(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 360 949 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **88830394.8**

(51) Int. Cl.[5]: **B05B 11/00**

(22) Date of filing: **30.09.88**

(43) Date of publication of application:
04.04.90 Bulletin 90/14

(84) Designated Contracting States:
AT BE CH DE ES FR GB GR IT LI LU NL SE

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(54) Manually operated sprayer for liquids.

(57) The object of the invention is a manually operated sprayer for liquids suitable for fixing on the opening of a container, comprising a pump (8) which draws liquid from the container by means of appropriate ducts (12, 14) and sends it to a nebulizer nozzle (15) said sprayer also being provided with a duct (16) extending from the opening of the said container to the surrounding air, the outlet (17) of the said duct (16) being able to be closed by a stopper (23), integral with the operating lever (19) of the pump (8) which closes the external outlet (17) of the said duct (16) when at rest. The stopper (23) is located very near to the fulcrum (20) of the lever (19).

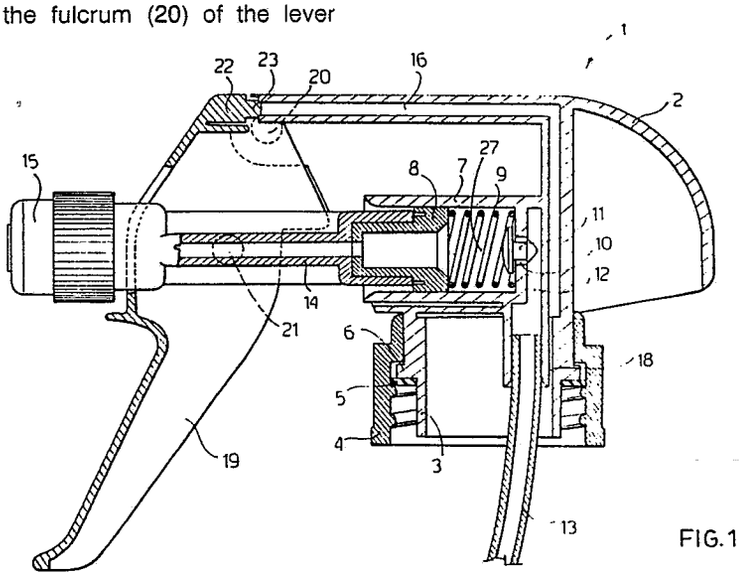

FIG.1

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MANUALLY OPERATED SPRAYER FOR LIQUIDS

The present invention relates to a manually operated sprayer for liquids of the type for fixing on the opening of a container.

Sprayers of the abovementioned type are already known and used for various purposes, such as, for example, homogeneous moistening, spray painting, spraying plants with liquid pesticides etc.

Such sprays usually comprise a pump which draws liquid from a container and sends it to a nebulizer nozzle by means of an appropriate duct. When part of the liquid has been drawn from the container it is necessary to replenish the empty space in the container with air to allow the liquid to continue to come out; it is for this reason that provision is made for the sprayer to have an air duct, connected to the inner chamber of the container.

One problem connected with carrying out these sprayers is the possibility of an escape of liquid from the air duct when the container (with the sprayer incorporated) is put away in a position which is not perfectly vertical, or when it is overturned by mistake, for example by a impact received by accident during use or in transit.

The object of the present invention is to carry out a manual sprayer which is both efficient and durable, having an automatic closing means to prevent the accidental escape of liquid from the container when the sprayer is at rest.

The above object has been achieved with a sprayer capable of being fixed on the opening of a container. This sprayer is provided with a channel extending from the said container to the surrounding air, the said channel having an external outlet which can be closed by a stopper integral with the operating lever of the pump.

Preferably the said stopper is positioned very close to the fulcrum of the lever.

Preferably the said fulcrum of the operating lever is positioned immediately below the stopper, which is positioned at the highest part of the sprayer when the latter is in the position for use.

Preferably the operating lever, subjected to the action of a spring located in a pumping chamber, is put into communication with the liquid in the tank by a valve means described in the Italian utility model no. 24282 B/84.

When the lever is moved, its lower part comes close to the body and the upper projecting part with which the stopper is integral moves away from the channel outlet, thus allowing air to enter. When the lever is released, the stopper moves towards the said channel outlet, closing it.

The protective action against accidental escape of the liquid is preferably completed by a sealing strip between the neck of the container and the sprayer body.

One form of embodiment of a sprayer in accordance with the invention makes provision for a sealing strip in soft material at the vent channel outlet.

A preferred embodiment of a sprayer in accordance with the present invention is shown in the enclosed figures, in which:

Figure 1 shows a sectional side view of a sprayer at rest;

Figure 2 shows the sprayer in figure 1 in operational state;

Figure 3 shows a form of embodiment different from the one in figure 1.

The sprayer illustrated in figures 1 and 2 is of a manually operated type having a body 2 whose extremity 3 is substantially cylindrical and is surrounded by a threaded ring nut 4 for screwing it to the neck of a liquid container. A sealing strip 5 covers a flange 6, provided on the extremity 3, which carries out the counterboring for the neck of the container.

The body 2 contains a jacket 7 which forms a pumping chamber 27, housing a piston 8 and a spring 9. The chamber 27 has at its entrance a notched hole 10. The said hole is provided with a rubber occlusion member 11 which forms a valve means described in utility model no. 24282 B/84. The chamber 27 is thus connected to a duct 12, extended by a suction pipe 13 which crosses the extremity 3 and is inserted into the container. The said chamber 27 is connected at its exit with a duct 14 ending in a nebulizer nozzle 15 of the type already known.

The body 2 also contains a vent channel 16 extending from the entry 18 provided inside the extremity 3 of the body 2 to the outlet 17 positioned near the fulcrum 20 of the operating lever 19. This fulcrum 20 is located in the upper part of the body 2 of the sprayer when the latter is in the operating position. The piston 8 which slides into the chamber 27 is operated by the said lever 19 by means of two coaxial pins. On a projecting part 22 of the lever 19, immediately above the fulcrum 20, a stopper 23 is provided, which closes the outlet 17 of the channel 16 when the sprayer is at rest.

When the lower part of the lever 19 is pressed against the body 2 of the sprayer 1, to set the piston 8 pump in operation in the well-known manner, and therefore to draw the liquid from the container and then send it to the nebulizer nozzle 15, the upper projecting part 22 moves away from the outlet 17 allowing air to enter the container through the channel 16. When the lever 19 returns

to its rest position, owing to the effect of the spring 9, the projecting part 22 moves close to the body 2 and the stopper 23 is inserted into outlet 17.

The presence of this stopper 23, which closes channel 16, acts as a sure prevention against an unwanted escape of the liquid when the sprayer 1 is at rest, no matter what position the container may be in.

The form of embodiment of the sprayer illustrated in figure 3 differs from the one previously described solely in having a strip 25 arranged as a lining inside and on the edge of the outlet 17 of the channel 16. This variant allows a perfectly sealed housing of the stopper 23 in the outlet 17.

Claims

1. A manually operated sprayer for liquids suitable for fixing on the opening of a container, and comprising a pump (8) which draws liquid from the container by means of appropriate ducts (12, 14) and sends it to a nebulizer nozzle (15), characterized in that it is provided with a channel (16) extending from the opening of said container to the surrounding air, the outlet (17) of the said channel (16) being able to be closed by a stopper (23), integral with the operating lever (19) of the pump (8), which closes the external outlet (17) of the said channel (16) when at rest.

2. A sprayer according to claim 1, characterized in that the stopper (23) is positioned very near to the fulcrum (20) of the lever (19).

3. A sprayer according to claims 1 and 2, characterized in that the fulcrum (20) of the operating lever (19) is positioned immediately below the stopper (23), which is located at the highest part of the sprayer (1), when the latter is in the working position.

4. A sprayer according to any one of the foregoing claims, characterized in that the stopper (23) is shaped on a projecting part (22) of the lever (19).

5. A sprayer according to any one of the foregoing claims from 1 to 4, characterized in that provision is made for a sealing strip (5) between the neck of the container and the extremity (3) of the body (2) of the sprayer (1).

6. A sprayer according to any one of the foregoing claims, characterized in that a seal (25) is provide to carry out the sealing of the outlet (17) of the vent channel (16).

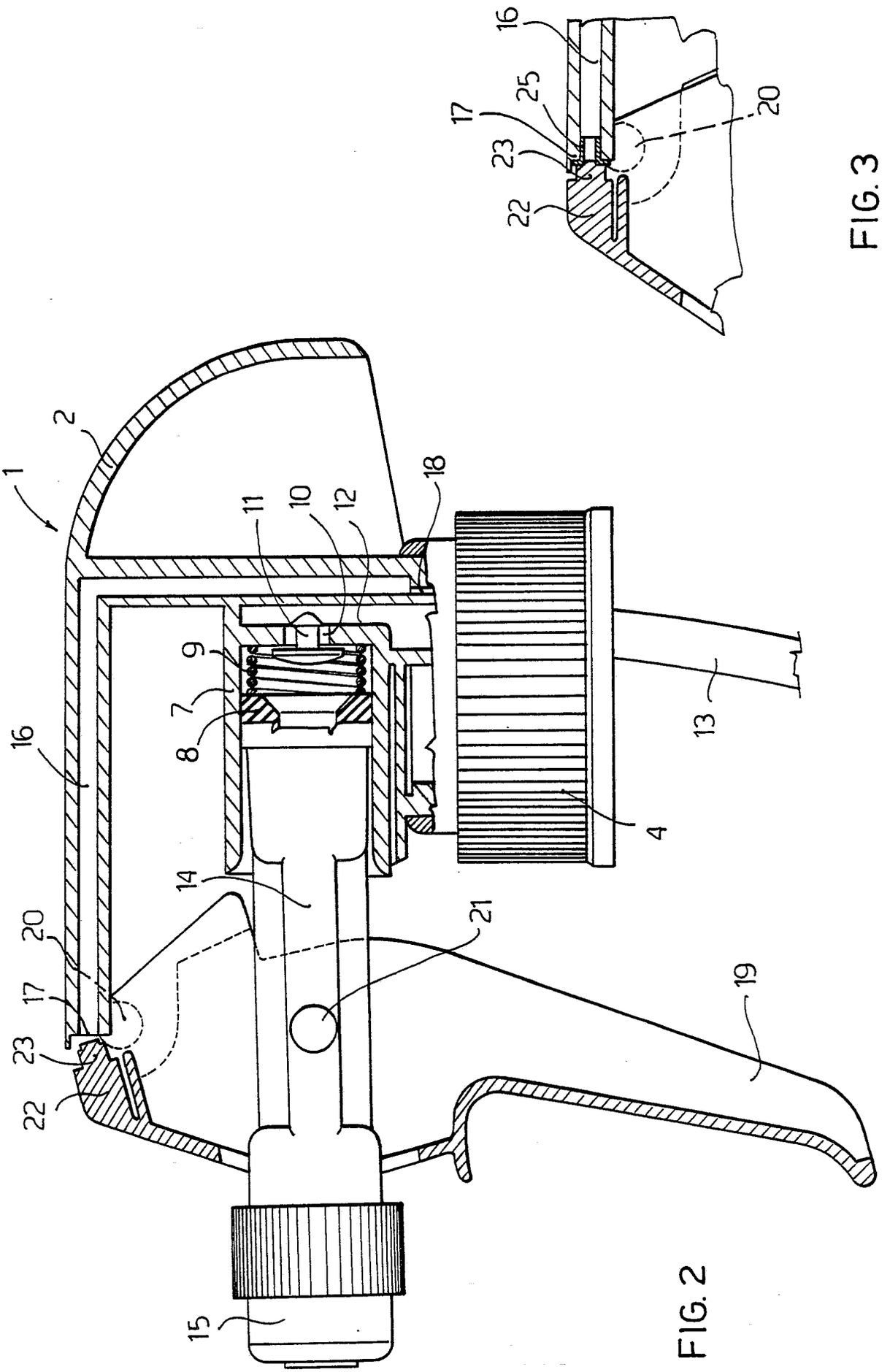

FIG. 2

FIG. 3

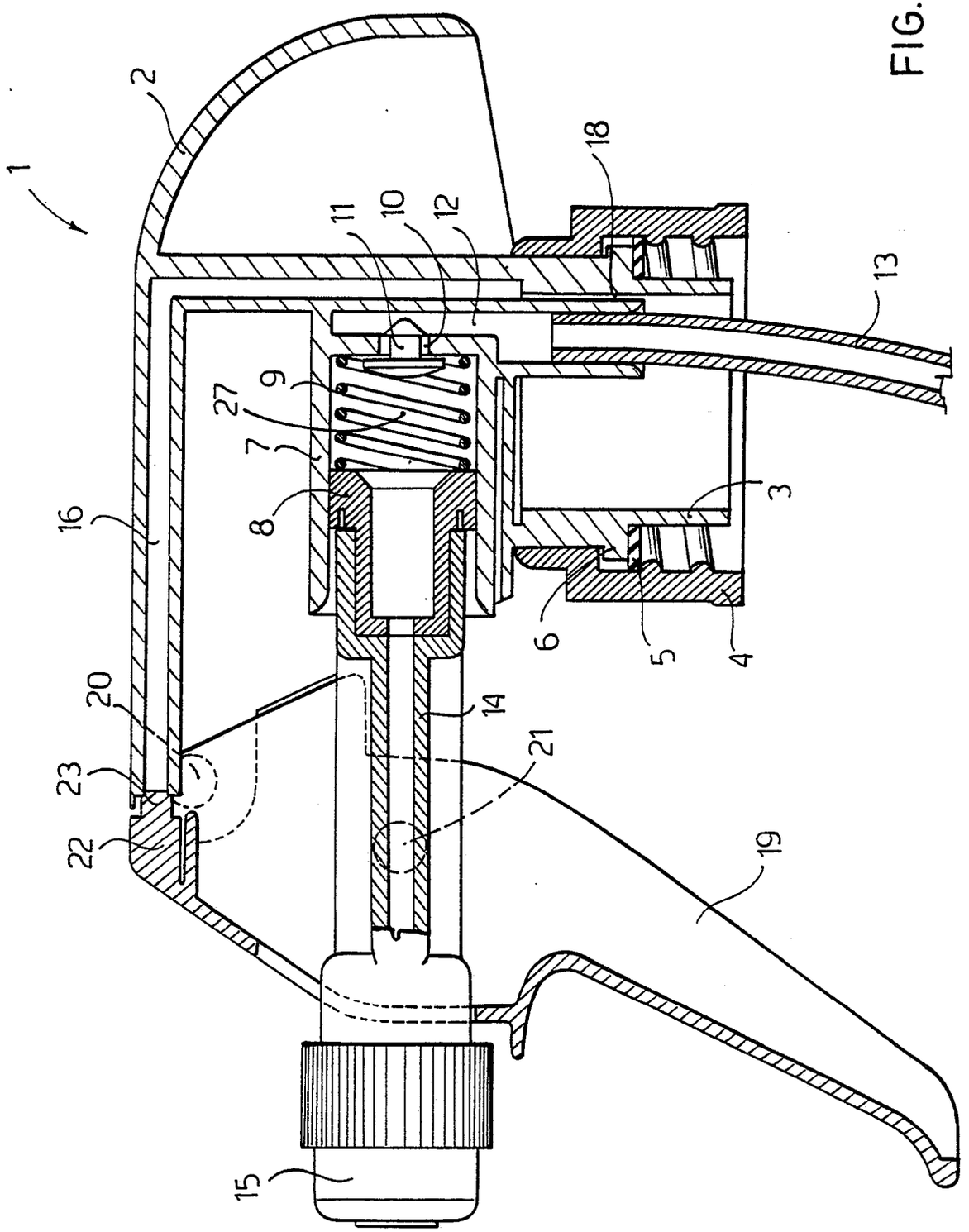

FIG.1

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EUROPEAN SEARCH REPORT

Application Number

EP 88 83 0394

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	FR-A-2 260 393 (T. TADA) * Figure 2; page 6, lines 25-28 *	1	B 05 B 11/00
A	EP-A-0 202 380 (CANYON CORP.) * Abstract; figure 1; page 11, lines 8-33 *	1	
A	DE-U-8 535 472 (SPRAY PLAST S.p.A.) * Figures 1,3,5; page 4, lines 22-31 *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 05 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	12-05-1989	GUASTAVINO L.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P0401)