May 30, 1950 V. L. ROBERSON 2,509,369

LIQUID DISPENSING CONTAINER

Filed Aug. 3, 1945

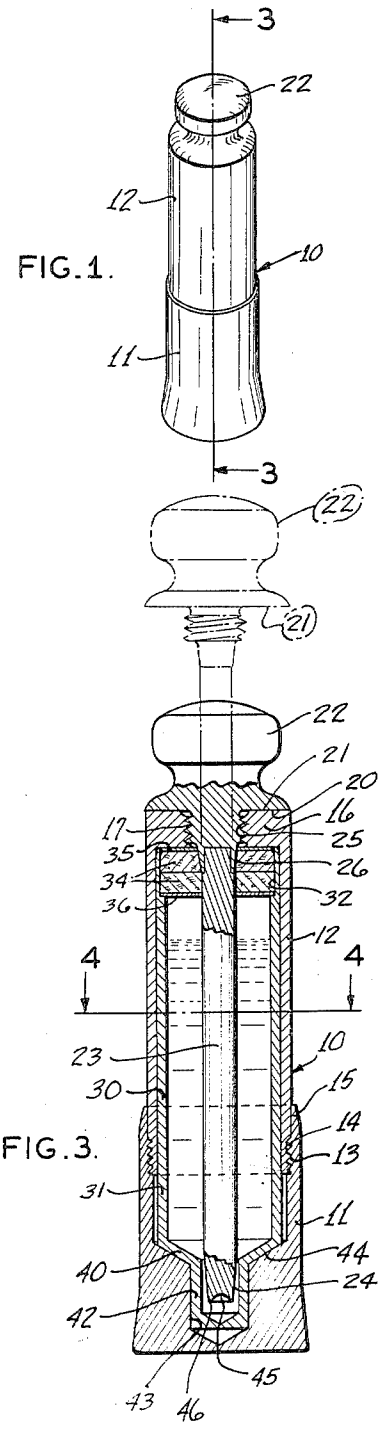


FIG. 1.

FIG. 3.

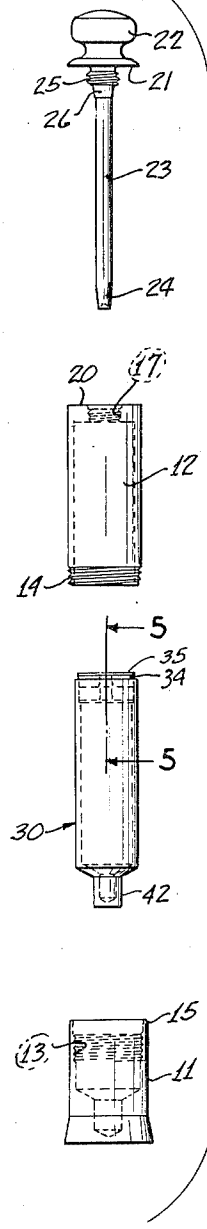


FIG. 2.

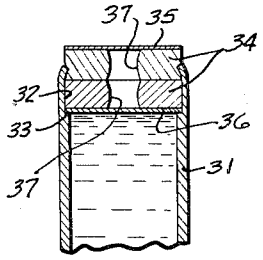


FIG. 5.

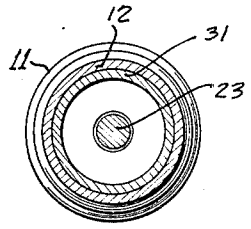


FIG. 4.

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Patented May 30, 1950

2,509,369

UNITED STATES PATENT OFFICE

2,509,369

LIQUID DISPENSING CONTAINER

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Application August 3, 1945, Serial No. 608,730

2 Claims. (Cl. 15—140.3)

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This invention relates to improvements in liquid dispensing containers, and more particularly to a dispensing device for liquids to be carefully protected against leakage. In preferred forms, the devices embodying the present improvements are those of cartridge refill type, and further incorporate means for utilizing or applying the cartridge content, with little or no waste.

Prevalent dispensers for perfumes and the like present many disadvantages, among which are a high likelihood of loss of the relatively high-cost liquids by evaporation, due to the fact that most such materials are of alcohol-soluble types, and hence characterized by a highly volatile, low viscosity solvent or vehicle. Those types of perfume dispensers heretofore offered to the trade and designed to be carried on the person, as in a purse or the like, are frequently subject to spillage and leakage difficulties. Furthermore, incident to heretofore prevalent modes of application of the perfume for personal use, a high percentage of waste and loss occurs. Accordingly, the present invention has as its general objective, an improved design of liquid dispensing vial which will obviate or at least minimize, the usual shortcomings experienced with containers of this class.

A further and important object of the invention is attained in a virtually non-collapsible container provided with improved liquid-sealing provisions; further objectives incident to these improvements include a novel "dry" type of applicator, and multiple liquid sealing provisions which, in present embodiments, are associated with the applicator.

Yet another and important objective of the invention is attained by the provision of a perfume-dispensing container characterized by inner and outer elements, both of unique construction and intended for the highest quality product. The especial form and construction of the companion container components are such as to require, in discouragement of commercial substitution, an inner container specially formed to be received only by a special outer container or casing.

Still another highly important objective of the present improvements is attained in a novel perfume cartridge core or vial intended to be produced and sold as such, as an article of manufacture, and provided with improved sealing means which is fully effective prior to the first fill or refill stage, and equally effective after the cartridge vial is put into use.

The foregoing and numerous other objects will more clearly appear from the following detailed description of preferred embodiments of the several improvements, particularly when considered in connection with the accompanying drawing, in which:

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Fig. 1 is an isometric view of an assembled liquid dispensing vial of a type suitable to be carried as a purse vial when employed for a perfume or the like;

Fig. 2 is an exploded view showing the four principal elements of the embodiment of Fig. 1, prior to their assembly;

Fig. 3 is an enlarged longitudinal sectional view of the assembly of Fig. 1, as taken along line 3—3 thereof;

Fig. 4 is a transverse sectional view as taken along line 4—4 of Fig. 3, and

Fig. 5 is an enlarged fragmentary sectional view through the replaceable core or cartridge element of the assembly.

Referring now by characters of reference to the drawing, the container comprises, by preference, a two-part outer tubular casing or enclosing body generally indicated at 10. This is comprised of a lower cup-like solid section 11 and a companion upper section 12. Since at times the container may be employed at least occasionally in dressing table use, it is required to stand upright, and to provide an augmented area of base of support, the substantially solid base portion of section 11 is, as indicated by the numeral 12, somewhat outwardly enlarged in diameter, if of circular section as shown, so as to present an appreciable flare.

Provided internally of the open end or mouth of section 11 and preferably somewhat below the upper margin thereof, are internal threads 13 mating with a companion threaded portion 14 on the upper section 12 of the outer casing or body. The unthreaded marginal lip on portion 11 serves, when the sections are first brought together, as a guide in directing the parts into alignment and so serves to facilitate threaded engagement. It will be further noted as a preference, principally for the provision of a relatively smooth exterior of the casing, slightly to taper the unthreaded lip of section 11 in the zone where in assembly it approaches the body 12, the tapered lip being indicated at 15.

The upper portion of the upper section 12 is provided with a relatively thick end wall 16 which is internally threaded as at 17 for the reception of a threaded applicator, later to be described. The top surface 20 of the upper section is by preference smooth, of planar aspect, and may, if desired, be carefully machined or even polished. It will now have been observed that in assembly the

planar surface 20 closely engages, in fact forms a liquid seal with a companion planar surface 21 defining the base of a handle or cap 22 serving to carry an applicator rod 23.

The applicator rod 23 is preferably of substantially even diameter throughout the major portion of its exposed length, except for a slight constricting taper near its extreme free end, as indicated at 24. The assembly of rod 23 and handle 22 is preferably provided with screw threads 25 mating with the thread 17 in the outer axial opening of the upper body section 12, so that the handle 22 constitutes in effect a screw cap, and is provided with an integral axial extension carrying the threads 25 below which this extension is socketed to receive an upper conforming end of rod 23. Assembly in this zone may be effected as by welding or by expanding the rod into the socket. A further preference is to form the extension so that it presents a taper or gradual diametral enlargement toward the threads, as indicated at 26. This enlargement tends to enhance the seal of the applicator rod where it extends into the inner core of cartridge, later more particularly described.

Proceeding now to a description of the replaceable cartridge core, this structure is generally designated at 30, and similarly to the outer casing or body, is of closed-end tubular form being, but for a special base conformity later described, substantially cylindrical. It is distinctly to be understood that the description of the hollow elements of the assembly as tubular or cylindrical, is without limitation to any particular cross sectional form, the circular sections having been selected principally for ready availability and ease in machining.

With particular reference to Fig. 5, it will be seen that the wall 31 of the cartridge is somewhat undercut just inwardly of its upper end, thus providing a portion of relatively enlarged internal diameter as at 32, and an internal shoulder 33, this arrangement forming a seat for a closure now to be described. The closure, in the article of manufacture as originally sold in the full assembly or in the cartridge core for replacement purposes, consists of a plurality of layers (shown as two), of a depthwise compressible, absorbent sealing material, such as punched layers of sheet cork 34. Cemented, as by an alcohol-insoluble cement, to the top surface of the closure, is a thin layer of metal 35 such as aluminum foil for example, and a similar foil layer 36 being cemented to the lower surface of the lowermost cork element. Both of the metal layers are initially imperforate for sealing purposes as the vial cartridge is sold and virtually filled with its liquid content. The two intervening layers of the laminar sealing structure are centrally or axially apertured as at 37, and by preference the four-ply closure assembly is, after filling the cartridge with liquid, somewhat compressed into the closure seat, and the upper, otherwise free margins of the cartridge wall spun or otherwise turned slightly inwardly as shown by Fig. 5, to retain the closure under a slight compression therein.

It has been heretofore briefly noted as a preference to form the inner cartridge vial 30 so that a special shape thereof results in discouragement of commercial substitution of cartridges containing an inferior or imitative product. Such special conformities may be imparted to the inner and outer enclosures in a variety of ways, but for convenience of production the embodiment of this feature consists of a portion of stepped diameters, best appearing from Figs. 2 and 3. It will be seen that the normal cross section of the wall 31 is carried into a funnel-like, inverted frusto-conical portion 40, below which and preferably integrally therewith, being located a well portion 42. This latter may be and conveniently is in the form of a short cylinder integral with the remainder of the cartridge body, and its inner diameter being very close to the external diameter of the tapered end 24 of the applicator rod. In addition to the keying function of the irregularly shaped parts, the well has a particular functional advantage in that, since the applicator as will appear, substantially reaches the bottom of the well, almost the last vestige of liquid may and normally will be picked up by the rod.

For the purpose of snugly receiving and accommodating the irregularly shaped funnel and well portions of the cartridge or core 30, the base section 11 of the outer casing is internally conformed similarly to the various portions just described. As will appear from Fig. 3, a lowermost bore 43 snugly receives the well portion 42 and a tapered part 44 in section 11 closely engages the portion 40 of the cartridge.

It will be seen, particularly from Fig. 3 and as noted, that the length of the applicator rod 24 in assembly is such that it closely approaches a bottoming relation to the cartridge, in that it extends deeply into the well 42. Thus it now becomes apparent that, were it attempted to substitute a cylindrical cartridge of even diameter throughout, the substitute element could not be accommodated to permit its assembly within and between the sections 11 and 12 of the casing, and still permit the introduction and threaded closure of the handled applicator rod. Accordingly it will now be seen that, without redesign of several of the elements and retooling for their production, it will be impossible to interchange with substitution of liquid content, either the inner or outer elements of assembly with regularly formed substitute parts.

Further reference should be made to the structure and important function of the improved applicator rod, which of itself may, now obviously, be utilized with some other forms of dispensing container. As before noted, the rod is preferably of a nearly uniform diameter throughout. It is intended to function as a dry element, i. e., one in which the circumference of the rod plays no part as a liquid carrier. The liquid carrying function is provided for in the current design solely by the provision of a recess extended inwardly of the free end face of the rod, as indicated at 45 (Fig. 3). The depth of this recess may be, for different perfumes, or particularly for other liquids, arrived at on a basis of viscosity of the liquid, but it is a preference in dispensing perfumes and the like, to form the recess 45 of a generally meniscus shape as shown. This form of recess will, when the rod end is immersed, serve to pick up and retain until personal dislodgement, a drop of the liquid of a volume generally suitable for a single application.

It will now have appeared that the handled applicator assembly serves in the disclosure a triple purpose, namely, the described purpose as an applicator; a second purpose in providing a liquid-tight seal between the planar surfaces 20 and 21, and thirdly, as a plug or closure element sealing the opening through the closure of the cartridge vial. The latter function will now be more particularly referred to: Incident to initial

supply or replacement of the liquid cartridge, this element 30 filled and sealed is inserted with its well end in section 11, the latter then being separated from section 12. The body sections are then threaded together. It has heretofore been mentioned that the sealing closure of the cartridge, although it projects slightly as shown above the outer end of wall 31, is nevertheless under a slight compression. The length of cartridge, and the inside length of assembled outer body or casing, are substantially conforming, so that as parts 11 and 12 are threaded more closely together, the cartridge or core is still further compressed and the depthwise compressible closure is still further compressed, thus serving resiliently to retain the cartridge under axial compression within and between the sections of the outer casing. For purposes of assembly thus far, the applicator rod will have been removed. It may now be inserted axially of the assembly. It may be noted further that by forming the meniscus recess 45 of about the same diameter as the end face of the rod, there results a circular cutting edge 46. As this edge portion is driven through the metal foil elements 35 and 36, it produces a clean perforation thereof and serves to carry the cut-out disc portions to the interior of the vial where they will not interfere in any manner with perfection of the liquid seal at the top of the cartridge.

It is a preference in forming the opening 37 through the layers of cork or similar material, that these openings be of such diameter as not to exceed that of the applicator rod 23. The openings will obviously be somewhat constricted as the cartridge closure is compressed, thus enhancing the sealing action about the rod at the top of the vial.

The manner of usage, and the advantages stated in the objects expressed and implied, have adequately been disclosed in the detailed description of parts and assembly. It may be noted, however, that with the parts fully assembled, an application of the liquid is effected by unthreading the handled or threaded cap closure 22 and withdrawing it axially from the vial. As the rod is removed, the recess 45 will carry the required amount of liquid, and as the rod is withdrawn it will now appear that the cork or like material under compression about opening 37 will exert a distinct wiping action fully around the cylindrical surface of the rod. The liquid wiped from the rod will be returned to the vial without waste, and without unwanted application. Restoration of the applicator will obviously again reseal the outer container between parts 20 and 21, and will effectively plug the openings 37. This latter sealing effect is further enhanced by the distinct taper indicated at 26 which provides a final wedging action as the applicator threads are fully turned up.

No preference of materials has thus far been stated. Assemblies thus far produced have been formed of a high lustre, non-corroding metal such as an aluminum alloy constituting each of the elements of the assembly, with the exception of the cartridge closure. It is distinctly contemplated, however, that other materials such as various thermoplastic or thermosetting resins of types not soluble in alcohol nor adversely effected by other solvents in the vial contents, may be utilized. It is a preference that at least the outer casing be formed of a sufficiently rigid material as to resist any usual crushing effects or other deformation stresses. Throughout the description, for brevity, certain of the parts have been referred to as "upper" and "lower." Such terms are to be understood as without limitation, inasmuch as they refer solely to the positions of the elements as shown in the drawing, and with the container in an upright position.

Although the invention has been described by reciting in detail the characteristics and assembly of a single selected embodiment, the detail of description is to be understood solely in an instructive, rather than in any limiting sense, since numerous variants are possible within the spirit and full intended scope of the claims hereunto appended.

I claim as my invention:

1. In a liquid dispenser for use with perfume or the like, a two-part substantially cylindrical metal holder, the two parts of which are detachably threadedly connected inwardly of the ends of the holder, the lower end of the holder being imperforate, and the outer or upper end of the holder being provided with an axial internally threaded opening, a dispensing rod provided with a head on its outer end, and threaded to conform to said threaded opening inwardly of the head, the head and adjacent end of the holder, when threaded up, serving as a liquid tight seal for the outer container, an inner cartridge type core serving as a replaceable container for the liquid, the core being provided at its lower end with a converging or funnel-like portion and therebeyond, with a portion of reduced diameter constituting a well, the opposite end of the core being internally shouldered, a laminar closure fitted to the end of the core in abutment to said shoulder, and consisting of a layer of compressively resilient material, and a layer of impervious imperforate sealing material, the outer end of the core being formed to retain the closure therein under a moderate compression, but with a portion of the closure projecting outwardly of the adjacent end of the core, the compressively resilient layer of the closure being provided with an opening which, with the material under compression, is slightly less in diameter than the diameter of the dispensing rod, one of the sections of the holder being internally conformed to correspond with the imperforate portion of the core in which the well is provided, the applicator rod being of a length such that in assembly, it extends substantially over the full length of the core, and such that the lower end of the applicator rod approaches a bottoming relation to said well, the internal length of the holder and the overall external length of the cartridge core being such that, with the core in place and the sections of the holder fully threaded up, the core closure and core are retained under at least a moderate compression.

2. In a liquid dispenser for perfume or the like, an outer casing comprising separable hollow elements defining an interior chamber, one of said hollow elements being provided with an apertured end wall, a liquid containing vial removably positionable in said casing chamber, said vial having an open filler end adjacent said apertured end wall, and a small diameter pocket or well at its opposite end, laminar closure means for the open end of said vial, said closure means consisting of a centrally perforated layer of compressively resilient material and a layer of imperforate sealing material at each side of the perforated layer to form an initially liquid tight closure for the vial, a liquid dispensing and applicator rod of a length to extend over the full length or depth of the vial into said well, and

having one end adapted, upon insertion through the apertured end wall of said one hollow element, to perforate said layers of imperforate material and extend depthwise to the bottom of the vial, said rod being slidably removable through said layers with a wiping effect thereof on the rod, the rod being formed with a plug portion for liquid tight seating engagement in said perforated layer of resilient material and a threaded portion outwardly of but adjacent the plug portion for securement in said perforated end wall, and cap means on said rod for engagement with said perforated end wall to provide a liquid tight seal for the casing.

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