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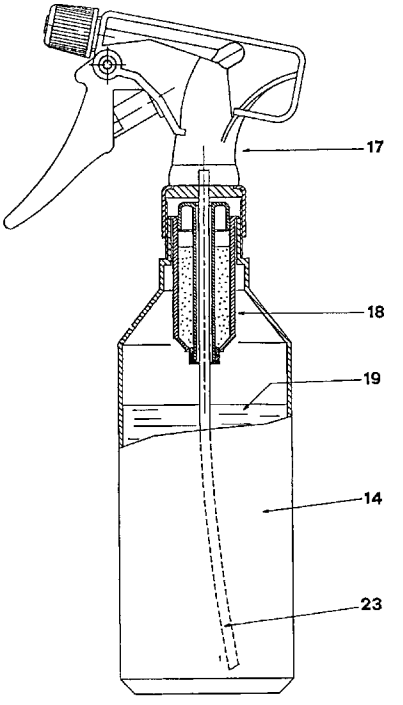
(54) **CONTENANT POUR POUDRE OU LIQUIDE CONCENTRE A PLACER, AU MOMENT DE SON UTILISATION, DANS UNE SOLUTION A L'INTERIEUR D'UNE ENCEINTE**

(54) **CONTAINER FOR CONCENTRATED POWDER OR LIQUID SUBSTANCES TO BE PUT IN SOLUTION WITHIN AN ENCLOSURE AT THE TIME OF USE**



(57) La présente invention se rapporte à un contenant pour poudre ou liquide concentré à placer, au moment de son utilisation, dans une solution à l'intérieur d'une enceinte composée de plusieurs éléments. Ces éléments sont essentiellement creux, de forme cylindrique et de configuration axiale et sont assemblés mécaniquement de façon à former des zones de différents diamètres. Lesdits éléments définissent en leur centre intérieur un caisson étanche en forme de couronne cylindrique par rapport à leur positionnement axial.

(57) The invention relates to a container for concentrated powder or liquid substances to be put in solution within an enclosure at the time of use, of the type comprised of a plurality of elements, essentially hollow and with cylindrical shape and arranged coaxially, assembled by mechanical engagement in correspondence with zones of different diameter, said elements defining internally, in their intermediate space, a watertight chamber in the shape of a cylindrical crown in correspondence with their reciprocal precise axial positioning.

Title:

Container for concentrated powder or liquid substances to be put in solution within an enclosure at the time of use

The invention relates to a container for concentrated powder or liquid substances to be put in solution within an enclosure at the time of use, of the type comprised of a plurality of elements, essentially hollow and with cylindrical shape and arranged coaxially, assembled by mechanical engagement in correspondence with zones of different diameter, said elements defining internally, in their intermediate space, a watertight chamber in the shape of a cylindrical crown in correspondence with their reciprocal precise axial positioning.

(Fig. 1).

Description

This invention relates to a container for concentrated powder or liquid substances to be put in solution within an enclosure at the time of use according to the general part of claim 1.

It is known that sometimes concentrated substances need to be preserved, usually in the form of a liquid or powder, which are dissolved in a solvent, generally composed of water, only at the time they are used.

Typically this occurs, for example, in the domestic area for advance preparation of fertilizer, herbicide or other similar solutions.

The fact that these substances can be kept in sealed containers enables the following advantages: first, a bottle or similar container can be filled with the desired solution only when there is an actual need to use it, and second, many of the substances mentioned above tend to deteriorate over time once they are put in solution, but retain their quality for extremely long periods of time if kept in an essentially airtight package.

Industrial patent no. 1,188,018 and patent application no. V192A000192 describe a container comprised of a pair of essentially hollow elements having a cylindrical shape, one of which is located inside the other, and which are assembled by mechanical engagement in correspondence with two zones of different diameter; said elements define internally, in their intermediate space, a watertight chamber in the shape of a

cylindrical crown in correspondence with their reciprocal precise axial positioning.

This container is especially suitable for being fitted to the mouth of a bottle.

As claimed in the invention, the internal element can be slid in an axial direction with respect to the external element, while the latter remains fixed to the aforementioned mouth; this is easy to do while screwing down the ring nut of a sprayer capable of ejecting the solution from the bottle.

This causes the ejection of the concentrated substances from the aforementioned chamber and consequently their dropping into the bottle, causing mixing of the substances with the solvent which fills the bottle.

Thus, all the user need do is acquire the container containing the liquid which he needs, which requires an extremely small amount of space due to the high concentration of its contents, with application as a matter of general principle to any bottle, enclosure or the like.

It is also evident that given the small space occupied by a single container, it is very useful and simple for the user to acquire and keep a plurality thereof, not to mention that for the industry which produces concentrated substance it is easier to market a substance in a small container than it is to market the substance in a large bottle or the like.

However, the containers manufactured in the aforementioned other patents have the disadvantages which arise both in the phase of manufacturing the individual pieces which are to form

the container itself and during use of the container, when it is applied to the bottle or the like.

Specifically, the container described in patent no. 1,188,018 is not sufficiently tight relative to the discharge of the substance from between the two aforementioned cylindrically shaped elements, due to the smallness of the surfaces which intervene in correspondence with the zone of greater diameter.

The container described in patent application no. VIA92000192, however, has a movable element provided with radial projections. This makes it complicated to manufacture using the injection molding technique, and moreover requires considerable effort to open, which takes place by widening and opening the discharge hole, not to mention the need to use a considerable amount of plastic material and the disadvantage of the volume of the aforementioned watertight chamber.

The object of this invention is a container characterized by security, functionality, ease of manufacture and with limited consumption of materials in its manufacture, which is considerably superior to known devices of this type and in particular to the devices cited above.

The object is achieved as claimed in the invention with a container comprised of three substantially hollow elements with cylindrical shape, coaxial and reciprocally assembled by mechanical engagement in correspondence with three zones of different diameter, in such a way as to define in their intermediate space a watertight chamber in the form of a cylindrical crown.

In terms of construction, the first cylindrically symmetrical element has a bottom with an axial hole in its lower part.

The second cylindrically symmetrical element is situated inside the first element and is comprised of a collar in the shape of an inverted cup, from the bottom of which projects a last coaxial cylindrical element towards the bottom of the aforementioned first element.

The outside diameter of the collar is such that it can slide inside the first element with engagement in such a way as to obtain a watertight fit.

The third element is a ring which threads onto the end of the cylindrical element projecting from the second element and when tightened until locked forms a single piece with this second element.

The external diameter of the ring allows it to slide within the hole in the bottom of the first element with engagement in such a way as to obtain a watertight fit.

After assembling the three elements, the container made in this way is composed of two parts, the first composed of the first element placed externally, and the second placed internally and coaxial with the aforementioned first element, composed of the second and third elements.

In correspondence with a precise position of the second part with respect to the first, the aforementioned collar and ring close the two ends opposite the intermediate space which comprises the watertight chamber in the shape of a cylindrical crown into which the concentrate has been previously poured.

The possibility of axially sliding the internal part with respect to the external part towards the bottom of the first element determines the axial shift of the ring which, completely emerging from the first part, clears the hole from the bottom of the latter, allowing as a consequence the concentrated substance to leave the aforementioned chamber and as a result its dropping into the underlying bottle.

Finally, the invention has on the internal surface of the first element at least one microprojection which, defining a microdeformation of the external surface of the collar when the latter completely enters the first element, forms a channel which places the top part of this chamber in contact with the outside, thereby facilitating the emptying of concentrated substance from its lower part.

The invention also relates in its dependent claims to particular embodiments which make it especially simple and efficient.

These and other characteristics of the invention shall be described in detail below with reference to a particular embodiment, given by way of non-restrictive example, with the aid of the attached diagrams, wherein:

Fig. 1 (Plate I) shows a longitudinal cross-section of the container according to the invention, applied to a bottle, equipped with a sprayer on top, in the closed or watertight position;

Fig. 2 (Plate II) shows the same view with the container in the open position in such a way as to allow the concentrated substance inside it to be discharged;

Fig. 3 (Plate III) shows a longitudinal cross-section of the first cylindrically symmetrical element present in the device as claimed in to the invention;

Fig. 4 shows a detailed view cut away along line IV-IV shown in Fig. 3.

Fig. 5 shows a longitudinal cross-section of the second cylindrically symmetrical element present in the device as claimed in the invention;

Fig. 6 shows a longitudinal cross-section of the third cylindrically symmetrical element present in the device as claimed in the invention;

Fig. 7 shows a longitudinal cross-section of the container in the closed or watertight position;

Fig. 8 (Plate IV) shows a longitudinal cross-section of the reciprocal assembly phase of the first and second elements to form the container;

Fig. 9 shows a longitudinal cross-section of the phase in which the concentrate is injected into the container;

Fig. 10 shows the assembly phase of the third element for closure of the container;

Fig. 11 shows a longitudinal cross-section of the container in the open or emptying position;

Fig. 12 shows a detailed view cutaway along line XII-XII depicted in Fig. 11.

As shown in the attached figures, the container as claimed in the invention is composed of three elements 1, 2 and 3, all of essentially cylindrical shape; in particular, elements 2 and 3 are capable of being inserted coaxially into element 1. The

latter has, in correspondence with its lower part, bottom 4 in whose central part hole 5 is made axially.

Element 2 has collar 6 in the shape of an inverted cup, and from the latter final projecting element 7 projects towards hole 5 of element 1.

Element 3 is a ring with central hole 8 which allows the ring to be threaded and locked onto terminal portion 9 of aforementioned projecting element 7, forming a single piece with element 2.

As is obvious from Figures 7 and 10, in correspondence with a precise position of elements 2 and 3 (joined together) with respect to external element 1, intermediate space 10 is formed which can accommodate concentrate 11 in the form of powder or liquid.

The particular size (upon engagement) of the external diameter of element 3 and of hole 5, present on bottom 4 of element 1, makes it possible in reciprocal contact zone 12 to ensure that substance 11 is contained in a watertight manner (see Fig. 7).

Likewise, the particular size (upon engagement) of the external diameter of collar 6 and of an upper part of the internal cylindrical surface of element 1 makes it possible in reciprocal contact zone 13 to ensure that substance 11 is contained in a watertight manner (see Fig. 10) when the container is being filled.

The container as claimed in the invention can, as shown in Fig. 1 by way of example, be put fitted to the upper mouth of bottle 14 containing a solvent, for example, water.

In this case, advantageously the upper portion of element 1 will be shaped like collar 15 which rests on the top edge of said mouth.

As shown in Figures 1 and 2, when ring 16 of sprayer 17 is screwed onto the threaded mouth of bottle 14, an opening is formed toward the bottom of container 18, in such a way that the substance it contains within will drop into underlying solvent 19 contained in the bottle.

More specifically, this is due to the fact that following axial shift towards the bottom of element 2, following the push caused by said ring 16 on collar 6, element 3, joined to said element 2, is moved away from bottom 4 of element 1, forming a circular opening 20 which allows discharge of substance 11 from container 18 (see Fig. 11).

The emptying action from intermediate space 10 is promoted by putting the top part of the aforementioned into contact with the outside in such a way as to eliminate the effects of the so-called opposite cavity.

This is done by the presence on the internal wall of element 1 of at least one microprojection 21 which defines a deformation of the external surface of collar 6 when the latter, pushed by ring 14, enters element 1 (see Fig. 12).

Finally, inside projecting element 7 there is advantageously channel 22 which allows the internal part of bottle 14 or the enclosure to which the container is applied with the outside to be put into communication, said channel allowing passage of hollow needle 23 used for the operation of sprayer 17.

Container 18 as claimed in the invention can be applied as well to a bottle or similar object without a sprayer.

As demonstrated above, there are numerous advantages deriving from adoption of the container according to the invention.

A first advantage derives from the simplified geometry of the three elements, for which reason the molding of these parts can be done very quickly.

A second advantage relates to the operation of filling with the concentrate which can be done by using injectors 24 with vertical needles, considerably simplifying this operation.

In addition, the force required to open the container is minimal, since all that need be done is to overcome the resistance of the engagement coupling between hole 5 of element 1 and element 3, in reciprocal contact zone 12.

Finally, considering that the containers before use can be kept in very many different places, in case of their exposure to the sun or while sitting in the heat, the watertightness of intermediate space 10 is always ensured.

In the container as claimed in the invention, watertightness is ensured since in the case of heating the area contained in the intermediate space exerts maximum pressure on collar 6, where however the watertight surface 13 is considerable.

Claims

1. Container for concentrated powder or liquid substances to be put in solution in an enclosure at the time of use, of the type comprised of a plurality of elements, essentially hollow and with cylindrical symmetry and arranged coaxially, assembled by mechanical engagement in correspondence with zones of different diameter, said elements defining internally, in their intermediate space, a watertight chamber in the shape of a cylindrical crown in correspondence with their reciprocal precise axial positioning, characterized in that the container is comprised of three elements, the first element (1) having in its lower part funnel-shaped bottom (4) with hole (5) situated axially, the second element (2) having collar (6) in the shape of an inverted cup [illeg.] from the opposite part with respect to the bottom of the preceding element, there being from the bottom of said collar projecting towards said hole (5) last projecting element (7), the third element (3) comprising a ring whose center hole (8) is locked by engagement on the terminal part (9) of said projecting element (7) in correspondence with a well defined axial position of the three elements, and characterized in that the external surface of element (3) mechanically engages the surface of hole (5) and the external surface of collar (6) mechanically engages the internal surface of first element (1), creating two watertightness zones (12, 13) for intermediate space (10) containing the concentrate (11).

2. Container as claimed in claim 1, wherein first element (1), situated externally, contains within it second element (2)

and in [sic] third element (3), these latter two elements comprising a single body which, sliding axially, removes third element (3) from hole (4), causing emptying of intermediate space (10).

3. Container as claimed in either of the preceding claims, wherein on the internal surface of first element (1) there is at least one microprojection (21) which deforms the external surface of collar (6) when the latter enters first element (1).

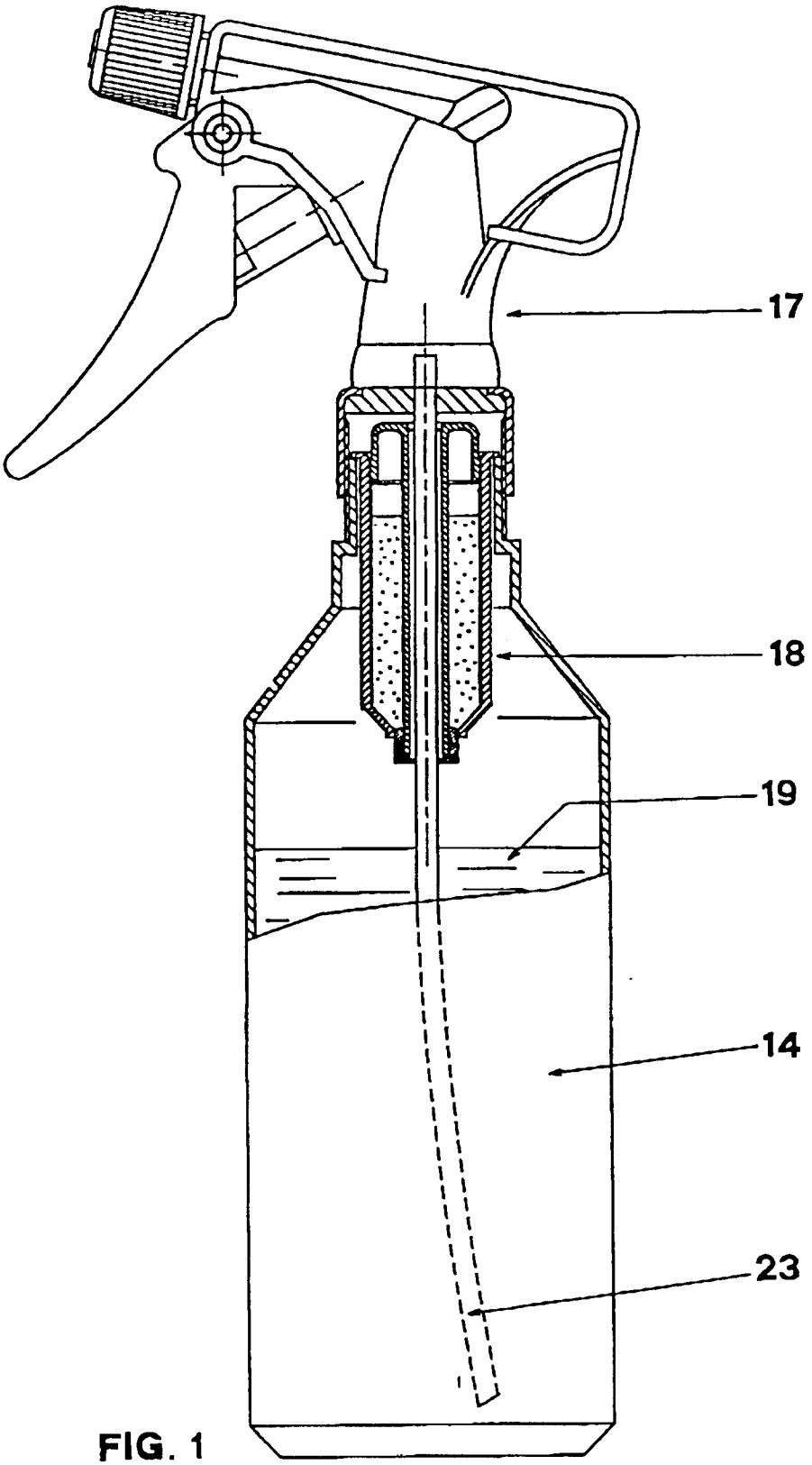


FIG. 1

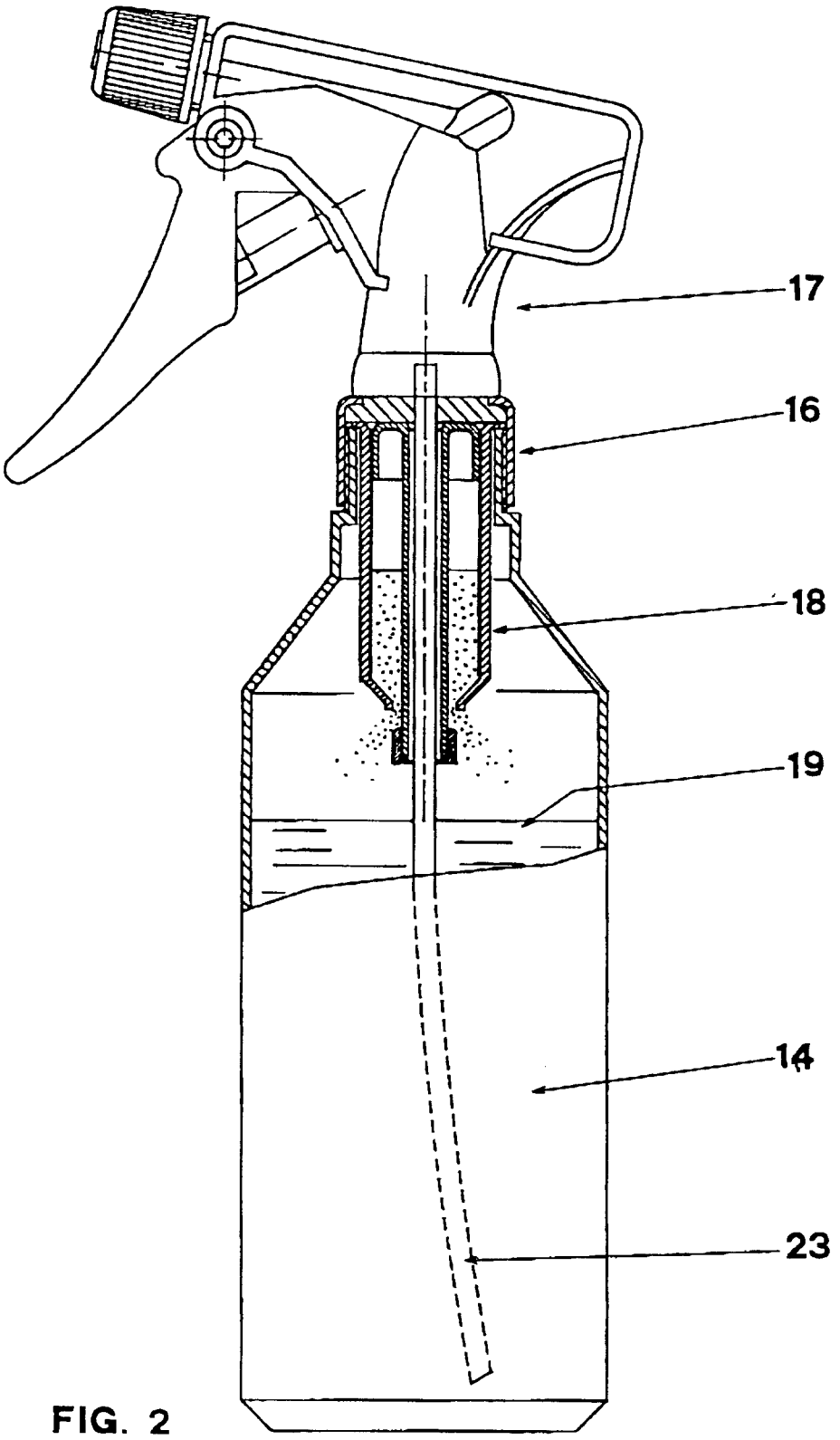


FIG. 2

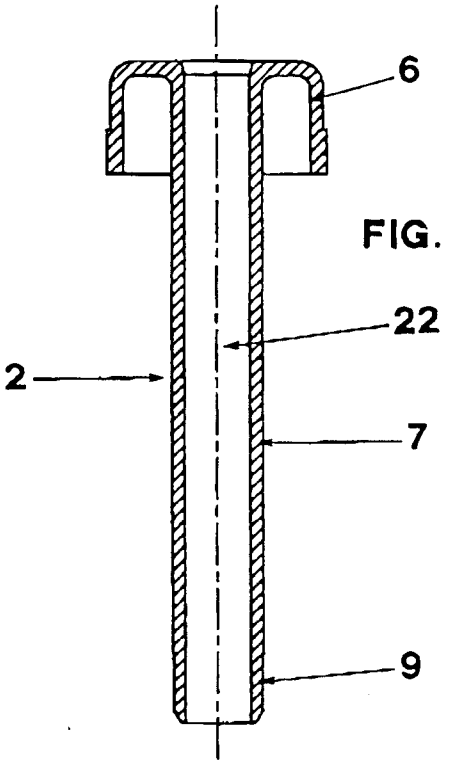


FIG. 5

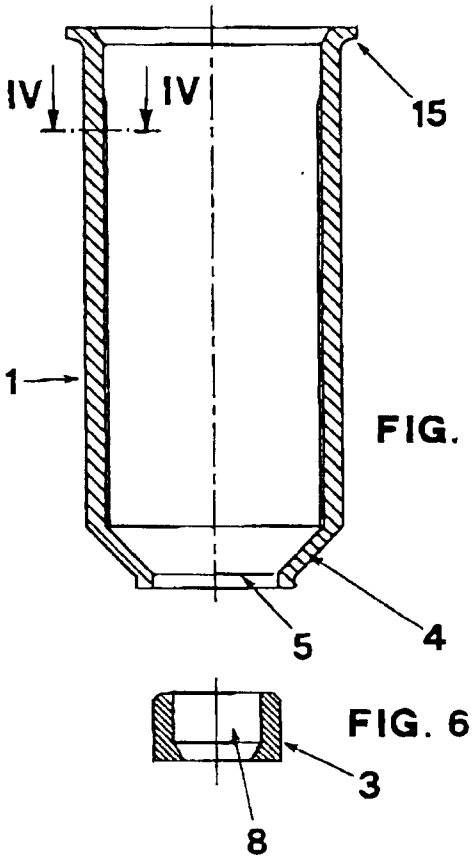


FIG. 3

FIG. 6

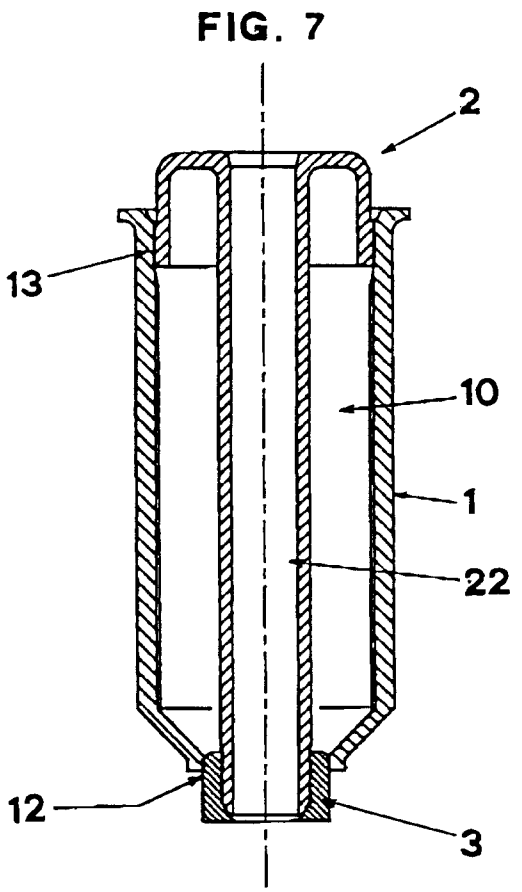


FIG. 7

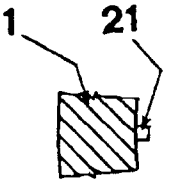


FIG. 4

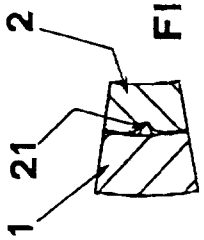


FIG. 12

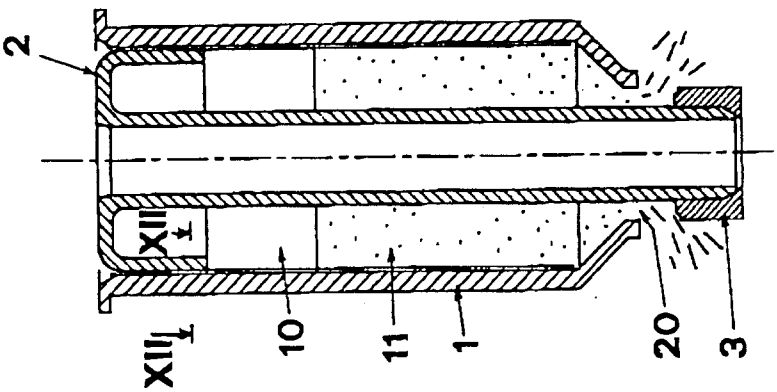


FIG. 11

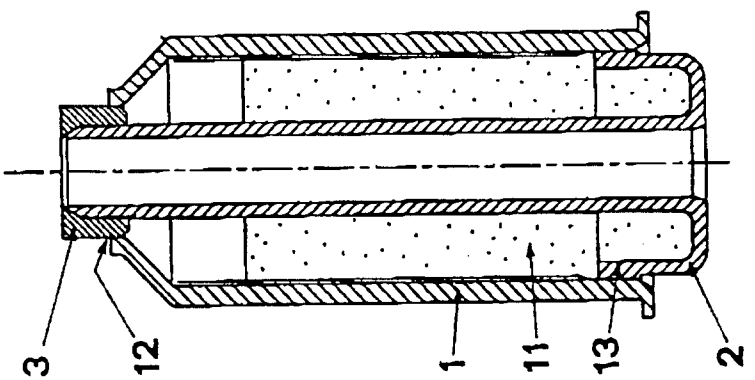


FIG. 10

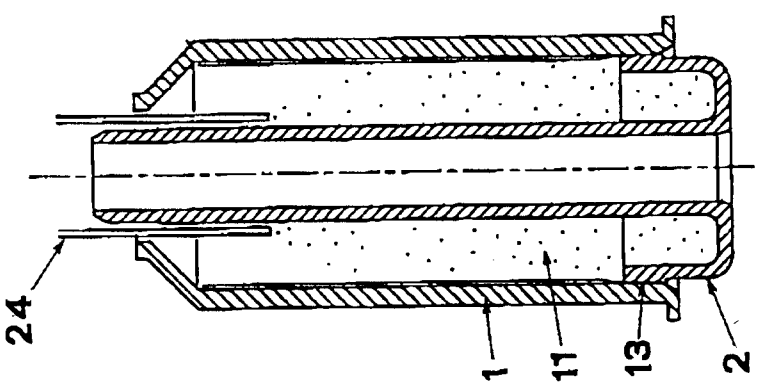


FIG. 9

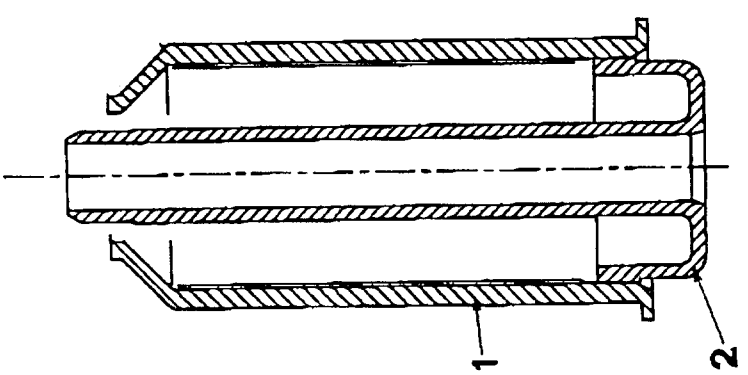
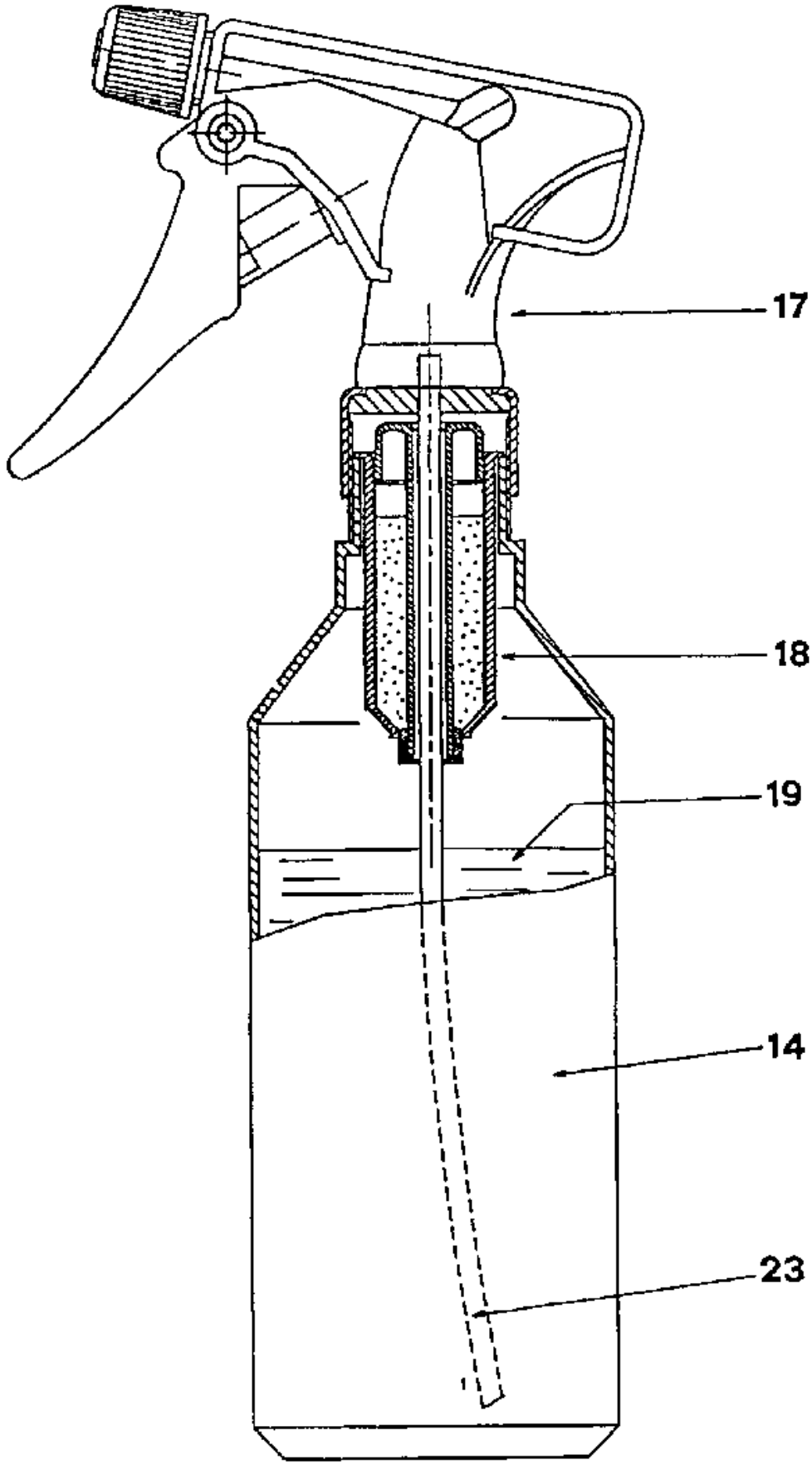


FIG. 8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