 RBs in the second time slot are used for carrying the broadcast channels of first kind. The last three symbols in the time domain in the 6 RBs in the second time slot are used for carrying broadcast channels of second kind, wherein, resources

elements occupied by the broadcast channels of second kind are 214 REs.

[00149] The communication unit is specifically used for determining channel quality indication information based on received reference signal.

[00150] Correspondingly, the information processing unit is specifically used for determining a first number of the control channel resources units according to the channel quality indication information, and parsing to obtain the control information from the second control channel based on the first number of the control channel resources units.

[00151] Determining channel quality indication information based on the received reference signal may be: after receiving the reference signal (RS) by the electronic apparatus of second kind, determining a received power of reference signal according to the RS, and in turn determining the channel quality indication information according to the received power of reference signal.

[00152] By using the above-described method, the electronic apparatus of second kind can determine the first number of the control channel resources elements according to the currently calculated channel quality indication information, and in turn parse the control information according to the determined first number. The first number of the control channel resources elements may be a polymerization degree of CCE.

[00153] For example, the information processing unit is specifically used for parsing to obtain at least one piece of information of the following from the control information: paging information, system information block, random access response information and downlink control information corresponding to the electronic apparatus of second kind.

[00154] Further, a procedure of parsing the control information is described in combination with determining the first number of the control channel resources elements according to the channel quality indication information by the electronic apparatus of second kind as follows.

[00155] It assumes that resources of the control channel are in units of CCE, and the channel quality indication information is CQI, search directions in the time domain and the frequency domain of the control information can be shown in Fig. 8, that is, a direction in the time domain from early to late in time, and a direction in the frequency domain from high to low in frequency.

[00156] It should be noted that, generally, it is necessary to determine the information of the first number of the control channel resources elements to be downlink control information corresponding to each of the electronic apparatus of second kind according to the channel quality indication information of the electronic apparatus of second kind, and other several kinds of information is transmitted by using fixed number of control channel resources elements generally. A number of the control channel resources elements with respect to each kind of information can be shown as following table:

Control information	First number of the control channel resources elements	Times of blind detection
Downlink control information corresponding to the electronic apparatus of second kind	1	6
	2	3
System information block	2	3
Random access response information	2	3
Paging information	4	1

[00157] It can be seen from the table that, at the time of adopting different first numbers of the control channel resources elements, the times of blind detection with respect to the control channel of the electronic apparatus of second kind are different.

[00158] Hereinafter, a flow is explained in combination with Fig. 9 by taking parsing the downlink control information corresponding to the electronic apparatus of second kind as example.

[00159] Step 901: acquiring CQI by the electronic apparatus of second kind firstly.

[00160] Step 902: deciding whether the CQI is larger than a threshold, wherein, the threshold can be set as a matter of experience, for example, can be set as 8, i.e., $CQI > 8$, which illustrates that a quality of the downlink channel of a UE is good, a polymerization

degree is 1, and efficiency is high; otherwise, it illustrates that the quality of the downlink channel of the UE is not so good, the polymerization degree is 2, and it can be transmitted by using an encoding mode of lower code rate, which ensures that the UE can receive information of the PDCCH correctly. If the CQI is larger than the threshold, step 903 is
5 executed; otherwise, step 906 is executed.

[00161] Step 903: providing an extracting pointer to extract a single CCE to decode according to search directions.

[00162] Step 904: checking the extracted CCE by using a scrambling code itself to decide whether the checking is successful, and if it is successful, it determines that the control
10 information (DCI) is acquired successfully, and a processing flow ends; otherwise, step 905 is executed.

[00163] Step 905: deciding whether the extracting pointer extracted currently has already pointed to an end of the second control channel, and if the current extracting pointer has already pointed to the end of the second control channel, it determines that acquisition of
15 DCI fails, and the processing flow ends; otherwise, it returns to step 903.

[00164] Step 906: setting an extracting pointer to extract two CCEs to decode according to the searching directions.

[00165] Step 907: checking the extracted two CCEs by using the scrambling code itself to decide whether the checking is successful, if it is successful, it determines that the control
20 information (DCI) is acquired successfully, and the processing flow ends; otherwise, step 908 is executed.

[00166] Step 908: deciding whether the current extracting pointer has already pointed to the end of the second control channel, and if the current extracting pointer has already pointed to the end of the second control channel, it determines that the acquisition of the DCI
25 fails, and the processing flow ends; otherwise, it returns to step 906.

[00167] Only a method of parsing the downlink control information corresponding to the electronic apparatus of second kind is provided above, however, it can understand that methods of parsing the system information block, the random access response information and the paging information are same as the above methods, except a step of checking using
30 the scrambling code itself is removed.

[00168] It can be seen that, by adopting the above-described solution, the control information for the electronic apparatus of second kind can be mapped to the second control channel and the control information can be transmitted to the electronic apparatus of second kind. Thus, the electronic apparatus of second kind supporting less band width can search the control information from the second control channel, so as to reduce the searching complexity of the electronic apparatus of second kind, and in turn reduce a power consumption and latency of the electronic apparatus of second kind , and can be compatible to the original broadcast channel.

[00169] Fifth embodiment

[00170] The embodiment further provides an information processing system, as shown in Fig. 12, the information processing system includes: a base station 1201 for determining a second control channel different from a first control channel, wherein, the first control channel is used for providing control information for an electronic apparatus of first kind, and the second control channel is used for providing control information for an electronic apparatus of second kind, and the bandwidth supported by the electronic apparatus of first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first bandwidth; generating control information for the electronic apparatus of second kind; mapping the control information for the electronic apparatus of second kind to the second control channel; and transmitting the corresponding control information to the electronic apparatus of second kind through the second control channel; an electronic apparatus 1202 for accessing to a second control channel and acquiring corresponding control information from the second control channel.

[00171] Here, the first control channel may be a physical downlink control channel (PDCCH) for mainly carrying dispatch and other control information, which may specifically include information of transmission format, allocation of resource, uplink dispatch permission, power control and uplink retransmission or the like. PDCCH is defined with: resource element group (RE Group, REG) and control channel element (CCE). Wherein, one CCE is constituted of nine REGs.

[00172] In the present embodiment, the electronic apparatus of first kind may be a common mobile terminal, and the first band width may be 20M, and generally, the electronic apparatus of first kind may support a communication band width of 1.4M, 5M, 10M, 15M and 20M or the like. The electronic apparatus of second kind may be a machine type communication (MTC) terminal, and correspondingly, the second band width only can be 1.4M.

[00173] Further, functions provided by the electronic apparatus and the base station providing in the present embodiment are same as those in the above embodiments, and they are no longer described for redundancy.

[00174] It can be seen that, by adopting the above-described solution, the control information for the electronic apparatus of second kind can be mapped to the second control channel and the control information can be transmitted to the electronic apparatus of second kind. Thus, the electronic apparatus of second kind supporting less band width can search the control information from the second control channel, so as to reduce the searching complexity of the electronic apparatus of second kind, and in turn reduce a power consumption and latency of the electronic apparatus of second kind.

[00175] In the several embodiments provided by this disclosure, it is understood that the disclosed apparatus and method can be implemented by other means. For example, the above-described embodiment of the apparatus is only schematic, for example, the division of the units is only a logical functional division, and there can be other manners of division in the actual implementation, for example, a plurality of units or components can be combined or integrated into another system, or some features can be neglected or are not implemented. Further, coupling or direct coupling or communication connection between the respective constituent parts shown or discussed may be indirect coupling or communication connection through some interfaces, apparatus or units, and may be electrical, mechanical or other forms.

[00176] The above - described units explained as separate components may be or may not be separated physically, components shown as units may be or may not be physical units, that is, they may be positioned at one place, or may be distributed onto a plurality of network units, or a part or all of the unit therein can be selected according to actual requirement to implement purposes of the solutions of the embodiments.

[00177] Further, all of the respective functional units in the embodiments can be integrated into one processing module; or the respective units exists as one unit respectively; or two or more units are integrated into one unit; the above - described integrated units can be implemented in form of hardware or in form of hardware plus software functional unit.

5 [00178] Those skilled in the art can understand: a part or all of steps for implementing the above - described embodiment of method can be implemented by hardware related to programmed instruction, and aforementioned program may be stored in a computer readable storage medium, and executes steps including the above - described embodiment of method at the time of being executed; and aforementioned storage medium includes: media which is
10 able to store program code such as a portable storage apparatus, a read-only memory (ROM), a random access memory (RAM), a magnetic disk or an optical disk or the like.

[00179] The above mentioned are only the detailed implementations of this disclosure, but the range sought for protection of this disclosure is not limited thereto, variations or replacements thought out by those skilled in the art easily in the technical range disclosed in
15 this disclosure should be covered within the range sought for protection by this disclosure. Therefore, the range sought for protection by the present disclosure is defined by the protection range of the claim.

CLAIMS

WHAT IS CLAIMED IS:

1. An information processing method, comprising:

5 acquiring control information for an electronic apparatus of second kind, and the electronic apparatus of second kind is different from a electronic apparatus of first kind, and the bandwidth supported by the electronic apparatus of first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first bandwidth;

10 mapping the control information for the electronic apparatus of second kind to a second control channel; and the second control channel is different from a first control channel which is used for providing control information for the electronic apparatus of first kind, and

transmitting the control information to the electronic apparatus of second kind through the second control channel.

15 2. The method according to claim 1, wherein the method further comprising:

acquiring resource management information for the electronic apparatus of second kind, wherein, the resource management information is used for indicating a location of resource of the second control information;

mapping the resource management information to a broadcast channel; and

20 transmitting the resource management information to the electronic apparatus of second kind through the broadcast channel.

3. The method according to claim 1 or 2, wherein the second control channel comprising: control channel resources elements of preset number;

correspondingly,

25 mapping the control information for the electronic apparatus of second kind to the second control channel comprising:

determining a first number of the control channel resources units required by carrying the control information for the electronic apparatus of second kind; and

30 mapping the control information for the electronic apparatus of second kind to the second control channel including the control channel resources units of the first number.

4. The method according to claim 3, wherein determining the first number of the control channel resources elements required by carrying the control information of the electronic apparatus of second kind comprising:

acquiring channel quality indication information transmitted from the electronic
5 apparatus of second kind; and

determining the first number of the control channel resources units required by carrying the control information for the electronic apparatus of second kind based on the channel quality indication information.

5. The method according to claim 1, wherein acquiring control information for the
10 electronic apparatus of second kind comprising:

treating at least one piece of information of paging information, system information block, random access response information, downlink control information corresponding to the electronic apparatus of second kind as the control information for the electronic apparatus of second kind.

6. An information processing method applied in an electronic apparatus which is an
15 electronic apparatus of second kind different from an electronic apparatus of first kind, and the bandwidth supported by the electronic apparatus of first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first bandwidth, and the information
20 processing method comprising:

accessing to a second control channel, wherein, the second control channel is different from a first control channel, and the first control channel is used for providing control information for the electronic apparatus of first kind, and the second control channel is used for providing control information for the electronic apparatus of second kind; and

25 acquiring control information from the second control channel.

7. The method according to claim 6, wherein the method further comprising:

acquiring resource management information for the electronic apparatus of second kind from broadcast channel, wherein, the resource management information is used for indicating a location of resource of the second control information; and

30 accessing to corresponding resource according to the resource management information.

8. The method according to claim 6 or 7, wherein, acquiring the control information from the second control channel comprising:

determining channel quality indication information based on received reference signal;

5 determining a first number of control channel resources elements according to the channel quality indication information; and

parsing to obtain the control information from the second control channel based on the first number of the control channel resources elements.

9. The method according to claim 6, wherein, after acquiring the control information from the second control channel, the method further comprising:

10 parsing to obtain at least one piece of following information from the control information: paging information, system information block, random access response information and downlink control information corresponding to the electronic apparatus of second kind.

10. A base station, the base station comprising:

15 an information acquiring unit for acquiring control information for an electronic apparatus of second kind, and the electronic apparatus of second kind is different from a electronic apparatus of first kind, and the bandwidth supported by the electronic apparatus of first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first
20 bandwidth;

a processing unit for mapping the control information for the electronic apparatus of second kind to the second control channel, and the second control channel is different from a first control channel which is used for providing control information for the electronic apparatus of first kind; and

25 a communication unit for transmitting the control information to the electronic apparatus of second kind through the second control channel.

11. The base station according to claim 10, wherein, the information acquiring unit is further used for acquiring resource management information for the electronic apparatus of second kind, and the resource management information is used for indicating a location of
30 resource of the second control information;

the processing unit is further used for mapping the resource management information to a broadcast channel; and

the communication unit is further used for transmitting the resource management information to the electronic apparatus of second kind through the broadcast channel.

5 12. The base station according to claim 10 or 11, wherein the second control channel comprising: preset number of control channel resources elements;

correspondingly,

the processing unit is specifically used for determining a first number of the control channel resources units required by carrying the control information for the electronic
10 apparatus of second kind and mapping the control information for the electronic apparatus of second kind to the second control channel including the control channel resources units of the first number.

13. The base station according to claim 12, wherein, the processing unit is specifically used for acquiring channel quality indication information transmitted by the electronic
15 apparatus of second kind, and determining the first number of the control channel resources units required by carrying the control information for the electronic apparatus of second kind based on the channel quality indication information.

14. The base station according to claim 10, wherein, the information acquiring unit is specifically used for treating at least one piece of information of paging information, system
20 information block, random access response information, the downlink control information corresponding to the electronic apparatus of second kind as the control information for the electronic apparatus of second kind.

15. An electronic apparatus which is an electronic apparatus of second kind different from an electronic apparatus of first kind, and the bandwidth supported by the electronic
25 apparatus of first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first bandwidth, and the electronic apparatus comprising:

a communication unit for accessing to a second control channel, wherein, the second control channel is different from a first control channel, and the first control channel is used
30 for providing control information for the electronic apparatus of first kind, and the second

control channel is used for providing control information for the electronic apparatus of second kind; and

an information processing unit for acquiring control information from the second control channel.

5 16. The electronic apparatus according to claim 15, wherein, the information processing unit is further used for acquiring resource management information for the electronic apparatus of second kind from a broadcast channel, wherein the resource management information is used for indicating a location of resource of the second control information; and accessing to corresponding resource according to the resource management information.

10 17. The electronic apparatus according to claim 15 or 16, wherein, the communication unit is specifically used for determining channel quality indication information based on received reference signal;

correspondingly, the information processing unit is specifically used for determining a first number of the control channel resources units according to the channel quality indication information, and parsing to obtain the control information from the second control channel based on the first number of the control channel resources units.

15 18. The electronic apparatus according to claim 15, wherein, the information processing unit is specifically used for parsing to obtain at least one piece of information of the following from the control information: paging information, system information block, random access response information and downlink control information corresponding to the electronic apparatus of second kind.

19. An information processing system comprising:

a base station for acquiring control information for the electronic apparatus of second kind, and the electronic apparatus of second kind is different from a electronic apparatus of first kind, and the bandwidth supported by the electronic apparatus of first kind is no more than a first bandwidth, and the bandwidth supported by the electronic apparatus of second kind is no more than a second bandwidth which is less than the first bandwidth; mapping the control information for an electronic apparatus of second kind to a second control channel, and the second control channel is different from a first control channel which is used for providing control information for the electronic apparatus of first kind; and transmitting the

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control information to the electronic apparatus of second kind through the second control channel; and

an electronic apparatus for accessing to the second control channel and acquiring control information from the second control channel.

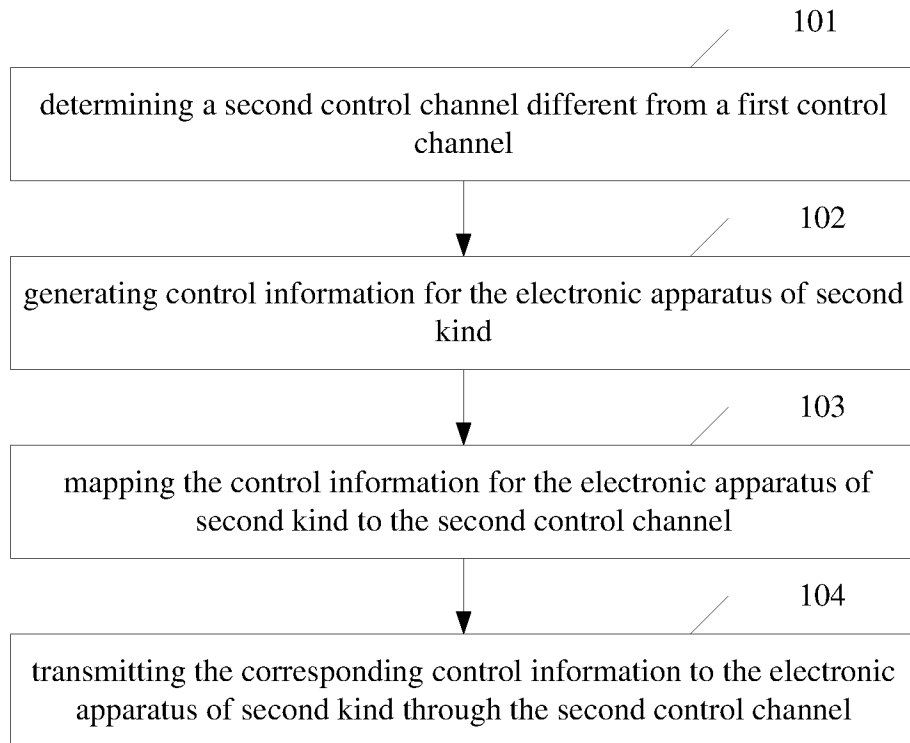


Fig. 1

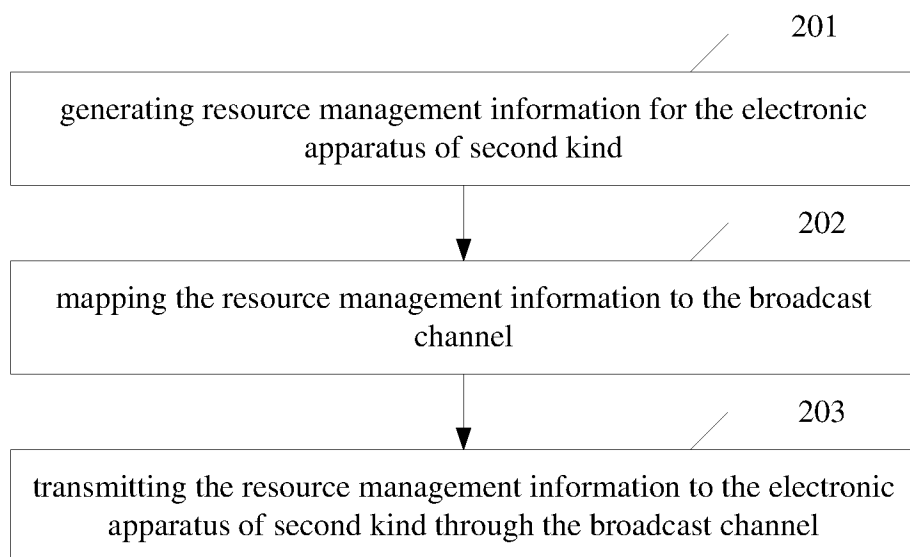


Fig. 2

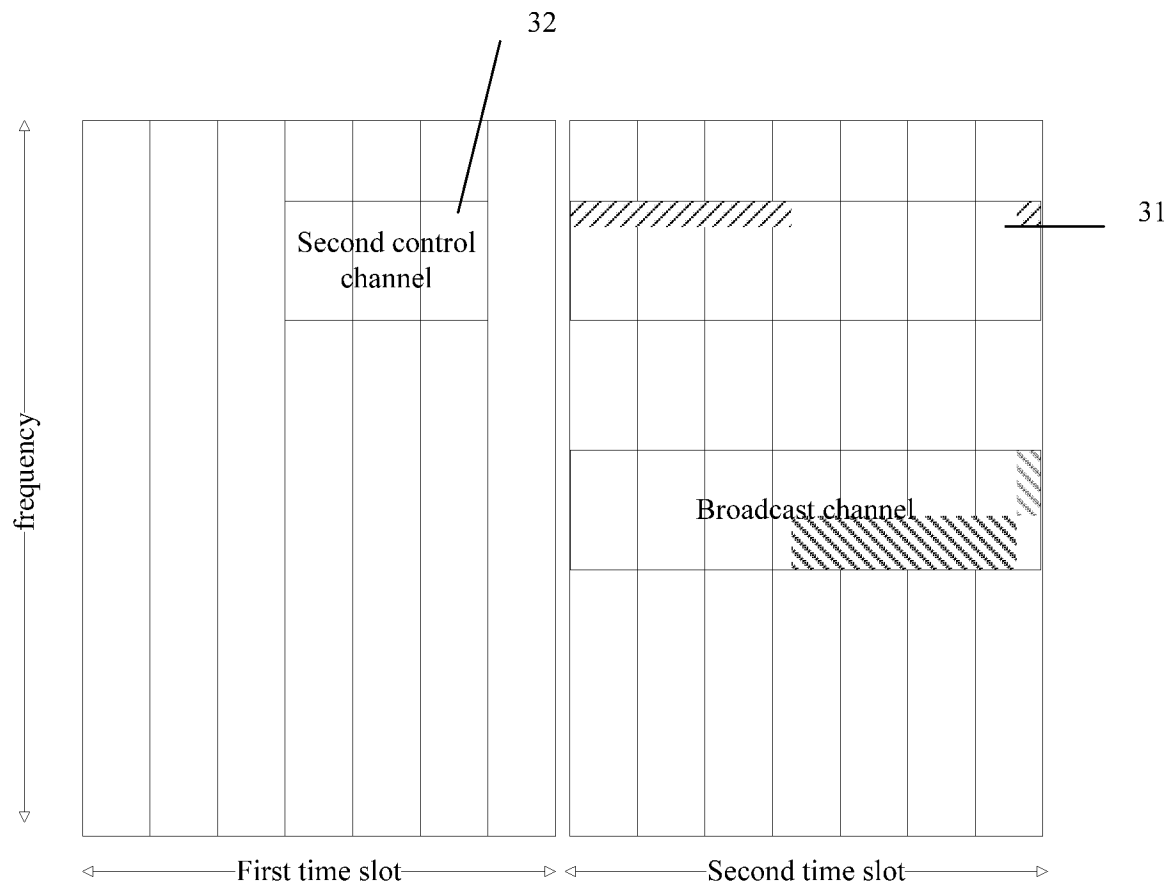


Fig. 3

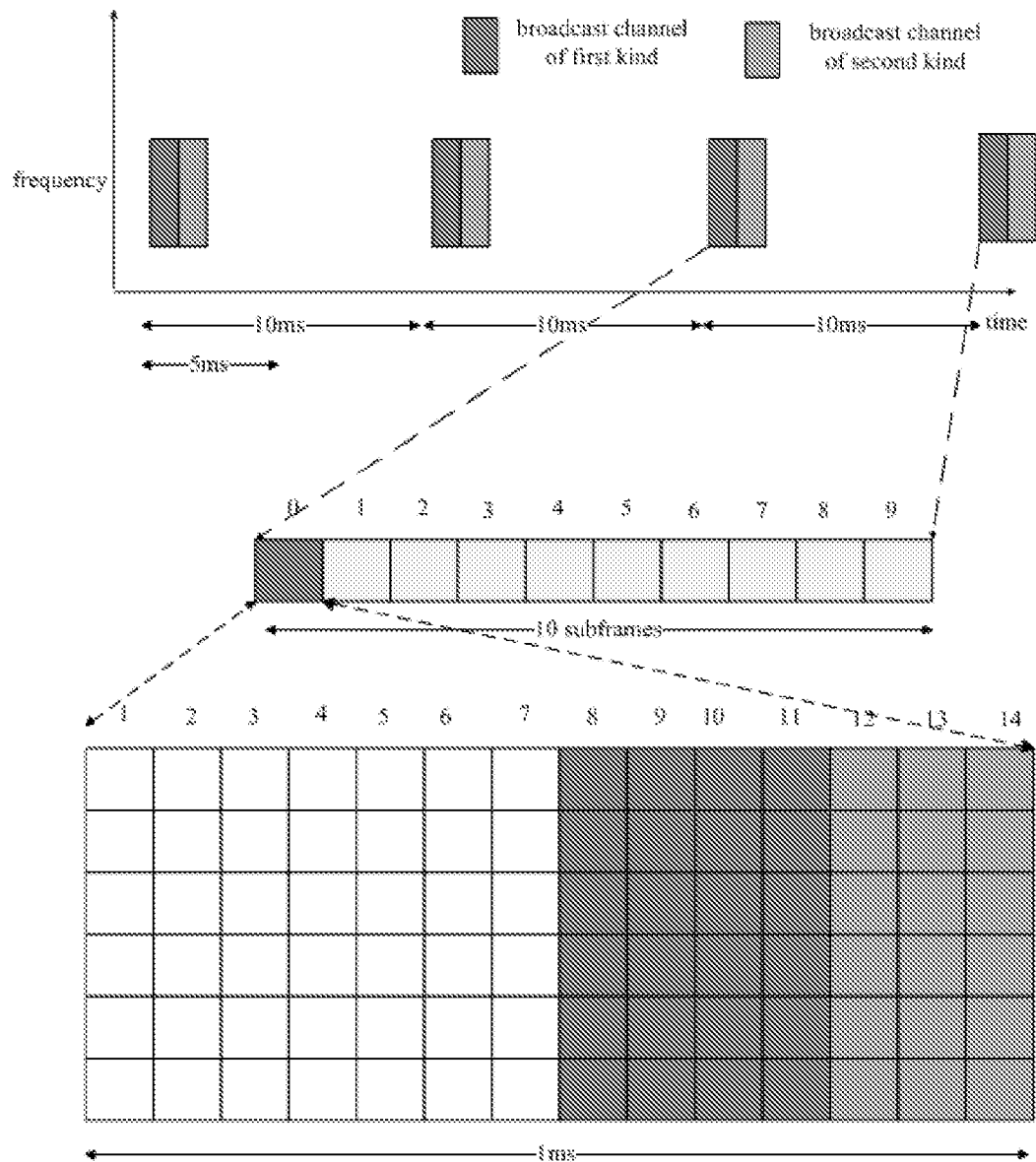


Fig. 4

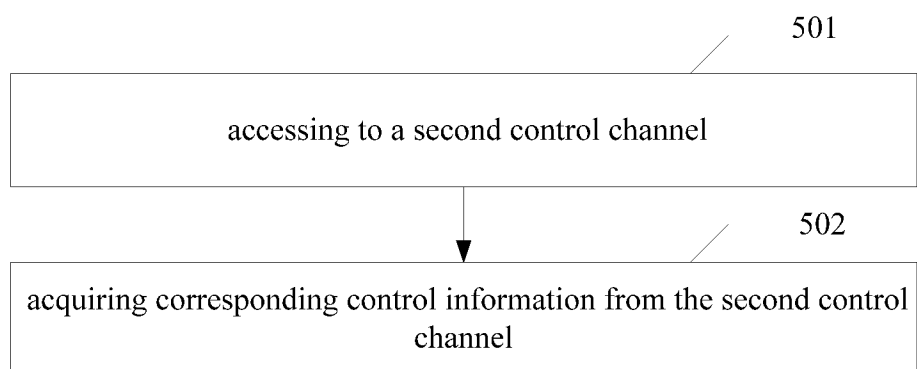


Fig. 5

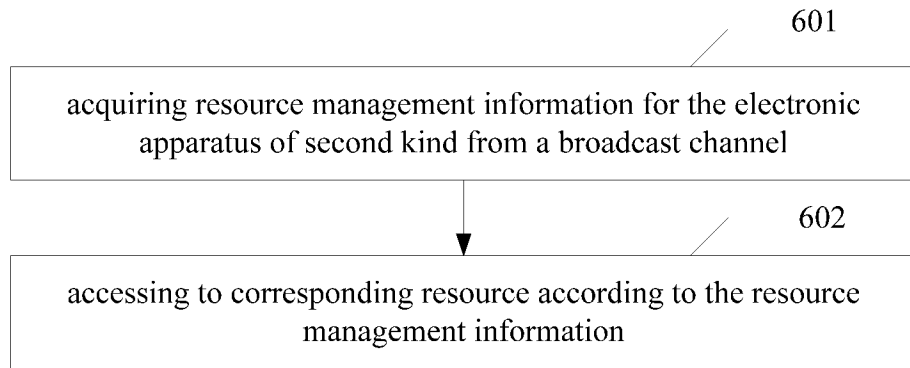


Fig. 6

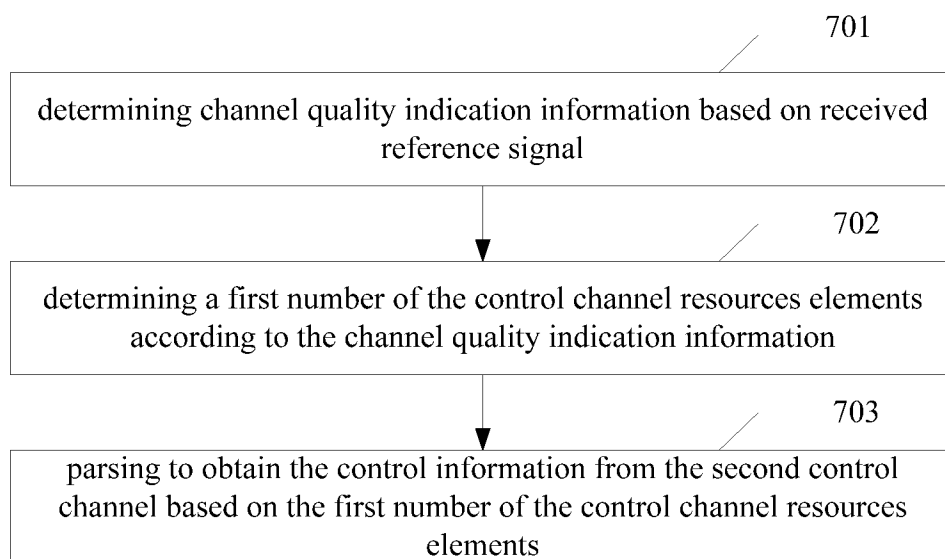


Fig. 7

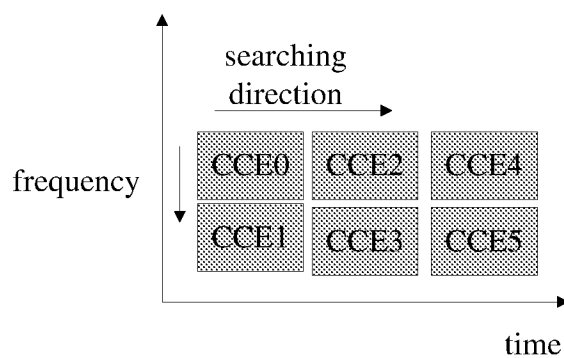


Fig. 8

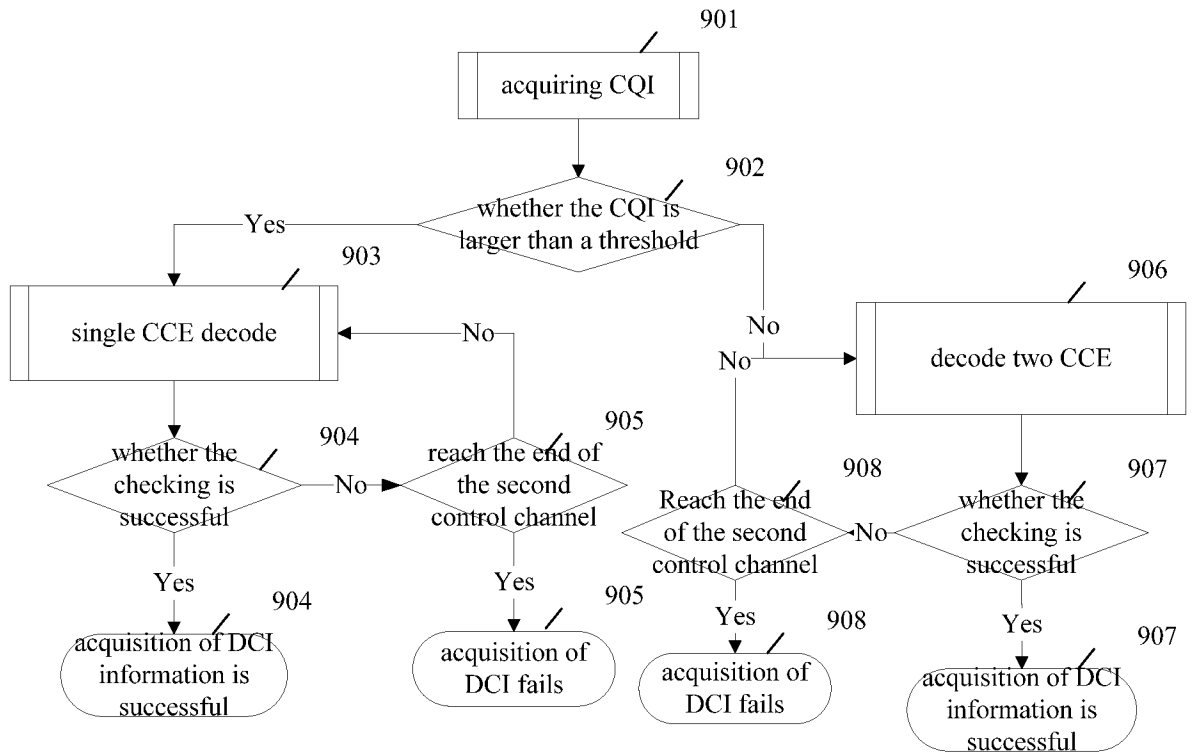


Fig. 9

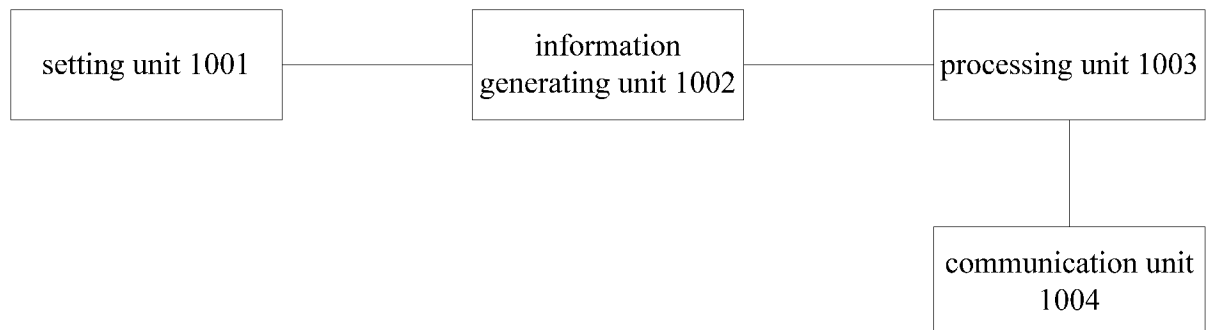


Fig. 10



Fig. 11



Fig. 12

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2015/089267

A. CLASSIFICATION OF SUBJECT MATTER

H04W 24/00(2009.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04W; H04Q; H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNPAT,CNKI,WPI,EPODOC,IEEE,3GPP: control channel, control information, first, second, kind, type, bandwidth, less, more, map+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 101155399 A (BEIJING SAMSUNG TELECOM TECHNOLOGY CO., LTD. ET AL.) 02 April 2008 (2008-04-02) abstract, description, page 9 paragraph 4 – page 11 paragraph 7	1-19
A	US 2011149890 A1 (LG ELECTRONICS INC.) 23 June 2011 (2011-06-23) the whole document	1-19
A	CN 101808411 A (ZTE CORPORATION) 18 August 2010 (2010-08-18) the whole document	1-19
A	WO 2013000814 A2 (TELEFONAKTIEBOLAGET L M ERICSSON) 03 January 2013 (2013-01-03) the whole document	1-19



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

“A” document defining the general state of the art which is not considered to be of particular relevance

“E” earlier application or patent but published on or after the international filing date

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“O” document referring to an oral disclosure, use, exhibition or other means

“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

15 December 2015

Date of mailing of the international search report

05 January 2016

Name and mailing address of the ISA/CN

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Telephone No. (86-10)82245296

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2015/089267

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	101155399	A	02 April 2008	None			
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				KR	20110070684	A	24 June 2011
				CN	102696271	A	26 September 2012
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WO	2013000814	A2	03 January 2013	CN	103621146	A	05 March 2014
				JP	2014526159	A	02 October 2014
				US	2012327894	A1	27 December 2012
				US	2014357272	A1	04 December 2014
				EP	2724565	A2	30 April 2014