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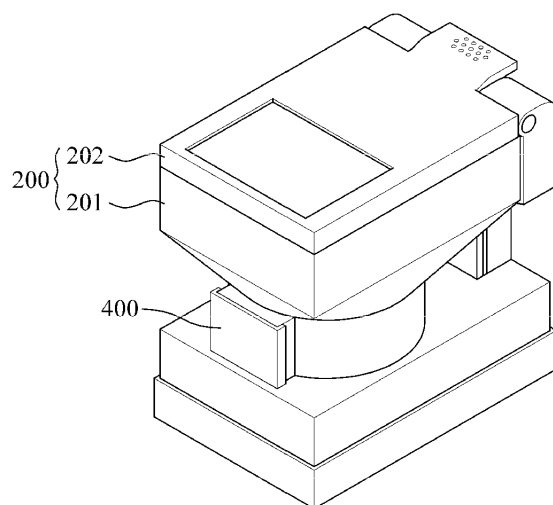
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(54) **Pill cartridge for medication packaging apparatus**

(57) A pill cartridge for a medication packaging apparatus, and more specifically, the pill cartridge with a stopper whose height can be freely adjusted to a shape of a pill and be installed therein. An exemplary embodiment may include a rotor to have a plurality of gear members protruding at regular intervals along a circumference of the rotor and have insertion grooves formed between the gear members to thereby accommodate a pill; a case to include a collection chamber to accommodate the pill therein; a rotor housing portion at a lower portion of the collection chamber to house the rotor; and a dispensing opening formed on a lower portion of the rotor housing portion.

**FIG. 1**



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## Description

### CROSS-REFERENCE TO RELATED APPLICATION(S)

[0001] This application claims the benefit under 35 U.S.C. §119(a) of Korean Patent Application No. 10-2013-0054607, filed on May 14, 2013, in the Korean Intellectual Property Office, the entire disclosure of which is incorporated herein by reference for all purposes.

### BACKGROUND

#### 1. Field

[0002] The following description relates to a pill cartridge for a medication packaging apparatus, and more specifically, to a pill cartridge with a stopper whose height can be freely adjusted to the shape of a pill and be installed therein.

#### 2. Description of the Related Art

[0003] In order to solve a well-known problem of pharmacists manually packaging pills, a medication packaging apparatus is provided. In general, the medication packaging apparatus has multiple pill cartridges, which are arranged in multiple layers at an upper portion to contain various types of pills. The pills contained in the pill cartridges may be selectively discharged under the user's control by use of a computer interfaced with the pill cartridges, and the pills discharged from the pill cartridges are collected in a hopper, and then packaged in a packaging unit located in a lower portion of the medication packaging apparatus.

[0004] The pill cartridge has an opening for dispensing pills at a lower portion of a case, and a cylindrical rotor above the dispensing opening with a plurality of "guide-teeth" and pill insertion grooves along its circumference. The rotor is connected to a rotator placed under the dispensing opening. The rotor rotates along with the rotator, which is rotated by a rotation motor.

[0005] A large number of pills are contained in the case of the pill cartridge, and a single pill or a predetermined number of pills are stored in each pill insertion groove between the guide-teeth of the rotor disposed below the case. In this state, as the rotor rotates, the pill insertion grooves change positions, and each is sequentially brought into line with the dispensing opening, such that the pills in the pill insertion grooves are discharged through the dispensing opening. At this time, a pill stopper is provided at the top of the dispensing opening. The pill stopper closes the top of the pill insertion grooves that are placed in line with the dispensing opening, so as to prevent other pills contained in another pill insertion groove from being discharged through the dispensing opening.

[0006] According to conventional methods, an instal-

lation of a pill stopper in a case is difficult to perform. To address this problem, Korean Utility Model Registration No. 20-0438560 (published on February 22, 2008) discloses a coupling projection unit on one side of a pill case to allow for the installation of a pill separation plate, which is equivalent to a pill stopper. The coupling projection unit includes inserting projections on each side. The pill case has an insertion hole at a position corresponding to the center of the coupling projection unit. The pill separation plate with fixed projections is inserted into the insertion hole. A cover having inserting grooves formed on both sides thereof is attached to the coupling projection unit.

[0007] If the type of pills to be contained in the case changes, a rotor needs to be replaced by another one having a width and height suitable for the different pills. According to the related art, an insertion hole has to be altered in accordance with the width and height of pill insertion grooves of the new rotor, so as to allow the pill separation plate to be inserted through the case, and thus difficulties in efficiently adapting to the rotor replacement occur.

### SUMMARY

[0008] To address the problem mentioned above, provided is a pill cartridge for a medication packaging apparatus with a stopper capable of being flexibly and conveniently adjusted corresponding to different shapes of pills.

[0009] In one general aspect, a pill cartridge for a medication packaging apparatus, the pill cartridge includes: a rotor to have a plurality of gear members protruding at regular intervals along a circumference of the rotor and to have an insertion groove formed between the plurality of gear members to thereby accommodate a pill; and a case to comprise a collection chamber to accommodate the pill therein, a rotor housing portion at a lower portion of the collection chamber to house the rotor, and a dispensing opening formed on a lower portion of the rotor housing portion, wherein further comprises a stopper of a planar shape to be additionally disposed above the dispensing opening to close a top of the insertion groove, wherein the case comprises an installation opening of a size that allows a height of the stopper to be adjustable when the stopper is inserted in the case, wherein the installation opening is formed by an opening portion on one side of the case, and wherein further comprises a stopper cover, which is coupled to the opening portion and comprises a plurality of slits that is formed in a longitudinal direction and into which one side of the stopper is inserted and fixed so as to dispose the stopper in the installation opening.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

FIG. 1 is a diagram illustrating an example of a pill cartridge for a medication packaging apparatus according to an exemplary embodiment.

FIG. 2 is an exploded perspective view illustrating an example of a stopper cover and a stopper of a pill cartridge illustrated in FIG. 1 according to an exemplary embodiment.

FIG. 3 is a side-sectional view illustrating an example of FIG. 1 according to an exemplary embodiment.

FIG. 4 is a transverse-sectional view illustrating an example of FIG. 1 according to an exemplary embodiment.

FIG. 5 is another exploded perspective view illustrating an example of a stopper cover and a stopper of a pill cartridge for a medication packaging apparatus according to an exemplary embodiment.

FIGS. 6 and 7 illustrate that a pill is discharged by a pill cartridge for a medication packaging apparatus according to exemplary embodiments.

**[0011]** Throughout the drawings and the detailed description, unless otherwise described, the same drawing reference numerals will be understood to refer to the same elements, features, and structures. The relative size and depiction of these elements may be exaggerated for clarity, illustration, and convenience.

#### **DETAILED DESCRIPTION**

**[0012]** The following description is provided to assist the reader in gaining a comprehensive understanding of the methods, apparatuses, and/or systems described herein. Accordingly, various changes, modifications, and equivalents of the methods, apparatuses, and/or systems described herein will be suggested to those of ordinary skill in the art. Also, descriptions of well-known functions and constructions may be omitted for increased clarity and conciseness.

**[0013]** FIG. 1 is a diagram illustrating an example of a pill cartridge for a medication packaging apparatus according to an exemplary embodiment. FIG. 2 is an exploded perspective view illustrating an example of a stopper cover and a stopper of a pill cartridge illustrated in FIG. 1 according to an exemplary embodiment. FIG. 3 is a side-sectional view illustrating an example of FIG. 1 according to an exemplary embodiment. FIG. 4 is a transverse-sectional view illustrating an example of FIG. 1 according to an exemplary embodiment.

**[0014]** An exemplary embodiment may include a rotor 100 to have a plurality of gear members 110 protruding at regular intervals along a circumference of the rotor 100 and have insertion grooves 120 formed between the gear members 110 to thereby accommodate a pill; and a case 200 to include a collection chamber 210 to accommodate the pill therein, a rotor housing portion 220 at a lower portion of the collection chamber 210 to house the rotor 100, and a dispensing opening 230 formed on a lower portion of the rotor housing portion 220.

**[0015]** The rotor 100 may be connected with a rotator (not shown) at a lower portion thereof. The rotor 100 rotates along with the rotator that is driven by a motor, such as a rotation motor. The rotator and the rotation motor may be provided in a cartridge base mounted on a lower portion of the case 200. The width and height of each insertion groove 120 may be determined to conform to the shape of a pill 10 contained in the case 200.

**[0016]** According to an exemplary embodiment, a planar stopper 300 may be additionally disposed above the dispensing opening 230 to close a top of insertion grooves 120. Also, the case 200 includes an installation opening 240 with a size that allows a height of the stopper 300 to be adjustable when the stopper 300 is inserted in the case 200, wherein the installation opening 240 is formed by an opening portion 250 on one side of the case 200. Furthermore, the exemplary embodiment further includes a stopper cover 400, which is coupled to the opening portion 250 and includes a plurality of slits 422 and 425, which is formed in a longitudinal direction and into which one side of the stopper 300 is inserted and fixed so as to dispose the stopper 300 in the installation opening 240.

**[0017]** The stopper 300 is disposed to close a top of insertion grooves 120 positioned to be connected to the dispensing opening 230. A portion of the stopper 300 that covers the top of insertion grooves 120 may be larger than a top opening of the insertion grooves 120. The stopper 300 may be designed to adapt to virtually all widths of the insertion grooves 120, which may vary depending on the types of pills.

**[0018]** In another exemplary embodiment, a pusher may be additionally provided. The pusher may rotate above the stopper 300 and push the pill mounted above the stopper 300 while being fixed in the rotor 100 so as to keep the pill from remaining above the stopper 300. Also, an inclined plane, which is either straight or curved, may be formed above the stopper 300, so that the pill above the stopper 300 may automatically slide and free-fall.

**[0019]** The case 200 may include a collection chamber 210 to accommodate the pills. The case 200 may include a rotor housing portion 220 at a lower portion of the collection chamber 210 so as to house the rotor 100. The case 200 may have a dispensing opening 230 formed on a lower portion of the rotor housing portion 220, corresponding to a position of the stopper 300.

**[0020]** The case 200 may include a case body 201 and a case cover 202. The case body 201 includes the collection chamber 210, the rotor housing portion 220, and the dispensing opening 230. The case body 201 is configured to have a top opening allowing the pills to pass therethrough. The case cover 202 is hinged to a top edge of the case body 201 in such a manner to open and close the top opening of the case body 201.

**[0021]** A large number of pills may be contained in the collection chamber 210 of the case 200, and a single pill or a predetermined number of pills may be stored in each

insertion groove 120 of the rotor 100. As the rotor 100 rotates, the insertion grooves 112 change positions and each is sequentially brought into line with the dispensing opening 230, such that the pills in the insertion groove 120 are discharged through the dispensing opening 230. In this state, the stopper 300 closes the top opening of the insertion groove 120 placed in a line with the dispensing opening 230, and hence only the pills contained in the insertion groove 120 in the position can be discharged through the dispensing opening 230.

**[0022]** The case body 201 of the case 200 has an installation opening 240 with a length that allows for the stopper 300 to adjust its height while being inserted into the installation opening 240 which is formed by the opening portion 250 on one side of the case 200. The stopper cover 400 is attached to the case 200 to close the opening portion 250, and the plurality of slits 422 is formed on an inner side of the stopper cover 400 where the stopper 300 is inserted and fixed at an adjusted height. The plurality of slits 422 may be used as space where one side of the stopper 400 is supported by being inserted into the slits or put thereon.

**[0023]** As such, even when the height of the insertion grooves 112 changes as the types of pills to be contained in the case 200 are changed, the height of the stopper 300 is able to be adjusted within the installation opening 240 to correspond to the changed height of the insertion grooves 120. The stopper 300 is coupled to the stopper cover 400 at the adjusted height. Therefore, it is possible to flexibly and conveniently deal with the change of the height of the insertion hole 120 for different types of pills.

**[0024]** In an exemplary embodiment, one side of the stopper 300, which faces the rotor 100, may be concave in form with a curved line so as to have a curvature similar or identical to a circumference curvature of the rotor 100. In such a case, the stopper 300 may adhere to a surface of the circumference of the rotor 100, so that the pill accommodated in the collection chamber 210 may not be lost through a gap between the rotor 100 and the stopper 300.

**[0025]** The stopper 300 may include: a stopper body 310 to close the top of insertion grooves 120 positioned to be connected to the dispensing opening 230; first extension ends 320 to extend from each side of the stopper body 310 toward the stopper cover 400; second extension ends 330 that are bent inward and extend from the respective first extension ends 320. The stopper cover 400 may include: a cover body 410 to be coupled to the case 200 so as to close the opening portion 250; and a height adjustment portion 420. The height adjustment portion 420 is formed on an inner surface of the cover body 410, and includes: guide grooves 421, into which the second extension ends 330 are inserted and which are formed to be concavely inserted in a longitudinal direction on both sides; and the plurality of slits 422 formed in a longitudinal direction toward the guide grooves 421 to support the second extension ends 330.

**[0026]** The stopper body 310 may have a size large

enough to close the top of insertion grooves 120 positioned to be connected to the dispensing opening 230. The first extension ends 320 extend from each side of the stopper body 310 toward the stopper cover 400. The second extension ends 330 are bent inward and extend from the respective first extension ends 320. The first extension ends 320 and the second extension ends 330 may together form an "L" shape.

**[0027]** The stopper cover 400 may include the cover body 410 and the height adjustment portion 420. The cover body 410 is coupled with the case 200 to close and open the opening portion 250. The height adjustment portion 420 is formed along an inner surface of the cover body 410. Guide grooves 421 may be formed to be concavely inserted in a longitudinal direction into the stopper cover 400 on both sides of the height adjustment portion 420, and guide the movement of the second extension ends 330. The first extension ends 320 move along both sides of the height adjustment portion 420 when the second extension portion 330 moves inside the stopper cover 400. The plurality of slits 422 is formed in a longitudinal direction to be concavely inserted into inner surfaces on both sides, where the guide grooves 421 of the height adjustment portion 420 are formed. As the plurality of slits 422 are formed in the height adjustment portion 420, the stopper 300 may be fixed to the stopper cover 400, either in a manner in which the second extension ends 330 moving along the guide grooves 421 are inserted to the plurality of slits 422 at positions corresponding to a size of a pill, or in which some parts of the second extension ends 330 are supported by the slits 422.

**[0028]** The stopper 300 is made of an elastic material, and width W1 of each guide groove 421 is smaller than depth D1 of each second extension end 330. As mentioned above, the stopper 300 may be made of an elastic material so that a gap between each of the first extension ends 320 of the stopper 300 can be restored after the gap is changed wider by an external force, which is then removed. For example, the stopper 300 may be made of silicon, soft resin, rubber, etc., which have elasticity. As such, in a case where the stopper 300 is made of an elastic material, even though the width W1 of each guide groove 421 is smaller than the depth D1 of each second extension end 330, the depth D1 is capable of moving along the guide grooves 421 while becoming smaller. In this case, the second extension ends 330 may also be extended to the original shape at positions where the plurality of the slits 422 is formed, so that the second extension ends 300 may be fixed to the plurality of slits 422 by being pressed and inserted.

**[0029]** FIG. 5 is another exploded perspective view illustrating an example of a stopper cover and a stopper of a pill cartridge for a medication packaging apparatus according to an exemplary embodiment. FIGS. 6 and 7 illustrate that a pill is discharged by a pill cartridge for a medication packaging apparatus according to exemplary embodiments.

**[0030]** In an exemplary embodiment, a stopper 300

may include: a stopper body 310 to close a top of insertion grooves 120 positioned to be connected to a dispensing opening 230; a third extension end 340 to extend from a middle of one side of the stopper body 310 toward the stopper cover 400; and fourth extension ends 350 that extend from the third extension end 340 to protrude from the both sides of the third extension end 340. The stopper cover 400 may include: a cover body 410 to be coupled to a case 200 so as to close an opening portion 250; and a height adjustment portion 420. The height adjustment portion 420 is formed on an inner surface of the cover body 410, and includes: a vertical groove 423, into which the third extension end 340 is inserted, and a horizontal groove 424, into which the fourth extension ends 350 are inserted, wherein the horizontal groove 424 is formed to be concavely inserted in a longitudinal direction on a surface toward the stopper 300; and a plurality of slits 425 formed in a longitudinal direction toward the horizontal groove 424 to support the fourth extension ends 350.

**[0031]** As mentioned above, the stopper body 310 may have a size large enough to close the top of insertion grooves 120 positioned to be connected to a dispensing opening 230. The third extension end 340 extends from a middle of one side of the stopper body 310 toward the stopper cover 400. The fourth extension ends extend from the third extension end 340 to protrude from the both sides of the third extension end 340. The third extension end 340 and the fourth extension ends 350 may together form a "T" shape.

**[0032]** The stopper cover 400 may include the cover body 410 and the height adjustment portion 420. The cover body 410 is coupled to the case 200 to close and open an opening portion 250. The height adjustment portion 420 is formed along an inner surface of the cover body 410. The height adjustment portion 420 may include the vertical groove 423 in the middle thereof to be concavely inserted in a longitudinal direction into an inner surface on a side toward the stopper 300, and the vertical groove 423 may guide the movement of the third extension portion 340. In addition, the vertical groove 423 and the horizontal groove 424 may together form a "T" shape on both sides of the vertical groove 423, and the horizontal groove 424 may guide the movement of the fourth extension portion 350.

**[0033]** The plurality of slits 425 is formed in a longitudinal direction to be concavely inserted into inner surfaces on the side, where the horizontal groove 424 of the height adjustment portion 420 is formed. In response to the plurality of slits 425 formed in the height adjustment portion 420, the stopper 300 may be fixed to the stopper cover 400, in a manner that the fourth extension ends 350 moving along the horizontal groove 424 are inserted to the plurality of slits 425 at positions corresponding to a size of a pill, or in a manner that some parts of the fourth extension ends 350 are supported by the slits 425.

**[0034]** The stopper 300 is made of an elastic material, and width W2 of the horizontal groove 424 is smaller than depth D2 of each fourth extension end 350.

**[0035]** As mentioned above, the stopper 300 may be made of an elastic material so that gaps between the third extension end 340 and the fourth extension ends 350 can be restored after the gaps are changed wider by an external force, which is then removed. For example, the stopper 300 may be made of silicon, soft resin, rubber, etc. As such, in a case where the stopper 300 is made of elastic material, even though the width W2 of the horizontal groove 424 is smaller than the depth D2 of the fourth extension ends 350, the depth D2 is capable of moving along the horizontal groove 424 while becoming smaller. In this case, the fourth extension ends 350 may also be extended to the original shape at positions where the plurality of the slits 425 is formed, so that the fourth extension ends 350 may be fixed to the plurality of slits 425.

**[0036]** The rotor 100 may form, at regular intervals, a plurality of coupling grooves 130 which are concavely inserted into an inner surface along the circumference thereof, and gear members 110 are fixed to the coupling grooves 130 according to a size corresponding to a shape of a pill accommodated in a collection chamber 210.

**[0037]** A size of the insertion groove 120 may be adjusted according to the shape of the pill contained in the case 200. Conventionally, as a type of a pill accommodated in the case 200 changes, the rotor 100 is changed to another rotor with a size of an insertion groove corresponding to the different types of pills. However, exemplary embodiments of a pill cartridge for a medication packaging apparatus are capable of adjusting the size of the insertion groove 120 to the changed pill without changing the rotor 100. According to the exemplary embodiment, if the coupling grooves 130 are formed along the circumference of the rotor 100, one end on one side of each gear member 110 is inserted and fixed to each coupling groove 130. In this case, the gear members 110 may be inserted and fixed by selecting the coupling grooves 130 according to the shape of the pill and the corresponding position. There may be the plurality of the gear members 110. In addition, the desired number of the gear members 110 may be fixed to each of the coupling grooves 130 of various heights, and a size of the insertion groove 120 may be readily adjusted according to the width and height of the fixed gear members 100. Moreover, the gear members 110 and the rotor 100 may be fixed to or separated from each other by using various well-known coupling elements that are detachable. For example, the gear members 110 may include snap projections, and the rotor 100 may include snap grooves at regular intervals along the circumference.

**[0038]** As mentioned above, the exemplary embodiments of a pill cartridge for a medication packaging apparatus is capable of immediately changing the stopper 300 according to the shape of the changed pill in a case where the type of the pill contained in the case 200 is changed. Although the accommodated pill is changed, the exemplary embodiments may adjust the size of the insertion groove 120 corresponding to the shape of the

changed pill without the replacement of the rotor 100, so that the exemplary embodiments have advantages of flexibly and conveniently dealing with different pill sizes.

[0039] The methods and/or operations described above may be recorded, stored, or fixed in one or more computer-readable storage media that includes program instructions to be implemented by a computer to cause a processor to execute or perform the program instructions. The media may also include, alone or in combination with the program instructions, data files, data structures, and the like. Examples of computer-readable storage media include magnetic media, such as hard disks, floppy disks, and magnetic tape; optical media such as CD ROM disks and DVDs; magneto-optical media, such as optical disks; and hardware devices that are specially configured to store and perform program instructions, such as read-only memory (ROM), random access memory (RAM), flash memory, and the like. Examples of program instructions include machine code, such as produced by a compiler, and files containing higher level code that may be executed by the computer using an interpreter. The described hardware devices may be configured to act as one or more software modules in order to perform the operations and methods described above, or vice versa. In addition, a computer-readable storage medium may be distributed among computer systems connected through a network and computer-readable codes or program instructions may be stored and executed in a decentralized manner.

[0040] A number of examples have been described above. Nevertheless, it should be understood that various modifications may be made. For example, suitable results may be achieved if the described techniques are performed in a different order and/or if components in a described system, architecture, device, or circuit are combined in a different manner and/or replaced or supplemented by other components or their equivalents. Accordingly, other implementations are within the scope of the following claims.

## Claims

1. A pill cartridge for a medication packaging apparatus, the pill cartridge comprising:

a rotor to have a plurality of gear members protruding at regular intervals along a circumference of the rotor and to have an insertion groove formed between the plurality of gear members to thereby accommodate a pill; and

a case to comprise a collection chamber to accommodate the pill therein, a rotor housing portion at a lower portion of the collection chamber to house the rotor, and a dispensing opening formed on a lower portion of the rotor housing portion,

wherein a stopper of a planar shape is further

provided to be additionally disposed above the dispensing opening to close a top of the insertion groove,

wherein the case comprises an installation opening of a size that allows a height of the stopper to be adjustable when the stopper is inserted in the case, wherein the installation opening is formed by an opening portion on one side of the case, and

wherein a stopper cover is further provided, which is coupled to the opening portion and comprises a plurality of slits that is formed in a longitudinal direction and into which one side of the stopper is inserted and fixed so as to dispose the stopper in the installation opening.

2. The pill cartridge of claim 1, wherein the stopper comprises:

a stopper body to close a top of the insertion groove positioned to be connected to the dispensing opening;

first extension ends to extend from each side of the stopper body toward the stopper cover; and second extension ends that are bent inward and extend from the respective first extension ends, wherein the stopper cover comprises:

a cover body to be coupled to the case so as to close the opening portion, and a height adjustment portion that is formed on an inner surface of the cover body, and comprises: guide grooves, into which the second extension ends are inserted and which are formed to be concavely inserted in a longitudinal direction on both sides; and the plurality of slits formed in a longitudinal direction toward the guide grooves to support the second extension ends.

3. The pill cartridge of claim 2, wherein the stopper is made of an elastic material, and a width of the respective guide grooves that is smaller than a depth of the respective second extension ends.

4. The pill cartridge of claim 1, wherein the stopper comprises:

a stopper body to close a top of the insertion groove positioned to be connected to the dispensing opening;

a third extension end to extend from a middle of one side of the stopper body toward the stopper cover; and

fourth extension ends to extend from the third extension end to protrude from both sides of the third extension end,

wherein the stopper cover comprises:

a cover body to be coupled to the case so as to close the opening portion, and a height adjustment portion that is formed on an inner surface of the cover body, and comprises: a vertical groove, into which the third extension end is inserted; and a horizontal groove, into which the fourth extension ends are inserted, wherein the horizontal groove is formed to be concavely inserted in a longitudinal direction on a surface toward the stopper; and the plurality of slits formed in a longitudinal direction toward guide grooves to support the fourth extension ends.

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5. The pill cartridge of claim 4, wherein the stopper is made of an elastic material, and a width of the horizontal groove is smaller than a depth of the respective fourth extension ends.

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6. The pill cartridge of claim 1, wherein the rotor comprises, at regular intervals, a plurality of coupling grooves, which is concavely inserted into an inner surface along the circumference thereof, and gear members are fixed to the coupling grooves according to a shape of the pill accommodated in the collection chamber.

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FIG. 1

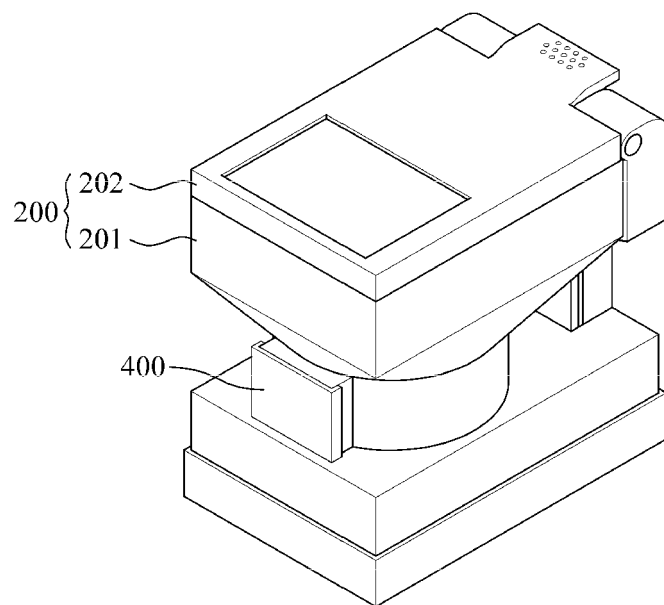




FIG. 2

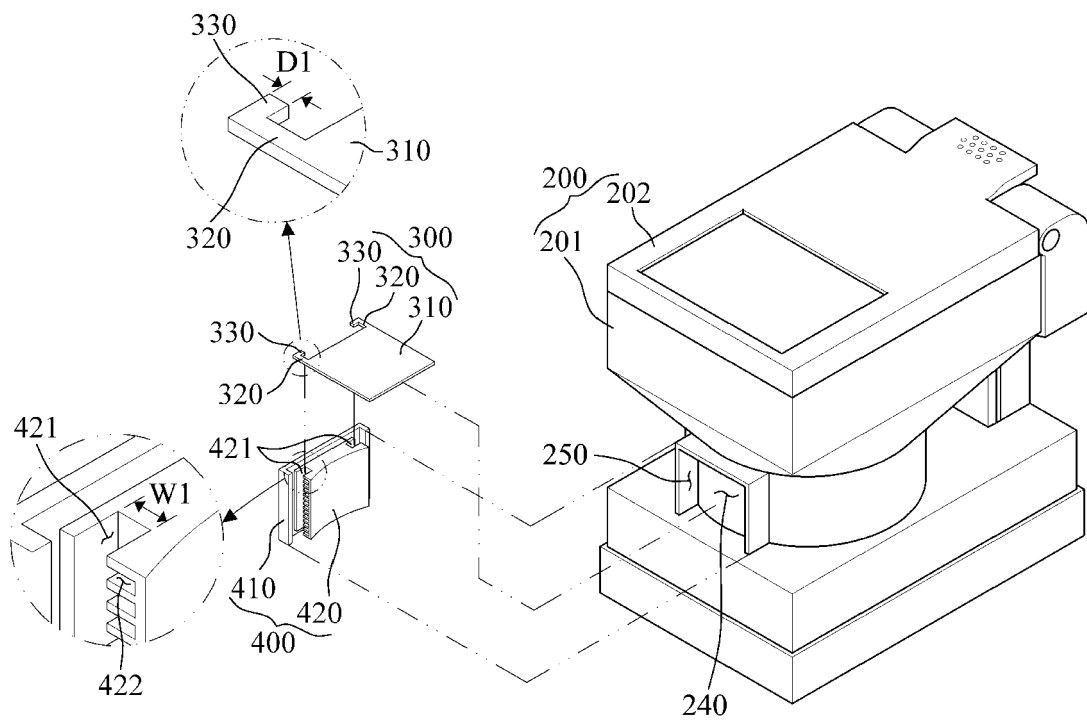


FIG. 3

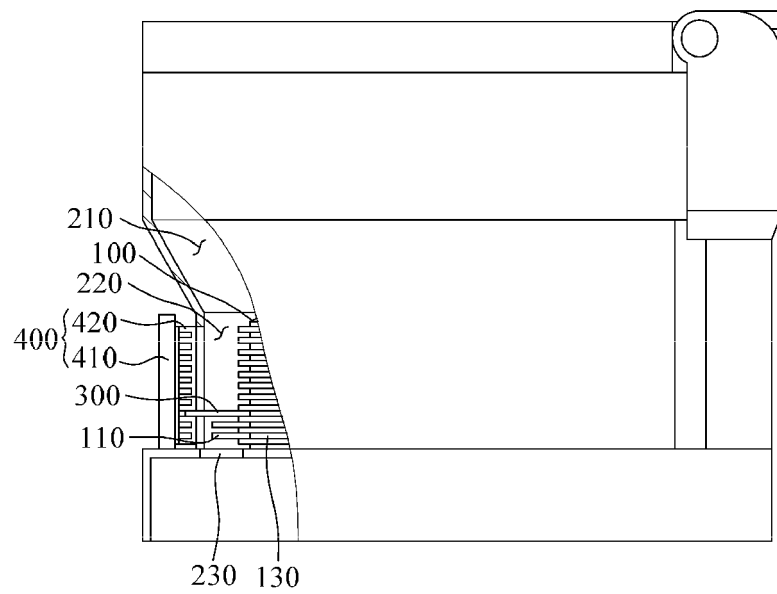


FIG. 4

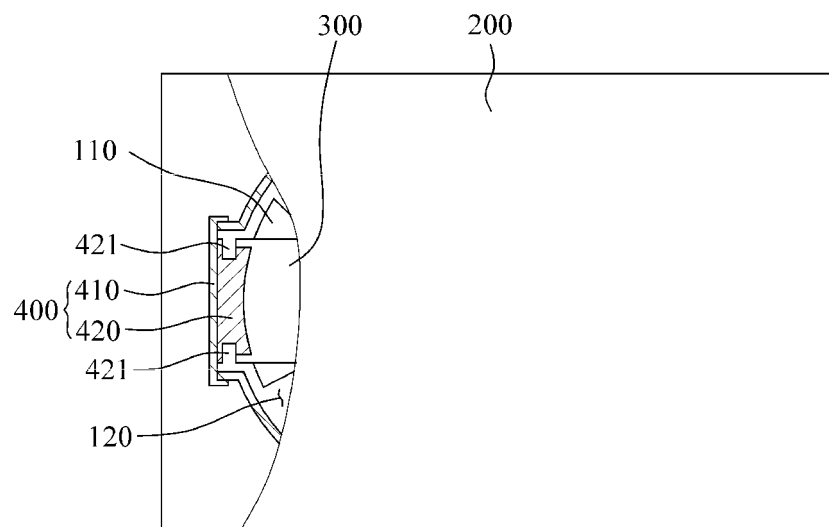


FIG. 5

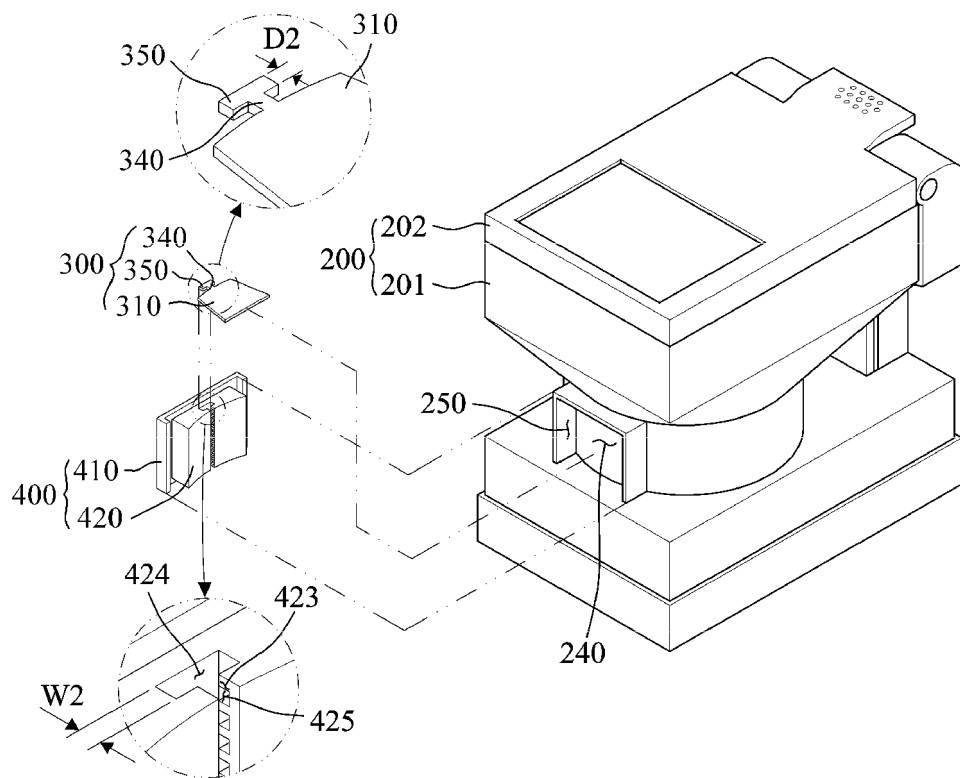


FIG. 6

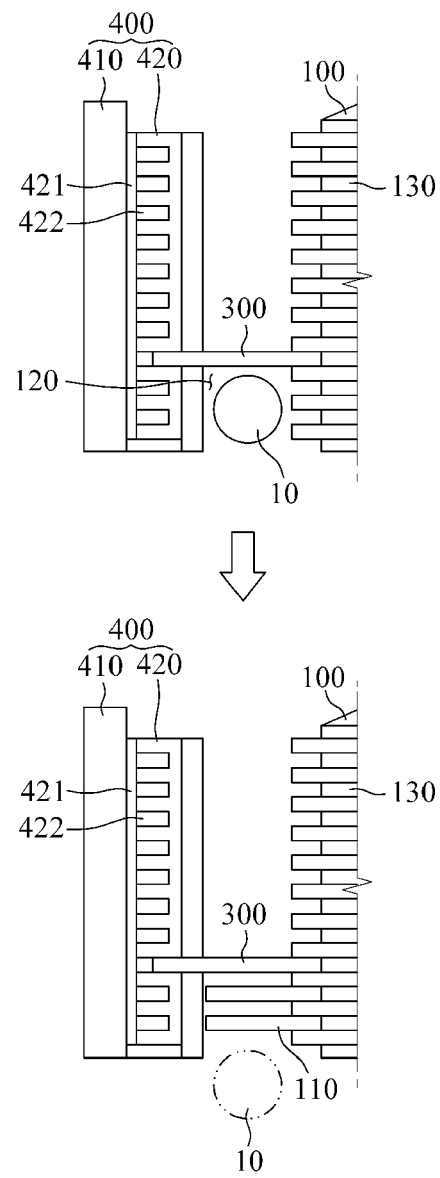
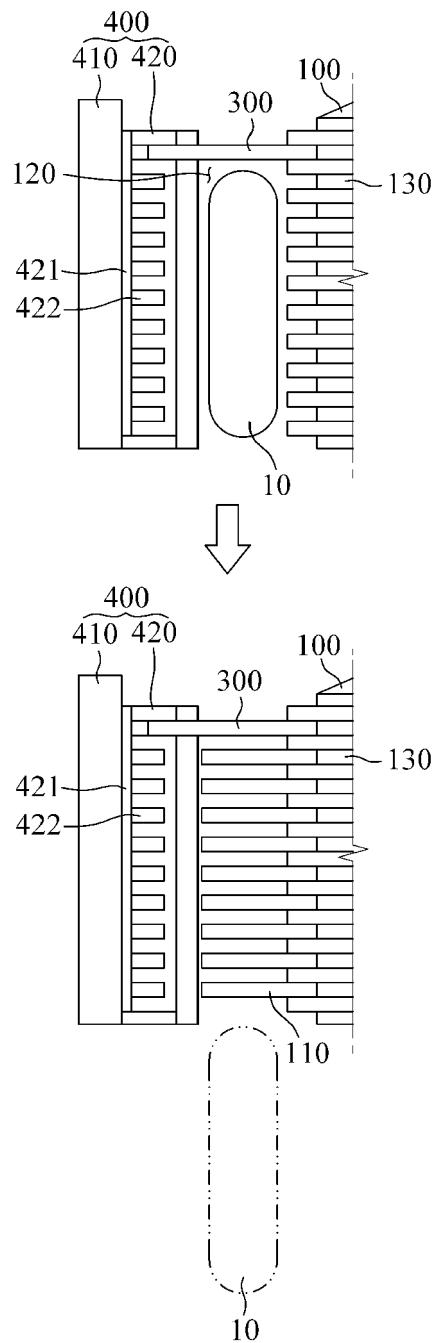


FIG. 7





## EUROPEAN SEARCH REPORT

Application Number  
EP 14 16 8229

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
E	EP 2 752 181 A2 (INFOPIA CO LTD [KR]) 9 July 2014 (2014-07-09) * the whole document *	1-6	INV. G07F17/00 A61J7/00 B65D83/00
X	EP 2 572 995 A1 (YUYAMA MFG CO LTD [JP]) 27 March 2013 (2013-03-27) * the whole document *	1-6	
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 3 October 2014	Examiner Guenov, Mihail
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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