

June 14, 1960

K. A. NORRISH ET AL

2,940,641

LIQUID SPRAY DISPENSER

Filed March 10, 1958

2 Sheets-Sheet 1

FIG. 1

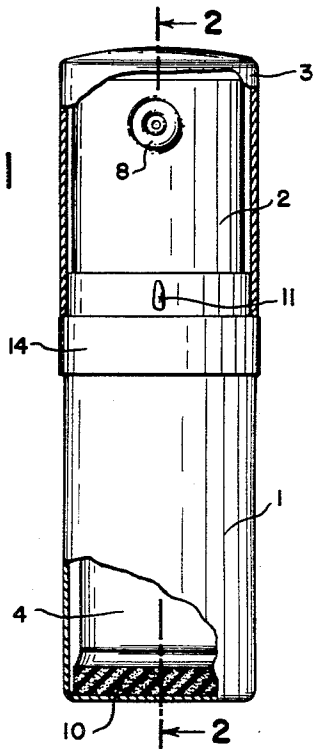


FIG. 2

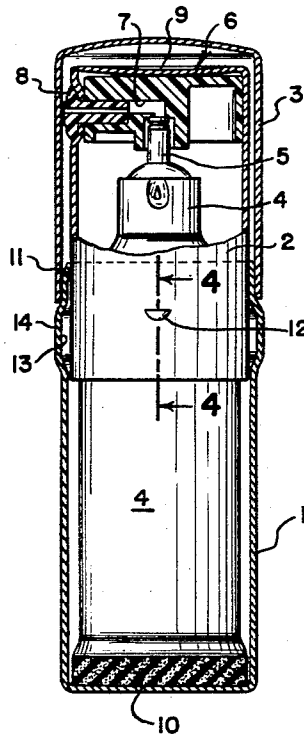


FIG. 3

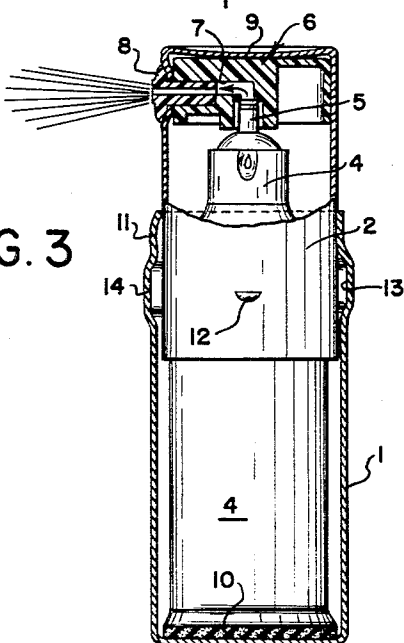
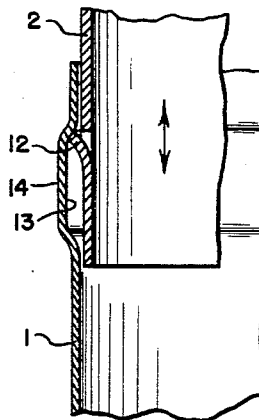


FIG. 4



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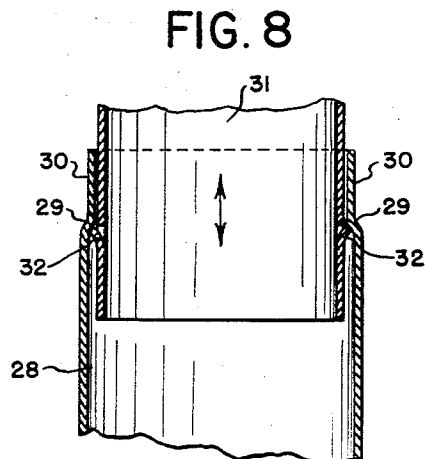
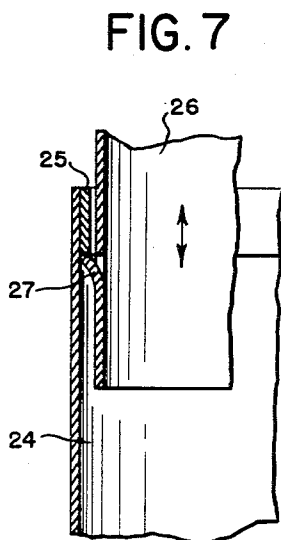
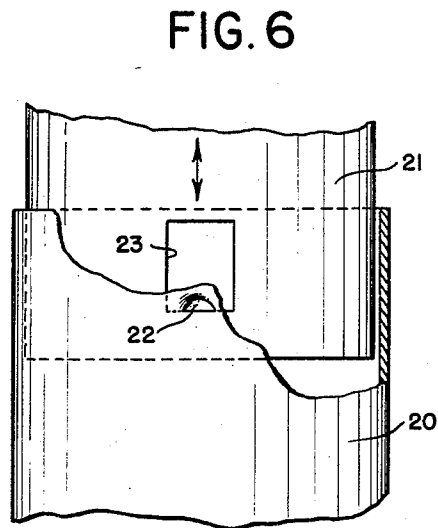
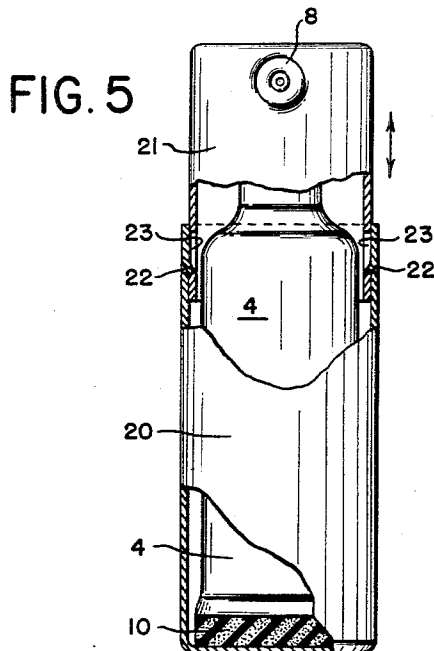
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LIQUID SPRAY DISPENSER

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2 Sheets-Sheet 2



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LIQUID SPRAY DISPENSER

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7 Claims. (Cl. 222-183)

The present invention relates to a permanent casing for dispensable, valve-operated, pressure-tight containers, and more particularly to a telescoping casing adapted to operate the container enclosed therein. This application is a continuation-in-part of a copending application of Kenneth A. Norrish and John C. White, Serial No. 700,875, filed December 5, 1957.

The present invention has particular utility in the application, as a spray, of perfumes and the like. This method of application is not new and in fact has been widely accepted as superior technique. However, the spray devices or atomizers heretofore employed have impeded its widespread usage.

Spray devices of the conventional type employ a dip stick arranged within a bottle containing a liquid perfume preparation. The liquid is forced up into the dip stick by means of a squeeze bulb or plunger element, and out a nozzle as a finely distributed mist. This device is relatively bulky, and subject to leakage unless maintained in an upright position. Therefore, for all practical purposes, its usage is limited to the home. Even there it has found little favor due primarily to the need for refilling the bottle with the liquid preparation. Such operation is at best quite messy resulting in the spreading of a lasting aroma to the immediate area, including the person, and further aggravated by the danger of spilling the expensive liquid.

Accordingly, it is one of the objects of the present invention to provide a spray dispenser for perfumes and the like having none of the above-enumerated disadvantages. To this end the invention prescribes the use of a valve-operated, pressure-tight container similar to the conventional aerosol container, for example. This container may be filled with a liquid perfume under pressure so that operation of the valve releases the liquid. Such a container can be inexpensively made and may therefore be sold directly to the consumer as a dispensable item. In addition, the containers may be made leakproof and quite compact so as to be readily portable in a hand-bag or the like.

To make the use of such container more attractive the present invention provides a permanent casing adapted to operate the container enclosed therein. The casing comprises an open-ended receptacle member for the container and a removable cap member telescopically mated with the receptacle member and variable in position along the telescopic axis. Further, the telescoping members are adapted so that they arrange the container therein with the operating axis of its valve in operative alignment with the telescopic axis. In this way relative telescopic movement of the receptacle and cap members may be employed to operate the valve. The liquid thus released from the container may be conducted out of the casing through an opening in the cap member. Advantageously the liquid is conducted through a sharp angular bend so as to break up the fluid into a finely distributed mist prior to its release from the cap member. A plastic conduit

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insert attached to the cap member in alignment with the hole therein and arranged so as to fit over the container valve may be employed for this purpose.

One of the primary advantages of the casing of the invention is the simplicity and speed with which it permits perfume application. The valve in the pressure-tight container will, of course, always be subject to a reverse pressure tending to maintain it in a closed position. The valve may therefore be opened simply by telescoping the casing by hand to apply pressure on the valve opposite to that normally in operation. Ordinarily the casing is of such a size that it may be conveniently operated with the thumb while holding it in the palm of the hand. In this context the cap member provides a large surface area for the thumb operation. Furthermore, the normal reverse pressure on the valve may be employed to return the casing members to their original positions after the temporary operating pressure has been removed.

To prevent slippage of one casing member within the other while retaining the removability of the cap member, the invention prescribes that there be frictional engagement between the telescoping members. Unfortunately, the operability of the casing would normally be impeded thereby. This is particularly true for the return operation which is dependent solely upon the normal reverse pressure of the valve. In solving this dilemma the invention provides a projection extending laterally from the telescoping surface of one of the casing members. Further, the invention provides a recess in the telescoping surface of the other member which is adapted to mate with this projection. In this way telescopic movement of the casing members is relatively frictionless when the projection is within the limits defined by the recess. By properly proportioning the relative axial dimensions of the recess and projection this relatively frictionless telescoping range may be made to substantially coincide with the range of axial movement required for the operation of the valve. Only outside the limits of this recess does the projection extending from the one member abut against the telescoping surface of the other member. Thus the frictional engagement required to prevent slippage is provided without impeding the operative telescopic movement of the casing members.

Advantageously the axial limits of the recess are arranged so that the projection prevents the cap member both from slipping out of or into the receptacle member by contact with the upper limit or lower limit, respectively. A recess without a lower limit so arranged may also be employed, however, due to the support provided the cap member by the enclosed container.

In addition to the ease of operation and compactness as above described, many other advantages adhere to the casing which forms the present invention. The perfume containing pressure-tight container may be conveniently bought as an inexpensive, dispensable, and leakproof unit. Replacement within the casing is then very simply and quickly effected by removing the cap member from the receptacle member thus avoiding messiness and spillage. Furthermore, the casing can be very attractively and inexpensively made of a polished lustrous metal.

The invention can best be understood by referring to the following drawings in which:

Fig. 1 is a partially cut-away view of an embodiment of a spray dispenser in accordance with the invention;

Fig. 2 is a section of Fig. 1 taken along line 2-2;

Fig. 3 is a sectional view of the dispenser of Fig. 1 illustrating its operation;

Fig. 4 is a section of the casing of Fig. 2 taken along line 4-4;

Fig. 5 is a partially cut-away view of an alternate dispenser embodiment in accordance with the invention;

Fig. 6 is an expanded view of a portion of Fig. 5 illustrating the telescoping mechanism;

Fig. 7 is a partial sectional view of a dispenser in accordance with the invention showing alternative telescoping means; and

Fig. 8 is a partial sectional view of a dispenser in accordance with the invention showing further alternative telescoping means.

The invention will be first described in connection with the dispenser embodiment illustrated in Figs. 1, 2, 3, and 4. The casing comprises three basic units, the receptacle member 1, the cap member 2, and the cover member 3. The cover member 3 is employed solely for protecting the cap member and for presenting an outwardly attractive unit, and is removed during the operation of the dispenser as illustrated in Fig. 3. The cap member is telescopically mated within the receptacle member and variable along the telescopic axis which, in this case, coincides with the line 2—2 of Fig. 1.

The liquid preparation to be sprayed is contained within a dispensable container 4. This container is inserted within the casing simply by removing the cap member 2, placing the container within the receptacle member, and replacing the cap member. The container is made pressure-tight and the liquid therein is maintained at a pressure substantially higher than that of the atmosphere, as, for example, is the liquid within an aerosol container. Release of the liquid preparation from the container is then effected by means of a plunger valve 5. This valve in its normal position seals the container 4 retaining the pressurized liquid preparation therein. To release the liquid from the container the valve 5 is depressed into the container along its operating axis, thereby creating an opening through which the pressurized liquid may escape.

In the invention the operation of valve 5 is effected by relative telescopic movement of the casing members 1 and 2. Accordingly, the casing members are adapted to arrange the container 4 with the operating axis of the valve 5 in operative alignment with their telescopic axis as illustrated in Fig. 2. Further, the cap member is provided with a plastic insert 6 having a conduit 7 therein designed to lead the liquid out of the cap member, and to direct it to its desired point of application. To this end, the insert 6 is positioned with one end of the conduit 7 mating with the valve 5, while the other end of the conduit mates with a nozzle 8 forming a liquid-tight external seal with the cap member. It will be noted that the conduit incorporates a sharp right-angular bend and that it leads to a smaller opening in the nozzle which thus forms a shoulder across most of the conduit diameter. These features are designed therein to convert the pressurized liquid escaping from the container 4 into a finely divided mist as illustrated in Fig. 3.

In its operation the dispenser is held in the hand while pressure is downwardly applied with the thumb to the top of the cap member to telescope the cap member within the receptacle member as illustrated in Fig. 3. The top of the cap member 9 is therefore advantageously shaped to fit the thumb. The coincidence of the operating axis of the valve 5 with the telescoping axis of the casing members depresses the valve within the container 4 to release the liquid through the conduit 7 and out of the nozzle 8 as a finely divided mist. Advantageously the base of the container 4 is separated from the bottom of the receptacle member by means of a cushion 10 to facilitate the described operation.

The simplicity and ease of operation is apparent. The dispensing of the liquid is effected by providing operating pressure with the thumb to telescope the casing as illustrated in Fig. 3. Upon removal of the thumb the return pressure continuously acting upon the valve 5 operates to return the cap member to its normal position as illustrated in Fig. 2. The cover member 3 may then be replaced as in Fig. 1 to complete the portable, compact, leakproof,

attractive unit. When the container 4 is emptied of liquid, replacement is simply a matter of throwing away the dispensable container and substituting a new container unit within the casing.

The invention prescribes that there be frictional engagement between the cap member 2 and the receptacle member 1. Such engagement prevents the one member from slipping out of the other member, while at the same time permitting removal of the cap member. Unfortunately, however, frictional engagement prevents the smooth operation of the dispenser unit; particularly that operation which is dependent upon the valve 5 to return the cap member to its normal position, since the return pressure on the valve may not be sufficient to overcome the frictional restraint. To solve this dilemma the cap member 2 is provided with a projection in the form of a lance 12 extending laterally outward from the cap member. This projection is dimensioned to normally abut against the inside surface of the receptacle member, as is best illustrated in Fig. 4, in order to provide the desired frictional engagement. Further, the invention provides an annular depression 13 in the receptacle member which is positioned so as to mate with the projection 12. Thus when the projection is within the limits defined by the depression 13, the frictional engagement caused by the projection will be removed and the telescopic movement of the casing members will be relatively frictionless. By properly proportioning the relative axial dimensions of the depression 13 and the projection 12 this relatively frictionless telescoping range may be made to coincide with the range of axial movement required for the operation of the valve 5. In this way the dilemma is solved; since within the valve operating range defined by the depression relatively frictionless telescopic movement is provided, while outside the valve operating range the projection is positioned without the recess thereby providing the frictional engagement required to prevent slippage.

The depression 13 serves a double purpose in that it provides an annular projection 14 on the outside surface of the receptacle member 1. This annular projection is advantageously employed as a shoulder against which the cover member 3 may abut when in position. In this context a lance projection 11 is provided on the outside surface of the receptacle member to frictionally engage the cover 3 thus retaining it in position.

An embodiment alternative to that described is illustrated in Figs. 5 and 6. This embodiment again encloses a pressurized container 4 within a receptacle member 20 and a cap member 21. Again, the valve of the container 4 is mated within an insert leading to a nozzle 8 while the base of the container is separated from the bottom of the receptacle member 20 by a cushion 10. Further, the operation of the container is again effected by relative telescopic movement of the cap member 21 and the receptacle member 20.

The major difference in the instant embodiment lies in the means providing frictional engagement between the two casing members while permitting relatively frictionless operative movement. The projection is again in the form of the lance 22 as in the prior embodiment. The depression of the prior embodiment is, however, replaced by a recess 23 in the form of a rectangular opening. This arrangement thus provides frictional engagement which impedes relative rotational movement of the casing members as well as axial movement when the projection is out of the recess. Further, this embodiment does not employ a cover member. Advantageously, the recess 23 is positioned in the cap member and the projection 22 in the receptacle member so that the recess may be concealed.

In Figs. 7 and 8 further embodiments are illustrated wherein the means for permitting relatively frictionless operative movement differ in one major respect from those described hereinbefore. In the embodiments of Figs. 1 through 6 the recesses are axially dimensioned so that their upper and lower limits prevent the cap member from

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either slipping into or out of the receptacle member. However, as best seen in Fig. 3 there is very little danger that the cap member 2 will slip into the receptacle member 1 due to the support provided by the enclosed pressure-tight container 4. Further, with the container 4 removed, the nozzle 8 may be dimensioned to project beyond the lip of the receptacle member to prevent the cap member from slipping therewithin.

For these reasons annular depressions of the type shown in Figs. 7 and 8, wherein means for preventing slippage of the cap member into the receptacle member are not provided, may also be employed in the dispenser unit of the invention where preferred. The depression of Fig. 7 is formed by press fitting an annular insert 25 within a receptacle 24 with the lower edge of the insert arranged to form the upper limit of the depression. In this way, when within the volume defined by the insert member 25, the projection 27 on cap member 26 will frictionally engage the insert to prevent outward slippage. However, when the projection is below the lower edge of the insert, within the annular depression, substantially non-frictionless telescopic movement is provided to permit the dispenser operation. Since means for preventing slippage of the cap member into the receptacle member is not required, the depression may extend down to the bottom of the receptacle member thereby actually forming a major portion thereof.

In the embodiment of Fig. 8 the necessity for employing a separate insert is avoided by dimensioning the receptacle member 28 so that the diameter of its upper portion 30 is made smaller than the remainder to form a shoulder 29. The position of this shoulder is arranged to provide the upper limit of the annular depression thus formed. Frictional engagement preventing outward slippage of the cap member 31 is then provided by the receptacle upper portion 30 and a projection 32, while the depression formed in the remainder of the receptacle member provides the required substantially non-frictionless operative movement.

One of the advantages provided by the embodiment of Fig. 8 is derived from its use in conjunction with a cover member like that denoted by the numeral 3 in Fig. 1. The annular depression of Fig. 8 forms an annular projection wherein shoulder 29 provides an abutment for seating such a cover member as does the upper limit of the annular projection 14 of Fig. 1. However, the cover member so seated in Fig. 8 produces a dispenser having a smooth cylindrical outside surface unbroken by the inward bend resulting from the arrangement of the lower limit of the depression of Fig. 1. It will also be noted that such smooth effect may be produced in the embodiment of Fig. 7 by raising the upper edge of insert 25 above that of the receptacle member to form a seat for a cover member therefor.

Wherever the term "recess" has been used heretofore and is used in the appended claims, it is intended to be generic in nature so as to include within its meaning the depression 13 of Fig. 2, the opening 23 of Fig. 6, and the depressions of Figs. 7 and 8.

Preferred embodiments of the invention have been described. Various changes and modifications may be made in the scope of the invention as set forth in the appended claims.

We claim:

1. For use in combination with a disposable valve-operated, pressurized container of the type having an axially depressible tube at one end forming a combined valve and outlet and normally urged axially outward to a closed position, a permanent casing comprising an open-ended receptacle member for said container, a removable cap member telescopically mated with said receptacle member and variable in position along the telescopic axis, said

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cap and receptacle members being adapted to support said container with the operating axis of its valve tube in operative alignment with said telescopic axis, insert means in said cap member engaging the valve tube and forming a passage leading to the exterior of said cap member for the discharge of contents of the container, said insert means having a tube-engaging shoulder for operating said valve upon relative telescopic movement of said cap and receptacle members, one of said members having a recess in the telescoping surface thereof, and a projection extending laterally from the telescoping surface of the other of said members to fit within the said recess when said cap member is telescopically fitted with said receptacle member, the axial dimensions of said projection and said recess being proportioned to permit relatively frictionless telescopic movement of said cap member relative to said receptacle member substantially throughout the axial operating range of said valve.

2. The combination of claim 1, in which the said projection is in the form of a lance.

3. A permanent casing in accordance with claim 1, in which the said recess is in the form of an opening.

4. A permanent casing in accordance with claim 3, in which the said opening is arranged within the said cap member, and the said projection is arranged on the said receptacle member.

5. A permanent casing in accordance with claim 1, in which the said recess is in the form of an annular depression providing a shoulder.

6. A permanent casing in accordance with claim 1, in which the recess is formed by an annular insert fixed to one of the telescoping members and providing a shoulder for engaging said projection.

7. For use in combination with a disposable, valve-operated, pressurized container of the type having an axially depressible tube at one end forming a combined valve and outlet and normally urged axially outward to a closed position, a permanent casing comprising an open-ended receptacle member for said container, a removable cap member telescopically mated within said receptacle member and variable in position along the telescopic axis, said cap and receptacle members being adapted to support said container with the operating axis of its valve tube in operative alignment with said telescopic axis, insert means in said cap member engaging the valve tube and forming a passage leading to the exterior of said cap member for the discharge of contents of the container, said insert means having a tube-engaging shoulder for operating said valve upon relative telescopic movement of said cap and receptacle members, an annular depression in the telescoping inner surface of said receptacle member forming an annular projection on the outer surface thereof, a projection extending laterally outward from the telescoping outer surface of said cap member adapted to fit within the said depression when the said cap member is telescopically fitted in said receptacle member, the axial dimensions of said projection and said depression being proportioned to permit relatively frictionless telescopic movement of said cap member relative to said receptacle member substantially throughout the axial operating range of said valve, and a cover member for said cap member adapted to fit over said receptacle member in abutting relationship with said annular projection.

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