

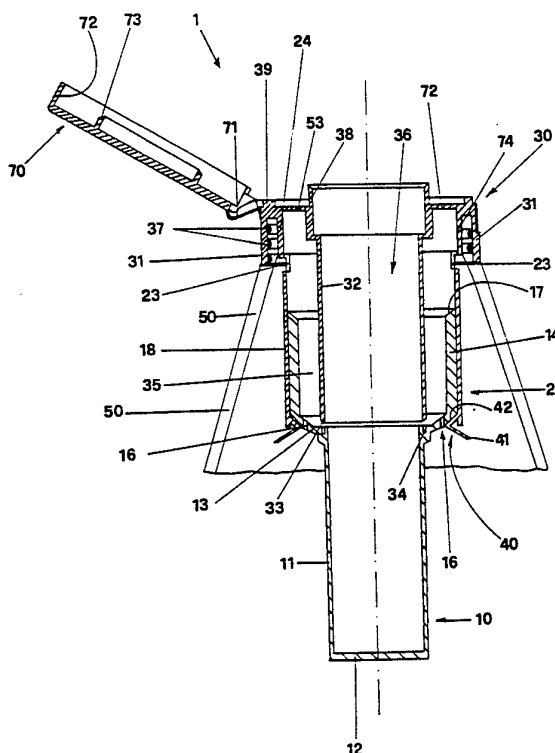


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/EP93/02425 (22) International Filing Date: 8 September 1993 (08.09.93) (30) Priority data: VI92A000130 10 September 1992 (10.09.92) IT (71) Applicant (for all designated States except US): TAPLAST SRL [IT/IT]; Strada Marosticana, 65/67, I-36031 Povol-aro (IT). (71)(72) Applicant and Inventor (for CA US only): SANTAGIU-LIANA, Evans [IT/IT]; Via O. Da Pordenone, 13, I-36100 Vicenza (IT). (74) Agent: BONINI, Ercole; Studio Ing. E. Bonini SRL, Cor-so Fogazzaro, 8, I-36100 Vicenza (IT).	(81) Designated States: BR, CA, JP, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	

(54) Title: IMPROVED MEASURING/DISPENSING DEVICE FOR LIQUID PRODUCTS**(57) Abstract**

The invention discloses a measuring-dispensing device for liquid substances comprising: a first element (10), for holding the measured product to be dispensed; a second element (20), provided with slits (33) for the transit of the substance, slidably coupled in said first element (10); a third element (30) comprising a first tubular part (31) attached to the container (50) and a second tubular part (32) coupled with the first element (10) which defines in its interior a dispensing duct (36) and on its exterior a measuring chamber (35). Said second element (20) and said third element (30) are manufactured in a single piece through a moulding process and said second element (20) is provided with leading means (41) and with elastic deformation means (43) suited to house the coupling of the first element (10), as well as with supporting means (42) suited to prevent the separation of the first element (10) when the coupling has occurred.



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1 IMPROVED MEASURING/DISPENSING DEVICE FOR LIQUID PRODUCTS

2 The invention concerns an improved measuring/dispensing
3 device for liquid products.

4 It is a known fact that detergents are sold in containers,
5 often provided with a measuring cap, which guarantees the
6 dispensing of a pre-determined and constant quantity of
7 detergent.

8 Some measuring/dispensing devices of the known type, fore-
9 see the use of a ball placed in the interior of dispensing
10 channels and immersed in the liquid detergent, which,
11 whenever the container is capsized, moves toward the
12 dispensing hole thus occluding it after a while.

13 Said measuring devices present the inconvenience of having
14 a rather limited precision, the dispensed quantity being
15 influenced by various parameters, such as the different
16 speed at which the ball falls down depending on the vis-
17 cosity of the liquid detergent into which said ball is
18 immersed, the speed variations of the ball depending on
19 the degree of inclination of the container and finally, the
20 speed differences of the detergent itself in relation to
21 the liquid head.

22 Other types of as well-known measuring devices present a
23 measuring chamber, into which the detergent to be dispensed
24 enters when the container is capsized, and a collecting
25 chamber, into which the measured detergent enters when the
26 container is brought back to its upright position.

27 The dispensing of the product occurs when the container is
28 capsized again, at which point the pre-measured detergent
29 flows out of the collecting chamber, while a new quantity
30 of detergent flows from the container into the measuring
31 chamber.

32 Such measuring devices present the inconvenience of being
33 rather imprecise when the change of the container from its
34 vertical position into the dispensing slanted position
35 occurs slowly.

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1 In order to overcome the mentioned inconveniences, the
2 measuring-dispensing device for liquid products object of
3 the deposit n. 85695 in the name of the same inventor has
4 been disclosed, said device presenting an external body,
5 connected to the container, and a dispensing duct, inter-
6 nally co-axial with the external body, a ring-shaped area
7 being defined between them in which a measuring element is
8 arranged, which slides axially and is freely coupled with
9 the external body.

10 When the container is capsized, the measuring element
11 slides within the external body, thus allowing a measuring
12 chamber to be filled up; its contents subsequently flow
13 into the measuring element, when the container is brought
14 back to its upright position.

15 When the container is capsized again, the dispensing of the
16 pre-measured detergent occurs, while, at the same time, the
17 measuring chamber is filled up again.

18 The described measuring-dispensing device realises a mea-
19 suring precision which is independent from the liquid
20 density, but presents the inconvenience of being of rather
21 complex manufacture because it consists of three separate
22 pieces.

23 Moreover, said pieces, which must be connected together and
24 to the container, require also a considerable assembly
25 work which is normally performed with automatic assembling
26 machines.

27 It is the purpose of the present invention to obtain a
28 measuring-dispensing device consisting of separate parts,
29 the number of which is smaller than that of the above
30 mentioned measuring-dispensing device.

31 It is yet another purpose for said measuring-dispensing
32 device to present all the advantages of the mentioned
33 measuring-dispensing devices.

34 It is another purpose that the manufacture and the assembly
35 of the measuring-dispensing device according to the inven-

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tion can be more economical in relation to the measuring-dispensing devices of the known type.

The described purposes are reached by a measuring-dispensing device for liquid substances, which, in accordance with the main claim comprises:

- a first element for holding the measured product to be dispensed, presenting a holding chamber closed by a bottom layer, connected to a collecting chamber through a truncated-conic intersecting surface;
- a second element consisting of a tubular body sliding coupled with the external surface of the collecting chamber of said first element, said second element presenting an open bottom provided with means for holding said first element after they have been coupled, and with one or more slits for the transit of the substance, made in the tubular body itself;
- a third element comprising a first tubular part, attached to the container through coupling means and a second tubular part, internally coupled with the collecting chamber of the mentioned first element, said tubular parts being connected to one another through an annular area, wherein said second tubular part defines in its interior a dispensing duct and on its exterior it defines a measuring chamber delimited by the inner wall of the collecting chamber of the first element,

and is characterized in that said second element and said third element are obtained in a single piece through a moulding process, the upper rim of said second element belonging to the annular area of said third element, said second element being also provided with leading means and with elastic deformation means suited to help the yielding of the tubular body forming it, in order to house the coupling of the collecting chamber of the first element, as well as with supporting means suited to prevent the separation of the first element when the coupling has

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1 occurred.

2 Advantageously, the measuring-dispensing device according
3 to the invention is less costly to manufacture as compared
4 with the measuring devices of the same type.

5 Moreover, advantageously it is of simpler assembly, being
6 formed by a smaller number of pieces which make it possible
7 to simplify the assembling cycle in the automatic assem-
8 bling machines.

9 Further scope of applicability of the present invention
10 will become apparent from the detailed description given
11 hereinafter. However, it should be understood that the
12 detailed description and specific example, while indicating
13 a preferred embodiment of the invention, are given by way
14 of illustration only, since various changes and modifica-
15 tions within the spirit and scope of the invention will
16 become apparent to those skilled in the art from this
17 detailed description and from the drawings, wherein:

18 - Fig. 1 represents in a cross-section the measuring-dis-
19 pensing device according to the invention, coupled with a
20 container;

21 - Fig. 2 represents the measuring-dispensing device in an
22 exploded view of its components;

23 - Fig. 3 represents the measuring-dispensing device of Fig.
24 2 during the joining phase of the first element to the
25 second and third element;

26 - Fig. 4 represents the measuring-dispensing device of Fig.
27 1 while the measuring chamber is being filled up;

28 - Fig. 5 represents the measuring-dispensing device of Fig.
29 1 while the holding chamber is being filled up;

30 - Fig. 6 represents the measuring-dispensing device of Fig.
31 1 while the liquid product is being dispensed.

32 - Fig. 7 represents in a cross-section a different embodi-
33 ment of the measuring-dispensing of the invention;

34 - Fig. 8 represents one of the elements which compose the
35 device of fig. 7;

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1 - Fig. 9 represents a further element which composes the
2 device in Fig. 7;

3 - Fig. 10 represents a plan view of the element represented
4 in Fig. 9.

5 As can be observed in Fig. 1 and in Fig. 2, the measuring-
6 dispensing device according to the invention, indicated as
7 a whole with 1, comprises a first element, indicated as a
8 whole with 10, presenting a holding chamber 11 provided
9 with a bottom layer 12, connected to a collecting chamber
10 14 ending with a bevelled rim 17 through a truncated-conic
11 intersecting surface 13.

12 The measuring-dispensing device comprises a second element
13 too, indicated as a whole with 20, presenting a tubular
14 body 18 provided with an open bottom 19 at one end and with
15 slits 23 on the side for the transit of the product.

16 Finally, the measuring-dispensing device is completed with
17 a third element, indicated as a whole with 30, and present-
18 ing a first tubular part 31 attached to the container 50
19 through a thread 37 and a second tubular part 32, internal
20 in relation to the first one, within which a dispensing
21 duct 36 is defined, said tubular parts being connected to
22 one another through an annular area 53. The device is
23 completed with a lid 70 connected to the first tubular part
24 31 of the third element 30 through a tab 71.

25 It can be observed in particular in Fig. 1 that the second
26 element 20 presents the upper rim 24 realising a single
27 body with the annular area 53 of the third element 30, the
28 second element 20 and the third element 30 being obtained
29 in a single piece during the moulding process and form
30 therefore, at the end of said moulding process, a single
31 body.

32 This fact allows to simplify the manufacture of the measur-
33 ing-dispensing device and to make faster and easier the
34 assembling for the automatic machines, the pieces to be
35 assembled being reduced in number.

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1 In order to assembly the measuring-dispensing device, it is
2 necessary to couple the collecting chamber 14 of the first
3 element 10 within the tubular body 18 which forms the
4 second element 20.

5 For this purpose, as can be observed in Fig. 2 and also in
6 Fig. 3, the second element 20 presents in correspondence
7 with the open bottom 19, a rim 40 consisting of a trunca-
8 ted-conic lip 41, converging toward the interior of the
9 element which intersects with another truncated-conic lip
10 42 diverging from and ending against the inner surface of
11 the tubular body 18 which is provided with notches 43.

12 When the upper rim 17 of the first element 10 is axially
13 pushed following direction 51 against the converging trun-
14 cated-conic lip 41 of the second element 20, it radially
15 stresses the tubular body 18 of said second element, which,
16 because of the presence of the notches 43, expands radially
17 following direction 52, thus allowing the collecting cham-
18 ber 14 to penetrate into the tubular body 18, as can be
19 observed in Fig. 3.

20 When the coupling has been completed, as can be observed
21 in Fig. 1, the divergent truncated-conic lip 42 of rim 40
22 belonging to the second element 20, contrasts against the
23 truncated-conic intersecting surface 13 of the first ele-
24 ment 10 and acts as a holding element which prevents the
25 mutual separation between the first element 10 and the
26 second element 20.

27 The first element 10, driven by the tubular body 18 of the
28 second element 20 within which is coupled, can, therefore,
29 slide axially.

30 In order to make the measuring-dispensing device function,
31 it is necessary first of all, to capsize the container, as
32 indicated in Fig. 4, so that rim 33 of the second tubular
33 part 32 belonging to the third element 30, penetrates into
34 the annular impression 34 of the first element 10, thereby
35 sealing the annular opening 44 for the transit of the

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1 liquid from the annular measuring chamber 35 to the hold-
2 ing chamber 11, said annular measuring chamber being com-
3 prises between the second tubular part 32 of the third
4 element 30 and the collecting chamber 14 of the first
5 element 10, so as to isolate the two corresponding spaces.
6 As the second tubular part 32 belonging to the third ele-
7 ment 30 of the device defines also, as has already been
8 said, a dispensing duct, indicated with 36, which is in
9 communication with the holding chamber 11, when the measur-
10 ing-dispensing device is capsized, the liquid 52 contained
11 in container 50, enters into the annular measuring chamber
12 35 following direction 61, through the slits 23.
13 When the container is brought back to its upright position,
14 as can be observed in Fig. 5, the first element 10 moves
15 away from the rim 33 of the second tubular part 32 because
16 of the gravity, thus opening the annular opening 44 through
17 which the measured dose is conveyed from the annular mea-
18 suring chamber 35 into the holding chamber 11 following
19 direction 62, while
20 the quantity of liquid exceeding the volume of the holding
21 chamber 11, flows out through the holes 16 made on the
22 truncated-conic intersecting surface 13 following direction
23 63, and returns into the container 50 itself.
24 Another capsizing of the container, as can be observed in
25 Fig. 6, permits to the dose contained in the holding cham-
26 ber 11 to flow out through the dispensing duct 36 following
27 direction 64, while, at the same time, another dose of
28 substance is being filled up into the annular measuring
29 chamber 35 passing through the slits 23, again with direc-
30 tion 61.
31 The device according to the invention is completed with a
32 lid 70 which is moulded together with the third element 30
33 of the device and which presents an annular external rim 72
34 engaging with the corresponding projection 39 belonging to
35 the more external part of the third element 30, while the

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1 annular external rim 73 of the lid 70 engages on the rim 38
2 belonging to the second tubular part 32 of the third ele-
3 ment 30 itself.

4 A different embodiment of the measuring-dispensing device
5 of the invention based on the same resolute idea is
6 represented in Fig.7 where you can see that the measuring-
7 dispensing device, showed on the whole with 100 comprises a
8 first element, showed on the whole with 110, also represen-
9 ted in Figg. 9 and 10 and a second element, showed on the
10 whole with 120, also represented in Fig. 8.

11 In particular, in Fig. 7 and in Fig. 8 you can see that
12 said second element 120 presents, near the open bottom 119,
13 a rim 140 having a truncated conic profile 141 with the
14 conicity facing said open bottom 119 and provided, in the
15 internal zone, with a shoulder 142 which makes the first
16 element 110 hold when it is internally coupled to the
17 second element 120 and when it is disposed vertically as
18 represented in Fig. 7.

19 Also in this embodiment, the coupling of said elements
20 between them happens by a radial elastic deformation of the
21 rim 140 appertaining to the second element 120 when the
22 first element 110 is pushed inside the open bottom 119 of
23 the second element 120 following the direction 151.

24 About the first element 110 you can see, particularly
25 referring to figg. 9 and 10, that it laterally presents an
26 opening 116 which functions both as a discharger, in the
27 container 150 to which the measuring dispensing device is
28 coupled of the quantity of liquid exceeding the volume of
29 the holding chamber 111 and as a device which escapes air,
30 if contained inside.

31 You can also see that on the opposite part from the opening
32 116 is disposed a conveyor 190, constituted by a surface
33 having a substantially semicircular form, disposed on the
34 continuity of the tubular surface which defines the holding
35 chamber 111.

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1 When said first element 110 is coupled to said second
2 element, said conveyor 190 projects inside the second
3 element 120 and functions as an orientator of the liquid
4 flux in the dispensing duct 136 during the pouring.
5 Finally, you can see that said first element 110 presents
6 also a couple of orienting ribs 180 disposed symmetrically
7 and on opposite sides from the opening 116, suitable for
8 coupling in corresponding seats made in the tubular body
9 118 of the second element 120.

10 The scope of said ribs is that, when the first element is
11 coupled to the second element 120, the conveyor 190 is
12 disposed as represented in fig. 7. In this way the conveyor
13 190 is oriented on the frontal part of the measuring-dis-
14 pensing device so that the pouring of the product is fa-
15 voured when the container is rotated in the direction 200.

16 On the basis of what has been described, it is easy to
17 understand how the measuring-dispensing device according to
18 the invention reaches the proposed purposes.

19 In fact the purpose of obtaining a measuring-dispensing
20 device presenting a smaller number of components in rela-
21 tion to the measuring-dispensing devices of the known type
22 having similar characteristics is reached.

23 Moreover the purpose of simplifying the manufacturing
24 processes as well as that of allowing a simpler and, there-
25 fore, less costly assembly, thus reducing the assembly
26 cycle on the assembling machine is also reached.

27 During the manufacturing process the measuring-dispensing
28 device according to the invention, may undergo some modifi-
29 cations concerning both the shape of the components and
30 their dimensions.

31 Moreover, the shape, the number and the dimensions of the
32 leading means and of the deformation means which allow the
33 coupling of the elements forming the measuring-dispensing
34 device according to the invention may also.

35 It is however understood that the mentioned modifications

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1 or any others must be considered to fall under the spirit
2 and the scope protected by the present invention.

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1 CLAIMS

2 1) A measuring-dispensing device for liquid substances
3 comprises:
4 - a first element (10) for holding the measured product to
5 be dispensed, presenting a holding chamber (11) closed by a
6 bottom layer (12), connected to a collecting chamber (14)
7 through a truncated-conic intersecting surface (13);
8 - a second element (20) consisting of a tubular body (18)
9 slidably coupled with the external surface of the collect-
10 ing chamber (14) of said first element (10), said second
11 element (20) presenting an open bottom (19) provided with
12 means (42) holding said first element (10) after the coup-
13 ling, and with one or more slits (23) for the transit of
14 the substance made on the side of the tubular body (18)
15 itself;
16 - a third element (30) comprising a first tubular part
17 (31), attached to the container (50) through coupling means
18 (37) and a second tubular part (32), internally coupled
19 with the collecting chamber (14) of the mentioned first
20 element (10), said tubular parts being connected to one
21 another through an annular area (53), wherein said second
22 tubular part (32) defines in its interior a dispensing duct
23 (36) and on its exterior it defines a measuring chamber
24 (35) delimited by the inner wall of the collecting chamber
25 (14) of the first element (10),
26 and is characterized in that said second element (20) and
27 said third element (30) are obtained in a single piece
28 through a moulding process, the upper rim (24) of said
29 second element (20) belonging to the annular area (53) of
30 said third element (30), said second element (20) being
31 also provided with leading means (41) and with elastic
32 deformation means (43) suited to help the yielding of the
33 tubular body (18) forming it, in order to house the coup-
34 ling of the collecting chamber (14) of the first element
35 (10), as well as with supporting means (42) suited to

1 prevent the separation of the first element (10) after the
2 coupling has occurred.

3 2) A device according to claim 1, characterized in
4 that in said first element (10), the truncated-conic sur-
5 face (13) intersecting between the holding chamber (11) and
6 the collecting chamber (14) presents holes (16) suited for
7 the transit of the exceeding quantity of the filled dose.

8 3) A device according to claim 1, characterized in
9 that in said third element (30) the second tubular part
10 (32) presents a rim (33) matching an annular impression
11 (34) found in the truncated-conic intersecting surface (13)
12 belonging to the first element (10) while the device is
13 selecting the dose, said coupling closing the annular
14 opening (44) setting the measuring chamber (35) and the
15 holding chamber (11) into communication.

16 4) A device according to claim 1, characterized in
17 that the coupling means (41) present in said second element
18 (20) and suited to help the elastic yielding of its tubular
19 body (18), are a truncated-conic lip (41) converging toward
20 the interior of said second element (20), wherein said
21 truncated-conic lip (41) intersects with another truncated-
22 conic lip (42) diverging from and ending against the inter-
23 nal surface of the tubular body (18) and acting as a holder
24 suited to prevent the separation of the first element (10)
25 when the coupling has been completed by contrasting against
26 the truncated-conic intersecting surface (13) of the lat-
27 ter, said truncated-conic lips (41, 42) belonging to a
28 single rim (40) arranged in correspondence with the open
29 bottom (19) of the tubular body (18).

30 5) A device according to claim 1, characterized in
31 that the elastic deformation means (43) present in said
32 second element (20) and suited to help the yielding of its
33 tubular body (18), are notches (43) made on the tubular
34 body (18) itself.

35 6) A device according to claim 5, characterized in

1 that the notches (43) have the shape of open slits having a
2 longitudinal development.

3 7) A device according to any of the previous claims,
4 characterized in that said third element (30) presents a
5 lid (70) provided with an external annular rim (71) and
6 with an internal annular rim (72) both matching the corre-
7 sponding annular rims (39, 38) respectively present in the
8 annular rim (53) of said third element (30).

9 8) Device according to claim 1 characterized in that
10 said first element (110) laterally presents at least one
11 opening (116) suitable for discharging the quantity of the
12 charged measure in excess in the container (150) to which
13 said device is coupled.

14 9) Device according to claim 1, characterized in that
15 said coupling means located in said second element (120)
16 are a truncated-conic profile (141) with the conicity
17 facing the open bottom (119) of said second element (120)
18 and belonging to the rim (140) of said open bottom (119).

19 10) Device according to claim 9 characterized in that
20 said rim (140) of said second element (120) internally
21 presents a supporting shoulder (142).

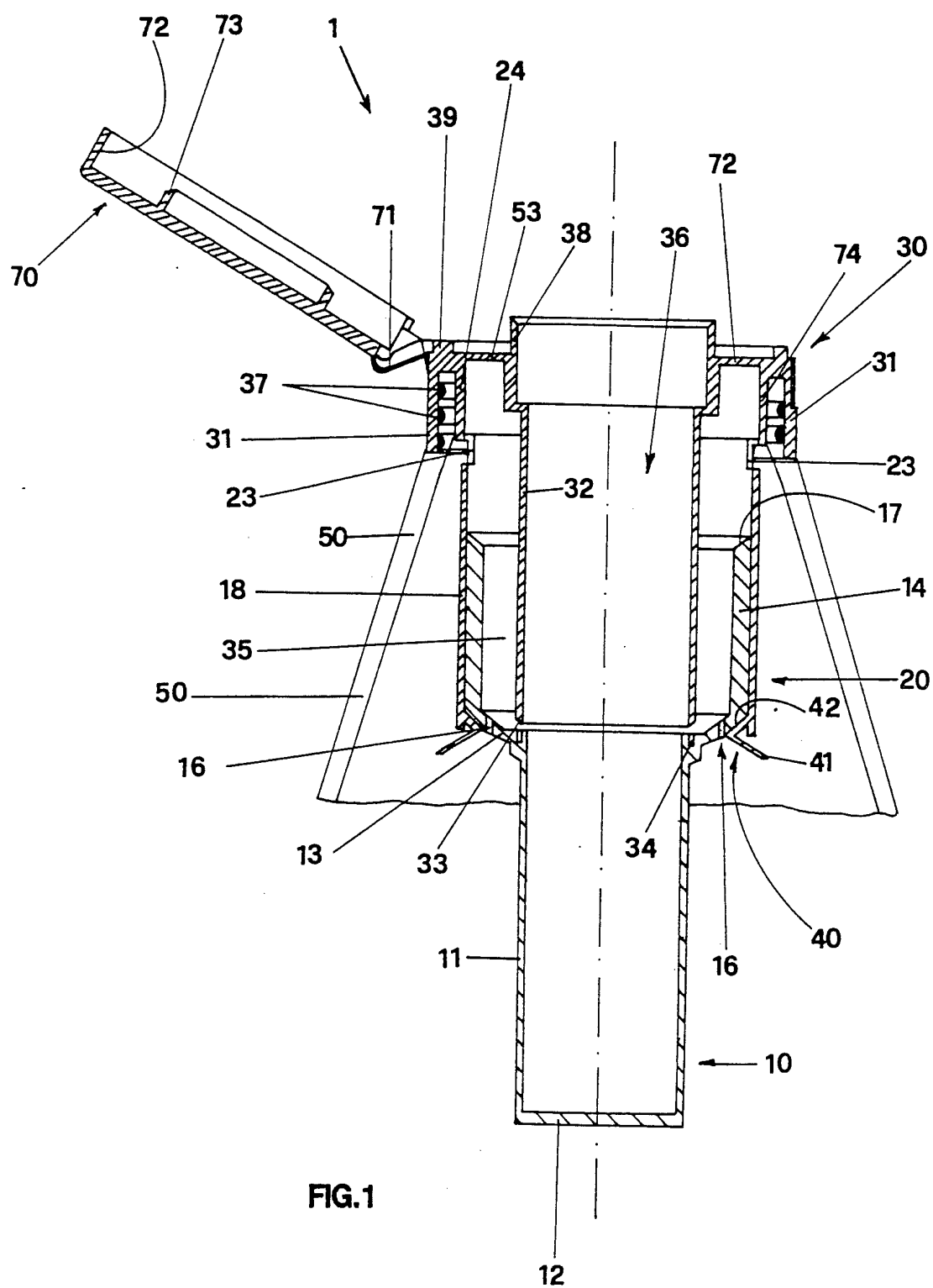
22 11) Device according to claim 1, characterized in that
23 said first element (110) externally presents at least one
24 longitudinal rib (180) suitable for coupling in a corre-
25 sponding seat made in said second element (120), said at
26 least one rib (180) and said at least one corresponding
27 seat being suited to define, mutually cooperating, the
28 coupling position of said first element (110) as regards to
29 said second element (120).

30 12) Device according to claim 1, characterized in that
31 said first element (110) is provided with a conveyor (190)
32 having a substantially semicircular surface which defines
33 the holding chamber (111) of said first element (110), said
34 conveyor (190) being projected inside said second element
35 (120), when said first element (110) is coupled internally

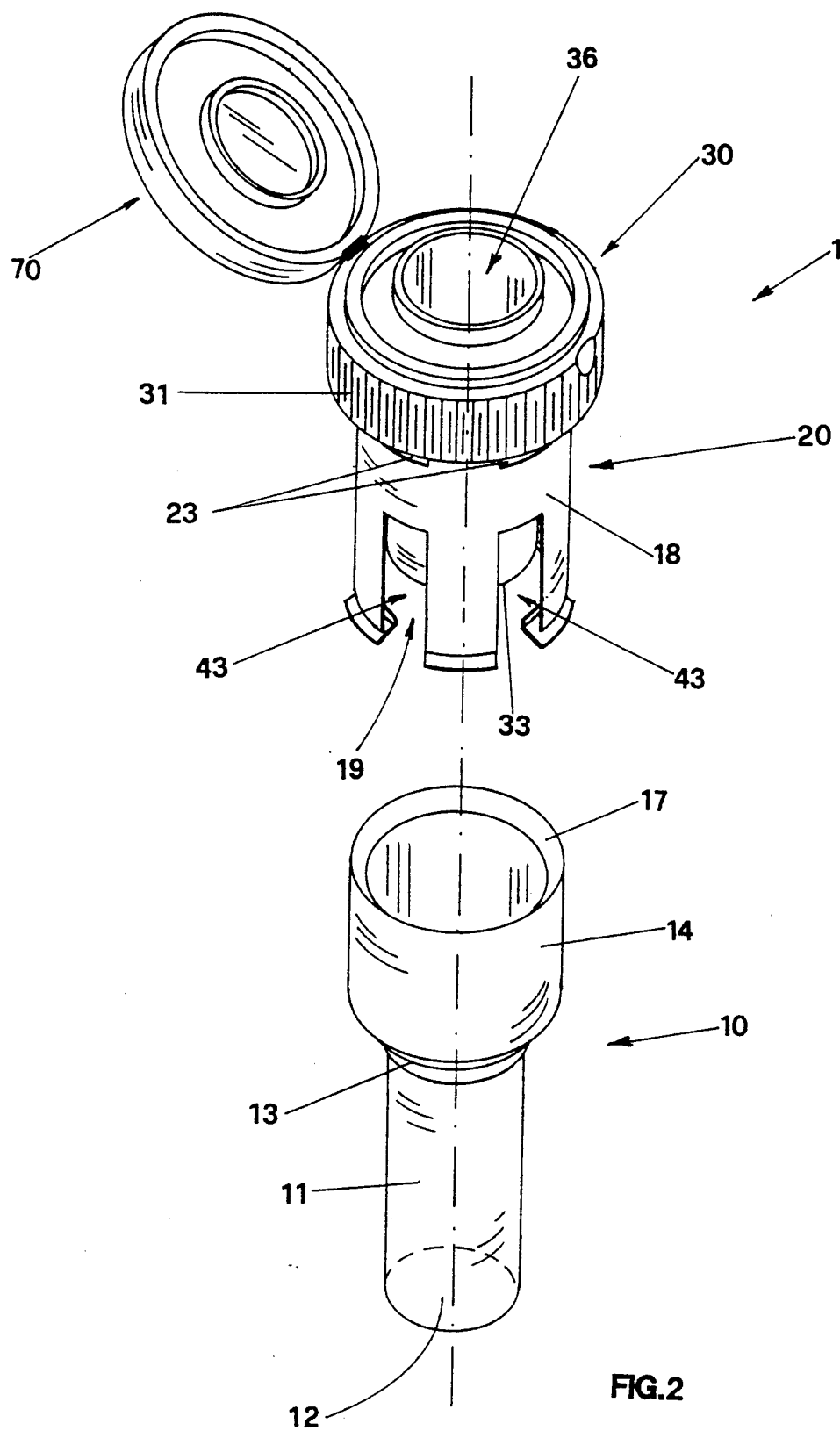
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1 with said second element (120).
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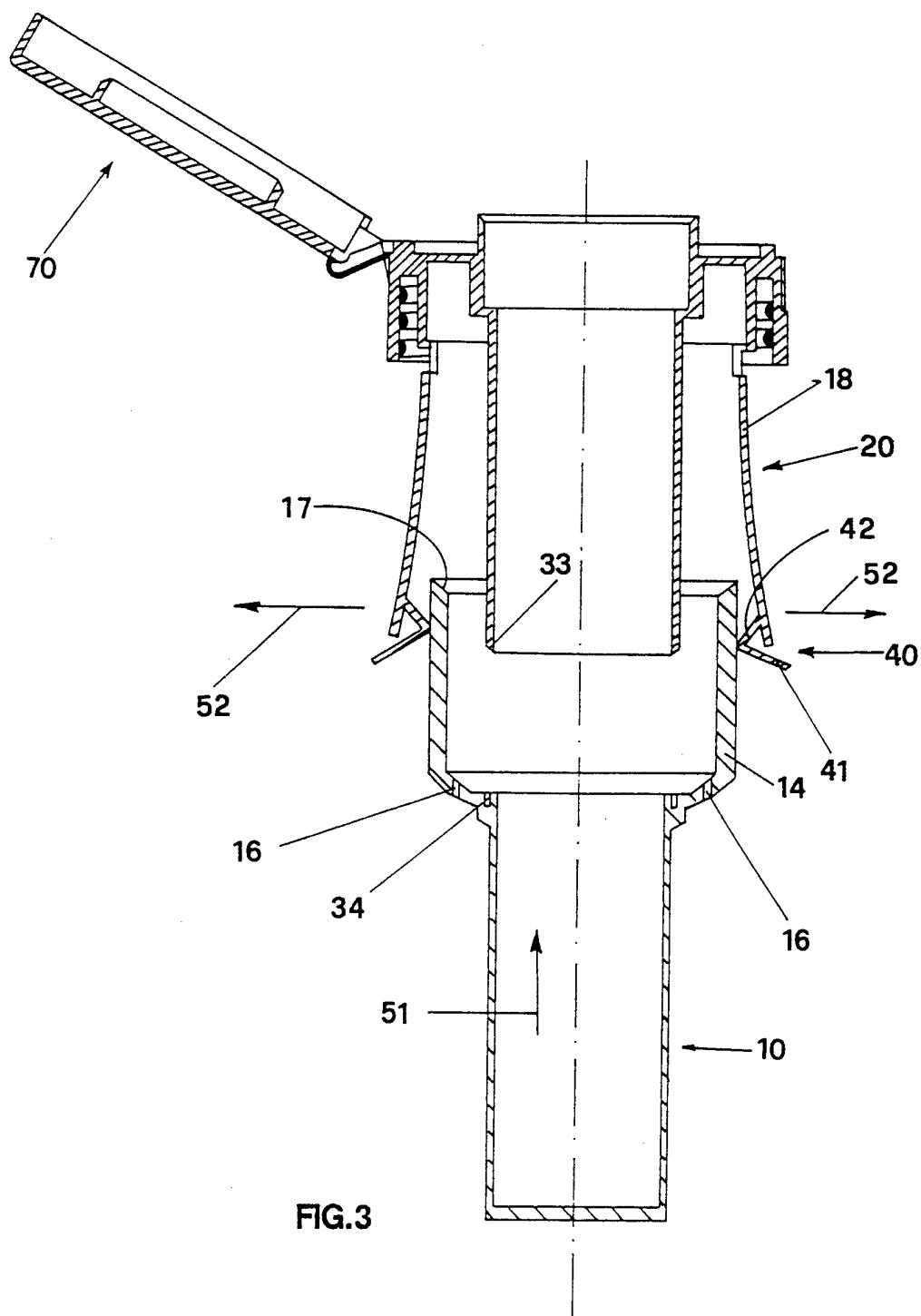


FIG.3

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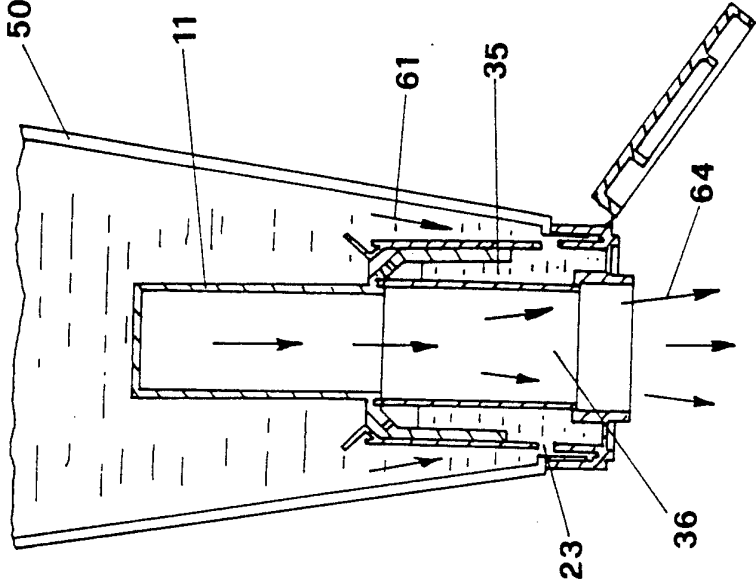


FIG. 6

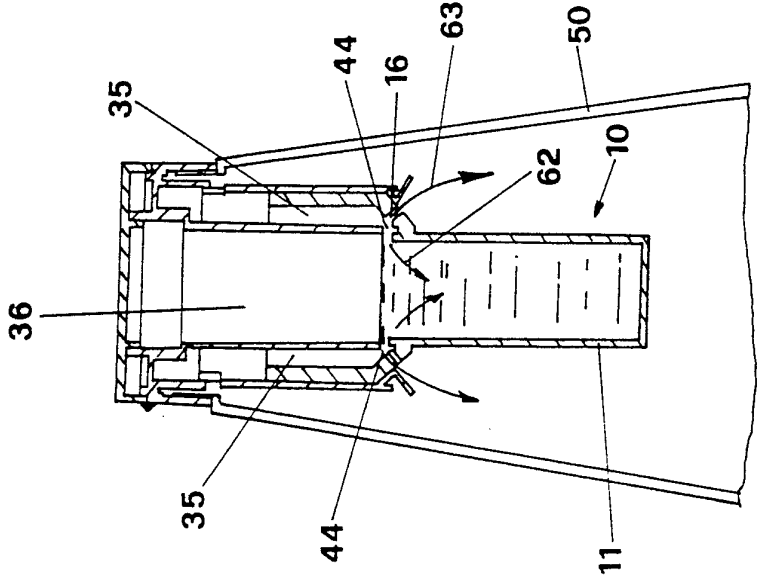


FIG. 5

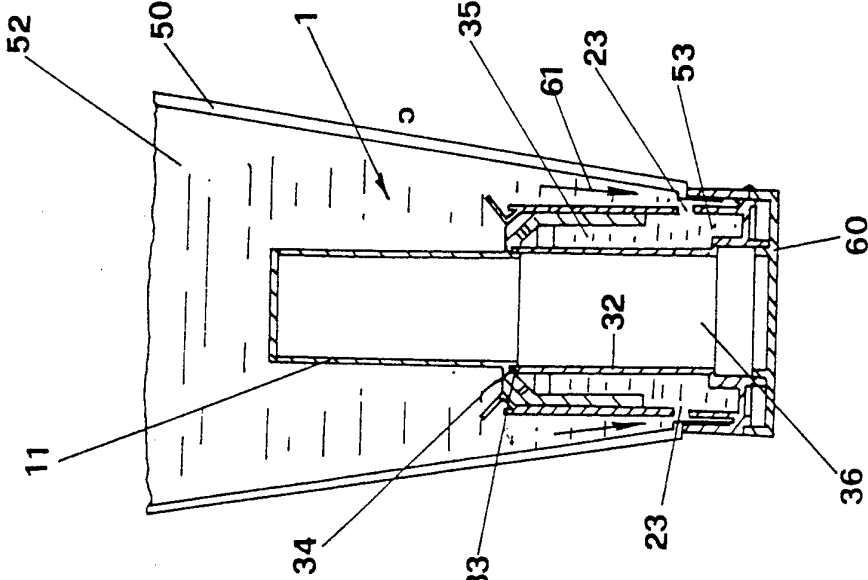


FIG. 4

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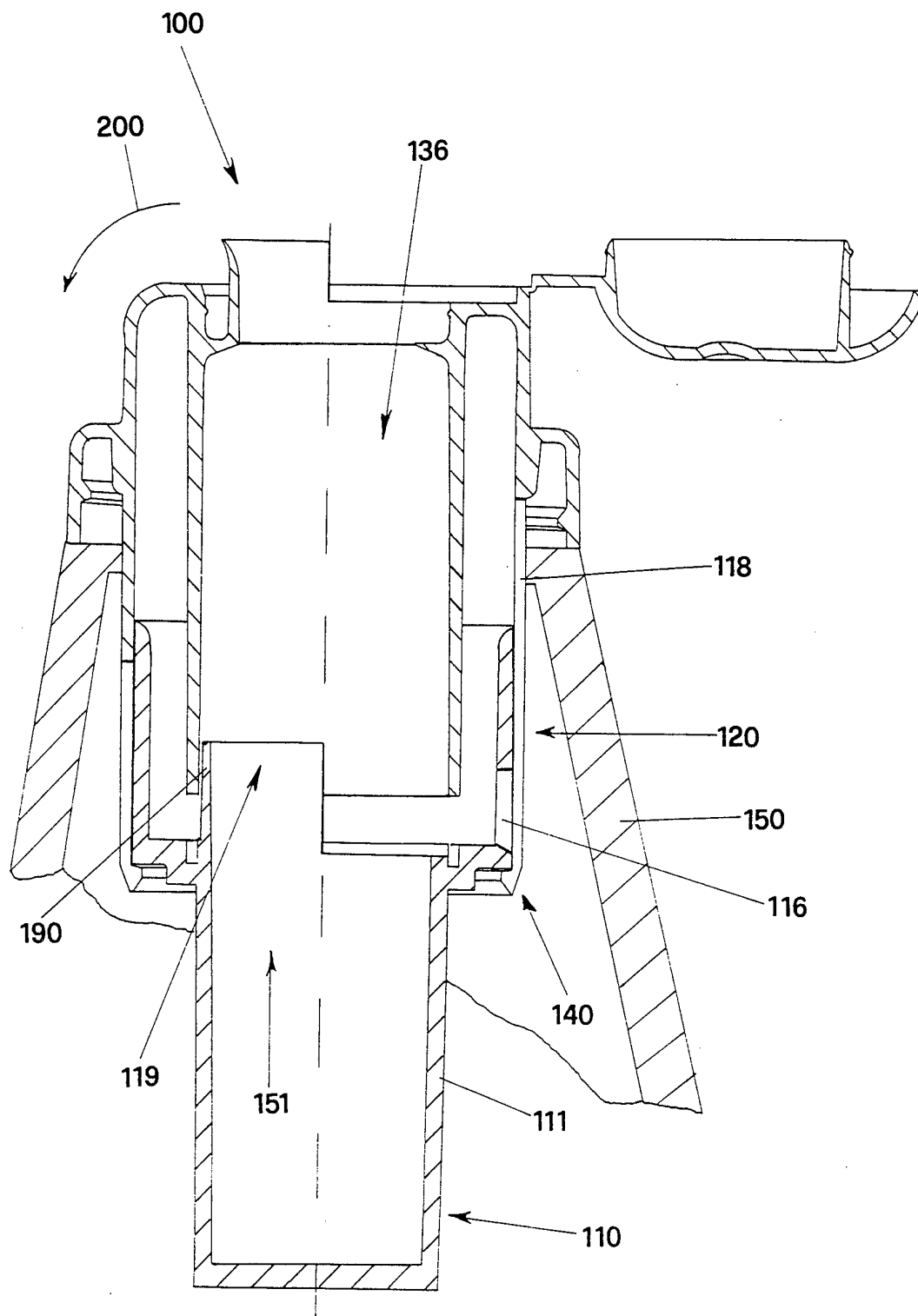
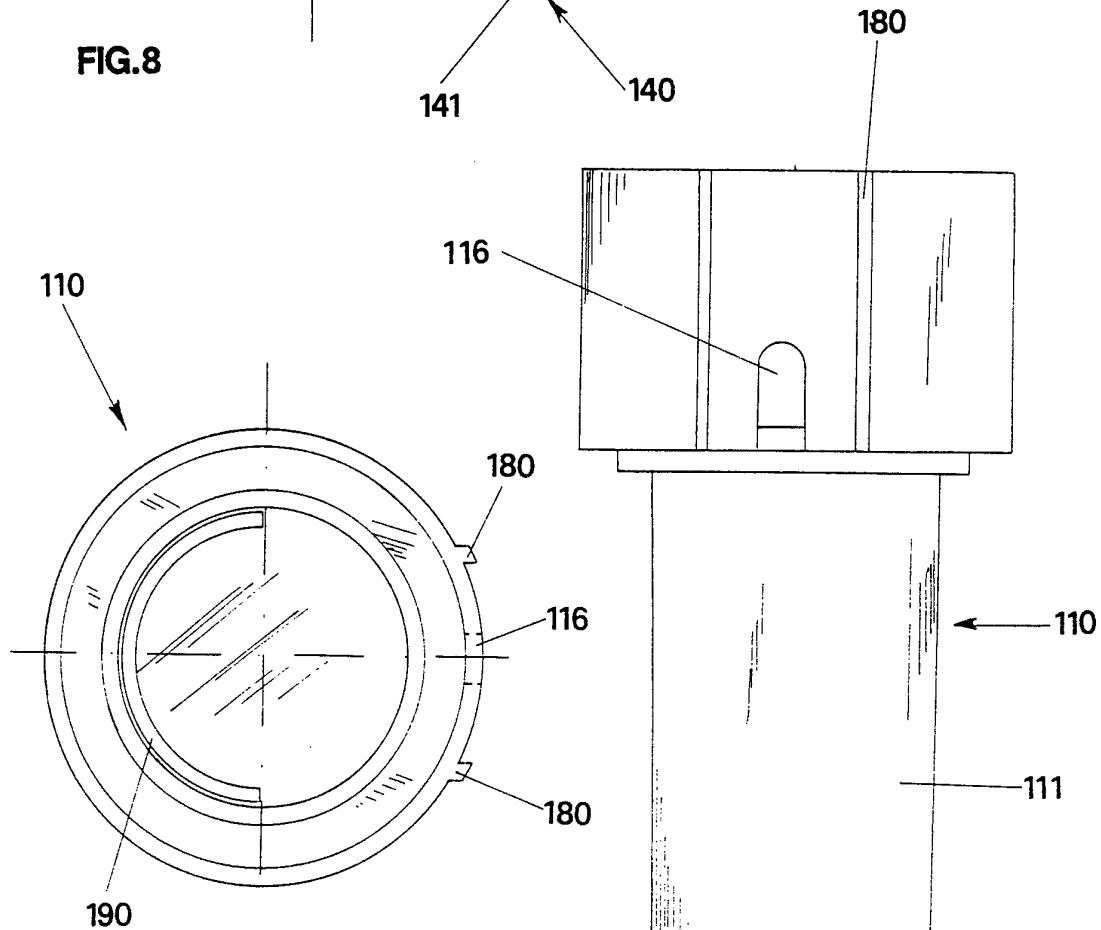
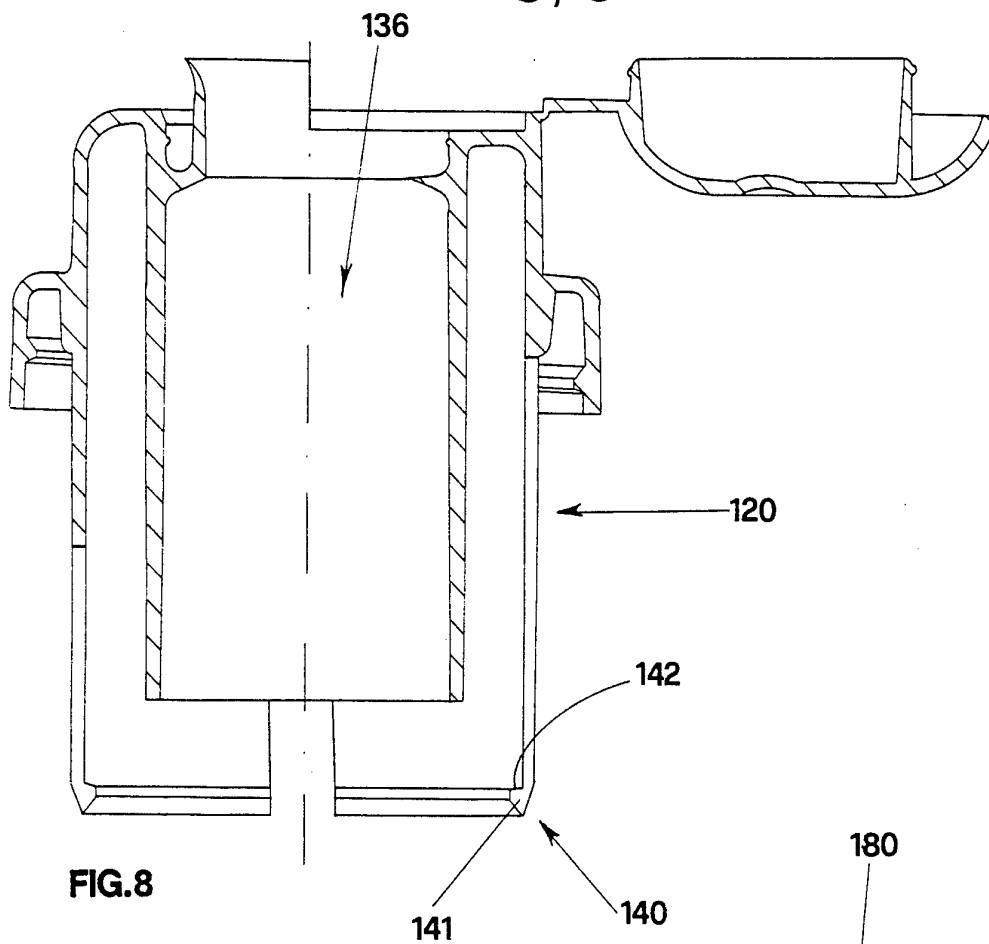


FIG. 7

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 93/02425

A. CLASSIFICATION OF SUBJECT MATTER
IPC 5 G01F11/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 5 G01F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO,A,91 10115 (TAPLAST) 11 July 1991 cited in the application see page 4, line 33 - page 7, line 19; figures	1-3,7,9, 10

P,A	WO,A,92 21942 (TAPLAST) 10 December 1992 see page 4, line 31 - page 6, line 10; figures	1-3,5-7, 9,10

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Information on patent family members

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