

COMMONWEALTH OF AUSTRALIA

619801

Patents Act 1952

CONVENTION APPLICATION FOR A STANDARD PATENT

We, COLGATE-PALMOLIVE COMPANY, a Delaware corporation of 300 Park Avenue, New York New York 10022, United States of America, hereby apply for the grant of a Standard Patent for an invention entitled

"DISPENSING DEVICE"

which is described in the accompanying complete specification.

Details of basic applications:-

Number of basic application:- 161,550

Name of Convention country in which basic application was filed:- United States of America

Date of basic application:- 28 February 1988

Our address for service is: F.B. RICE & CO.,  
28A Montague St,  
Balmain N.S.W. 2041

Dated this 17th day of February 1989

COLGATE-PALMOLIVE COMPANY

By:   
Registered Patent Attorney

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TO: The Commissioner of Patents,  
COMMONWEALTH OF AUSTRALIA

167,530

Commonwealth of Australia  
The Patents Act 1952  
DECLARATION IN SUPPORT

In support of the (Convention) Application made by: COLGATE-PALMOLIVE COMPANY,  
of 300 PARK AVENUE, NEW YORK. NEW YORK 10022 U.S.A.

for a patent for an invention entitled: "DISPENSING DEVICE"

I ~~(We)~~ Robert C. Sullivan

of and care of the applicant company do solemnly and sincerely declare as follows:

a) ~~I am (We are) the applicant(s) for the patent~~

or

b) I am ~~(We are)~~ authorised by the applicant~~(s)~~ for the patent to make this declaration on its behalf.

Delete the following if not a Convention Application.

The basic application(s) as defined by section 141 ~~(142)~~ of the Act was ~~(were)~~ made

on 29 February 1988 in U.S.A.

~~in~~ ~~in~~

~~in~~ ~~in~~

by James C. McKinney

The basic application(s) referred to in this paragraph is ~~(are)~~ the first application~~(s)~~ made in a Convention country in respect of the invention the subject of the application.

a) ~~I am (We are) the actual inventor(s) of the invention.~~

or JAMES C. MCKINNEY, of 38 Kingsbury Drive Somerset,

b) New Jersey. U.S.A.

is ~~(are)~~ the actual inventor~~(s)~~ of the invention and the facts upon which

The applicant company

is ~~(are)~~ entitled to make the application are as follows:

The applicant is the assignee of the invention from the said actual inventor/s.

Declared at Piscataway, this MAY 13 1991 day of 19  
New Jersey

Signed *Robert C. Sullivan* Status Vice President and Chief Patent Counsel

Declarant's Name Robert C. Sullivan

F. B. RICE & CO PATENT ATTORNEYS

This form is suitable for any type of Patent Application. No legalisation required.

**(12) PATENT ABRIDGMENT (11) Document No. AU-B-30048/89**  
**(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 619801**

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**DISPENSING DEVICE**
- International Patent Classification(s)  
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**F B RICE & CO , 28A Montague Street, BALMAIN NSW 2041**
- (56) Prior Art Documents  
**AU 87078/82 A45D**  
**AU 88850/82 A45D**
- (57) Claim

1. A dispensing device for dispensing pasty material comprising:

a closed housing having top and bottom portions and an interior chamber;

a nozzle movable between first and second positions, said nozzle having a channel with an inlet and an outlet and having a blocking surface, said nozzle being located external to said closed housing;

a tube extending from the nozzle into said interior chamber of said housing, said tube being secured to said closed housing and having a channel with an inlet and an outlet, said tube inlet communicating directly with said interior chamber and said tube outlet communicating directly with said nozzle inlet when said nozzle is in said first position and being blocked by said blocking surface when said nozzle is in said second position;

a piston slidably disposed around said tube for displacement within said interior chamber; and

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spring means disposed between said top portion of said housing and said piston for urging said piston toward said bottom portion of said housing,

whereby the pasty material in said interior chamber is discharged out said nozzle outlet by way of said tube when said nozzle is in said first position in response to the urging of said spring means.

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C O M P L E T E   S P E C I F I C A T I O N

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Complete Specification for the invention entitled:

"DISPENSING DEVICE"

The following statement is a full description of this invention including the best method of performing it known to us:-

### FIELD OF THE INVENTION

Dispensing devices for pasty and other viscous materials such as toothpaste pumps.

### BACKGROUND

5 In recent years, dispensing devices for a wide range of pasty and viscous substances such as food products, e.g., cheese, etc., creams and for other materials have come into wide use. Especially popular are hand-held pumps which provide attractive, easy-to-use containers for  
10 use by consumers both at home and while travelling.

In particular, hand-held pumps for dentrifice materials such as toothpaste and gels (hereinafter referred to for convenience collectively as "pastes") have gained considerable consumer acceptance. They have become  
15 an alternative to tubes, but tubes are currently substantially less expensive than paste pumps now on the market.

Since pumps have properties many consumers prefer over tubes, it is believed that if a pump could be  
20 designed for manufacture at a cost equal to or less than tubes, sales of such a pump would increase substantially.

Pumps adapted for dispensing paste are generally found in Int. Classes G01F 11/00, B67D 5/32 in Class 222 in the U.S. Patent and Trademark Office. Representative  
25 thereof are the following U.S. Patents issued in recent years: 4,511,068; 4,598,843; 4,437,591 and 4,657,161.

It will be noted that the pumps disclosed in the foregoing Patents are relatively complicated, i.e., they have a relatively large number of components. As a  
30 consequence, since cost generally is a function of complexity and number of parts, these pumps are more expensive than desirable.

Moreover, it will be noted that all paste pumps currently on the market in the U.S. utilize an actuator  
35 mechanism which requires the application of pressure

thereon by the user. These actuator mechanisms themselves are typically quite complicated. Certain pumps now on the market are connected to a rod which, in turn, is connected to a piston, i.e., movement of the actuator by hand  
5 pressure moves the rod which draws the piston against the paste to force the paste from the spout of the pump.

In addition, such current pumps are of the "draw up" type, i.e., the product to be dispensed is loaded above the piston and the piston, via the aforesaid means, is  
10 pulled up against the product to force it out of the pump nozzle.

Although such pumps generally function well, as indicated, because they are relatively complicated, they are relatively expensive.

15 Thus, an important object of this invention is to provide a new pump which is less complicated and therefore less expensive than those currently in use.

Another object of this invention is to provide a pump for paste products wherein the piston is located above the product to be dispensed and wherein there is provided a  
20 source of constant downward pressure on such piston so that the product is forced up a tube passing through the piston whereby, when the nozzle or spout is in registry with the tube, the product flows out continuously until  
25 the nozzle is closed.

Another important object is to provide, in connection with the above combination, a rotatable turret type spout or nozzle which has an opening therein, and wherein the opening can be moved in and out of registry with the tube.

30 Another important object of the invention is to provide a pump which is refillable. i.e., to provide a "basic" pump which is designed to receive a refill container of paste and thereafter pump the contents of the container therefrom, whereby the consumer, having  
35 purchased one basic pump, is saved the cost of purchasing

successive new pumps and is required only to purchase a  
refill container of paste, much as in the case of the  
system used in the home razor blade market, wherein once  
the consumer buys the razor holder, he or she need  
5 thereafter only purchase the refill blades.

Another key objective of this invention is to provide  
a "bottom heavy" pump which, in contrast to current paste  
pumps, maintains the material to be dispensed at the  
bottom of the container, thereby maintaining a low center  
10 of gravity so that the pump does not tip over. Current  
pumps draw the material to be dispensed upwardly, so that  
the center of gravity increasingly rises to the top of the  
pump, whereby the pump becomes top-heavy and tips over  
easily.

15 A further objective of this invention is to provide a  
refill container for hand-held dispensing devices,  
especially devices of the type of the present invention  
relating to pumps for pastes.

These and other objects of the invention will become  
20 apparent from the following detailed description, drawing  
and claims.

The present invention provides a dispensing device  
for dispensing pasty material comprising:

25 a closed housing having top and bottom portions and  
an interior chamber;

a nozzle movable between first and second positions,  
said nozzle having a channel with an inlet and an outlet  
and having a blocking surface, said nozzle being located  
external to said closed housing;

30 a tube extending from the nozzle into said interior  
chamber of said housing, said tube being secured to said  
closed housing and having a channel with an inlet and an  
outlet, said tube inlet communicating directly with said  
interior chamber and said tube outlet communicating  
35 directly with said nozzle inlet when said nozzle is in





said first position and being blocked by said blocking surface when said nozzle is in said second position;

a piston slidably disposed around said tube for displacement within said interior chamber; and

5 spring means disposed between said top portion of said housing and said piston for urging said piston toward said bottom portion of said housing,

whereby the pasty material in said interior chamber is discharged out said nozzle outlet by way of said tube  
10 when said nozzle is in said first position in response to the urging of said spring means.

THE DRAWINGS

Figure 1 illustrates one embodiment of the pump device of this invention in vertical cross-section in the  
15 fully loaded condition.

Figure 2 illustrates another cross-sectional view of the device of this invention shown in Figure 1 but with the contents partially emptied and the turret nozzle in the open position.

20 Figure 3 is a vertical cross-section of another embodiment of this invention illustrating a refillable pump wherein the turret nozzle is in the closed position and the refill has just been fitted into the pump in a full condition.

25 Figure 4 is another cross-section of the pump of



Figure 3 in partially emptied loaded condition after the insertion of a refill container, and with the nozzle in the open position discharging the contents of the tube.

Figure 5 is another embodiment of the combination pump/refill device of the present invention in vertical cross-section.

Figure 6 is yet another embodiment of this invention taken in vertical cross-section.

#### DETAILED DESCRIPTION

10 Figure 1 shows a hand-held paste pump 11 having a turret-type nozzle or spout 13 at the top thereof. The nozzle includes a ball 12 rotatably seated within a housing 12a. Nozzle 13 has a spout portion connected to ball 12 movable therewith and includes a channel 13a  
15 terminating in a dispensing spout 13b. Channel 13a extends through ball 12 and terminates in a material receiving opening 13c.

Housing 12a is fitted to--and may be an integral part of--a container body 15 which has a base 16, the latter  
20 having a base cover 16a.

Disposed within container body 15 is a piston 17 with flexible side seals 18 which is vertically moveable in the body 15. A tube 20 which has an upper opening 20a,  
25 extends through piston 17 and has a lower opening 20c.

There is provided a compression spring 19, which may be helical, between the upper interior surface of body portion 12b and the top of piston 17, whereby spring 19 continuously exerts downward force on piston 17. Paste (or other previously mentioned viscous mater) M is loaded  
30 into the body of the pump below piston 17 and above bottom 16a. As shown in Figure 1, material M is blocked from movement beyond the opening 20a of tube 20 by the surface of ball 12, but it will be observed tube 20 has been filled with paste by the downward pressure of piston 17  
35 under force of spring 19 up through opening 20c in the

tube 20.

Figure 2 shows the tube of Figure 1 with the turret nozzle 13 in the open position, i.e., the user has rotated the nozzle to the left in Figure 1 so that opening 13c of the tube channel is in registry with the opening 20a of dip tube 20, whereby the contents of the tube, M, are flowing continuously from nozzle 13b as indicated by the arrow.

Thus, the embodiment illustrated in Figures 1 and 2 is remarkably uncomplicated and, in fact, comprises only five elements: A body, a nozzle, a piston, a dip tube and a spring (or other functionally equivalent means of exerting force), all of which have the further advantage of being easy to mold and to assemble. By contrast, for example, the pump currently on the market sold under the Trademark "Crest" for tartar control paste has at least eight elements and represents an extremely complicated design which, presumably, is difficult to mold and assemble, and therefore relatively expensive.

Further, prior art pumps are of the draw-up variety have a piston which moves upwardly within the pump housing to dispense the paste, so that the pump becomes increasingly top-heavy and therefore more likely to fall over. Sometimes this is merely an annoying inconvenience, but in the event the pump falls from, say, a bathroom sink onto a tile or other hard bathroom floor, the pump can be damaged.

In addition, paste pumps according to the present invention are very easy to fill with paste on a high-speed assembly line.

As indicated previously, it has also been discovered that pumps made in accordance with the present invention can be modified to be refillable, thereby even further increasing the cost-savings to the consumer.

One embodiment of a re-fillable pump is shown in in

Figures 3 and 4 wherein parts identical or functionally equivalent to those shown in Figures 1 and 2 are marked with a prim, so that it is unnecessary to specifically reiterate them here. In the embodiment of Figures 3 and 4, the body wall 15', preferably cylindrical in cross-section terminates in an edge 15a' which defines an opening 15b'. Inserted into this opening is a refill container 22 with paste M already loaded therein. (Although not shown, it will be understood that container 22, as sold, will have a suitable cover which the consumer removes just before inserting container 22 within the pump 11'.)

Refill container 22 is inserted within pump 10' by threading it into the wall 15'. Thus, wall 15' has screw threads 26 on its inner surface adjacent bottom edge 15a and container 22 has matching threads 25 on its outer surface. Once container 22 is securely threaded into pump 10', the flared top portion 24 of the container 22 forms a tight seal against the inner surface of wall 15' above piston 17'. Similarly, the bottom surface 23c of container 22 preferably fits against the lower edge 15a' of the pump wall 15, thereby enhancing the seal provided by threads 25, 26 to provide a sealed compartment for the material M. The refill has feet 23a and 23b to provide a base for maintaining the assembly in an upright position.

Figure 3 shows the refillable pump with its dispensing nozzle 13' in the closed position, while Figure 4 shows such nozzle in the open position with the material M being discharged as indicated by the arrow..

Thus, in addition to the advantages of the pump shown in Figures 1 and 2, the pump of Figures 3 and 4 have the great benefit of being capable of utilizing refills, at substantial savings to the consumers.

Another embodiment of a refillable container according to this invention is illustrated in Figure 5

wherein the basic pump body 11" does not have an a long body wall extending down the length of the container, but instead comprises what might be termed a head block 28 terminating in a lower edge 29. Just above the line of termination 29 the body 28 is provided with external threads 33. The latter are for the purpose of receiving a refill 27 which has a body wall 30 and threads 32 on the inner wall at the top which engage threads 33 of the body 28.

5  
10 Refill 27 has a closed bottom end 31 and, as packaged for retail sale, will have its open top end closed by a cap, foil or other suitable cover which will protect the contents M and which may be easily removed just prior to attachment as described above.

15 It will be evident that the refill container, 27 in Figure 5, offers great advantages. In particular, the consumer need only purchase the pump mechanism once and, thereafter, simply purchase the refill 27, thus saving the cost of buying an entire new pump on each occasion.

20 Figure 6 illustrates a pump 11" which is similar in construction to pump 10 of Figure 1. However, in the embodiment shown in Figure 6, pump 10" has an open bottom end equipped with external threads 43. These are designed to engage threads 44 on the inner surface of a lip 42a of a removable bottom cover 42. The purpose of this configuration is to permit the cover to be removed and the insertion of a refill 40, preferably a cylinder, containing paste M. Refill cylinder 40 has a closed bottom 45 and terminates in an open top end 41.

25  
30 As in the case of the embodiment shown in Figure 5, the invention of Figure 6 offers similar substantial advantages in cost and product safety to both the consumer and manufacturer. Indeed, the refill 40 can be easily slid into the interior housing of pump 10", and be ready  
35 for instant use by attaching cover 42.

The refill containers thus described and illustrated should be considered as part of the present invention.

Moreover, the refills may take a number of different forms and comprise not only a refill container per se, but, if desired, may include a new piston, such as the piston 17" in Figure 5, in which case the original piston will be discarded.

In addition, the refills may be made of a wide variety of suitable materials. For example, currently sold toothpaste pumps employ polypropylene (PP) or polyethylene (PE) or polyethylene terephlate (PET) or copolymers of PP and PE for the body walls of the pump which contains the paste and these body walls typically are relatively thick in order to prevent loss of flavorants, etc. through the body wall, which can occur when long shelf-life is required.

Alternatively, the refills shown herein can be made relatively thin and of said current materials, where long shelf-life is not needed. Or, where long shelf-life is desired, the refill may be made relatively thin and utilize so-called gas barrier materials, such as ethylene alcohol copolymer (EVOH), polyamides such as Nylin (PA), polyvinylidene chloride and copolymers thereof (PC), etc., which prevent the escape of flavorants or other components of the paste which can convert into a gas phase. These materials may be formed in a single layer, such as by extruding the same as a tube or by extrusion blow molding (EBM), the latter being more desirable since the bottom of the refill is formed in the mold, as well as the threads or other means of attachment. More preferably, these barrier materials are incorporated in a multiple layer structure which is extruded, again preferably by EBM coextrusion. This latter use of barrier materials formed into a refill is believed to be preferable particularly for refill 40 of Figure 6.

Further, although only certain specific embodiments thereof have been shown and described, it is well within this invention that refill containers having the same inventive concept but different designs may be used.

5 For example, the particular means whereby the refill container is attached to the pump or inserted therein is, to some degree, a matter of choice.

10 Further, by way of additional modifications which are within this invention, the pump body may be other than circular in cross-section. For example, the body can just as well be square or rectangular in cross-section, in which case the re-fill would have the same cross-section and means other than screw threads would normally be employed.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A dispensing device for dispensing pasty material comprising:

a closed housing having top and bottom portions and an interior chamber;

5 a nozzle movable between first and second positions, said nozzle having a channel with an inlet and an outlet and having a blocking surface, said nozzle being located external to said closed housing;

10 a tube extending from the nozzle into said interior chamber of said housing, said tube being secured to said closed housing and having a channel with an inlet and an outlet, said tube inlet communicating directly with said interior chamber and said tube outlet communicating directly with said nozzle inlet when said nozzle is in said first position and being blocked by said blocking surface when said nozzle is in said second position;

15 a piston slidably disposed around said tube for displacement within said interior chamber; and

20 spring means disposed between said top portion of said housing and said piston for urging said piston toward said bottom portion of said housing,

whereby the pasty material in said interior chamber is discharged out said nozzle outlet by way of said tube when said nozzle is in said first position in response to the urging of said spring means.

25

2. The dispensing device as defined in claim 1, wherein





said nozzle is rotatable between first and second positions.

3. The dispensing device as defined in claim 1, wherein said pasty material is a dentrifice.

4. The dispensing device as defined in claim 1, wherein  
5 said bottom portion is integrally connected to a first cylindrical wall to form a refill container having said interior chamber, further comprising means for removably securing said refill container at a predetermined position relative to said top portion.

5. The dispensing device as defined in claim 4, wherein  
10 said means for removably securing comprises interengaging threads on said refill container and on said top portion.

6. The dispensing device as defined in claim 4, wherein  
said means for removably securing comprises interengaging threads on said refill container and on a second cylindrical wall extending  
15 from and integrally connected to said top portion.

7. The dispensing device as defined in claim 1, wherein  
said bottom portion is removably coupled by attachment means to a cylindrical wall extending from and integrally connected to said top portion, further comprising a refill container having said  
20 interior chamber which is slidably insertable in said cylindrical wall when said bottom portion is removed therefrom.

8. The dispensing device as defined in claim 7, wherein  
said attachment means comprise interengaging threads on said bottom portion and on said cylindrical wall.

9. The dispensing device as defined in claim 7, wherein  
25 said attachment means comprise means for snap-fitting.

10. The dispensing device as defined in claim 4, wherein



said refill container is formed of one or more polymeric materials selected from the groups consisting of PP, PE, copolymers of PP and PE, PET, EVOH, PA and PC.

5 11. The dispensing device as defined in claim 7, wherein said refill container is formed of one or more polymeric materials selected from the groups consisting of PP, PE, copolymers of PP and PE, PET, EVOH, PA and PC.

12. The dispensing device as defined in claim 4, wherein said means for removably securing comprises means for snap-fitting.

10 13. The dispensing device as defined in claim 4, wherein said refill container comprises a single-layer structure.

14. The dispensing device as defined in claim 4, wherein said refill container comprises a multiple-layer structure.

15 15. The dispensing device as defined in claim 7, wherein said refill container comprises a single-layer structure.

16. The dispensing device as defined in claim 7, wherein said refill container comprises a multiple-layer structure.

DATED this 22nd day of November, 1991.

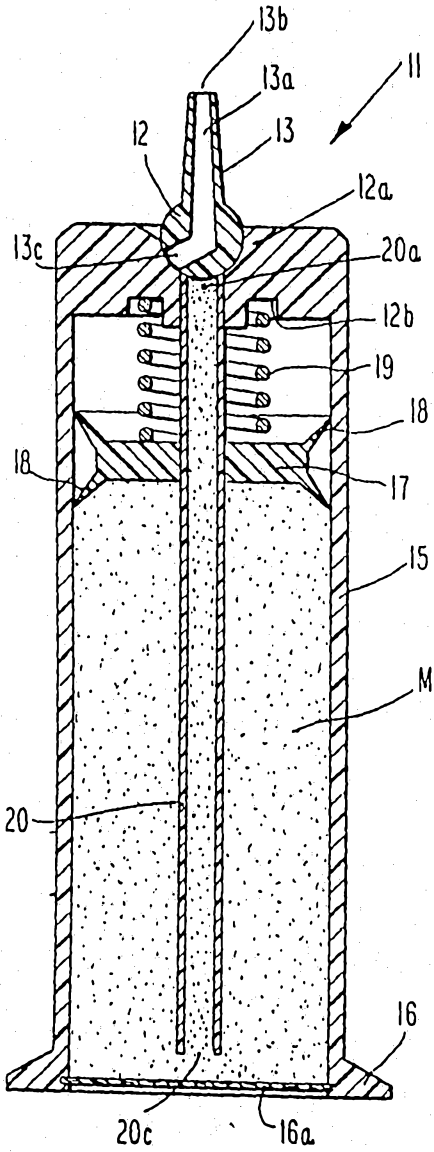
COLGATE-PALMOLIVE COMPANY

Patent Attorneys for the applicant:

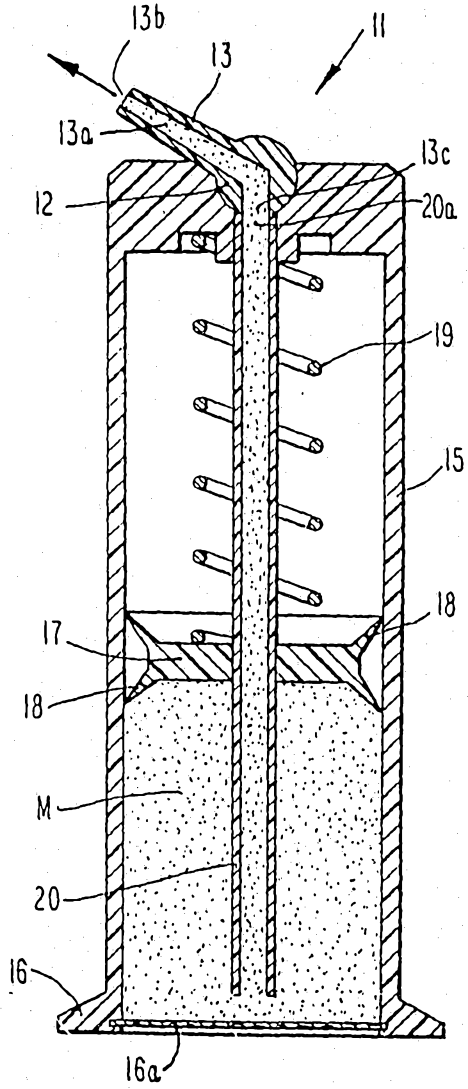
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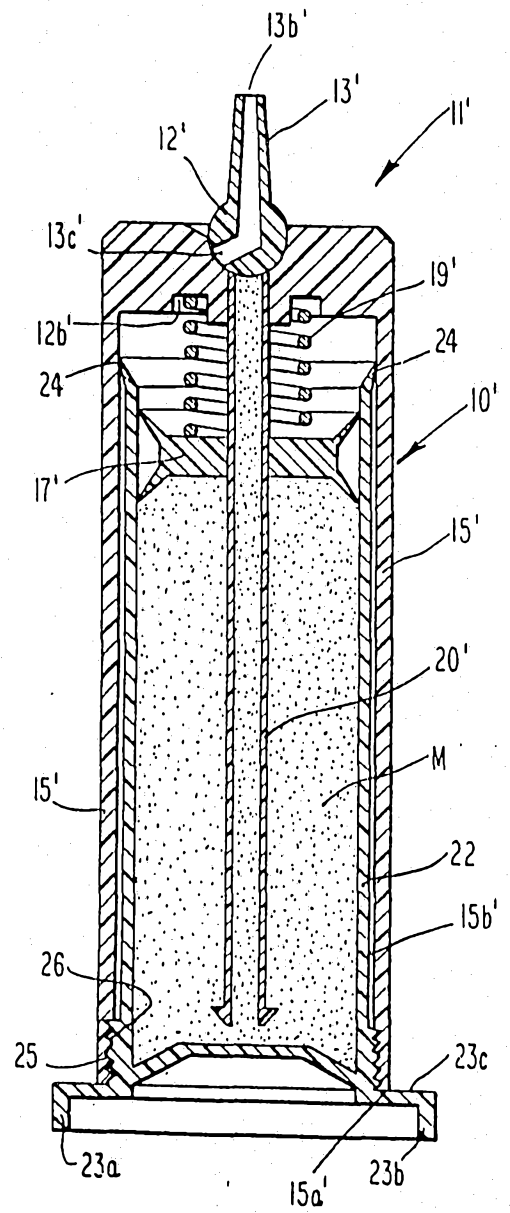
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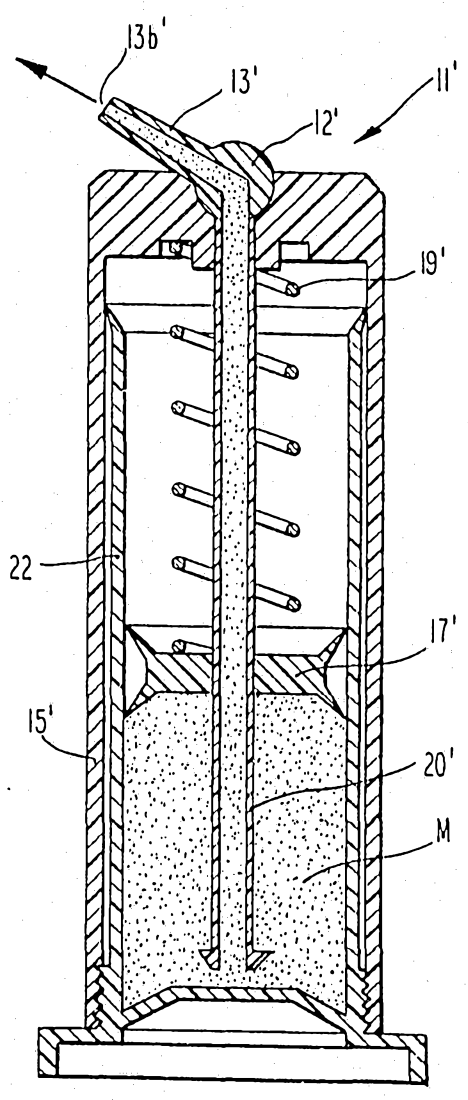
**Fig. 1**



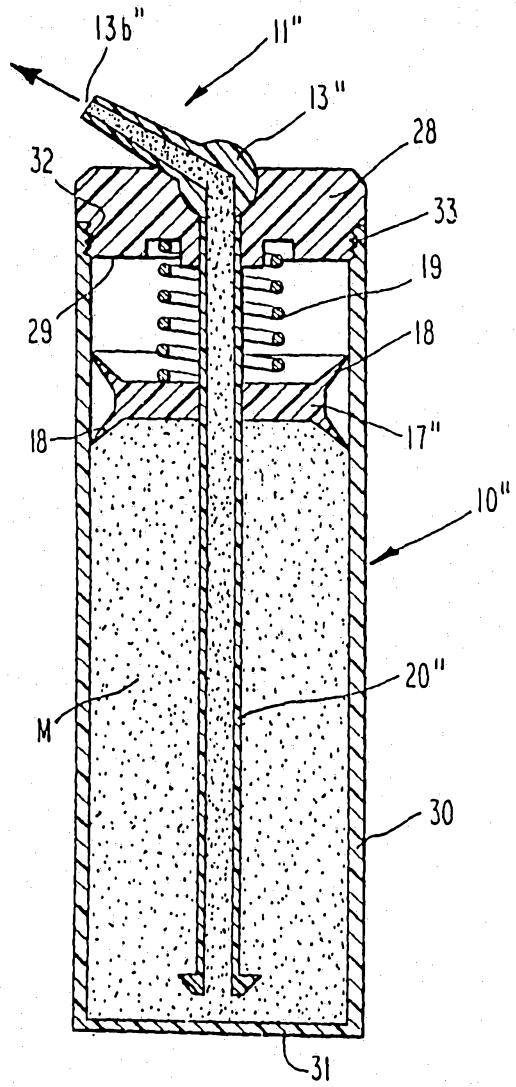
**Fig. 2**



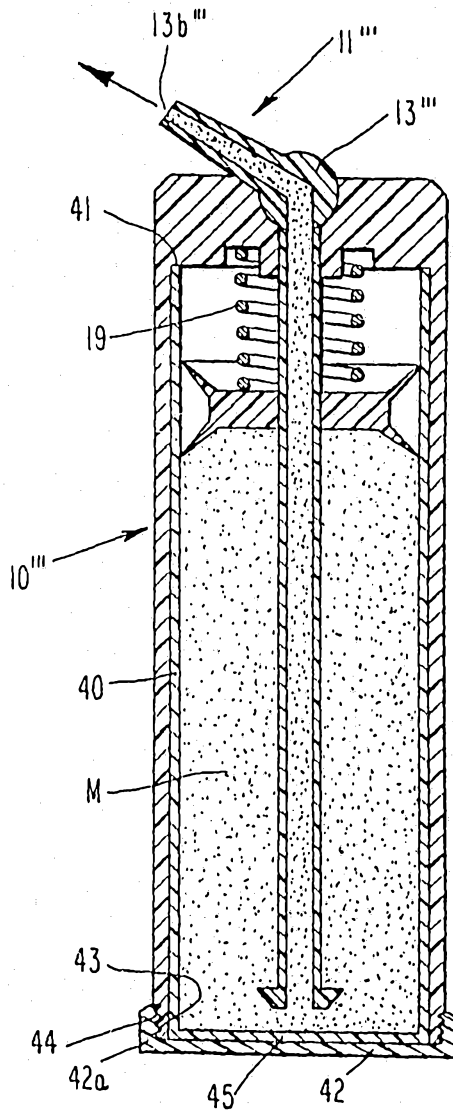
**Fig. 3**



**Fig. 4**



**Fig. 5**



**Fig. 6**