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Dispenser, for example seasoning dispenser

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Dispenser, for example seasoning dispenser (1), including a chamber (2) for storing particulate product (P) to be dispensed, and a product dispensing structure (3) configured to dispense product from the chamber (2) upon movement of a movable part (3a) of that structure (3) relative to the chamber (2), wherein the dispenser (1) includes a detector (7) configured to detect movement of the dispensing structure part (3a) relative to the chamber (2) and to generate an electronic detection result.

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Title: Dispenser, for example seasoning dispenser

The present invention relates to a dispenser, for example seasoning
5 dispenser, including a chamber for storing particulate product to be
dispensed, and a product dispensing structure configured to dispense
product from the chamber upon movement of a movable part of that
structure relative to the chamber.

Dispensers as such are known in various configurations, and can be
10 configured for dispensing various types of particulate products, for example
a powder, formula, granulate, edible foodproduct, various types of seasoning
(e.g. salt, pepper) and a mix thereof.

As an example, a commonly known seasoning dispenser includes a
chamber containing seasoning to be dispensed, and a manually rotatable
15 dispensing mechanism for iteratively dispensing portions of seasoning by
iteratively rotating an operating member of that mechanism. In particular,
the dispensing mechanism can be configured to be operable to provide
dispensing passages through which the product can flow or fall, by gravity
(and e.g. shaking), from the chamber, to a product outlet. Depending on the
20 type of seasoning, the mechanism can include crushing means for crushing
dispensing seasoning, for example for crushing pepper grains or salt crystals
into smaller parts.

A problem of such known, manually operable dispensers is that
dosing a predetermined amount of product can be cumbersome. A user
25 usually has to weigh (on a scale) or volumetrically measure (e.g. using a
spoon) a dispensed amount of product before further use (e.g. before being
added to other cooking recipe ingredients in case of an seasoning product) in
case dosing precision is desired. Measuring a dosed amount, before being
used, can lead to product loss and can be time consuming.

30 Also, a disadvantage of known manually operable dispensers is
that they lack a sort of user-feedback regarding the dispenser. Besides,

certain types of product (e.g. certain powders or certain types of seasoning) may clog during prolonged storage, hampering proper dispensing.

The present invention aims to provide an improved dispenser. In particular, the invention aims to provide a dispenser that can provide
5 improved product dosing. For example, an aspect of this disclosure aims to provide a dispenser that can efficiently dispense a predetermined amount of product, or a predetermined desired amount of product (e.g. a certain amount of seasoning that is required in a certain cooking recipe). Also, an aspect of the present disclosure aims at providing improved user-
10 friendliness, and improved product dispensing.

According to a first aspect of the invention, to this aim there is provided a dispenser according to the features of claim 1.

It is preferred that the dispenser includes a detector configured to detect movement of the (movable) dispensing structure part relative to the
15 chamber and to generate an electronic detection result, in particular concerning that movement.

The electronic detection result, concerning the movement of the dispensing structure part relative to the chamber, can be used e.g. for determining or predicting an amount of product that has been dispensed.
20 Processing of the electronic detection result can be carried out e.g. by the dispenser (e.g. in case the dispenser includes processing means configured to carry out such data processing) and/or by external processing means that may be associated with the dispenser (e.g. the detector can be provided with communication means for transmitting the detection result to a remote data
25 processor or computer device that has communication means for receiving the electronic detection result).

For example, the electronic detection result can relate to a total or cumulative amount of movement of the movable dispensing structure part with respect to the product chamber, for example rotation and/or

displacement of that part in at least one direction, and preferably in at least two orthogonal directions.

Also, for example, the electronic detection result can relate to a total or cumulative speed of a moving dispensing structure part with respect to the product chamber, for example rotation and/or displacement of that part.

In a preferred embodiment, the electronic detection result includes acceleration of the movable dispensing structure part, in particular acceleration with respect to the product chamber. To that aim, preferably, the detector can be an accelerometer. In that case, an afore-mentioned data processor can be configured to determine acceleration of the movable part of the dispensing structure in at least one dimension, preferably at least two dimensions and more preferably in three dimensions, in particular based on the electronic detection result. A detected acceleration can then be used or processed by the data processor to determine or estimate an amount of dispensed product.

As an example, the dispenser can be configured to determine or estimate an amount of dispensed product based on the electronic detection result, for example using predetermined calibration data and/or an algorithm regarding product dispensing and respective detection results. The skilled person will appreciate that this can be achieved in various ways e.g. by microelectronics or a suitable microcontroller of or associated with the dispenser.

According to a further embodiment, the movable part of the dispensing structure and a stationary section of the dispensing structure can define a product release opening, wherein the product release opening iteratively opens and closes (for iteratively allowing passage of product out of the chamber) when said movable part moves from a first to a second position with respect of said stationary section.

In this way, well defined product dispensing can be achieved, to be detected by the detector via the above-mentioned movement detection.

According to a further embodiment the movable part of the dispensing structure can be at least one, and preferably each, of:

5 -rotational with respect to a stationary section of the dispensing structure;

 - movable towards and away from the chamber;

 -movable in an undulated, vibrating or pulsating manner with respect of the chamber.

10 It is preferred that the movable part is manually operable for dispensing product from the dispenser, providing improved manufacturability and a low cost dispenser solution. It follows that the dispenser preferably does not include an electric actuator or motor for actuating the dispensing structure of the dispenser.

15 As follows from the above, it is also preferred that the dispenser includes and/or is associated with a data processor configured to process the detection result, for example to provide processed detection data.

 According to a further embodiment the dispenser includes and/or is associated with a user interface for providing the detection result and/or
20 processed detection data to a user.

 Besides, the dispenser can include communication means for transmitting the detection result and/or processed detection data to a remote receiver.

 Further, an aspect of the present disclosure provides a dispensing
25 system including a dispenser according to the invention, wherein the dispenser includes communication means for transmitting the detection result and/or processed detection data to a remote receiver, wherein the system further includes a receiver configured to receive the detection result and/or processed detection data.

Preferably, the receiver includes or is provided with a user interface. The receiver can also include or be provided e.g. with a display for displaying the detection result and/or processed detection data.

Moreover, an aspect of the invention, which may be combined with
5 the first aspect, provides a dispenser, including a chamber for storing particulate product to be dispensed, and a product dispensing structure configured to dispense product from the chamber upon movement of a movable indicator part of that structure relative to the chamber,

wherein the movable indicator part of the dispensing structure is
10 at least one, and preferably each, of:

- rotational with respect to a stationary section of the dispensing structure;

- movable towards and away from the chamber;

- movable in an undulated, vibrating or pulsating manner with
15 respect of the chamber.

In this aspect, optionally, the movable indicator part and a stationary section of the dispensing structure can define a product release opening that iteratively opens and closes when said movable indicator part moves from a first to a second position with respect of a stationary section.

20 In this way, improved product dispensing can be achieved. For example, the movement of the indicator part can provide tactile feedback (as indicator) to a user, e.g. due to corresponding accelerations of respective dispenser components that can be felt by the user holding the dispenser. Besides, such movement of the indicator part of the dispenser may be visible
25 to the user, providing additional feedback via visual indication of the functioning of the device. Further, such movement may lead to relatively large dispenser accelerations that can provide unclogging of any clogged product contained in the chamber, leading e.g. to improved dispensing of a cloggable product.

In the following, the invention will be explained further using exemplary embodiments and drawings. The drawings are schematic. In the drawings, similar or corresponding elements have been provided with similar or corresponding reference signs. In the drawings:

5 Fig. 1 shows a side view of a first non-limiting example of the invention;

 Figure 2 shows an exploded view of a dispensing part of the first embodiment;

 Figure 3 depicts a longitudinal cross-section of the dispenser of the
10 embodiment of Fig. 1, in an operational position;

 Figure 4 is similar to Fig. 3 showing the dispenser after movement of a dispensing structure part, during dispensing product;

 Figure 5 depicts a perspective view of the first embodiment during dispensing of product;

15 Figure 6 is a longitudinal cross-section of part of a second embodiment of the invention;

 Figure 7 is similar to Fig. 6, showing the part after movement of a dispensing structure part;

 Figure 8 is a longitudinal cross-section of part of a third
20 embodiment of the invention;

 Figure 9 is a perspective view of a stationary section of the third embodiment;

 Figure 10 is a cross-section of the stationary section depicted in Fig. 9;

25 Figure 11 depicts part of a further embodiment of a dispenser;

 Figure 12 is an exploded view of par of a dispenser having a grinding structure;

 Figure 13 shows the dispenser of Fig. 12 in a longitudinal cross-section; and

Figure 14 is similar to Fig. 13, showing the dispenser during product discharge.

Figure 1 shows a first example a dispenser 1 for dispensing particulate product P (e.g. dry seasoning product, e.g. including salt, pepper, herbs, spices, and/or a mixture of such and/or different seasoning). The dispenser can be part of a system that additionally includes at least one remote receiver T (one being depicted in Fig. 1). In Fig. 1 the dispenser is shown in a storage position (a dispenser bottom facing downwardly) whereas Figures 3-5 show the dispenser 1 during operation, in which case it can be in a substantially upside down orientation.

The dispenser 1 can be a portable (light-weight) dispenser, i.e. portable by hand, to be manually operated by a single user. Regarding portability, a maximum volume of the chamber 2 of the dispenser can e.g. be about 0.5 liter, for example maximum 100 ml. A maximum weight of the dispenser 1, filled with the product P to be dispensed, can e.g. be 1 kg, for example maximum 0.5 kg. However, the invention is not limited to such exemplary numbers.

As follows from Figures 1-3, the dispenser 1 has a chamber 2 for storing the particulate product P, and a product dispensing structure 3 configured to dispense product from the chamber 2 upon movement of a movable (indicator) part 3a of that structure 3 relative to the chamber 2.

In this embodiment, the chamber 2 includes, or is connected to a stationary section 3b of the dispensing structure 3. The chamber 2 can e.g. be defined by a container or chamber wall 2a, e.g. made of plastic or glass or another material, having an open top defined by a neck portion 2b. The stationary section 3b of the dispensing structure 3 can be connected e.g. to the chamber 2 via the respective neck portion 2b (see Fig. 3). For example, the connection can be releasable such that the chamber 2 can be released from the dispensing structure 3, e.g. for refilling of the chamber 2 and/of for connecting another chamber to the dispensing structure 3 (so as to provide a

modular dispensing system). As an example, a connection between chamber 2 and dispensing structure 3 can be provided by a bayonet-coupling, screw-thread coupling 2c, 3c (as in the present drawings) or differently, as will be appreciated by the skilled person.

5 The movable part (or indicator part) 3a of the dispensing structure 3 is manually operable for dispensing product from the dispenser 1. The present movable part 3a of the dispensing structure is rotational with respect to the stationary section 3b of the dispensing structure 3 (as is indicated by arrow R in Figures 2, 5); a respective axis of rotation is
10 indicated by dashed line X (which is a center line of the present dispenser 1).

Also, the moveable part 3a of the dispensing structure is movable away from the chamber 2 (in axial direction, as is indicated by double arrow Z in Fig. 4), e.g. as a plunger. It is preferred that the dispenser 1 includes
15 spring means 15 for counteracting such axial movement of the moveable part 3a, i.e. for returning the moveable part 3a back to its initial axial position. The spring means can include e.g. one or more leaf springs, coil springs, elastic spring material, magnetic spring means or the-like.

For example, the movable part 3a of the dispensing structure is at
20 least rotational with respect to the stationary section 3b of the dispensing structure 3, as well as axially movable towards and away from the chamber 2 over a distance Z of at least 0.5 mm, for example a distance Z in the range of about 0.5 – 20 mm, in particular a distance Z of at least 2 mm, in particular a distance Z in the range of about 2 – 15 mm. At such a relatively
25 large axial displacements good results, e.g. regarding user feedback and sensor detection can be achieved. The former holds for a dispenser that does not include a detector 7 (mentioned below) configured to detect movement of the dispensing structure part 3a relative to the chamber 2 and to generate an electronic detection result.

The moveable part 3a of the dispensing structure can e.g. be held by or connected to, more particularly be positioned at least partly within, an operating member 14 (e.g. a rotatable sleeve or rotatable dispenser head) that is rotatably coupled to the stationary section 3a of the dispensing structure 3. This rotational coupling can be achieved e.g. via a suitable clicking or clamping connection 9, which can include e.g. a circumferential groove of one part cooperating with slide cam of the other part to allow rotational movement of the two parts 3b, 14. The dispenser 1 is configured such that rotation of the operating member 14 is to be carried out manually.

Also, the moveable part 3a of the dispensing structure 3 can be axially slidable with respect to the respective operating member 14 to provide said axial movement in axial direction Z. For example, a sliding connection can be provided by one or more suitable cooperating cams and grooves (respective grooves 16, in this case of the moveable part 3a, are shown in Fig. 2). In a further embodiment, the afore-mentioned spring means 15 can be located in these grooves 16 to provide said spring action.

The dispenser 1 can e.g. include one or more product dispensing openings 19 for dispensing the product (to an environment), that can e.g. be provided or defined by the operating member (e.g. rotational dispenser head) 14. For example, the operating member 14 can be provided with a cover member or top 18 that includes the one or more dispensing openings 19. In this example, a cover member 18 is provided that includes a dispersion structure that has an array of dispensing openings 19, arranged concentrically with respect to said axis of rotation X. Alternatively, the dispenser can include only one downstream product dispensing opening 19, or one or more circumferential slits in or at the cover member as product dispensing opening.

It is preferred that the movable part 3a of the dispensing structure 3 and a stationary section 3b of the dispensing structure can define a product release opening 4 (e.g. a circumferential slit, see Fig. 4) there-

between. The product release opening 4 can e.g. be defined between two opposite wall sections or surfaces of the movable part 3a and stationary section 3b; a width of the opening 4 can e.g. be sufficient to allow particulate product P held in the container chamber 2 to pass the opening 4. During
5 rotation of the moveable part 3a, the product release opening 4 preferably iteratively opens and closes, allowing iterative passage of a dose of product P out of the chamber 2. To achieve the opening and closing, said movable part 3a of the dispensing structure 3 can iteratively move between a first and second axial position with respect of said stationary section 3b. For
10 example, the movable part 3a of the dispensing structure 3 can include a uneven guide structure 13a (e.g. an axially wavy cam surface) that cooperates with an opposite guide structure 13b (e.g. an axially wavy cam surface) of a stationary part 3b of the dispensing structure 3 during movement of the movable part, for iteratively accelerating the movable part
15 3a during that movement. In an example, the uneven guide structures 13a, 13b can have mating, substantially sawtooth surfaces that provide rather abrupt accelerations during operation. In particular, each wavy cam surface of the movable part 3a and stationary part can include wave tops WT and wave bottoms WB (see Fig. 2, and also the example in Fig. 10) that are
20 separated axially over a relatively large distance Z can e.g. be about half the above-mentioned distance Z of axial movement of the movable part 3a with respect to the stationary section 3b of the dispensing structure 3. It follows that the cooperating wavy (e.g. sawtooth-shaped) cam surfaces of the movable part 3a and stationary section 3b can include wave tops WT and
25 wave bottoms that are separated axially over a distance Z of at least about 1 mm, for example a distance Z in the range of about 1 – 10 mm, in particular a distance Z of at least about 2 mm, in particular a distance Z in the range of about 2 – 8 mm.

Besides, according to an embodiment, the wavy cam surface of the movable part 3a can have substantially the same shape and dimensions as the opposite wave cam surface of the stationary section 3b.

In an alternative embodiment, one of the stationary section 3b and
5 movable part 3a can include the wave cam structure, wherein the other of the stationary section 3b and movable part 3a can include a number of protrusions or individual cam sections that cooperate with that single wavy cam surface for providing said large axial displacement of the movable part 3a during its rotation.

10 For example, the respective acceleration can be in an axial dispenser direction, but also in other directions (e.g. circumferentially). Thus, according to a further embodiment, the moveable part 3a of the dispensing structure 3 can be moved in an undulated, vibrating or pulsating manner with respect of the chamber 2.

15 Figure 3 shows a first axial position of the moveable part 3a of the dispensing structure 3, wherein product release opening 4 is substantially closed. Figure 4 shows a second axial position of the moveable part 3a of the dispensing structure 3, which is achieved by a rotational displacement of the operating member (in direction R), such that cooperation of the uneven
20 guide structures 13a, 13b axially moves the moveable part 3a outwardly (against the spring force of said spring means 15), so that the product release opening 4 is opened and allows (gravity induced) product flow there-through. A subsequent rotational displacement of the operating member (in direction R) leads to a closing of the product release opening 4 again (by
25 spring force of the spring means 15), wherein the opening/closing process can repeat, in particular depending on the total amount of rotational displacement and the guide structure profiles as will be clear to the skilled person.

Also, it is preferred that the movable part 3a of the dispensing
30 structure 3 can provide or define a bottom B to the interior of the chamber 2

(facing e.g. an opposite chamber wall 2d), wherein the bottom B is preferably convex, for example cone-shaped (see Fig. 3, 4). In an operating position (said convex bottom B facing substantially upwards), product P can be guided by the bottom B towards the product release openings 4 to allow efficient, controlled product dispensing. Figure 11 shows an example wherein the bottom B of the movable part 3a of the dispensing structure 3 includes a relief, for example number of inwardly (i.e. upwardly) extending protrusions or vanes 20 (e.g. three vanes 20), that can further improve product dispensing. The relief (e.g. vanes 20 or other types of protrusions) on the bottom B can stir or disperse product P during bottom rotation, improving product stream towards the product release opening 4.

Advantageously, the dispenser 1 can include a detector 7 configured to detect movement of the dispensing structure part 3a relative to the chamber 2 and to generate an electronic detection result (depending on such movement). It should be noted that an alternative embodiment does not include the detector 7, but does include the product release opening 4 that can iteratively open and close when the movable part 3a moves from a first to a second position with respect of said stationary section 3b (e.g. allowing improved dispensing and visual and/or tactile user feedback). Moreover, it should be noted that another alternative embodiment does not include an iteratively opening-closing product release opening 4, see e.g. Figures 12-14, wherein the movable part 103a of the dispenser can provide an indicator part, e.g. indicating operation.

The detector 7 is preferably integrated in the dispensing structure 3, e.g. in its movable part 3a as in the drawings, and/or in another part of the dispensing structure. The detector 7 can e.g. be provided on an optional detector base 5, e.g. a printed circuit board, that is fixed to or integral part of the movable dispensing structure part 3a. In case of an electrically powered detector 7, the dispenser 1 can include e.g. a battery or power

source 6 for electrically powering the detector 7 (and any other electric components, e.g. a data transmitter 11, if present).

Also, the dispenser 1 can include and/or be associated with a data processor 8 configured to process the electronic detection result, for example
 5 to provide processed detection data. In an example, the data processor 8 can be part of the remote receiver T, but that is not required. Alternatively, the data processor can be located e.g. at a suitable location in the dispenser 1, e.g. near or next to the detector 5 or be integrated with the detector 5.

In case of a remote receiver T, the dispenser 1 can include
 10 communication means 11 for transmitting a detection result and/or processed detection data (as will be explained below) to the remote receiver T, whereas the receiver T can have receiving means 12 to receive the detection result and/or processed detection data. The communication means 11 of the dispenser 1 can be e.g. part of or integrated with the detector 7.
 15 The remote receiver T can be configured in various ways and can include or be provided e.g. with a user interface UI, display, touch screen, for displaying detection result and/or processed detection data et cetera. Data communication between (achieved/carried out by) the communication means 11, 12 of the dispenser 1 and remote receiver T can be provided in various
 20 ways, e.g. via suitable electromagnetic and/or optical, via one or more of various protocols (e.g. Bluetoothtm, BLE, WIFI, Zigbee, LTE, NFC or the-like) as will be appreciated by the skilled person.

In this embodiment, the dispenser 1 is associated with a remote user interface UI, namely the UI of the remote receiver T, e.g. for providing
 25 the detection result and/or processed detection data to a user. The remote receiver T can e.g. be and/or include suitable micro-electronics, hardware, software, a computer, a cell phone, a tablet computer and/or different type of remote receiver as will be clear to the skilled person.

Alternatively, or additionally, the dispenser 1 can include or be
 30 provided e.g. with a user interface UI, display, touch screen, for displaying

detection result and/or processed detection data et cetera (for example in case said data processor is part of the dispenser 1).

The data processor 8 can be configured to determine or estimate an amount of dispensed product based on a received detection result, for example using predetermined calibration data and/or an algorithm regarding product dispensing and respective detection results. For example, the data processor 8 can include a memory that stores predetermined calibration data. Such data can e.g. be based on a number of dispenser calibration runs (wherein e.g. the dispenser 1 has been operated a number of times to dispense product P, wherein resulting dispensed product amounts have been measured and respective detector signals/results have been obtained, wherein the measured dispensed product amounts and the respective detector signals have been stored in the memory as a calibration data set). Also, a data processor 8 can use an algorithm regarding product dispensing and respective detection results, wherein the algorithm may have been can be based on the results of such calibration runs.

According to a first embodiment, advantageously, the detector 7 can be an accelerometer (e.g. configured to provide an electronic detection signal that is dependent on acceleration of the detector 7). In that case the data processor 8 can be configured to determine acceleration of the movable part of the dispensing structure in at least one dimension, preferably at least two dimensions and more preferably in three dimensions (e.g. three orthogonal dimensions), based on the detector detection result.

For example, movement and in particular acceleration of the moveable dispensing structure part 3a can correlate with an amount of dosed product, in particular when the dispenser is being held in a predetermined orientation (e.g. the depicted substantial vertical orientation with the dispensing opening facing downwards). In particular, a said undulated, vibrating or pulsating movement (causing respective

accelerations) can be detected in a straight-forward manner by the acceleration detector 7.

During operation, as shown in Fig. 5, a user (not depicted) can hold the dispenser 1 and turn the operating member 14 in the respective direction R, with respect to the chamber 2. As a result, the product release opening 4 iteratively opens and closes (as in Figures 3, 4) due to a resulting axial movement of the movable dispensing structure part 3a 9 (as explained above). Each time that the product release opening 4 is open, a certain amount of product P can drop through the opening to be delivered via the downstream product dispensing opening/openings 19 of the cover member 18.

The integrated accelerometer 7 detects respective acceleration and transmits a corresponding detection result via the communication means 11 to the communication means 12 of the remote receiver T (data transmission being indicated by arrow S). The data processor 8 of the receiver T processes the received detection result and informs the user of a corresponding dispensed product amount, e.g. via the user interface (e.g. display and/or via sound/voice). It will be appreciated that the dispensed amount can be indicated by the user interface UI in various ways or units, e.g. by (detected, calculated or estimated) weight, volume, number of dispensed particulates, teaspoons, and/or a combination of such or other quantities.

Moreover, in a further embodiment, the data processor 8 can be configured to inform a user of a certain cooking recipe, e.g. via the user interface UI, wherein the cooking recipe at least includes the product P that is stored in the dispenser as an ingredient. In that case, the data processor 8 can be configured to determine if a dispensed amount of product meets a required recipe amount of product, and can inform the user (via the user interface UI) whether or not the required amount of product has been dispensed. Besides, in a further embodiment, the system can include a plurality of dispensers 1 that are filled with different recipe ingredients. In

that case, the data processor 8 can lead the user through a certain cooking recipe, via the user interface UI, which cooking recipe makes use of the different ingredients. In this way, a user can efficiently prepare a recipe, wherein the system can inform the user if required amounts (doses) of products have been dispensed.

Figures 6, 7 depict a further example of part of the dispenser, which differs from the embodiment shown in Figures 1-5 in that the detector 7' includes a switch (e.g. microswitch) that has a first state when the moveable part 3a of the dispensing structure is in its first axial position (Fig. 6), and in a second switch state when the moveable part 3a of the dispensing structure is in its second axial position (Fig. 7). For example, the switch 7' can be mechanically operated (i.e. for changing the state of the switch) by a respective switch activation part 3e of the moveable dispensing structure part 3a (wherein an axial position of the switch activation part 3e, relative to the stationary section 3b, determines a state of the switch 7'). The switch-type detector 7' can be e.g. connected to or provided with an afore-mentioned communication means 11 for transmitting detection results to communication means 12 of/associated with the processor 8. As in the above embodiment, a resulting detector result (e.g. a switch position and/or a change of the switch state) can be used by the data processor 8 to determine or estimate a respective amount (dose) of dispensed product.

Figures 8-10 depict a yet a further example of part of the dispenser, which differs from the embodiments shown in Figures 1-7 in that the detector 7'' includes an optical sensor or encoder configured to detect rotation (in particular an amount of rotation) of the moveable part 3a of the dispensing structure 3. For example, the sensor of the detector 7'' can be located opposite an inner surface of a stationary part 3b, which surface can be provided with an optically detectable marking 25 that is associated with the uneven guide structure guide structure 13b of the stationary part 3b. As in the above embodiments, during operation, a resulting detector result (e.g.

the detector 7" a detecting a passing mark of the marking structure 25) can e.g. be transmitted to the data processor 8, to be used by the data processor 8 to determine or estimate a respective amount of dispensed product.

Figures 12-14 show an example of a dispenser 101 that is similar to the above examples, and includes a chamber 102 for storing particulate product P to be dispensed, and a product dispensing structure 103 configured to dispense product from the chamber 102 upon movement of a movable indicator part 103a of that structure 103 relative to the chamber. The example which differs from the examples of Fig. 1-11 in that a grinding structure 121, 122 is integrated therein.

The grinding structure 121, 122 is configured for grinding the product P, and in particular to discharge the product P. For example, the grinding structure can include a fixed/stationary grinding part 121 that is rotationally fixed with respect to the stationary section 103b of the dispensing structure (e.g. via a connecting element or bolt 123), as well as an opposite rotating grinding part 122 that is coupled/connected to or integrated with a rotatable operating member 114 of the dispenser 101 to be rotated thereby. The stationary grinding part 121 and rotating grinding part 122 define a grinding slit 135 there-between (in particular between opposite grinding surfaces 121a, 122a, which may e.g. be opposite substantially conical grinding surfaces) for receiving and grinding product P. During operation, rotation of the operating member 114 (around a central axis X) leads to rotation of the respective grinding structure part 122 with respect to the stationary section 103b (a stationary grinding part), such that the two grinding parts 121, 122 grind product P (supplied from the chamber 2) there-between and discharge ground product P' towards the discharge opening(s) 119 of the dispenser 101. It is preferred that a width of the grinding slit 135 between the stationary grinding part 121 and rotating grinding part 122 is adjustable, which can e.g. be achieved via a screw-threaded adjusting means.

In the embodiment of Figures 12-14, the dispenser 101 includes a detector 107 configured to detect movement of a respective indicator structure part 103a relative to the chamber 102 and to generate an electronic detection result, as in above embodiments. In this example the
5 movable indicator part 103a is located opposite/downstream with respect to the grinding structure 121, 122 and is axially movable between a first axial position (see Fig. 13) and second axial position (see Fig. 14), over a distance Z, with respect to the grinding structure 121, 122. To that aim (as in the earlier embodiment) the movable part 103a includes a uneven guide
10 structure 113a that cooperates with a guide structure 113b of a stationary part 103b of the dispenser 101 during the rotation of the movable part 103b. It follows that in the present example the movable part 103a structure 103 and respective stationary section 103b of the dispenser 101 do not define a dedicated product release opening that iteratively opens and closes when
15 said movable part 103a moves from a first to a second position with respect of the stationary section 103b.

Also, the detector 107 can be connected to the cover member 118, that is coupled to the axially movable indicator part 103a of the dispenser. The same holds for a respective battery 108.

20 The example of Figures 11-13 allows for ease of grinding and dosing of a grindable product P, wherein the optional detector 107 can provide an electronic detection result (as in the above examples) regarding the dispensing operation. Besides, the axial movement of the indicator part 103a and respective axially moving dispenser parts provide above-
25 mentioned advantages.

While the invention has been explained using exemplary embodiments and drawings, these do not limit the scope of the invention in any way, said scope being provided by the claims. It will be appreciated that many variations, alternatives and extensions are possible within said scope,
30 as will be clear to the skilled person from the description and the drawings.

For example, it will be appreciated that manually moving of a part 3a of the dispensing structure 3 relative to the product containing chamber 2 can include moving the chamber 2 with respect to that part 3a, i.e. the chamber 2 and dispensing structure part 3a are movable with respect to each other.

The electronic detection result, generated by the detector 7, can e.g. be an analogue signal and/or a digital signal, representing information concerning the detected movement.

An accelerator type detector can e.g. be a MEMS or micromechanical type accelerometer, piezoelectric accelerometer, or differently, as will be clear to the skilled person.

Conclusies

1. Dispenser, bijvoorbeeld een kruidendispenser (1; 101), omvattende een kamer (2; 102) om af te geven particulaat product (P) op te slaan, en een productafgiftestructuur (3; 103) geconfigureerd om product van de kamer (2; 102) af te geven bij beweging van een beweegbaar deel (3a) van die
5 structuur (3; 103) ten opzichte van de kamer (2; 102), waarbij de dispenser (1; 101) een detector (7; 107) omvat geconfigureerd om beweging van het afgiftestructuurdeel (3a; 103a) ten opzichte van de kamer (2; 102) te detecteren en om een elektronisch detectieresultaat te genereren.
2. Dispenser volgens conclusie 1, waarbij het beweegbare deel (3a) van
10 de afgiftestructuur (3) en een stationair deel (3b) van de afgiftestructuur een productvrijgaveopening (4) definiëren, waarbij de productvrijgaveopening (4) iteratief opent en sluit wanneer genoemd beweegbaar deel (3a) van een eerste naar een tweede positie beweegt ten opzichte van het genoemde stationaire deel (3b).
- 15 3. Dispenser volgens conclusie 1 of 2, waarbij het beweegbare deel (3a) van de afgiftestructuur ten minste één, en bij voorkeur elk, is van:
-roteerbaar ten opzichte van een stationair deel (3b) van de afgiftestructuur (3);
-beweegbaar naar en weg van de kamer (2);
20 -beweegbaar op golvende, vibrerende of pulserende wijze ten opzichte van de kamer (2).
4. Dispenser volgens een der voorgaande conclusies, waarbij het beweegbare deel (3a) handmatig bedienbaar is om product uit te dispenser (1) af te geven.
- 25 5. Dispenser volgens een der voorgaande conclusies, waarbij de dispenser omvat en/of is geassocieerd met een gegevensverwerker (8) welke

is geconfigureerd om het detectieresultaat te verwerken, bijvoorbeeld om verwerkte detectiegegevens te voorzien.

6. Dispenser volgens conclusie 5, waarbij de gegevensverwerker (8) is uitgevoerd om een hoeveelheid afgegeven product te bepalen of te schatten
 5 gebaseerd op het detectieresultaat, bijvoorbeeld onder gebruikmaking van voorafbepaalde kalibratiegegevens en/of een algoritme betreffende productafgifte en respectieve detectieresultaten.
7. Dispenser volgens een der voorgaande conclusies, waarbij de detector een accelerometer (7) is.
- 10 8. Dispenser volgens conclusie 7 in combinatie met conclusie 5 of 6, waarbij de gegevensverwerker is geconfigureerd om versnelling van het beweegbare deel van de afgiftestructuur in ten minste één dimensie te bepalen, bij voorkeur ten minste twee dimensies en meer bij voorkeur in drie dimensies.
- 15 9. Dispenser volgens een der voorgaande conclusies, waarbij de dispenser (1) omvat en/of is geassocieerd met een gebruikersinterface (UI) om het detectieresultaat en/of verwerkte detectiegegevens aan een gebruiker te leveren.
- 10 10. Dispenser volgens een der voorgaande conclusies, omvattende communicatiemiddelen (11) om het detectieresultaat en/of verwerkte detectiegegevens aan een op afstand geplaatste ontvanger (T) te zenden.
11. Dispenser volgens een der voorgaande conclusies, waarbij het beweegbare deel (3a) van de afgiftestructuur (3) een bodem verschaft aan de kamer (2), waarbij de bodem bij voorkeur convex is, bijvoorbeeld
 25 kegelvormig.
12. Dispenser volgens een der voorgaande conclusies, waarbij het beweegbare deel (3a) van de afgiftestructuur (3) een niet-vlakke geleidestructuur (13a) omvat welke samenwerkt met een geleidestructuur

(13b) van een stationair deel (3b) van de afgiftestructuur (3) tijdens beweging van het beweegbare deel, voor iteratief versnellen van het beweegbare deel (3a) tijdens die beweging.

13. Afgiftesysteem, omvattende:

- 5 -een dispenser volgens een der voorgaande conclusies, waarbij de dispenser communicatiemiddelen (11) omvat voor het zenden van het detectieresultaat en/of verwerkte detectiegegevens naar een ontvanger-op-afstand (T); en
-een ontvanger (T) geconfigureerd om het detectieresultaat en/of verwerkte detectiegegevens te ontvangen.
- 10 14. Systeem volgens conclusie 13, waarbij de ontvanger (T) omvat of is voorzien van een gebruikersinterface (UI).
- 15 15. Systeem volgens conclusie 13 of 14, waarbij de ontvanger (T) omvat of is voorzien van een scherm om het detectieresultaat en/of verwerkte detectiegegevens af te beelden.
- 16 16. Dispenser, bijvoorbeeld een kruidendispenser (1; 101), bijvoorbeeld een dispenser volgens een der conclusies 1-12, omvattende een kamer (2; 102) om af te geven particulaat product (P) op te slaan, en een productafgiftestructuur (3; 103) geconfigureerd om product van de kamer (2; 102) af te geven bij beweging van een beweegbaar indicatordeel (3a; 103a)
20 van die structuur (3; 103) ten opzichte van de kamer (2; 102), waarbij het beweegbare indicatordeel (3a; 103a) van de afgiftestructuur ten minste één, en bij voorkeur elk, is van:
-roteerbaar ten opzichte van een stationair deel (3b; 103b) van de afgiftestructuur (3; 103);
25 -beweegbaar naar en weg van de kamer (2; 102);
-beweegbaar op golvende, vibrerende of pulserende wijze ten opzichte van de kamer (2; 102),

waarbij het beweegbare deel (3a) van de afgiftestructuur (3) en een stationair deel (3b) van de afgiftestructuur optioneel een productvrijgaveopening (4) definiëren die iteratief opent en sluit wanneer genoemd beweegbaar deel (3a) van een eerste naar een tweede positie

5 beweegt ten opzichte van genoemde stationaire deel (3b).

17. Dispenser volgens conclusie 16, waarbij de dispenser (1) veermiddelen (15) omvat om een axiale beweging van het beweegbare indicatordeel (3a; 103a) tegen te werken, bijvoorbeeld om het beweegbare deel (3a; 103a) terug te bewegen naar een initiële axiale positie ten opzichte van een stationair

10 deel (3b; 103b).

18. Dispenser volgens een van conclusie 16-17, waarbij het beweegbare indicatordeel (3a; 103a) van de afgiftestructuur ten minste roteerbaar is ten opzichte van een stationair deel (3b; 103b) van de afgiftestructuur (3; 103), alsmede axiaal verplaatsbaar naar en weg van de kamer (2; 102) over een

15 afstand (Z) van ten minste 0,5 mm, bijvoorbeeld een afstand (Z) in het bereik van ongeveer 0,5 – 20 mm, in het bijzonder een afstand (Z) van ten minste 2 mm, in het bijzonder een afstand (Z) in het bereik van circa 2 – 15 mm.

19. Dispenser volgens een der voorgaande conclusies, omvattende een

20 maalstruicuur (121, 122) om het particulaat product (P) te malen.

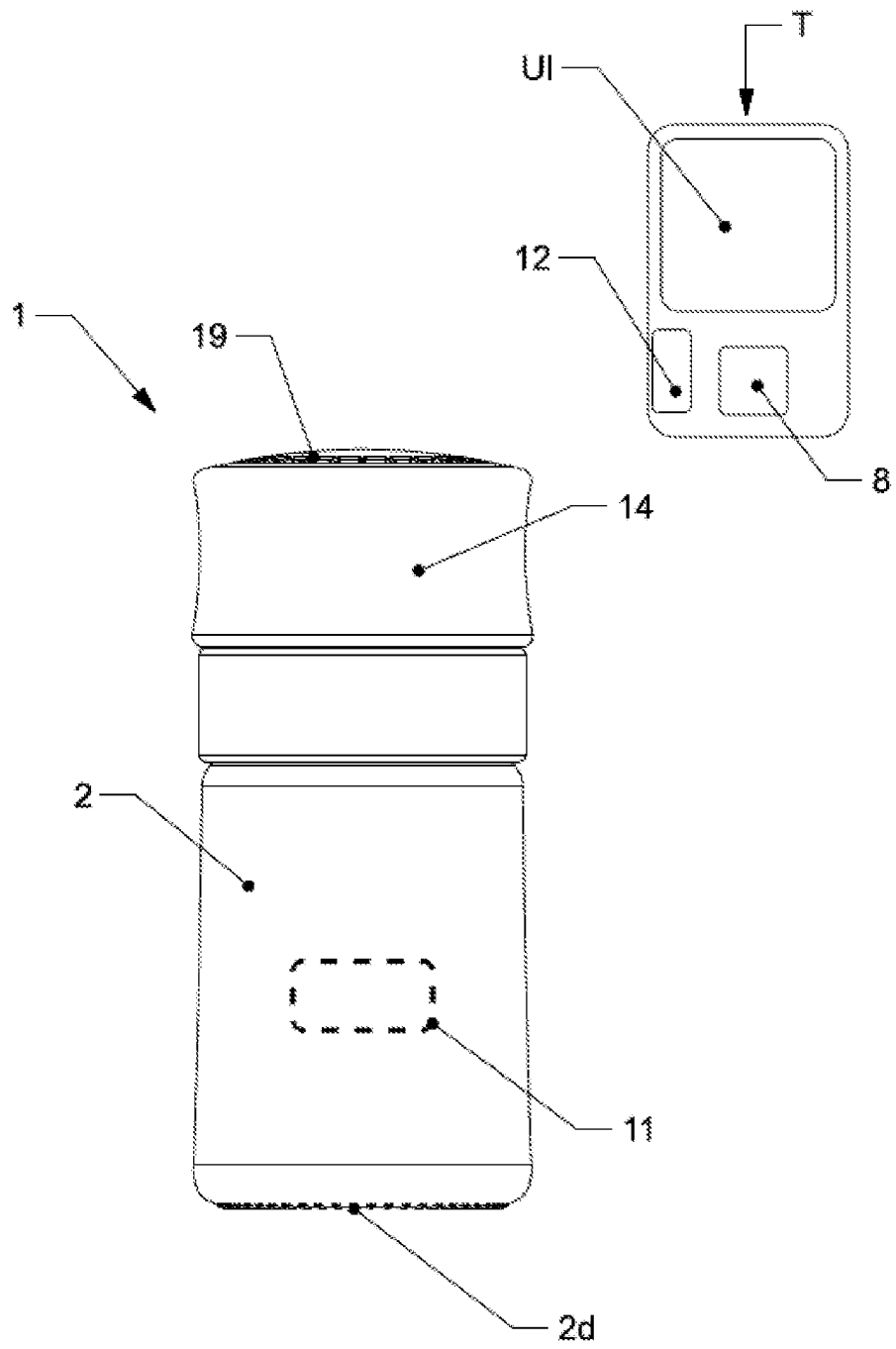


Fig. 1

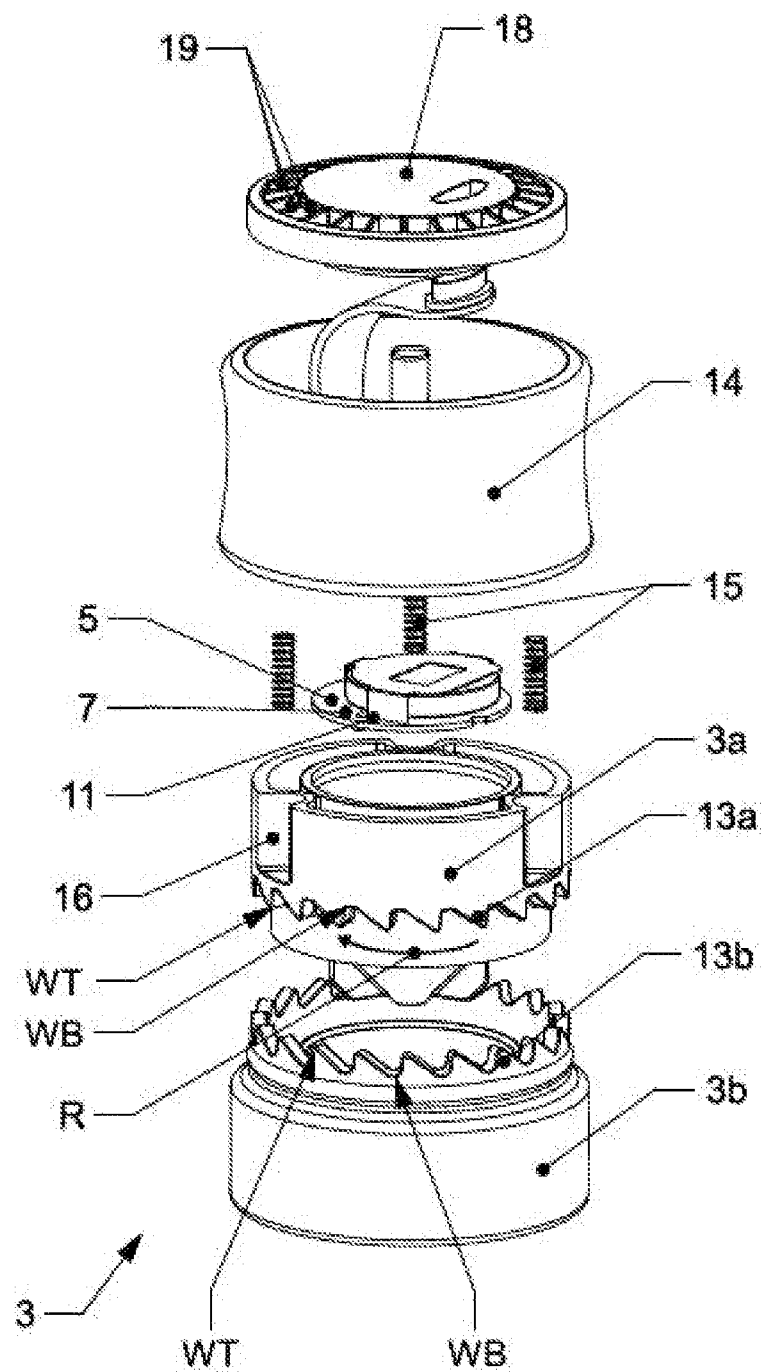


Fig. 2

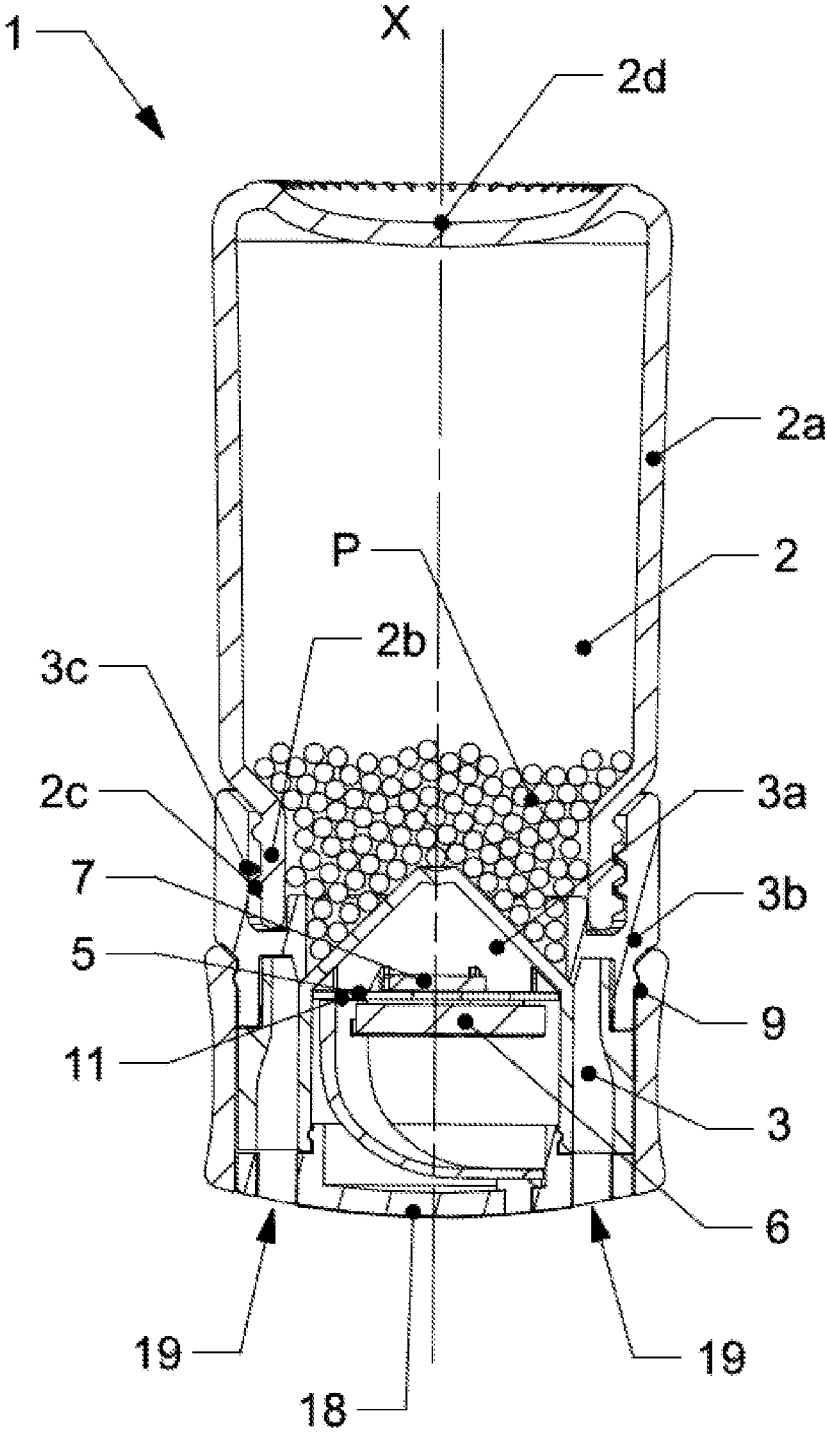


Fig. 3

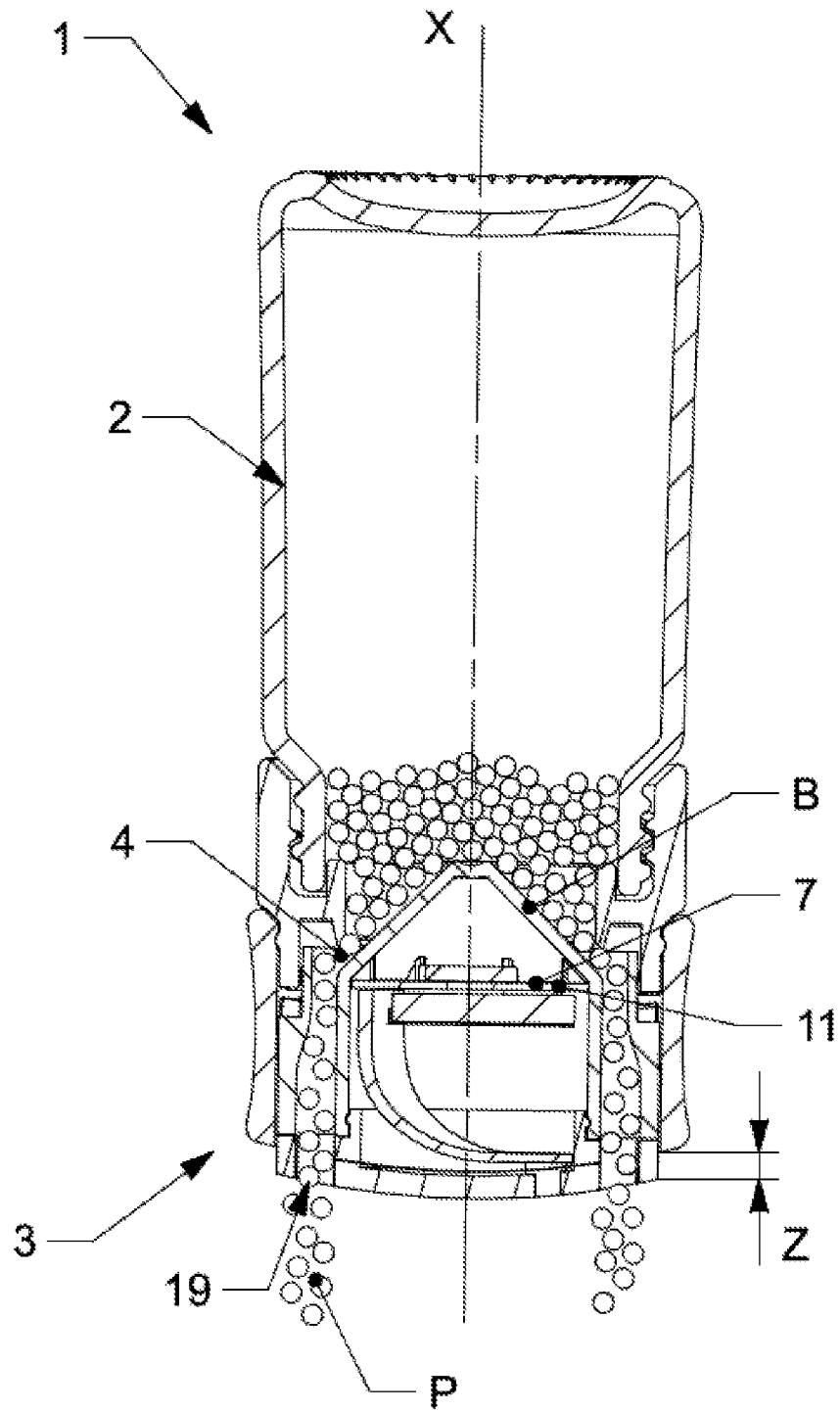


Fig. 4

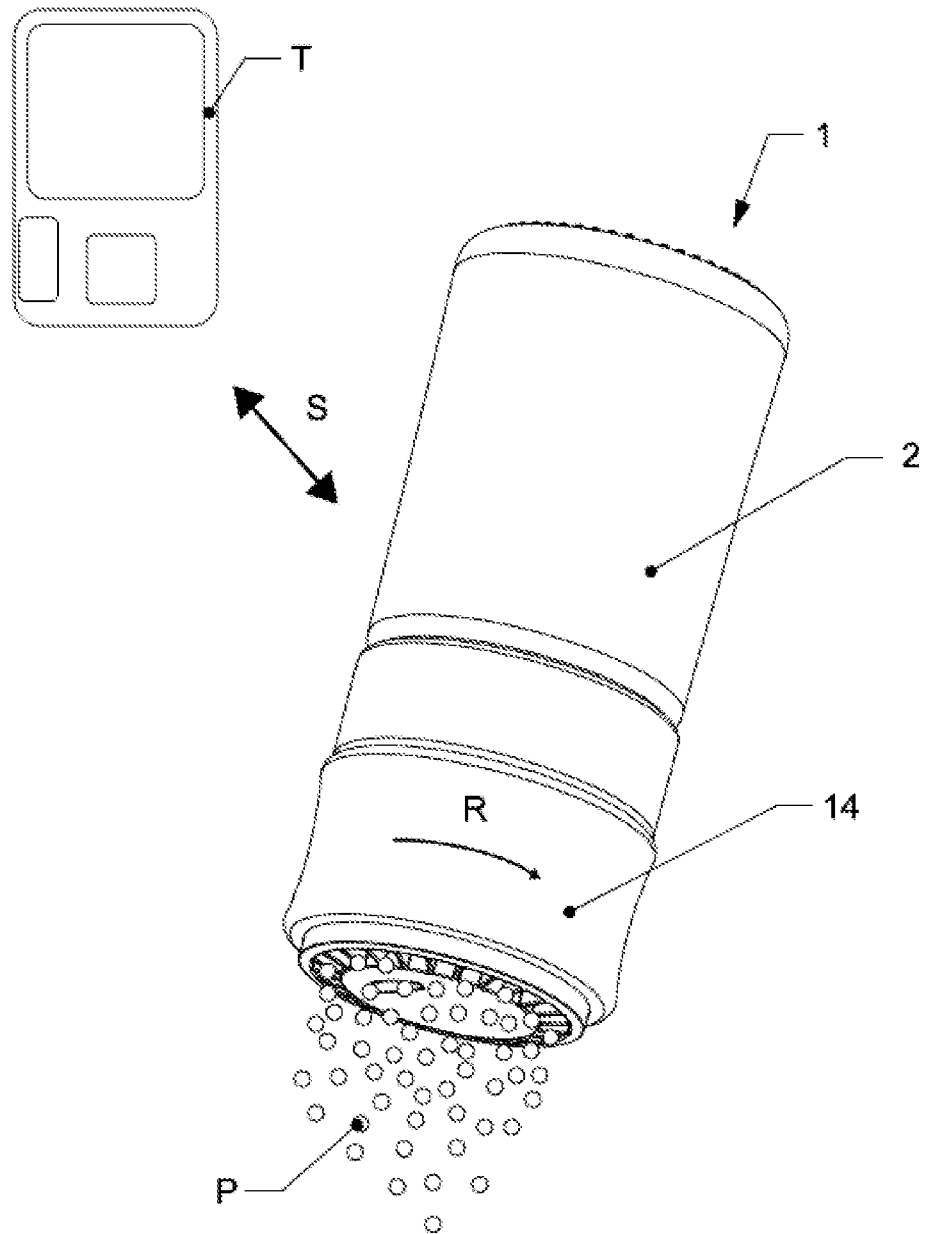


Fig. 5

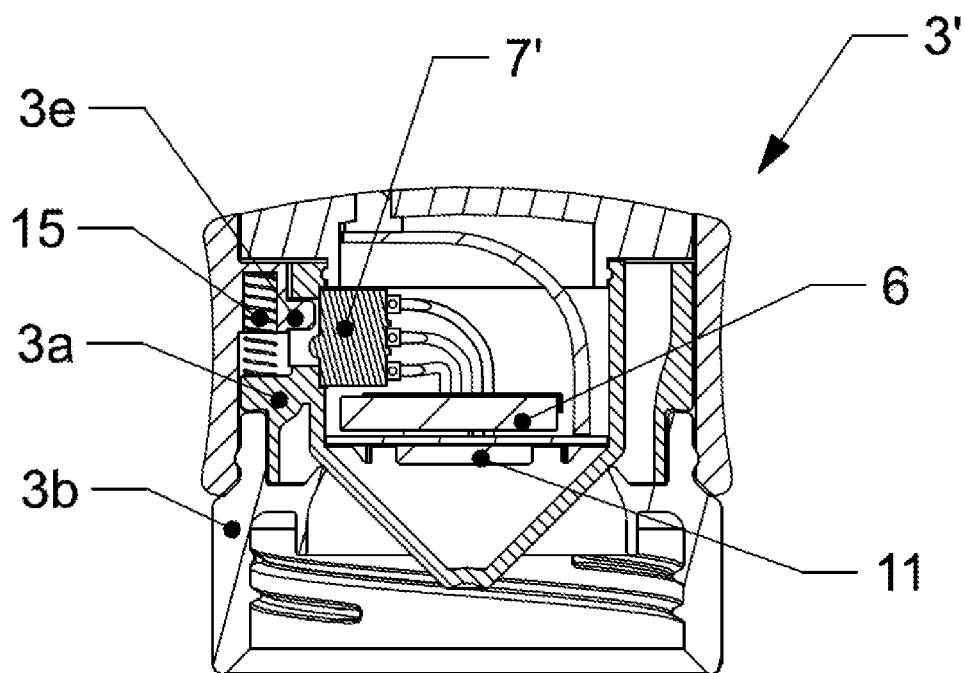


Fig. 6

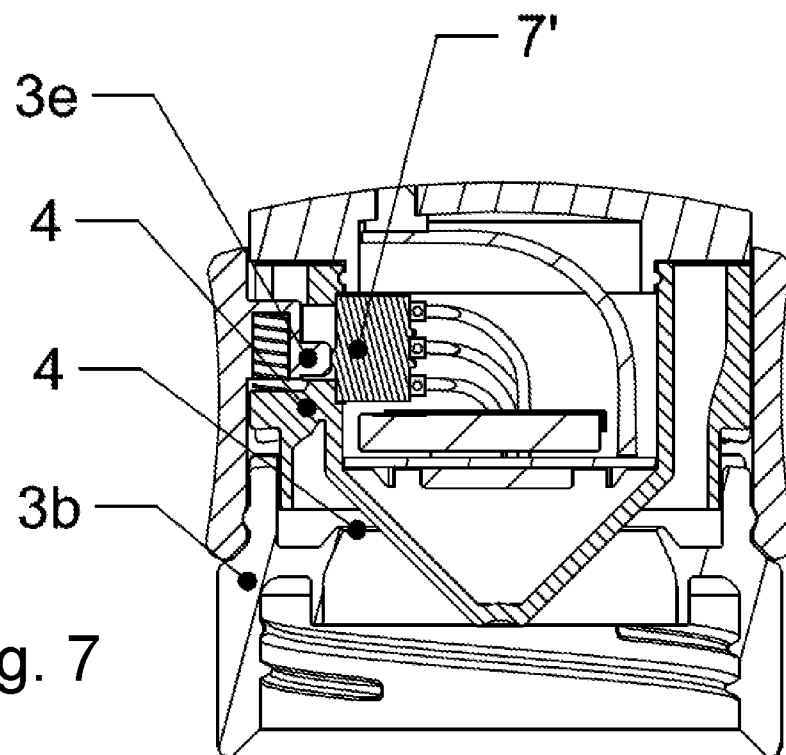


Fig. 7

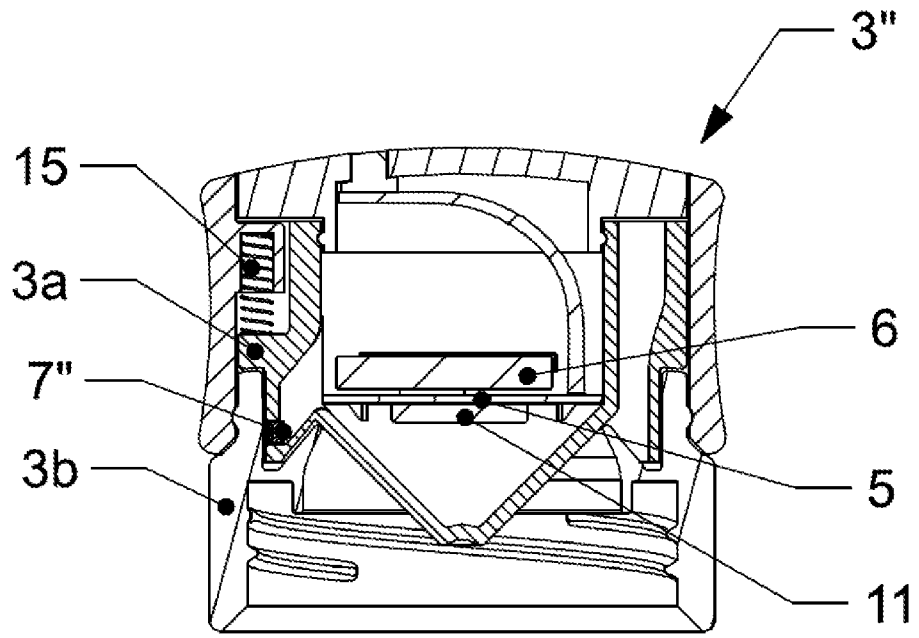


Fig. 8

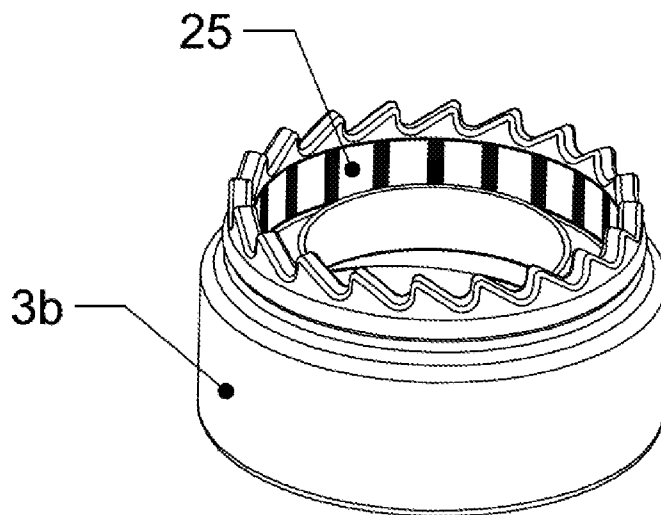


Fig. 9

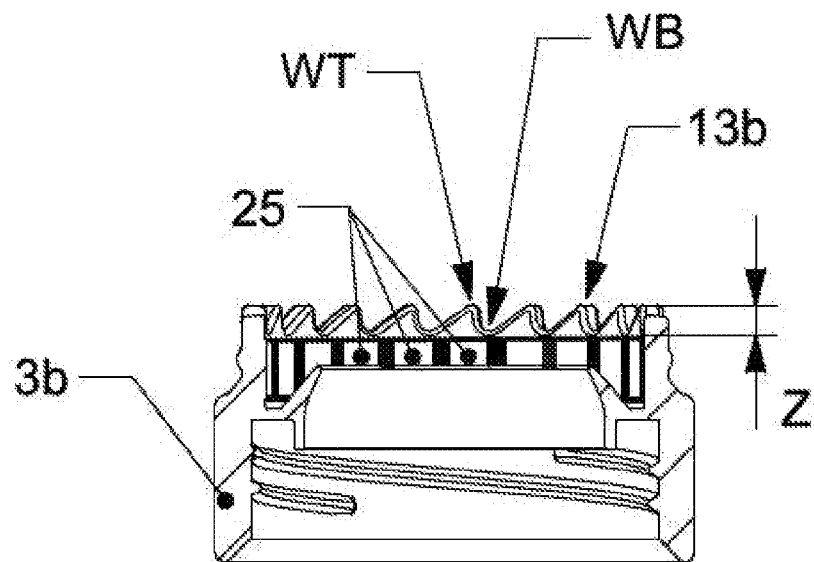


Fig. 10

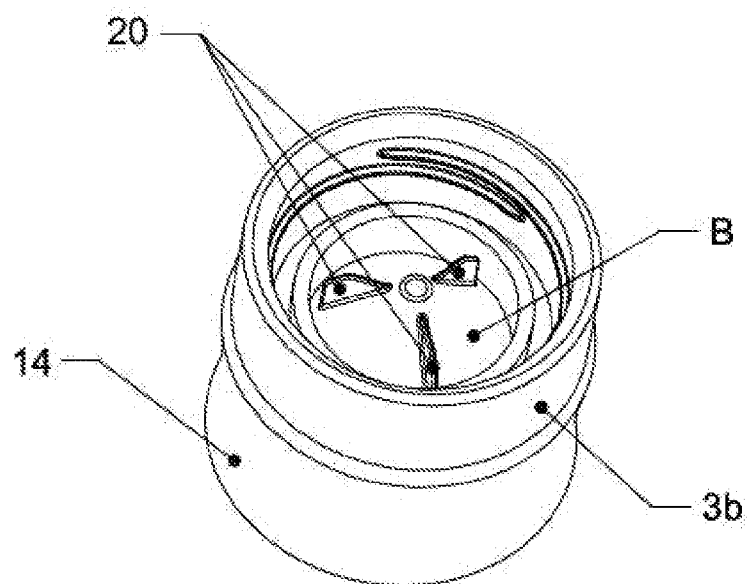


Fig. 11

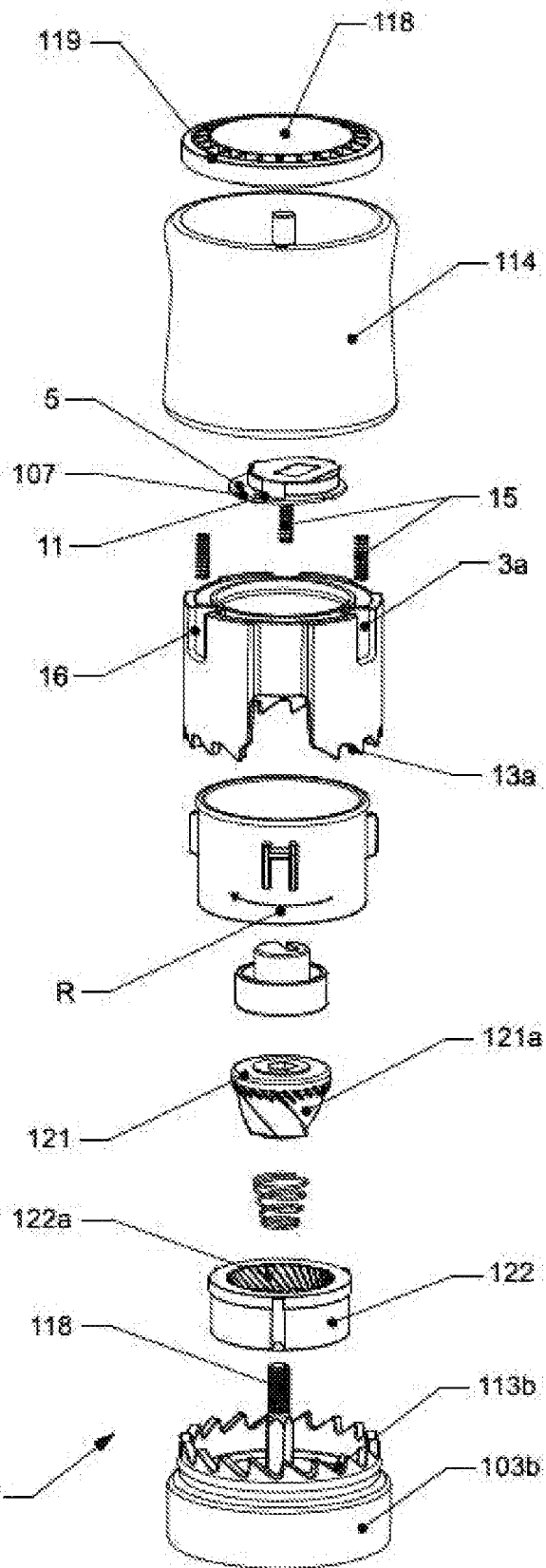


Fig. 12

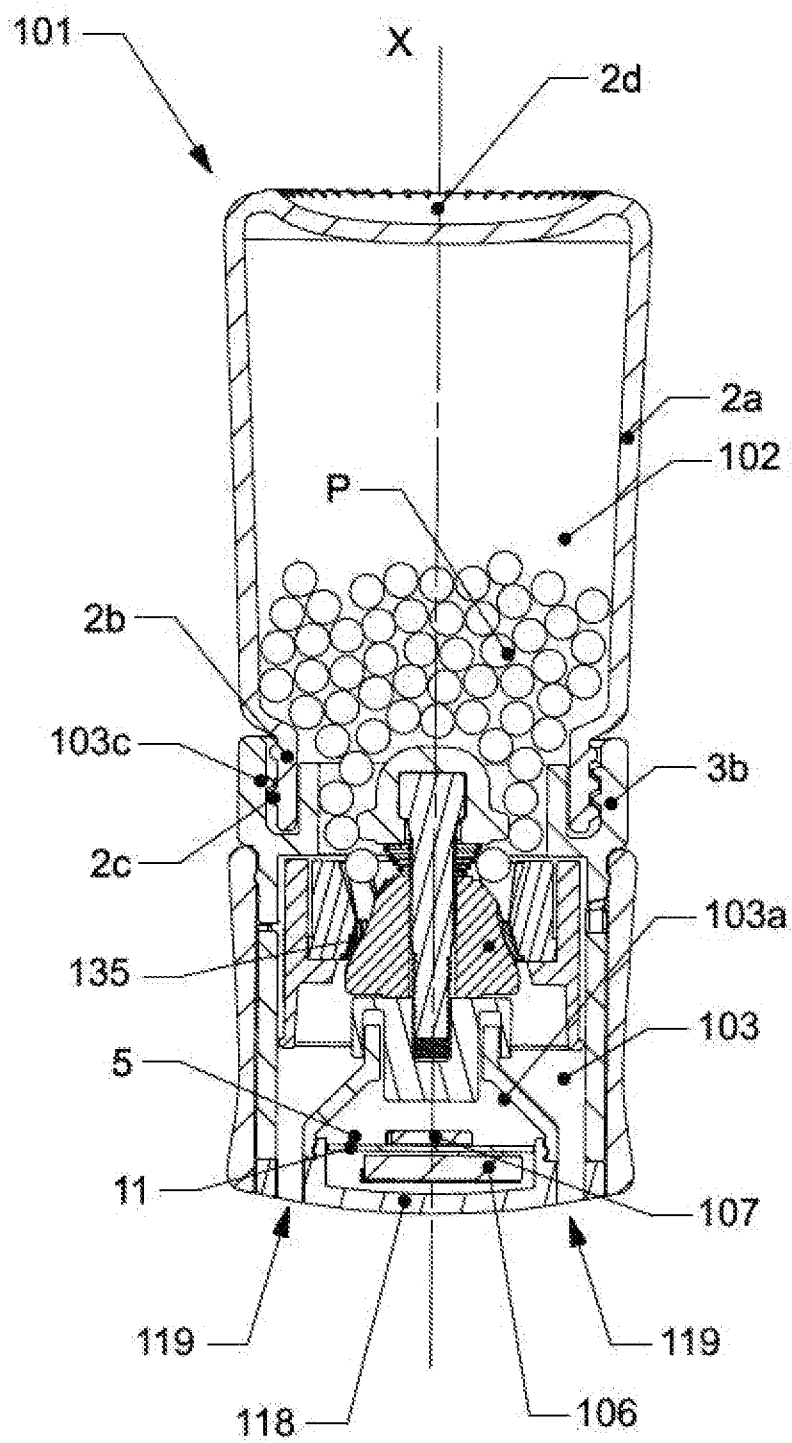


Fig. 13

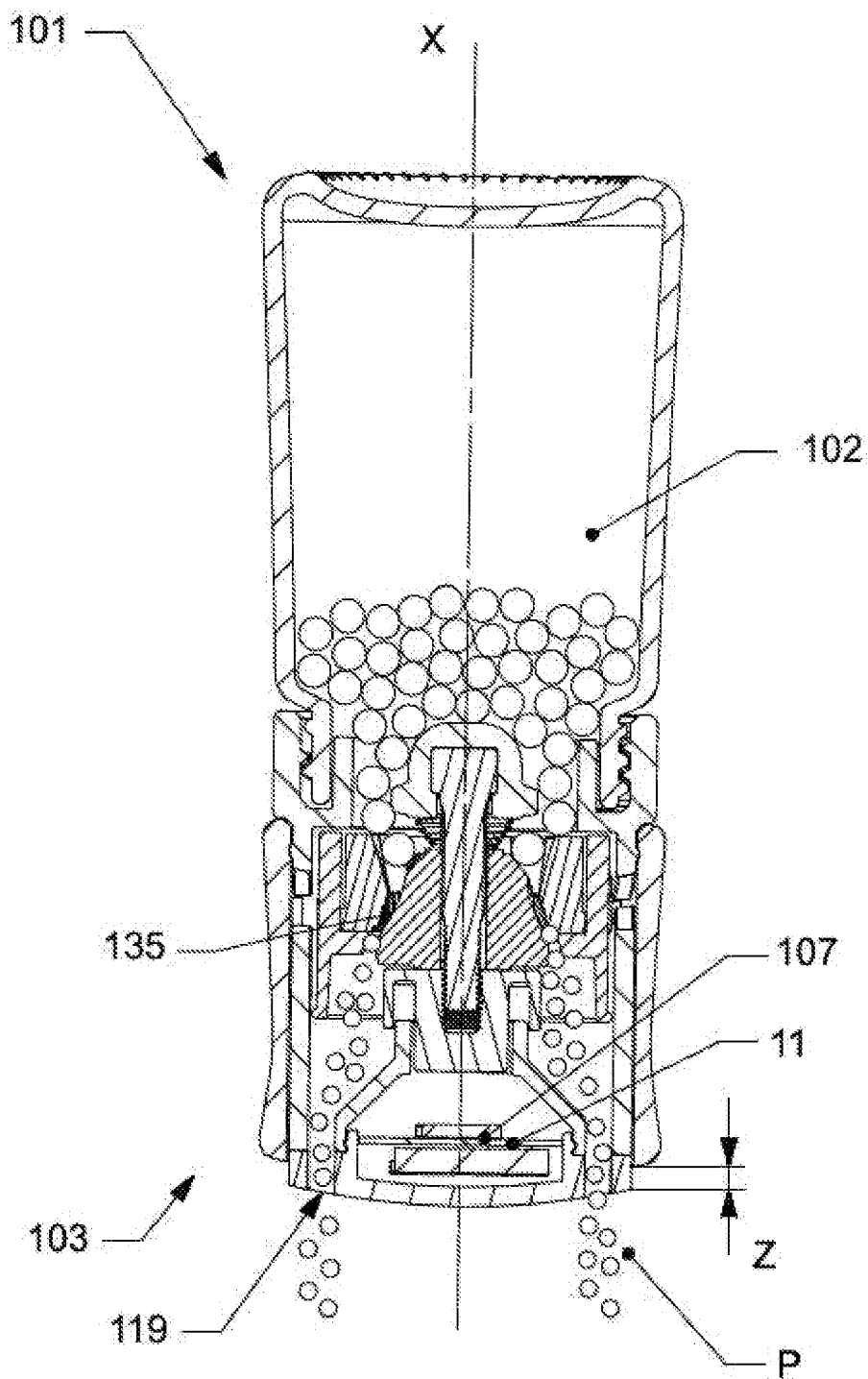


Fig. 14

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE		KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE	
Nederlands aanvraag nr. 2029903		Indieningsdatum 25-11-2021	
		Ingeroepen voorrangsdatum	
Aanvrager (Naam) Fluctus			
Datum van het verzoek voor een onderzoek van internationaal type 12-03-2022		Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr. SN80814	
I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)			
Volgens de internationale classificatie (IPC) Zie onderzoeksrapport			
II. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK			
Onderzochte minimumdocumentatie			
Classificatiesysteem	Classificatiesymbolen		
IPC	Zie onderzoeksrapport		
Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen			
III.	GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES		(opmerkingen op aanvullingsblad)
IV.	GEBREK AAN EENHEID VAN UITVINDING		(opmerkingen op aanvullingsblad)

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2029903

A. CLASSIFICATIE VAN HET ONDERWERP

INV. A47J42/38 A47G19/24 A47G19/18 B65D47/20 G01F11/34
ADD.

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHETE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimum documentatie (classificatie gevolgd door classificatiesymbolen)

A47J A47G B65D G01F

Onderzochte andere documentatie dan de minimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)

EPO-Internal

C. VAN BELANG GEACHTE DOCUMENTEN

Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
X	EP 3 533 368 A1 (OP HYGIENE IP GMBH [CH]) 4 september 2019 (2019-09-04) * alineas [0078] - [0237]; figuren * -----	1-6, 9-18
X	US 10 464 091 B2 (OP HYGIENE IP GMBH [CH]) 5 november 2019 (2019-11-05) * alineas [0013] - [0061]; figuren * -----	1-18
A	US 2011/060457 A1 (DE VRUGHT GERHARDUS JOHANNES ANTONIUS [NL] ET AL) 10 maart 2011 (2011-03-10) * bladzijde 22, regel 24 - bladzijde 58; figuren * -----	1, 16
A	US 11 013 361 B1 (SHEN JI [US] ET AL) 25 mei 2021 (2021-05-25) * kolom 3, regel 65 - kolom 10, regel 28; figuren * -----	1, 16

☐ Verdere documenten worden vermeld in het vervolg van vak C.

☒ Leden van dezelfde octrooifamilie zijn vermeld in een bijlage

° Speciale categorieën van aangehaalde documenten

"A" niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

"D" in de octrooiaanvraag vermeld

"E" eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

"L" om andere redenen vermelde literatuur

"O" niet-schriftelijke stand van de techniek

"P" tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

"T" na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

"X" de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

"Y" de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

"&" lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid

14 juni 2022

Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type

Naam en adres van de instantie

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

De bevoegde ambtenaar

Van Bastelaere, Tiny

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2029903

In het rapport genoemd octrooigeschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
EP 3533368	A1	04-09-2019	
		CA 2694569 A1	27-08-2010
		CA 2967107 A1	27-08-2010
		EP 2223642 A2	01-09-2010
		EP 2322068 A2	18-05-2011
		EP 3533368 A1	04-09-2019

US 10464091	B2	05-11-2019	
		CA 2911934 A1	13-05-2017
		EP 3167783 A1	17-05-2017
		US 2017136479 A1	18-05-2017

US 2011060457	A1	10-03-2011	
		EP 2231098 A2	29-09-2010
		EP 2289480 A2	02-03-2011
		US 2011060457 A1	10-03-2011
		WO 2009080309 A2	02-07-2009

US 11013361	B1	25-05-2021	GEEN

WRITTEN OPINION

File No. SN80814	Filing date (<i>day/month/year</i>) 25.11.2021	Priority date (<i>day/month/year</i>)	Application No. NL2029903
International Patent Classification (IPC) INV. A47J42/38 A47G19/24 A47G19/18 B65D47/20 G01F11/34			
Applicant Fluctus			

This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the application
- ☐ Box No. VIII Certain observations on the application

	Examiner Van Bastelaere, Tiny
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WRITTEN OPINION

Box No. I Basis of this opinion

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the application as filed.
 - ☐ filed together with the application in electronic form.
 - ☐ furnished subsequently for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Yes: Claims	19
	No: Claims	1-18
Inventive step	Yes: Claims	19
	No: Claims	1-18
Industrial applicability	Yes: Claims	1-19
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1 EP 3 533 368 A1 (OP HYGIENE IP GMBH [CH]) 4 september 2019 (2019-09-04); & US 10 464 091 B2 (OP HYGIENE IP GMBH [CH]) 5 november 2019 (2019-11-05)
- D2 US 2011/060457 A1 (DE VRUGHT GERHARDUS JOHANNES ANTONIUS [NL] ET AL) 10 maart 2011 (2011-03-10)
- D3 US 11 013 361 B1 (SHEN JI [US] ET AL) 25 mei 2021 (2021-05-25)

1. D1 discloses (see §78-237 and figures) a dispenser (**bijvoorbeeld** een kruidendispenser), omvattende een kamer (reservoir 15) om af te geven particulaat product (fluid 25) op te slaan, en een productafgiftestructuur (piston pump assembly 16) geconfigureerd om product van de kamer af te geven bij beweging van een beweegbaar deel (piston member 24) van die structuur ten opzichte van de kamer, waarbij de dispenser een detector (dispenser sensor unit 46) omvat geconfigureerd om beweging van het afgiftestructuurdeel ten opzichte van de kamer te detecteren en om een elektronisch detectieresultaat te genereren (see §88: *The data communications unit 48 is schematically illustrated in Figures 1 and 2 and intended to receive information from the dispenser sensor unit 46, preferably via the controller 62, and to transmit information wirelessly as to a wireless receiver 68.*).

Hence the subject-matter of **claim 1 is not novel**.

2. D1 discloses even so (see §78-237 and figures) een dispenser, (**bijvoorbeeld** een kruidendispenser, **bijvoorbeeld** een dispenser volgens een der conclusies 1-12), omvattende een kamer (reservoir 15) om af te geven particulaat product (fluid 25) op te slaan, en een productafgiftestructuur (piston pump assembly 16 + link 29 + magnet 40) geconfigureerd om product van de kamer af te geven bij beweging van een beweegbaar indicatordeel (piston 24 + link 29 + magnet 40) van die structuur ten opzichte van de kamer, waarbij het beweegbare indicatordeel van de afgiftestructuur ten minste één, en

bij voorkeur elk, is van:

(-roteerbaar ten opzichte van een stationair deel van de afgiftestructuur;)

-beweegbaar naar en weg van de kamer;

-beweegbaar op golvende, vibrerende of pulserende wijze ten opzichte van de kamer, waarbij het beweegbare deel van de afgiftestructuur en een stationair deel van de afgiftestructuur optioneel een productvrijgaveopening definiëren die iteratief opent en sluit wanneer genoemd beweegbaar deel van een eerste naar een tweede positie beweegt ten opzichte van genoemde stationaire deel.

Hence the subject-matter of **claim 16 is not novel**.

3. D1 discloses furthermore the features of dependent **claims 2-6 and 9-18**, so their subject-matter is evenso **not novel**.

Remarks:

Claim 2: see §88: *In a cycle of operation of the dispenser assembly 10, the actuating lever 27 is manually moved from the forward rest position in Figure 1 to the rear position in Figure 2 and when released by the hand of a user, the actuating lever 27 then returns under the bias of the spring 28 to the forward rest position.*

Claim 3: het beweegbare deel (piston 24) van de afgiftestructuur is:

-beweegbaar naar en weg van de kamer;

-beweegbaar op golvende, vibrerende of pulserende wijze ten opzichte van de kamer.

Claim 4: handmatig bedienbaar via lever 27

Claims 5, 9,10,13,14,15: gegevensverwerker: see §88: *Figure 2 schematically shows the data dispensing unit 48 as having an antenna 64 for transmitting information wirelessly to the antenna 66 of a remote wireless receiver 68 only schematically shown. The receiver 68 preferably also comprises a wireless hub interconnecting with a computer 69 that preferably employs a web browser for viewing information sent via the hub.*

Claim 6: see §125: *The dispenser sensor unit 46 can count the number of cycles which count can be used to generate an empty signal when a maximum number of cycles has been exceeded since last replacement of the bottle 15, which maximum number of cycles can be considered to represent an indication that the bottle 15 needs to be replaced. When this empty signal is generated, the information can be communicated to*

the data communication unit 48 which can transmit the information as a suitable signal wirelessly to the receiver 68. A mechanism for resetting the counter with replacement of the bottle may be provided.

Claim 7: see figure 3

Claim 8: see §81: *The piston chamber-forming member 22 carries a one-way valve member 23 and an axially reciprocal piston member 24 such that in a known manner reciprocal axial movement of the piston member 24 within the piston chamber-forming member 22 will dispense fluid 25 within the bottle 15 out a discharge outlet 26 of the piston member 24.*

Claim 17: veermiddelen: spring 28 see figure 1

Claim 18: see figures 1 and 2: het beweegbaar indicatordeel is (piston 24 + link 29 + magnet 40), of which:

- * piston 24 is axiaal verplaatsbaar and
- * link 29 is roteerbaar tov een stationair deel

4. D1 even so discloses the features of claim 1 (see figures) and furthermore the features of **claims 7 and 8** (see §13-§61), therefore the subject matter of these claims being **not novel**.

5. The combinations of features of **dependent claim 19** are neither known from, nor rendered obvious by, the available prior art. Hence their subject-matters are considered novel and inventive over the prior art .