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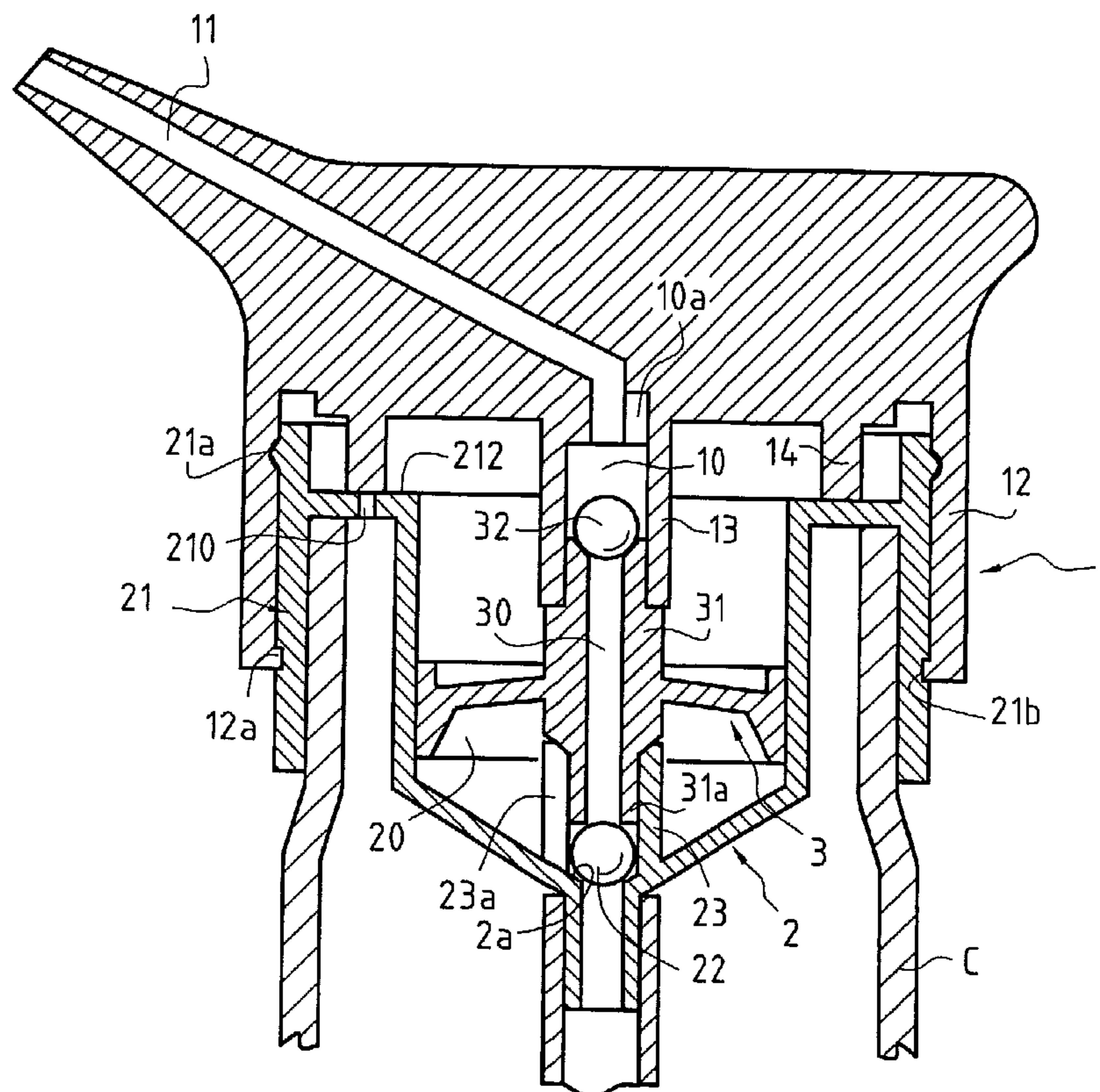
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(54) Titre : DISPOSITIF POUR LE DOSAGE DE PRODUITS LIQUIDES OU EN GEL

(54) Title: DEVICE FOR METERING LIQUID OR GEL PRODUCTS



(57) Abrégé/Abstract:

The invention concerns a device for dispensing a dose of liquid or gel products comprising a dispensing head (1) axially mobile mounted on a product reservoir and provided with an outlet conduit (11) and a metering chamber (20) delimited by an intake valve (22) and by a piston (3) whereof the rod (31) is connected to said head (1) and which is equipped with an exhaust valve (32). The invention is characterised in that the rod (31) of the piston (3) extends inside the chamber (20) through a projecting lower end (31a) providing sealed locking of the intake valve (22) when the head (1) is in low position.

Abstract

The invention concerns a device for dispensing a dose of liquid or gel products comprising a dispensing head (1) axially mobile mounted on a product reservoir and provided with an outlet conduit (11) and a metering chamber (20) delimited by an intake valve (22) and by a piston (3) whereof the rod (31) is connected to said head (1) and which is equipped with an exhaust valve (32). The invention is characterised in that the rod (31) of the piston (3) extends inside the chamber (20) through a projecting lower end (31a) providing sealed locking of the intake valve (22) when the head (1) is in low position.

Device for metering liquid or gel products

The present invention relates to a device for metering a liquid or gel product.

More precisely, the device of the invention is of the type comprising an axially mobile dispenser head on top of a product reservoir, which head is provided with an outlet duct, and a metering chamber defined on the one hand by an inlet valve and on the other hand by a piston, whose rod is connected to said head and which is equipped with an outlet valve.

However, devices of this type are complex, in particular because the outlet valve has to ensure that the chamber remains sealed at the upper part, this latter always being full of product when the device is in the rest position.

Moreover, these devices generally comprise a return member for returning the head to the upper position, consisting of a metal helical spring.

Apart from the recycling problems created thereby, this spring is a component which it is difficult to position functionally without impairing the effectiveness of the device or making it bulkier.

EP 0 974 401 discloses a device of this type provided with a return spring for returning the head to the upper position, in which device the piston rod is extended inside the chamber by a lower projecting end ensuring sealed locking of the inlet valve when the head is in the lower position and in which device the chamber is formed in a cylindroconical socket provided with an upper flange for attachment to the rim of the reservoir.

In this known device, the head is held in the upper position with regard to separation relative to the reservoir by a flange.

The head is held in the lower position by a bayonet system which is brought into operation by pressing on the head and rotating the latter. However, in said lower position, slight vertical deflection of the head is possible and there is a risk that the valve may not always be locked in sealed manner. Moreover, when it is in the upper position, the head may easily be moved downwards, causing untimely actuation of the device.

The object of the present invention is to provide satisfactory solutions to these technical problems.

This object is achieved according to the invention in that the dispenser head comprises an outer lateral skirt provided with first catch means capable of cooperating by latching with second, lower catch means formed on said flange for catching the head in the lower position and
5 capable of cooperating with second, upper catch means for holding the head in the upper position, with regard to separation, and in that the device is free of a dispenser head displacement return means.

Owing to these arrangements, even if, with the head in the upper position, pressure were exerted involuntarily on the latter resulting in
10 downward displacement thereof, it would automatically be caught in the lower position by simple latching, thereby preventing refilling of the metering chamber.

Advantageously, the first catch means are formed at the lower part of the outer lateral skirt.

15 Advantageously, the first catch means take the form of a catch rib, while the second, lower catch means take the form of a lower recessed portion.

The second, upper catch means are for their part advantageously formed of an upper retaining ring capable of retaining the
20 catch rib.

This rib and this retaining ring may be so dimensioned as to generate, when the skirt of the head slides against the flange, frictional forces requiring the application of a given minimum effort to displace the head.

25 In a variant, the second, upper catch means may cooperate by latching with the first catch means when the head is in the upper position.

For example, these second, upper catch means may take the form of an upper recessed portion, similar to the lower recessed portion.

Preferably, said flange is provided with a venting orifice
30 optionally extended by a groove formed in the outer wall of the socket.

In this case, the venting orifice is advantageously disposed through a shoulder providing a connection with the body of the socket. Furthermore, said head advantageously comprises a cylindrical internal wall, coaxial with said skirt and designed to seal the venting orifice when
35 the head is in the lower position.

According to another feature, the piston rod comprises an axial ejection duct opening, at the upper part, in a cavity in said head in which the outlet valve is accommodated.

5 According to a variant, said cavity is formed in a sleeve integral with the lower part of the head and connected coaxially with the upper end of the piston rod.

Preferably, the upper wall of said cavity is provided with channels communicating with the outlet duct for the product.

10 According to another feature, the inlet valve comprises an axial tube projecting inside the chamber and in which the lower end of the piston rod engages when the head is in the lower position.

According to a variant, the side wall of said tube comprises at least one port for passage of the product.

15 According to another variant, the inlet valve and/or the outlet valve comprise a mobile sealing ball.

Due to its simple structure consisting of only a few components, the device according to the invention does without any return means of the spring type. It is also easy to manufacture and thus reliable and economical.

20 This device may be used both in the field of pharmacy, where it may allow metering and dispensing in particular of syrups, and in the field of cosmetic or food products.

The invention will be better understood from a reading of the following description made with reference to the drawings, in which:

25 - Figure 1 is a sectional view of an embodiment of the device according to the invention.

- Figures 2A to 2D show sectional views of the device of Figure 1, mounted on a product reservoir, during the various dispensing phases.

30 The device shown in Figure 1 is designed for metering liquid or gel products. To this end, the device comprises an axially mobile dispenser head 1 on top of a product reservoir R (of which only the neck C is visible in Figure 1). The head 1 is provided with a product outlet duct 11.

35 The device also comprises a metering chamber 20 defined on the one hand by an inlet valve 22 and on the other hand by a piston 3, whose rod 31 is connected to the head 1. The piston 3 is equipped with an outlet valve 32.

In the embodiment shown, the inlet and outlet valves each comprise a mobile sealing ball. The chamber 20 is here formed in a socket 2 with a cylindroconical body, provided with an upper flange 21 for attachment to the rim of the neck C of the reservoir.

5 The rod 31 of the piston 3 is extended inside the chamber 20 by a lower projecting end 31a ensuring locking of the inlet valve 22 when the head 1 is in the lower position.

10 The head 1 comprises an outer lateral skirt 12 provided at its lower part with a catch rib 12a capable of cooperating with two catch abutments formed on the outer wall of the flange 21.

 These two abutments are formed respectively of an upper retaining ring 21a limiting upward travel of the head and a lower recessed portion 21b ensuring that the head 1 is held in the lower position by disengageable latching of the rib 12a.

15 The inner periphery of the skirt 12 has an annular groove 12b into which the retaining ring 21a enters by latching when the head 1 is in the lower position.

20 In this lower position, the end 31a of the piston 31 may be very slightly compressed resiliently against the valve 22 and/or the seat 2a of the valve 22 may undergo slight resilient deformation to ensure sealed closure of said valve.

25 Axial displacement of the rod 1 is effected by pulling or pushing manually in push/pull mode in the absence of any return means, guidance being provided by sliding contact of the rib 12a on the outer wall of the flange 21, between the two abutments 21a, 21b.

 The flange 21 is provided, where necessary, with a venting orifice 210. This orifice is disposed through the shoulder 212 providing connection with the body of the socket 2.

30 When the neck C is trapped with slight clamping between the body of the socket 2 and the side wall of the flange 21, provision is made for the orifice 210 to be extended by a vertical groove (not shown) formed on the outer wall of the body of the socket 2.

35 In the embodiment shown, said groove is not necessary, due to the fact that a space has been inserted which allows air to be taken back into the reservoir via the orifice 210.

Likewise, the very slight play existing between the internal wall of the skirt 12 and in particular the rib 12a, on the one hand, and the outer wall of the flange 21, on the other hand, is sufficient to allow air to be taken back in.

5 The head 1 comprises a cylindrical internal wall 14 situated coaxially and radially to the inside of the skirt 12 and designed to seal the venting orifice 210 when the head 1 is in the lower position.

To this end, the wall 14 is disposed opposite the orifice 210 and its thickness is greater than the diameter of the orifice 210.

10 When the head 1 is in the lower position, the wall in which the shoulder 212 is formed may undergo slight resilient deformation towards the inside of the receptacle under the effect of pressure exerted by the cylindrical wall 14, to ensure sealing of the vent 210.

15 The rod 31 of the piston 3 comprises over its entire height an axial ejection duct 30 opening, at the upper part, in a cavity 10 in the head 1 in which the outlet ball valve 32 is accommodated. The lower end of the duct 30 defines the orifice for evacuating the product from the chamber 20.

20 The cavity 10 is formed in a sleeve 13 integral with the lower part of the head 1 and connected coaxially with the upper end of the rod 31.

25 The upper wall of the cavity 10 is provided with a network of channels 10a communicating with the outlet duct 11 for the product and allowing passage of the product when the ball of the valve 32 is forced against said wall in the dispensing phase (see Figure 2C) under pressure from the ejected product.

The inlet valve 22 comprises an axial tube 23 which projects inside the chamber 20 and in which the lower end 31a of the rod 31 of the piston 3 engages when the head 1 is in the lower position.

30 This engagement, which takes place without radial clamping, continues until the end 31a of the rod 31 comes to rest against the ball of the valve 22. Locking of the valve in this sealed position, corresponding to wedging of the ball in the bottom of the tube 23, is ensured by latching of the rib 12a in the recessed portion 21b of the flange 21, as shown in Figures 2A and 2D.

The side wall of the tube 23 comprises at least one port 23a allowing transverse passage of the product during filling of the chamber by raising of the head 1 and suction of the product, as shown in Figure 2B.

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CLAIMS

1. A device for metering liquid or gel products, comprising an axially mobile dispenser head (1) on top of a product reservoir (R), which head (1) is provided with an outlet duct (11), and a metering chamber (20) defined on the one hand by an inlet valve (22) and on the other hand by a piston (3), whose rod (31) is connected to said head (1) and which is equipped with an outlet valve (32), the rod (31) of the piston (3) being extended inside the chamber (20) by a lower projecting end (31a) ensuring sealed locking of the inlet valve (22) when the head (1) is in the lower position, said chamber (20) being formed in a cylindroconical socket (2) provided with an upper flange (21) for attachment to the rim of the reservoir (R), wherein the dispenser head (1) comprises an outer lateral skirt (12) provided with first catch means (12a) capable of cooperating by latching with second, lower catch means (21b) formed on said flange for catching the head in the lower position and capable of cooperating with second, upper catch means (21a) for holding the head in the upper position, with regard to separation, and wherein the device is free of a dispenser head displacement return means.
2. A device as claimed in claim 1, wherein the first catch means (12a) are formed at the lower part of the outer lateral skirt (12).
3. A device as claimed in claim 1 or claim 2, wherein the first catch means take the form of a catch rib (12a), while the second, lower catch means take the form of a lower recessed portion (21b).
4. A device as claimed in any one of claims 1 to 3, wherein the second, upper catch means take the form of an upper retaining ring (21a).
5. A device as claimed in claim 4, wherein the outer lateral skirt (12) has an annular groove (12b) capable of cooperating by latching with the retaining ring (21a) when the dispenser head is in the lower position.
6. A device as claimed in any one of claims 1 to 5, wherein said flange (21) is provided with a venting orifice (210) optionally extended by a groove formed in the outer wall of the socket (2).
7. A device as claimed in claim 6, wherein said head (1) comprises a cylindrical internal wall (14), coaxial with said skirt (12) and designed to seal the venting orifice (210) when the head (1) is in the lower position.

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8. An arrangement as claimed in claims 6 or 7, wherein the venting orifice (210) is formed through a shoulder (212) providing a connection with the body of the socket (2).

5 9. A device as claimed in claim 8, wherein the wall in which said shoulder (212) is formed is capable of undergoing resilient deformation under the effect of pressure exerted by the cylindrical wall (14) when the dispenser head (1) is in the lower position.

10 10. A device as claimed in one of the preceding claims, wherein the rod (31) of the piston (3) comprises an axial ejection duct (30) opening at the upper part, in a cavity (10) in said head in which the outlet valve (32) is accommodated.

15 11. A device as claimed in claim 10, wherein said cavity (10) is formed in a sleeve (13) integral with the lower part of the head (1) and connected coaxially with the upper end of the rod (31) of the piston (3).

12. A device as claimed in claim 10 or 11, wherein the upper wall of said cavity (10) is provided with channels (10a) communicating with the outlet duct (11) for the product.

20 13. A device as claimed in any one of the preceding claims, wherein the inlet valve (22) comprises an axial tube (23) projecting inside the chamber (20) and in which the lower end (31a) of the rod (31) of the piston (3) engages when the head (1) is in the lower position.

14. A device as claimed in claim 13, wherein the side wall of said tube (23) comprises at least one port (23a) for passage of the product.

25 15. A device as claimed in one of the preceding claims, wherein the inlet valve (22) and/or the outlet valve (32) comprise a mobile sealing ball.

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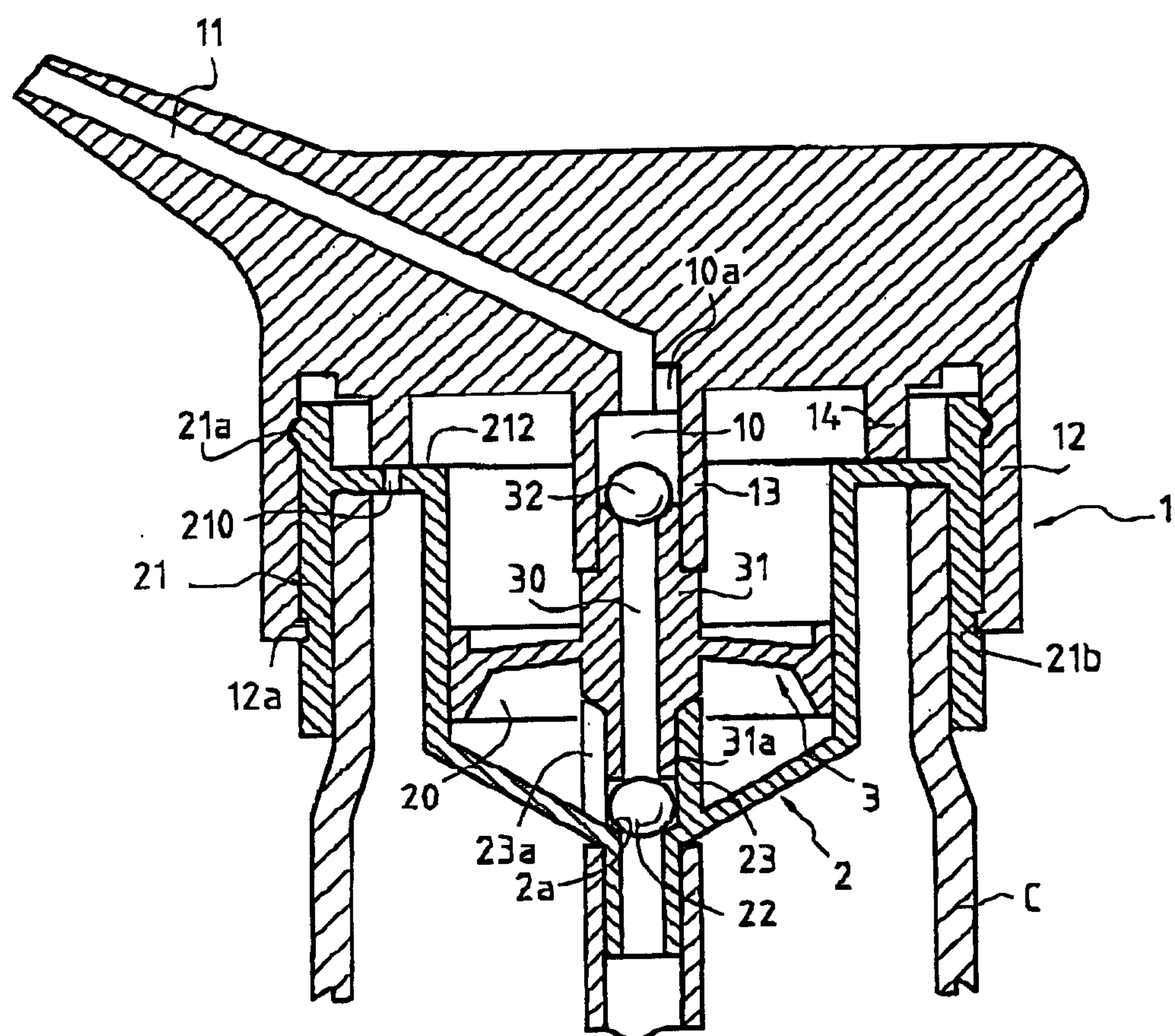


FIG.1

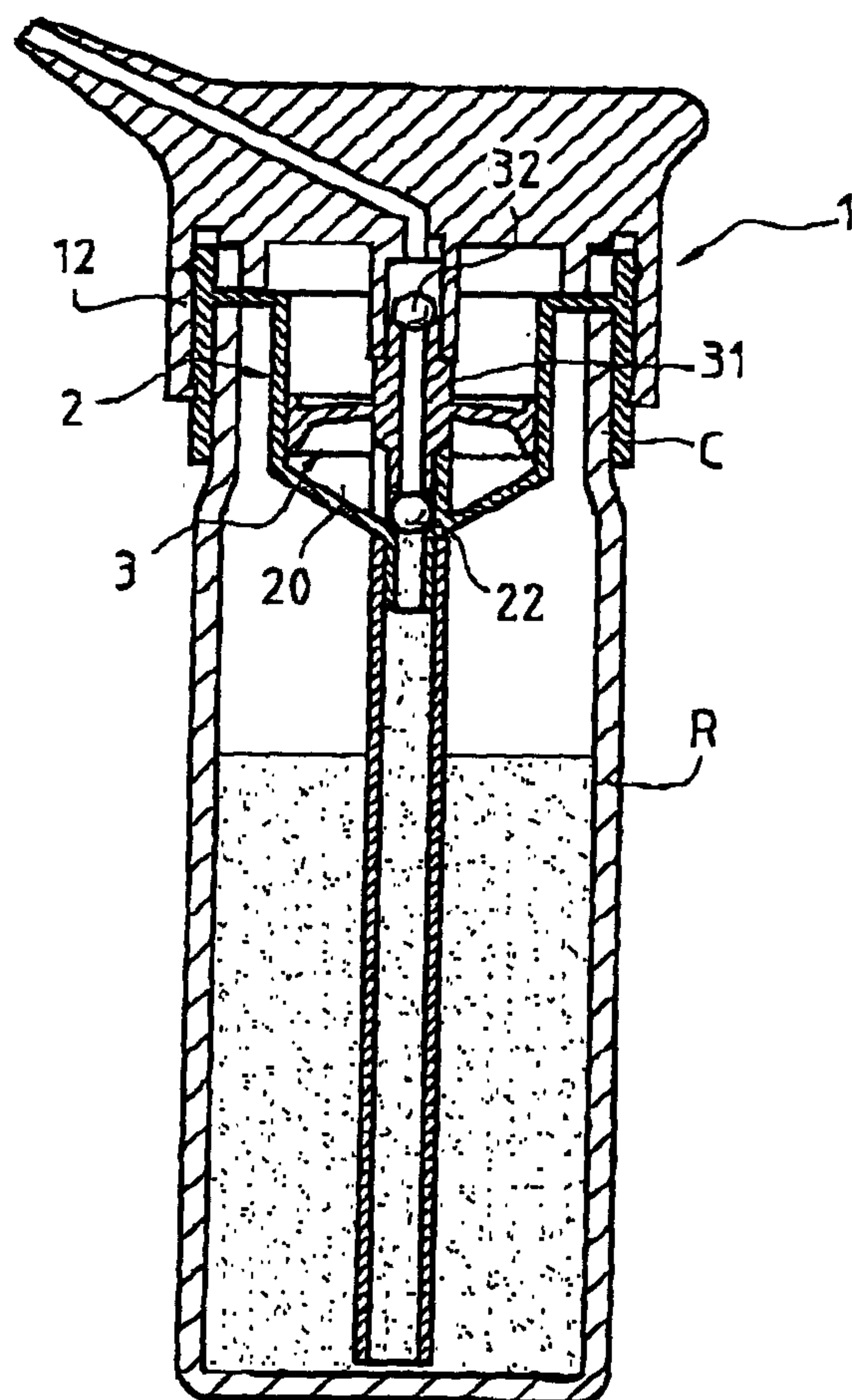


FIG. 2A

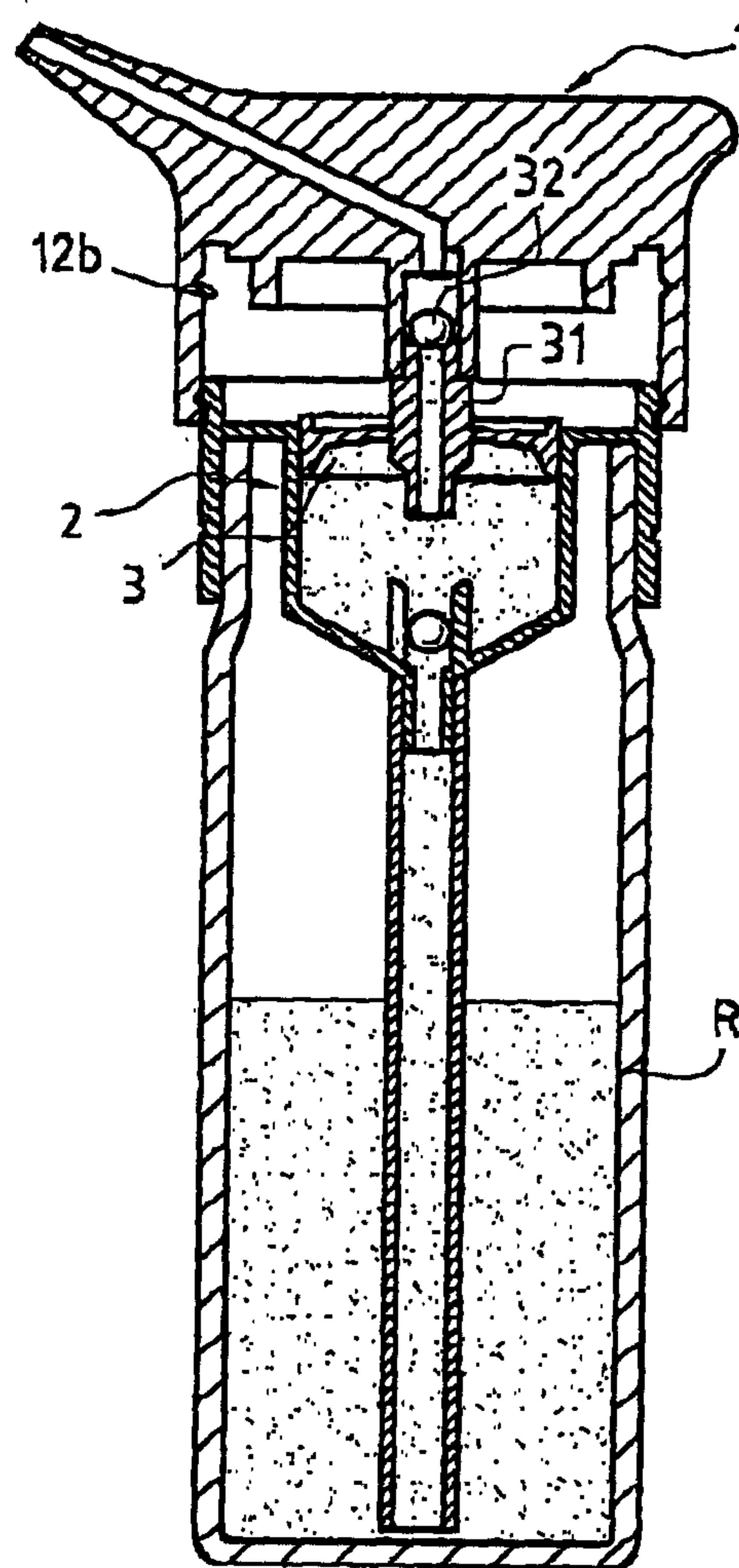


FIG. 2B

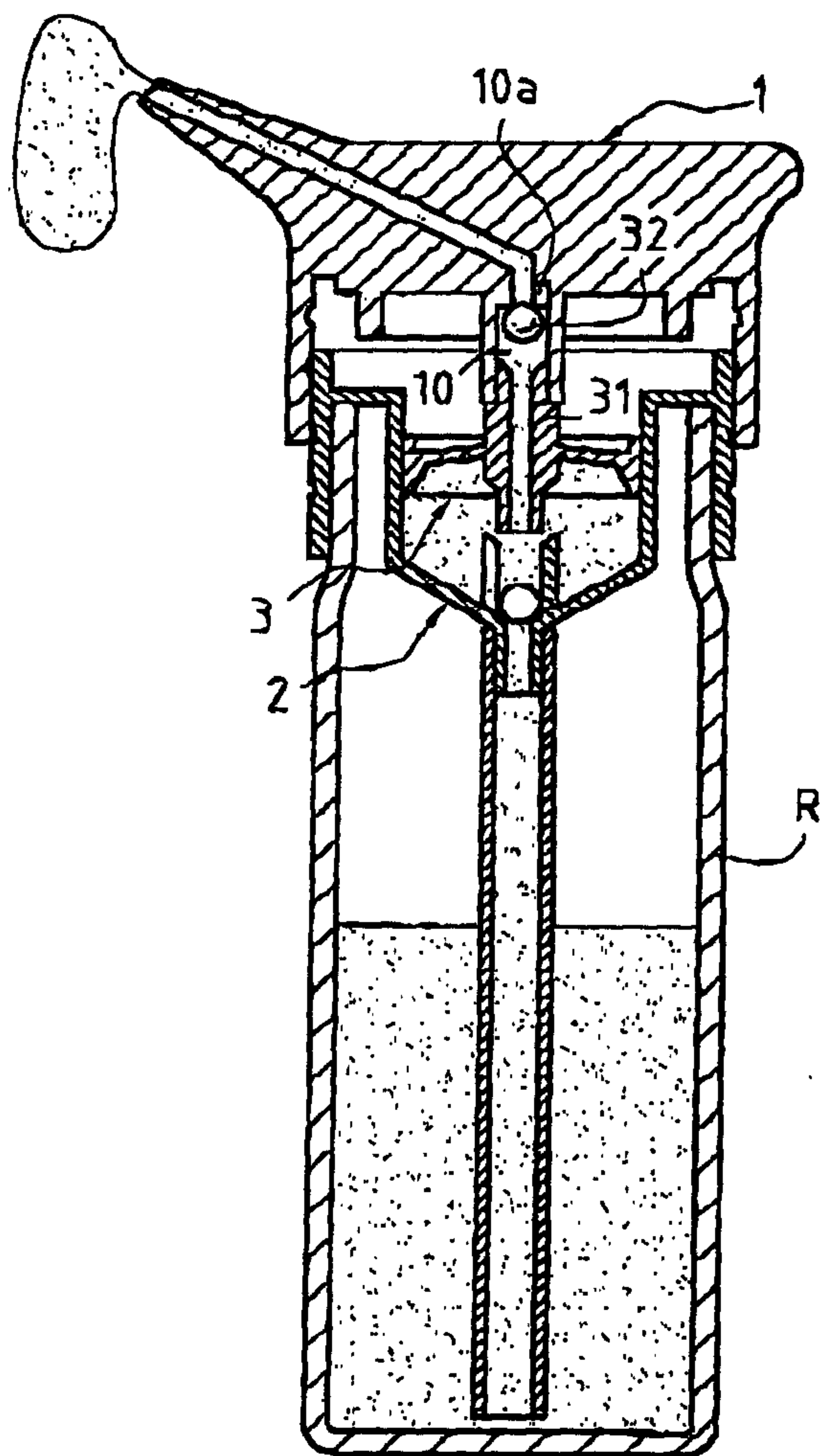


FIG. 2C

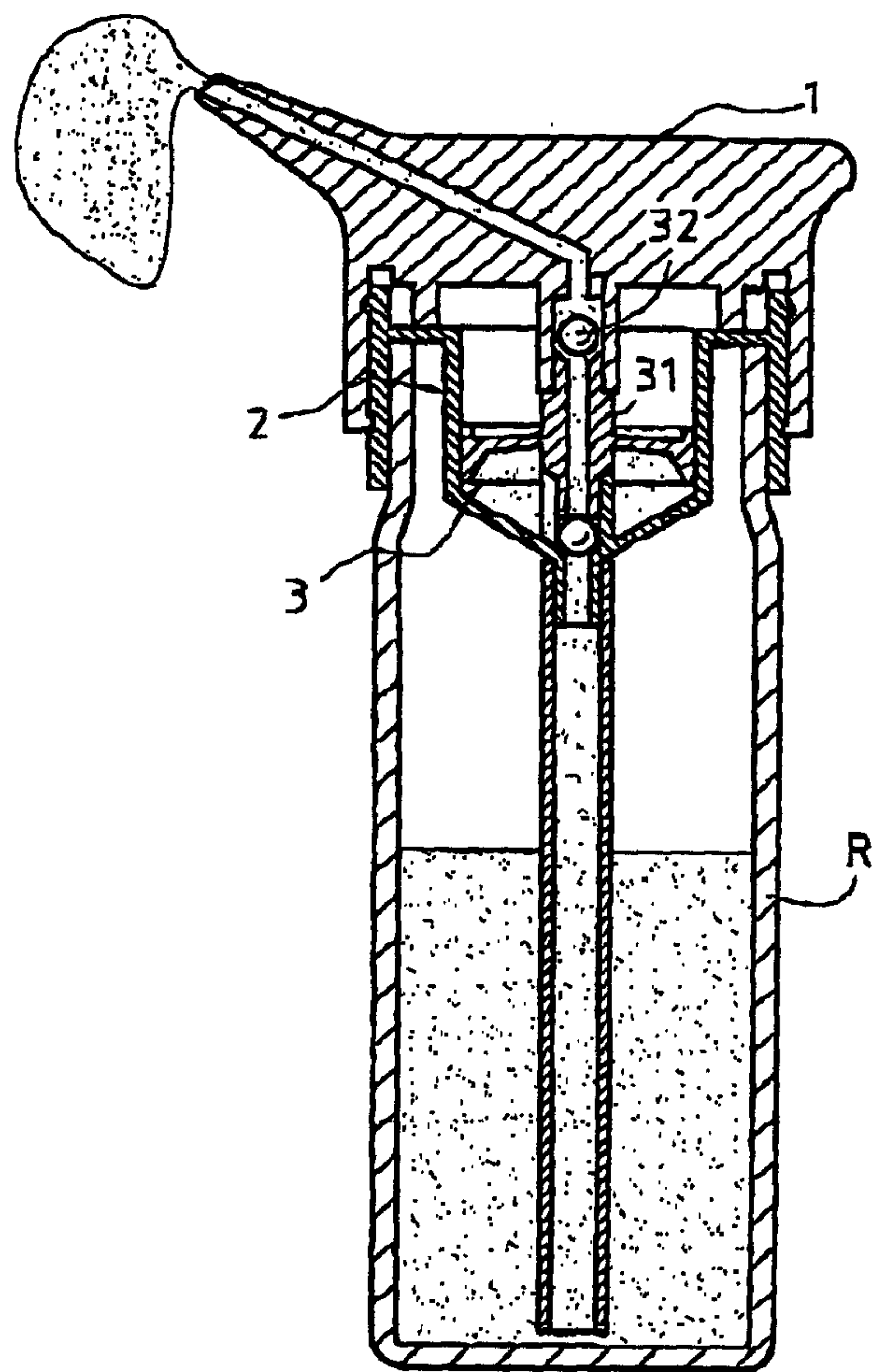


FIG. 2D

