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(54) **Title:** DISPENSER FOR MEDICATIONS, FOOD ADDITIVES, AND SUPPLEMENTS

(57) **Abstract:** A device for dispensing edible items, comprising a body; a control unit, a dispensing apparatus secured to the body and comprising a product container for storing the edible items, said product container has a top opening enables insertion of the edible items into the product container and a bottom opening. The device also comprises a dispenser unit located under the product container. The edible items passage from the product container to the dispenser unit via the bottom opening. The dispenser unit is tilted around lateral hinges when dispensing the edible items. The dispensing apparatus comprises a lifting mechanism designed to lift the edible items towards to upper end of the dispenser unit while rotating around a longitudinal axis of the dispenser unit. The dispenser unit moves around the hinge and the lifting mechanism rotates in response to commands sent from the control unit.

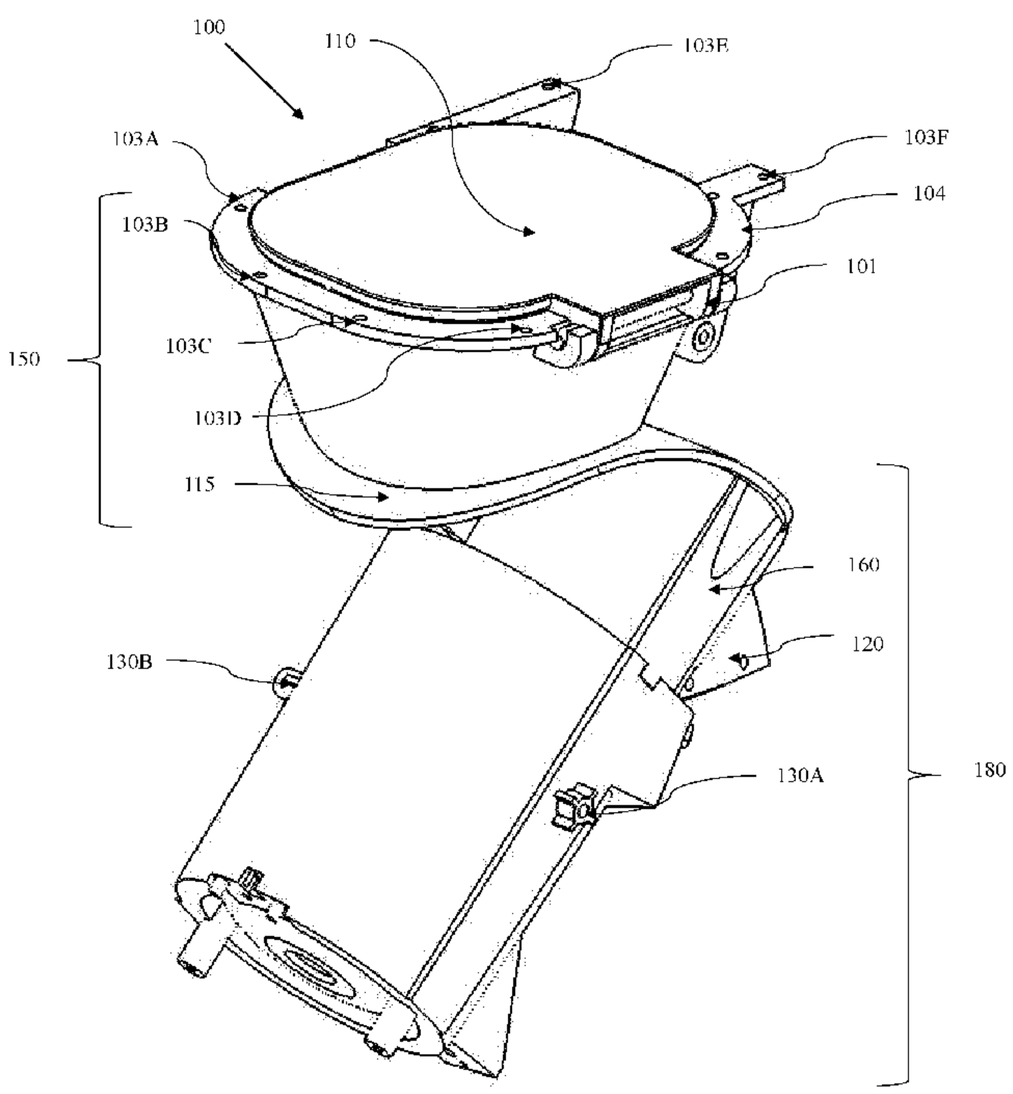


Fig. 1

WO 2021/090314 A1

DISPENSER FOR MEDICATIONS, FOOD ADDITIVES, AND SUPPLEMENTS

FIELD OF THE INVENTION

The present invention generally relates to a dispenser, more particularly to automatic dispensers of medications and dietary supplements for domestic and institutional usage.

BACKGROUND OF THE INVENTION

Medications and food supplements (or dietary supplements) are products intended to treat or prevent diseases and supplement the diet of a consumer. Medication and/or food supplements can provide the essential ingredients, either extracted from food sources or synthetically made in a lab. Examples for medications comprise recombinant proteins, vaccines, blood products (such as IVIG), gene therapy, and cell therapy. Examples for food supplements comprise vitamins, minerals, dietary fibers, fatty acids, and amino acids. In the United States and Canada, in a similar manner to medications, dietary supplements are considered a subset of foods and are also regulated accordingly by the FDA. Most of the medications and food supplements today are sold in a form of pills, capsules, tablets, powders or liquids in multiple dosage forms. These medications and food supplements are typically purchased in a sealed medication-like container. Currently, the consumers consume medications and food supplements in an almost completely manual fashions. In such manual fashions, a customer may purchase the desired medication and/or food supplement and consume the desired amount of medication and/or food supplement by opening the container of the medication and/or food supplement, taking out the desired dose stored within the container and consume the taken dose.

The aforementioned manual method of distribution of medications and food supplements may arise several challenges for the consumer. Such challenges can be compliance and adherence to consumer needs, safe usage, safe storage, inventory management, child resistance, ease of use, drug interactions and the like. For example, one problem may be that wrong medication and/or food supplements or wrong dosages thereof may be consumed due to human error of the consumer. Such human error may potentially cause some health complications. Another problem with manual distribution is that the containers of the medications and/or food supplements may be stored in bad conditions.

In view of the above-mentioned problems of the manual method of medications and/or food supplements distribution, there is a need for an automatic method of distributing medications and/or food supplements to consumers to prevent or mitigate such problems from occurring.

SUMMARY OF THE INVENTION

The present invention discloses an automatic dispensing device for dispensing edible products in a solid dosage form. The automatic dispensing device may be configured to store and automatically dispense the edible products, for example in a form of a tablet, capsule, pill, gels and the like. The invention deals with the mechanical aspect of storing, conveying and dispensing the edible products. In some cases, the edible products can be medicines, food additives, supplements, and the like. The automatic dispensing device can be configured to dispense products of oral solid dosage forms such as dietary supplements, nutrients, micronutrients, minerals, pharmaceuticals, medicines, and the like, in a predetermined amount associated with a consumer.

The terms “product” and “products” as mentioned herein depicts edible materials and medication in an oral dosage form, which are intended to be consumed by a consumer. The products may comprise medications, dietary supplements, medical foods, vitamins, nutrients, micronutrients, food additives, candy and the like. The products may be provided in varied form factors such as pills, tablets, capsules, soft gels, and other small particles with dimensions that fit oral consumption. In some cases, the products dispensed by the automatic dispensing device may be uniformly sized or variable-sized articles. In some cases, the size of the oral solid dosage forms may vary in the range of 5 to 25 millimeters. The size of the edible products may be defined by a radius, diameter, volume and the like. In some cases, the dispensed products may be contained in one or more containers (hereinafter “product containers”) designed to be placed within the automatic dispensing device for the purpose of supplying the products that are stored within the products container by the automatic dispensing device.

In some embodiments of the present invention, the automatic dispensing device can be adapted to comprise casing designed to contain the dispensing mechanism in a comprehensive manner and provide the required interfaces for a consumer utilizing the dispensing mechanism. In some cases, the casing is configured to isolate the dispensing mechanism located within the casing from the environment outside of the casing. In such cases, the casing can protect the dispensing

mechanism from environmental harms which can damage or affect the activity level of the products stored at the automatic dispensing device.

It is another object of the subject matter to disclose a device for dispensing edible items, comprising a body; a control unit; a dispensing apparatus secured to the body, said dispending apparatus comprising: a product container configured to store the edible items, said product container has a top opening and a bottom opening, said top opening enables insertion of the edible items into the product container; a dispenser unit located under the product container; wherein the edible items passage from the product container to the dispenser unit via the bottom opening; a lateral hinge secured to the dispenser unit; a tilting motor secured to the dispenser unit, said tilting motor maneuvers the dispenser unit around the hinge; a lifting mechanism located inside the dispenser unit and designed to lift the edible items towards to upper end of the dispenser unit while rotating around a longitudinal axis of the dispenser unit; a communication unit communicating with the control unit, such that the dispenser unit moves around the hinge and the lifting mechanism rotates in response to commands sent from the control unit to the communication unit.

In some cases, the device further comprising a blocking module coupled to the dispenser unit and located below the bottom opening of the product container, wherein the blocking module disables flow of the edible items from the product container into the dispenser unit. In some cases, the device further comprising one or more hinge holders securing the lateral hinge to the body.

In some cases, the dispenser unit comprising a nozzle located in a top section of the dispenser unit, wherein the edible items flow from the dispenser unit via the nozzle. In some cases, the device further comprising a distribution tray secured to the body and located under the nozzle, wherein the edible items flow from the nozzle to the distribution tray. In some cases, the lifting mechanism is a two-part hollow cylinder, located in the internal space of the dispenser unit.

In some cases, an upper part of the lifting mechanism has a smooth surface, and a second part of lifting mechanism has a screw-shaped surface, wherein the edible items fit between protrusions of the screw-shaped surface of the second part of lifting mechanism. In some cases, the device further comprises a rotating motor configured to rotate the lifting mechanism around the longitudinal axis of the dispenser unit.

In some cases, the device further comprises an array of dispensing apparatuses, each apparatus is configured to dispense another edible item. In some cases, the control unit communicates separately with each communication unit associated with a single dispensing

apparatus. In some cases, the product container comprising a removable lid covering the top opening. In some cases, the dispenser unit has a regular state in which products cannot fall from the product container to the dispenser unit and a dosage state in which the edible items fall from the dispenser unit.

BRIEF DESCRIPTION OF THE FIGURES

Some embodiments of the invention are herein described, by way of example only, with reference to the accompanying drawings. With specific reference now to the drawings in detail, it is stressed that the particulars shown are by way of example and for purposes of illustrative discussion of embodiments of the invention. In this regard, the description taken with the drawings makes apparent to those skilled in the art how embodiments of the invention may be practiced.

In the drawings:

Fig. 1 shows a single automatic dispensing apparatus of an automatic dispensing device, according to exemplary embodiments of the present invention;

Fig. 2 discloses a single dispenser unit, according to exemplary embodiments of the present invention;

Fig. 3 discloses a dispenser unit and a product container, when the dispenser unit is in vertical state, according to exemplary embodiments of the present invention;

Fig. 4 discloses an overview of a single dispenser unit mounted on a dispenser unit socket of the dispensing apparatus, according to exemplary embodiments of the present invention;

Fig. 5 shows a single dispenser unit tilted in a manner that dispenses the edible product towards the conveyor, according to exemplary embodiments of the present invention

Fig. 6 discloses an overview of an edible product located in the lifting mechanism, according to exemplary embodiments of the present invention;

Fig. 7 shows components of the automatic dispensing device, according to exemplary embodiments of the present invention;

Figure 8 shows a shelf holding multiple dispensing apparatuses, according to exemplary embodiments of the subject matter;

Figure 9 shows a shelf and a structure of a dispensing apparatus, according to exemplary embodiments of the subject matter;

Figure 10 shows a motor and a dispenser unit, according to exemplary embodiments of the subject matter;

Figures 11A-11C show different positions of a dispenser unit, according to exemplary embodiments of the subject matter.

DETAILED DESCRIPTION

The present invention discloses an automatic dispensing device for dispensing edible products. The automatic dispensing device is designed for storing, managing inventory and dispensing the edible products. The automatic dispensing device comprises multiple product containers, one product container for each type of edible product. The automatic dispensing device comprises a mechanism for outputting a specific amount of edible products from the product containers, as requested by a control unit of the automatic dispensing device.

In some cases, the product may be stored in the original containers thereof. In some cases, each product container contains only one type of product in a unitary form.

Fig. 1 shows a single automatic dispensing apparatus of an automatic dispensing device, according to exemplary embodiments of the present invention. The automatic dispensing device comprises multiple automatic dispensing apparatuses, one for each of product of the products dispensed by the automatic dispensing device. A standard automatic dispensing apparatus comprises a product container 150 connected to a dispenser unit 180. The dispenser unit 180 is configured to be coupled with the product container 150 and dispense the edible products stored at the product container 150. The dispenser unit 180 is designed to conduct a dispensing flow of products, wherein the dispensing flow initiates by conveying products from the product container 150 and ends by dispensing the conveyed products in the distribution tray 819 from which the consumer can take the products.

In some embodiments of the present invention, the product container 150 may be configured to store a plurality of products therein, having the same shape and size. For example, the product container 150 may be formed in the shape of a bottle, or a cylinder. In some cases, the product container 150 may be at a specific size. For example, the product container 150 may have

a size of 120 CC's (Cubic centimeters), 110 CC's, or any other volume size used for storing the products.

The product container 150 may have a top opening and a bottom opening. In some cases, the product container 150 may comprise a top opening configured to receive a lid 110, which may be attached to and removed from the top opening. The products flow from the product container 150 to the dispenser unit 180 via the bottom opening, according to the posture of the dispenser unit 180. In the posture shown in figure 1, blocking module 115 is located below the bottom opening of the product container 150, disabling passage of the edible products into the dispenser unit 180. The size of the blocking module 115 is sufficient to prevent the product containers to passage downwards from the product container 150, via the bottom opening. In some cases, the size of the blocking module 115 is at least the size of the bottom opening of the product container 150. The blocking module 115 may extend from top lips 118 of the dispenser unit 180.

In a regular state, the blocking module 115 is configured to and block passage of edible products from the product container 150. The dispenser unit 180 is further configured to be tilted downwards and upwards around a lateral hinge placed between hinge holders 130A and 130B. In some cases, the hinge holders 130A and 130B extend horizontally from the dispenser unit 180. In such cases, the hinge holders 130A and 130B may be configured to receive connectors, such as bolts or screws, for fastening the dispenser unit 180 to the body of the dispensing device. The hinge may be coupled to a motor and a communication unit. The motor enables to maneuver the dispenser unit 180 affixed to the hinge. The communication unit is configured to receive commands from the control unit regarding dispensing of edible products from the specific dispenser unit 180. The control unit may be coupled to multiple communication units associated with multiple dispenser units, each dispenser unit is associated with another product dispensed from the automatic dispensing device.

The dispenser unit 180 comprises an extraction container 160 for containing the edible products flowing downwards from the product container 150. When the dispenser unit 180 is pivoted laterally, the internal space of the extraction container 160 is exposed, enabling the edible products from the product container 150 to fall into the top side of extraction container 160. The dispenser unit 180 comprises a nozzle 120 via which the edible products are dispensed from the dispenser unit 180 towards the distribution tray, where they are collected by the user. The nozzle 120 may be located in the upper part of the dispenser unit 180, forming a slope relative to the top

lips 118 of the dispenser unit 180. When the dispenser unit 180 moves along the hinge laterally at a predefined range of angles, the edible products fall from the nozzle 120. The edible products may be conveyed along a conveyer after falling from the nozzle 120, until reaching the distribution tray disclosed below.

In some cases, the product container 150 comprises a base 104 on which the lid 110 is mounted. The base 104 may secure the product container 150 to the body of the dispensing device. The base 104 may comprise base apertures, such as base aperture 103A, 103B, 103B, 103D, 103E, and 103F. In such cases, the base 104 may be directly attached to the body of the dispensing device.

Fig. 2 discloses a single dispenser unit, according to exemplary embodiments of the present invention. In some embodiments of the present invention, a dispenser unit 180 is configured to receive products from a product container 150 and dispense the products through the product extraction unit 220. In some embodiments of the present invention, the single dispenser unit 180 comprises a product extraction unit 220 and lower container base 240.

In some embodiments of the present invention, the dispenser unit 180 comprises a lifting mechanism 205 designed to lift the edible products in the dispenser unit 180 towards the nozzle 120. The lifting mechanism 205 may be designed as a two-part hollow cylinder, located in the internal space of the product extraction unit 220. In some cases, the diameter of the lifting mechanism 205 may be in the range of 1-10 centimeters. In some exemplary embodiments, an upper part of the lifting mechanism 205A has a smooth surface, and a second part of lifting mechanism 205B has a screw-shaped surface. When a command is received from the control unit to dispense an edible product from the dispenser unit 180, the second part of lifting mechanism 205B rotates, thereby raising a product towards the nozzle 120. The edible product fits between protrusions of the screw-shaped surface of the second part of lifting mechanism 205B. The lifting mechanism 205B is connected to a rotating motor, configured to rotate the lifting mechanism 205B around an axis, said axis is generally parallel to a longitudinal axis of the dispenser unit 180. In some exemplary cases, the height of the teeth in the screw-shape of the inner surface of the lifting mechanism reduces as the edible item is closer to the upper end of the dispenser unit 180. For example, the teeth height may be 15 millimeters at first, and the last teeth before the nozzle 120 is 12 millimeters high. The change in the height of the teeth improves the grasp of the edible items in the dispenser unit 180. In some other cases, the reduction in height of the teeth may be in the range of 3%-12% from the prior teeth.

In some exemplary cases, the protrusion of the teeth of the screw also changes along the inner wall of the dispenser unit 180. The lower teeth protrude more from the inner wall than the upper teeth. For example, the lower teeth may protrude in the range of 8-15 millimeters while the upper teeth may protrude in the range of 5-8 millimeters.

In some exemplary cases, the lifting mechanism 205B may rotate while the dispenser unit 180 is tilted laterally around a lateral hinge, forming an angle in which the products may fall from the nozzle 120. The second part of lifting mechanism 205B may rotate after the dispenser unit 180 is tilted. The dispenser unit 180 is tilted at a predefined range of angles, moving into a dosage state, enabling the edible products to fall from the nozzle 120. In regular state, the blocking module 115 is configured to block passage of products from the product container 150. In dosage mode of operation, extraction unit 220 is tilted laterally around the hinge, placing the lifting mechanism 205 under the bottom opening of the product container 150. This position enabling a product to flow downwards from product container 150 to the lifting mechanism 205. The product is conveyed from the lifting mechanism 205 to product extraction unit 220 as a result of a rotational movement of the lifting mechanism 205.

In some embodiments of the present invention, the product extraction unit 220 comprises a nozzle 120. The nozzle protrudes laterally from the top lips 118 of the dispenser unit 180. The nozzle 120 forms a slope relative to the inner sidewalls of the dispenser unit 180, facilitating dispensing of the edible products when the dispenser unit 180 is tilted.

The lower container base 240 is configured to be attached to an inner surface of a dispensing device for support of the product extraction unit 220.

Fig. 3 discloses a dispenser unit 180 and a product container 150, when the dispenser unit is in vertical state, according to exemplary embodiments of the present invention. When the dispenser unit 180 is in vertical state, the dispensing module is in a dosage mode of operation. The vertical state may be defined when the angle between the longitudinal axis of the product container 150 and the longitudinal axis of the dispenser unit 180 is less than 15 degrees. In other cases, the dosage mode of operation is defined as a state in which the edible product can fall downwards from the product container 150 to lifting mechanism 205 of the dispenser unit 180.

The dispenser unit 180 may move from one mode of operation to another mode of operation when tilted around the hinge located between hinge holders 130A and 130B. When the dispenser unit 180 is tilted, the blocking module 115 changes its location. In the regular mode of

the operation, the blocking module 115 is configured to block the bottom opening of the product container 150. When the dispenser unit 180 tilts at about 20-30 degrees, the aperture of the lifting mechanism 205 is placed under bottom opening neck of the product container 150. This configuration allows the edible product to fall downwards from the product container 150 to the lifting mechanism 205.

Fig. 4 discloses an overview of a single dispenser unit 180 mounted on a dispenser unit socket 400 of the dispensing module, according to exemplary embodiments of the present invention. The dispenser unit socket 400 is configured to secure the dispenser unit 180 in place, and enable tilting of the dispenser unit 180 inside a hollow body 415 of the dispenser unit socket 400. In some cases, the dispenser unit socket 400 comprises a rear side 409, two sidewalls 410A and 410B connected to the rear side 409 and base 406. The rear side 409 and two sidewalls 410A and 410B extend upwards from the base 406. The dispenser unit socket 400 is mechanically coupled to the dispenser unit 180, for example via the hinge on which the dispenser unit 180 tilts. In some cases, the dispenser unit socket 400 is mechanically coupled to the body of the dispensing device. The base 400 may comprise base apertures, such as base aperture 425. In some cases, the product container 400 comprises a groove 420 adapted to be connected with a hinge holders 130A and 130B located at the rear side of the dispenser unit 180 and extended horizontally from it.

Fig. 5 shows a single dispenser unit tilted in a manner that dispenses the edible product towards the conveyor, according to exemplary embodiments of the present invention. When the dispenser mode is tilted in a manner that enables the edible product to be dispensed from the nozzle of the dispenser unit, the dispenser unit changes its position from dosage mode of operation to extraction mode of operation. The dispenser unit changes its position towards the extraction mode by tilting around the hinge located between of hinge holders 130A and 130B. In the dosage mode, the dispenser unit is tilted in 60-90 degree relative to the ground. In this position, the edible products flow from the dispenser unit.

Fig. 6 discloses an overview of an edible product located in the lifting mechanism, according to exemplary embodiments of the present invention. The edible product falls from product container 150 into the lifting mechanism 205. The product is located in the bottom of the lifting mechanism 205B. In some cases, the bottom of the lifting mechanism is a cylinder with threaded inner walls. The radius of the cross section of the threaded hole may be in the range of 1-6 mm. In some cases, the base of lifting mechanism 205 moves in a rotational movement. As a

result of the rotational movement, the base of the lifting mechanism moves upwards, and the edible product moves upwards together with the base of the lifting mechanism. The speed of base of the lifting mechanism may be in the range of 0.5-10 Rounds Per Second (RPM).

Figure 7 schematically shows components of the automatic dispensing device, according to exemplary embodiments of the subject matter. The automatic dispensing device may comprise a sensor module 710, for example for detecting whether a product is at the dispensing section 'A' of the conveyer tunnel. The sensor module 710 may include sensors such as proximity sensors, image sensor, weight sensor, laser sensor and the like.

The automatic dispensing device comprises an array of tilting motors 720 for maneuvering the dispenser units around the hinges. Each motor in the array of tilting motors 720 may be coupled to a single dispenser unit of the multiple dispenser units. The motors in the array of tilting motors 720 may operate in response to commands received from the control unit 760.

The automatic dispensing device comprises an array of rotating motors 725 for maneuvering the lifting mechanism. The rotating motors 725 generate a rotating movement combined with linear movement of the lifting mechanism towards the nozzles of the dispenser units. The rotating motors 725 may operate in response to commands received from the control unit 760. In an exemplary embodiment of the invention, each dispensing unit is coupled to a separate rotating motor. In some other cases, one dispensing motor provides energy to multiple lifting mechanisms.

The automatic dispensing device comprises product containers 730. Each product container contains only one type of product. The product containers have an opening used to insert the edible items thereto. The product containers are coupled to the body of the dispensing device. The products are maneuvered from the containers 730 to the dispensing opening via the conveyer 740. The containers may be identical in size and shape, or have different sizes and/or shapes.

The automatic dispensing device comprises conveyer 740 configured to receive the edible items from the product extraction unit and convey the received product into a conveyer tunnel. The conveyer tunnel is configured to enable the edible items to travel outwards from the conveyer unit into a dispensing funnel which in some cases may be situated below the dispensing opening.

The automatic dispensing device may also comprise an interface 750 for providing options to the consumer for controlling the dispensed doses, configure dispensing options, and the like. In some cases, the interface panel comprises an input unit and a barcode reader. The user interface

750 may comprise an electronic display device configured to display instructions and information for a consumer utilizing the automatic dispensing device 700. For example, the user interface 750 can be configured to display to a consumer utilizing the automatic dispensing device 700 information on the dose currently being prepared by the automatic dispensing device 700. In some cases, the user interface 750 may display information regards the dispensing process. In some cases, the user interface 750 is configured to receive input from the consumer utilizing the automatic dispensing device 700. For example, the consumer may utilize the user interface 750 for requesting information regarding expire dates and the environmental conditions inside the automatic dispensing device 700. In some cases, the user interface 750 may comprise a touchscreen, a keyboard or side buttons and the like.

The automatic dispensing device comprises control unit 760 configured to manage the inventory, shelf life and control the distribution of products in the automatic dispensing device. In some cases, the control unit 760 is connected to the body of the dispensing device. In some cases, the control unit 760 may be in communication with the product containers 730. Also, the control unit 760 may be in communication with other electrical device of the automatic dispensing device, such as the user interface and the barcode reader on the interface panel. In some cases, the control unit 760 may comprise an internal power source such as a battery or means for connecting to an external power. For example, a power cable may extend from the control unit 760 and through the casing of the automatic dispensing device and may be configured to be connected to a power socket. In some embodiments of the present invention, the control unit 760 comprises a processor, a memory and a communication module enabling the control unit to communicate with a remote server. In some cases, the control unit 760 may be configured to exchange data with a consumer, receive and store the received data.

Figure 8 shows a shelf holding multiple dispensing modules, according to exemplary embodiments of the subject matter. The shelf may be located in an upper section of the dispensing device, where a user of the dispensing device fills the containers with edible products 845 when necessary. The shelf comprises sidewalls 810 to which the product containers are secured, for example using securing member 820 extending laterally from product container 830. The product containers have an upper lid, such as lids 835, 836, 837 and 838. The lids are maneuvered in order to fill the product containers, or in order to clean the product containers. When the user of the dispensing device wishes to fill a product container, the user maneuvers the lid upwards, for

example via a rotating movement as in lid 850 that rotates around a hinge. Then, the user brings a bottle 840 close to the product container and pours the edible products 845 into the product container.

Figure 9 shows a shelf and a structure of a dispensing module, according to exemplary embodiments of the subject matter. The product container 960 is located above the dispenser unit 970, such that a blocking module 940 may block passage of the edible products from the product container 960 towards the dispenser unit 970. The lid 910 of the product container 960 may move around a hinge 920 located on upper lips 930 of the product container 960. The dispenser unit 970 is partially surrounded by housing 950. The housing 950 is secured to the body of the dispensing device, thus securing the dispenser unit 970 in place, enabling only tilting movement of the dispenser unit 970 as elaborated above.

Figure 10 shows a motor and a dispenser unit, according to exemplary embodiments of the subject matter. The dispensing unit comprises blocking module 1040, rotating lifting mechanism 1020 and container 1050 for containing the edible product falling from the product container. The dispensing unit comprises a nozzle 1030 from which the edible products are dispensed and fall towards the distribution tray. The dispensing unit comprises a nozzle sensor configured to detect presence of the edible product in the nozzle 1030. When the edible product is detected in the nozzle, a rotating motor 1010 rotating the lifting mechanism 1020 receives a command to change the direction of the rotational movement of the lifting mechanism 1020. For example, in case the lifting mechanism 1020 rotates clockwise in order to lift an edible product towards the nozzle 1030, after detection of the edible product in the nozzle 1030, the lifting mechanism 1020 rotates counter clockwise.

Figures 11A-11C show different positions of a dispenser unit, according to exemplary embodiments of the subject matter. In figure 11A there is no edible product in the nozzle. In figure 11B, the edible product is located in the nozzle. In figure 11C, the edible product falls downwards from the nozzle.

While the disclosure has been described with reference to exemplary embodiments, it may be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the invention. In addition, many modifications may be made to adapt a particular situation or material to the teachings without departing from the essential scope thereof. Therefore, it is intended that the disclosed subject

matter not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out this invention, but only by the claims that follow.

CLAIMS:

1. A device for dispensing edible items, comprising:

a body;

a control unit;

a dispensing apparatus secured to the body, said dispending apparatus comprising:

a product container configured to store the edible items, said product container has a top opening and a bottom opening, said top opening enables insertion of the edible items into the product container;

a dispenser unit located under the product container;

wherein the edible items passage from the product container to the dispenser unit via the bottom opening;

a lateral hinge secured to the dispenser unit;

a tilting motor secured to the dispenser unit, said tilting motor maneuvers the dispenser unit around the hinge;

a lifting mechanism located inside the dispenser unit and designed to lift the edible items towards to upper end of the dispenser unit while rotating around a longitudinal axis of the dispenser unit;

a communication unit communicating with the control unit, such that the dispenser unit moves around the hinge and the lifting mechanism rotates in response to commands sent from the control unit to the communication unit.

2. The device of claim 1, further comprising a blocking module coupled to the dispenser unit and located below the bottom opening of the product container, wherein the blocking module disables flow of the edible items from the product container into the dispenser unit.
3. The device of claim 1, further comprising one or more hinge holders securing the lateral hinge to the body.
4. The device of claim 1, wherein the dispenser unit comprising a nozzle located in a top section of the dispenser unit, wherein the edible items flow from the dispenser unit via the nozzle.
5. The device of claim 4, further comprising a distribution tray secured to the body and located under the nozzle, wherein the edible items flow from the nozzle to the distribution tray.

6. The device of claim 1, wherein the lifting mechanism is a two-part hollow cylinder, located in the internal space of the dispenser unit.
7. The device of claim 6, wherein an upper part of the lifting mechanism has a smooth surface, and a second part of lifting mechanism has a screw-shaped surface;
wherein the edible items fit between protrusions of the screw-shaped surface of the second part of lifting mechanism.
8. The device of claim 1, further comprises a rotating motor configured to rotate the lifting mechanism around the longitudinal axis of the dispenser unit.
9. The device of claim 1, further comprises an array of dispensing apparatuses, each apparatus is configured to dispense another edible item.
10. The device of claim 9, wherein the control unit communicates separately with each communication unit associated with a single dispensing apparatus.
11. The device of claim 1, wherein the product container comprising a removable lid covering the top opening.
12. The device of claim 1, wherein the dispenser unit has a regular state in which products cannot fall from the product container to the dispenser unit and a dosage state in which the edible items fall from the dispenser unit.

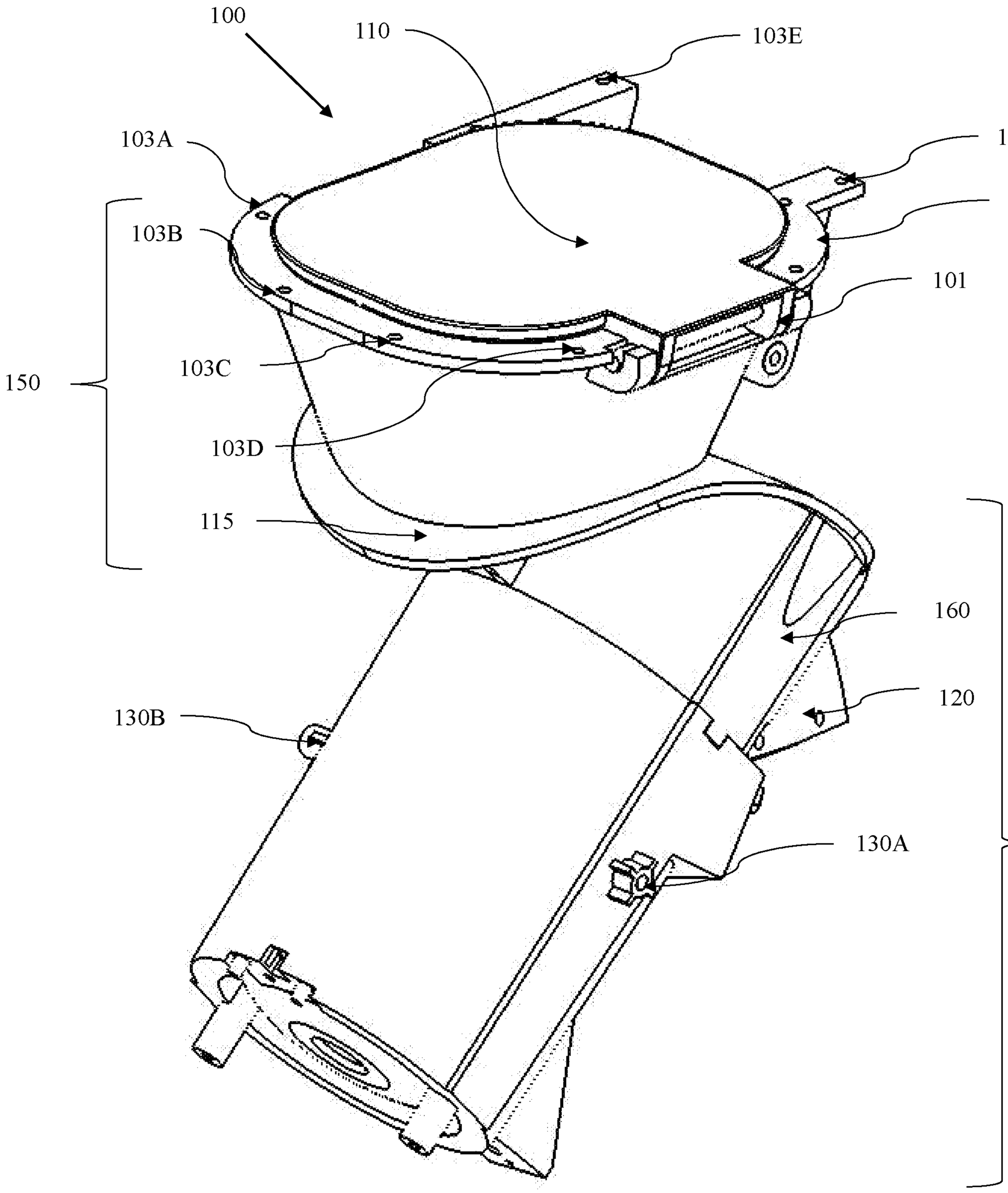

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130A
180

Fig. 1

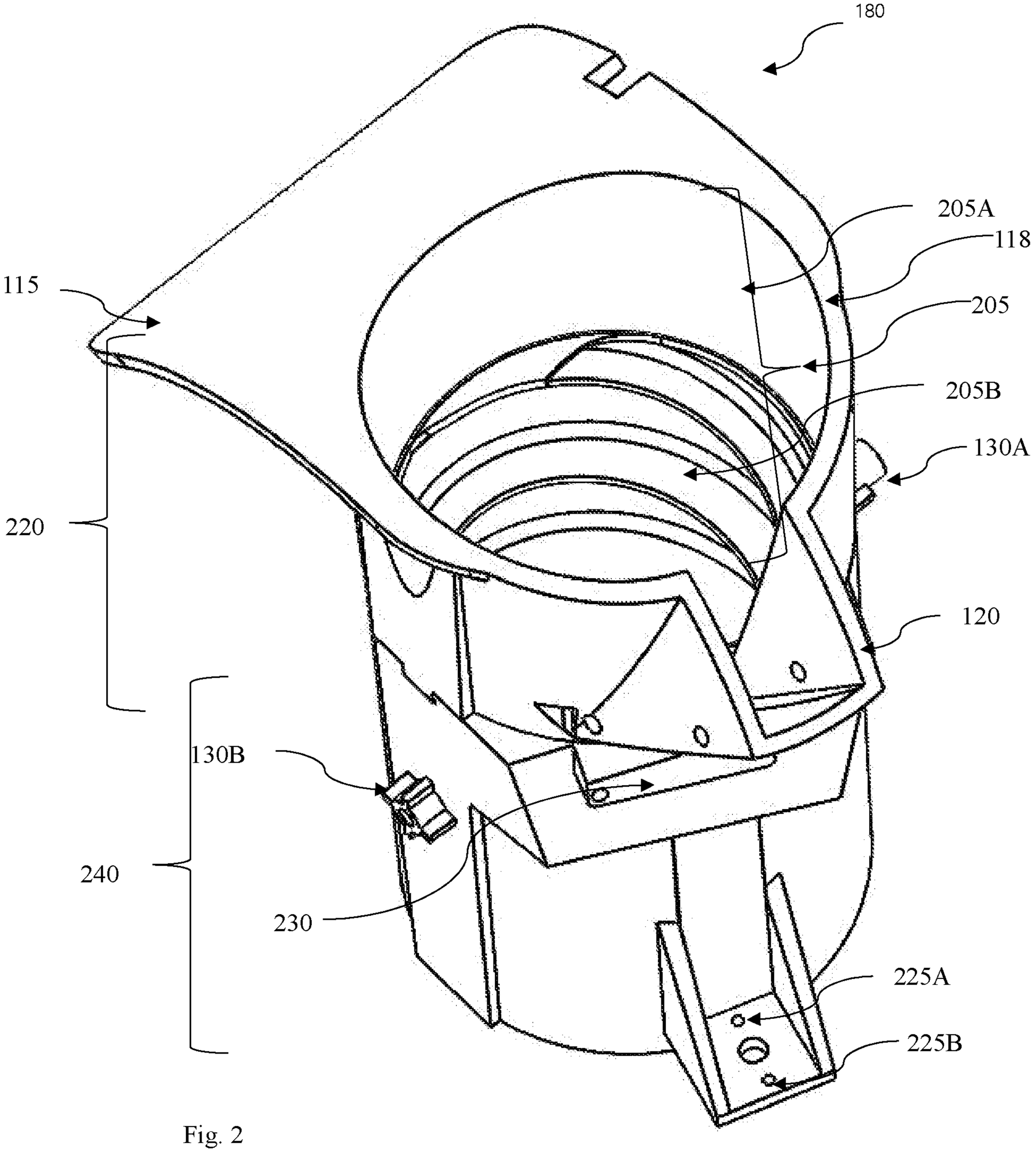


Fig. 2

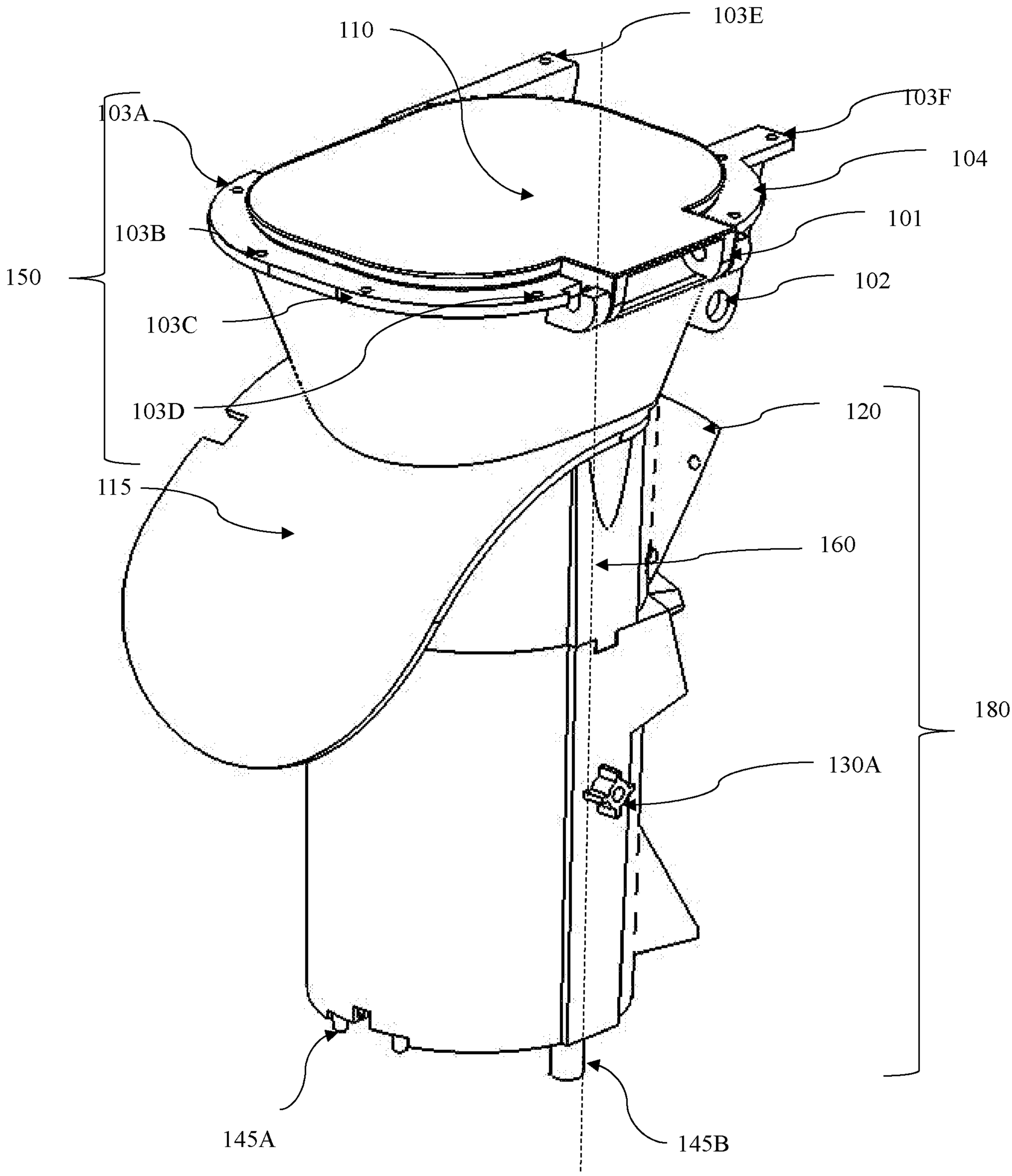

110
103E
103A
103F
104
103B
101
150
102
103C
103D
120
115
160
180
130A
145A
145B

Fig. 3

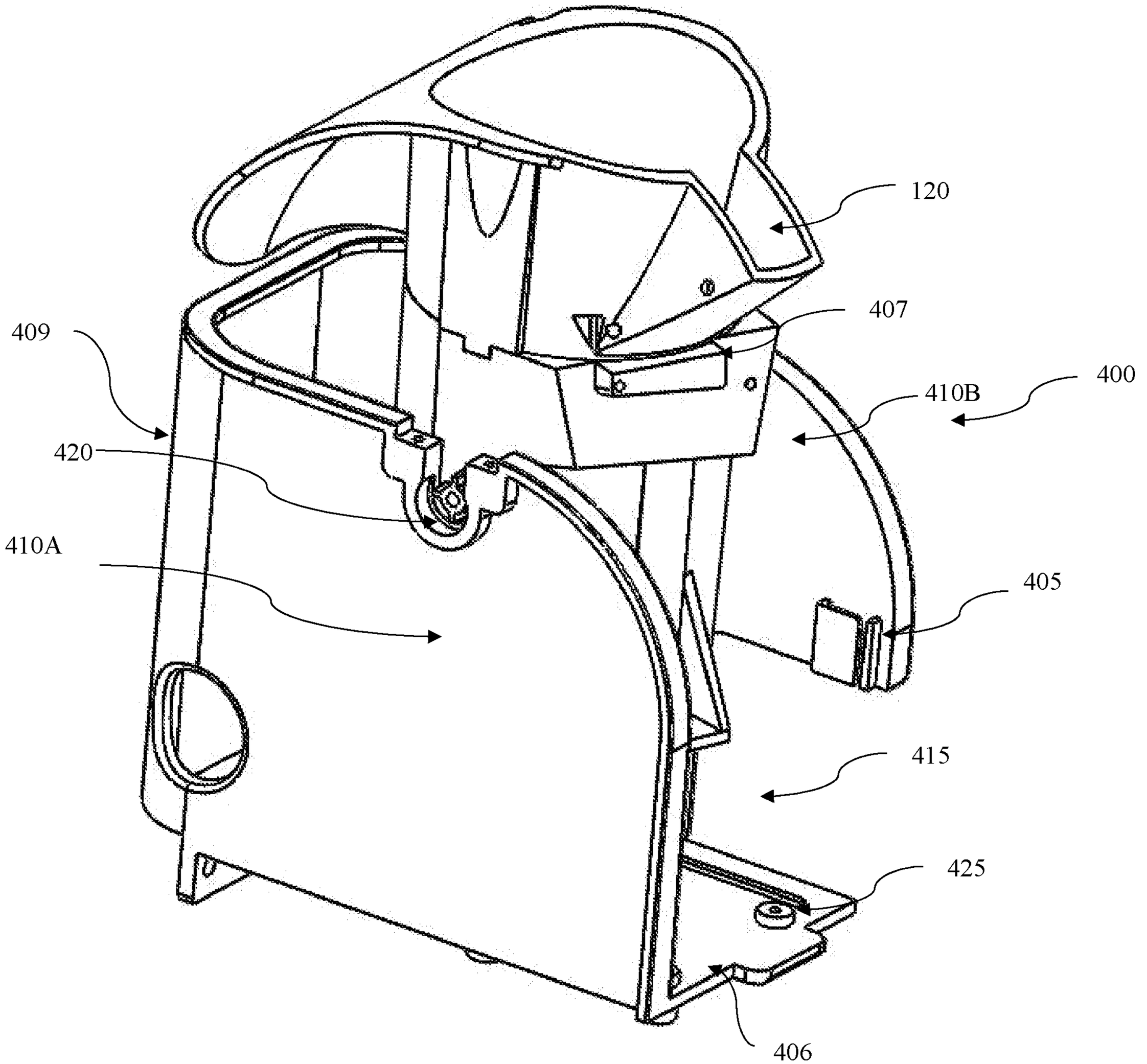


Fig. 4

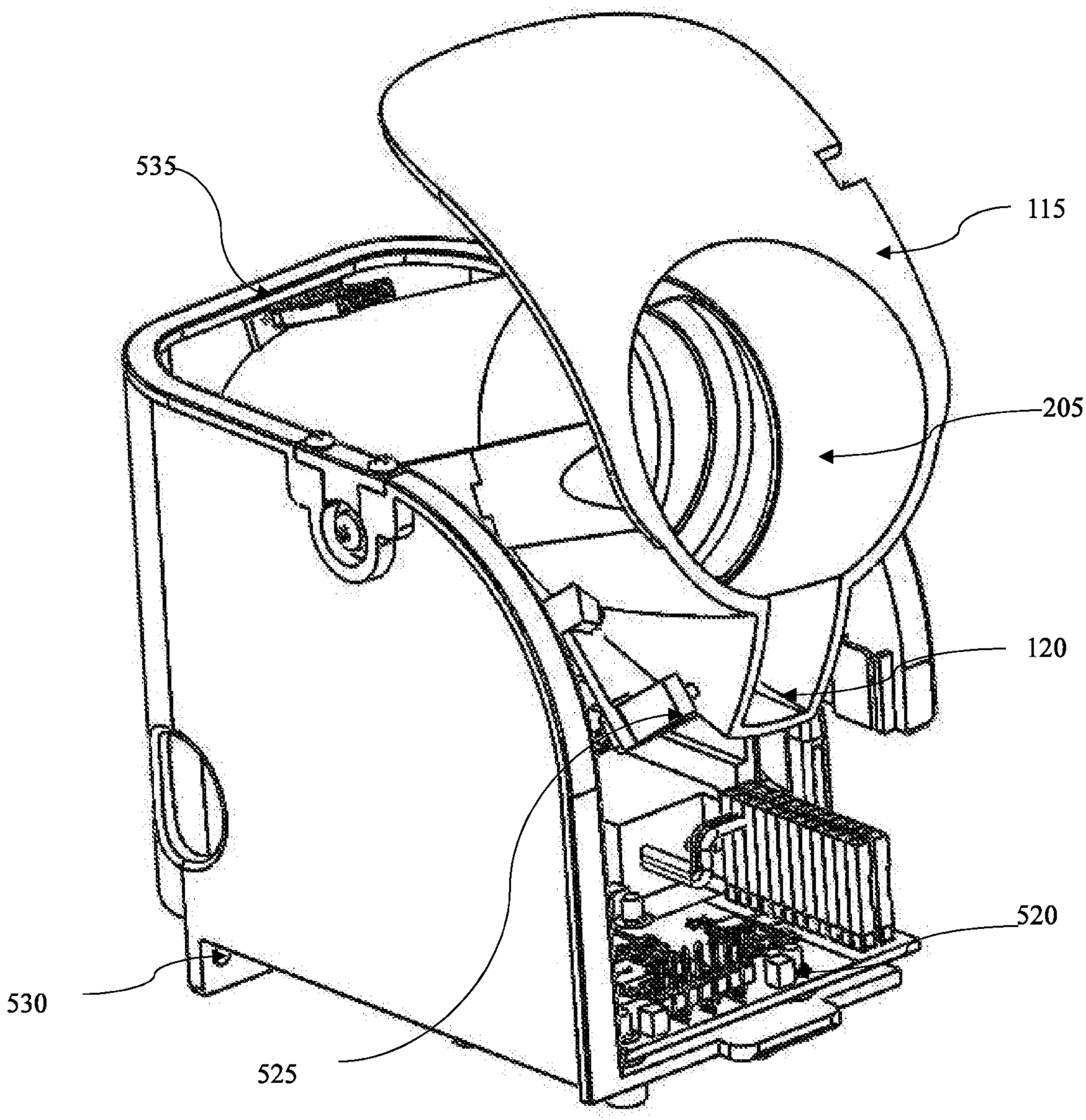


Fig. 5

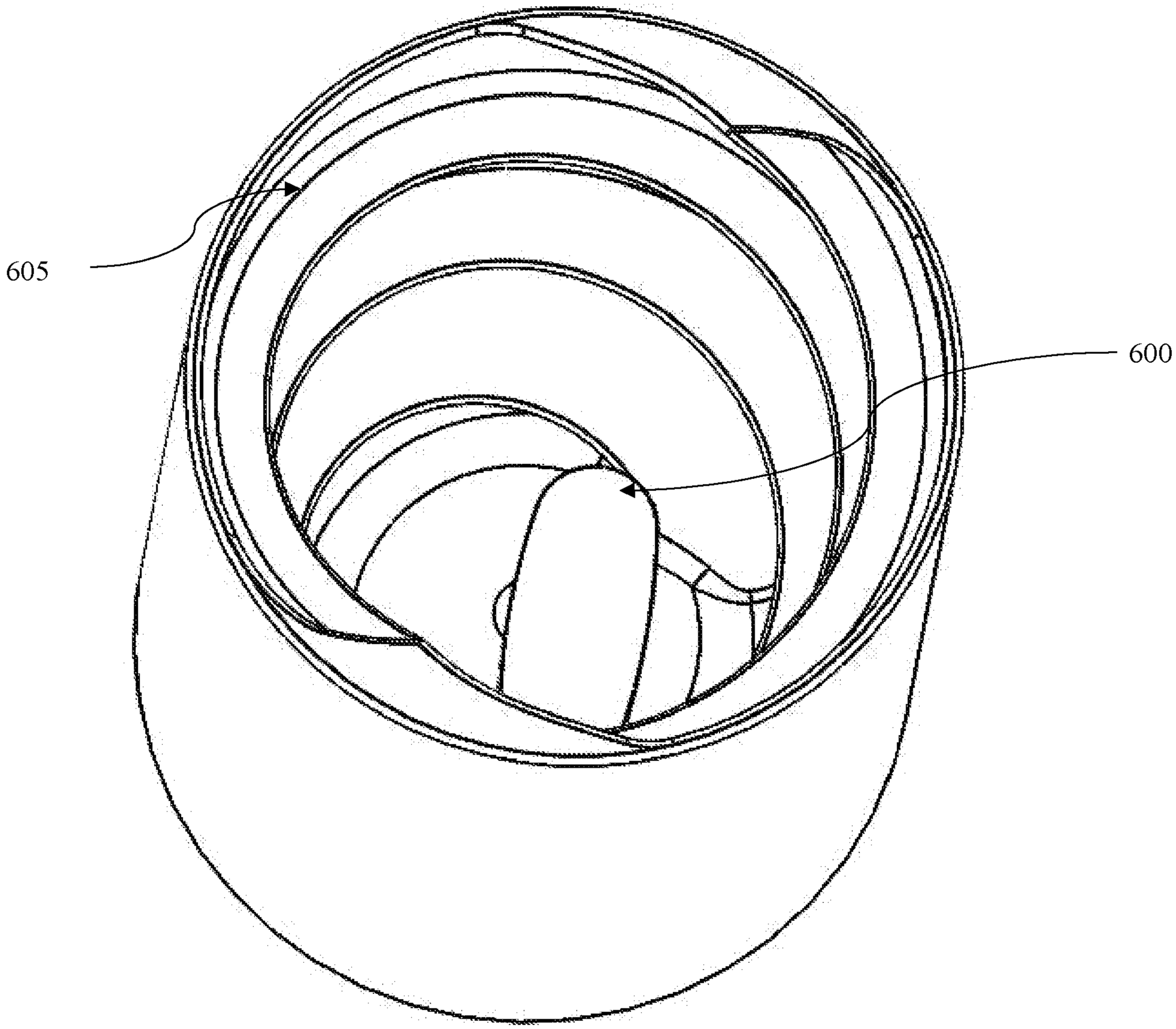


Fig. 6

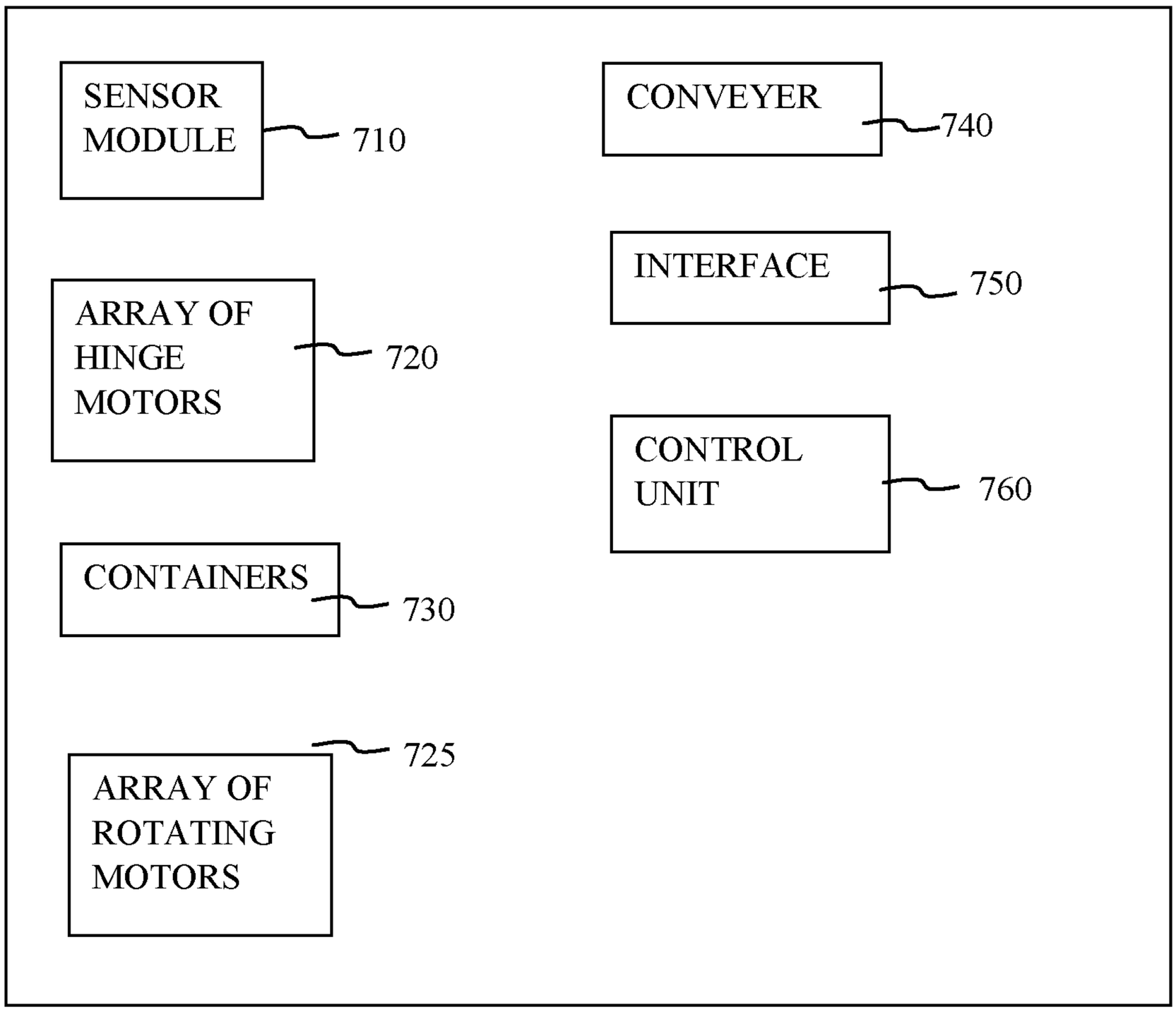

SENSOR MODULE
710
CONVEYER
740
INTERFACE
750
ARRAY OF HINGE MOTORS
720
CONTROL UNIT
760
CONTAINERS
730
725
ARRAY OF ROTATING MOTORS

Fig. 7

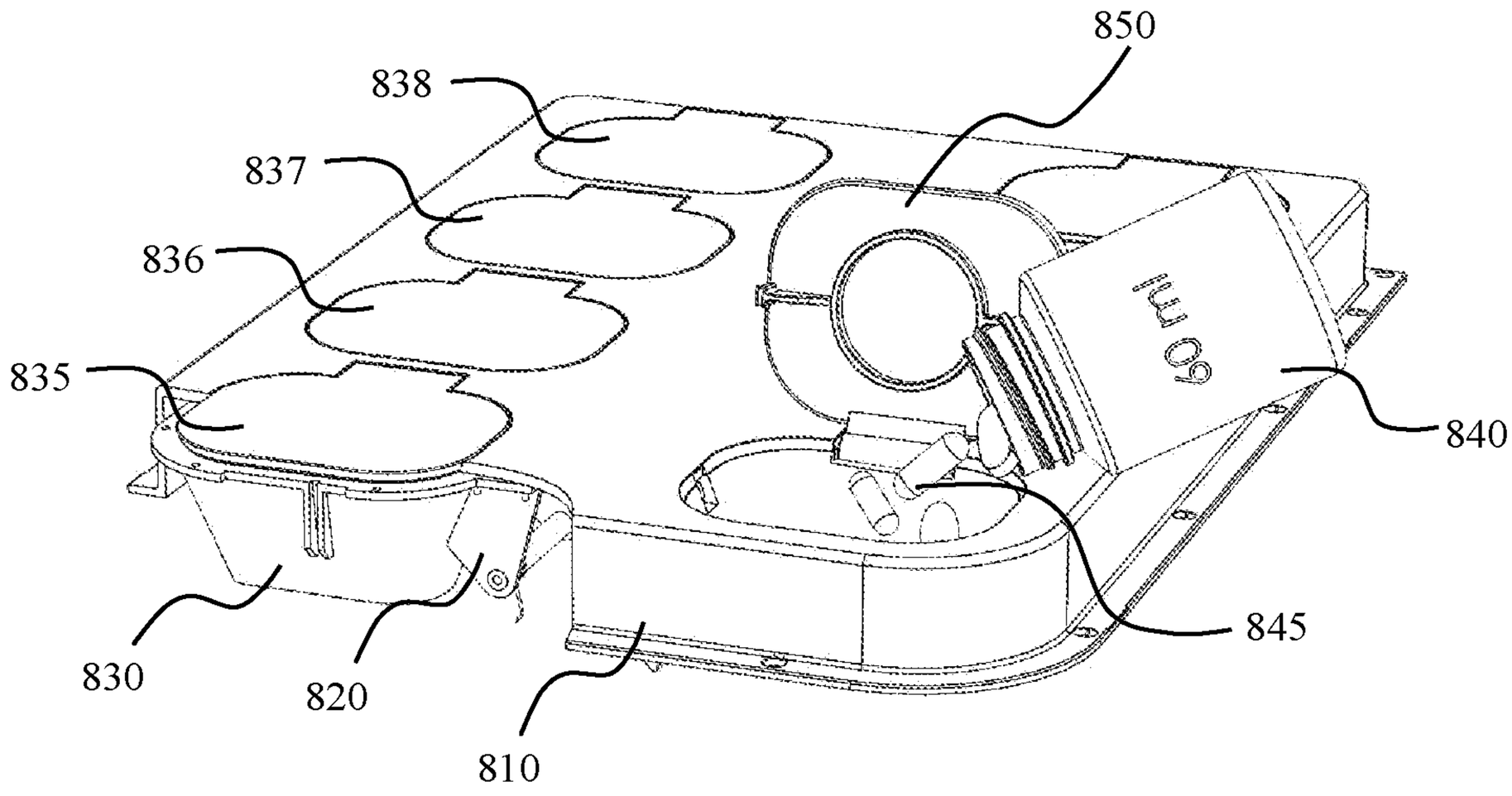


Fig. 8

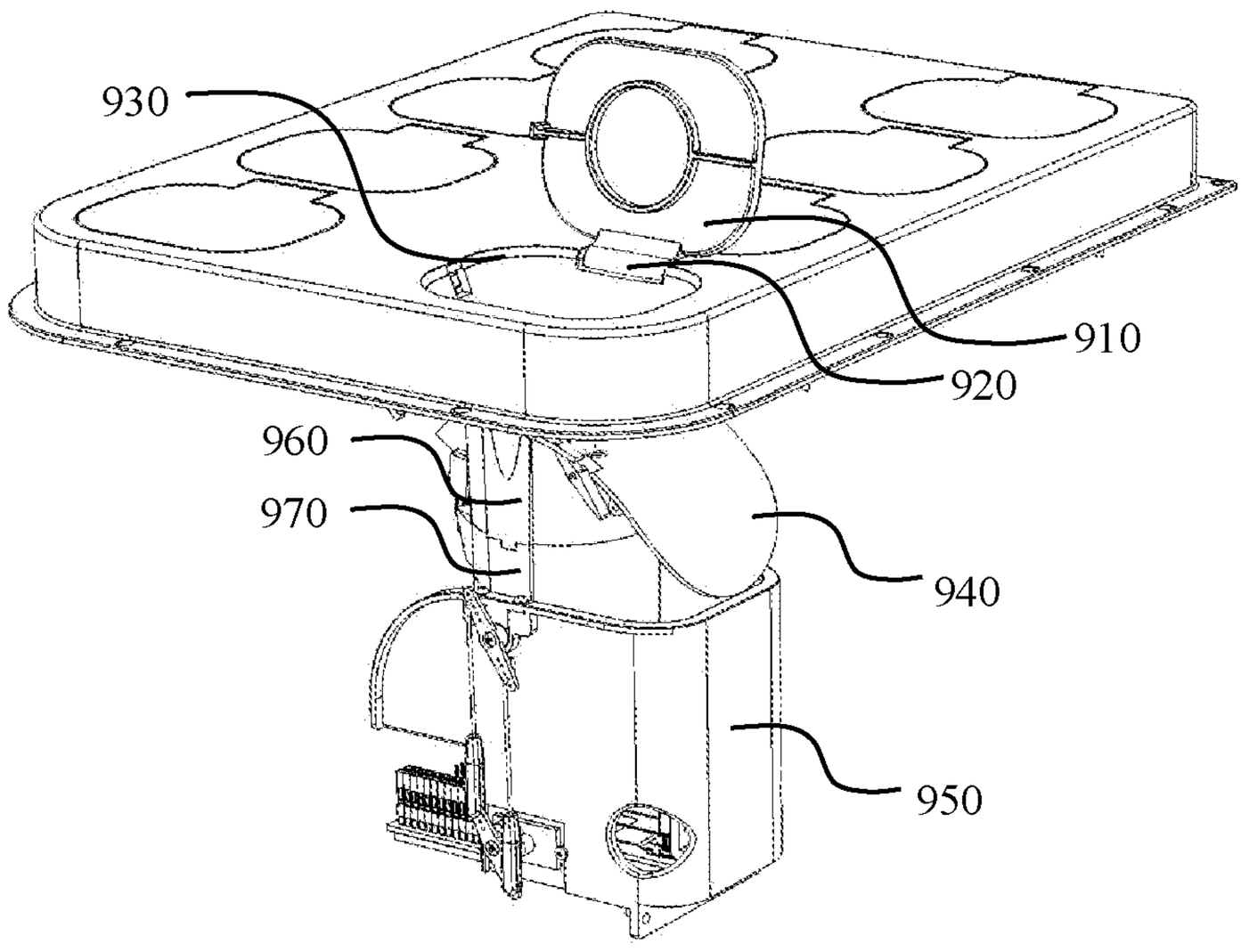


Fig. 9

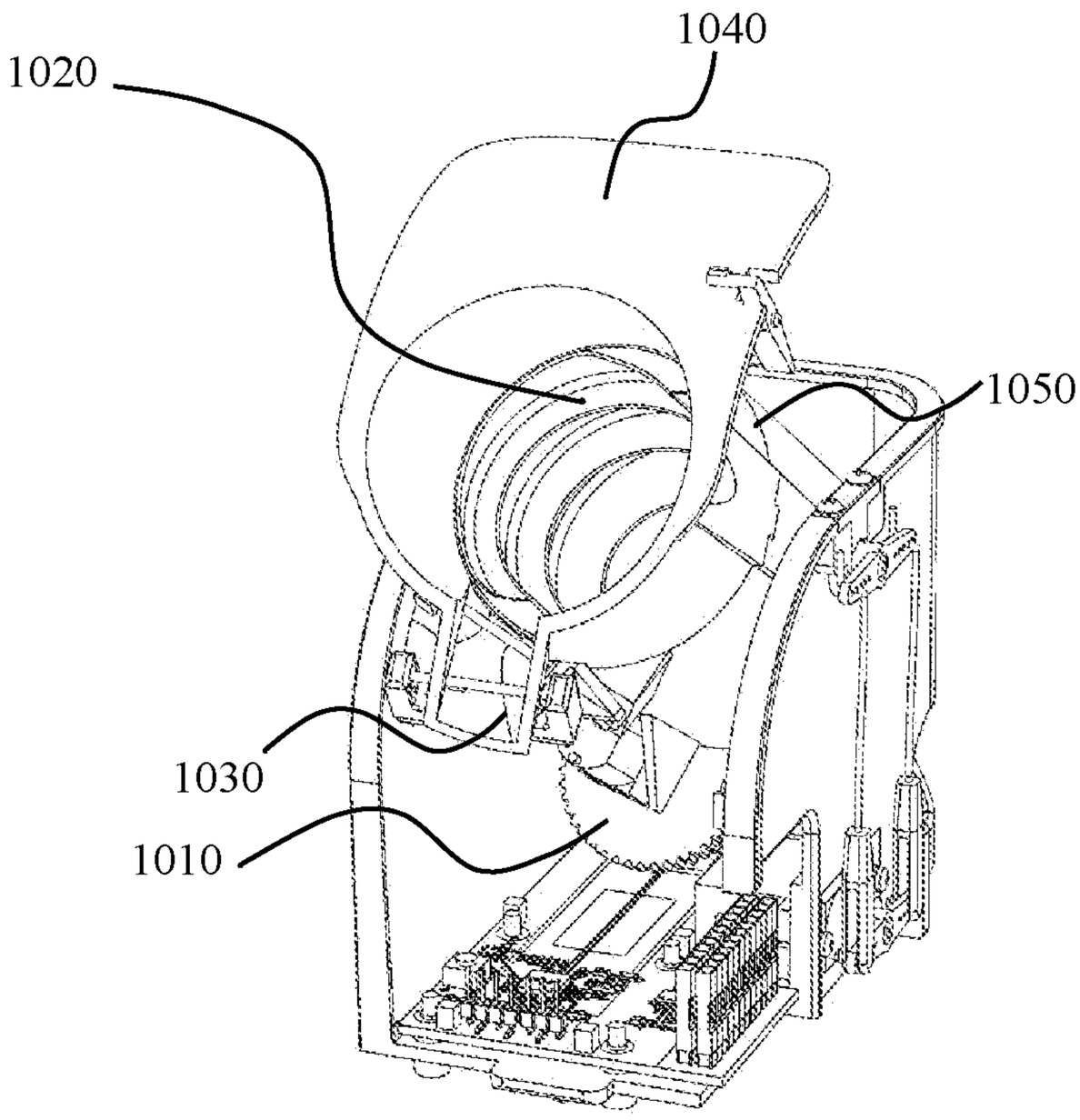


Fig. 10

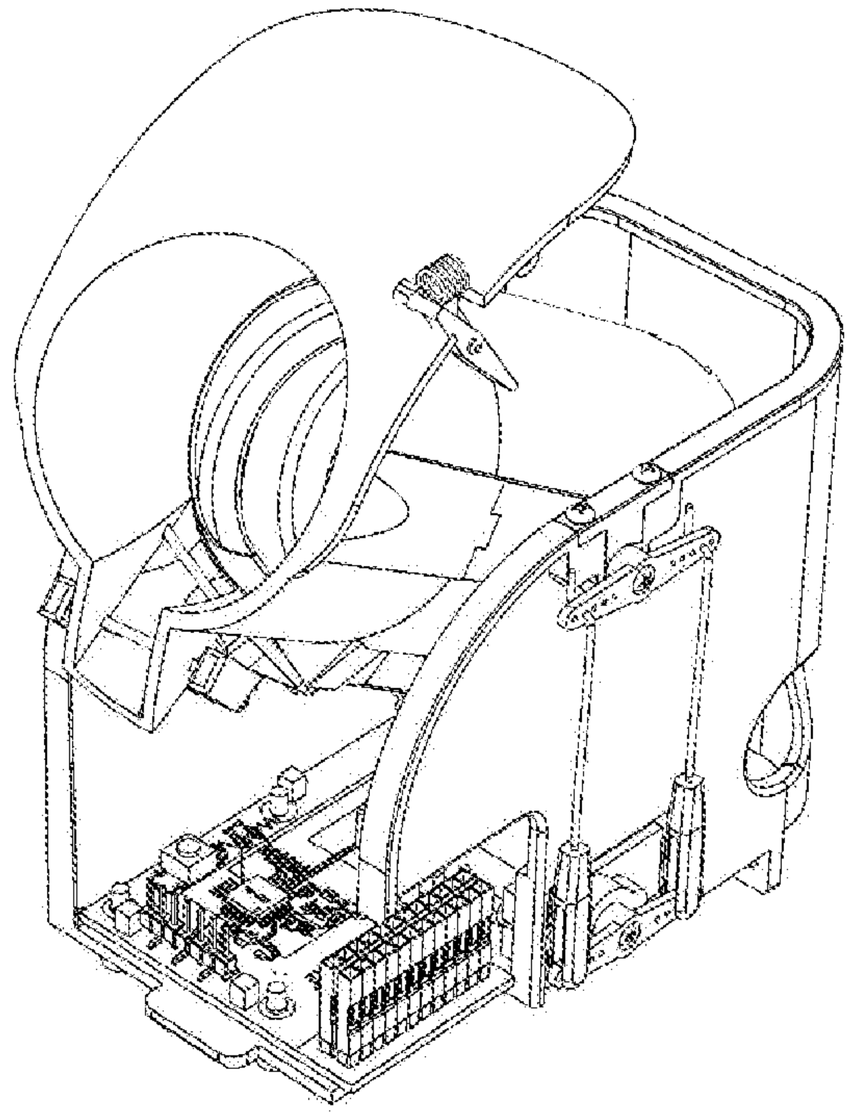


Fig. 11A

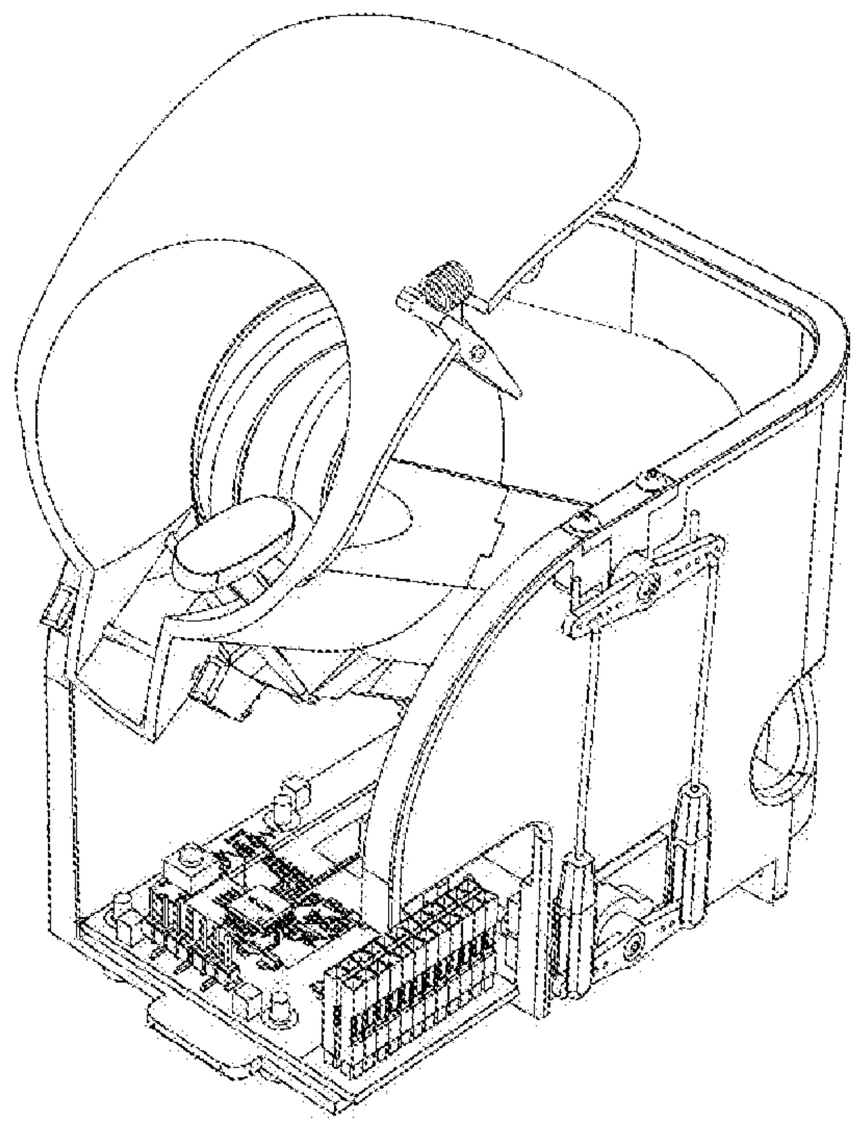


Fig. 11B

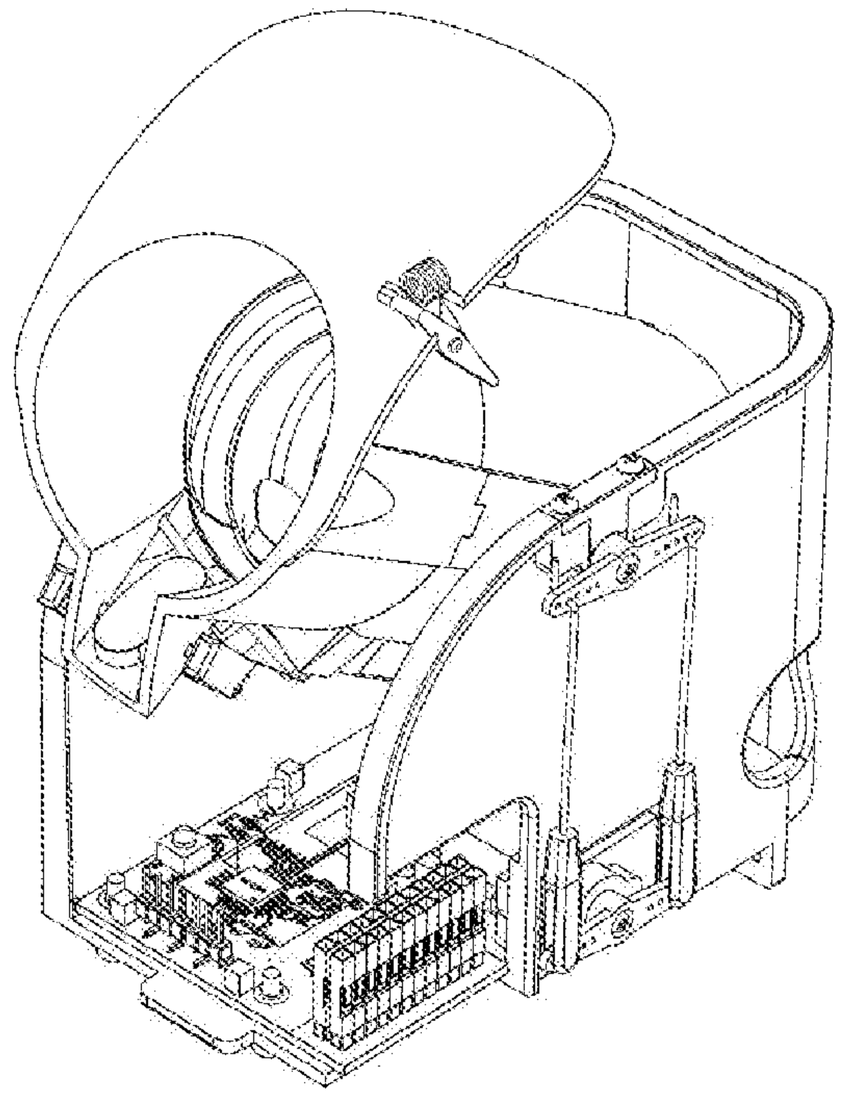


Fig. 11C

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL2020/051143

A. CLASSIFICATION OF SUBJECT MATTER
IPC (20200101) B65D 83/04, B65D 83/00, A61J 1/03
CPC (20130101) B65D 83/0409, B65D 83/0011, B65D 83/0083, A61J 1/03
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)
IPC (20200101) B65D 83/04, B65D 83/00, A61J 1/03
CPC (20130101) B65D 83/0409, B65D 83/0011, B65D 83/0083, A61J 1/03

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)
Databases consulted: Esp@cenet, Google Patents, Google Scholar, Orbit, SIMILARI
Search terms used: PILL DISPENSER, DRUG DISPENSER, TILTING MECHANISM, LIFT AND TILT DISPENSER

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2016031631 A1 KIM GS. 04 Feb 2016 (2016/02/04) abstract; figs. 1-3; [0001]; [0008]-[0010]; [0020]-[0030]	1-12
A	US 2010294791 A1 VIFOR INTERNATIONAL AG. 25 Nov 2010 (2010/11/25) abstract; fig. 1-6; [0063]-[0072]	1-12
A	US 2015266654 A1 ACCESS BUSINESS GROUP INTERNATIONAL LLC. 24 Sep 2015 (2015/09/24) abstract; figs. 1-6; [0005]; [0106]	1-12

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"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

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"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	Date of mailing of the international search report
24 Dec 2020	27 Dec 2020
Name and mailing address of the ISA: Israel Patent Office Technology Park, Bldg.5, Malcha, Jerusalem, 9695101, Israel Email address: pctoffice@justice.gov.il	Authorized officer GUTMAN Ariel Telephone No. 972-73-3927180

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/IL2020/051143

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International application No.
PCT/IL2020/051143

Patent document cited search report	Publication date	Patent family member(s)	Publication Date
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