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N. MEURER

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LIQUID SPRAYER

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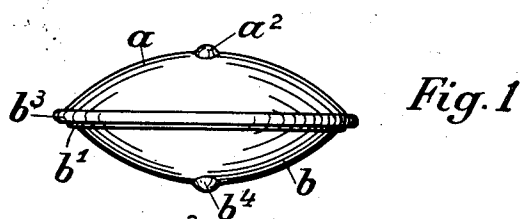


Fig. 1

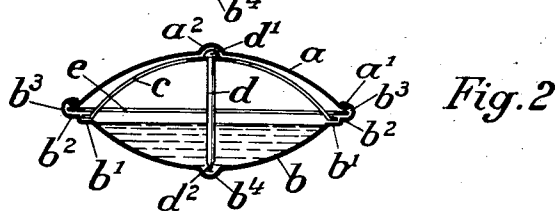


Fig. 2

Fig. 3

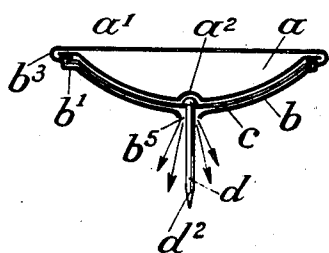


Fig. 5

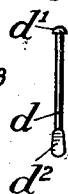


Fig. 4

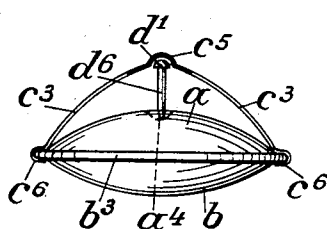
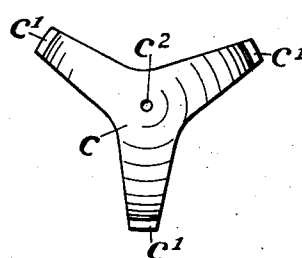


Fig. 6

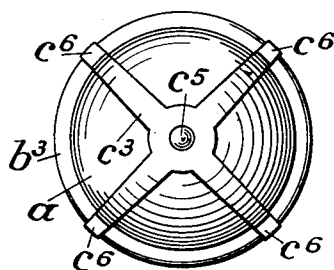


Fig. 7

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LIQUID SPRAYER

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12 Claims. (Cl. 299—90)

My invention relates to a spray or atomizer for liquids. It is intended for containing and spraying small quantities of liquids, particularly for perfumes (scents, eau de Cologne, mouth wash, etc.,) and which, after use or after emptying the contents, may be simply thrown away as worthless when the small quantity of liquid contained therein has sufficed for use on one occasion only.

The spray in accordance with the invention consists substantially of a closed hollow capsule of a double calotte shape, made of materials such as aluminium sheet, tin foil, rather resilient but fairly soft metals, but also of celluloid, gelatine, film composition, acetyl-cellulose, paper covered with metal foil, in short, all materials which may be easily opened or punctured with a pricking element, such as a needle, and then deformed or squeezed flat by pressure from the finger, so that the contents of the original hollow interior is forced out of the punctured hole in spray form. These capsule sprays are suitable particularly for refreshing the face, head, hands and other parts of the body or also for containing single issues of mouth wash for rinsing the mouth etc., after fatiguing marches, on journeys or after other bodily exertions.

The invention will be better understood by referring to the accompanying drawing in which Figs. 1-7 show some practical embodiments of the spray in accordance with the invention.

Fig. 1 being a side elevation of the first example, in which the pricking member is arranged inside the spray,

Fig. 2 a vertical section through Fig. 1 and Fig. 3 a vertical section through a completely evacuated capsule according to Figs. 1 and 2.

Fig. 4 shows a plan of the holder for the pricking element according to Figs. 1 and 2 and

Fig. 5 a side elevation of the pricking element itself.

Figs. 6 and 7 illustrate a modified example of the invention,

Fig. 6 being a side elevation of the modified spray, showing the holder for the pricking member in section, whilst

Fig. 7 is a plan of the example according to Fig. 6.

In the two different examples shown in the drawing, the capsule-form liquid container consists of two hollow halves in the shape of a calotte or spherical segment, that is, a top half *a*, and a bottom half *b*. Both halves are joined together liquid-tight at the base by folding, welding, adhesion, solution or the like.

In the example according to Figs. 1-3, this

union is made by the horizontal flange *a*¹ of the top half *a*, being placed on the horizontal flange *b*² of the bottom half *b*, with a thin packing ring *e*, of rubber, cork, paraffined paper or the like interposed therebetween, after which a turned over flange *b*³, unites the two halves *a* and *b* to each other.

The capsule *a, b* is opened by means of a pricking member *d*. This member may consist of an ordinary pin whose head *d*¹ rests in a cavity *a*² provided in the middle of the top half *a*, whilst the point *d*² may rest in a corresponding cavity *b*⁴ of the bottom piece *b*. By exerting a pressure on the top portion *a* in the direction of the axis of the pricking member *d*, the point *d*² punctures the wall of the container at the cavity *b*⁴. With continuing pressure, preferably exerted by the thumb whilst the index and middle fingers are held against the surface of the bottom piece *b*, each side of the indentation *b*⁴, the liquid contents are emptied through the punctured hole, as the top cover *a*, is deformed. When this is done, the top half *a*, as will be seen in Fig. 3, rests flat against the bottom portion *b*, so that the very last remains of the liquid are forced out through the orifice. The capsule thus emptied, is then thrown away as worthless.

The capsule half *b*, is filled of course, before the top cover half *a*, is joined on to it. When the cover *a*, has been placed on the filled bottom half *b*, the previously vertical flange *b*³, has its top portion pressed flat on the edge *a*¹ of the cover by the descent of a pressure die, whilst an interposed packing ring ensures that a tight joint is effected.

In order to facilitate the insertion of the pricking member *d*, in the capsule portions *a, b* when the cover portion is placed upon the filled bottom half *b*, and also to fix the position of the pricking member, it is possible to use a three-armed needle holder *c*, which is provided in the centre with an aperture *c*² which corresponds approximately to the diameter of the pricking member *d*, but is smaller than the head *d*¹ of the same. This holder *c* is preferably adapted to the segmental shape of the cover portion *a*, that is, the arms cling closely to the curved shape of the inner wall of the cover portion *a*. The ends *c*¹ of the holder *c* are fixed with respect to the bottom portion *b*, by fitting in an annular recess *b*¹ of the latter. Whilst the bottom portion *b* is open, the holder *c*, with the pricking member *d* inserted in the hole *c*², is laid on the bottom portion *b*, whereupon the top portion *a*

is placed over and the two halves *a* and *b* then joined together.

Instead of the pricking member *d*, being placed between the parts *a* and *b*, the point *d*² of the pricking member *d*, may also be inserted in a hollow *a*⁴ let in the cover *a*, whilst the head *d*¹ of the pricking member is embraced by a cup-shaped indentation *c*⁵, the ends *c*⁶ of the arms *c*³ of the holder being clipped over the flanged edge *b*³. With this type, the spray is used by pressure being exerted on *c*⁵, *d*¹ in the axial direction of *d*⁶, thus piercing a hole in the hollow *a*⁴ of the cover portion *a*. The ends *c*⁶ of the arms *c*³ clipping the flanged rim *b*³ are then deformed so that the entire holder *c*³ together with the pricker *d*⁶ can be taken off from the portions *a*, *b* and discarded. Then the bottom half *b*, is pushed against the top half *a*, until its shape conforms to that of the top half and all the liquid from the bottom part *b*, has been squirted out through the pierced hole.

It is advisable to shape the point *d*² of the pricking member *d* somewhat flat like a chisel, so as to obtain a long pierced hole from which the liquid may issue at each side of the round stem of *d*, easier than if the point were conical as in an ordinary pin.

Of course, the outer shape of the container may be of a form other than segmental, without the invention having to be modified in any essential details.

I claim:

1. A receptacle adapted to hold a small amount of a substance, especially a liquid one, to be ejected out of the receptacle in the form of a jet, and consisting of a material impermeable to liquids and comprising a hollow body so constructed as to permit it to be collapsed into a relatively thin solid shape in order to eject thereby the respective substance in the form stated, and a pricking member formed by a piece of rigid wire having a head at one of its ends and being pointed at the other of its ends and means retaining it in proper position relatively to the hollow body at both said ends with its pointed end opposite a portion of the body wall and being adapted to produce an ejecting aperture in the wall portion located opposite said pointed end when the said hollow body is being collapsed, this latter having, prior thereto no externally visible ejecting aperture, nor a filling aperture.

2. A receptacle adapted to hold a small amount of a substance, especially a liquid one, to be ejected out of the receptacle in the form of a jet, and consisting of a material impermeable to liquids and comprising a hollow body, composed of two basin-like shallow parts placed upon one another at their rims and being there tightly connected with one another so as to permit said body to be collapsed into a relatively thin solid shape in order to eject thereby the respective substance in the form stated; a pricking member formed by a piece of rigid wire having a head at one end and being pointed at the other end, and a holder therefor connected with the hollow body and holding said pricking member with its pointed end opposite the body wall and its head in position for engagement with a source of pressure, this latter having, prior to being pierced by the said pricking member when this is being operated, no externally visible aperture, nor a filling aperture.

3. A receptacle adapted to hold a small amount of a substance, especially a liquid one, to be ejected out of the receptacle in the form of a

jet, and consisting of a material impermeable to liquids and comprising a hollow body composed of two shallow basin-like parts connected tightly with one another at their rims so as to permit said body to be collapsed into a relatively thin solid shape in order to eject thereby the respective substance in the form stated; a pricking member formed by a piece of rigid wire having a head at one end and being pointed at the other end and adapted to pierce with its pointed end the wall of the hollow body when it is actuated; and a pricking member holder having at least three curved supporting arms and being connected with the said hollow body by the intermediary of said arms said holder supporting said member with its pointed end adjacent the body wall and its head end in position to be actuated by a source of pressure, the said body having externally, prior to being pierced by the pointed end of the said pricking member, no externally visible ejecting aperture, nor a filling aperture.

4. A receptacle adapted to hold a small amount of a substance, especially a liquid one, to be ejected out of the receptacle in the form of a jet, and consisting of a material impermeable to liquids and comprising a hollow body composed of two shallow, basin-shaped parts tightly connected with one another at their rims so as to permit said body to be collapsed into a relatively thin solid shape in order to eject thereby the respective substance in the form stated; a pricking member formed by a piece of rigid wire having a head at one end and being pointed at the other end and adapted to pierce with its pointed end the wall of the hollow body when it is actuated; a pricking member holder having at least three curved supporting arms holding the pricking member in proper position for use and being connected at the free ends of the same with the said body at said rims, the said hollow body having no externally visible ejecting aperture, nor a filling aperture.

5. A receptacle adapted to hold a small amount of a substance, especially a liquid one, to be ejected out of the receptacle in the form of a jet, and consisting of a material impermeable to liquids, and comprising a hollow body composed of two shallow, basin-like parts tightly connected with one another at their rims so as to permit said body to be collapsed into a relatively thin solid shape in order to eject thereby the respective substance in the form stated; a pricking member formed by a piece of rigid wire having a head at one end and being pointed at the other end and retained with its pointed end opposite the body wall and its head in position for engagement with a source of pressure, said pointed end being adapted to pierce the oppositely located portion of the wall of the body when this is being collapsed; and a pricking member holder having at least three curved supporting arms and being connected with the said body by the intermediary of said arms, the said hollow body having externally, prior to being pierced, no externally visible ejecting aperture, nor a filling aperture.

6. A receptacle adapted to hold a small amount of a substance, especially a liquid one, to be ejected out of the receptacle in the form of a jet, and consisting of a material impermeable to liquids and comprising two basin shaped shallow parts tightly connected with one another at their rims and permitting of being collapsed into a relatively thin solid shape in order to eject there-

by the respective substance in the form stated; a pricking member formed by a piece of rigid wire being at one end pointed said pointed end being retained by a portion of the container wall so as to be adapted to pierce the said portion of the wall of the hollow body when this latter is being collapsed; and a pricking member holder having at least three curved arms connected at their free ends with the hollow body at the rim thereof, and being in its centre portion engaged by the other end of the said pricking member, the said hollow body having, prior to being pierced by the said pricking member, no externally visible ejecting aperture, nor a filling aperture.

7. A receptacle adapted to hold a small amount of a substance, especially a liquid one, to be ejected out of the receptacle in the form of a jet, and consisting of a material impermeable to liquid and comprising a hollow body composed of two equal parts tightly connected with one another at their rims so as to permit this body to be collapsed into a relatively thin solid shape in order to eject thereby the respective substance in the form stated; a pricking member formed by a piece of rigid wire having at one end a head and at the other end a point positioned opposite a portion of the wall of said body and adapted to pierce the oppositely located wall portion in order to produce thereby an ejecting aperture when the said hollow body is being collapsed; and a holder for said pricking member, said holder having at least three arms curved approximately in correspondence with the curvature of the hollow body and being firmly connected with the same at the rim thereof with the aid of their free ends, the centre portion of said holder having a cavity engaged by the head of said pricking member, the said hollow body showing neither a filling aperture, nor, prior of its being collapsed, an ejecting aperture.

8. A capsular hollow body having no exteriorly visible filling and discharging aperture and consisting of two superposed concave members having compressible walls of a flexible material allowing of manually pressing one of said members towards and into the other until their inner surfaces contact with one another, said hollow body containing an amount of a liquid substance corresponding at the highest to the capacity of one of said members, access to that substance being possible only after one of the said members has been manually pierced when the respective substance can be pressed out through the aperture thus produced.

9. A capsular hollow body having no exteriorly visible filling and discharging aperture and comprising two superposed concave members having compressible walls of a flexible material allowing of manually pressing one of said members towards and into the other until their inner surfaces contact with one another, and a pricking member so arranged relatively to one of the said members as to be adapted to pierce the respective member when being manually pressed against it, said hollow body containing an amount of a liquid substance corresponding

at the highest to the capacity of one of said members, access to that substance being possible only after one of the said members has been pierced by said pricking member when the respective substance can be pressed out through the aperture thus produced.

10. A capsular hollow body having no exteriorly visible filling and discharging aperture and comprising two superposed concave members having compressible walls of a flexible material allowing of manually pressing one of said members towards and into the other until their inner surfaces contact with one another, and a pricking member having a head at one end and being pointed at its other end and being so arranged relatively to one of the said members as to be adapted to pierce the respective member with its pointed end when manual pressure is exerted upon its head, said hollow body containing an amount of a liquid substance corresponding at the highest to the capacity of one of said members, access to that substance being possible only after one of the said members has been pierced by said pricking member when the respective substance can be pressed out through the aperture thus produced.

11. A capsular hollow body having no exteriorly visible filling and discharging aperture and comprising two superposed concave members having compressible walls of a flexible material allowing of manually pressing one of said members towards and into the other until their inner surfaces contact with one another; a pricking member so arranged relatively to one of the said members as to be adapted to pierce the respective member when being manually pressed against it, and a pricking member holder connected with the said hollow body, this latter containing an amount of a liquid substance corresponding at the highest to the capacity of one of said members, access to that substance being possible only after one of the said members has been pierced by said pricking member when the respective substance can be pressed out through the aperture thus produced.

12. A capsular hollow body having no exteriorly visible filling and discharging aperture and comprising two superposed concave members having compressible walls of a flexible material allowing of manually pressing one of said members towards and into the other until their inner surfaces contact with one another; a pricking member so arranged relatively to one of the said members as to be adapted to pierce the respective member when being manually pressed against it and a pricking member holder comprising three equally spaced arms connected with the said hollow body, this latter containing an amount of a liquid substance corresponding at the highest to the capacity of one of said members, access to that substance being possible only after one of the said members has been pierced by said pricking member when the respective substance can be pressed out through the aperture thus produced.

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