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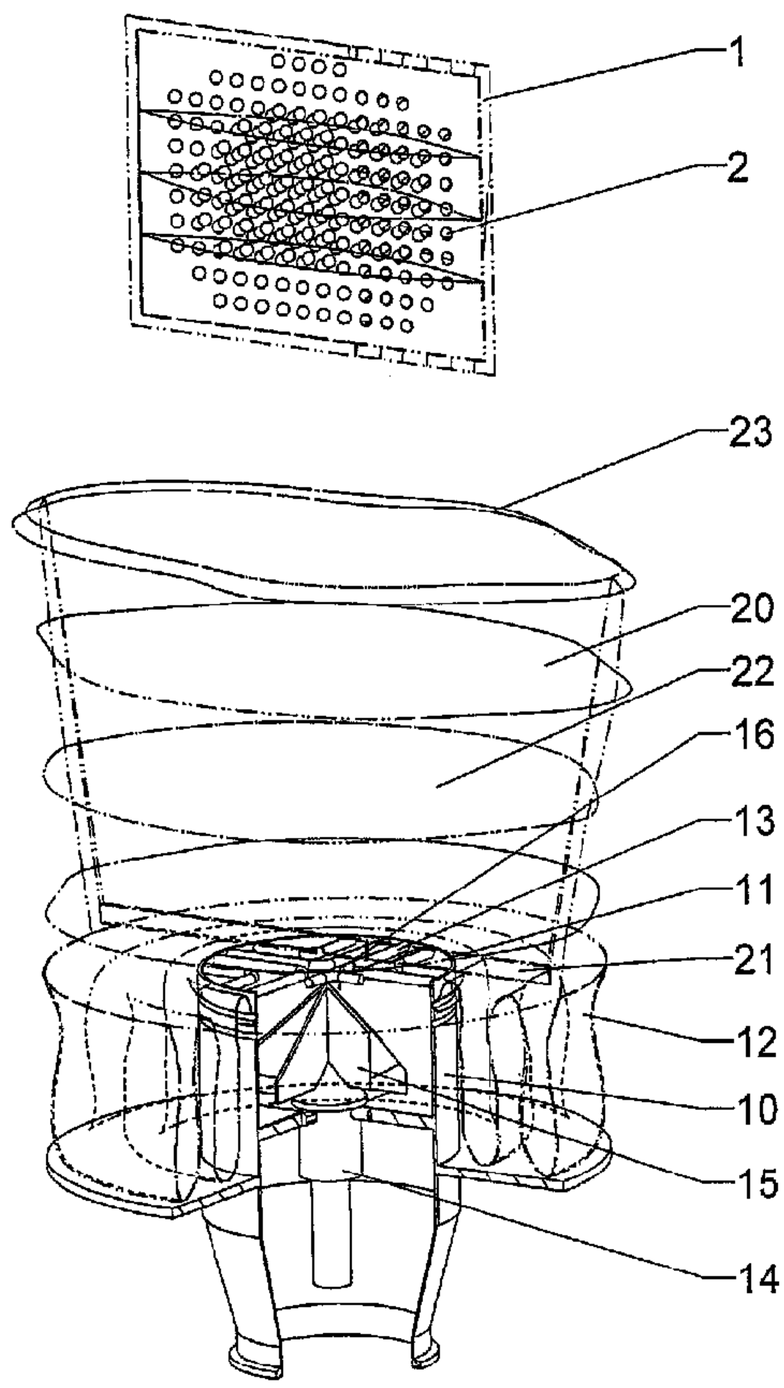
(54) **Titre : PROCEDE ET DISPOSITIF DE VIDAGE SANS CONTAMINATION D'UN EMBALLAGE AU MOINS PARTIELLEMENT FLEXIBLE**

(54) **Title: DISCHARGE METHOD AND DISCHARGE DEVICE FOR DISCHARGING AN AT LEAST PARTIALLY FLEXIBLE CONTAINER WITHOUT CONTAMINATION**



(57) **Abrégé/Abstract:**
The invention relates to a discharge method for discharging an at least partially flexible container without contamination, in which method the container (1) is discharged into a base body (10), a liner (20) that encloses a filling opening (11) of the base body (10)

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(57) **Abrégé(suite)/Abstract(continued):**
being secured to the base body (10). According to the invention, a filling end (21) of the liner (20) is folded inwards such that a receiving region forms for the container (1). The receiving region is sealed in such a manner that a discharge opening formed by means of a knife (15) allows the container (1) to be discharged whilst being completely sealed off to the exterior.

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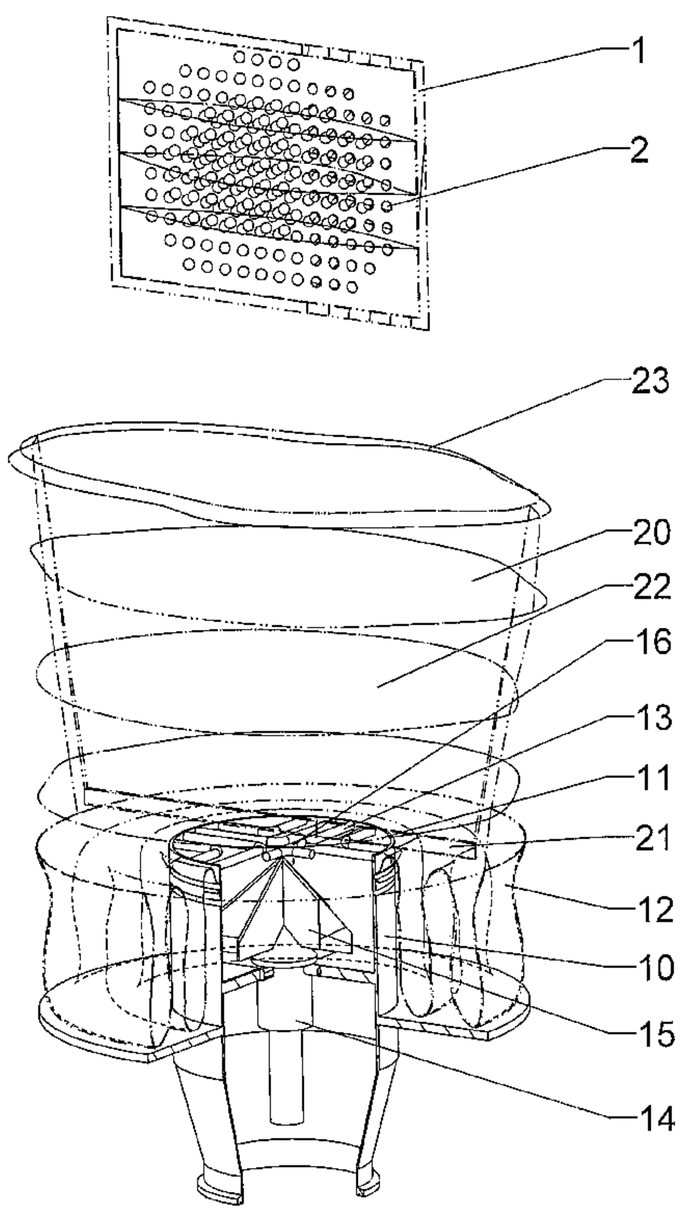
(54) Title: DISCHARGE METHOD AND DISCHARGE DEVICE FOR DISCHARGING AN AT LEAST PARTIALLY FLEXIBLE CONTAINER WITHOUT CONTAMINATION

(54) Bezeichnung : ENTLEERVERFAHREN UND ENTLEERVORRICHTUNG FÜR EIN KONTAMINATIONSFREIES ENTLEEREN EINES ZUMINDEST TEILWEISE FLEXIBLEN GEBINDES

Fig. 2



(57) **Abstract**: The invention relates to a discharge method for discharging an at least partially flexible container without contamination, in which method the container (1) is discharged into a base body (10), a liner (20) that encloses a filling opening (11) of the base body (10) being secured to the base body (10). According to the invention, a filling end (21) of the liner (20) is folded inwards such that a receiving region forms for the container (1). The receiving region is sealed in such a manner that a discharge opening formed by means of a knife (15) allows the container (1) to be discharged whilst being completely sealed off to the exterior.

(57) **Zusammenfassung**: Die Erfindung betrifft ein Entleerverfahren für ein kontanimationsfreies Entleeren eines zumindest teilweise flexiblen Gebindes, bei dem das Gebinde (1) in einen Grundkörper (10) entleert wird, wobei ein Liner (20) eine Befüllöffnung (11) des Grundkörpers (10) umschließend an dem Grundkörper (10) befestigt ist. Erfindungsgemäß wird der Liner (20) mit einem Befüllende (21) eingestülpt, sodass ein Aufnahmebereich für das Gebinde (1) entsteht. Der Aufnahmebereich wird derart verschlossen, dass durch eine mittels eines Messers (15) erzeugte Entleeröffnung ein nach außen vollständig abgeschlossenes Entleeren des Gebindes (1) gestattet ist.

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Discharge Method and Discharge Device for Discharging an at Least Partially Flexible Container without Contamination

FIELD

The invention related to a discharge method and a discharge device for discharging an at least partially flexible container without contamination.

BACKGROUND

In the further processing of raw materials that would pose a significant health hazard for those persons working with these substances in the event of direct contact therewith, care must be taken to ensure increased cleanliness and absolutely contamination-free work in many industries, for example in the pharmaceutical or chemical industry. Even in the case of lower requirements in terms of freedom from contamination, considerable effort has thus far been invested in making the discharging of at least partially flexible containers into a production unit or an additional flexible container possible. In most cases, known insulators are used at appropriate interfaces.

Known methods or devices are disclosed for example in DE 10 2009 017 545 A1 or DE 10 2006 057 760 B3.

In the case of the device known from DE 10 2006 057 760 B3, a liner that encloses a filling opening of a base body is attached to the base body.

This manner of attachment does not solve the problem of the docking of sealed, at least partially flexible containers however.

SUMMARY

An object of the invention is therefore to provide a cost-effective, easy to handle and absolutely clean method and a device for implementing the method for the environmentally sealed connection of at least partially flexible containers to a processing system, in particular without contamination.

In some embodiments, the invention makes it possible to establish an environmentally-sealed connection, also referred to as a contamination-free docking, of an at least partially flexible container to a processing system, which has a filling opening in a base body. The use of an insulator is not necessary. In some embodiments, the invention makes it possible to dock any containers, which have at least one flexible region, which region can be cut, for example by a blade, for example a metal container having a film bottom that is heat-sealed on.

Pursuant to the method according to some embodiments of the invention, the flexible region of the container is oriented facing the filling opening. If the container is completely flexible, such as a bag, the method does not depend on a particular orientation.

In some embodiments, the method according to the invention makes it possible for the container to be contained in a liner.

A person skilled in the art understands the term 'liner' to refer to a kind of tube or tubular film. The liner is provided as a continuous liner in a liner cassette for example. The liner is folded together in the liner cassette in a space-saving manner. In the case of known filling openings, the line cassette is attached to the base body such that it encloses the filling opening.

The method comprises the following process steps:

The liner may be drawn out of the liner cassette at a specific starting length at a filling end sealed over the filling opening before the method begins. The liner is then folded inward, in particular the filling end thereof. Thus the liner still seals the filling opening. A receiving area is created, into which the container may be completely inserted.

The container is inserted into the receiving area, after which an at least double-walled end of the liner mostly extends over the container. If necessary, the liner must be drawn further out of the liner cassette. However it is not necessary for the at least double-walled end to protrude when it is possible to crimp or heat seal the at least double-walled end together with the container.

The liner is subsequently sealed so that the receiving area is sealed.

The liner is subsequently opened, in particular cut open, on the side facing the filling opening, especially preferably at the filling end thereof, which is folded inward. At the same time, the container is cut open so that a largely corresponding

discharge opening of the container as well as of the liner lie one on top of the other. A bag opening that allows the contents of the container to pass through is thereby created between the container and the filling opening. The receiving area, which is open to the filling opening, thereby remains closed to the exterior.

Finally, the container is discharged.

In an advantageous embodiment of the method according to the invention, after the cutting open of the liner and of the container, the liner is withdrawn from the filling opening, bringing the container with it. It is especially advantageous that this occur immediately after the cutting open and during the discharging.

In a further advantageous embodiment of the method, after the discharging, the liner is sealed between the container and the filling opening in at least one sealing region. This may be done by heat sealing or crimping.

In a further advantageous embodiment of the method according to the invention, after being sealed within the sealing region, or between two sealing regions created spaced apart from one another, the liner is separated at a cutoff point, so that a sealed end is available on the side of the filling opening as a filling end.

Such methods according to the invention are more cost effective than known methods, since no insulator is needed in order to discharge the container in a contamination-free manner. The material originally contained in the container is kept sealed in at all times. The discharged container, which has often not been completely

discharged, can also be provided completely sealed for disposal.

Pursuant to an advantageous embodiment of a discharge device for the discharge method according to the invention, the filling opening is radially disposed enclosing a liner cassette having a liner on the base body. If the liner is sealed at the filling end, the entire base body is completely sealed by means of a corresponding attachment of the liner cassette to the base body. The liner can be drawn out of the liner cassette, away from the filling opening, in particular by a lifting and gripping device.

Pursuant to a further advantageous embodiment of the discharge device according to the invention, the filling opening is partially sealed by means of a catch grid.

In the event that the container becomes disengaged in the receiving area and the container threatens to fall into the filling opening through the discharge opening created by the cutting, a catch grid of this kind prevents a blockage of the processing system.

Pursuant to a further embodiment of the discharge device according to the invention, a cutting device is disposed in a region of the filling opening, in particular a lifting and cutting device having a blade that may be moved towards the container.

Pursuant to a further advantageous embodiment of the discharge device according to the invention, the blade is disposed on the side of the catch grid facing away from the container, and the catch grid has an opening disposed so that

it corresponds to the blade, such that the blade can be moved towards the container, penetrating through the catch grid.

A risk of injury, which in principle would be posed by the blade, is eliminated by an embodiment of this kind. Likewise, unintentional damage to the containers is prevented.

According to an aspect of the present invention, there is provided a discharge method for discharging an at least partially flexible container without contamination, in which the container is discharged into a base body, wherein a liner that encloses a filling opening of the base body is attached to the base body, with the following successive process steps:

a. folding the liner inward, wherein this liner is sealed by a filling end and thus the liner seals the filling opening so that a receiving area is created, into which the container may be completely inserted;

b. inserting the container into the receiving area, wherein an at least double-walled end of the liner extends over the container and the at least double-walled end thereof completely encloses the container;

c. sealing the liner so that the receiving area is sealed;

d. opening the liner in the receiving area and the container, such that a discharge opening is created between the container and the filling opening, which discharge opening allows a filling material of the container to pass through, wherein the receiving area and the filling opening are sealed to the exterior;

e. discharging the container;

f. sealing the liner between the container and the filling opening in at least one sealing region; and

g. separating the liner at a cutoff point within a sealing region or between two sealing regions, which are created such that they are spaced apart from one another, so that a sealed end is available on the side of the filling opening as a filling end.

According to another aspect of the present invention, there is provided a discharge device for a discharge method as described herein, wherein the filling opening is disposed such that it radially encloses a liner cassette out of which the liner may be drawn away from the filling opening.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is explained in detail below based on the drawings. The process steps are each depicted in a sectional view, wherein approximately a quarter has been cut away in a circumferential direction in a wedge cutout in order to in order to make it possible to see inside the device.

Shown are:

Figure 1 a schematic, simplified illustration of a container and of a discharge device disposed thereunder for a method according to the invention pursuant to an embodiment with a sealed filling end of a liner,

Figure 2 the discharge device from Figure 1 with a filling end that is folded inward,

Figure 3 the discharge device from Figure 2 with an inserted container,

Figure 4 the discharge device from Figure 3 with a receiving area sealed around the container,

Figure 5 the discharge device from Figure 4 with a blade in penetrating the filling end and the container,

Figure 6 the discharge device from Figure 5 with a withdrawn container,

Figure 7 the discharge device from Figure 5 with a withdrawn container and cutoff point and

Figure 8 the discharge device from Figure 7 with a separated filling end.

DETAILED DESCRIPTION

Figures 1 to 8 show a perspective view of an embodiment of a discharge device according to the invention, wherein a view of the inside of the discharge device is provided by means of a wedge cutout. Figures 1 to 8 disclose the discharge method when viewed in succession.

Pursuant to the embodiment shown, a discharge device provided for the discharge method according to the invention is integrated into a kind of connecting piece of a processing system, for example a connecting piece of a pipe or of a container. The discharge device has a base body 10, in which a filling opening 11 is available for the filling of the system. A container 1 is depicted above the base body 10, the contents 2 of which container must be poured into the filling opening 11. In order to prevent contamination, the filling of the processing system (not completely shown) or the emptying of the container 1 respectively is carried out sealed off from the environment.

A liner cassette 12 is disposed such that it encloses the filling opening 11, out of which liner cassette a liner 20 can be drawn to the container 1. The liner, as a tube, is connected

to the base body 10 in a manner that is sealed off from the environment by means of the continuous liner cassette 12. The liner may be drawn upward, out of the liner cassette 12, towards the container 1.

The end of the liner 20 that may be drawn out of the liner cassette 12 is referred to as the filling end 21. This filling end is sealed by means of a heat-sealed seam. Alternatively, the filling end may be crimped.

Figure 2 shows how the filling end 21 is folded inward in order to form a receiving area 22.

Figure 3 shows that the container 1 can be completely inserted into the receiving area 22.

The contours of the container 1 as well as of the liner 20 that are not visible are illustrated with a dashed line in all of the figures. The contents 2 of the container, typically a fluid or a granular material, are indicated by circles.

Figure 4 shows the receiving area 22 after a double-walled end 23 that protrudes over the container has been sealed. The container 1 is closed off such that it may essentially be moved freely in the receiving area 22. In especially advantageous embodiments, it may be provided that the container is fixed in the receiving area 22, in particular by sealing the double-walled end 23 by means of heat sealing.

Figure 5 shows how a blade 15 extends out of the filling opening 11 through catch grid 13 into the filling end 21 and into the container 1, so that the contents 2, which are indicated by circles, are discharged from the container 1 into the processing system.

After or during the discharging, the liner 20 is drawn further upward out of the liner cassette 12 at the double-walled end 23. A free region is formed as a sealing region 24 between the filling end 21 and filling opening 11. The sealing region 24 is created by crimping or heat sealing, in particular a so-called double seam having a perforation. The perforation is a special form of cutoff point 25 in the sealing region 24. The cutoff point 25 may be disposed between two sealing regions that have been created.

Reference symbol list

1	container
2	contents
3	discharge opening
10	base body
11	filling opening
12	liner cassette
13	catch grid
14	cutting device
15	blade
16	opening
20	liner
21	filling end
22	receiving area
23	double-walled end
24	sealing region
25	cutoff point

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A discharge method for discharging an at least partially flexible container without contamination, in which the container is discharged into a base body, wherein a liner that encloses a filling opening of the base body is attached to the base body, with the following successive process steps:

a. folding the liner inward, wherein this liner is sealed by a filling end and thus the liner seals the filling opening so that a receiving area is created, into which the container may be completely inserted;

b. inserting the container into the receiving area, wherein an at least double-walled end of the liner extends over the container and the at least double-walled end thereof completely encloses the container;

c. sealing the liner so that the receiving area is sealed;

d. opening the liner in the receiving area and the container, such that a discharge opening is created between the container and the filling opening, which discharge opening allows a filling material of the container to pass through, wherein the receiving area and the filling opening are sealed to the exterior;

e. discharging the container;

f. sealing the liner between the container and the filling opening in at least one sealing region; and

g. separating the liner at a cutoff point within a sealing region or between two sealing regions, which are created such that they are spaced apart from one another, so that a sealed end is available on the side of the filling opening as a filling end.

2. The discharge method according to claim 1, wherein after opening the liner (d), the liner is withdrawn from the filling opening, taking the container with it.

3. The discharge method according to claim 1 or 2, wherein directly after cutting open (d) and still during the discharging (e), the liner is withdrawn from the filling opening, taking the container with it.

4. A discharge device for a discharge method according to any one of claims 1 to 3, wherein the filling opening is disposed such that it radially encloses a liner cassette out of which the liner may be drawn away from the filling opening.

5. The discharge device of claim 4, wherein the filling opening is disposed such that it radially encloses a continuous liner cassette out of which the liner may be drawn away from the filling opening.

6. The discharge device of to claim 4 or 5, wherein the filling opening is disposed such that it radially encloses a liner cassette out of which the liner may be drawn away from the filling opening by a lifting and gripping device.

7. The discharge device of any one of claims 4 to 6, wherein the filling opening is partially sealed by means of a catch grid.

8. The discharge device of any one of claims 4 to 7, wherein a cutting device is disposed in a region of the filling opening.

9. The discharge device of claim 8, wherein the cutting device is a lifting and cutting device having a blade that can be moved towards the container.

10. The discharge device of claim 8 or 9, wherein the blade is disposed on the side of the catch grid facing away from the container and the catch grid has an opening disposed so that it corresponds to the blade, such that the blade can be moved toward the container, extending through the catch grid.

Fig. 1

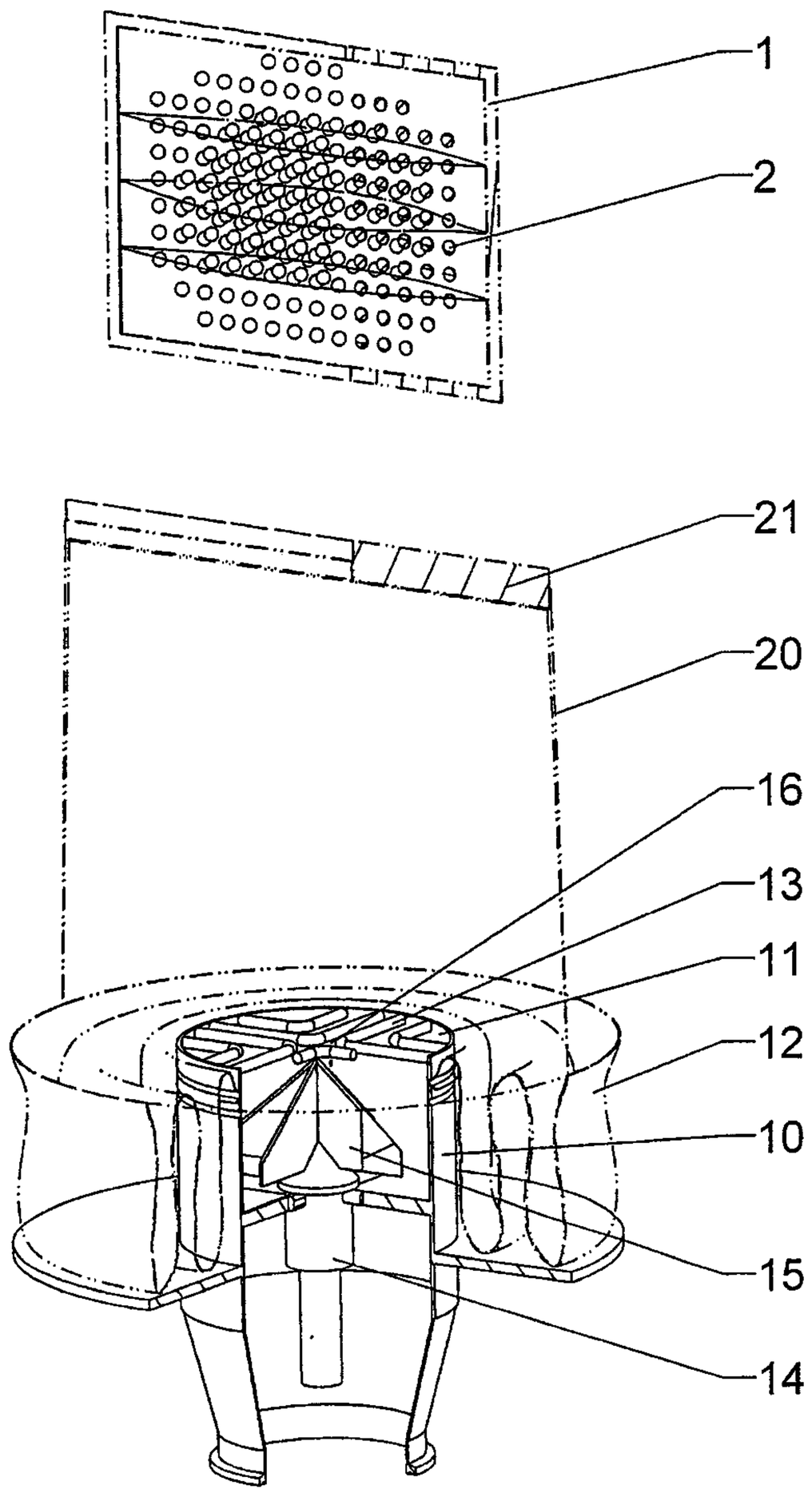


Fig. 2

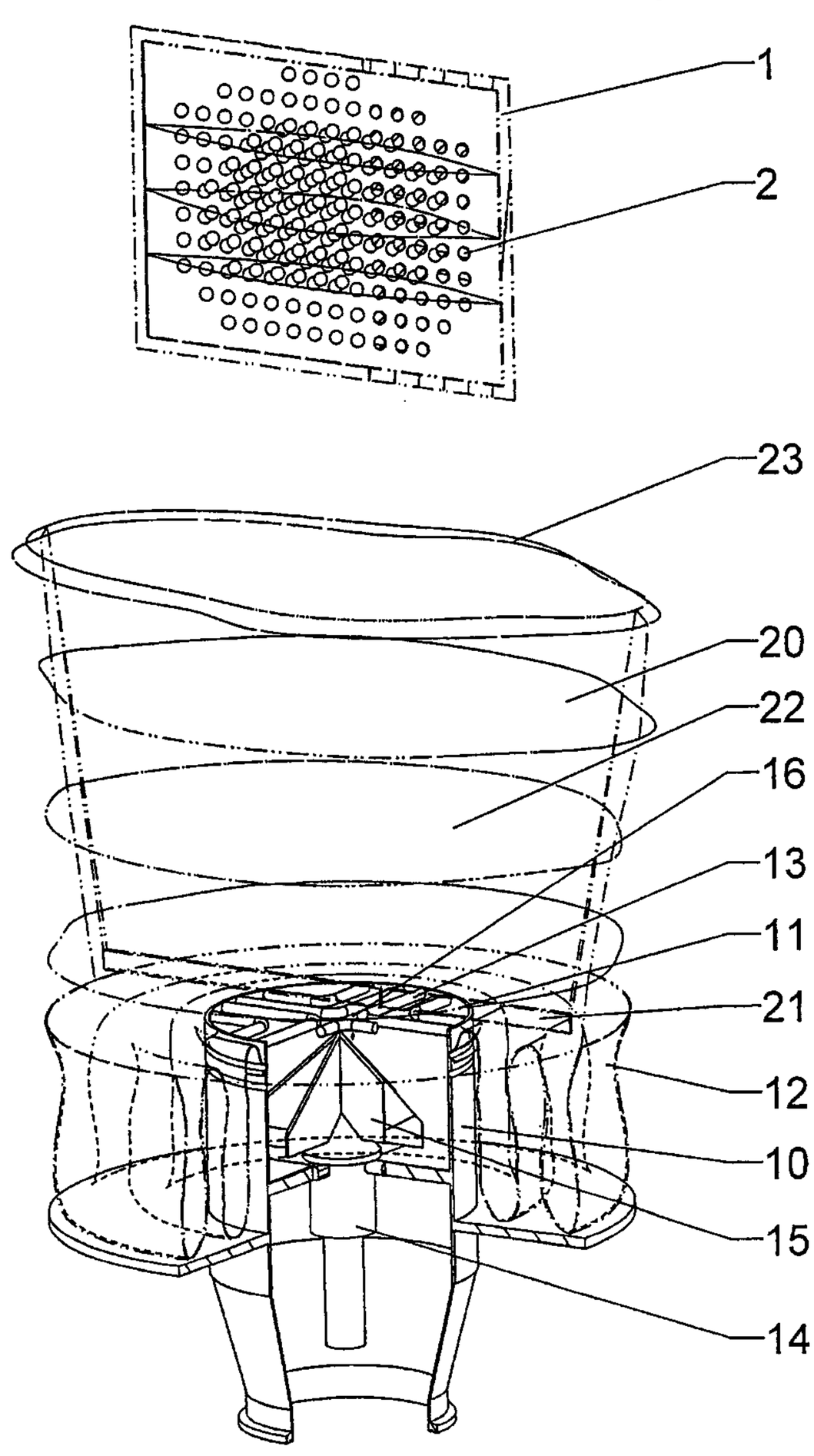


Fig. 3

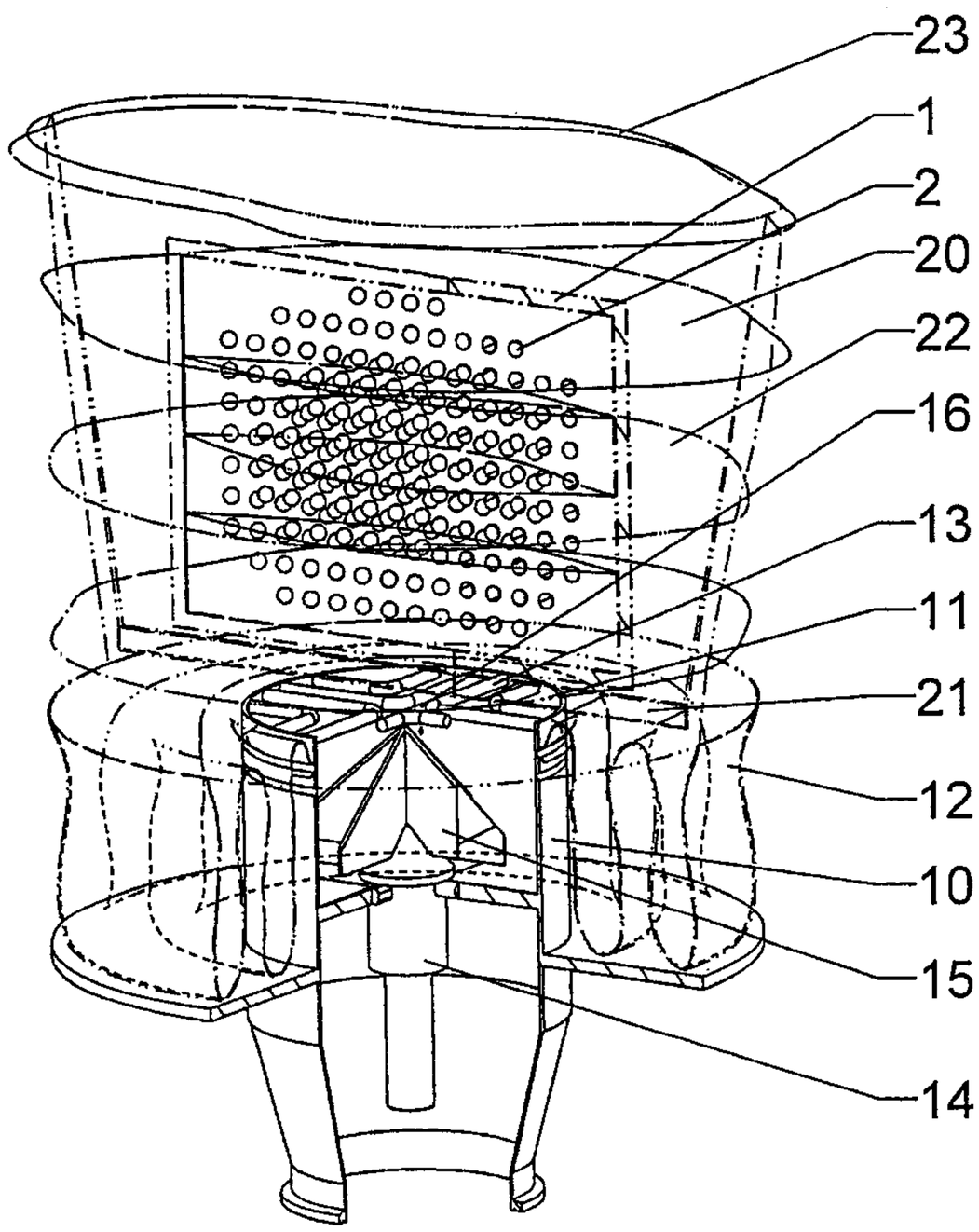


Fig. 4

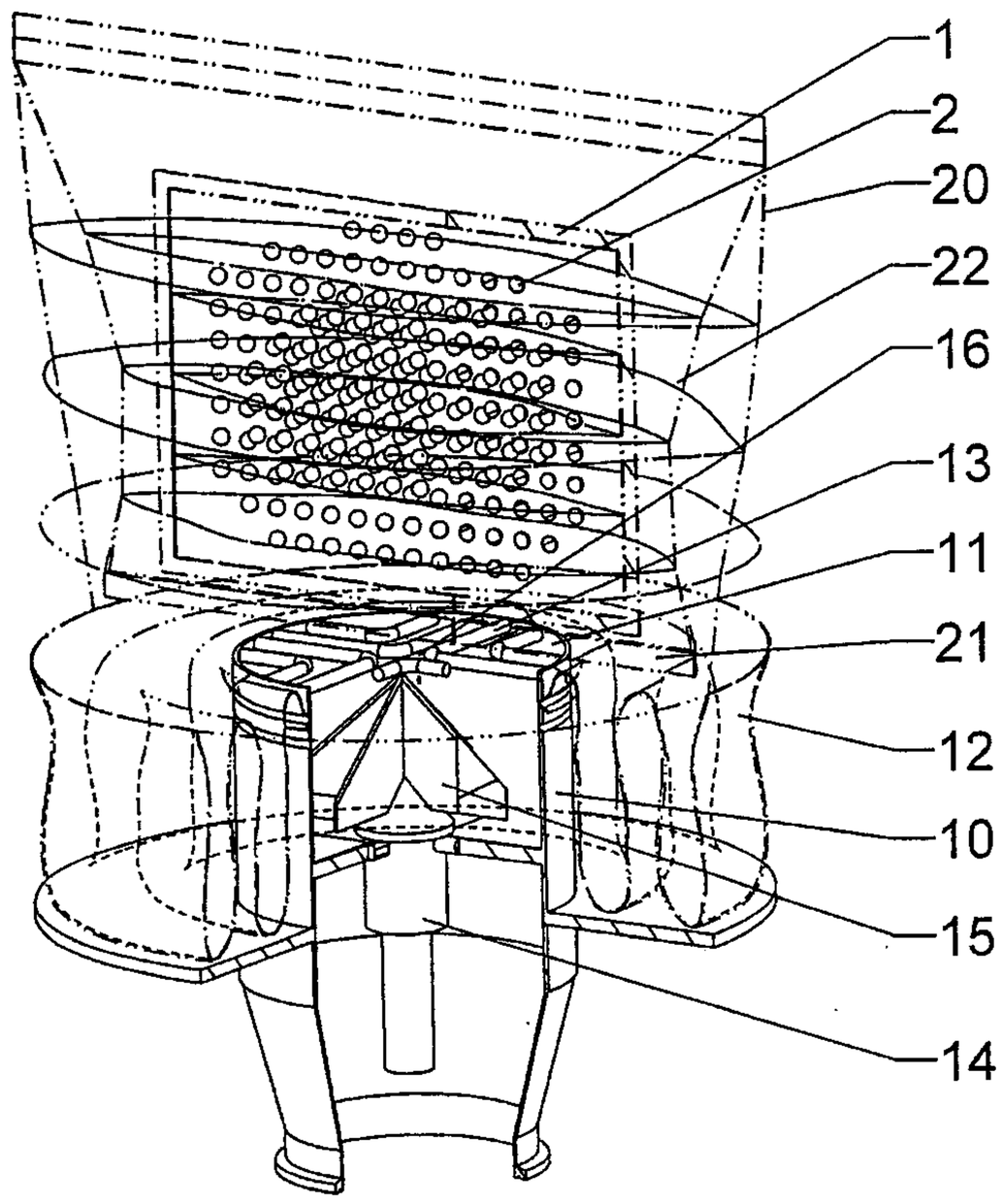


Fig. 5

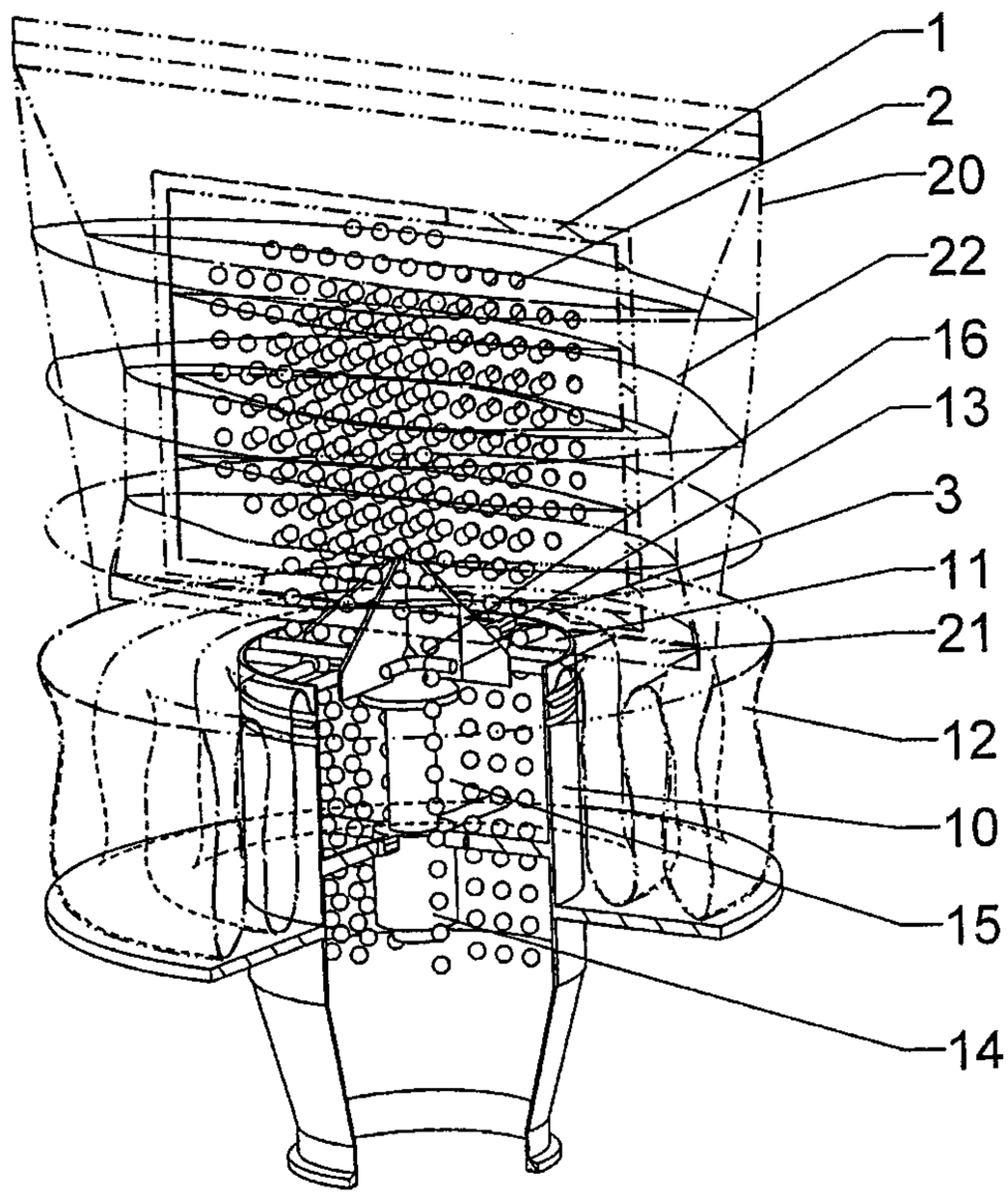


Fig. 6

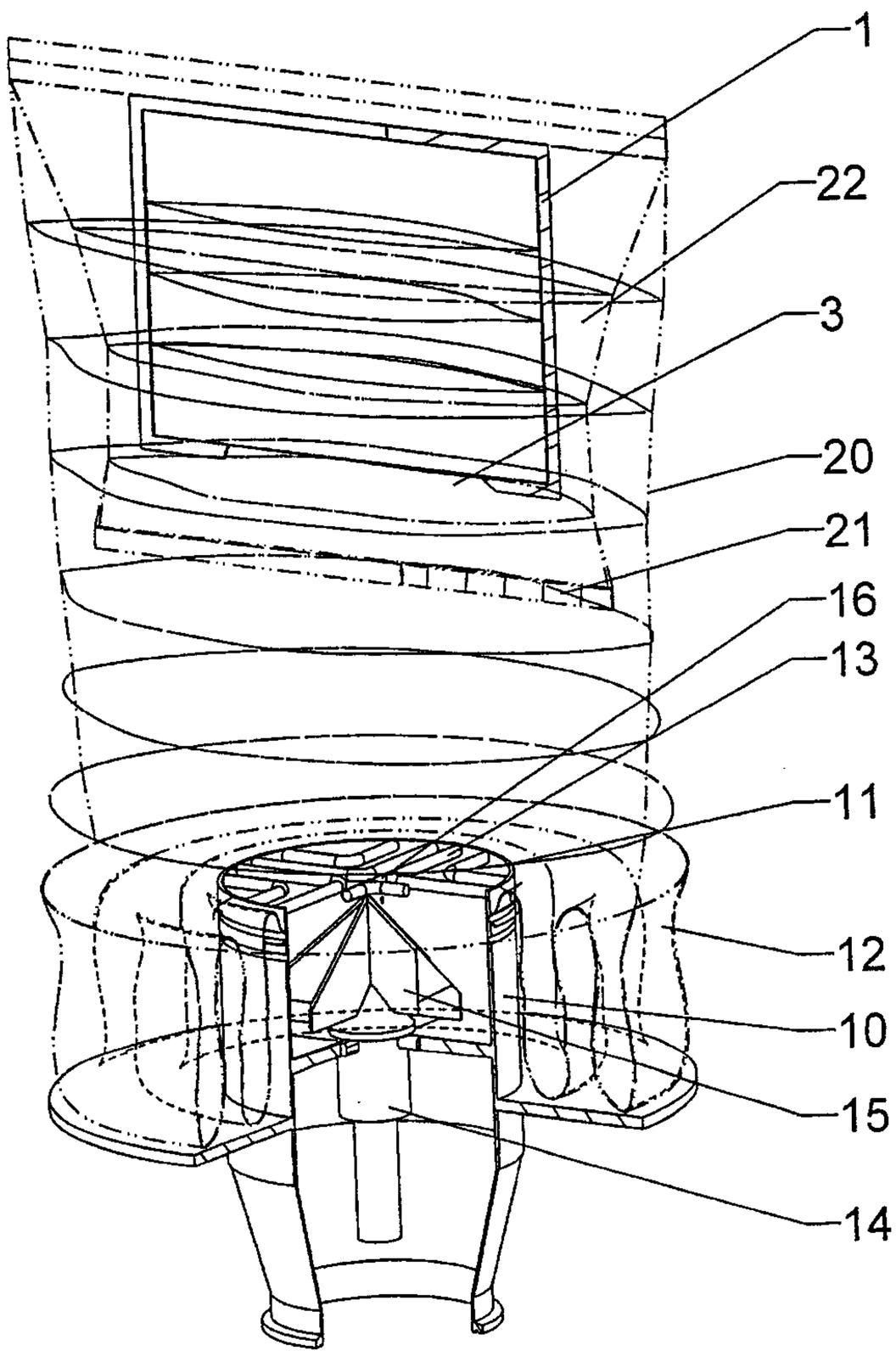


Fig. 7

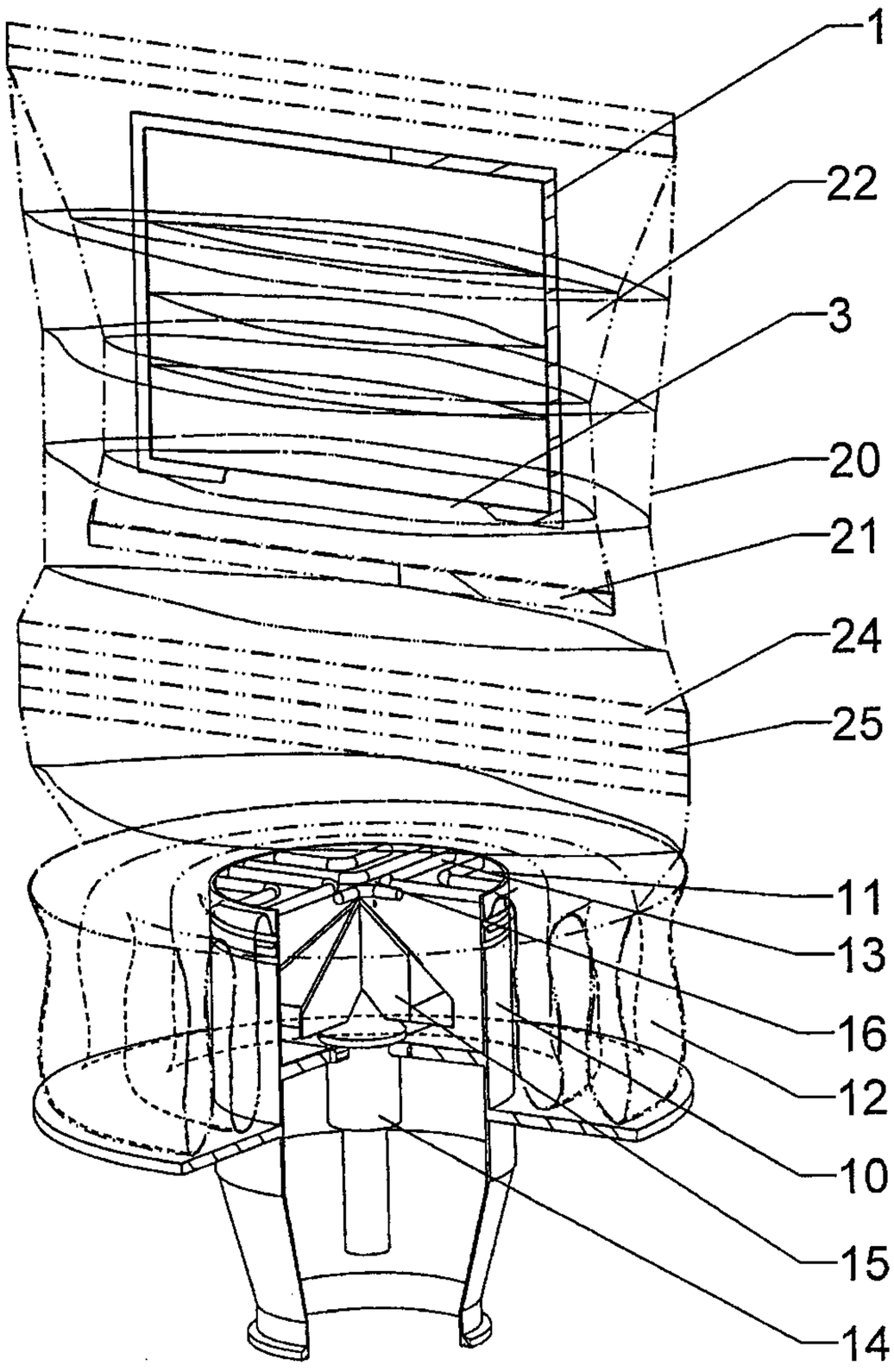
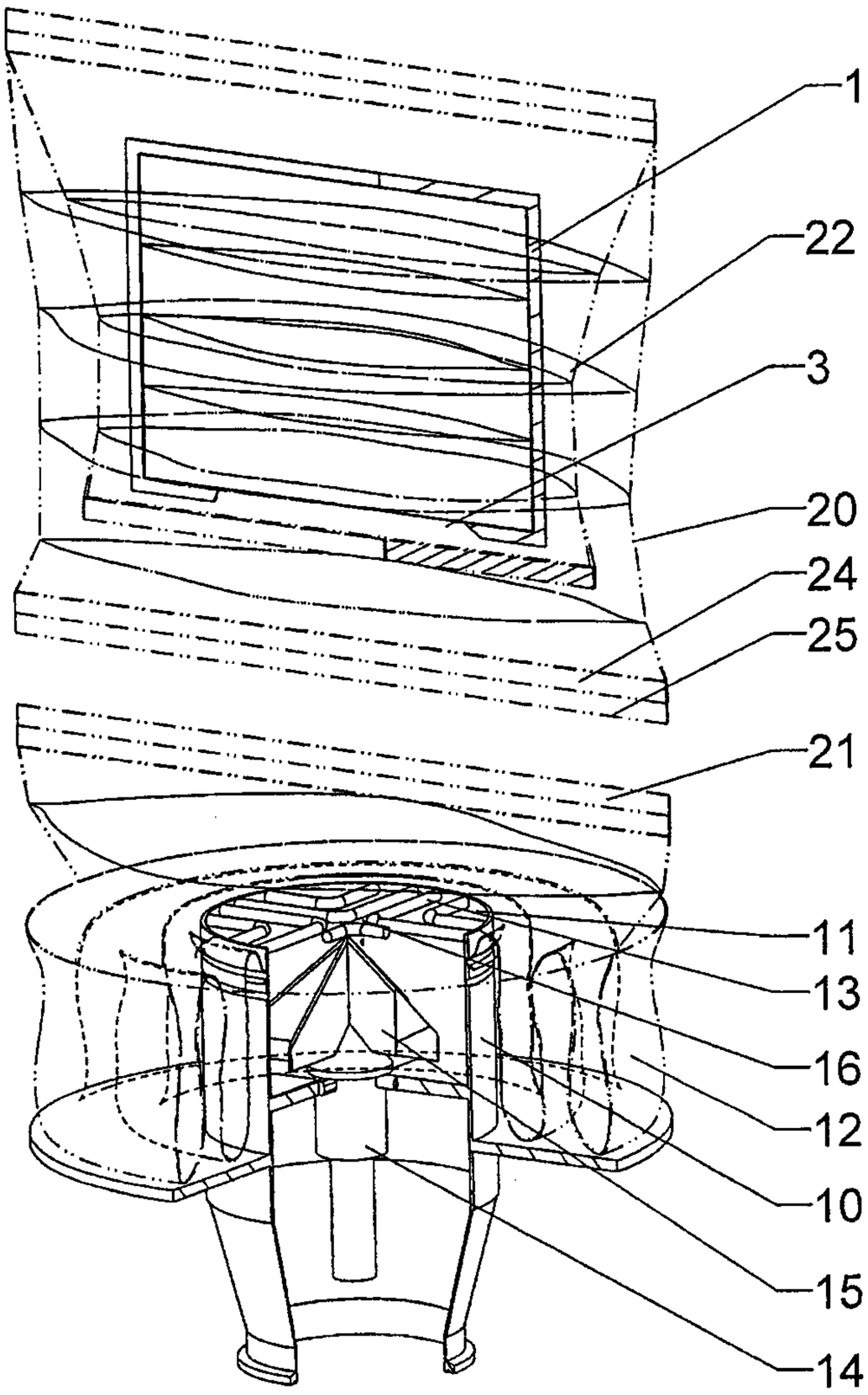
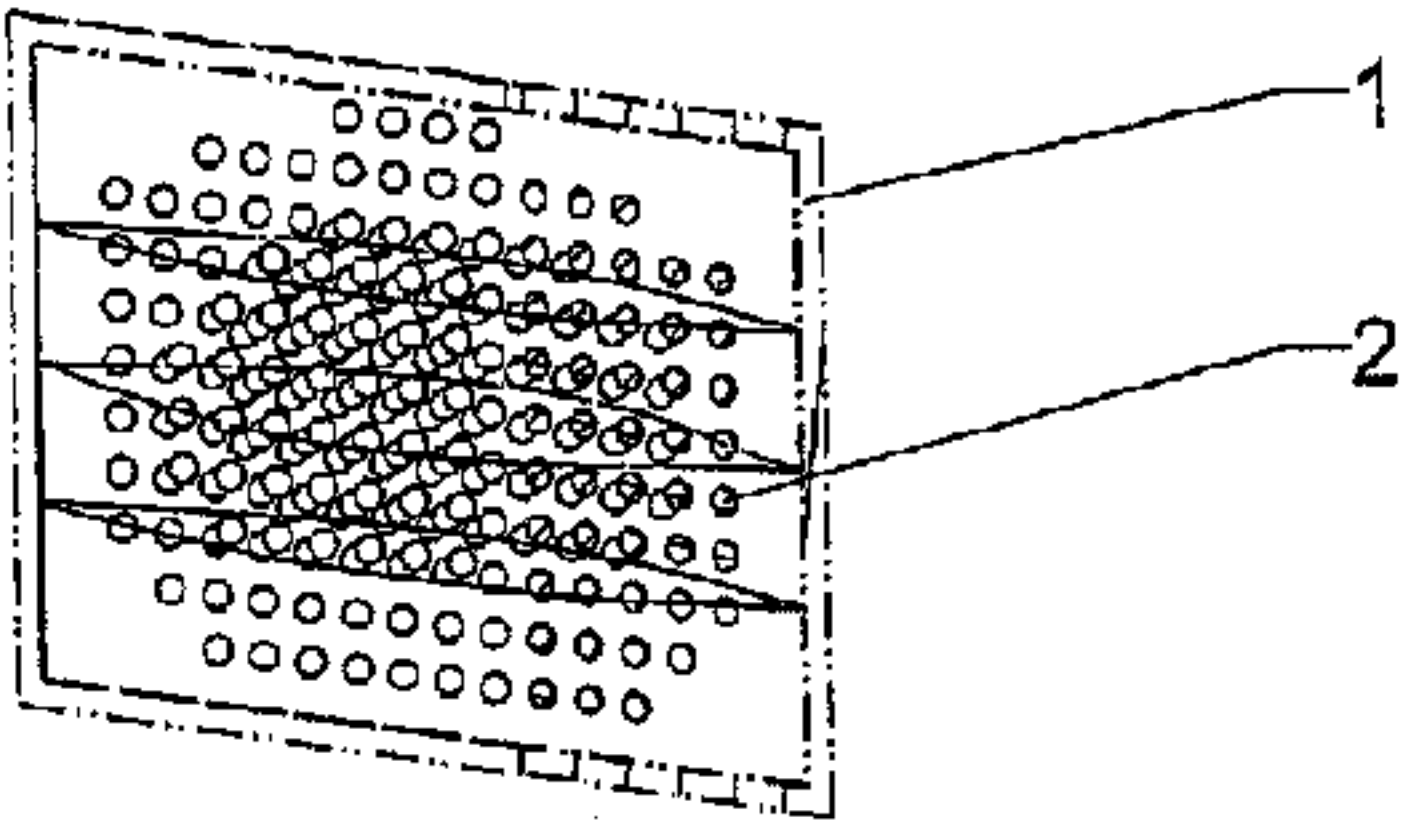


Fig. 8

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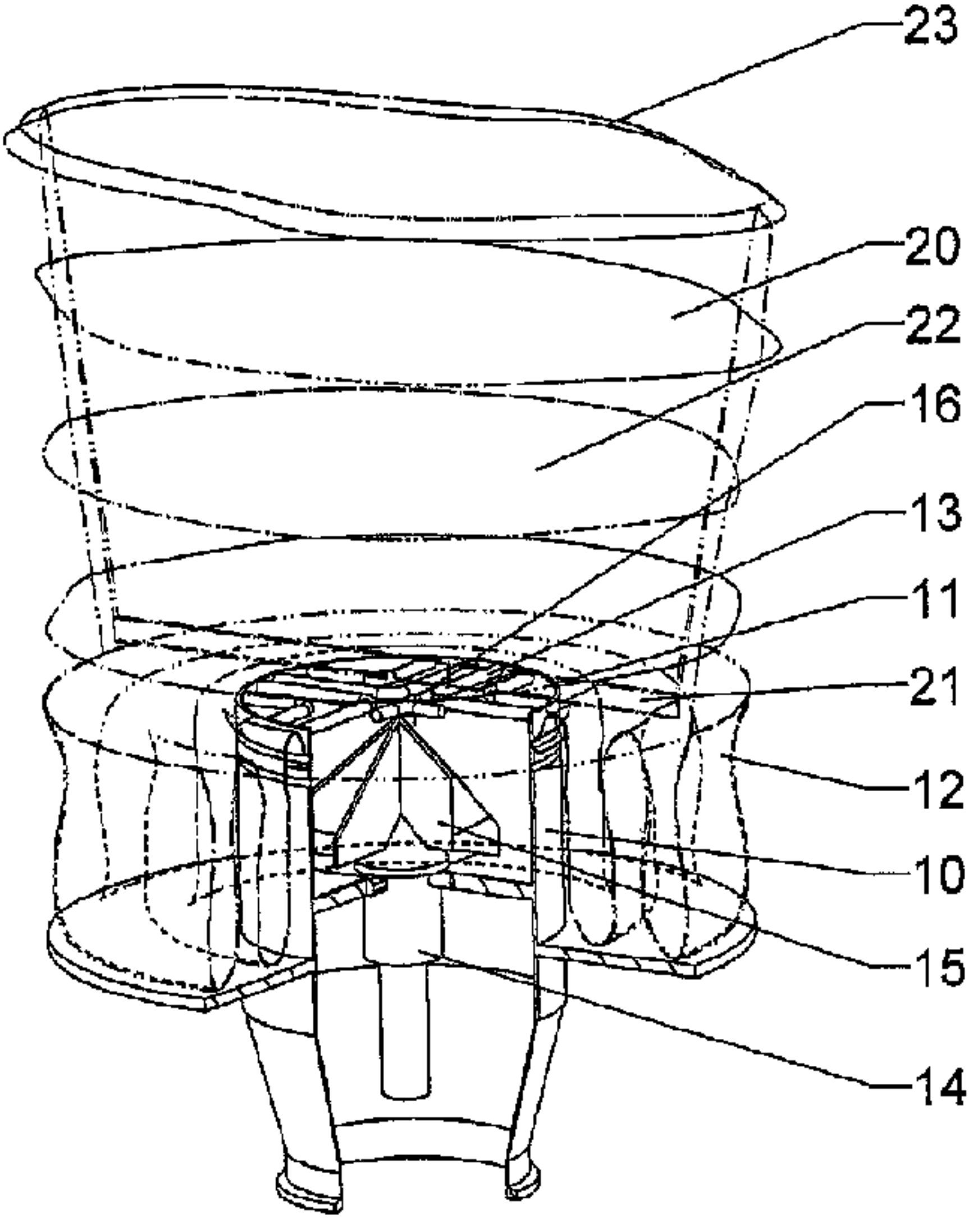
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