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LIQUID ATOMIZER

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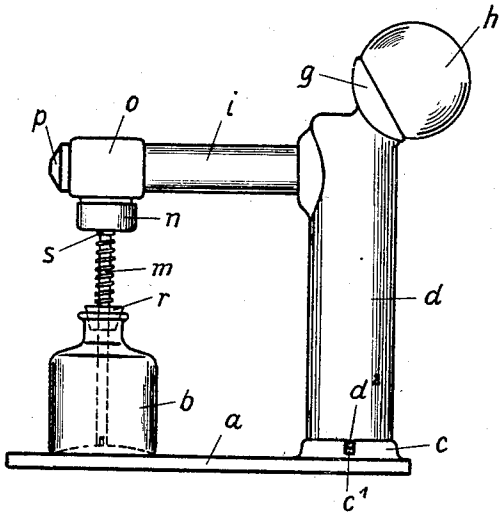


Fig: 1

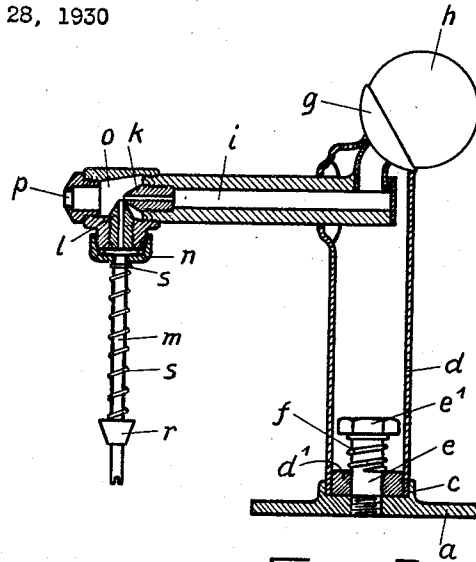


Fig: 2

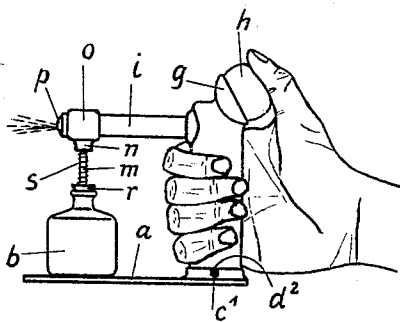


Fig: 3

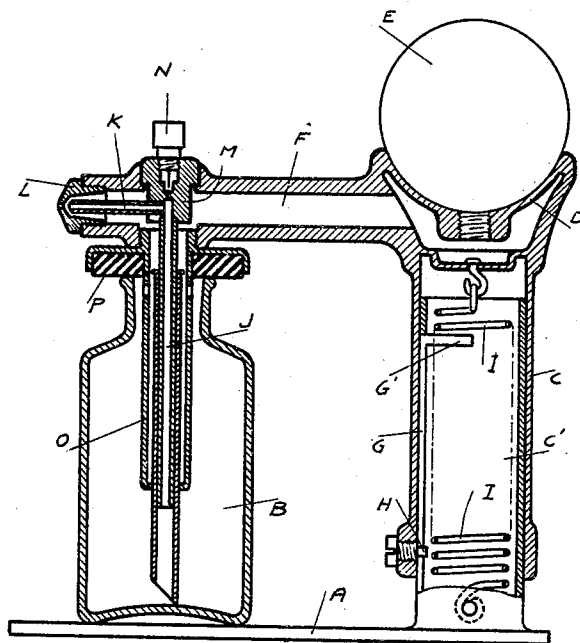


Fig: 4

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LIQUID ATOMIZER

Application filed May 28, 1930, Serial No. 456,583, and in Germany September 29, 1929.

The present invention relates to a liquid atomizer for perfume and the like, which at the same time forms for support for the vessel, bottle or the like, containing the liquid to be dispersed, and which can be actuated by one hand. It permits of clamping liquid containers such as flasks of the most diverse type and height so that it is possible, without pouring out and without loss of liquid to atomize the liquid directly from the vessel in which it is sold, for example from perfumery bottles which are mostly constructed of very tasteful appearance.

The new liquid atomizer consists of the actual atomizing device and a supporting plate for the liquid vessel, for example the perfume bottle, arranged parallel thereto. Both these members are connected together by a shaft located on one side which is extensible and which at the same time forms the handle. The shaft itself consists of two parts resiliently connected together. These parts are preferably formed of two tubular members telescopically fitted one upon the other and rotatable about their axis. The spring to the action of which they are exposed and which draws them together is located within the innermost tubular member.

Spaced laterally from the connecting shaft, simultaneously forming the handle of the atomizer, there is provided on a laterally extending arm the stand pipe for the liquid to be atomized.

For closing the opening of the vessel or bottle the stand pipe may be provided with a sliding and spring actuated closure member (packing disc, plug or the like) or a similar closure member may also be immovably secured to the horizontally extending arm at the point of closure of the stand pipe. The first mentioned movable arrangement of the closure member is selected when the liquid containers, for example bottles, are of a height which is less than the distance between the closure plate and the horizontal arm carrying the atomizing nozzle. The other construction with the stationary closing member may be used when the liquid containers, for example bottles, are of considerable height. In any case the stand pipe is preferably pro-

vided with an extensible extension member. In this form of construction the spring located in the shaft which simultaneously serves as the handle is also adapted to press the opening of the container against the closing closure member.

In the accompanying drawing are illustrated two examples of construction of the invention and their method of use.

Figures 1 and 2 show one form of construction for use with a low liquid container, Figure 1 being an elevation and Figure 2 a section with the supporting plate for the liquid container swung laterally.

Figure 3 shows the method of use or the atomizer in use, and

Figure 4 shows a section to another form of construction for liquid containers of considerable height.

In Figures 1 to 3, *a* indicates the supporting plate for the liquid container, for example a bottle *b*, containing the perfume or the like to be atomized. At one end of the supporting plate there is provided a bearing pan *c* formed by an annular raised edge into which is rotatably fitted the hollow shaft *d*, simultaneously forming the handle, for the actual atomizing device. The pivot *e* passes through the bottom *d'* of the shaft and is secured in the supporting plate *a* in any suitable manner. Between its enlarged head *e'* and the bottom *d'* of the shaft there is provided a spring *f* wound around the pivot *e*. The shaft *d* is movable longitudinally on the pivot *e* for a predetermined distance and is always urged by the spring *f* towards the supporting plate. A slot *c'* open at the top and located in the projecting rim of the bearing pan and a pin *d²* projecting outwardly from the shaft *d* form a pin and slot joint and secure the shaft in the correct position when the liquid container *b* has been fitted in position. The shaft *d* is provided at the top with a shell *g* for seating a rubber ball *h*, adapted to be used as a blower, and is also provided with a horizontal tubular arm *i* through which the air from the blower (rubber ball) reaches the blower nozzle *k*. At an angle to the nozzle is located the suction nozzle *l* of the stand pipe *m* leading into the liq-

uid container (the bottle) and together with this is secured by a cap nut *n* in the vertical limb of a T-piece *o* screwed to the free end of the tubular arm *i*. Opposite the blower nozzle *k* there is screwed into the horizontal portion of the T-piece *o* the common outlet nozzle *p*.

On the stand pipe *m* slides an apertured closure plug *r* which is under the action of a spring *s* bearing at one end against the cap nut *n* and constantly tending to press the plug downwardly, that is to say against the neck opening of the liquid container or the bottle *b* and thus to close this and also the passage of the stand pipe *m* in a fluid-tight manner. The spring *f* of the shaft *d* must not be weaker, but on the contrary should be stronger than the plug pressing spring *s* for the container closure.

The method and manner of using the liquid atomizer described will be readily seen from Figure 3.

After the bottle *b* with the liquid to be atomized has been clamped between the supporting plate *a* and the actual atomizing device or the spring actuated closure plug *i* mounted on the stand pipe *m* and forming a part of the atomizing device, the shaft *d* is gripped by the four fingers of one hand. When thus held the atomizer may be operated by pressing the thumb on the blower *h* (the rubber ball) to produce the necessary compressed air for drawing the liquid from the bottle and atomizing it. The finely atomized liquid passes out of the nozzle *p* in the form of a mist.

The actual liquid atomizing device does not form the subject of the present invention and may, therefore, be constructed in any suitable known manner. The essential feature of the invention resides in the clamping in position of liquid containers (bottles) of any suitable shape and height.

This is effected in the manner that the liquid container (the bottle) after previously moving the supporting plate laterally (Figure 2) is fitted from the bottom on the stand pipe *m* thus forcing back the spring actuated closure plug *r*. At the same time the shaft *d* is somewhat extended against the action of its stronger spring *f* and the supporting plate *a* is swung underneath the liquid container (the bottle). In this connection rotation about the pivot *e* takes place until the pin *d*² of the shaft *d* can engage with the slot *c*¹ of the projecting rim of the bearing pan *c* and thus secures the relative position of the pivoted parts of the shaft or handle and the atomizing device and supporting plate carried thereby. When unclamping or removing the liquid container (the bottle) the shaft *d* is again extended against the action of its spring *f* until the pin *d*² passes out of the slot *c*¹, then the supporting plate *a* is swung outwardly and the liquid container (the bottle)

is withdrawn downwardly from the stand pipe *m*.

In Figure 4 A indicates the supporting plate for the liquid container, B (the bottle), C, C' the extensible shaft with the shell D for seating a rubber ball E, serving as a blower, and a tubular arm F for applying the suction to and atomizing the liquid by the compressed air produced. The stationary part C' of the shaft on the supporting plate A also forms in this form of construction a tubular member on which the other part C, carrying the atomizing device, is telescopically fitted.

The shaft portion C' is provided with a longitudinal slot G which at the top terminates in a transverse slot G' and the shaft portion C is provided with a guide pin H engaging with the said slot G. The length of this slot limits the extent by which the two shaft parts C, C' can be extended. When the guide pin H has reached the upper end of the slot G, when extending the shaft parts, then on the rotation thereof it engages with the transverse slot G' and holds the parts in the extended position. The spirally wound tension spring I located within the shaft part C' is secured at its lower end to a transverse pin of the shaft part C' and at its upper end is suspended from a hook of the shaft part C.

The actual atomizing device differs somewhat from that illustrated in Figures 1 to 3. The stand pipe J is provided with an extensible extension and an angular branch K which is freely open directly in front of the outlet nozzle L so that the stream of air passing through F can pass around the branch K and through the passage formed between the free end of the branch and the wall of the outlet nozzle L and is also capable of passing through the nozzle itself thus drawing the liquid out of the bottle B. The stand pipe J and its branch K are secured in a separate member M fitted into the tubular arm F, the member M being constructed in a particular manner for the reception of a nozzle cleaning needle N which can be unscrewed. Opposite this member M there is secured in the tubular arm F a protecting pipe O, for the stand pipe J provided with the extensible extension, the pipe O being provided with an annular row of air inlet openings.

This protecting pipe O is provided with a cap bearing against the tubular arm F and fitted with a packing plate P of rubber or the like which closes the opening of the liquid container or bottle pressed against it from underneath. The device is used in the same manner as the other construction shown in Figures 1 and 2 and in the manner illustrated in Figure 3.

For removing the bottle B the shaft C, C', simultaneously forming the handle, is extended against the action of the spring I until the guide pin H of the shaft part C is on a

level with a transverse slot G' of the other shaft part C' and permits axial turning of the two parts. Simultaneously with the turning and lateral swinging of the supporting plate A the bottle B can be withdrawn downwardly from the stand pipe J and its protecting pipe O.

When another bottle is to be placed in position this is fitted on the extensible stand pipe and compressing this upwardly to such an extent that its opening bears against the packing plate P. The supporting plate A is then swung back into its position so that it engages under the bottle. As now the spring I is again capable of exerting its full force the bottle is clamped between the supporting plate and the tubular arm, and its opening is pressed firmly against the packing plate P.

I claim:—

1. Liquid atomizer for operation by one hand, particularly for perfume and the like, comprising a supporting plate adapted to receive a liquid container, a shaft rotatably mounted on said supporting plate at right angles thereto, said shaft being adapted to be normally urged against said supporting plate, a blower device mounted on said shaft, a horizontal pipe mounted on said shaft in communication with said blower device, an atomizing nozzle at the free end of said pipe, a vertical stand pipe carried by said horizontal pipe in aspirating relation with the atomizing nozzle and adapted to be passed into said liquid container, and means carried by said stand pipe adapted to close the opening of said liquid container.

2. A liquid atomizer according to claim 1, wherein said shaft is hollow, and a spring located in said shaft, said spring normally pressing said shaft into engagement with said bearing plate.

3. A liquid atomized according to claim 1, wherein said shaft comprises two parts telescopically mounted one within the other, a spring located in said parts and normally drawing them into their collapsed position, and means for limiting the extension of said parts and also their relative turning movement.

4. A liquid atomizer for use by one hand, particularly for perfume and the like, comprising a supporting plate for a liquid container such as a bottle, a horizontal tubular arm mounted parallel above said supporting plate, said arm and said supporting plate being capable of relative rotary movement about an axis perpendicular to the plate, an atomizing device mounted on said arm in communication therewith, said device comprising a hollow ball adapted to develop air pressure in said arm and to be pressed so as to force air through said arm, a shaft forming a handle mounted between said supporting plate and said arm, said shaft serving to connect together said supporting plate and said

arm, the atomizing device being mounted on said shaft, said shaft consisting of two parts mounted telescopically one within the other, a spring located in said parts and normally drawing them together, one of said parts having a slot therein, said slot extending for a predetermined length along said part and then extending at right angles, a pin on the other part, said pin being adapted to cooperate with said slot, a nozzle at the end of said arm, a stand pipe mounted in said arm, a horizontal branch extending from said stand pipe and leading to a point adjacent said nozzle, an extension member slidably mounted on said stand pipe, and a packing member between said arm and the top of the bottle for the purpose of closing the discharge opening in the latter, the arrangement being such that actuation of the atomizing device serves to draw liquid from said bottle and to discharge it in an atomized condition through said nozzle.

5. An atomizing device comprising a supporting plate, an annular rim on said supporting plate, a hollow shaft rotatably mounted in said rim, a pivot secured to said supporting plate and located centrally in said shaft a spring between said pivot and the bottom of said shaft, whereby said shaft is normally urged into engagement with said supporting plate, a rubber ball mounted at the upper end of said shaft, a horizontal pipe extending laterally from the upper end of said shaft and communicating with the interior of said ball, a T-piece fitted on the other end of said pipe, a nozzle in the end of said pipe adjacent said T-piece, a nozzle in the vertical limb of said T-piece in aspirating relation to said first-mentioned nozzle, an outlet nozzle in the end of said T-piece remote from that secured to said pipe, a vertical stand pipe communicating with the nozzle in the vertical limb of the T-piece, a plug slidably mounted on said stand pipe, a spring normally urging said plug downwardly, and means such as a pin and slot located between said shaft and said supporting plate, whereby said supporting plate is capable of being turned relatively to said shaft.

In testimony whereof I affixed my signature.

HANS KREIDEL.

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