Sept. 20, 1971 M. QUERCIA ET AL 3,605,133

SPRAYING DEVICES CAPABLE OF BEING MOUNTED ON A LAVATORY PAN

Filed Aug. 5, 1969 4 Sheets-Sheet 1

Fig. 1.

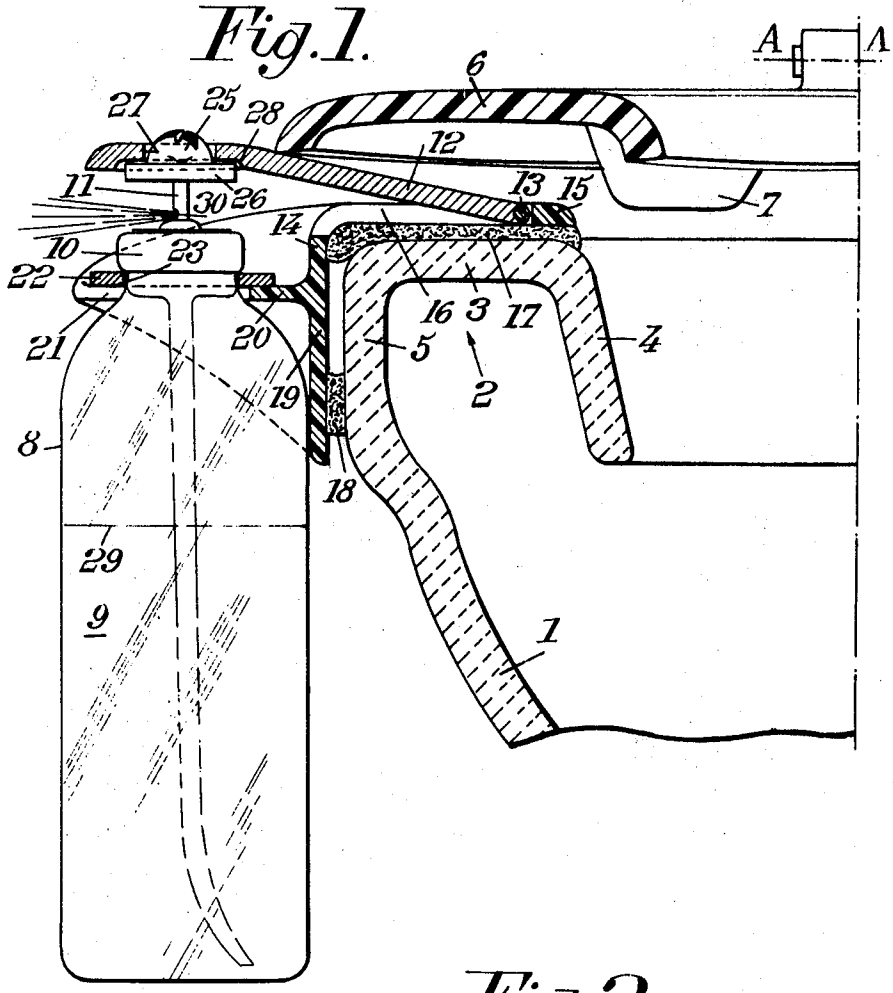
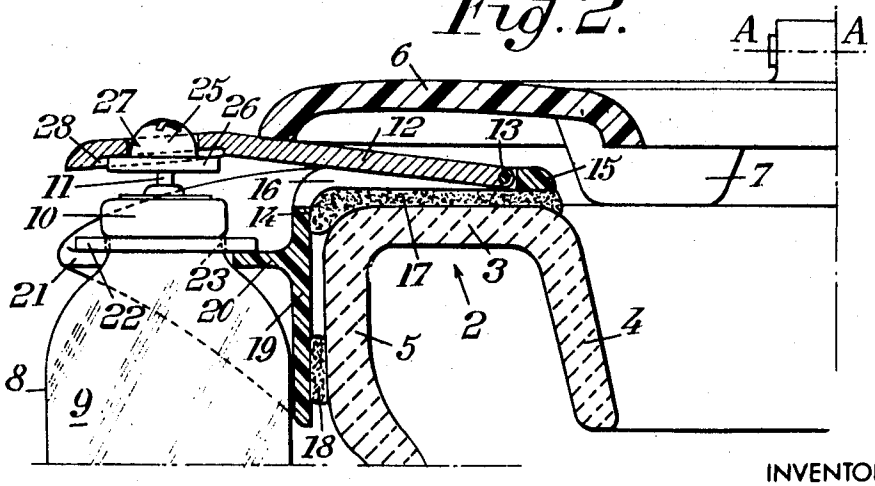


Fig. 2.



INVENTOR
MARCEL QUERCIA
BY GILBERT ANDREANI
ATTORNEY

Sept. 20, 1971 M. QUERCIA ET AL 3,605,133

SPRAYING DEVICES CAPABLE OF BEING MOUNTED ON A LAVATORY PAN

Filed Aug. 5, 1969 4 Sheets-Sheet 2

Fig. 3.

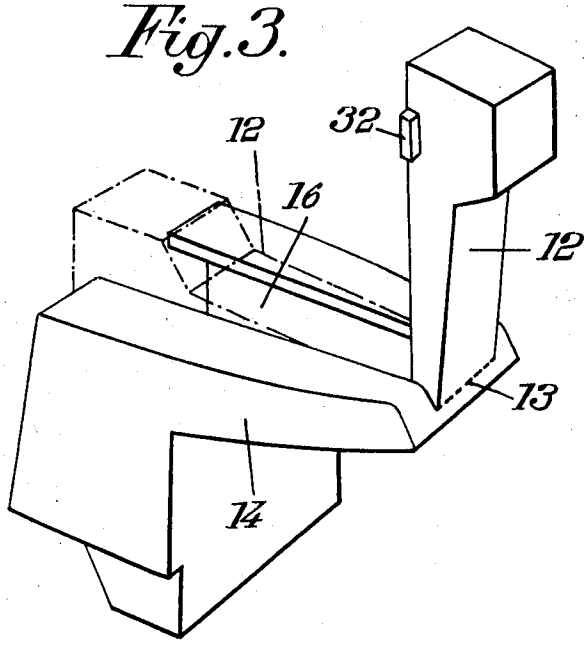
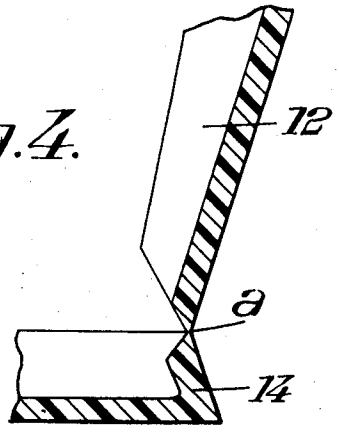


Fig. 4.



INVENTOR
MARCEL QUERCIA
BY GILBERT ANDREMONT
M. Andrémont
ATTORNEY

Sept. 20, 1971 M. QUERCIA ET AL 3,605,133

SPRAYING DEVICES CAPABLE OF BEING MOUNTED ON A LAVATORY PAN

Filed Aug. 5, 1969 4 Sheets-Sheet 3

Fig.5.

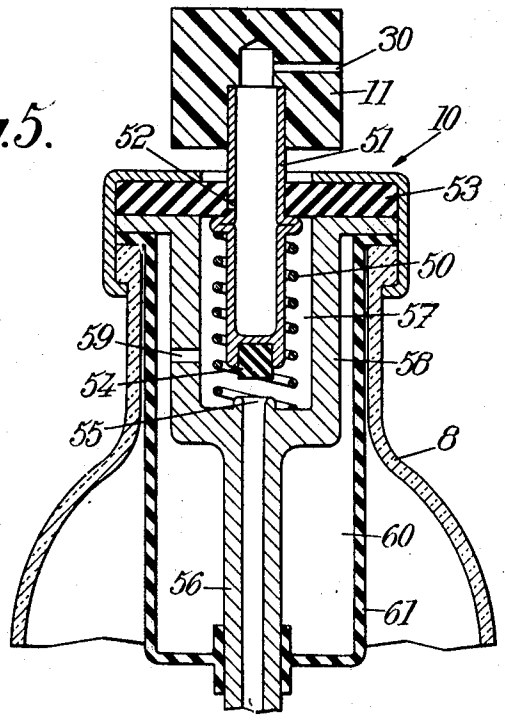
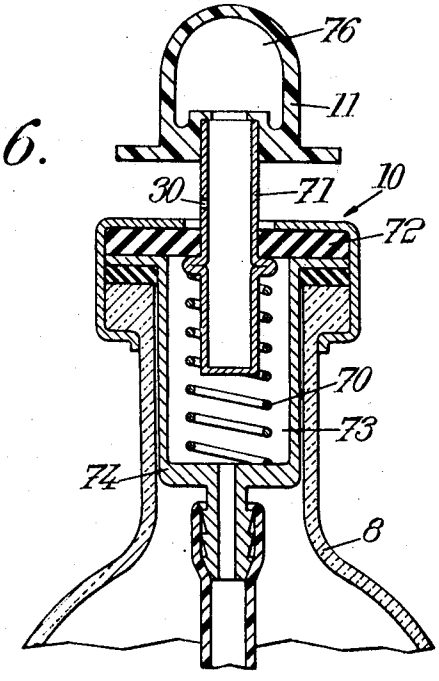


Fig.6.



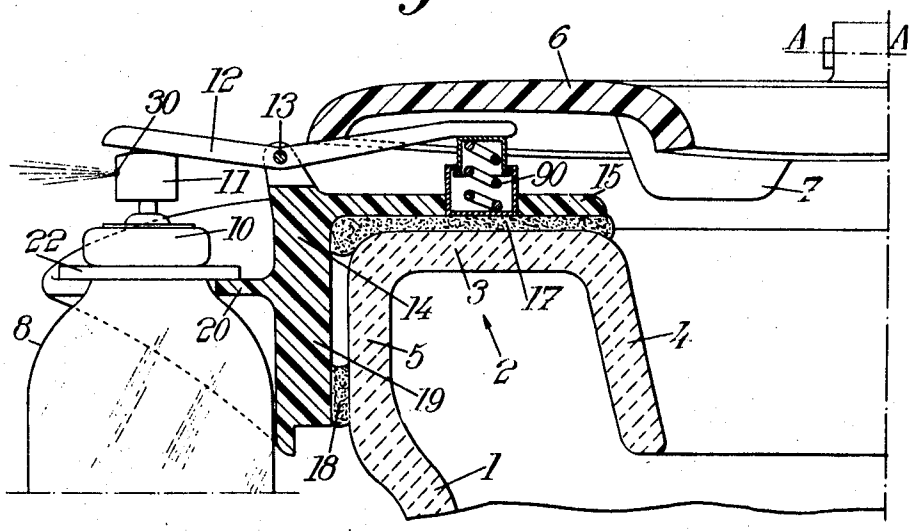
INVENTOR
MARCEL QUERCIA
BY GILBERT ANDREMONT
ATTORNEY

Sept. 20, 1971 M. QUERCIA ET AL 3,605,133

SPRAYING DEVICES CAPABLE OF BEING MOUNTED ON A LAVATORY PAN

Filed Aug. 5, 1969 4 Sheets-Sheet 4

Fig. 7.



INVENTOR
MARCEL QUERCIA
BY GILBERT ANDRAEMONT
Marcel L. Stiles
ATTORNEY

United States Patent Office 3,605,133
Patented Sept. 20, 1971

3,605,133

SPRAYING DEVICES CAPABLE OF BEING MOUNTED ON A LAVATORY PAN

Marcel Quercia and Gilbert Andermont, Paris, France, assignors to Flaminaire Marcel Quercia, Paris, France

Filed Aug. 5, 1969, Ser. No. 847,552
Claims priority, application France, Aug. 6, 1968, 162,061
Int. Cl. E03d 9/02
U.S. Cl. 4—231 10 Claims

ABSTRACT OF THE DISCLOSURE

A lavatory equipped with the subject spraying device of this invention offers many advantages, the main ones being the following:

The fact that no particular manual action, notably on the seat, is required in order to spray the liquid, such spraying occurring automatically when the person rises from the seat, there being nothing to stop the seat from being raised into a vertical position.

The fact that the invention can be applied to most existing lavatories without the need to modify them in any way, since the spraying device and its supporting member in particular serve to restrain the bottle containing the liquid, while the actuating lever can adapt to widely differing lavatory pan shapes, including pans with acutely curved surfaces.

This invention relates to a spraying device comprising a bottle which contains a liquid under pressure possessing deodorizing, scenting or disinfecting properties, said bottle being equipped with a valve capable of spraying the liquid into the surrounding air when a person using the lavatory on which said spraying device is mounted pivots the lavatory seat and thereby actuates said valve.

Now in order to ensure a large number of sprayings with one and the same bottle and avoid wasting the product, it is necessary to control the spraying so that it lasts only for a short moment each time the lavatory is used.

To this end it has already been proposed to make use, for the purpose of actuating the sprayer valve, of part of the swivelling movement of the lavatory seat during which it is fetched from its utilization position—in which it rests on the lavatory pan—into a position requiring it to be raised, or vice versa, in the course of which movement it exerts on the spraying valve an effect that triggers and arrests the spraying. If the amplitude of the seat movement required to both trigger and arrest the spraying is large, it may be a nuisance for the user or may not be covered in full when the latter moves the seat; on the other hand, if the necessary amplitude of this motion is small, that is to say if the seat retains an approximately horizontal position while describing the motion required to trigger and arrest the spraying, then such prior art actuating means become complicated and unreliable.

It is the object of the present invention to overcome the drawbacks of prior art devices of this kind.

It is a further object of the invention to so devise such spraying devices as to enable them to be fitted to and removed from existing lavatory pans without the need to modify the latter in any way.

The subject spraying device of this invention is actuated by the pivoting motion of the lavatory seat, such motion being of small amplitude whereby the seat invariably remains in a substantially horizontal position during actuation of the spraying device, the latter being characterized by the fact that the spraying valve on the bottle containing the liquid under pressure to be sprayed is a proportioning valve and by the fact that this proportioning valve together with the drive transmitting means interconnecting it with

the seat are so devised that spraying takes place when the user rises from the lavatory seat and the latter pivots upwards responsively to elastic restoring means.

The fact that spraying occurs only when the person using the lavatory rises from the seat is important from the standpoint of allowing the spraying to produce its full effect, in contrast to what happens, in the case of a known device, during the relatively slow evaporation of a given quantity of liquid into the surrounding atmosphere. In this latter case, the releasing of the dose of liquid to be evaporated, namely the moment at which evaporation of the latter can begin, may take place when the user sits on the lavatory seat.

It will be appreciated that each time the lavatory has been used a spraying of liquid will necessarily occur without any intervention on the part of the lavatory user and that this spraying will involve only the quantity of liquid delivered by the proportioning valve.

In a preferred embodiment of the invention, the spraying device comprises, by way of a support, a bracket-shaped member one of whose walls rests on top of the edge of the pan, while its other wall rests against the lateral surface of the edge of the pan. This bracket includes a horizontal surface for supporting the bottle, the drive transmitting means between the seat and the proportioning valve consisting of an actuating lever hingedly connected to said support and on which the lavatory seat bears, while the tip of this lever extending outwardly in relation to the pan is adapted to actuate the proportioning valve. The description which follows with reference to the accompanying non-limitative exemplary drawings will give a clear understanding of how the invention can be carried into practice.

In the drawings:

FIG. 1 shows in partial section with cutaway portions a lavatory equipped with a preferred embodiment of the subject spraying device of this invention, the seat being shown in a slightly raised position.

FIG. 2 shows the same lavatory in corresponding fashion to FIG. 1, the seat being here shown in abutment against the edge of the pan.

FIGS. 3 and 4 depict, respectively in perspective and in section, a first alternative embodiment of part of said spraying device.

FIGS. 5 and 6 are sectional portrayals of two different embodiments of an important component part of the subject spraying device of this invention; and

FIG. 7 shows in partial section a lavatory equipped with yet another alternative embodiment of the spraying device according to this invention.

The lavatory proper, which is not shown in its entirety, includes, as well known per se and as shown in FIGS. 1, 2 and 7, a pan **1**, a seat **6** hingedly connected thereto about a hinge line AA located behind pan **1**, a lid (not shown) being possibly pivotally connected about the same hinge line AA.

The pan **1** is formed with a rim **2** extending round its upper opening.

FIGS. 1, 2 and 7 depict this lavatory in partial section through a vertical plane parallel to hinge-line AA and located substantially halfway between the front and rear of pan **1**.

The rim **2** of pan **1** includes a horizontal wall **3**, an inside wall **4** and an outside wall **5**, the seat **6** being capable of abutting against horizontal wall **3** of rim **2** through the agency of blocks **7** preferably made of rubber. The spraying device includes a bottle **8** containing a liquid **9** under pressure.

This spraying device is operated by a pivotal motion of seat **6** of small amplitude, whereby seat **6** invariably remains in a position very close to the horizontal position while the spraying device is being actuated. It is a principal

teaching of this invention that the spray-valve of the bottle **8** containing the pressurized liquid **9** to be sprayed is a proportioning valve **10** which, together with the drive transmitting means interconnecting it with seat **6**, is devised so that spraying takes place when the lavatory user rises from the seat **6** and the latter accordingly also rises responsively to elastic restoring means.

Preferably, bottle **8** is fixed to the side of pan **1**, approximately halfway between the front and rear thereof.

The position of bottle **8** in the vertical sense is preferably such that operating plunger **11** of proportioning valve **10** project slightly above the plane tangential to the horizontal wall **3** of rim **2**, both in the final position (shown in FIG. 1) between which said plunger **11** can be moved.

The drive transmitting means between seat **6** and plunger **11** of proportioning valve **10** may consist of an actuating lever **12** one of whose ends bears upon plunger **11** and whose other end is pivoted about a pin **13** fixedly carried in a suitable support on the horizontal wall **3** of rim **2** of pan **1**, and this actuating lever **12** is arranged so that it extends between said horizontal wall **3** and the seat **6** when the latter occupies a horizontal position (resting on pan **1**) or a substantially horizontal position (when it is raised slightly by the elastic restoring means).

The elastic restoring means may be a spring or else the pressure of the gas used to atomize the liquid to be sprayed, which spring or pressure is designed to act on plunger **11** and to be transmitted to seat **6** through drive transmitting means consisting of actuating lever **12**.

In FIGS. 1 and 2, the hinge pin **13** of lever **12** is fixed to the rim **2** of pan **1** through the medium of a preferably bracket-shaped supporting member **14** which bears against the horizontal and outside walls **3** and **5** of the rim **2** of pan **1**, and the lavatory seat **6** bears on lever **12** in an area located between hinge pin **13** and plunger **11**.

As shown in FIG. 7, the hinge pin **13** for lever **12** is fixed to the rim **2** of pan **1** through the medium of a supporting member **14**, and the seat **6** bears on lever **12** in an area located on the side of hinge pin **13** remote from plunger **11**.

A spring **90** urges lever **12** in the direction tending to raise seat **6** and exerts a force greater than that of the spring of proportioning valve **10** or of the pressure of the pressurizing gas.

Supporting member **14** is preferably made of plastic and is held in position by securing means to be described hereinbelow.

The horizontal wall **15** of supporting member **14** is formed with an indentation **16** in the bottom of which is positioned hinge pin **13**, a more or less large portion of lever **12** lodging itself inside indentation **16** in the course of its pivotal motion (FIG. 2).

Preferably, supporting member **14** is restrained upon the rim **2** of pan **1** by an adhesive coating **17** whose two sides possess a powerful adhering capacity and which is interposed between horizontal wall **3** of rim **2** and wall **15** of supporting member **14**, and also by abutments **18** made of a non-slipping substance such as an elastomer foam.

Bottle **8** can be fixed with advantage to pan **1** by means of a horizontal wall **20** which is rigid with the vertical wall **19** of supporting member **14** and which projects from pan **1** and is formed with an indentation **21** into which the upper part of bottle **8** can be inserted.

A circlip **22** engaged into a groove **23** formed by adjacent proportioning valve **10** restrains bottle **8** on horizontal wall **20**.

The plunger **11** of bottle **8** may conveniently be formed with a spherical cap **25** comprising a collar **26**, while the end of lever **12** adjacent plunger **11** may be formed with a hole **27** through which cap **25** extends, with the lever **12** bearing against collar **26** which lodges in a recess **28** formed in said lever. Bottle **8** is preferably made of a transparent material such as glass or an appropriate plastic so that the level **29** of the pressurized liquid it contains may be visible.

The liquid is sprayed through a horizontal hole **30** drilled through plunger **11**.

The proportioning valve **10** proper may be devised as shown in FIG. 5 and may be equipped with the spraying device shown in FIG. 7 (in which spraying occurs when plunger **11** of proportioning valve **10** is depressed). Proportioning valve **10** comprises:

A plunger **11** urged upwardly by a spring **50** and carried in a hollow tube **51** formed with a port **52** which, when plunger **11** is in its uppermost position, is masked by a seal **53**, the lower end of hollow tube **51** being equipped with a valve **54** which, when plunger **11** is in its bottom position, is adapted to mask an orifice **55** in a pipe **56** dipping into the liquid to be sprayed;

A first chamber **57** bounded by a flared extension **58** of pipe **56**, which extension is leaktightly joined to seal **53** and is formed with a transfer passage **59** therethrough; and

A second chamber **60** surrounding the first chamber **57** and bounded by a rubber wall **61** which is leaktightly connected on the one hand to flared extension **58** at the level of seal **53** and on the other to pipe **56**, the volume of this second chamber **60** being at least approximately equal to the volume of liquid sprayed each time plunger **11** moves from its uppermost to its lowermost position.

In the uppermost position of plunger **11** (FIG. 5), pipe **26** supplies the second chamber **60** through transfer passage **59**, and in the lowermost position of plunger **11** valve **54** masks the orifice **55** in pipe **56** while port **52** places second chamber **60** in communication with the spray-hole **30** via transfer passage **59**, thereby causing spraying to take place.

Alternatively, proportioning valve **10** may be devised as shown in FIG. 6 and may equip the spraying device shown in FIGS. 1 and 2 (in which spraying takes place when plunger **11** of proportioning valve **10** is in its uppermost position).

Proportioning valve **10** in this case comprises:

A plunger **11** urged upwardly by a spring **70** and carried by a hollow tube **71** formed with a spray-hole **30** which, when plunger **11** is in its uppermost position, is positioned above a seal **72** and which, when plunger **11** is in its lowermost position, is located below seal **72**, the lower end of hollow tube **71** being obturated;

A first chamber **73** bounded by a flared extension **74** of a pipe **75** dipping into the liquid to be sprayed, which extension is leaktightly attached to seal **72**; and

A second chamber **76** which may be formed with advantage inside plunger **11** in communication with hollow tube **71**, the interior volume of hollow tube **71** and of second chamber **76** being at least approximately equal to the volume of liquid sprayed each time plunger **11** moves from its lowermost position to its uppermost position.

When plunger **11** moves to its lowermost position, spray-hole **30** moves below seal **72**, thereby filling hollow tube **71** and second chamber **76**, and when plunger **11** moves into its uppermost position (FIG. 6) spray-hole **30** moves above seal **72** once more, thereby venting the pressurized liquid trapped in hollow tube **71** and second chamber **76** and causing it to be sprayed. A lavatory equipped with the spraying device shown in FIGS. 1 and 2 accordingly functions in the following manner.

When the lavatory is not in use, the seat **6** is raised slightly by lever **12** in relation to its utilization position wherein the blocks **7** bear, responsively to the weight of the person seated on seat **6**, against the rim **2** of pan **1**. The lever **12** itself then occupies its uppermost position corresponding to the initial position of plunger **11** (FIG. 1). When the lavatory is to be used, the user sits on seat **6** without bothering about the fact that the latter is slightly raised, as a result of which the seat is applied against the rim **2** of pan **1** through the medium of rubber blocks **7** (FIG. 2).

The slight movement of seat **6** causes lever **12** to pivot about hinge pin **13** and to move plunger **11** against the countering spring **50** (FIG. 5) into its ultimate position at the end of its travel (FIG. 2).

When the lavatory user rises from seat **2**, spring **50** (FIG. 5) urges plunger **11** back into its initial position (FIG. 1) and, by reason of the type of proportioning valve **10** adopted, a deodorizing or scenting liquid is sprayed into the surrounding air through hole **30**.

Actuating lever **12** may be made hollow whereby to embody a passageway for the liquid to be sprayed, in which case the spray would be directed into the pan **1**.

The present invention provides for an alternative embodiment of the support for the spraying device.

In this alternative embodiment, lever **12** is obtained integrally with the support **14** proper by a single injection moulding operation. Lever **12** is then connected to support **14** by a plastic hinge consisting of a thin zone *a* the constituent molecules of which are appropriately oriented and which interconnects the bevelled edges of support **14** and lever **12**, whereby the latter is capable of pivoting in relation to support **14** about an axis forming the hinge-line **13**. To make this hinge effective after the moulding operation, the lever **12** is operated several times in order to form the hinge, after which lever **12** is snapped into the indentation **16** on the support with the aid of moulded-on cleats **32**, whereby the lever then adopts the position in relation to the support shown by dot-dash lines in FIG. 3.

In the alternative embodiment portrayed in FIGS. 3 and 4, lever **12** is devoid of an opening for passage therethrough of cap **25** but instead its end is hollow and covers cap **25**.

A lavatory equipped with the subject spraying device of this invention offers many advantages, the main ones being the following:

The fact that no particular manual action, notably on the seat, is required in order to spray the liquid, such spraying occurring automatically when the person rises from the seat, there being nothing to stop the seat from being raised into a vertical or near-vertical position.

The fact that the invention can be applied to most existing lavatories without the need to modify them in any way, since the spraying device and its supporting member in particular serve to restrain the bottle containing the liquid, while the actuating lever can adapt to widely differing lavatory pan shapes, including pans with acutely curved surfaces.

What we claim is:

1. In a lavatory comprising a pan and a seat hinged thereon, a spraying device comprising a bottle containing a pressurized liquid to be sprayed; proportioning valve means for spraying upon actuation a predetermined amount of the liquid, said valve means being actuated by a small amplitude pivotal movement of said seat whereby the latter remains in a near horizontal position in the course of actuation of said valve means; and actuating means comprising elastic restoring means cooperating with said seat for permitting slight pivotal movement of the latter from a rest position when the user sits down on said seat and for moving said seat back to said rest position when the user rises from said seat, and drive transmitting means between the seat and said valve means and cooperating with the latter so that the spraying takes place during movement of said seat from said tilted back to said rest position.

2. A spraying device as defined in claim **1**, and including support means for supporting said bottle on said pan, said drive transmitting means comprising an actuating lever hingedly connected about a hinge line to said support means, said seat bearing upon said actuating lever and said latter having an end extending outwardly away from said pan and acting on said valve means.

3. A spraying device as defined in claim **2**, wherein said seat bears upon a portion of said actuating lever between said hinge line and said valve means.

4. A spraying device as defined in claim **2**, wherein said proportioning valve comprises a plunger and wherein said elastic restoring means acts on said plunger and through the latter on said actuating lever and said seat.

5. A spraying device as defined in claim **4**, wherein said restoring means comprises a spring.

6. A spraying device as defined in claim **2**, wherein said seat acts upon a portion of said actuating lever located on that side of said hinge line which is remote from said valve means, and including a spring urging said actuating lever in a direction tending to raise said seat.

7. A spraying device as defined in claim **2**, wherein said pan has an upper rim and wherein said valve means comprises a plunger having an upper end located always above the level of said rim.

8. A spraying device as defined in claim **2**, wherein said actuating lever is hollow and forms a passageway therein through which the liquid to be sprayed is caused to pass, said passageway being directed towards the interior of said pan.

9. A spraying device as defined in claim **8**, wherein said support means and said actuating lever are integrally molded and interconnected by a flexible hinge which forms the hinge line for said actuating lever.

10. A spraying device as defined in claim **2**, wherein said proportioning valve means comprises wall means forming in said bottle a first chamber in communication with said pressurized liquid therein, a hollow plunger arranged for reciprocation relative to said first chamber between an upper and a lower end position in which the interior of said hollow plunger communicates with said first chamber and elastic means forming a second chamber communicating with the interior of said plunger and that of said first chamber at least when said plunger is moved to said lower end position thereof, said plunger being moved from said upper to said lower end position by said actuating lever and said elastic restoring means acting on said plunger for moving the latter back to said upper end positions.

References Cited

UNITED STATES PATENTS

3,143,735	8/1964	Price	222—180
3,178,070	4/1965	Leland	222—180

FOREIGN PATENTS

608,563	11/1960	Canada	239—274

ROBERT B. REEVES, Primary Examiner

L. MARTIN, Assistant Examiner

U.S. Cl. X.R.

222—180