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(54) **CONTROL METHOD AND APPARATUS FOR COOLING BEVERAGE, AND REFRIGERATOR**

(57) Provided are a control method and apparatus for cooling beverage, and a refrigerator. The control method for cooling beverages is applied in a refrigerator. The method includes: obtaining parameter information of a beverage to be cooled in the refrigerator; determining, based on the parameter information of the beverage, a cooling time length required for cooling beverage to a specified temperature; and controlling the refrigerator to refrigerate the beverage and start a timekeeping, and prompting, in response to the timekeeping reaching the

cooling time length, a user by a predetermined prompting manner. The method can effectively manage the cooling time of the beverage by determining the cooling time length required for cooling beverage to the specified temperature, and prompt the user when the cooling time length is reached, thereby avoiding the problems that the beverage is inadequate for the user due to the undesired temperature or excessively low temperature thereof. In this way, the intelligence of the refrigerator and the user experience is improved.

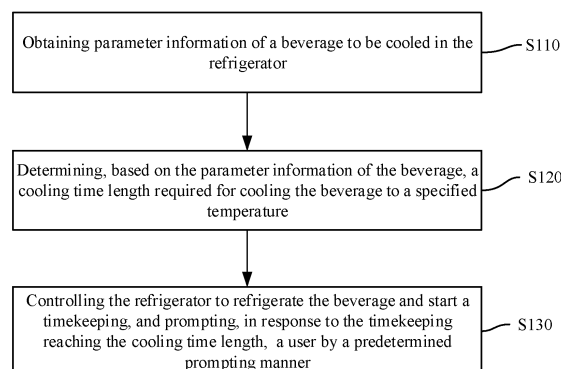


FIG. 1

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Application No. 201911106145.9, titled "CONTROL METHOD AND APPARATUS FOR COOLING BEVERAGE, AND REFRIGERATOR" and filed with the China National Intellectual Property Administration on November 13, 2019, which is incorporated herein by reference in its entirety.

FIELD

[0002] The present disclosure relates to the field of refrigeration technology, and in particular, to a control method and apparatus for cooling beverage, a refrigerator, and a computer-readable storage medium.

BACKGROUND

[0003] Refrigerator or refrigeration equipment uses cold air to keep various foods or beverages in fresh state for a long time. When refrigerant in the form of liquid in a typical refrigeration cycle in the refrigerator from surrounding environment is changed to vapor, cold air is generated and supplied to a storage space.

[0004] In the related art, when a user puts a beverage into a fresh food compartment, due to a relatively small temperature difference between the fresh food compartment and the beverage, the cooling of the beverage is slow, which cannot meet the demand for rapid cooling. When the user puts the beverage into a freezer compartment, due to a relatively great temperature difference between the freezer compartment and the beverage, the cooling of the beverage is rapid. Since it is impossible to know when it is the optimal time for drinking, if the beverage is not taken out after a long time period, the beverage will freeze or crack, resulting in a poor user experience.

SUMMARY

[0005] The purpose of the present disclosure is to solve one of the technical problems in the related art at least to a certain extent.

[0006] Therefore, one purpose of the present disclosure is to propose a control method for cooling beverage, which can effectively manage the cooling time of the beverage and then prompt the user when reaching the cooling time length to avoid the problems that the beverage is inconvenient for the user because the temperature of the beverage is undesirable or too low. In this way, the intelligence of the refrigerator and the user experience is improved.

[0007] A second purpose of the present disclosure is to propose a control apparatus for cooling beverage.

[0008] A third purpose of the present disclosure is to

propose a refrigerator.

[0009] A fourth purpose of the present disclosure is to propose a computer-readable storage medium.

[0010] In order to achieve the above purpose, the control method for cooling beverage is proposed according to the embodiments of a first aspect of the present disclosure. The method is applied in a refrigerator. The method includes: obtaining parameter information of a beverage to be cooled in the refrigerator; determining, based on the parameter information of the beverage, a cooling time length required for the beverage to be cooled to a specified temperature; and controlling the refrigerator to refrigerate the beverage and start a timekeeping, and prompting, in response to the timekeeping reaching the cooling time length, a user by a predetermined prompting manner.

[0011] In the control method for cooling beverage according to the embodiments of the present disclosure, the parameter information of the beverage to be cooled in the refrigerator can be obtained, and based on the parameter information of the beverage, the cooling time length required for cooling beverage to a specified temperature can be determined. Then, the refrigerator is controlled to refrigerate the beverage and start a timekeeping, and when the timekeeping reaches the cooling time length, the user will be prompted by a predetermined prompting manner. The method can effectively manage the cooling time of the beverage by determining the cooling time length required for cooling beverage to the specified temperature, and prompt the user when the cooling time length is reached, thereby avoiding the problems that the beverage is inadequate for the user due to the undesired temperature or excessively low temperature thereof. In this way, the intelligence of the refrigerator and the user experience is improved.

[0012] According to an embodiment of the present disclosure, the parameter information includes a volume of a beverage bottle and the number of the beverage bottles.

[0013] According to an embodiment of the present disclosure, the refrigerator includes an electronic screen disposed on a housing thereof, and the parameter information is set by the user through the electronic screen.

[0014] According to an embodiment of the present disclosure, the refrigerator includes an indicator light disposed thereon, and the indicator light is controlled to flash to prompt the user.

[0015] According to an embodiment of the present disclosure, the refrigerator includes a sound prompting module disposed thereon, and said prompting the user by the predetermined prompting manner includes: broadcasting, by the sound prompting module, voice prompting information.

[0016] According to an embodiment of the present disclosure, said obtaining the parameter information of the beverage to be cooled in the refrigerator includes: obtaining parameter information set by the user for the beverage through a terminal device. The terminal device is

in a communication connection with the refrigerator.

[0017] According to an embodiment of the present disclosure, said prompting the user by the predetermined prompting manner includes: generating prompting information, and transmitting the prompting information to the terminal device to allow the user to learn the prompting information through the terminal device.

[0018] In order to achieve the above purpose, the control apparatus for cooling beverage is proposed according to the embodiment of the present disclosure in the second aspect. The apparatus is applied in a refrigerator, and the apparatus includes: an obtaining module configured to obtain parameter information of a beverage to be cooled in the refrigerator; a determination module configured to determine, based on the parameter information of the beverage, a cooling time length required for cooling beverage to a specified temperature; and a refrigeration module configured to control the refrigerator to refrigerate the beverage and start a timekeeping, and prompt, in response to the timekeeping reaching the cooling time length, the user by a predetermined prompting manner.

[0019] According to the control apparatus for cooling beverage in the embodiment of the present disclosure, the parameter information of the beverage to be cooled in the refrigerator can be obtained, and then based on the parameter information of the beverage, the cooling time length required for cooling beverage to a specified temperature is determined, and then the refrigerator is controlled to refrigerate the beverage and start a timekeeping, and when the timekeeping reaches the cooling time length, the user will be prompted by a predetermined prompting manner. In this way, the cooling time of the beverage can be effectively managed by determining the cooling time length required for cooling beverage to the specified temperature, and then the user can be prompted when the cooling time length is reached, thereby avoiding the problems that the beverage is inconvenient for the user to use because the beverage does not reach the suitable temperature or has a very low temperature. In this way, the intelligence of the refrigerator and the user experience is improved.

[0020] According to an embodiment of the present disclosure, the parameter information includes a volume of a beverage bottle and the number of the beverage bottles.

[0021] According to an embodiment of the present disclosure, the refrigerator includes an electronic screen disposed on a housing thereof, and the parameter information is set by the user through the electronic screen.

[0022] According to an embodiment of the present disclosure, the refrigerator includes an indicator light disposed thereon, and the indicator light is controlled to flash to prompt the user.

[0023] According to an embodiment of the present disclosure, the refrigerator includes a sound prompting module disposed thereon, and said prompting the user by the predetermined prompting manner includes: broadcasting, by the sound prompting module, voice prompting

information.

[0024] According to an embodiment of the present disclosure, the obtaining module is further configured to: obtain parameter information set by the user for the beverage through a terminal device. The terminal device is in a communication connection with the refrigerator.

[0025] According to an embodiment of the present disclosure, said prompting the user by the predetermined prompting manner includes: generating prompting information, and transmitting the prompting information to the terminal device to allow the user to learn the prompting information through the terminal device.

[0026] In order to achieve the above purpose, the refrigerator is proposed according to the embodiment of the present disclosure in the third aspect. The refrigerator includes: a memory, a processor, and a computer program stored in the memory and executable on the processor. The processor, when executing the computer program, implements the control method for cooling beverage described in the embodiments of the present disclosure in the first aspect.

[0027] In order to achieve the above purpose, the computer-readable storage medium is proposed according to the embodiment of the present disclosure in the fourth aspect. The computer-readable storage medium has a computer program stored thereon, and the computer program, when being executed by a processor, implements the control method for cooling beverage described in the embodiments of the present disclosure in the first aspect.

[0028] Additional aspects and advantages of the present disclosure will be set forth in part in the following description, and in part will be apparent from the following description or learned by practice of the present disclosure.

BRIEF DESCRIPTION OF DRAWINGS

[0029] The above and/or additional aspects and advantages of the present disclosure will become apparent and readily understood from the following description of embodiments, taken in conjunction with the accompanying drawings.

FIG. 1 is a flowchart of a control method for cooling beverage according to an embodiment of the present disclosure.

FIG. 2 is a flowchart of a control method for cooling beverage according to a specific embodiment of the present disclosure.

FIG. 3 is a schematic structural diagram of a control apparatus for cooling beverage according to an embodiment of the present disclosure.

FIG. 4 is a schematic structural diagram of a refrigerator according to an embodiment of the present disclosure.

DESCRIPTION OF EMBODIMENTS

[0030] Embodiments of the present disclosure will be described in detail below. Examples of the embodiments are illustrated in the accompanying drawings, throughout which the same or similar reference numerals refer to the same or similar elements or elements having the same or similar functions. The embodiments described below with reference to the accompanying drawings are illustrative and only used to explain the present disclosure, and should not be construed as limitation on the present disclosure.

[0031] In the related art, when a user puts a beverage into a fresh food compartment, due to a relatively small temperature difference between the fresh food compartment and the beverage, the cooling of the beverage is slow, which cannot meet the demand for rapid cooling. When the user puts the beverage into a freezer compartment, due to a relatively great temperature difference between the freezer compartment and the beverage, the cooling of the beverage is rapid. Since it is impossible to know when it is the optimal time for drinking, if the beverage is not taken out after a long time period, the beverage will freeze or crack, resulting in a poor user experience.

[0032] In order to solve the technical problems existing in the above-mentioned related technologies, the present disclosure proposes a control method for cooling beverage. The method is applied in a refrigerator. The method includes: obtaining parameter information of a beverage to be cooled in the refrigerator; determining, based on the parameter information of the beverage, a cooling time length required for the beverage to be cooled to a specified temperature; and controlling the refrigerator to refrigerate the beverage and start a timekeeping, and prompting, in response to the timekeeping reaching the cooling time length, a user by a predetermined prompting manner.

[0033] FIG. 1 is a flowchart of a control method for cooling beverage according to an embodiment of the present disclosure. It should be noted that the control method for cooling beverage in the embodiments of the present disclosure can be applied in a control apparatus for cooling beverage in the embodiments of the present disclosure, and the control apparatus for cooling beverage can be applied in a refrigerator.

[0034] As illustrated in FIG. 1, the control method for cooling beverage may include the following actions in blocks.

[0035] At S110, the parameter information of the beverage to be cooled in the refrigerator is obtained.

[0036] In an embodiment of the present disclosure, the user can set the parameter information for the beverage to be cooled through a terminal device. Correspondingly, a control apparatus in the refrigerator can obtain the parameter information set for the beverage from the terminal device. The terminal device and the refrigerator have established a communication connection therebetween.

The parameter information includes a volume of a beverage bottle and the number of the beverage bottles.

[0037] It should be noted that the communication connection includes, but is not limited to, a WIFI connection, a Bluetooth connection, and the like.

[0038] The terminal device includes, but is not limited to, a hardware device such as a mobile phone and a tablet computer.

[0039] In another embodiment of the present disclosure, the user can set parameter information for the beverage through an electronic screen disposed on the refrigerator. Specifically, the electronic screen can be disposed on a housing of the refrigerator, such that the parameter information set by the user for the beverage through the electronic screen can be obtained.

[0040] For example, after the user puts the beverage at any position in the freezer compartment of the refrigerator, the volume of the beverage bottle and the number of beverage bottles can be set through the electronic screen on the refrigerator, and correspondingly, the control apparatus in the refrigerator can obtain, based on the user's setting operation, the volume of the beverage bottle of the beverage to be cooled and the number of the beverage bottles. The volume of the beverage bottle is 0.4 L, and the number of the beverage bottles is 1.

[0041] In another embodiment of the present disclosure, an image of the beverage to be cooled may be captured by a camera, the captured image information of the beverage can be analyzed to determine the parameter information of the beverage to be cooled.

[0042] Specifically, after it is detected that the user puts the beverage into the refrigerator, the camera in the refrigerator can capture the image of the beverage put into the refrigerator, and transmit the captured image information of the beverage to a control apparatus. Correspondingly, the control apparatus can analyze the image information of the beverage to determine identification information of the beverage to be cooled, and obtain, based on the identification information, the volume of the beverage bottle of the beverage to be cooled, and determine the number of the beverage bottles of the beverage to be cooled by analyzing the image information of the beverage.

[0043] At S120, based on the parameter information of the beverage, the cooling time length required for cooling beverage to a specified temperature is determined.

[0044] That is to say, after obtaining the volume of the beverage bottle and the number of the beverage bottles, the cooling time length required for cooling beverage to the specified temperature can be determined through a beverage rapid cooling algorithm based on the volume of the beverage bottle and the number of the beverage bottles.

[0045] It can be understood that when the volume of the beverage bottle is larger and the number of the beverage bottles is greater, the cooling time length required for cooling beverage to the specified temperature is longer; and when the volume of the beverage bottle is smaller

and the number of the beverage bottles is smaller, the cooling time length required for cooling beverage to the specified temperature is shorter.

[0046] The specified temperature in the present embodiment may be a default temperature value set in the refrigerator, or a temperature value preset in the refrigerator by a user according to requirements, in order to meet the user's requirement for personalized setting of beverage temperature.

[0047] In this embodiment, the user can preset the temperature value in the refrigerator. For example, the specified temperature can be preset through the electronic screen on the refrigerator, or the specified temperature can be set through the terminal device connected to the refrigerator, which is not specifically limited in the present embodiment.

[0048] At S130, the refrigerator is controlled to refrigerate the beverage and start a timekeeping, and in response to the timekeeping reaching the cooling time length, a user is prompted by a predetermined prompting manner.

[0049] In the embodiment of the present disclosure, prompting information may be generated, and the prompting information may be transmitted to the terminal device, so that the user can learn the prompting information through the terminal device.

[0050] That is to say, after obtaining the volume of the beverage bottle and the number of the beverage bottles, which are set by the user through the terminal device for the beverage, the cooling time length required for cooling beverage to the specified temperature is determined, and then the refrigerator is controlled to refrigerate the beverage and start the timekeeping. When the timekeeping reaches the cooling time length, the prompting information can be generated and transmitted to the terminal device, so that the user can learn the prompting information through the terminal device.

[0051] In addition to the above-mentioned prompting manners, in order to provide the user with various prompting manners, in the embodiments of the present disclosure, the refrigerator may include an electronic screen disposed on a housing thereof, and the user can be prompted through the electronic screen.

[0052] For example, the user sets the volume of the beverage bottle and the number of the beverage bottles through the electronic screen, where the volume of the beverage bottle is 0.4L and the number of the beverage bottles is 1, and then the cooling time length required for cooling beverage to the specified temperature is determined to be 18 minutes. Then, the refrigerator is controlled to refrigerate the beverage and start the timekeeping. When the timekeeping reaches 18 minutes, the electronic screen disposed on the housing of the refrigerator displays "Time is up, please take all the beverages".

[0053] In the embodiments of the present disclosure, the refrigerator may include an indicator light disposed thereon, and the indicator light is controlled to flash to prompt the user.

[0054] For example, after the cooling time length required for cooling beverage to the specified temperature is determined, the refrigerator can be controlled to refrigerate the beverage and start the timekeeping. When the timekeeping reaches the cooling time length, the indicator light disposed on the refrigerator flashes to prompt the user.

[0055] In the embodiments of the present disclosure, the refrigerator may further include a sound prompting module disposed thereon, and the user can be prompted in such a prompting manner that the sound prompting module broadcasts voice prompting information. For example, after the cooling time length required for cooling beverage to the specified temperature is determined, the refrigerator can be controlled to refrigerate the beverage and start the timekeeping. When the timekeeping reaches the cooling time length, the sound prompting module on the refrigerator will voice broadcast to prompt the user.

[0056] In the embodiments of the present disclosure, the refrigerator may further include an alarm prompting module disposed thereon, and the user is prompted by the alarm module in a voice prompting manner. For example, after the cooling time length required for cooling beverage to the specified temperature is determined, the refrigerator can be controlled to refrigerate the beverage and start the timekeeping. When the timekeeping reaches the cooling time length, the alarm prompting module on the refrigerator prompts the user in the voice prompting manner, and then the user may open the refrigerator door to cancel the alarm mode.

[0057] In the control method for cooling beverage according to the embodiments of the present disclosure, the parameter information of the beverage to be cooled in the refrigerator can be obtained, and based on the parameter information of the beverage, the cooling time length required for cooling beverage to a specified temperature can be determined. Then, the refrigerator is controlled to refrigerate the beverage and start a timekeeping, and when the timekeeping reaches the cooling time length, the user will be prompted by a predetermined prompting manner. The method can effectively manage the cooling time of the beverage by determining the cooling time length required for cooling beverage to the specified temperature, and prompt the user when the cooling time length is reached, thereby avoiding the problems that the beverage is inadequate for the user due to the undesired temperature or excessively low temperature thereof. In this way, the intelligence of the refrigerator and the user experience is improved.

[0058] In order to facilitate those skilled in the art understanding the present disclosure, the control method for cooling beverage according to the embodiments of the present disclosure will be further described below with reference to FIG. 2.

[0059] As illustrated in FIG. 2, a user puts a beverage into a refrigerator (S201), and then the user sets a volume of a beverage bottle and the number of the beverage bottles through a terminal device (S202). The refrigerator

obtains the volume of the beverage bottle and the number of the beverage bottles that the user set through the terminal device (S203). Based on the volume of the beverage bottle and the number of the beverage bottles, a cooling time length required for cooling beverage to a specified temperature is determined (S204). Then, the refrigerator is controlled to refrigerate the beverage and start a timekeeping (S205), and it is determined whether the timekeeping reaches the cooling time length (S206). If the timekeeping reaches the cooling time length required for cooling beverage to the specified temperature, prompting information is generated and the prompting information is transmitted to the terminal device (S207), so that the user can learn the prompting information through the terminal device. Then, it is determined whether the user opens the refrigerator door to take all the beverages (S208), and if yes, the current beverage refrigeration operation is ended (S209).

[0060] Corresponding to the control method for cooling beverage provided by the above-mentioned embodiments, an embodiment of the present disclosure further provides a control apparatus for cooling beverage. Since the control apparatus for cooling beverage according to the embodiment of the present disclosure corresponds to the control method for cooling beverage according to the above embodiments, the foregoing embodiments of the control method for cooling beverage are also applicable to the control apparatus for cooling beverage provided in the embodiment. The control apparatus for cooling beverage is not described in detail in the embodiment. FIG. 3 is a schematic structural diagram of a control apparatus for cooling beverage according to an embodiment of the present disclosure. It should be noted that the control apparatus for cooling beverage is applied in a refrigerator.

[0061] As illustrated in FIG. 3, the control apparatus 300 for cooling beverage may include an obtaining module 310, a determination module 320, and a refrigeration module 330.

[0062] Specifically, the obtaining module 310 is configured to obtain parameter information of the beverage to be cooled in the refrigerator. The parameter information includes a volume of a beverage bottle and the number of the beverage bottles. As an example, the obtaining module 310 is specifically configured to: obtain parameter information set by the user for the beverage through a terminal device. The terminal device and the refrigerator have established a communication connection therebetween.

[0063] The determining module 320 is configured to determine, based on the parameter information of the beverage, a cooling time length required for cooling beverage to a specified temperature.

[0064] The refrigeration module 330 is configured to: control the refrigerator to refrigerate the beverage and start a timekeeping, and prompt, in response to the timekeeping reaching the cooling time length, the user by a predetermined prompting manner.

[0065] In an embodiment of the present disclosure, the refrigerator may include an electronic screen disposed on a housing thereof, and the parameter information is set by the user through the electronic screen.

5 **[0066]** In an embodiment of the present disclosure, the refrigerator may include an indicator light disposed thereon, and the indicator light is controlled to flash to prompt the user.

10 **[0067]** In an embodiment of the present disclosure, the refrigerator may include a sound prompting module disposed thereon the refrigerator, and said prompting the user by the predetermined prompting manner includes: broadcasting, by the sound prompting module, voice prompting information.

15 **[0068]** In an embodiment of the present disclosure, said prompting the user by the predetermined prompting manner includes: generating prompting information, and transmitting the prompting information to the terminal device to allow the user to learn the prompting information through the terminal device.

20 **[0069]** In the control apparatus for cooling beverage according to the embodiments of the present disclosure, the parameter information of the beverage to be cooled in the refrigerator can be obtained, and based on the parameter information of the beverage, the cooling time length required for cooling beverage to a specified temperature can be determined. Then, the refrigerator is controlled to refrigerate the beverage and start a timekeeping, and when the timekeeping reaches the cooling time length, the user will be prompted by a predetermined prompting manner. The method can effectively manage the cooling time of the beverage by determining the cooling time length required for cooling beverage to the specified temperature, and prompt the user when the cooling time length is reached, thereby avoiding the problems that the beverage is inadequate for the user due to the undesired temperature or excessively low temperature thereof. In this way, the intelligence of the refrigerator and the user experience is improved.

30 **[0070]** In order to realize the above embodiments, the present disclosure further proposes a refrigerator.

35 **[0071]** FIG. 4 is a schematic structural diagram of a refrigerator according to an embodiment of the present disclosure. As illustrated in FIG. 4, the refrigerator 400 includes a memory 410, a processor 420, and a computer program 430 stored in the memory 410 and executable on the processor. The processor 420, when executing the computer program 430, implements the control method for cooling beverage according to any one of the above-mentioned embodiments in the present disclosure.

40 **[0072]** In order to implement the above embodiments, the present disclosure further proposes a computer-readable storage medium, having a computer program stored thereon. The program, when being executed by a processor, implements the control method for cooling beverage according to any one of the above-mentioned items in the present disclosure.

[0073] In the present disclosure, the description with reference to the terms "an embodiment", "some embodiments", "an example", "a specific example", or "some examples", etc., means that specific features, structures, materials, or characteristics described in conjunction with the embodiment(s) or example(s) are included in at least an embodiment or example of the present disclosure. In the present disclosure, any illustrative description of the above terms does not necessarily refer to the same embodiment(s) or example(s). Moreover, the specific features, structures, materials or characteristics as described can be combined in any one or more embodiments or examples as appropriate. Furthermore, those skilled in the art may combine the different embodiments or examples described in the specification, as well as the features of the different embodiments or examples, as long as they do not conflict each other.

[0074] Any process or method described in the flow-chart or described otherwise herein can be understood as a module, segment or part of codes that include one or more executable instructions for implementing steps of specific logical functions or processes. It can be appreciated by those skilled in the art that the scope of the preferred embodiments of the present disclosure includes additional implementations where functions may not be performed in the order as shown or discussed, including implementations where the involved functions are performed substantially in parallel or even in a reverse order.

[0075] The logics and/or steps represented in the flow-chart or described otherwise herein can be for example considered as a list of ordered executable instructions for implementing logic functions, and can be embodied in any computer-readable medium that is to be used by or used with an instruction execution system, apparatus, or device (such as a computer-based system, a system including a processing module, or any other system that can retrieve and execute instructions from an instruction execution system, apparatus, or device). For the specification, a "computer-readable medium" can be any apparatus that can contain, store, communicate, propagate, or transmit a program to be used by or used with an instruction execution system, apparatus, or device. More specific examples of computer-readable mediums include, as a non-exhaustive list: an electrical connector (electronic device) with one or more wirings, a portable computer disk case (magnetic devices), a Random-Access Memory (RAM), a Read Only Memory (ROM), an Erasable Programmable Read Only Memory (EPROM or flash memory), a fiber optic device, and a portable Compact Disk Read Only memory (CDROM). In addition, the computer-readable medium may even be paper or other suitable medium on which the program can be printed, as the program can be obtained electronically, e.g., by optically scanning the paper or the other medium, and then editing, interpreting, or otherwise processing the scanning result when necessary, and then stored in a computer memory.

[0076] It can be appreciated that each part of the present disclosure can be implemented in hardware, software, firmware or any combination thereof. In the above embodiments, a plurality of steps or methods can be implemented using software or firmware stored in a memory and executed by a suitable instruction execution system. For example, when implemented in hardware, as in another embodiment, it can be implemented by any one or combination of the following technologies known in the art: a discrete logic circuit having logic gate circuits for implementing logic functions on data signals, an application-specific integrated circuit with suitable combined logic gates, a Programmable Gate Array (PGA), a Field Programmable Gate Array (FPGA), etc.

[0077] It can be appreciated by those skilled in the art that all or some of the steps in the methods of the above embodiments can be implemented by relevant hardware following instructions of a program. The program may be stored in a computer-readable storage medium, and the program, when being executed, implements any one or combination of the steps of the method embodiments.

[0078] In addition, the functional units in various embodiments of the present disclosure may be integrated into one processing module, or each unit may be standalone physically, or two or more units may be integrated into one module. The above integrated module can be implemented in a form of hardware or in a form of a software function module. When implemented in the form of the software function module and sold or used as an independent product, the integrated module can also be stored in a computer-readable storage medium.

[0079] The storage medium mentioned above may be a read-only memory, a magnetic disk or an optical disc, etc. Although the embodiments of the present disclosure have been illustrated and described above, it can be appreciated that the above embodiments are merely illustrative, and should not be construed as limiting the present disclosure. Those skilled in the art can make various changes, modifications, replacements and variants to the above embodiments departing from the scope of the present disclosure.

Claims

1. A control method for cooling beverage, the method being applied in a refrigerator and comprising:

obtaining parameter information of a beverage to be cooled in the refrigerator;
determining, based on the parameter information of the beverage, a cooling time length required for cooling beverage to a specified temperature; and
controlling the refrigerator to refrigerate the beverage and start a timekeeping, and prompting, in response to the timekeeping reaching the cooling time length, a user by a predetermined

- prompting manner.
2. The method according to claim 1, wherein the parameter information comprises a volume of a beverage bottle and the number of the beverage bottles.
 3. The method according to claim 1, wherein the refrigerator comprises an electronic screen disposed on a housing thereof, and wherein the parameter information is set by the user through the electronic screen.
 4. The method according to claim 1, wherein the refrigerator comprises an indicator light disposed thereon, the indicator light being controlled to flash to prompt the user.
 5. The method according to claim 1, wherein the refrigerator comprises a sound prompting module disposed thereon, and wherein said prompting the user by the predetermined prompting manner comprises: broadcasting, by the sound prompting module, voice prompting information.
 6. The method according to claim 1, wherein said obtaining the parameter information of the beverage to be cooled in the refrigerator comprises: obtaining parameter information set by the user for the beverage through a terminal device, wherein the terminal device is in a communication connection with the refrigerator.
 7. The method according to claim 6, wherein said prompting the user by the predetermined prompting manner comprises: generating prompting information, and transmitting the prompting information to the terminal device to allow the user to learn the prompting information through the terminal device.
 8. A control apparatus for cooling beverage, the apparatus being applied in a refrigerator and the apparatus comprising:
 - an obtaining module configured to obtain parameter information of the beverage to be cooled in the refrigerator;
 - a determination module configured to determine, based on the parameter information of the beverage, a cooling time length required for cooling beverage to a specified temperature; and
 - a refrigeration module configured to: control the refrigerator to refrigerate the beverage and start a timekeeping, and prompt, in response to the timekeeping reaching the cooling time length, the user by a predetermined prompting manner.
 9. The apparatus according to claim 8, wherein the parameter information comprises a volume of a beverage bottle and the number of the beverage bottles.
 10. The apparatus according to claim 8, wherein the refrigerator comprises an electronic screen disposed on a housing thereof, and wherein the parameter information is set by the user through the electronic screen.
 11. The apparatus according to claim 8, wherein the refrigerator comprises an indicator light disposed thereon, the indicator light being controlled to flash to prompt the user.
 12. The apparatus according to claim 8, wherein the refrigerator comprises a sound prompting module disposed thereon, and wherein said prompting the user by the predetermined prompting manner comprises: broadcasting, by the sound prompting module, voice prompting information.
 13. The apparatus according to claim 8, wherein the obtaining module is further configured to: obtain parameter information set by the user for the beverage through a terminal device, wherein the terminal device is in a communication connection with the refrigerator.
 14. The apparatus according to claim 13, wherein said prompting the user by the predetermined prompting manner comprises: generating prompting information, and transmitting the prompting information to the terminal device to allow the user to learn the prompting information through the terminal device.
 15. A refrigerator, comprising:
 - a memory;
 - a processor; and
 - a computer program stored in the memory and executable on the processor, wherein the processor, when executing the computer program, implements the control method for cooling beverage according to any one of claims 1 to 7.
 16. A computer-readable storage medium, having a computer program stored thereon, wherein the computer program, when being executed by a processor, implements the control method for cooling beverage according to any one of claims 1 to 7.

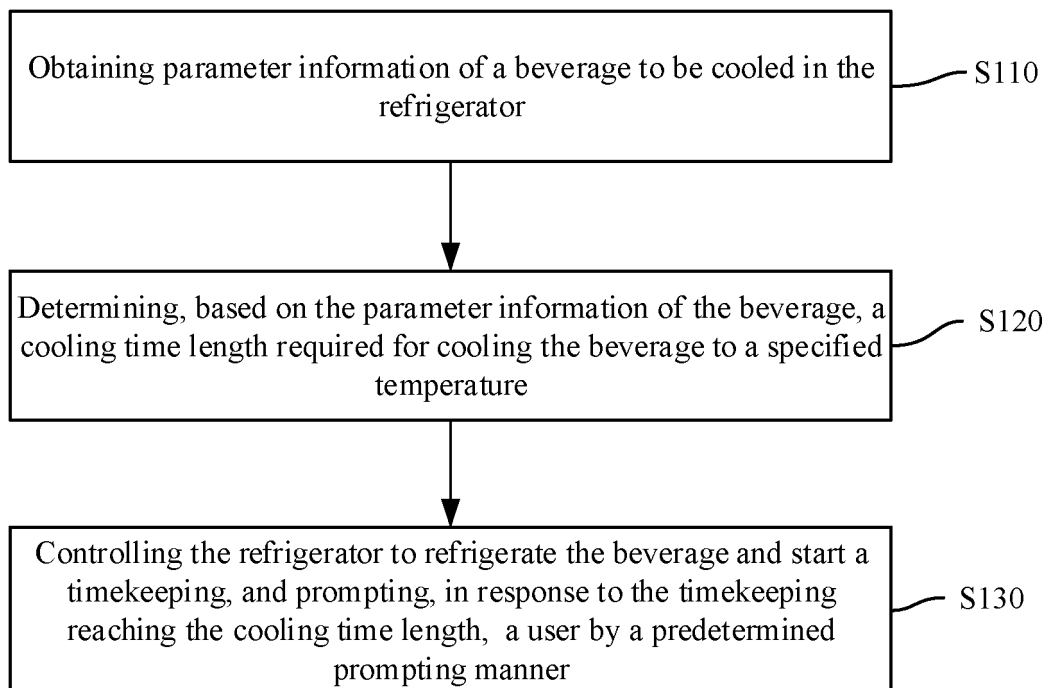


FIG. 1

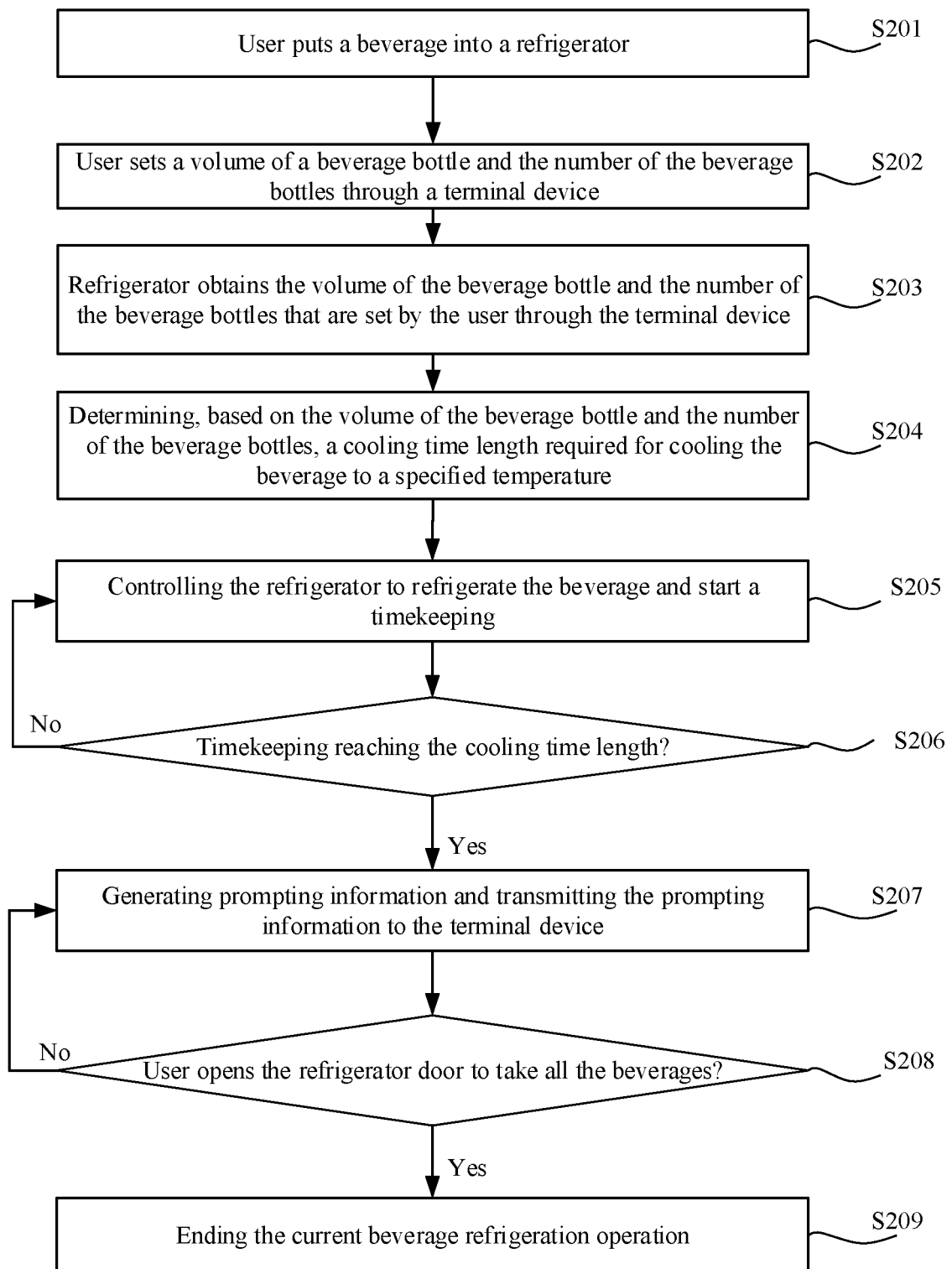


FIG. 2

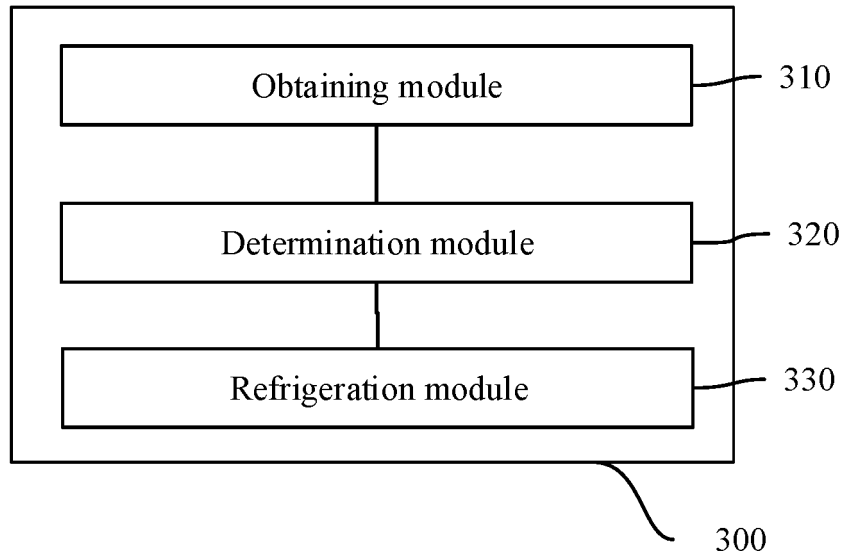


FIG. 3

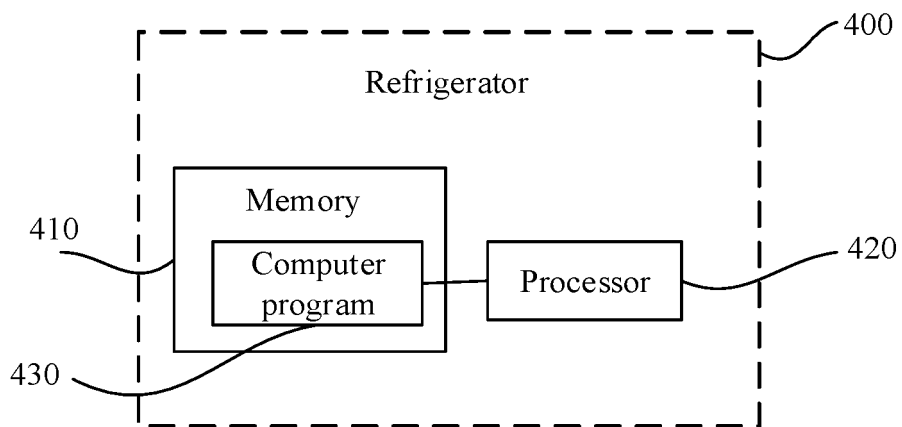


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2020/089414

A. CLASSIFICATION OF SUBJECT MATTER

F25D 29/00(2006.01)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)

F25D

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)

CNTXT, CNABS, CNKI, SIPOABS, DWPI; 冰箱, 饮料, 冷饮, 饮品, 参数, 时间, 时长, 计时, 提示, 提醒, 容积, 体积, 数量, 瓶数, 终端, 通讯, 存储器, 处理器, 可读存储介质, refrigerator, beverage, parameter, time, duration, reminder, volume, quantity, number, bottle, terminal, communication, memory, processor, readable, storage, medium

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 104833169 A (FENG, Lin) 12 August 2015 (2015-08-12) description, paragraphs [0021]-[0050], and figures 1-4	1-14
Y	CN 104833169 A (FENG, Lin) 12 August 2015 (2015-08-12) description, paragraphs [0021]-[0050], and figures 1-4	15-16
Y	CN 108626959 A (BEIJING JINGDONG SHANGKE INFORMATION TECHNOLOGY CO., LTD. et al.) 09 October 2018 (2018-10-09) description, paragraphs [0020]-[0085], and figures 1-6	15-16
PX	CN 110701865 A (GUANGZHOU MIDEA HUALING REFRIGERATOR CO., LTD.) 17 January 2020 (2020-01-17) description, paragraphs [0005]-[0087], and figures 1-4	1-16
A	CN 104697287 A (CHEN, Aishan) 10 June 2015 (2015-06-10) entire document	1-16
A	CN 107490240 A (NANJING SKYWORTH ELECTRICAL APPLIANCE RESEARCH INSTITUTE CO., LTD.) 19 December 2017 (2017-12-19) entire document	1-16

☒ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

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“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

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“&” document member of the same patent family

Date of the actual completion of the international search

03 August 2020

Date of mailing of the international search report

10 August 2020

Name and mailing address of the ISA/CN

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Facsimile No. (86-10)62019451

Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No. PCT/CN2020/089414

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 106885446 A (HAIER YOUJIA INTELLIGENT TECHNOLOGY (BEIJING) CO., LTD.) 23 June 2017 (2017-06-23) entire document	1-16
A	US 2017284733 A1 (TECO ELECTRIC & MACHINERY CO LTD) 05 October 2017 (2017-10-05) entire document	1-16

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2020/089414

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	104833169	A	12 August 2015	CN	107429966	A	01 December 2017
				CN	104833169	B	15 May 2020
				WO	2016188463	A1	01 December 2016
CN	108626959	A	09 October 2018	None			
CN	110701865	A	17 January 2020	None			
CN	104697287	A	10 June 2015	None			
CN	107490240	A	19 December 2017	CN	107490240	B	11 February 2020
CN	106885446	A	23 June 2017	None			
US	2017284733	A1	05 October 2017	None			

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REFERENCES CITED IN THE DESCRIPTION

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