(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 993 145 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
13.09.2017 Bulletin 2017/37

(21) Application number: **15163150.4**

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

(51) Int Cl.:
B65D 83/26 *(2006.01)* ***B05B 15/06*** *(2006.01)*
B05B 3/14 *(2006.01)* ***B65D 83/38*** *(2006.01)*
B05B 13/04 *(2006.01)*

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

MULTIDIREKTIONALER AEROSOLSPENDER ZUR VERWENDUNG MIT AEROSOLBEHÄLTERN UND ABGABEVERFAHREN

DISTRIBUTEUR D'AÉROSOL MULTIDIRECTIONNEL DESTINÉ À ÊTRE UTILISÉ AVEC DES RÉCIPIENTS AÉROSOL ET PROCÉDÉ DE DISTRIBUTION

(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

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

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

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(56) References cited:
WO-A1-2010/069529
CA-A- 1 028 665
US-A- 3 165 238
US-A- 6 036 108

EP 2 993 145 B1

Printed by Jouve, 75001 PARIS (FR)

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 which discloses a mutlidirectional aerosol dispenser according to the preamble of claim 1, 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 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.

[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 connection 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 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.

[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) comprising a diffuser (2), for use with an aerosol container (100), the aerosol container (100) having a first longitudinal axis of symmetry, and 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, wherein the dispenser (1) comprises operating means (A) which allow operating the valve of the aerosol container (100),
characterized in that
the dispenser (1) comprises mechanical means (B) for converting movement of the operating means (A) into a rotational movement of the diffuser (2) around a second longitudinal axis, said second longitudinal axis being parallel to the first longitudinal axis of symmetry, and said diffuser (2) 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 operating 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 when the multidirectional aerosol dispenser used is dependent on claim 3, **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 claim 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 17 or 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).

Patentansprüche

1. Multidirektionaler Aerosolspender (1) umfassend einen Diffusor (2), zur Verwendung mit einem Aerosolbehälter (100), wobei der Aerosolbehälter (100) eine erste longitudinale Symmetrieachse aufweist, und ein Ventil umfasst, das wiederum elastische Mittel umfasst, die das Ventil in einer geschlossenen Position halten, in der es keinen Durchlass von dem Produkt ermöglicht, das in dem Behälter enthalten ist, wobei das Ventil in der Lage ist, in einer geöffneten Position zu sein, in der es notwendig ist, von außen gegen die elastischen Mittel tätig zu sein und in der es Durchlass von dem Produkt ermöglicht,
wobei der Spender (1) Betriebsmittel (A) umfasst, die ein Betreiben von dem Ventil des Aerosolbehälters (100) ermöglichen,
dadurch gekennzeichnet, dass
der Spender (1) mechanische Mittel (B) umfasst, zum Umwandeln einer Bewegung von den Betriebsmitteln (A) in eine Rotationsbewegung des Diffusors

(2) um eine zweite longitudinale Achse, wobei die zweite longitudinale Achse parallel zu der ersten longitudinalen Symmetrieachse ist, und
der Diffusor (2) mit dem Ventil verbunden sein kann, um eine Produktanwendung in unterschiedliche Richtungen zu richten.

2. Spender (1) nach Anspruch 1, bei dem die mechanischen Mittel (B) zum Umwandeln der Bewegung von den Betriebsmitteln (A) in Rotationsbewegung des Diffusors (2) umfassen:

- erste Getriebe (5, 6, 7), die funktionsfähig mit den Betriebsmitteln (A) verbunden sind, so dass Bewegung der Betriebsmittel (A) eine Rotation der ersten Getriebe (5, 6, 7) erzeugt;
- ein Nocken (8), der durch die ersten Getriebe (5, 6, 7) betrieben wird; und
- eine Gleitführung (9), die durch den Nocken (8) betrieben wird, wobei die Gleitführung (9) mit dem Diffusor (2) verbunden ist, zum Erzeugen der Rotationsbewegung.

3. Spender (1) nach Anspruch 2, umfassend ein Schiebelement (20), das durch die Betriebsmittel (A) betrieben werden kann, die mit dem Ventil verbunden sein können, wobei die Verbindung zwischen den Betriebsmitteln (A) und den ersten Getrieben (5, 6, 7) durch einen Ratschenmechanismus ausgeführt wird, der ein Sperrrad (3) und einen Höcker (4) umfasst, der integral mit dem Schiebelement (20) ist, so dass wenn sich das Schiebelement (20) und der Höcker (4) als ein Ergebnis der Bewegung der Betriebsmittel (A) bewegen, der Höcker (4) mit einem Zahn des Sperrrades (3) zusammenwirkt und das Rad ein Teilungsabstand rotiert.

4. Spender (1) nach Anspruch 2, bei dem die Verbindung zwischen den Betriebsmitteln (A) und den ersten Getrieben (5, 6, 7) durch einen Ratschenmechanismus ausgeführt wird, der ein Sperrrad (3) und einen Höcker (4) umfasst, der integral mit einem Schiebenocken (16) ist, der von den Betriebsmitteln (A) umfasst ist, so dass wenn sich der Höcker (4) als ein Ergebnis der Bewegung des Schiebenockens (16) bewegt, er mit einem Zahn des Sperrrades (3) zusammenwirkt und das Rad ein Teilungsabstand rotiert.

5. Spender (1) nach einem der Ansprüche 3 oder 4, wobei die ersten Getriebe (5, 6, 7) ein erstes Zahnrad (5), das mit dem Sperrrad (3) verbunden ist, ein zweites Zahnrad (6), das mit dem ersten Zahnrad (5) verbunden ist, und eine Welle (7) von dem zweiten Zahnrad (6), das der Nocken (8) rotiert, umfasst.

6. Spender (1) nach einem der Ansprüche 3 - 5, wobei das Sperrrad (3) und die ersten Getriebe (5, 6, 7) konfiguriert sind, so dass jede Bewegung von dem Höcker (4) weniger als eine vollständige Drehung des Nocken (8) bewirkt.

7. Spender (1) nach Anspruch 6, wobei das Sperrrad (3) und die ersten Getriebe (5, 6, 7) konfiguriert sind, so dass jede Bewegung von dem Höcker (4) ungefähr eine Viertel Drehung des Nocken (8) bewirkt.

8. Spender (1) nach einem der Ansprüche 2-7, wobei der Nocken (8) mit der Gleitführung (9) durch einen Excenterbolzen (8a) von dem Nocken (8) verbunden ist, der sich in einer Einkerbung (9a) der Gleitführung (9) bewegen kann.

9. Spender (1) nach einem der Ansprüche 2-8, wobei der Diffusor (2) einen Fixpunkt (2a) aufweist und mit der Gleitführung (9) durch einen Bolzen (9b) verbunden ist, der integral mit der Gleitführung ist und der sich in einer Einkerbung des Diffusors (2) bewegen kann, so dass die lineare Bewegung von dem Bolzen (9b), die durch die Bewegung der Gleitführung (9) verursacht wird, eine Rotationsbewegung von dem Diffusor (2) um den Fixpunkt (2b) erzeugt.

10. Spender (1) nach einem der vorherigen Ansprüche, wobei die Verbindung zwischen dem Ventil von dem Aerosolbehälter (100) und dem Diffusor (2) durch eine flexible Mikroröhre (10) ausgeführt wird.

11. Spender (1) nach Anspruch 10, wobei die Mikroröhre (10) aus einem Material mit hoher chemischer Kompatibilität hergestellt ist.

12. Spender (1) nach einem der Ansprüche 2 - 11, wobei die Betriebsmittel (A), die ein Betreiben des Ventils ermöglichen, manuelle Betriebsmittel sind.

13. Spender (1) nach einem der Ansprüche 2 - 11, wobei die Betriebsmittel (A) automatische Betriebsmittel sind, die einen elektrischen Motor (11) umfassen, der mit einer Stromquelle verbunden sein kann, und die zweite Getriebe (12, 13, 14, 15) betreiben können, so dass sie das Ventil nach einer bestimmten Periodizität betreiben, wobei der Motor (11) intermittierend, periodisch durch die Stromquelle angetrieben wird, durch ein temporäres Stromübertragungssteuerungselement.

14. Spender (1) nach Anspruch 13, wobei die zweiten Getriebe (12, 13, 14, 15) ein erstes Zahnrad (12), das durch den elektrischen Motor (11) bewegt wird, ein zweites Zahnrad (13), das mit dem ersten Zahnrad (12) verbunden ist, ein drittes Zahnrad (14), das mit dem zweiten Zahnrad (13) verbunden ist, ein viertes Zahnrad (15), das mit dem dritten Zahnrad (14) verbunden ist, und ein Schiebenocken (16) umfasst, der integral mit dem vierten Zahnrad (15) be-

festigt ist, so dass eine Rotation des vierten Zahnrades (15) in eine Betriebsrichtung bewirkt, dass der Schiebenocken (16) das Ventil betreibt.

15. Spender (1) nach einem der vorherigen Ansprüche, weiterhin umfassend ein Gehäuse (17), das einen Aerosolbehälter (100) unterbringen kann, die Betriebsmittel (A), die ein Betreiben des Ventils ermöglichen, und die mechanischen Mittel (B) zum Umwandeln einer Bewegung der Betriebsmittel (A) in eine Rotationsbewegung von einem Diffusor (2).

16. Aerosoldosierverfahren, das ein Verwenden eines multidirektionalen Aerosolspenders nach einem der Ansprüche 1 bis 15 umfasst, umfassend die folgenden Phasen:

- Aktivieren der Betriebsmittel (A), wodurch der Betrieb des Ventils von dem Behälter erzeugt wird
- Umwandeln durch mechanische Mittel (B) der Bewegung, die durch die Betriebsmittel (A) produziert wird, in eine Rotationsbewegung des Diffusors, mit dem das Ventil von dem Aerosolbehälter verbunden ist.

17. Aerosoldosierverfahren nach Anspruch 16, wenn der verwendete multidirektionale Aerosolspender von Anspruch 3 abhängig ist,
dadurch gekennzeichnet, dass wenn sich das Schiebeelement (20) und der Höcker (4) als ein Ergebnis der Bewegung der Betriebsmittel (A) bewegen, der Höcker (4) die mechanischen Mittel (B) zum Umwandeln von Bewegung der Betriebsmittel (A) in eine Rotationsbewegung von dem Diffusor (2) betreibt.

18. Aerosoldosierverfahren nach Anspruch 17, **dadurch gekennzeichnet, dass** der Höcker (4) integral mit dem Schiebeelement (20) oder mit dem Schiebenocken (16) ist, die das Sperrrad (3) betreiben, das mit Getrieben (5, 6, 7) verbunden ist, die durch den Nocken (8) die Gleitführung (9) an der der Diffusor in einer artikulierenden Art gekoppelt ist, bewegt.

19. Verfahren nach einem der Ansprüche 17 oder 18, das ein sequentielles Betreiben des Ventils und des Ratschenmechanismus umfasst.

20. Verfahren nach Anspruch 19, umfassend:

- dass die Betriebsmittel (A) das Schiebeelement (20) gegen die Maßnahme des elastischen Mittels des Ventils bewegen,
- dass nach Überschreiten der geöffneten Position des Ventils und wenn die Betriebsmittel (A) nicht mehr auf das Schiebeelement (20) wirken, das Ventil aufgrund der Erholung der elastischen Mittel in die geschlossene Position zurückkehrt, und dem Höcker (4) ermöglicht, mit dem Zahn des Sperrrades (3) zusammenzuwirken.

21. Verfahren nach Anspruch 19, umfassend:

- dass die Betriebsmittel (A) das Schiebeelement (20) gegen die Maßnahme des elastischen Mittels des Ventils bewegen,
- dass vor Erreichen der geöffneten Position des Ventils, dem Höcker (4) ermöglicht wird, mit dem Zahn von dem Sperrrad (3) zusammenzuwirken.

Revendications

1. Distributeur d'aérosol multidirectionnel (1) comprenant un diffuseur (2), pour une utilisation avec un récipient d'aérosol (100),
le récipient d'aérosol (100) ayant un premier axe de symétrie longitudinal,
et comprenant une soupape comprenant à son tour des moyens élastiques qui tendent à maintenir la soupape dans une position fermée dans laquelle elle ne permet pas le passage du produit contenu dans le récipient, la soupape pouvant être dans une position ouverte, dans laquelle il est nécessaire d'agir extérieurement contre lesdits moyens élastiques et qui permet le passage dudit produit,
dans lequel le distributeur (1) comprend des moyens d'actionnement (A) qui permettent d'actionner la soupape du récipient d'aérosol (100),
caractérisé en ce que
le distributeur (1) comprend des moyens mécaniques (B) pour convertir un mouvement des moyens d'actionnement (A) en un mouvement de rotation du diffuseur (2) autour d'un second axe longitudinal, ledit second axe longitudinal étant parallèle au premier axe de symétrie longitudinal, et
ledit diffuseur (2) peut être relié à la soupape pour diriger une application de produit dans différentes directions.

2. Distributeur (1) selon la revendication 1, dans lequel les moyens mécaniques (B) pour convertir le mouvement des moyens d'actionnement (A) en mouvement de rotation du diffuseur (2) comprennent:

- des premiers engrenages (5, 6, 7) reliés de manière opérationnelle aux moyens d'actionnement (A) de telle sorte qu'un mouvement desdits moyens d'actionnement (A) entraîne une rotation des premiers engrenages (5, 6, 7),
- une came (8) actionnée par lesdits premiers engrenages (5, 6, 7), et

- un guide coulissant (9) actionné par la came (8), le guide coulissant (9) étant relié au diffuseur (2) pour provoquer ledit mouvement de rotation.

3. Distributeur (1) selon la revendication 2, comprenant un élément de poussée (20) qui peut être actionné par les moyens d'actionnement (A) qui peuvent être couplés à la soupape, dans lequel la liaison entre les moyens d'actionnement (A) et lesdits premiers engrenages (5, 6, 7) est réalisée au moyen d'un mécanisme à cliquet comprenant une roue à rochet (3) et une protubérance (4) solidaire de l'élément de poussée (20), de telle sorte que lorsque l'élément de poussée (20) et la protubérance (4) se déplacent en résultat du mouvement des moyens d'actionnement (A), la protubérance (4) vient en prise avec une dent de la roue à rochet (3) et fait tourner la roue sur une distance de pas.

4. Distributeur (1) selon la revendication 2, dans lequel la liaison entre les moyens d'actionnement (A) et lesdits premiers engrenages (5, 6, 7) est réalisée au moyen d'un mécanisme à cliquet comprenant une roue à rochet (3) et une protubérance (4) solidaire d'une came de poussée (16) formée par lesdits moyens d'actionnement (A), de telle sorte que lorsque la protubérance (4) se déplace en fonction du mouvement de la came de poussée (16) des moyens d'actionnement (A), elle vient en prise avec une dent de la roue à rochet (3) et fait tourner la roue sur une distance de pas.

5. Distributeur (1) selon l'une quelconque des revendications 3 et 4, dans lequel les premiers engrenages (5, 6, 7) comprennent une première roue dentée (5) reliée à la roue à rochet (3), une seconde roue dentée (6) reliée à la première roue dentée (5), et un arbre (7) de la seconde roue dentée (6) qui fait tourner la came (8).

6. Distributeur (1) selon l'une quelconque des revendications 3 à 5, dans lequel la roue à rochet (3) et les premiers engrenages (5, 6, 7) sont configurés de telle sorte que chaque mouvement de la protubérance (4) entraîne moins d'un tour complet de la came (8).

7. Distributeur (1) selon la revendication 6, dans lequel la roue à rochet (3) et les premiers engrenages (5, 6, 7) sont configurés de telle sorte que chaque mouvement de la protubérance (4) entraîne environ un quart de tour de la came (8).

8. Distributeur (1) selon l'une quelconque des revendications 2 à 7, dans lequel la came (8) est reliée au guide coulissant (9) au moyen d'une cheville excentrique (8a) de la came (8) qui peut se déplacer dans une rainure (9a) du guide coulissant (9).

9. Distributeur (1) selon l'une quelconque des revendications 2 à 8, dans lequel le diffuseur (2) a un point fixe (2b) et est relié au guide coulissant (9) au moyen d'une goupille (9b) solidaire du guide coulissant qui peut se déplacer dans une rainure du diffuseur (2), de telle sorte que le mouvement linéaire de la goupille (9b) provoqué par le mouvement du guide coulissant (9) entraîne un mouvement de rotation du diffuseur (2) autour du point fixe (2b).

10. Distributeur (1) selon l'une quelconque des revendications précédentes, dans lequel la liaison entre la soupape du récipient d'aérosol (100) et le diffuseur (2) est réalisée au moyen d'un microtube souple (10).

11. Distributeur (1) selon la revendication 10, dans lequel le microtube (10) est constitué d'un matériau ayant une compatibilité chimique élevée.

12. Distributeur (1) selon l'une quelconque des revendications 2 à 11, dans lequel les moyens d'actionnement (A) qui permettent l'actionnement de la soupape sont des moyens d'actionnement manuels.

13. Distributeur (1) selon l'une quelconque des revendications 2 à 11, dans lequel les moyens d'actionnement (A) sont des moyens d'actionnement automatiques comprenant un moteur électrique (11) qui peut être raccordé à une source d'alimentation, qui peut actionner des seconds engrenages (12, 13, 14, 15) de telle sorte qu'ils actionnent la soupape en fonction d'une périodicité prédéterminée, dans lequel le moteur (11) est alimenté par intermittence par la source d'alimentation de manière périodique au moyen d'un élément de commande de transmission de puissance temporaire.

14. Distributeur (1) selon la revendication 13, dans lequel les seconds engrenages (12, 13, 14, 15) comprennent une première roue dentée (12) mise en mouvement par le moteur électrique (11), une deuxième roue dentée (13) reliée à la première roue dentée (12), une troisième roue dentée (14) reliée à la deuxième roue dentée (13), une quatrième roue dentée (15) reliée à la troisième roue dentée (14), et une came de poussée (16) fixée solidaire de la quatrième roue dentée (15) de telle sorte qu'une rotation de ladite quatrième roue dentée (15) dans une direction d'actionnement amène la came de poussée (16) à actionner la soupape.

15. Distributeur (1) selon l'une quelconque des revendications précédentes, comprenant en outre un boîtier (17) qui peut recevoir un récipient d'aérosol (100), les moyens d'actionnement (A) qui permettent l'actionnement de la soupape, et les moyens mécaniques (B) pour convertir le mouvement des moyens

d'actionnement (A) en un mouvement de rotation d'un diffuseur (2).

16. Procédé de distribution d'aérosol qui comprend l'utilisation d'un distributeur d'aérosol multidirectionnel selon l'une quelconque des revendications 1 à 15, comprenant les phases suivantes :

- activer les moyens d'actionnement (A) entraînant l'actionnement de la soupape du récipient,
- convertir, par des moyens mécaniques (B), le mouvement produit par les moyens d'actionnement (A) en un mouvement de rotation d'un diffuseur auquel est reliée la soupape du récipient d'aérosol.

17. Procédé de distribution d'aérosol selon la revendication 16 lorsque le distributeur d'aérosol multidirectionnel utilisé est dépendant de la revendication 3, **caractérisé en ce que** lorsque l'élément de poussée (20) et la protubérance (4) se déplacent en résultat du mouvement des moyens d'actionnement (A), la protubérance (4) actionne les moyens mécaniques (B) pour convertir le mouvement des moyens d'actionnement (A) en un mouvement de rotation d'un diffuseur (2).

18. Procédé de distribution d'aérosol selon la revendication 17, **caractérisé en ce que** la protubérance (4) est solidaire de l'élément de poussée (20) ou de la came de poussée (16) actionnant la roue à rochet (3) reliée à des engrenages (5, 6, 7) qui déplacent, par l'intermédiaire de la came (8), le guide coulissant (9) sur lequel le diffuseur est couplé de manière articulée.

19. Procédé selon l'une quelconque des revendications 17 ou 18, qui comprend l'actionnement séquentiel de la soupape et du mécanisme à cliquet.

20. Procédé selon la revendication 19, comprenant:

- les moyens d'actionnement (A) déplaçant l'élément de poussée (20) à l'encontre de l'action des moyens élastiques de la soupape,
- après avoir dépassé la position ouverte de la soupape et lorsque les moyens d'actionnement (A) n'agissent plus sur l'élément de poussée (20), la soupape retourne à la position fermée en raison de la détente des moyens élastiques, en permettant à la protubérance (4) de venir en prise avec la dent de la roue à rochet (3).

21. Procédé selon la revendication 19, comprenant:

- déplacer l'élément de poussée (20) par l'intermédiaire des moyens d'actionnement (A) à l'encontre de l'action des moyens élastiques de la soupape,
- avant d'atteindre la position ouverte de la soupape, permettre à la protubérance (4) de venir en prise avec la dent de la roue à rochet (3).

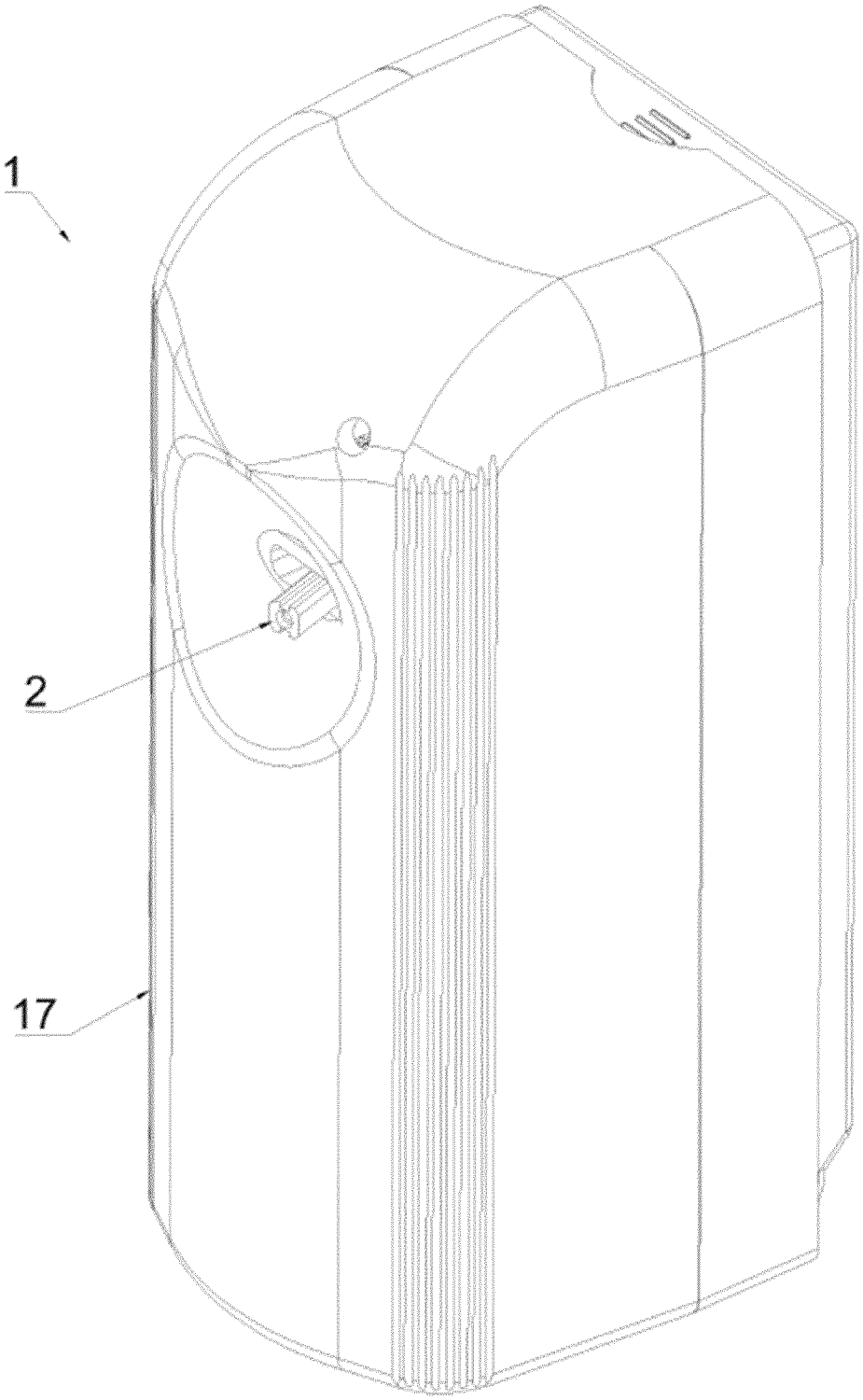

FIG. 1a

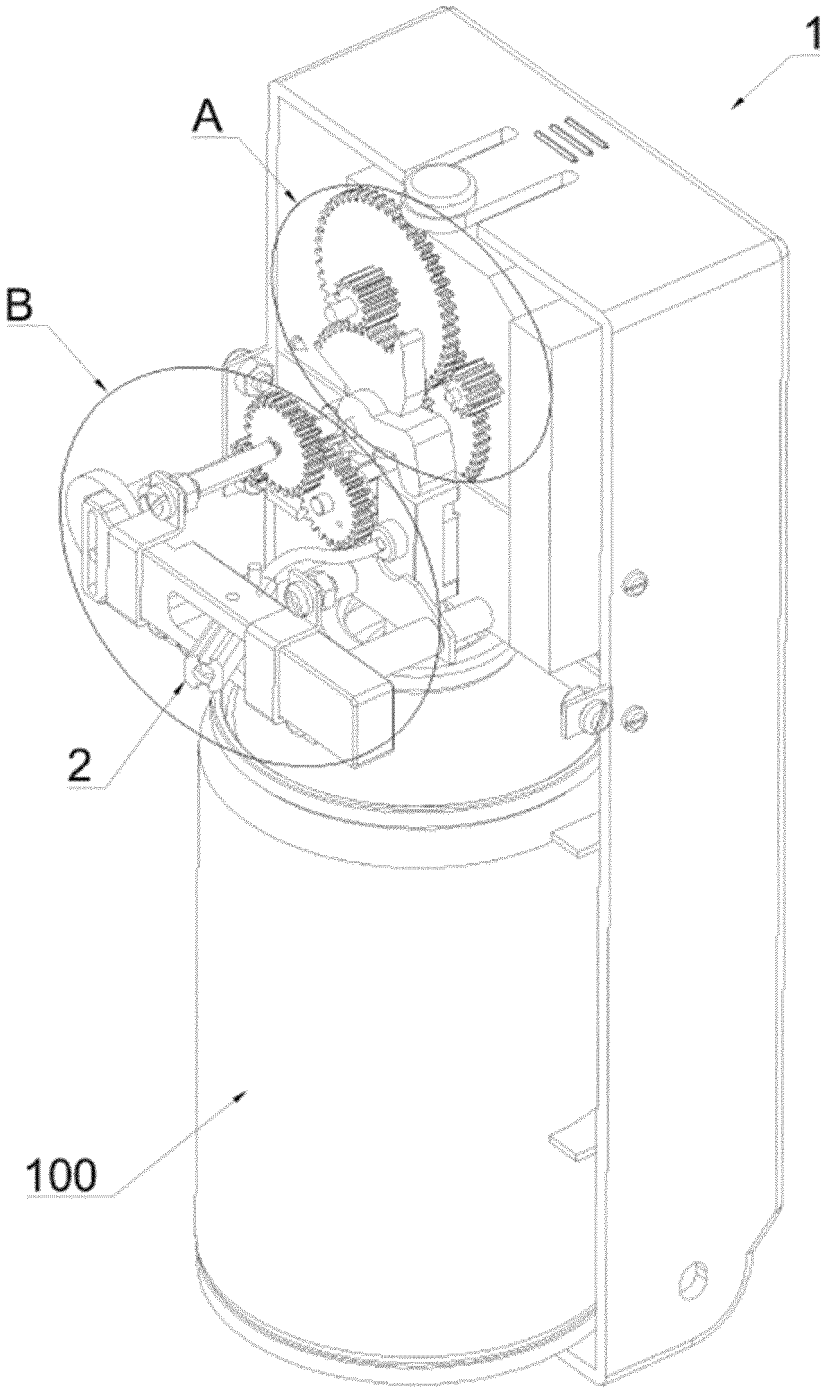

FIG. 1b

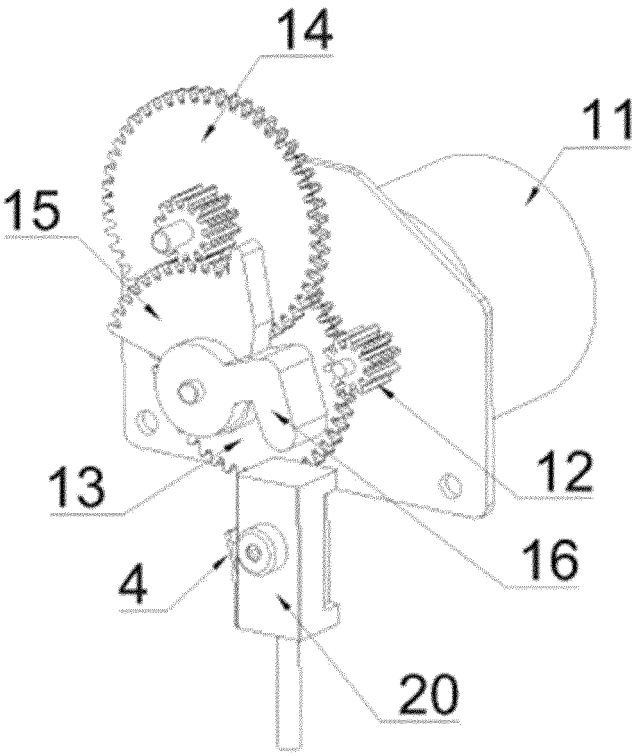

FIG. 2a

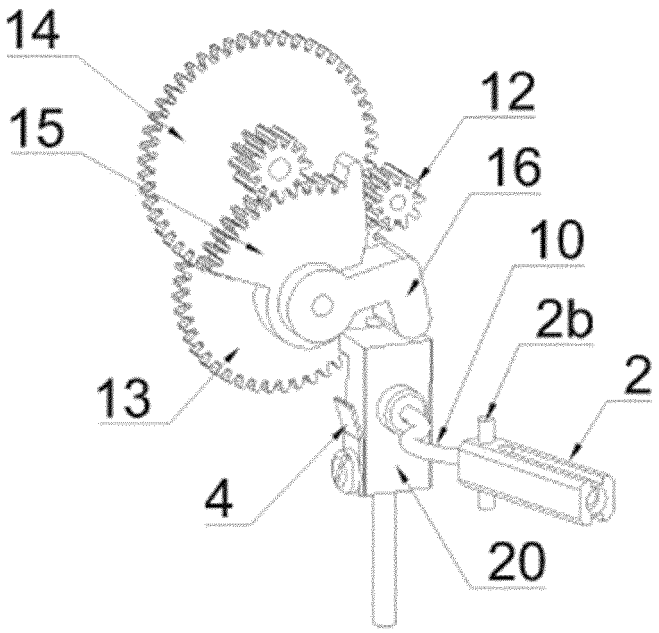

FIG. 2b

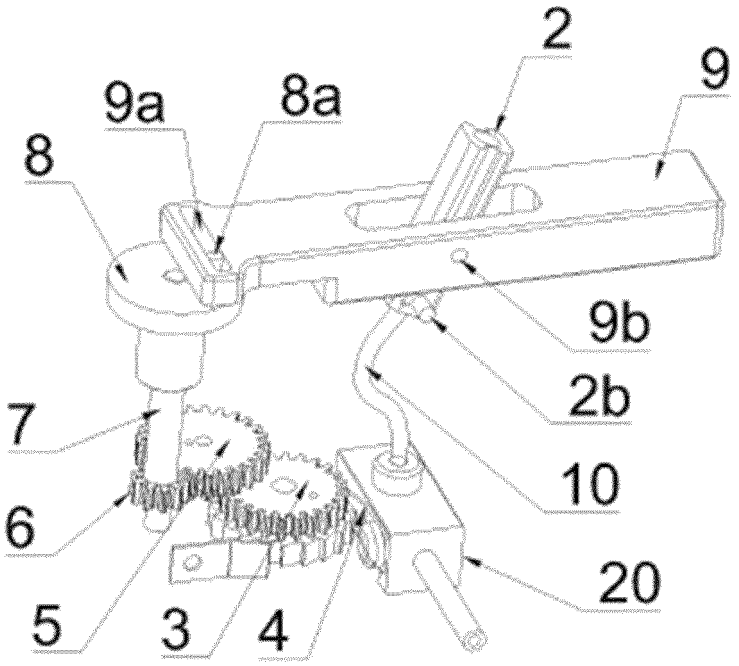

FIG. 3a

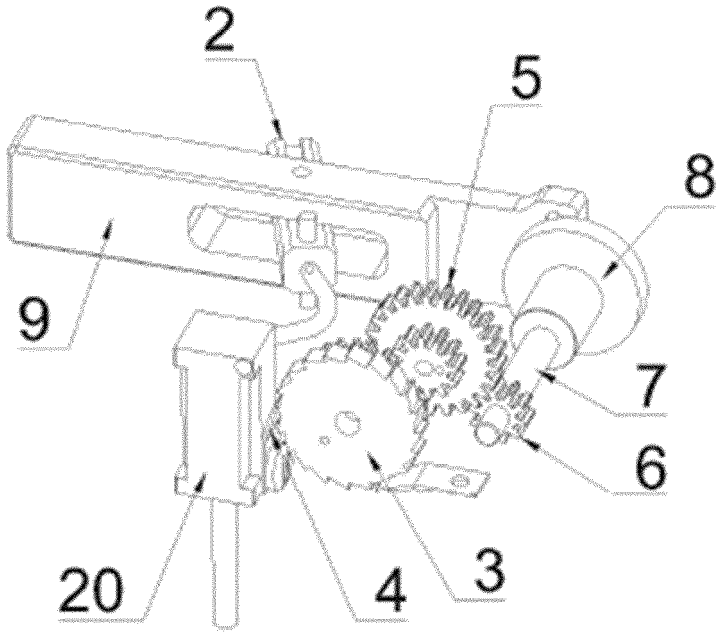

FIG. 3b

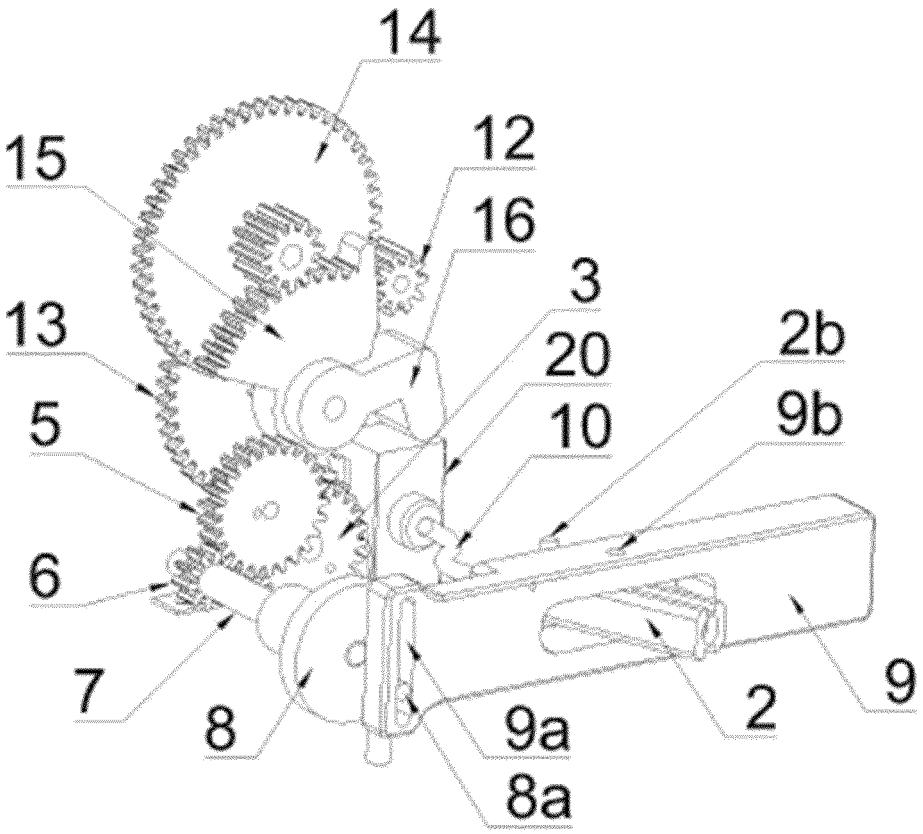

FIG. 4a

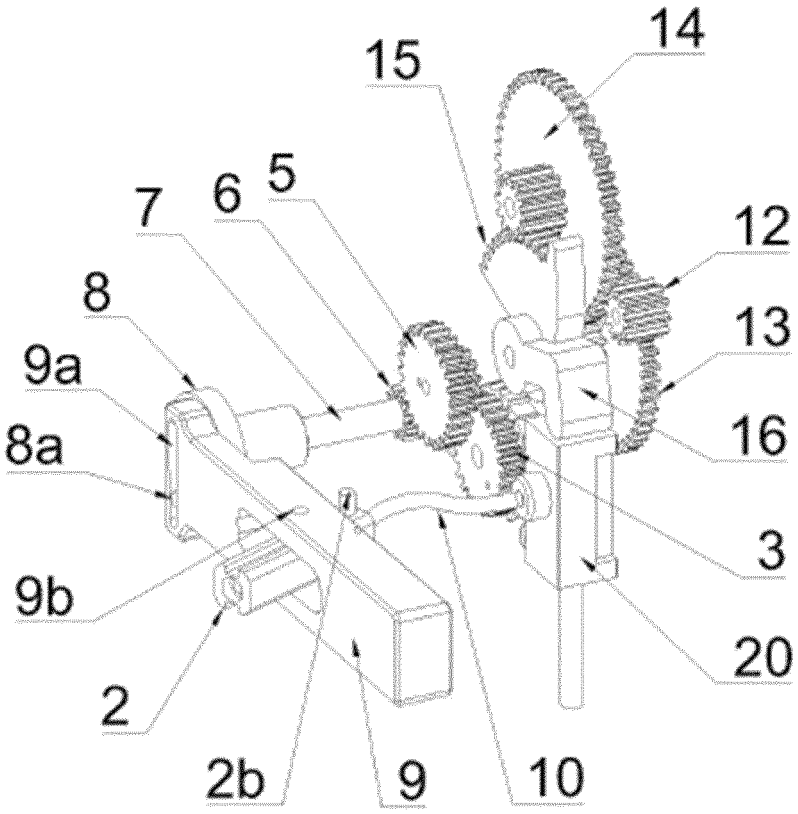

FIG. 4b

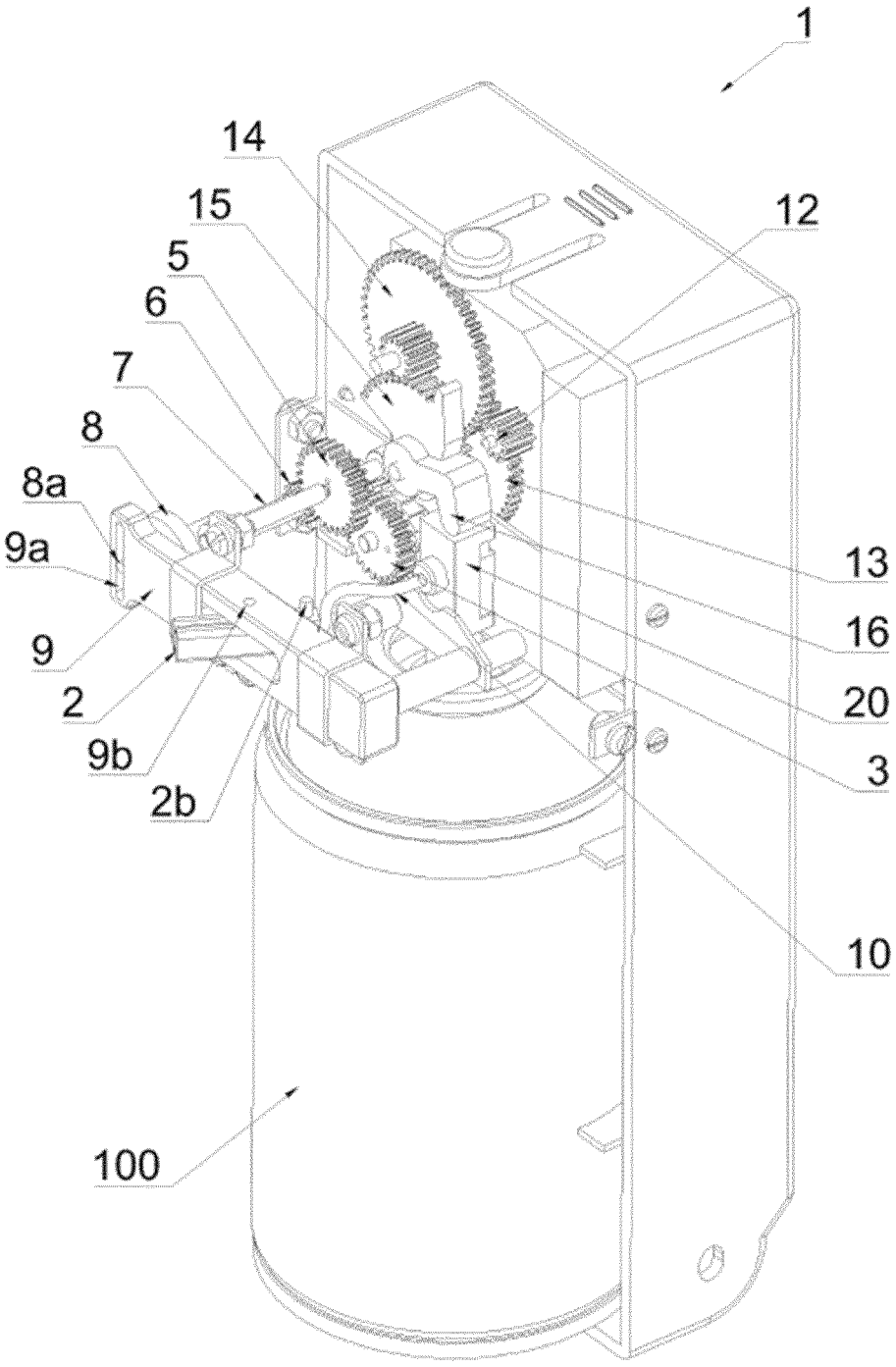

FIG. 5a

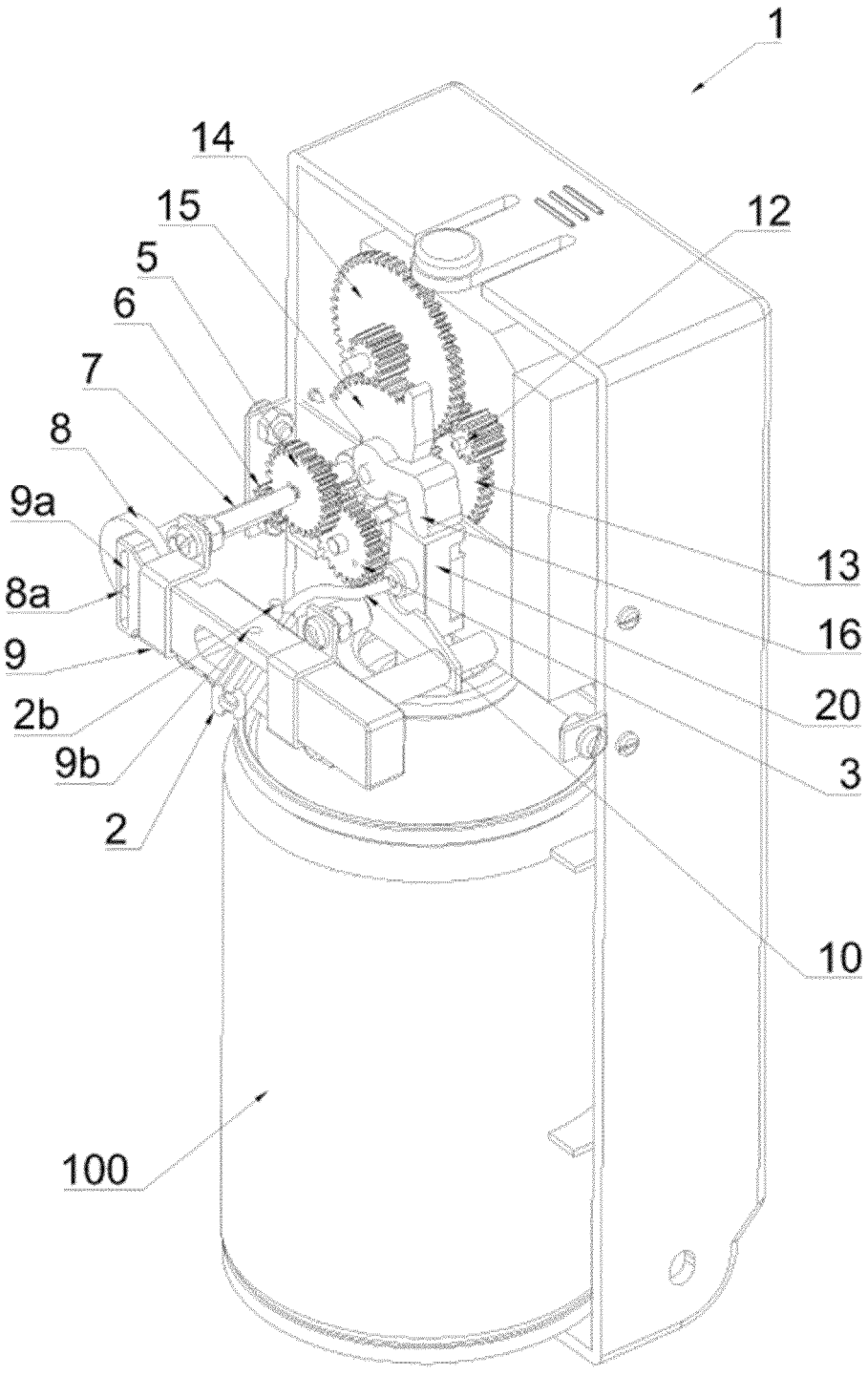

FIG. 5b

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- ES 1070039 U **[0008] [0010]**