



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
09.03.2016 Bulletin 2016/10

(51) Int Cl.:
B65D 83/26 (2006.01) **B05B 15/06** (2006.01)
B05B 3/14 (2006.01) **B65D 83/38** (2006.01)

(21) Application number: **15163150.4**

(22) Date of filing: **10.04.2015**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA

- **Mascato Domínguez, Mónica**
36400 PORRIÑO - Pontevedra (ES)
- **García Lago, Ramón**
36400 PORRIÑO - Pontevedra (ES)
- **Costas Fernández, Jerónimo**
36400 PORRIÑO - Pontevedra (ES)
- **Arosa Vázquez, Rafael**
36400 PORRIÑO - Pontevedra (ES)

(30) Priority: **10.04.2014 ES 201430535**

(74) Representative: **ABG Patentes, S.L.**
Avenida de Burgos, 16D
Edificio Euromor
28036 Madrid (ES)

(71) Applicant: **Zelnova, S.A.**
36400 Porrino - Pontevedra (ES)

(72) Inventors:
• **Lopez Figueroa, Esteban**
36400 PORRIÑO - Pontevedra (ES)

Remarks:

Claims 17 to 21 are deemed to be abandoned due to non-payment of the claims fees (Rule 45(3) EPC).

(54) **MULTIDIRECTIONAL AEROSOL DISPENSER FOR USE WITH AEROSOL CONTAINERS AND DISPENSING METHOD**

(57) Multidirectional aerosol dispenser (1) and dispensing method for use with an aerosol container (100) comprising a valve in turn comprising elastic means that tend to keep the valve in a closed position in which it does not allow passage of the product contained in the container, the valve being able to be in an open position, in which it is necessary to act externally against said elastic means and it does allow passage of said product, where the dispenser (1) comprises operating means (A) which allow operating the valve, where the dispenser (1) comprises mechanical means (B) for converting movement of the operating means (A) into a rotational movement of a diffuser (2) which can be connected to the valve for directing product application in different directions.

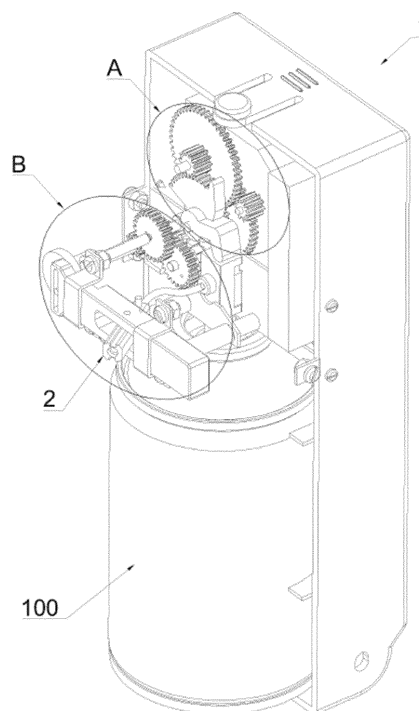


FIG. 1b

Description

Technical Field of the Invention

[0001] A first aspect of the present invention relates to a multidirectional aerosol dispenser and a second aspect relates to a dispensing method in which the dispenser of the first aspect of the invention is used, being applicable in the industry of aerosol dispensers, preferably automatic aerosol dispensers, and more specifically in the field of orientable dispensers, which allows directing dispensation of the product contained in the aerosol in different directions in space, whereby achieving a homogeneous product distribution around the device in the space of the room where said dispenser is located. The multidirectional dispenser object of the invention allows converting movement of operating means into a rotational movement of a diffuser which is connected to the valve of an aerosol container for directing product application in different directions, whereby achieving a more homogeneous product distribution around the device.

Background of the Invention

[0002] There is a wide range of devices today known as an aerosol container for dispensing products contained in an aerosol, such as an insecticide, air freshener, deodorant, bactericide, etc. These devices can be manual or automatic.

[0003] There are manual aerosol dispensing devices comprising operating means which allow operating the valve, user intervention being necessary for manually activating said operating means.

[0004] Manual dispensers have the drawback of requiring user intervention for activating the operating means and of only allowing product application in a specific direction, such that the product is discharged repeatedly in said direction, reaching other points outside the aerosol spray range much later and with less intensity, not allowing a homogeneous product distribution around the device.

[0005] In addition, automatic aerosol dispensing devices usually have an electric motor moving a small mechanism that is coupled to the aerosol container for automatically operating the valve. A temporary power transmission controlling element for controlling power transmission from the power source to the motor controls the electric motor such that the product is dispensed at regular intervals.

[0006] Automatic aerosol dispensers allow the periodic application of products contained in an aerosol without needing user intervention except for selecting the operating program which controls the product discharge frequency or replacing the aerosol containers and batteries, in the event that the power source is formed by batteries, but like in the case of manual dispensers, they only allow product application in a single direction, reaching other points outside the aerosol spray range much later and

with less intensity, not allowing a homogeneous product distribution around the device. In normal use of the device, it is not possible for a user to repeatedly and continuously change the location of the dispenser or the direction of product application while said device is in operation for purely practical reasons.

[0007] When a product contained in an aerosol is applied manually in the air, the user pushes a push element coupled to the valve directing the spray into the air in all directions, whereby achieving a homogeneous product distribution in the space where is applied. However, as has been seen most automatic or manual aerosol dispensers only allow product application in a specific direction, not allowing a homogeneous product distribution around the device.

[0008] There are automatic dispensing devices, such as that described in Spanish utility model application no. ES-1070039-U which allow directing product dispensation, to that end, the structure of the device is formed by two cylindrical bodies that are communicated with one another, being attached by a line oblique to the central axis of the cylindrical body, such that the user in turn changes the orientation in which the product is dispensed by means of manually rotating the upper body in which the dispensing opening is located, while keeping the lower body still, for example, supported on a shelf.

[0009] However, although the device mentioned in the preceding paragraph allows directing dispensation in specific directions, it still has the same drawback as most automatic or manual dispensing devices, i.e., user intervention is needed for reorienting the direction of product application. Said device does not allow obtaining a homogeneous product distribution in the space around the device in an automatic manner.

[0010] The automatic dispensing device described in ES1070039U allows selecting the direction of product application by means of manually rotating the upper body, but once the user manually selects a direction of application, the product will be discharged repeatedly in said single direction until a new user intervention takes place to reorient the direction of product application. In addition, repetitive and continuous user intervention for reorienting the direction of product application is unfeasible from a practical viewpoint. Therefore, the device described in ES1070039U does not solve the problem relating to improving product distribution in the environment in which it is located.

[0011] Finally, there is currently no device capable of dispensing the product contained in an aerosol in different directions which does not need manual user intervention and which achieves a homogeneous product distribution in space.

Description of the Invention

[0012] A first aspect of the present invention relates to a multidirectional aerosol dispenser which allows solving the preceding problems by means of converting move-

ment of operating means into a rotational movement of a diffuser which is connected to the valve of an aerosol container for directing product application in different directions, whereby achieving a more homogeneous product distribution around the device.

[0013] The multidirectional aerosol dispenser proposed by the invention is envisaged for being used with an aerosol container comprising a valve in turn comprising elastic means that tend to keep the valve in a closed position in which it does not allow passage of the product contained in the container. Likewise, the valve can be in an open position in which it is necessary to act externally against said elastic means and it does allow passage of said product.

[0014] The dispenser of the invention comprises operating means which allow operating said valve. When the operating means no longer act, the valve returns to the closed position due to the recovery of the elastic means.

[0015] According to the invention, the dispenser comprises mechanical means for converting movement of the operating means into a rotational movement of a diffuser which can be connected to the valve for directing product application in different directions. A rotational movement for orienting diffusion is thereby linked with the actual movement associated with the action of dispensing the product itself. In other words, movement of the operating means is transmitted through a mechanism which is described below until converting same into a diffuser orientation changing movement. Therefore, the diffuser is reoriented as a result of activating the operating means, preventing the product from always being dispensed in the same direction.

[0016] Among the different design options that fall within the invention, the possibility that the mechanical means for converting movement of the operating means into rotational movement of the diffuser comprising the following is contemplated:

- first gears operatively connected to the operating means such that movement of said operating means causes rotation of the first gears;
- a cam operated by said first gears; and
- a sliding guide operated by the cam, the sliding guide being connected to the diffuser for causing said rotational movement.

[0017] Likewise, the dispenser can comprise a push element which can be operated by the operating means that can be coupled to the valve, where the connection between the operating means and said first gears is carried out by means of a ratchet mechanism. Said ratchet mechanism in turn comprises a ratchet wheel and a protuberance integral with the push element, such that when the push element and the protuberance move as a result of the movement of the operating means, the protuberance engages a tooth of the ratchet wheel and rotates the wheel a pitch distance.

[0018] Alternatively, it is contemplated that the connec-

tion between the operating means and said first gears is carried out by means of a ratchet mechanism comprising a ratchet wheel and a protuberance integral, in this case, with a pushing cam comprised by said operating means, such that when the protuberance moves as a result of the movement of the pushing cam of the operating means, it engages a tooth of the ratchet wheel and rotates the wheel a pitch distance.

[0019] In addition, it is contemplated that the first gears comprise a first cogwheel connected to the ratchet wheel, a second cogwheel connected to the first cogwheel, and a shaft of the second cogwheel which rotates the cam.

[0020] It is understood that the term "cogwheel" can refer both to a complete cogwheel (covering 360°) and to cogwheel sectors, since a sector will sometimes be enough due to the back and forth movements that are transmitted. Furthermore, each "cogwheel" can refer to a part formed in turn by a larger wheel and a smaller wheel having a different radius and number of teeth which are integral with one another, regardless if it is made in two parts or in a single part.

[0021] Among the different design options that fall within the invention, it is contemplated that the ratchet wheel and the first gears are configured such that each movement of the protuberance causes less than a complete turn of the cam. This feature must be interpreted taking into account that a complete turn of the cam corresponds to a complete rotational back and forth movement of the diffuser. Producing less than a complete turn of the cam every time the protuberance moves as a result of the movement of the operating means allows the diffuser to gradually adopt several different orientations along its path of travel.

[0022] According to a preferred embodiment of the invention, the ratchet wheel and the first gears are configured such that each movement of the protuberance causes about a quarter turn of the cam. Therefore, every time the protuberance moves as a result of the movement of the operating means, the diffuser will rotate a quarter of its complete back and forth path of travel. If the cam is adjusted so that two of the four stopping points correspond with the end points of the path of travel of the sliding guide, the diffuser will alternatively adopt: a first position at one end of its path of travel, a second position at a midpoint of its path of travel, a third position at the opposite end of its path of travel, and a fourth position again at the midpoint of its path of travel. From there on, newly activating the operating means would cause the cycle to be repeated again. This will be seen in greater detail in reference to the drawings shown below in the present document.

[0023] The cam can in turn be connected to the sliding guide by means of an eccentric pin of the cam, where said eccentric pin can move in a groove of the sliding guide. According to a preferred embodiment, the diffuser has a fixed point and is connected to the sliding guide by means of a pin integral with the sliding guide which can move in a groove of the diffuser, such that the linear

movement of the pin caused by the movement of the sliding guide causes a rotational movement of the diffuser around the fixed point.

[0024] The possibility that the connection between the valve of the aerosol container and the diffuser is carried out by means of a flexible microtube, preferably made of a material with high chemical compatibility, is contemplated.

[0025] Obviously, the possibility that the operating means which allow operating the valve are manual operating means is contemplated, in which case manual actuation by a user serves to activate said operating means.

[0026] Nevertheless, according to a preferred embodiment of the dispenser of the invention the operating means are automatic operating means, in which case said operating means comprise an electric motor that can be connected to a power source, which can operate second gears such that they operate the valve according to a predetermined periodicity, where the motor is intermittently powered by the power source in a periodic manner by means of a temporary power transmission controlling element.

[0027] According to a preferred embodiment, the second gears comprise a first cogwheel moved by the electric motor, a second cogwheel connected to the first cogwheel, a third cogwheel connected to the second cogwheel, a fourth cogwheel connected to the third cogwheel, and a pushing cam fixed integrally to the fourth cogwheel such that rotation of said fourth cogwheel in an operating direction causes the pushing cam to operate the valve.

[0028] Finally, it is contemplated that the dispenser comprises a casing which can house an aerosol container, the operating means which allow operating the valve, and the mechanical means for converting movement of the operating means into a rotational movement of a diffuser.

[0029] A second aspect of the invention relates to an aerosol dispensing method which comprises using a multidirectional aerosol dispenser such as that one described above, comprising the following phases:

- activating the operating means causing the operation of the valve of the container
- converting by mechanical means the movement produced by the operating means into a rotational movement of a diffuser to which the valve of the aerosol container is connected.

[0030] It is contemplated that when the push element and the protuberance move as a result of the movement of the operating means, the protuberance operates the mechanical means for converting movement of the operating means into a rotational movement of a diffuser.

[0031] Likewise, it is contemplated that the protuberance is integral with the push element or with the pushing

cam operating the ratchet wheel connected to gears which move, through a cam, the sliding guide on which the diffuser is coupled in an articulated manner.

[0032] The possibility that the method comprises sequentially operating the valve and the ratchet mechanism is contemplated.

[0033] In this sense, according to a first embodiment the method comprises:

- the operating means moving the push element against the action of the elastic means of the valve,
- after exceeding the open position of the valve and when the operating means no longer act on the push element, the valve returns to the closed position due to the recovery of the elastic means, allowing the protuberance to engage the tooth of the ratchet wheel.

[0034] Alternatively, according to a second embodiment the method comprises:

- the operating means moving the push element against the action of the elastic means of the valve,
- before reaching the open position of the valve, allowing the protuberance to engage the tooth of the ratchet wheel.

Description of the Drawings

[0035] To complement the description that is being made and for the purpose of aiding to better understand the features of the invention according to a preferred practical embodiment thereof, a set of drawings is attached as an integral part of said description in which the following has been depicted with an illustrative and non-limiting character:

Figures 1a and 1b show two perspective views of a dispenser according to the invention with the complete casing and without the front casing, respectively.

Figures 2a and 2b show two perspective views of the automatic means which allow operating the valve.

Figures 3a and 3b show two perspective views of the means for converting movement of the automatic means which allow operating the valve into a rotational movement of the diffuser.

Figures 4a and 4b show two perspective views of a mechanism comprising both means shown in Figures 2a-2b and 3a-3b.

Figures 5a and 5b show two perspective views of the dispenser of the invention without the front casing which correspond to two positions of the diffuser.

Preferred Embodiment of the Invention

[0036] According to a preferred embodiment, the multidirectional aerosol dispenser (1) proposed by the invention is envisaged for use with an aerosol container (100). This preferred description of the embodiment will show only the physical means of a preferred embodiment of a multidirectional aerosol dispenser and does not expressly mention the method, although in view of the elements of said dispenser and of how they work, it is easy to understand the dispensing method which has been included in the description of the invention section in more detail.

[0037] The aerosol container (100) in turn comprises a valve in turn comprising elastic means that tend to keep the valve in a closed position in which it does not allow passage of the product contained in the container. Said valve can be in an open position in which it is necessary to act externally against said elastic means and it does allow passage of said product. The dispenser (1) in turn comprises operating means (A) which allow operating the valve.

[0038] The dispenser (1) comprises mechanical means (B) for converting movement of the operating means (A) into a rotational movement of a diffuser (2) which can be connected to the valve for directing product application in different directions.

[0039] According to a preferred embodiment, the mechanical means (B) for converting movement of the operating means (A) into rotational movement of the diffuser (2) comprise:

- first gears (5, 6, 7) operatively connected to the operating means (A) such that movement of said operating means (A) causes rotation of the first gears (5, 6, 7);
- a cam (8) operated by said first gears (5, 6, 7); and
- a sliding guide (9) operated by the cam (8), the sliding guide (9) being connected to the diffuser (2) for causing said rotational movement.

[0040] More specifically, the dispenser (1) comprises a push element (20) which can be operated by the operating means (A) that can be coupled to the valve. The connection between the operating means (A) and said first gears (5, 6, 7) is carried out by means of a ratchet mechanism comprising a ratchet wheel (3) and a protuberance (4) integral with the push element (20), such that when the push element (20) and the protuberance (4) move as a result of the movement of the operating means (A), the protuberance (4) engages a tooth of the ratchet wheel (3) and rotates the wheel a pitch distance.

[0041] Alternatively to the foregoing, although it has not been depicted, it is contemplated that the connection between the operating means (A) and said first gears (5, 6, 7) is carried out by means of a ratchet mechanism comprising a ratchet wheel (3) and a protuberance (4) integral with a pushing cam (16) comprised in said oper-

ating means (A), such that when the protuberance (4) moves as a result of the movement of the pushing cam (16) of the operating means (A), it engages a tooth of the ratchet wheel (3) and rotates the wheel a pitch distance.

[0042] In a manner common to both alternatives, according to a preferred embodiment the first gears (5, 6, 7) comprise a first cogwheel (5) connected to the ratchet wheel (3), a second cogwheel (6) connected to the first cogwheel (5), and a shaft (7) of the second cogwheel (6) which rotates the cam (8).

[0043] The ratchet wheel (3) and the first gears (5, 6, 7) are configured such that each movement of the protuberance (4) causes less than a complete turn of the cam (8).

[0044] Likewise, it is also contemplated that the ratchet wheel (3) and the first gears (5, 6, 7) are configured such that each movement of the protuberance (4) causes about a quarter turn of the cam (8).

[0045] The cam (8) is in turn connected to the sliding guide (9) by means of an eccentric pin (8a) of the cam (8) which can move in a groove (9a) of the sliding guide (9).

[0046] The diffuser (2) has a fixed point (2b) and is connected to the sliding guide (9) by means of a pin (9b) integral with the sliding guide which can move in a groove of the diffuser (2), such that the linear movement of the pin (9b) caused by the movement of the sliding guide (9) causes a rotational movement of the diffuser (2) around the fixed point (2b).

[0047] According to a preferred embodiment, the connection between the valve of the aerosol container (100) and the diffuser (2) is carried out by means of a flexible microtube (10) made of a material with high chemical compatibility.

[0048] Although it has not been depicted, it is contemplated that the operating means (A) which allow operating the valve are manual operating means.

[0049] Nevertheless, according to a preferred embodiment depicted in the drawings the operating means (A) are automatic operating means and comprise an electric motor (11) that can be connected to a power source, which can operate second gears (12, 13, 14, 15) such that they operate the valve according to a predetermined periodicity, where the motor (11) is intermittently powered by the power source in a periodic manner by means of a temporary power transmission controlling element.

[0050] Specifically, the second gears (12, 13, 14, 15) comprise a first cogwheel (12) moved by the electric motor (11), a second cogwheel (13) connected to the first cogwheel (12), a third cogwheel (14) connected to the second cogwheel (13), a fourth cogwheel (15) connected to the third cogwheel (14), and a pushing cam (16) fixed integrally to the fourth cogwheel (15) such that rotation of said fourth cogwheel (15) in an operating direction causes the pushing cam (16) to operate the valve.

[0051] Finally, a preferred embodiment of the dispenser (1) comprises a casing (17) which can house an aerosol container (100), the operating means (A) which allow

operating the valve, and the mechanical means (B) for converting movement of the operating means (A) into a rotational movement of a diffuser (2).

[0052] In view of this description and set of drawings, the person skilled in the art will understand that the embodiments of the invention which have been described can be combined in many ways within the object of the invention. The invention has been described according to several preferred embodiments thereof, but for the person skilled in the art it will be obvious that multiple variations can be introduced in said preferred embodiments without exceeding the object of the claimed invention.

Claims

1. A multidirectional aerosol dispenser (1) for use with an aerosol container (100) comprising a valve in turn comprising elastic means that tend to keep the valve in a closed position in which it does not allow passage of the product contained in the container, the valve being able to be in an open position, in which it is necessary to act externally against said elastic means and it does allow passage of said product, where the dispenser (1) comprises operating means (A) which allow operating the valve, **characterized in that** the dispenser (1) comprises mechanical means (B) for converting movement of the operating means (A) into a rotational movement of a diffuser (2) which can be connected to the valve for directing product application in different directions.
2. The dispenser (1) according to claim 1, wherein the mechanical means (B) for converting movement of the operating means (A) into rotational movement of the diffuser (2) comprise:
 - first gears (5, 6, 7) operatively connected to the operating means (A) such that movement of said operating means (A) causes rotation of the first gears (5, 6, 7);
 - a cam (8) operated by said first gears (5, 6, 7); and
 - a sliding guide (9) operated by the cam (8), the sliding guide (9) being connected to the diffuser (2) for causing said rotational movement.
3. The dispenser (1) according to claim 2, comprising a push element (20) which can be operated by the operating means (A) that can be coupled to the valve, where the connection between the operating means (A) and said first gears (5, 6, 7) is carried out by means of a ratchet mechanism comprising a ratchet wheel (3) and a protuberance (4) integral with the push element (20), such that when the push element (20) and the protuberance (4) move as a result of the movement of the operating means (A), the protuberance (4) engages a tooth of the ratchet wheel (3) and rotates the wheel a pitch distance.
4. The dispenser (1) according to claim 2, where the connection between the operating means (A) and said first gears (5, 6, 7) is carried out by means of a ratchet mechanism comprising a ratchet wheel (3) and a protuberance (4) integral with a pushing cam (16) comprised by said operating means (A), such that when the protuberance (4) moves as a result of the movement of the pushing cam (16) of the operating means (A), it engages a tooth of the ratchet wheel (3) and rotates the wheel a pitch distance.
5. The dispenser (1) according to any of claims 3 and 4, where the first gears (5, 6, 7) comprise a first cogwheel (5) connected to the ratchet wheel (3), a second cogwheel (6) connected to the first cogwheel (5), and a shaft (7) of the second cogwheel (6) which rotates the cam (8).
6. The dispenser (1) according to any of claims 3-5, where the ratchet wheel (3) and the first gears (5, 6, 7) are configured such that each movement of the protuberance (4) causes less than a complete turn of the cam (8).
7. The dispenser (1) according to claim 6, where the ratchet wheel (3) and the first gears (5, 6, 7) are configured such that each movement of the protuberance (4) causes about a quarter turn of the cam (8).
8. The dispenser (1) according to any of claims 2-7, where the cam (8) is connected to the sliding guide (9) by means of an eccentric pin (8a) of the cam (8) which can move in a groove (9a) of the sliding guide (9).
9. The dispenser (1) according to any of claims 2-8, where the diffuser (2) has a fixed point (2b) and is connected to the sliding guide (9) by means of a pin (9b) integral with the sliding guide which can move in a groove of the diffuser (2), such that the linear movement of the pin (9b) caused by the movement of the sliding guide (9) causes a rotational movement of the diffuser (2) around the fixed point (2b).
10. The dispenser (1) according to any of the preceding claims, where the connection between the valve of the aerosol container (100) and the diffuser (2) is carried out by means of a flexible microtube (10).
11. The dispenser (1) according to claim 10, where the microtube (10) is made of a material with high chemical compatibility.
12. The dispenser (1) according to any of claims 2 to 11, where the operating means (A) which allow operat-

ing the valve are manual operating means.

13. The dispenser (1) according to any of claims 2 to 11, where the operating means (A) are automatic operating means comprising an electric motor (11) that can be connected to a power source, which can operate second gears (12, 13, 14, 15) such that they operate the valve according to a predetermined periodicity, where the motor (11) is intermittently powered by the power source in a periodic manner by means of a temporary power transmission controlling element.
14. The dispenser (1) according to claim 13, where the second gears (12, 13, 14, 15) comprise a first cogwheel (12) moved by the electric motor (11), a second cogwheel (13) connected to the first cogwheel (12), a third cogwheel (14) connected to the second cogwheel (13), a fourth cogwheel (15) connected to the third cogwheel (14), and a pushing cam (16) fixed integrally to the fourth cogwheel (15) such that rotation of said fourth cogwheel (15) in an operating direction causes the pushing cam (16) to operate the valve.
15. The dispenser (1) according to any of the preceding claims, further comprising a casing (17) which can house an aerosol container (100), the operating means (A) which allow operating the valve, and the mechanical means (B) for converting movement of the operating means (A) into a rotational movement of a diffuser (2).
16. An aerosol dispensing method which comprises using a multidirectional aerosol dispenser according to any of claims 1 to 15, comprising the following phases:
- activating the operating means (A) causing the operation of the valve of the container
 - converting by mechanical means (B) the movement produced by the operating means (A) into a rotational movement of a diffuser to which the valve of the aerosol container is connected.
17. The aerosol dispensing method according to claim 16, **characterized in that** when the push element (20) and the protuberance (4) move as a result of the movement of the operating means (A), the protuberance (4) operates the mechanical means (B) for converting movement of the operating means (A) into a rotational movement of a diffuser (2).
18. The aerosol dispensing method according to claims 16 and 17, **characterized in that** the protuberance (4) is integral with the push element (20) or with the pushing cam (16) operating the ratchet wheel (3) connected to gears (5, 6, 7) which move, through

the cam (8), the sliding guide (9) on which the diffuser is coupled in an articulated manner.

19. The method according to any of claims 16 to 18, which comprises sequentially operating the valve and the ratchet mechanism.
20. The method according to claim 19, comprising:
- the operating means (A) moving the push element (20) against the action of the elastic means of the valve,
 - after exceeding the open position of the valve and when the operating means (A) no longer act on the push element (20), the valve returns to the closed position due to the recovery of the elastic means, allowing the protuberance (4) to engage the tooth of the ratchet wheel (3).
21. The method according to claim 19, comprising:
- the operating means (A) moving the push element (20) against the action of the elastic means of the valve,
 - before reaching the open position of the valve, allowing the protuberance (4) to engage the tooth of the ratchet wheel (3).

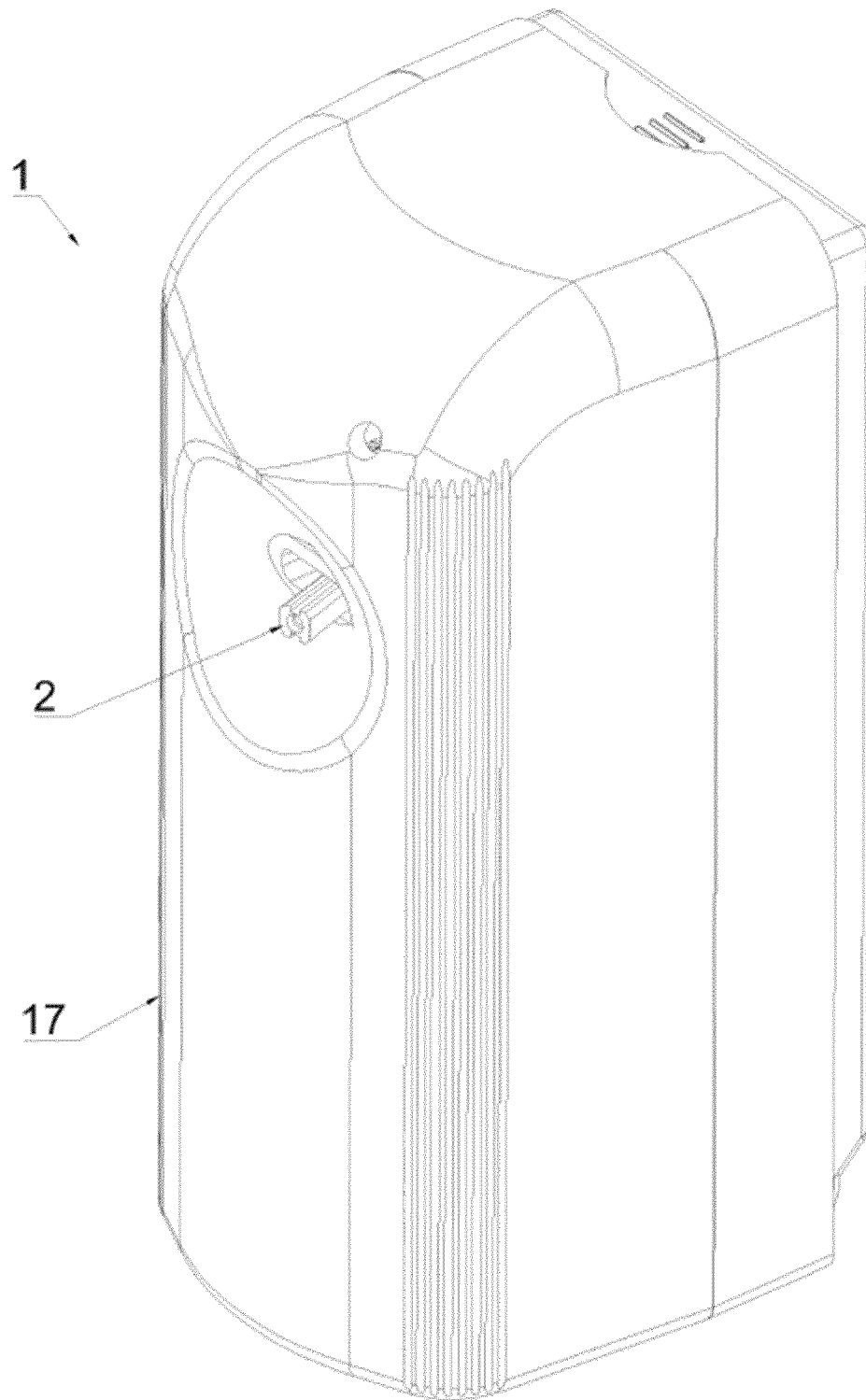


FIG. 1a

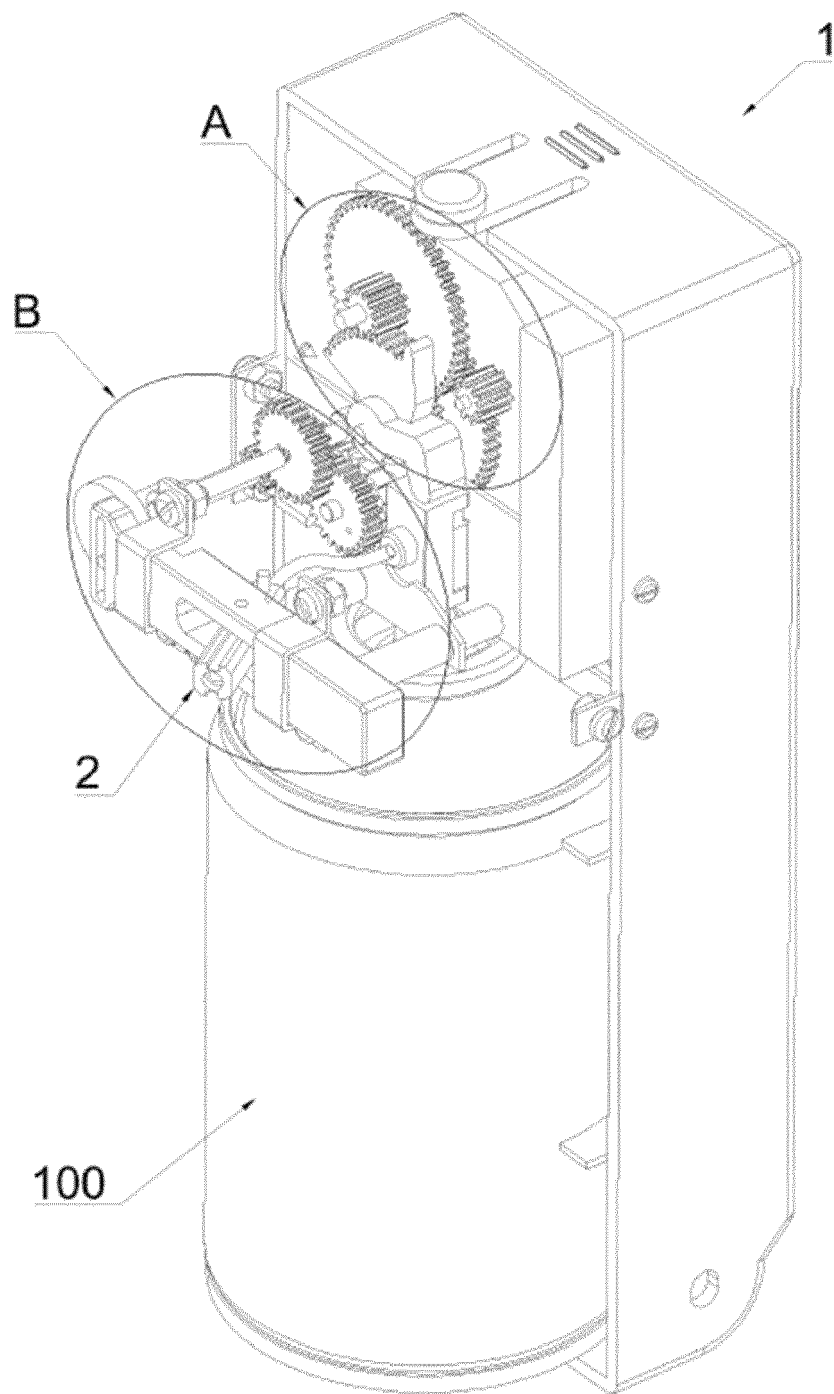


FIG. 1b

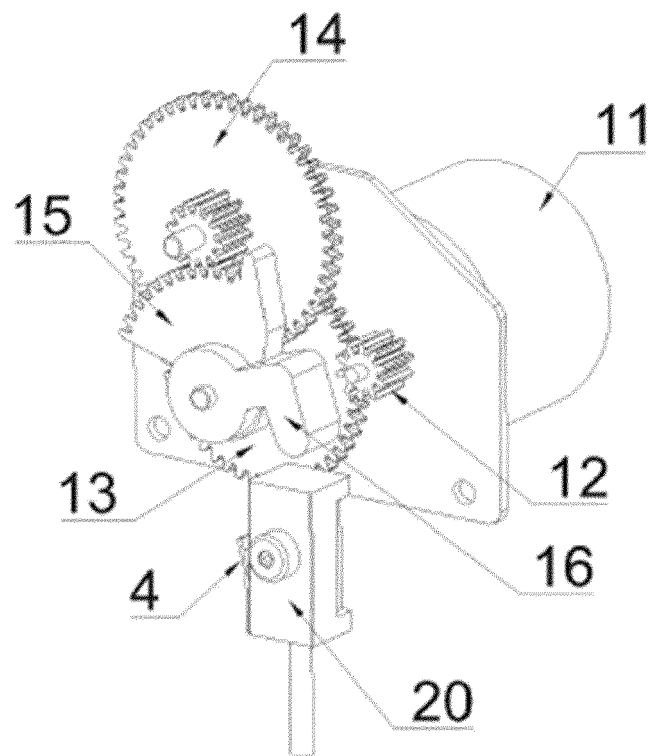


FIG. 2a

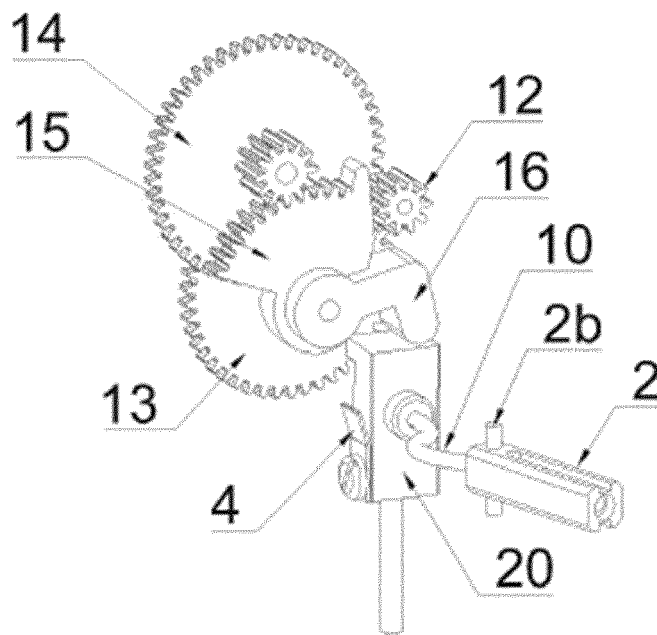


FIG. 2b

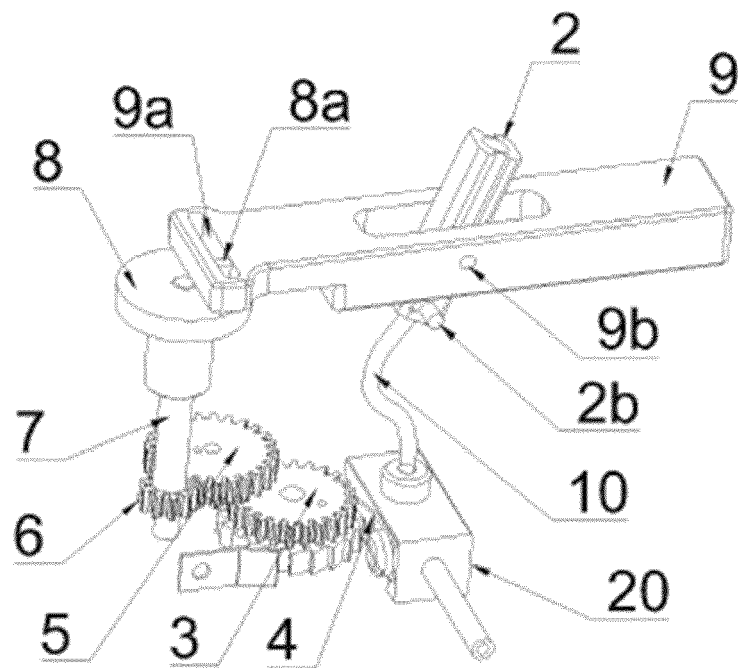


FIG. 3a

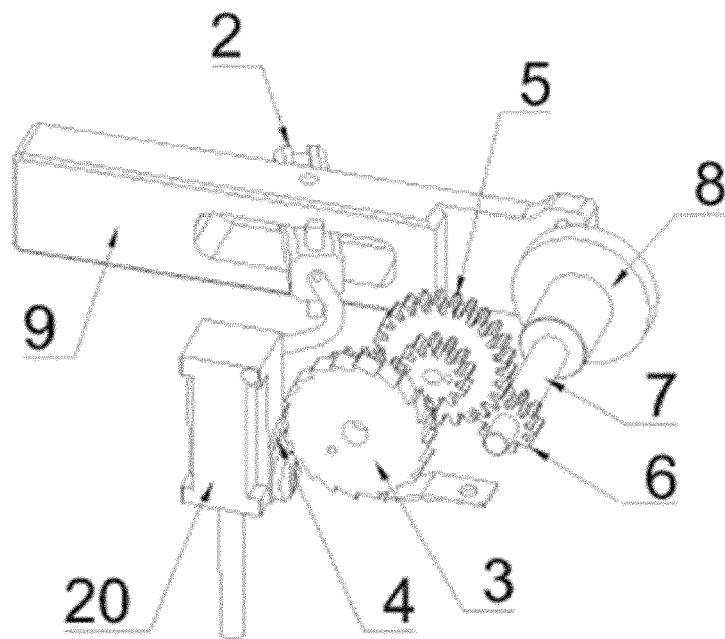


FIG. 3b

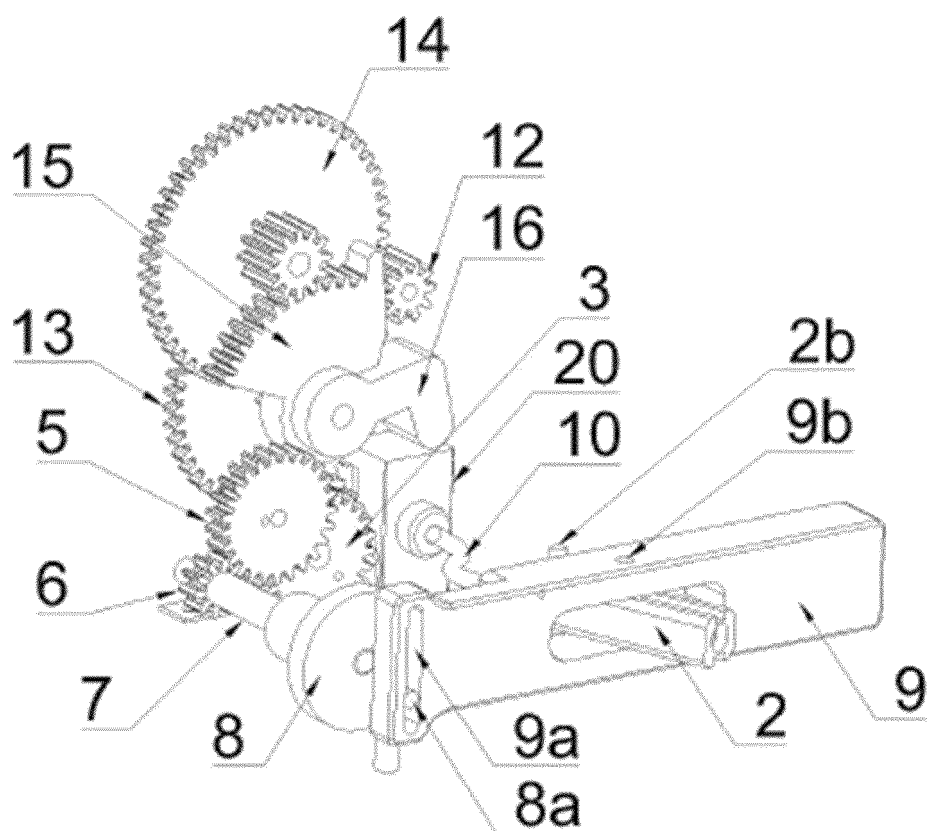


FIG. 4a

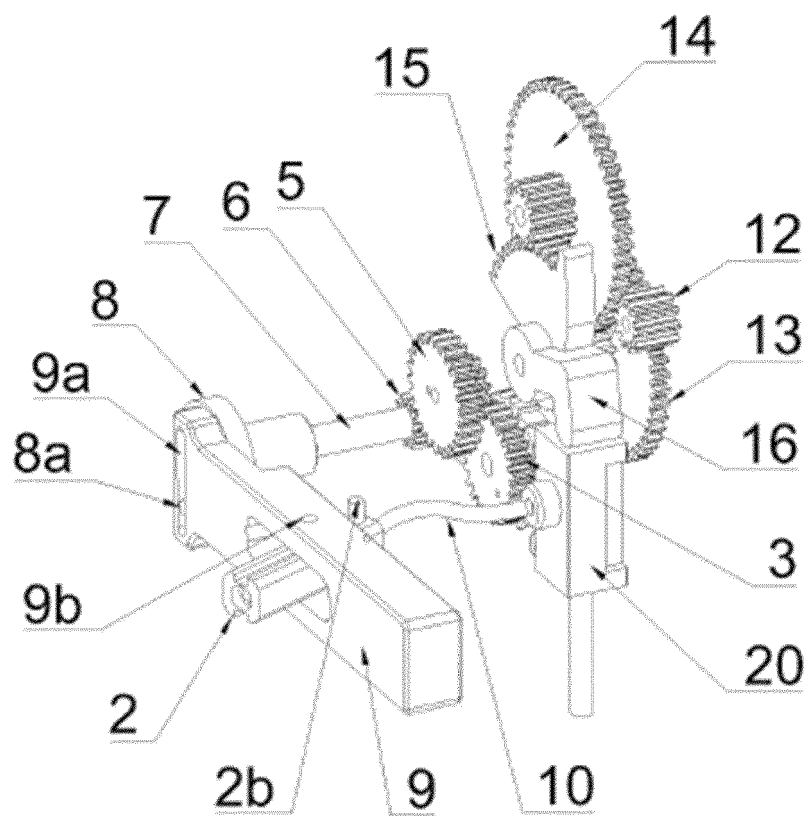


FIG. 4b

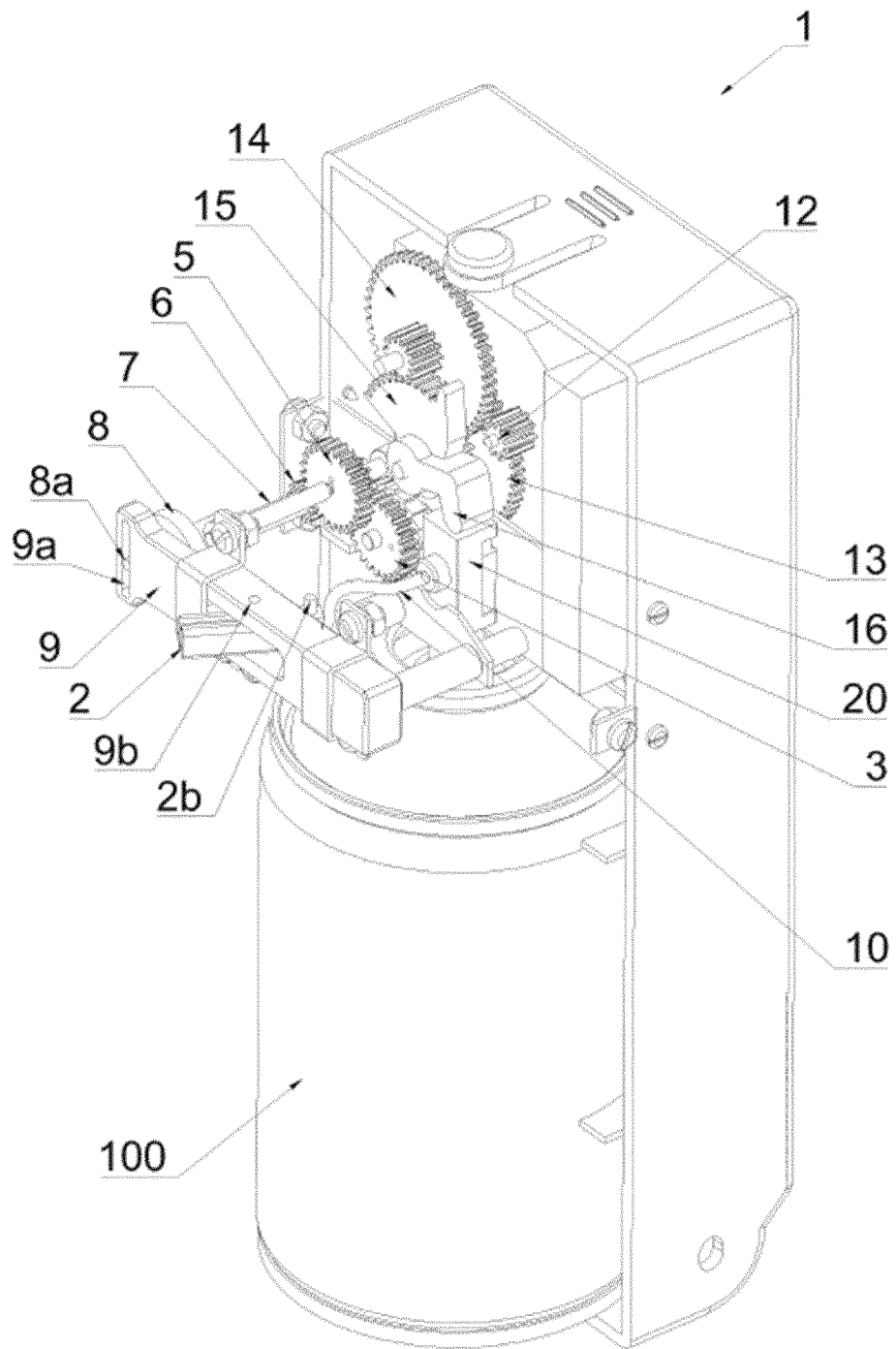


FIG. 5a

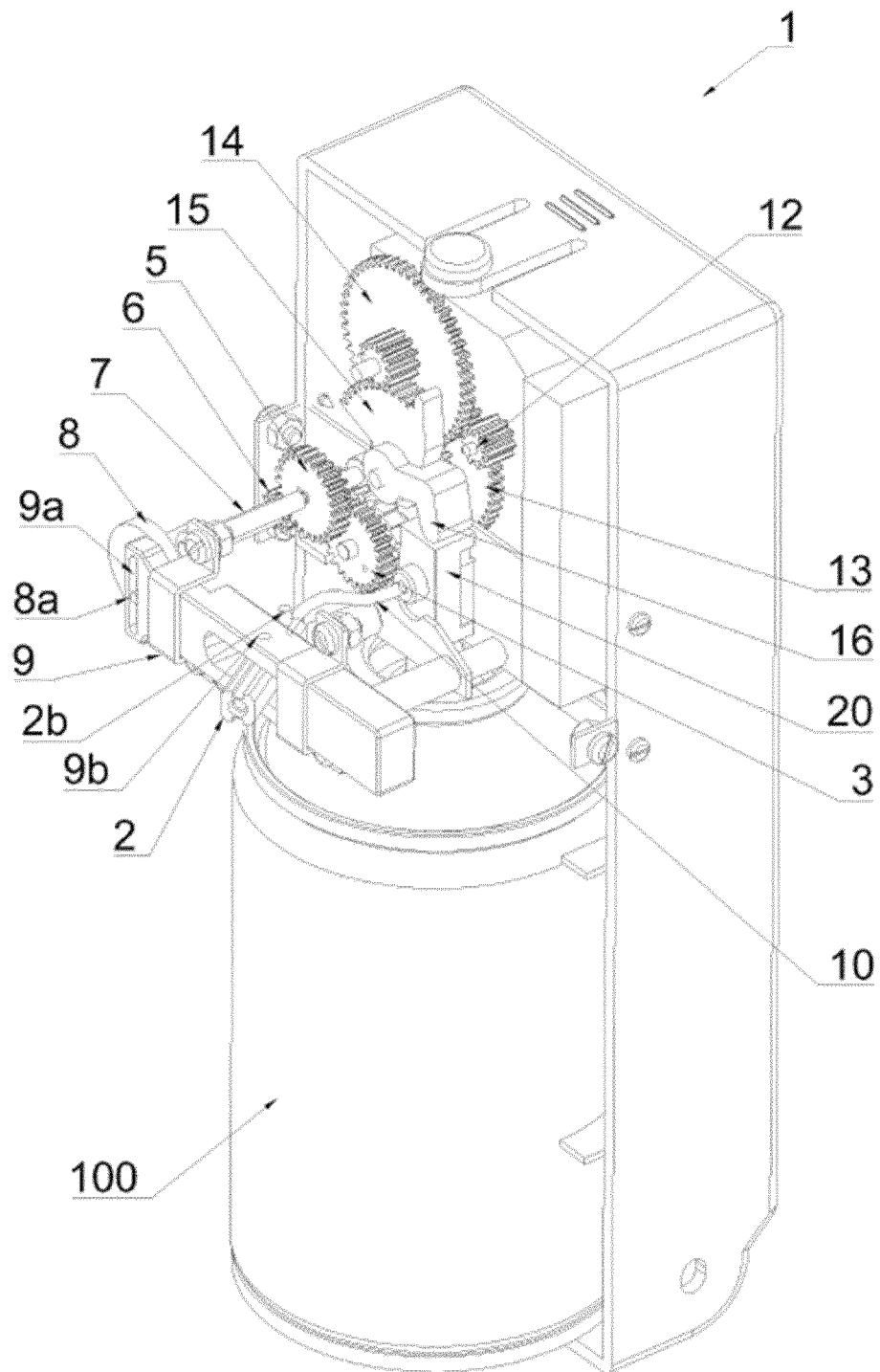


FIG. 5b



EUROPEAN SEARCH REPORT

Application Number
EP 15 16 3150

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 3 165 238 A (WILEY GASTON G) 12 January 1965 (1965-01-12) * the whole document *	1,13-16	INV. B65D83/26 B05B15/06 B05B3/14 B65D83/38
X	CA 1 028 665 A (JOHNSON & SON INC S C) 28 March 1978 (1978-03-28) * the whole document *	1,12,16	
X	US 6 036 108 A (CHEN CHENG-CHANG [TW]) 14 March 2000 (2000-03-14) * column 2, line 63 - column 3, line 6; figures 1,6 *	1,13-16	
A,D	WO 2010/069529 A1 (ZYXTUDIO DISEÑO E INNOVACION S [ES]; VICENTE BLASCO FEO [ES]) 24 June 2010 (2010-06-24) * the whole document *	1-16	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D B05B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 1 February 2016	Examiner Gineste, Bertrand
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.02 (P04C01)

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

EP 15 16 3150

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-02-2016

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3165238 A	12-01-1965	CH 1476262 A4 US 3165238 A	15-03-1965 12-01-1965
CA 1028665 A	28-03-1978	CA 1028665 A DE 2607859 A1 DE 7605787 U1 US 4068782 A	28-03-1978 28-04-1977 09-10-1980 17-01-1978
US 6036108 A	14-03-2000	NONE	
WO 2010069529 A1	24-06-2010	CN 102264480 A ES 1070039 U WO 2010069529 A1	30-11-2011 04-06-2009 24-06-2010

15

20

25

30

35

40

45

50

55

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- ES 1070039 U [0008] [0010]