

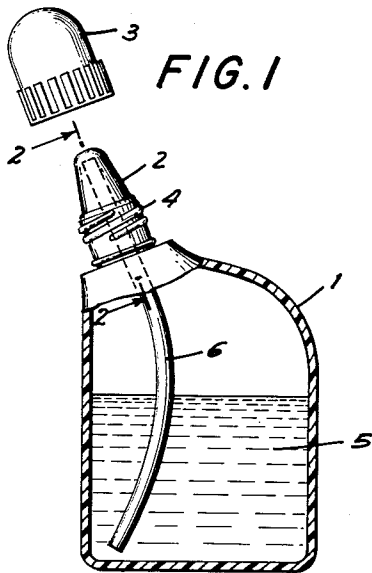
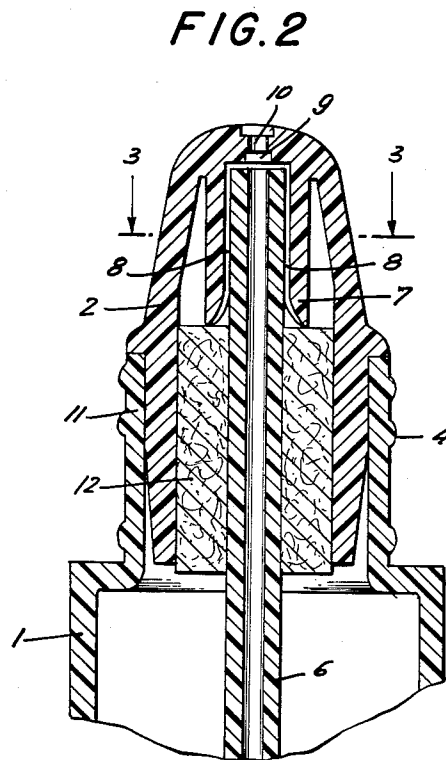
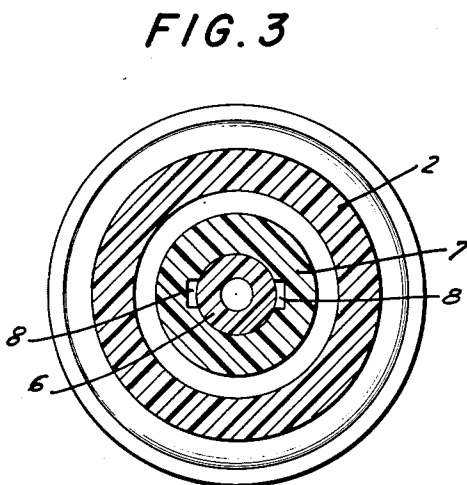
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ATOMIZERS

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ATOMIZERS

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This invention relates to an improvement in atomizers.

Many forms of atomizing devices for expelling liquids in a finely divided form have been made. For instance, a popular atomizing device commonly sold for administering medicaments to the nasal passages comprises a resilient container made of polyethylene or some other deformable plastic material holding a liquid and air and being so constructed that when the container is squeezed, both liquid and air are ejected in a mixed stream, the liquid being broken up, or atomized, in a finely divided form. Many times, it is desirable to include aromatic materials, antiseptics, anesthetics, vasoconstrictors, or other substances with the vapor stream. Often, these materials attack the container by physical or chemical action and result in damage and unsightly appearance to the container and even loss of material through the walls thereof. Also, some materials that may be desirable in the medicated spray are incompatible with other essential components and must be omitted from the liquid.

The present invention relates to an improved atomizing device whereby these difficulties are overcome, making it possible to include in the medicated spray certain desirable materials which tend to attack the walls of the container or which are incompatible or reactive with the liquid contained therein.

In order that the nature of our invention be made more apparent, reference is made to the single sheet of drawings in which:

FIGURE 1 is side elevation of a form of atomizer of the present invention with the walls of the container being partly broken away and the cap thereof exploded.

FIGURE 2 is a vertical cross section taken along line 2—2 of FIGURE 1 looking in the direction of the arrows.

FIGURE 3 is an enlarged horizontal cross section taken along line 3—3 of FIGURE 2 looking in the direction of the arrows.

Referring again to FIGURE 1, reference numeral 1 represents a container having an atomizing discharge nozzle 2 with cap 3 designed to fit thereover and being held in place by suitable threads 4 or by some other means.

The container 1 may be made of polyethylene, preferably, or some other resilient plastic material which can be deformed readily by the fingers to create pressure within the container, thus serving to eject liquid 5 through a suitable tube 6 and air through passage 8 (FIGURE 2) to the atomizing nozzle. As a matter of fact, the container may be made of glass or some other non-compressible material providing other means for developing pressure on the liquid is employed.

The operation of the atomizer will be more apparent from an inspection of FIGURE 2. The tube 6 which is designed to carry the liquid to the atomizing nozzle is fitted in the end of the nozzle and held by friction by the sleeve 7 which has one or more small grooves 8 which provide an air passage leading to chamber 9 where air which is also forced out of the container upon the application of pressure is mixed with liquid forced through tube 6 and expelled through orifice 10.

The atomizing nozzle 2 is simply fitted into the neck 11 of the container 1 and held by friction as shown in FIGURE 2.

The atomizing device and container described up to this point are old. The present invention is predicated

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upon our discovery that an air-permeable material 12 can be inserted in that section of the atomizer nozzle through which air passes, as is shown in FIGURE 2; and when saturated with a volatile aromatic or other medicament, the volatile material is released into the air stream which is then mixed with the liquid stream in chamber 9 and is effectively incorporated in the spray.

The air-permeable member 12 may be of various materials, wool felt being preferred. Spun glass, cotton, paper, sponge, or any other foraminous material which permits passage of air through its interstices and which will be absorbent and non-reactive to the aromatic or other medicinal agent may be used in lieu of wool felt for constructing this part of the atomizer.

As will be seen from the foregoing description, the present invention provides a remarkably simple solution to the problem of having in a single container a liquid and another volatile material which may be incompatible with one or more of the components of the liquid or with the container itself.

In addition to the above advantages, it has been observed that a decidedly better spray pattern in which the liquid appears to be in a more finely divided or smaller particle size is obtained because of the presence of the air-permeable member, for instance wool felt, in the air passage in the atomizer head. We are unable to give a reason for these improved results.

The invention is not dependent upon any particular medicament in the foraminous member 12 except to the extent that it should be volatile to some degree and will, therefore, be volatilized from the structure into the air passing through it. Although various aromatic substances and combinations thereof may be effectively incorporated into the spray from the nozzle, the invention will find its most widespread use in dispersing aromatic essential oils containing turpenes, menthol, borneol, methyl salicylate, piperonal, safrol, and the like which occur in plant extracts such as oil of eucalyptus, peppermint oil, and the like. Of course, various other volatile aromatics may be used which have medicinal properties other than those mentioned above such as the germicidal phenols, analgesics, vasoconstrictors and the like.

We claim:

1. An atomizing device for the dispensing of liquids in finely divided form which comprises a resilient container adapted to hold liquid and air, a tube leading from the bottom of said container to a mixing chamber in an atomizing head and adapted to carry liquid therethrough, an air passage in said atomizing head joining to said mixing chamber and the air space in the container, said mixing chamber having an atomizing orifice, a liquid-absorbent, air-porous material capable of holding a volatile liquid and permitting air to pass therethrough disposed in said air passage, said resilient container being sealed so that when the container is deformed, pressure is created therein forcing liquid through said tube and air through said air passage into said chamber and through said orifice.

2. A spray device adapted to spray a mixture of particles of a finely divided liquid and volatilized aromatic oils which comprises an atomizing head adapted to fit into a container holding a liquid and air, said atomizing head having an atomizing discharge orifice and cylindrical side walls forming a space within said atomizing head, a mixing chamber in said atomizing head connected with said discharge orifice and an air passageway connecting said cylindrical space and said mixing chamber, a tubular liquid supply member joined to said mixing chamber providing a liquid passageway thereto and passing through the axis of said cylindrical side walls forming an annular space therein, and an annular, air permeable member

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carrying volatile aromatic oil disposed in said annular space.

3. A spray device adapted to spray a mixture of particles of a finely divided liquid and volatilized aromatic oils which comprises an atomizing head having at one end thereof an atomizing discharge orifice and at the other end cylindrical side walls, a tubular liquid supply member within said side walls forming an annular air passage space therewith, said air passage and said liquid supply member joining at said atomizing discharge orifice and an air permeable member carrying a volatile aromatic oil within said annular space.

4. An atomizing head having cylindrical side walls and having a tubular liquid supply member positioned along the axis thereof so as to form an annular chamber between said side walls and tubular member, an annular air permeable member carrying a volatile aromatic oil in

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said annular space, an air passage from said annular chamber to a mixing chamber, said tubular supply member also being connected to said mixing chamber whereby air from said annular space and liquid from said tubular supply member may mix and an atomizing discharge orifice in communication with said mixing chamber.

References Cited in the file of this patent

UNITED STATES PATENTS

10	644,703	Buckley	Mar. 6, 1900
	1,910,014	Hermann	May 23, 1933
	2,180,084	Gebauer	Nov. 14, 1939
	2,607,626	Tucci	Aug. 19, 1952
	2,651,544	Cuadras	Sept. 8, 1953
15	2,796,294	McKinnon	June 18, 1957
	2,921,745	Yost	Jan. 19, 1960