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(54) Title: METHOD FOR TERMINAL TO OPERATE SMART DIFFUSER AND TERMINAL THEREFOR

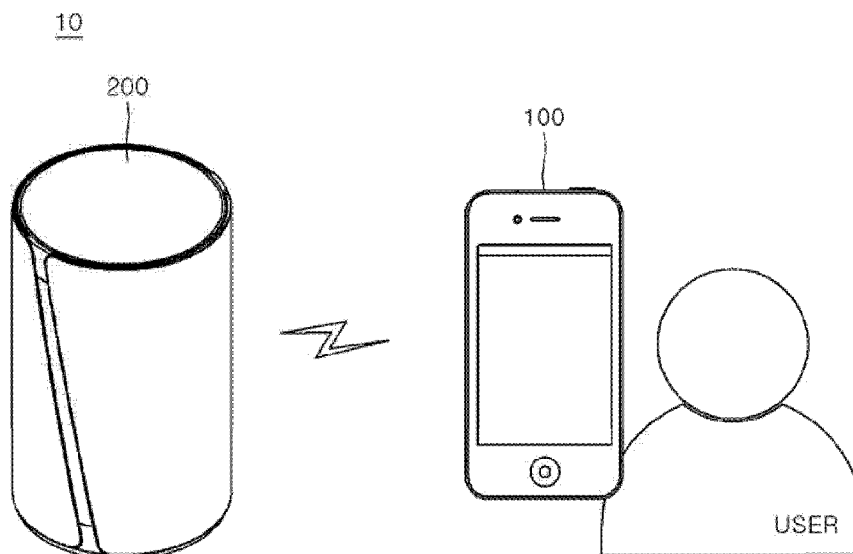


FIG. 1

(57) Abstract: The present disclosure relates to a method of operating a smart diffuser using a terminal connected to the smart diffuser via a network and a terminal therefor. The method of operating the smart diffuser using the terminal includes generating a mode selection signal comprising operation information on a plurality of oil cartridges mounted in the smart diffuser, wherein the operation information comprises at least one of an operation order, an operation duration, a fragrance emission intensity, and an operation time zone of each of the cartridges; and transmitting the mode selection signal to the smart diffuser. The present disclosure relates to a method of operating a smart diffuser (200) using a terminal (100) connected to the smart diffuser (200) via a network and a terminal therefor. The method of operating the smart diffuser (200) using the terminal (100) includes generating (S 10) a mode selection signal comprising operation information on a plurality of oil cartridges (CA) mounted in the smart diffuser (200), wherein the operation information comprises at least one of an operation order, an operation duration, a fragrance emission intensity, and an operation time zone of each of the



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**METHOD FOR TERMINAL TO OPERATE
SMART DIFFUSER AND TERMINAL THEREFORE**

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to and all of advantages of Korean Pat. App. No. 10-2018-0105408, filed on 04 September 2018, the contents of which is hereby incorporated by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present disclosure relates to a method of operating a smart diffuser using a terminal and a terminal therefor, and more particularly, to a method of operating a smart diffuser including a plurality of oil cartridges using a mobile terminal and a terminal therefor.

Description of the Prior Art

[0003] A diffuser generally utilizes aroma oil in a manner of gently emitting a fragrance indoors using a lid made of wood sticks.

[0004] In recent years, diffusers, which take the form of an electronic product so as to more actively induce fragrance emission, have also become available.

[0005] For example, there is a fragrance emission device having a structure in which a device capable of supplying air into the fragrance emission device is provided and the air is blown toward a container containing the aroma oil, thereby emitting a fragrance. Japanese Patent No. 6330680 (entitled: Fragrance Emission Device) discloses this structure.

[0006] Most conventional diffusers including the device disclosed in the above prior art document are provided with a single aroma oil container in a single diffuser. Therefore, when it is desired to use a different fragrance, there is an inconvenience in that the oil container mounted in the diffuser must be replaced with an oil container containing another fragrance.

[0007] It may also be possible to remove the oil container that is being used and to replace the oil container with a new one. Storing the existing oil container safely for future use also causes the inconvenience of the user.

[0008] Recently, as interest in indoor interiors and pleasant environment creation has increased, the needs of consumers who want to choose different fragrances depending on time and space have been increasing. However, the needs cannot be met only with the existing single oil container system. This is because, in the modern society, there is a need to create indoor atmospheres with different fragrances several times a day or periodically.

[0009] The inventor of the present disclosure has studied for a long time to solve these problems, and after trial and error, has come to complete the present disclosure.

SUMMARY OF THE INVENTION

[0010] An embodiment of the present disclosure provides a method for operating a smart diffuser including a plurality of oil cartridges using a mobile terminal, and a mobile terminal therefor.

[0011] Other aspects of the disclosure that are not described herein will be further considered based on the following detailed description and within the scope which can be easily deduced from the effects of the present disclosure.

[0012] A method of operating a smart diffuser using a terminal connected to the smart diffuser via a network according to an embodiment of the present disclosure may include: generating a mode selection signal comprising operation information on a plurality of oil cartridges mounted in the smart diffuser, wherein the operation information comprises at least one of an operation order, an operation duration, a fragrance emission intensity, and an operation time zone of each of the cartridges; and transmitting the mode selection signal to the smart diffuser.

[0013] The mode selection signal may include a manual mode selection signal, and the manual mode selection signal is generated based on the operation information on the plurality of oil cartridges, which is input from the user.

[0014] The mode selection signal may include a program mode selection signal, and the program mode selection signal may be generated based on the operation mode information on the smart diffuser, which is input from the user and comprises at least one of a home mode, a hotel mode, an office mode, a lounge mode, a conference room mode, a sleep mode, and a ventilation mode, and oil combination information on oils contained in the plurality of oil cartridges.

[0015] The oil combination information may be transmitted from the smart diffuser, or may be input by the user.

[0016] The smart diffuser may include a frame configured to define a diffusing position, a container mounted on the frame and including a space configured to mount a plurality of oil cartridges therein, and a control unit configured to control a corresponding cartridge among the plurality of oil cartridges to enter the diffusing position by driving the container based on the mode selection signal transmitted to the smart diffuser.

[0017] The frame may include fan, which is located directly above the diffusing position and configured to draw out a fragrance of an oil cartridge, which has entered the diffusing position, and the control unit may control the operation of the fan based on the mode selection signal transmitted to the smart diffuser.

[0018] The container may be rotatably mounted on the frame, and the control unit may rotate the container so as to control the selected cartridge to enter the diffusing position.

[0019] A terminal connected to a smart diffuser via a network so as to operate the smart diffuser according to an embodiment of the present disclosure may include: a mode selection signal generation unit configured to generate a mode selection signal comprising operation information on a plurality of oil cartridges mounted in the smart diffuser, wherein the operation information comprises at least one of an operation order, an operation duration, a fragrance emission intensity, and an operation time zone of each of the cartridges; and a communication unit configured to transmit the mode selection signal to the smart diffuser.

[0020] The present disclosure is capable of providing a method of operating a smart diffuser including a plurality of oil cartridges using a mobile terminal.

[0021] In addition, the present disclosure is capable of efficiently operating the smart diffuser according to the use environment.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] The above and other aspects, features and advantages of the present disclosure will be more apparent from the following detailed description taken in conjunction with the accompanying drawings, in which:

[0023] FIG. 1 is an overall schematic diagram of a smart diffuser operation system according to an embodiment of the present disclosure;

[0024] FIGS. 2A and 2B are perspective views of a smart diffuser according to an embodiment of the present disclosure, in which FIG. 2A illustrates the state in which the smart diffuser is powered off and FIG. 2B illustrates the state in which the smart diffuser is powered on;

[0025] FIG. 3 is an exploded perspective view of the smart diffuser according to the embodiment of the present disclosure;

[0026] FIG. 4 is a sectional view illustrating the structure of a smart diffuser according to the embodiment of the present disclosure, centering on a frame, a container, and a control unit, in order to show the structure of the smart diffuser in detail;

[0027] FIG. 5 is a plan view illustrating the structure of the smart diffuser according to the embodiment of the present disclosure, centering on the frame and the container, in order to show the structure of the smart diffuser in detail;

[0028] FIG. 6 is a view illustrating the detailed configuration of a terminal for operating a smart diffuser according to an embodiment of the present disclosure;

[0029] FIG. 7 is a flowchart illustrating a method of operating a smart diffuser using a terminal according to an embodiment of the present disclosure over time; and

[0030] FIGS. 8A to 8C are views of graphical user interfaces displayed through a display unit of a terminal according to an embodiment of the present disclosure, in which FIG. 8A illustrates a manual mode setting screen, FIG. 8B illustrates a screen representing oil type information on an oil contained in each cartridge, and FIG. 8C illustrates a program mode selection screen.

[0031] It is to be understood that the appended drawings illustrate embodiments of the present disclosure and the scope of the present disclosure is not limited by the drawings.

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

[0032] Hereinafter, an embodiment of the present disclosure will be described. In the drawings, thicknesses and intervals may be exaggerated compared to actual physical thicknesses and intervals for convenience of explanation. In describing the present disclosure, a description of known configurations irrelevant to the gist of the present description may be omitted. It should be noted that in adding reference numerals to the constituent elements of respective drawings, the same constituent elements will be denoted by the same numerals if possible, even if the constituent elements are illustrated on different drawings.

[0033] FIG. 1 is an overall schematic diagram of a smart diffuser operation system 10 according to an embodiment of the present disclosure.

[0034] As illustrated in FIG. 1, the smart diffuser operation system 10 includes a terminal 100 and a smart diffuser 200.

[0035] The terminal 100 is connected to the smart diffuser 200 through a network so as to operate the smart diffuser 200. The network may be a short-range wireless communication network. The short-range wireless communication network may be Bluetooth, Wi-Fi, RF, Zigbee, or the like.

[0036] The terminal 100 may be a portable phone, a smart phone, a PDA, a tablet PC, or the like.

[0037] The smart diffuser 200 may be a diffuser in the form of an electronic product having a short-range wireless communication unit. The power may be supplied from the outside, or the electricity stored in the battery provided inside the smart diffuser can be used. The smart diffuser may be of a type in which a blowing device capable of blowing air into the diffuser using power is provided and the air is blown toward a container containing an aroma oil so as to perform fragrance emission.

[0038] The smart diffuser 200 takes a form in which a plurality of oil cartridges are mounted in a single diffuser, as will be described later. For example, the smart diffuser 200 performs fragrance emission in a manner of locating a corresponding cartridge among the plurality of mounted oil cartridges at a fragrance emission position (diffusing position DP) in response to a control signal of the terminal 100 and drawing out the internal air through the blowing device.

[0039] The terminal 100 generates a control signal for operating the smart diffuser and transmits the control signal to the smart diffuser 200. Then, the smart diffuser 200 receives the control signal and performs fragrance emission on the corresponding one of the plurality of oil cartridges according to a corresponding condition.

[0040] The control signal includes information on a method of operating each of the cartridges. For example, it may include information on the operation order, operation duration, fragrance emission intensity, operation time zone, and the like of each of the cartridges.

[0041] As will be described later, since only one of the plurality of cartridges emits fragrance at the diffusing position DP, it is necessary to determine the operation order of each of the cartridges, to determine the duration of operation of each of the cartridges during operation thereof, to determine the fragrance emission intensity of each of the cartridges, and to determine the time zone in which each cartridge is operated.

[0042] The control signal is referred to as a mode selection signal. A manual mode and a program mode may be included in the modes. The manual mode is a mode of operating the smart diffuser 200 according to conditions entered by the user (user manual mode), and the program mode is a mode of operating the smart diffuser 200 according to predetermined conditions (diffuser program mode). The program mode includes a conference room mode, a restroom mode, a ventilation mode, a sleep mode, a home mode, a hotel mode, an office mode, and the like.

[0043] The smart diffuser 200 may operate in the user manual mode based on a manual mode selection signal received from the terminal 100 or may operate in the diffuser program mode based on a program mode selection signal received from the terminal 100.

[0044] That is, when there are four oil cartridges in the smart diffuser, four oil cartridges are operated according to operation information directly input by the user with respect to each of the oil cartridges in the manual mode, and the four oil cartridges are operated according to an operation mode selected by the user among the plurality of operation modes in the program mode.

[0045] For example, in the manual mode, four oil cartridges A, B, C, and D may sequentially perform fragrance emission. The cartridge A, the cartridge B, the cartridge C, and the cartridge D may be located at the diffusing position DP in this order in order to perform fragrance emission.

[0046] The operation duration of each cartridge may also be specified. The cartridge A may be operated for 1 hour, the cartridge B may be operated for 2 hours, the cartridge C may be operated for 3 hours, and the cartridge D may be operated for 30 minutes.

[0047] The fragrance emission intensity of each cartridge may also be specified. When there are weak, medium, and strong intensities, the cartridge A may be operated at the weak intensity, the cartridge B may be operated at the weak intensity, the cartridge C may be operated at the medium intensity, and the cartridge D may be operated at the strong intensity.

[0048] In the manual mode, depending on the operational information inputted by the user into the terminal 100, the cartridge A may first be located at the diffusing position DP so as to perform fragrance emission at the weak intensity for 1 hour, then the cartridge B may be located at the diffusing position DP so as to perform fragrance emission at the weak intensity for two hours, then the cartridge C may be located at the diffusing position DP so as to perform fragrance emission at the medium intensity for 3 hours, and finally, the cartridge D may be located at the diffusing position DP so as to perform fragrance emission at the strong intensity for 30 minutes. Without being limited thereto, various operational information regarding the operation order, the operation duration time, and the fragrance emission intensity of each of the cartridges may be input.

[0049] Operation time zones may also be designated. The cartridge A may be designated from 09:00 am to 12:00 pm, the cartridge B may be designated from 1:00 pm to 6:00 pm, the cartridge C may be designated from 7:00 pm to 10:00 pm, and the cartridge D may be designated from 11:00 am to 12:00 am.

[0050] Therefore, in the manual mode, depending on the operation information input into the terminal 100 by the user, the cartridge A may perform fragrance emission at the weak intensity from 9:00 am to 12:00 pm, the cartridge B may perform fragrance emission at the weak intensity from 1:00 pm to 6:00 pm, the cartridge C may perform fragrance emission at the middle intensity from 7:00 pm to 10:00 pm, and the cartridge D may perform fragrance emission at the strong intensity from 11:00 pm to 00:00 am.

[0051] As another example, in the conference room mode, depending on the programmed operation information, the cartridge A may be operated at the “middle” intensity from 09:00 am to 12:00 pm and from 1:00 pm to 6:00 pm. The other cartridges may not be used. The cartridge A may contain an oil fragrance that helps to improve concentration.

[0052] In the break room mode, depending on the programmed operation information, the cartridge B may be operated at the middle intensity from 12:00 pm to 1:00 pm and from 6:00 pm to 7:00 pm. The other cartridges may not be used. The cartridge B may contain an oil fragrance that promotes rest and relaxation.

[0053] In the ventilation mode, depending on the programmed operation information, the cartridge C may be operated at the strong intensity from 11:00 am to 12:00 am, from 1:00 pm to 2:00 pm, and from 4:00 pm to 5:00 pm. The other cartridges may not be used. The cartridge C may contain an oil fragrance that gives the user a pleasant feeling.

[0054] In the sleep mode, depending on the programmed operation information, the cartridge D may be operated at the weak intensity from 11:00 PM to 06:00 AM. The other cartridges may not be used. The cartridge D may contain an oil fragrance suitable for inducing sleep.

[0055] In the home mode, depending on the programmed operation information, the cartridge B and the cartridge D may be alternately operated for about 3 hours at the weak intensity from 09:00 am to 09:00 pm. The other cartridges may not be used.

[0056] In the hotel mode, depending on the programmed operation information, the cartridge B may be operated at the middle intensity from 08:00 am to 06:00 pm, may be operated at the strong intensity from 06:00 pm to 11:00 pm, and may be operated at the weak intensity from 11:00 pm to 08:00 am. The other cartridges may not be used.

[0057] In the office mode, depending on the programmed operation information, the cartridge A may be operated at the middle intensity from 09:00 am to 12:00 am, and may be operated at the strong intensity from 1:00 pm to 06:00 pm.

[0058] Meanwhile, in the program mode, information on the type of oil contained in each cartridge may be used together. This information may be input directly into the terminal 100

by the user, as will be described later, but may also be performed by a method of recognizing a cartridge in the smart diffuser 200.

[0059] Before describing the operation method in more detail, the structure of the smart diffuser 200 will be described first. Reference is made to FIGS. 2 to 5.

[0060] FIGS. 2A and 2B are perspective views of the smart diffuser 200 according to the embodiment of the present disclosure. FIG. 2A illustrates the state in which the smart diffuser 200 is powered off, and FIG. 2B illustrates the state in which the smart diffuser 200 is powered on.

[0061] Referring to FIGS. 2A and 2B, the smart diffuser 200 (hereinafter, also referred to as a “diffuser” for convenience of description) has a structure in which a lid unit 250 positioned in the upper portion thereof is opened.

[0062] That is, when not in use, the lid unit 250 enters a cover unit 240 so as to form a closed structure (see FIG. 2A) of the entire diffuser 200. When in use, the lid unit 250 is lifted up to the upper side of the cover unit 240 so as to form an open structure (see FIG. 2B) of the entire diffuser 200.

[0063] An open space O created as the lid portion 250 is moved up is illustrated in FIG. 2B. Through the open space O, the fragrance of an aroma oil located in the diffuser 200 is capable of being diffused to the outside (i.e., into the interior space). The aroma oil may be contained in each of a plurality of oil cartridges CA.

[0064] The inner structure of the diffuser 200 will be described in more detail.

[0065] FIG. 3 is an exploded perspective view of the smart diffuser 200 according to the embodiment of the present disclosure.

[0066] Referring to FIG. 3, the diffuser 200 may include a frame 210, a container 220, and a control unit 230, and may include the above-described cover unit 240 and lid unit 250.

[0067] The frame 210 forms the overall skeleton of the diffuser 200. The frame 210 is capable of determining the overall appearance of the diffuser 200.

[0068] The diffuser 200 has a substantially cylindrical shape, and the frame also has a cylindrical skeletal structure.

[0069] The frame defines the diffusing position DP (see FIG. 4). When one of the plurality of oil cartridges CA is located at the diffusing position DP, diffusing is performed from the corresponding oil cartridge.

[0070] The container 220 is rotatably mounted on the frame 210 and has a space for mounting the plurality of oil cartridges CA therein. It may have a hollow structure.

[0071] As illustrated in the drawing, the container 220 includes a plurality of partitioned space portions, and the plurality of oil cartridges CA may be fixedly mounted in respective space portions.

[0072] The drawing illustrates five radially partitioned space portions. In addition, four oil cartridges provided in four of the space portions are illustrated.

[0073] When one of the four oil cartridges enters the diffusing position DP according to the rotation of the container 220, fragrance emission is performed from the corresponding oil cartridge.

[0074] The present disclosure is not limited to the number of partitioned space portions or the number of oil cartridges, and fewer or more space portions and oil cartridges may be provided as needed.

[0075] The rotation of the container 220 is performed by the control unit 230. The control unit 230 rotates the container 220. The rotating direction may be clockwise or counterclockwise. In order to rotate the container 220, the control unit 230 may include a driving unit (for example, a bevel gear motor or the like) capable of applying a rotational force.

[0076] In addition, the control unit 230 may also be involved in the open structure of the diffuser described above. That is, the control unit 230 may move the lid unit 250 upward so as to switch the diffuser 200 from the closed state to the open state. In order to move the lid up and down, the control unit 230 may include a driving unit that enables upward and downward driving (e.g., a worm gear motor, a lack and pinion motor, or the like).

[0077] The control unit 230 may receive a control signal from the terminal 100 described above so as to control the driving unit.

[0078] Although two motors may be included so as to perform both the operation of rotating the container 220 and the operation of moving the lid portion upward and downward, the present disclosure is not limited thereto. Various other methods for switching a rotational motion performed using an external power source into a rotational motion or a linear motion in another axial direction may be applied.

[0079] FIG. 4 is a sectional view illustrating the structure of the smart diffuser 200 according to the embodiment of the present disclosure, centering on the frame 210, the container 220, and the control unit 230, in order to show the structure of the smart diffuser 200 in detail. In order to illustrate the diffusing position in more detail, the guide unit 216 is not sectioned.

[0080] In addition, FIG. 5 is a plan view illustrating the structure of the smart diffuser 200 according to the embodiment of the present disclosure, centering on the frame 210 and the container 220, in order to show the structure of the smart diffuser 200 in detail. The frame 210 is illustrated briefly in order to illustrate the structure of the container 220 in detail.

[0081] Referring to FIG. 3 together with FIG. 4, the frame 210 may include an upper frame 212, a lower frame 214, and a guide unit 216.

[0082] The diffusing position DP is defined in the guide unit 216.

[0083] The diffusing position DP is approximately located at the middle height of the frame 210. When any one of the oil cartridges is positioned at the diffusing position DP according to the rotation of the container 220, the fragrance of the corresponding oil cartridges is diffused. Details of the operation in which the diffusing is performed by the interaction between the guide unit 216 and the cartridge positioned at the diffusing position will be described later.

[0084] The upper frame 212 has a space H configured to accommodate the container 220 therein. In the upper frame 212, a space H is provided in which the container 220 is capable of performing rotational motion and up-and-down motion. The rotational motion is associated with causing a selected fragrance to move to the diffusing position, and the up-and-down motion is associated with the open/closed structure of the diffuser.

[0085] The upper frame 212 is provided with a fan FN. The fan FN is positioned directly above the diffusing position DP so as to draw out the fragrance of the oil cartridge that has entered the diffusing position DP. The fan FN may be a blower or the like. For example, a rotating blade is provided inside the fan FN, and the rotating blade is rotated in a direction creating wind from the inside to the outside, so that the fragrance can be drawn out to the outside of the diffuser 200.

[0086] The operation of the fan FN may be performed by the control unit 230. The control unit 230 may adjust the rotation amount of the fan FN. The control unit 230 may receive a control signal from the terminal 100 so as to control the rotational force of the fan FN. When fragrance emission at the weak intensity is required for the cartridge located at the diffusing position, the number of revolutions of the fan FN may be reduced, and when fragrance emission at the strong intensity is required, the number of revolutions of the fan FN may be increased. When fragrance emission at the middle intensity is required, the number of revolutions of the fan FN may be controlled to the middle level.

[0087] The lower frame 214 is disposed on a side opposite the lid unit 250, and the control unit 230 is disposed thereon. The lower frame 214 provides an inner space for mounting the control unit 230 therein.

[0088] The lower frame 214 serves to support the entire load of the diffuser 200.

[0089] The guide unit 216 is disposed between the upper frame 212 and the lower frame 214.

[0090] The guide unit 216 is provided with a hill portion HL so as to press an oil cartridge, which enters the diffusing position DP, upward.

[0091] A diffusing position DP is defined on the hill portion HL.

[0092] The hill portion HL has an upwardly bulged shape approximately above the upper plane of the guide portion 216. The hill portion HL usually has the shape of a hill, the height of which is the highest at the middle portion thereof and is lowered toward the opposite sides thereof. Thus, the diffusing position DP may be defined at the highest portion of the hill portion HL. That is, the diffusing position DP may be defined at the uppermost portion of the hill portion HL.

[0093] Next, referring to FIG. 5 together with FIG. 3 described above, the container 220 includes a plurality of radially partitioned space portions SH, S1, S2, S3, and S4.

[0094] Partition walls W may be disposed in order to partition the space portions SH, S1, S2, S3, and S4. As shown in the drawing, five partition walls W may be provided in order to form five space portions SH, S1, S2, S3, and S4. The present disclosure is not limited to the number.

[0095] A rotation shaft of the container is disposed at the middle of the space portions SH, S1, S2, S3, and S4 (that is, at the radial center of the space portions SH, S1, S2, S3, and S4), and the driving unit is fixedly inserted into the middle of the space portions so as to rotate the container along the rotation shaft.

[0096] A plurality of oil cartridges CA1, CA2, CA3, and CA4 are mounted in at least two of the space portions SH, S1, S2, S3, and S4. As illustrated in the drawing, four cartridges may be mounted in four of the five space portions S1, S2, S3, and S4.

[0097] The space portions SH, S1, S2, S3, and S4 may be referred to as a groove space portion SH, a first space portion S1, a second space portion S2, a third space portion S3, and a fourth space portion S4, respectively. In addition, the oil cartridges CA1, CA2, CA3, and CA4 may be referred to as a first cartridge CA1, a second cartridge CA2, a third cartridge CA3, and a fourth cartridge CA4.

[0098] The first cartridge CA1 is mounted in the first space S1, the second cartridge CA2 is mounted in the second space S2, the third cartridge CA3 is mounted in the third space S3, and the fourth cartridge CA4 is mounted in the fourth space S4.

[0099] Cases 221, 222, 223, and 224 may be further included in order to mount the respective cartridges therein. The respective cases are referred to as a first case 221, a second case 222, a third case 223, and a fourth case 224. The first cartridge CA1 is accommodated in the first case 221. The second cartridge CA2 is accommodated in the second case 222. The third cartridge CA3 is accommodated in the third case 223. Further, the fourth cartridge CA4 is accommodated in the fourth case 224.

[0100] An oil cartridge is not mounted in the groove space portion SH. As will be described later, this is to ensure that when the diffuser 200 is not used (that is, when the power is turned off), no cartridge is placed at the diffusing position DP since, when an oil cartridge is in the OFF state and then enters the diffusing position DP, the oil cartridge is switched to an ON state in a manner of being pressed upward through the hill portion HL. The OFF state of a cartridge means a state in which the oil contained in the cartridge is sealed such that the fragrance of the oil contained therein does not leak to the outside, and the ON state of a cartridge means a state in which the oil contained in the cartridge is opened such that the fragrance of the oil contained therein can be drawn out to the outside.

[0101] That is, when the fragrance emission of the first cartridge CA1 is required, the first space portion S1 is disposed at the diffusing position DP, when the fragrance emission of the second cartridge CA2 is required, the second space portion S2 is disposed at the diffusing position DP, when the fragrance emission of the third cartridge CA3 is required, the third space portion S3 is disposed at the diffusing position DP, and when the fragrance emission of the fourth cartridge CA4 is required, the fourth space portion S4 is disposed at the diffusing position DP. In addition, when the power is turned off, the groove space portion SH is disposed at the diffusing position DP.

[0102] Referring again to FIG. 4, the cases accommodating respective cartridges may include a protrusion B' protruding downward through the lower surface B of the container 220. The cartridges may be accommodated in these cases. FIG. 4 illustrates a first cartridge CA1, a first case 221 accommodating the first cartridge CA1, a fourth cartridge CA4, and a fourth case 224 accommodating the fourth cartridge CA4 due to application of a cross-sectional view.

[0103] As a result, because a protrusion is pressed when entering the hill portion HL, the cartridge accommodated in the corresponding case is also capable of being pressed upward,

and when the protrusion escapes from the hill portion HL due to an elastic force, the pressure is capable of being released.

[0104] That is, when entering the hill portion HL, the protrusion of the case is pushed upward (the cartridge housed in the corresponding case is also pushed upward) while moving up along the hill portion HL, and when getting out of the hill portion HL, the protrusion of the case returns to the original state thereof (the cartridge contained in the corresponding case also returns to the original state thereof) while moving down along the hill portion HL.

[0105] Hereinafter, a process of pressing each cartridge during the entrance of the cartridge into the diffusing position DP will be described in detail.

[0106] As illustrated in FIG. 5 described above, the groove space portion SH may be disposed at the diffusing position DP. Then, the container 220 may rotate in the rotation direction R, so that the first space portion S1 can be disposed at the diffusing position DP. The container 220 may further rotate in the rotation direction R, so that the second space portion S2 can be disposed at the diffusing position DP. Subsequently, when the container 220 rotates in the rotation direction R, the third space portion S3 may be disposed at the diffusing position, and the fourth space portion S4 may be disposed at the diffusing position DP. Conversely, each of the space portions may be disposed at the diffusing position DP by rotating in a direction opposite the rotation direction R illustrated in the drawing.

[0107] First, no cartridge is in an ON state when the groove space portion SH is disposed at the diffusing position DP. That is, all the cartridges are in the OFF state. For example, FIG. 5 illustrates a situation, which may correspond to the state in which the diffuser 200 is powered off. Alternatively, the state illustrated in FIG. 5 may be the intermediate state of a process of rotation from the fourth space portion S4 to the first space portion S1 (when rotating in the rotation direction R) or the intermediate state of a process of rotation from the first space portion S1 to the fourth space portion S4 (when rotating in the direction opposite the rotation direction R).

[0108] In the OFF state, since the oil cartridges are in the hermetically closed state, the fragrances in the oil cartridges may be held therein without being emitted.

[0109] Next, for the fragrance emission of the first cartridge, the first space portion S1 is disposed at the diffusing position DP. That is, the container 220 is rotated in the direction R by the control unit 230, and the first cartridge CA1 accommodated in the first space portion S1 enters the diffusing position DP.

[0110] When the first space portion S1 enters the diffusing position DP (that is, when the first cartridge enters the diffusing position DP) as the container 220 is rotated, the protrusion B' in the first case accommodating the first cartridge is pressed upward by the hill portion HL. At this time, the first cartridge is also pressed upward.

[0111] When the first cartridge is pressed upward, the first cartridge is capable of being switched from the OFF state to the ON state through the following process.

[0112] Specifically, when the protrusion B' of the first case is moved upward along the hill portion HL according to the rotation of the container 220, the cap CP of the first cartridge accommodated in the first case is also moved upward. At this time, because the upper portion of the header HD of the first cartridge is in a fixed state relative to the first case and the first cartridge is opened by the upward movement of the cap CP, the first cartridge is switched to the ON state, in which the fragrance inside the first cartridge can be diffused to the outside. That is, the upper portion of the header HD may be in the form of an opening, which is blocked by the cap CP and is opened by the upward movement of the cap CP. This is similar to the process in which the introduction opening of a container containing an oil is blocked by the cap CP and is then opened as the cap CP is moved upward. The upper end T of the first case may also be held stationary together with the header HD. The upper end T may be involved in stopping the cap CP that is moved upward. A spring SP is an element that is compressed when the protrusion B' is moved upward.

[0113] Subsequently, as the user selects the fragrance of the second cartridge, the second space portion S2 is disposed at the diffusing position DP. That is, the container 220 is further rotated in the direction R by the control unit 230, and the second cartridge CA2 accommodated in the second space portion S2 enters the diffusing position DP.

[0114] As described above, when the second space portion S2 enters the diffusing position DP (i.e., when the second cartridge enters the diffusing position DP) according to the rotation of the container 220, the protrusion B' of the second case is pressed by the hill portion HL. Thus, the cap CP of the second cartridge is moved upward and the header HD of the second cartridge is fixed relative thereto, so that the second cartridge in the OFF state can be switched to the ON state.

[0115] At the same time, since the first space portion S1 moves out of the diffusing position DP according to the rotation of the container 220 (i.e., the first cartridge moves out of the diffusing position DP), the protrusion B' of the first case (i.e., the first cartridge) is released from the pressed state. When the pressed state is released, the first cartridge in the ON state

is switched to the OFF state by the process opposite the above-described pressing process. That is, the protrusion B' returns to the original state thereof by getting out of the hill portion HL, which has pushed the protrusion B' upward, and thus the cap CP, which has moved together with the protrusion B', also returns to the original position thereof, whereby the upper portion of the header HD, which was open, is closed. In other words, the opening-type upper portion of the header HD is opened and then closed again as the cap CP is moved downward.

[0116] The same description is applicable when other cartridges enter the diffusing position DP. A more detailed description will be omitted.

[0117] Meanwhile, a selected cartridge should be stopped while fragrance emission is performed from the corresponding cartridge after it has entered the diffusing position DP. For example, the selected cartridge should remain at the diffusing position DP until another cartridge is selected, or until the diffuser 200 is powered off. At this time, the termination of entry of each cartridge into the diffusing position DP may be performed through the following process. For example, a sensor provided on the hill portion HL may recognize contact with the protrusion B', and the termination of entry of each cartridge into the diffusing position DP may be performed using information derived from the rotating amount of the container 220 and the position of each space portion S1, S2, S3, S4. Alternatively, the termination of entry of each cartridge into the diffusing position DP may be performed by counting the contact frequency of the sensor provided on the hill portion HL with the protrusion B' and matching the counted number to the order of the cartridges according to the rotational direction of the container 220. The present disclosure is not limited thereto, and the entry may alternatively be terminated using position recognition sensors.

[0118] FIG. 6 is a view illustrating the detailed configuration of a terminal 100 for operating a smart diffuser 200 according to an embodiment of the present disclosure.

[0119] FIG. 7 is a flowchart illustrating a method of operating a smart diffuser 200 using a terminal according to an embodiment of the present disclosure over time.

[0120] FIG. 8 is a view illustrating a Graphical User Interface (GUI) displayed through a display unit of a terminal 100 according to an embodiment of the present disclosure.

[0121] First, referring to FIGS. 6 and 7, the terminal 100 includes a mode selection signal generation unit 110 and a communication unit 120. A method of operating a smart diffuser 200 using a terminal 100 includes a step of generating a mode selection signal (S10) and a step of transmitting a mode selection signal to the smart diffuser (S20).

[0122] Specifically, in step S10, the mode selection signal generation unit 110 generates a mode selection signal including operation information on the plurality of oil cartridges CA1 to CA4 mounted in the smart diffuser 200.

[0123] The operation information may include at least one of an operation order, an operation duration time, a fragrance emission intensity, and an operation time zone of each of the cartridges.

[0124] According to an embodiment of the present disclosure, the mode selection signal may include a manual mode selection signal and a program mode selection signal.

[0125] First, the manual mode selection signal will be described.

[0126] The manual mode selection signal may be generated based on operation information on one or more of the plurality of oil cartridges CA, which has been input from the user.

[0127] For example, when a GUI is displayed as illustrated in FIG. 8A, the user may input operation information on each cartridge by touch as desired by the user.

[0128] In more detail, a time bar TB, in which the left end corresponds to 00 o'clock and the right end corresponds to 24 o'clock, is displayed, and the time bar is divided by the number of cartridges. Since it is assumed that there are four cartridges, an embodiment in which the displayed time bar is also divided into four sections will be mainly described. A first divisional element SG1 is associated with the operation of the first cartridge CA1, a second divisional element SG2 is associated with the operation of the second cartridge CA2, a third divisional element SG3 is associated with the operation of the third cartridge CA3, and the fourth divisional element SG4 is associated with the operation of the fourth cartridge. Respective divisional elements may be displayed to be distinguished by different colors.

[0129] The positions and sizes of the respective divisional elements may be adjusted through a touch input. In addition, some of the divisional elements may be removed to an inactive region through the touch input. Alternatively, a divisional element placed in the inactive region may be reloaded to an active region. A touch input that enlarges or narrows the GUI by two fingers may be applied for size adjustment. A GUI drag-and-drop input may be applied to adjust the positions of the split elements.

[0130] For example, a user who wishes to use four cartridges in order from 00:00 to 24:00 during a day may apply touch input such that the sizes of the four divided elements become equal to each other, as illustrated in FIG. 8A. When SG1 has a size and position ranging from 00 to 06, SG2 has a size and position ranging from 06 to 12, SG3 has a size and position ranging from 12 to 18, and SG4 has a size and position ranging from 18 to 24, it may be

considered that the user sets the first cartridge to operate from 00:00 to 06:00, the second cartridge to operate from 06:00 to 12:00, the third cartridge to operate from 12:00 to 18:00, and the fourth cartridge to operate from 18:00 to 24:00, during the day.

[0131] The mode selection signal generation unit generates the mode selection signal with this input information. The mode selection signal may include information of, for example, 00 to 06 : SG1, 06 to 12 : SG2, 12 to 18 : SG3, and 18 to 24 : SG4.

[0132] In the above embodiment, if the operation order is to be changed, the order of the four division elements may be changed. The positions of the divisional elements may be changed such that they lie in the order of SG4, SG1, SG2, and SG3 from the left in the time bar. In this case, it may be considered that the user sets the fourth cartridge to operate from 00:00 to 06:00, the first cartridge to operate from 06:00 to 12:00, the second cartridge to operate from 12:00 to 18:00, and the third cartridge to operate at 18:00 to 24:00, during the day.

[0133] As another example, a user who wishes to use only the second cartridge and the fourth cartridge in time zones corresponding to a daily routine may pull down the divisional elements SG1 and SG3 associated with the first and third cartridges to the inactive region, and may adjust the divisional elements SG2 and SG4 remaining in the time bar to a desired position and size. When, in the time bar, SG2 has a size ranging from 09 to 12 and SG4 has a size ranging from 12 to 18, it may be considered that the user sets the second cartridge to operate from 09:00 to 12:00 and the fourth cartridge to operate from 13:00 to 18:00, during the day. If it is desired to change the order of operations, the positions of the two division elements SG2 and SG4 displayed in the time bar may be exchanged with each other.

[0134] With this input information, the mode selection signal generation unit generates a mode selection signal, in which the mode selection signal may include information of, for example, 09 to 12 : SG2 and 13 to 18 : SG4.

[0135] Meanwhile, the terminal 100 may display information on the type of oil contained in each cartridge. As illustrated in FIG. 8B, information indicating that the oil contained in the first cartridge (CARTRIDGE A) is lavender, the oil contained in the second cartridge (CARTRIDGE B) is lemon, the oil contained in the third cartridge (CARTRIDGE C) is geranium, and the oil contained in the fourth cartridge (CARTRIDGE D) is phytoncide may be displayed in the form of an indicator on the display unit.

[0136] Respective indicators CO1, CO2, CO3, and CO4) may be displayed to be distinguished by different colors. CO1 may be displayed as purple, CO2 may be displayed as yellow, CO3 may be displayed as red, and CO4 may be displayed as green.

[0137] In addition, in order to allow the user to easily recognize the manual operation information when inputting the manual operation information, the colors of the indicators CO1 to CO4 that display oil type information on the oils contained in cartridges and the colors of divisional elements SG1 to SG4 of the time bar associated with the operations of respective cartridges may coincide with each other. That is, SG1 may be displayed as purple, SG2 may be displayed as yellow, SG3 may be displayed as red, and SG4 may be displayed as green.

[0138] These oil type information indicators CO1 to CO4 may be displayed on a separate screen as in FIG. 8B, but may be displayed together on the display screen of FIG. 8A described above.

[0139] According to an embodiment of the present disclosure, the oil type information may be directly input by the user. That is, the user may designate that the oil contained in the first cartridge is lavender. Similarly, the user may designate oils for the remaining cartridges. In addition, the input information may be stored and managed as cartridge-specific oil combination information in the terminal 100. The terminal 100 may further include a storage unit (not illustrated) for storage. The terminal 100 may configure the oil type information indicators as illustrated in FIG. 8B using the cartridge-specific oil combination information stored in the storage unit.

[0140] According to another embodiment of the present disclosure, the oil type information may be recognized by the smart diffuser 200 and may be transmitted to the terminal 100. That is, the smart diffuser 200 described above is provided with a recognition unit (not illustrated) capable of recognizing a cartridge, and the recognition unit recognizes the cartridge mounted on the smart diffuser 200, so that the oil information on the oil contained in the cartridge can be designated. For example, the recognition unit (not illustrated) may be provided in each of the cases 221, 222, 223, and 224 described above, and when a cartridge is mounted in a case, the recognition unit is capable of recognizing the mounted cartridge and determining the oil information on the oil contained in the corresponding cartridge. To this end, each of the cartridges may be provided with a unique code including oil information, and the recognition unit may recognize such a code. However, the present disclosure is not limited thereto, and various recognition methods may be applied.

[0141] The recognition information may be transmitted from the smart diffuser 200 to the terminal 100 so as to be stored and managed as cartridge-specific oil combination information in the terminal 100. In addition, the terminal 100 may configure the oil type information

indicators as illustrated in FIG. 8B using the oil combination information stored in the storage unit.

[0142] First, the program mode selection signal will be described. The program mode selection signal may be generated based on predetermined operation information for the operation mode input from the user among the various operation modes.

[0143] The operation information on each cartridge for each operation mode may be stored in advance in the terminal 100. Operation information on each cartridge for each operation mode described above with reference to FIG. 1 may be stored. When the terminal 100 is input with an operation mode from the user, the terminal 100 may search for the operation information on cartridges matching the input operation mode from the storage unit so as to generate a program mode selection signal.

[0144] At this time, the above-described cartridge-specific oil combination information may be used together. In order to provide fragrance emission optimized for a use environment, it is necessary to know which oil is contained in which cartridge among the various cartridges currently installed in the smart diffuser 200. That is, this is to select a cartridge containing lavender when emission of a lavender fragrance is needed. As described above, the cartridge-specific oil combination information may be directly input by the user so as to be stored and managed in the terminal 100. Alternatively, the cartridge-specific oil combination information may be stored and managed in the terminal 100 by being recognized by the smart diffuser 200 and transmitted to the terminal 100.

[0145] When the GUI is displayed as illustrated in FIG. 8C, the user may perform touch input for a desired operation mode.

[0146] More specifically, a home mode (HOME), a hotel mode (HOTEL), an office mode (OFFICE), a lounge mode (LOUNGE), a conference room mode (CONFERENCE), a sleep mode (SLEEP), and a ventilation mode (VENTILATION) may be displayed on the display unit of the terminal 100 in the form of a GUI.

[0147] For example, when a user applies a touch input with respect to CONFERENCE, the terminal 100 is capable of generating a program mode selection signal based on the operation information on cartridges matching the conference room mode and transmitting the program mode selection signal to the smart diffuser 200.

[0148] The program mode selection signal may include information of, for example, 09 to 12 : CA1 : medium, 13 to 18 : SCA1 : medium. This corresponds to operation time zone :

cartridge : fragrance emission intensity. Then, the smart diffuser 200 operates the oil categories based on the received program mode selection signal.

[0149] When the user applies a touch input with respect to HOME in the same manner, the terminal 100 is capable of generating a program mode selection signal based on the operation information on cartridges matching the home mode and transmitting the program mode selection signal to the smart diffuser 200. The mode selection signal may include information of, for example, 09 to 12 : CA2 : week, 12 to 15 : SCA4 : week, 15 to 18 : CA2 : week, and 18 to 21 : CA4 : week. Then, the smart diffuser 200 operates the oil categories based on the received program mode selection signal.

[0150] The same description is also applicable to other operation modes.

[0151] Meanwhile, the operation information on each cartridge for each operation mode may be received from a server (not illustrated). That is, when the terminal 100 receives the operation mode input from the user, the terminal 100 may send the received operation mode information together with the cartridge-specific oil combination information received from the smart diffuser 200 to the server, and may receive the operation information on matching cartridges from the server. Then, the terminal 100 may generate a program mode selection signal based on the received operation information and may transmit the program mode selection signal to the smart diffuser 200.

[0152] When the operation information on each cartridge is managed by the server, updating based on big data may be enabled. To this end, the smart diffuser 200 operation system 10 may further include a server (not illustrated) connected to the terminal 100 via a network. The network may be a wired or wireless communication network.

[0153] It should be noted that even though the technical spirit of the present disclosure has been specifically described with reference to the embodiments described above, the above-described embodiments are intended to be illustrative and not restrictive. It will be apparent to those skilled in the art that various embodiments can be made without departing from the spirit and scope of the present disclosure.

DRAWING REFERENCE NUMERALS

10: smart diffuser operation system	H: space
100: terminal	CP: cap
110: mode selection signal generation unit	W: partition wall(s)
120: communication unit	SH: groove space portion
200: smart diffuser	S1: (first) space portion
210: frame	S2: (second) space portion
212: upper frame	S3: (third) space portion
214: lower frame	S4: (fourth) space portion
216: guide unit	CA: oil cartridge(s)
220: container	CA1: (first) cartridge
221: first case	CA2: (second) cartridge
222: second case	CA3: (third) cartridge
223: third case	CA4: (fourth) cartridge
224: fourth case	SG1: (first) divisional element
230: control unit	SG2: (second) divisional element
240: cover unit	SG3: (third) divisional element
250: lid unit	SG4: (fourth) divisional element
DP: diffusing position	TB: time bar
FN: fan	CO: indicator(s)
SP: spring	CO1: (first) indicator
HL: hill portion	CO2: (second) indicator
HD: header	CO3: (third) indicator
B: lower surface	CO4: (fourth) indicator
B': protrusion	S10: step of generating a mode selection signal
T: upper end	S20: step of transmitting a mode selection signal to the smart diffuser
R: direction	
O: open space	

CLAIMS

What is claimed is:

1. A method of operating a smart diffuser (200) using a terminal (100) connected to the smart diffuser (200) via a network, the method comprising:
generating (S10) a mode selection signal comprising operation information on a plurality of oil cartridges (CA) mounted in the smart diffuser (220), wherein the operation information comprises at least one of an operation order, an operation duration, a fragrance emission intensity, and an operation time zone of each of the cartridges (CA); and
transmitting (S20) the mode selection signal to the smart diffuser (200).
2. The method of claim 1, wherein the mode selection signal comprises a manual mode selection signal, and the manual mode selection signal is generated based on the operation information on the plurality of oil cartridges (CA), which is input from a user.
3. The method of claim 1 or 2, wherein the mode selection signal comprises a program mode selection signal, and the program mode selection signal is generated based on the operation mode information on the smart diffuser (200), which is input from a user and comprises at least one of a home mode, a hotel mode, an office mode, a lounge mode, a conference room mode, a sleep mode, and a ventilation mode, and oil combination information on oils contained in the plurality of oil cartridges (CA).
4. The method of claim 3, wherein the oil combination information is transmitted from the smart diffuser (200) or input from the user.
5. The method of any one of claims 1 to 4, wherein the smart diffuser (200) comprises:
a frame (210) configured to define a diffusing position (DP);
a container (220) mounted on the frame (210) and comprising a space (H) configured to mount a plurality of oil cartridges (CA) therein; and
a control unit (230) configured to control a corresponding cartridge (CA) among the plurality of oil cartridges (CA) to enter the diffusing position (DP) by driving the container (220) based on the mode selection signal transmitted to the smart diffuser (200).

6. The method of claim 5, wherein the frame (210) comprises a fan (FN), which is located directly above the diffusing position (DP) and configured to draw out a fragrance of an oil cartridge (CA), which has entered the diffusing position (DP), and the control unit (230) controls an operation of the fan (FN) based on the mode selection signal transmitted to the smart diffuser (200).

7. The method of claim 5 or 6, wherein the container (220) is rotatably mounted on the frame (210), and the control unit (230) rotates the container (220) so as to cause the selected cartridge (CA) to enter the diffusing position (DP).

8. A terminal (100) connected to a smart diffuser (200) via a network so as to operate the smart diffuser (200), the terminal (100) comprising:

a mode selection signal generation unit (110) configured to generate a mode selection signal comprising operation information on a plurality of oil cartridges (CA) mounted in the smart diffuser (200), wherein the operation information comprises at least one of an operation order, an operation duration, a fragrance emission intensity, and an operation time zone of each of the cartridges (CA); and

a communication unit (120) configured to transmit the mode selection signal to the smart diffuser (200).

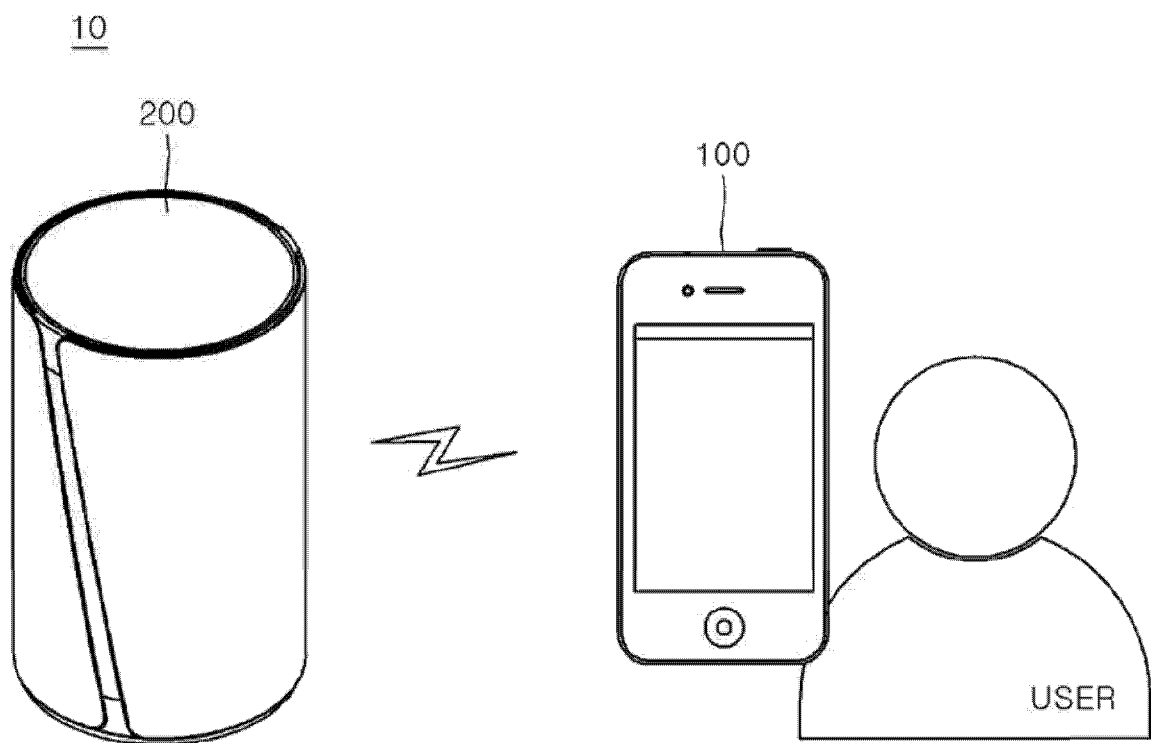


FIG. 1

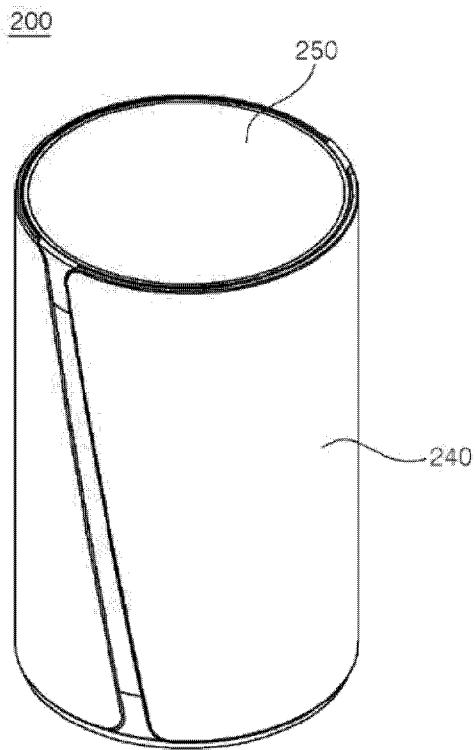


FIG. 2A

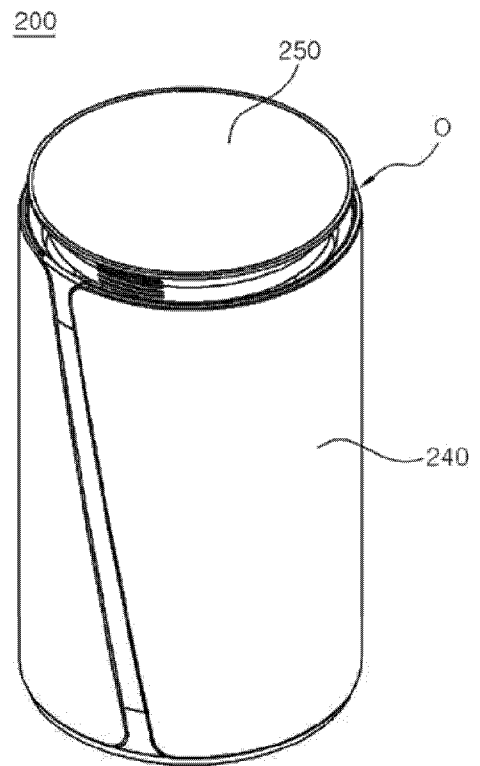


FIG. 2B

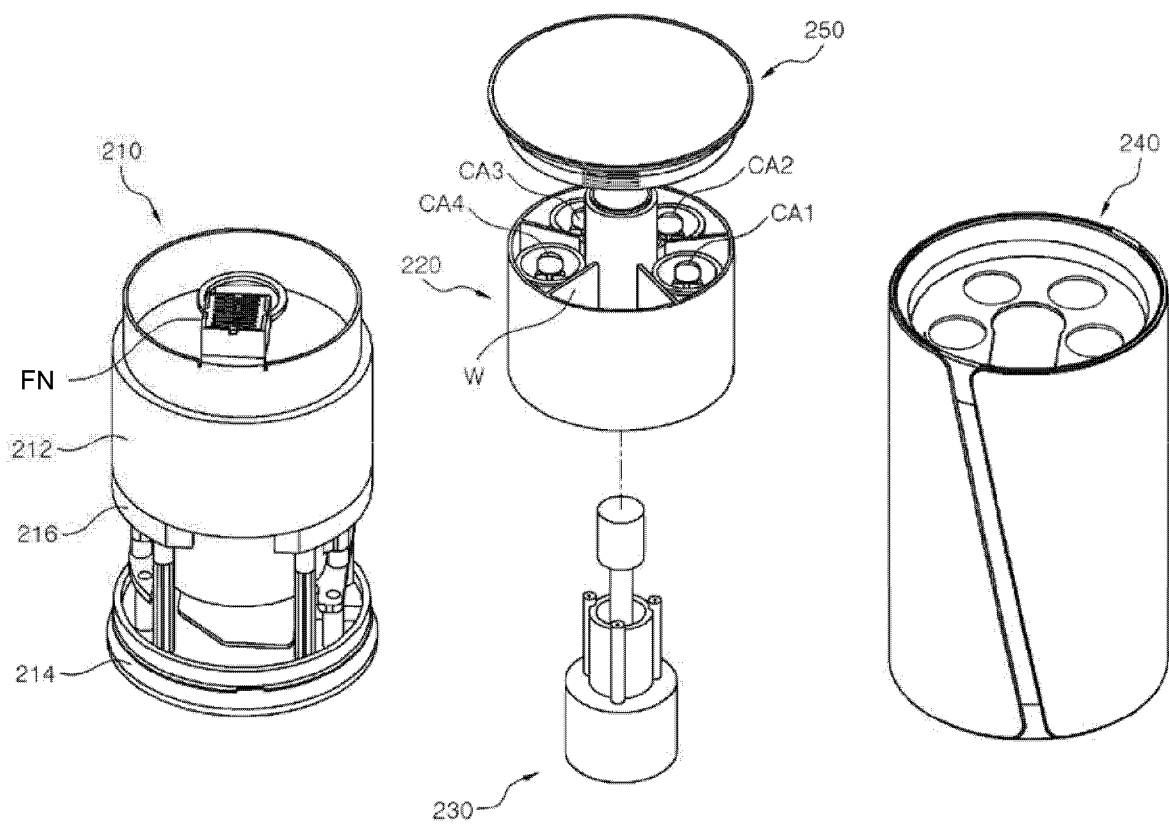


FIG. 3

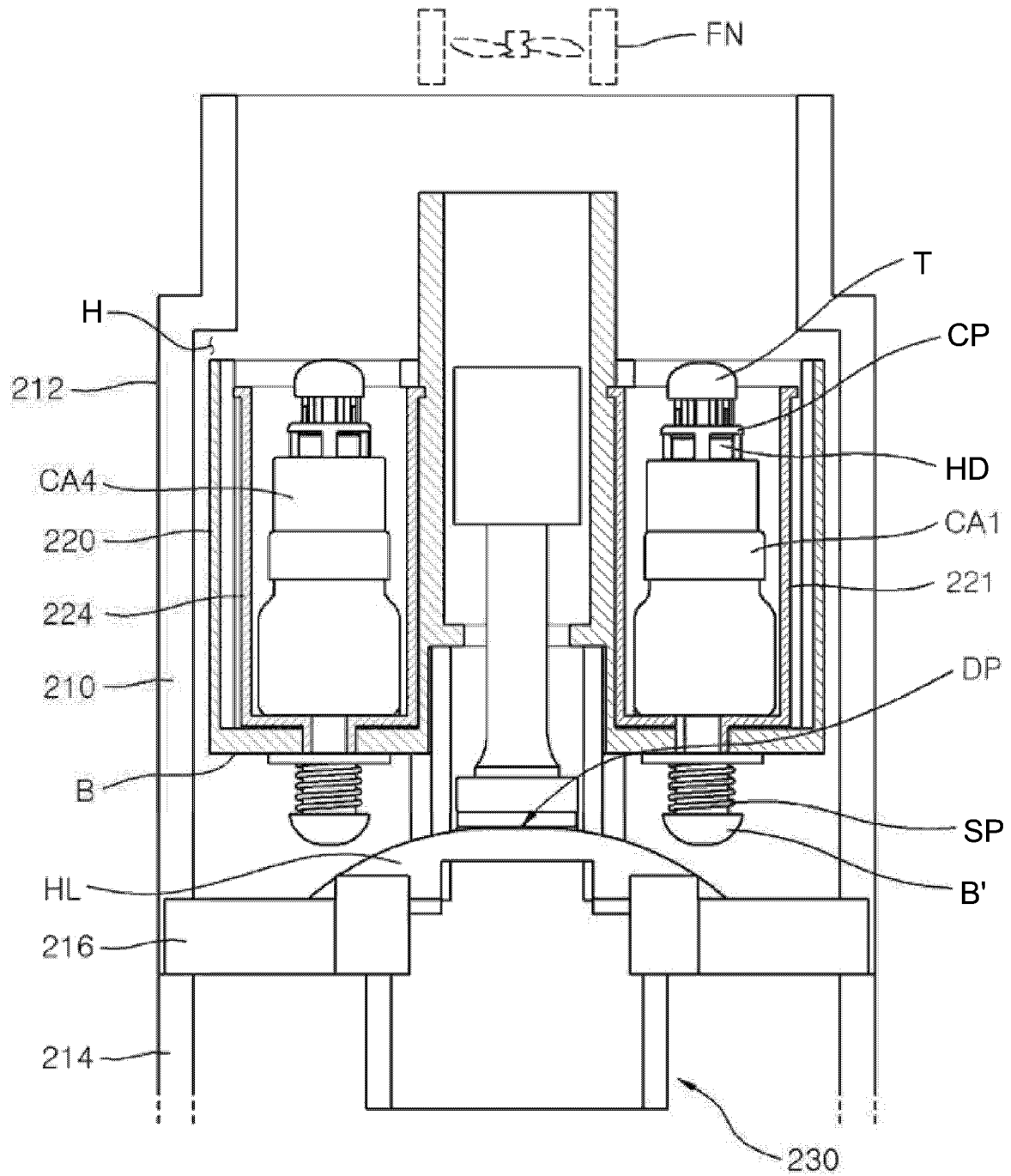


FIG. 4

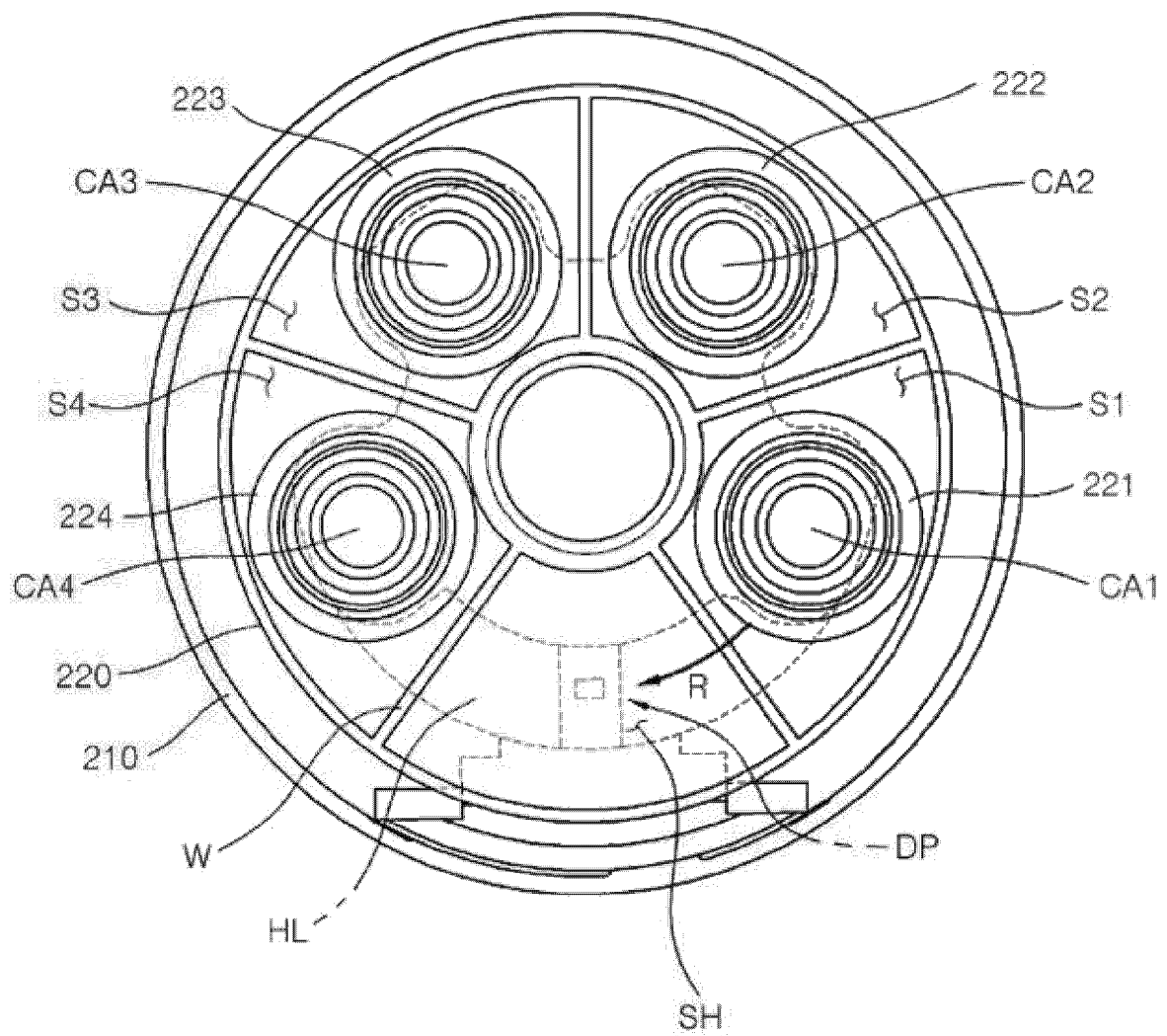


FIG. 5

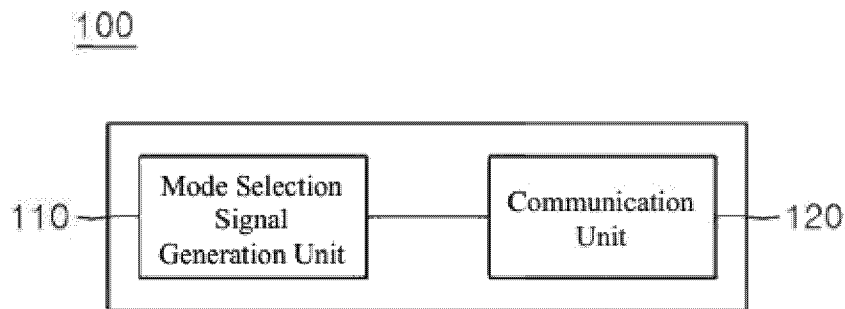


FIG. 6

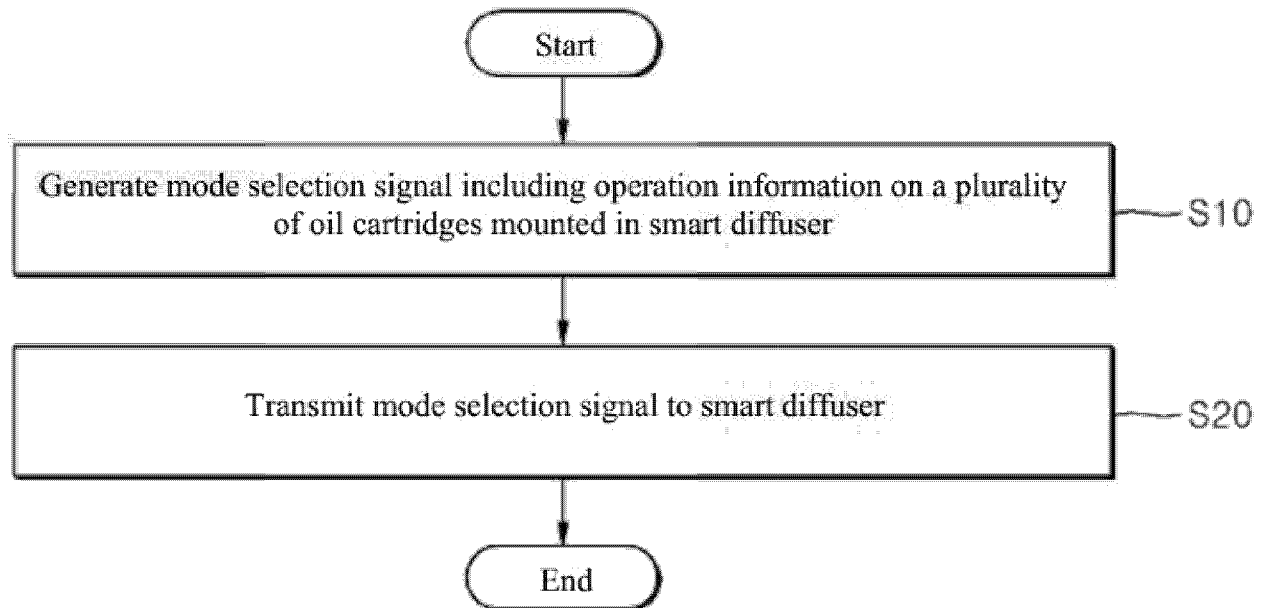


FIG. 7

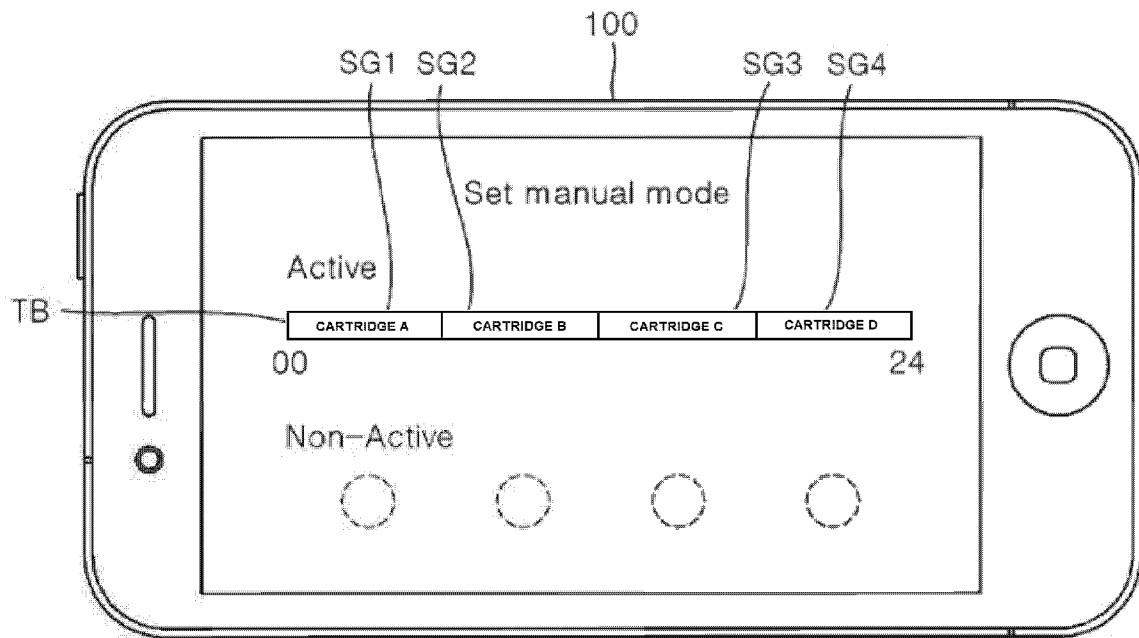


FIG. 8A

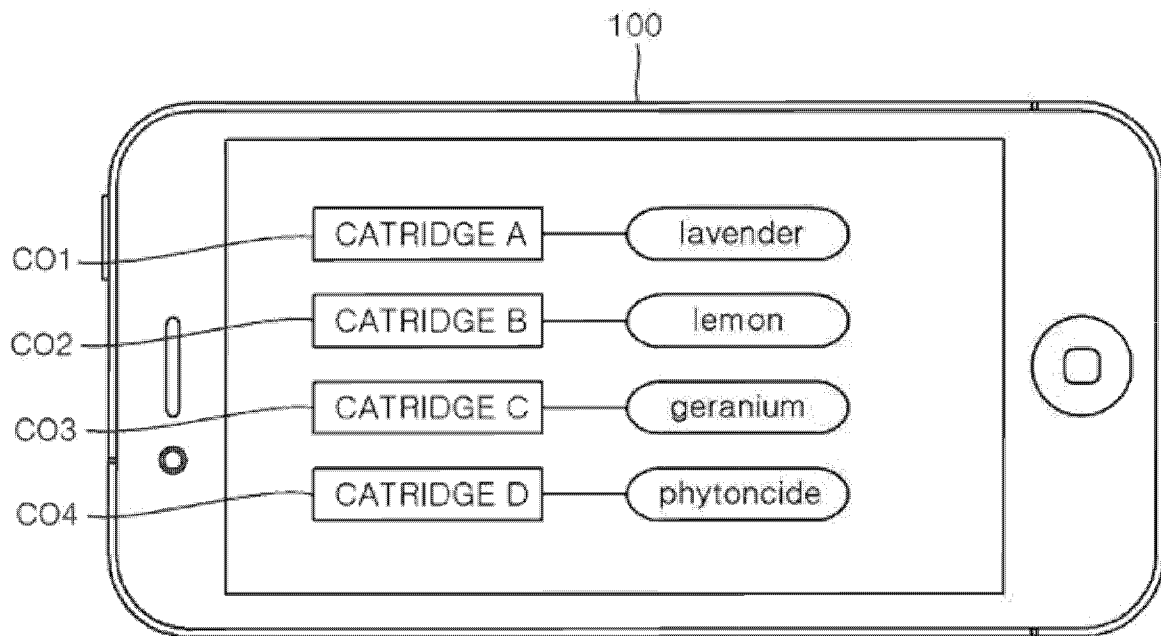


FIG. 8B

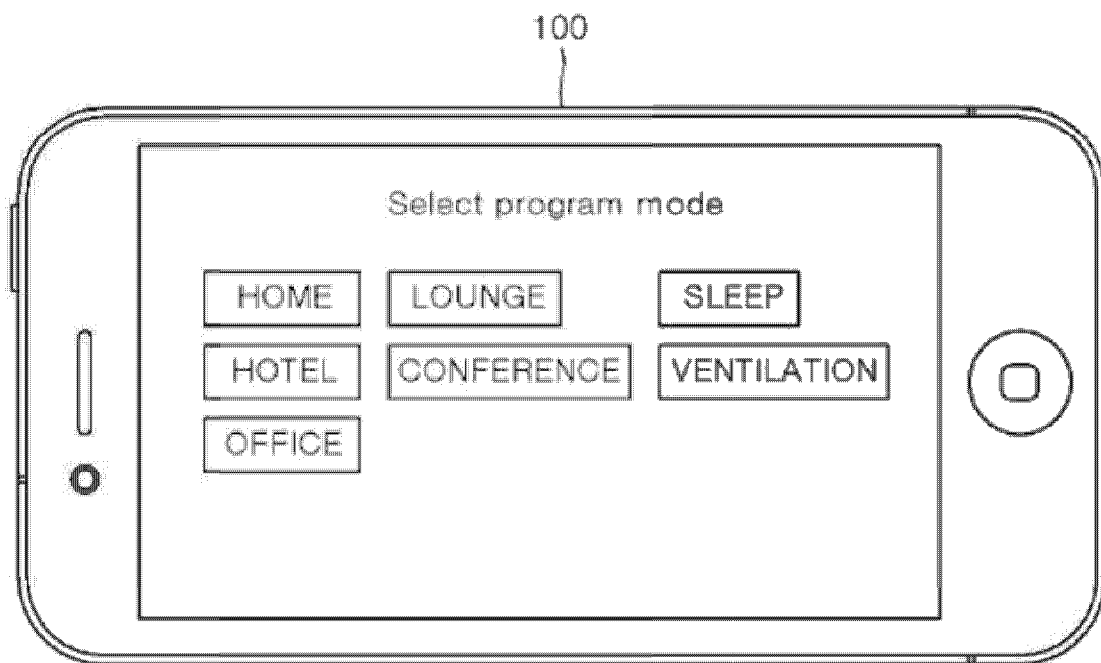


FIG. 8C

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2019/049037

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61L9/22

ADD.

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)

A61L

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)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2014/144636 A2 (EDWARDS DAVID A [US]; FIELD RACHEL DIANE [US] ET AL.) 18 September 2014 (2014-09-18) "essential oils"; page 15, paragraph 4 page 27, paragraph 2 figure 11	1-8
X	US 2003/206834 A1 (CHIAO DAHSHIARN [US] ET AL) 6 November 2003 (2003-11-06) paragraph [0106]; figures 1, 4B	1-8
X	WO 2018/022562 A1 (INHALIO INC [US]) 1 February 2018 (2018-02-01) paragraphs [0056], [0061]; figure 36	1-8
	-/-	



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

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"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

30 January 2020

Date of mailing of the international search report

06/02/2020

Name and mailing address of the ISA/

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Fischer, Michael

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2019/049037

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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