Nov. 15, 1932. J. B. SCHMITT 1,887,949

MEDICINAL SPRAY

Filed Aug. 28, 1930

Fig. 1

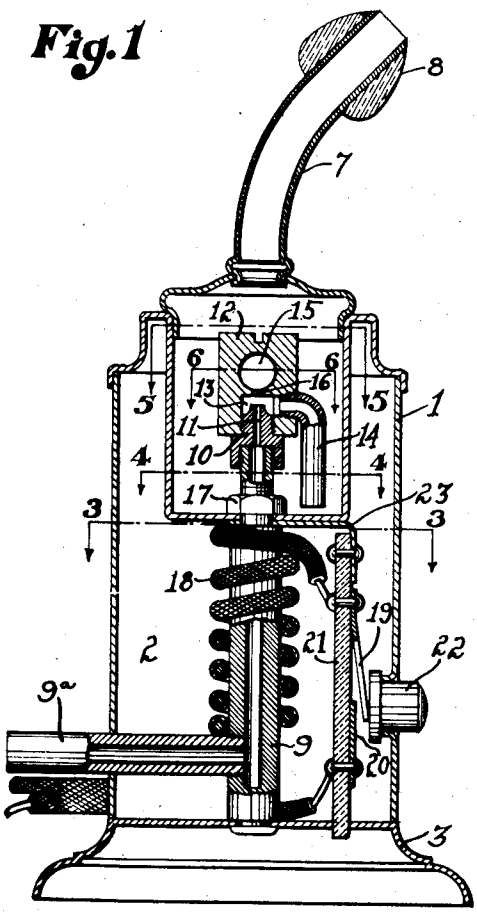


Fig. 2

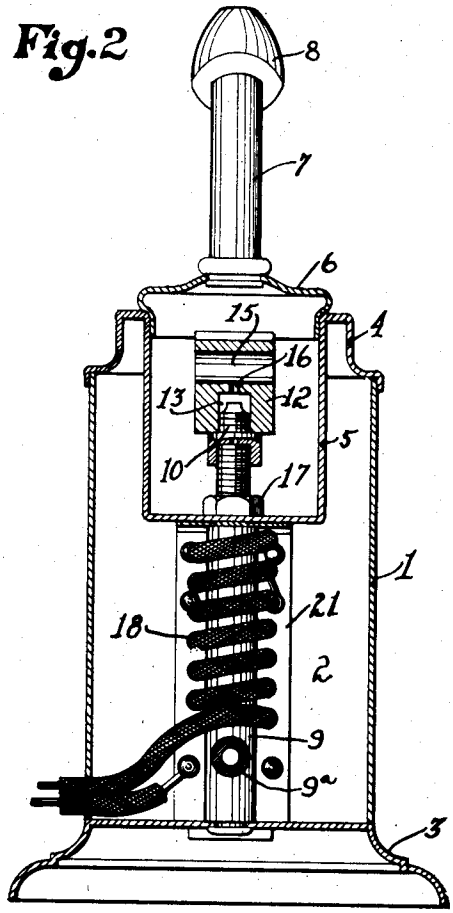


Fig. 3

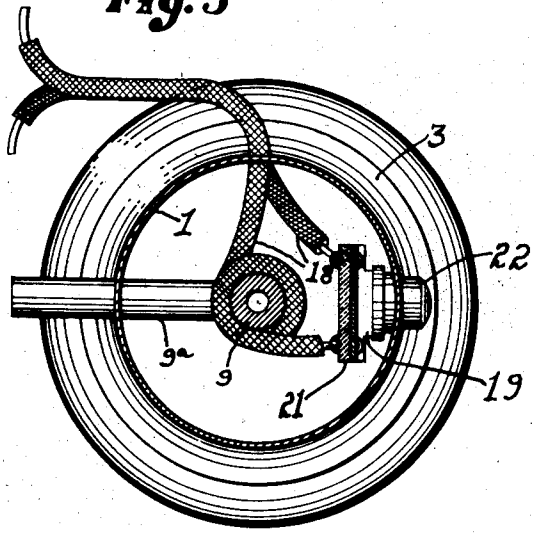


Fig. 4

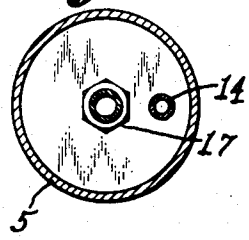


Fig. 5

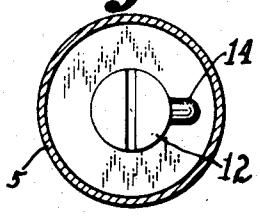
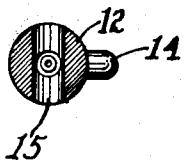


Fig. 6



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UNITED STATES PATENT OFFICE

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MEDICINAL SPRAY

Application filed August 28, 1930. Serial No. 478,361.

This invention relates to atomizing devices and particularly to those used for medicinal purposes for spraying liquids of a nature which are relatively thick when cold and which require heating to render them of spraying consistency.

The object of the invention is the provision of an improved device of this character which is simple in construction and capable of effecting a more thorough and efficient atomizing of the material being sprayed or nebulized than has, to my knowledge, been accomplished by devices heretofore used for the purpose.

The invention is fully described in the following specification, and while it is capable of embodiment in numerous forms, a preferred embodiment thereof is illustrated in the accompanying drawing, in which,—

Figures 1 and 2 are different central vertical sections of a device embodying the invention, with parts in full; Fig. 3 is a cross section on the line 3—3 in Fig. 1; and Figs. 4, 5 and 6 are cross sections, respectively, on the lines 4—4, 5—5 and 6—6 in Fig. 1.

Referring to the drawing, 1 designates a casing forming a heating chamber 2 and which, in the present instance, is closed at its lower end by a supporting base 3 and at its upper end by a top member 4.

The top member 4 has a receptacle 5 depending centrally therefrom into the upper portion of the chamber 2 in spaced relation to its sides so that heat within said chamber will have direct contact with the bottom and side walls of the receptacle. The receptacle 5, in the present instance, is formed by an inward drawing of the central portion of the top member 4, and its upper end is closed by a removable member 6 from which a spray discharge tube 7 centrally extends and is provided at its outer end with a nasal guard 8.

An air tube 9 is provided in the chamber 2, in the present instance, vertically through its central portion and extends at its upper end through the bottom of the receptacle 5, centrally thereof, and is provided within the receptacle with an upwardly directed discharge nozzle 10 having a restricted upwardly directed discharge orifice 11 therethrough.

A head 12 is mounted on the nozzle 10, being threaded thereon and cooperating with the outer reduced end portion of the nozzle to provide an annular chamber 13 thereabout. A liquid supply tube 14 is tapped into the side of the head 12 in communication at its upper end with the chamber 13 and having its lower end extended down to near the bottom of the receptacle 5.

The head 12 has a horizontally disposed cross opening 15 therein which communicates at its bottom substantially centrally of its end with the chamber 13 through an opening 16 through which the discharge of air from the free end of the nozzle 10 is directed. It is evident with this arrangement of parts that part 10 and enclosing part of the head 12 form inner and outer nozzles and that the discharge of air from the nozzle 10 through the opening 16 and into the cross opening 15 will create a suction through the chamber 13, thus drawing liquid from the receptacle through the tube 14 into the chamber 13 and thence through the opening 16 into the cross opening 15. The discharging of the air and liquid into the cross opening 15 effects a thorough and efficient breaking up and vaporizing of the liquid particles drawn therein through the opening 16 and the spray or vapor thus formed is discharged from both ends of the opening 15 into the upper portion of the receptacle 5, and thence passes out through the discharge tube 7. It is found in practice that the provision of the cross opening 15 in the head 12 not only provides an efficient mixing chamber for the air and liquid discharging therein, but also prevents the atomized stream from being discharged directly into and through the tube 7, but causes it first to enter the receptacle 5 and then by circuitous route to pass through the discharge tube. This creates a greater volume of discharge of vapor from the tube 7 than would otherwise be the case, inasmuch as the receptacle 5 is first substantially filled above the liquid therein by the vapor before it discharges from the outlet tube, and also acts as a baffle to prevent unatomized globules of liquid from discharging into the tube 7,

but causes them to drop back into the liquid in the receptacle.

The tube 9 has a branch 9ª leading from its lower end outwardly through a side of the casing 1 for attaching to any suitable source of air pressure supply. In the present instance, the lower end of the tube 9 is closed and anchored to the member forming the bottom of the chamber 2 and at its point of passing through the bottom of the receptacle 5 is firmly secured thereto by a shoulder on one side and a nut 17 on the other. It is thus apparent that the tube 9, in addition to serving as a tube for supplying air to the nozzle 10, also serves as a rigid spacing means for the bottoms of the casing 1 and receptacle 5 and serves to retain the top member 4 in assembled relation to the casing.

To adapt this device for the spraying of liquids, which when cold, are of a thick petroleum jelly nature, or which constitute petroleum jelly or a similar substance as its base, an electric heating coil 18 is disposed within the heating chamber 2 preferably in encircling relation to the tube 9 so as to heat such tube and the air passing therethrough and also to heat the interior of the chamber 2, which effects, by conduction through the wall of the receptacle 5, a heating of the material therein. The heat from the tube 9 is also conducted to the metal of the receptacle 5 to more effectively heat the same. The circuit wires for the heating element are extended to any suitable source of electric current supply without the device. A switch is disposed in the heating circuit and, in the present instance, comprises the normally spaced members 19 and 20, which are carried within the heating chamber 2 by a standard 21 of insulating material and are caused to be moved into circuit closing relation by inward pressure on a push button 22 that is mounted in one side of the casing 1. The standard 21 is attached at its lower end to the bottom member of the casing 1, and has its upper end attached to a bracket 23, which is secured to and projects from the upper end of the tube 9.

It is apparent in the use of my device that the material to be sprayed, which may be of a jelly or petroleum-like consistency when cold, is introduced into the receptacle 5 through the upper end thereof when the top 6 is removed. The electric circuit in which the heating element 18 is disposed, having been closed by inward movement of the switch button 22, causes a heating of the chamber 2 to effect a heating of the receptacle 5 and liquidization of the matter therein. Upon the forcing of air through the tube 9, it is heated by the coil and is distributed under pressure through the restricted orifice of the nozzle 10 into the mixing opening or chamber 15, effecting a drawing of the liquid from the container through the tube 14, annular chamber 13 and opening 16, as is well understood in the art. The discharge from the nozzle 10 and opening 16 is against the opposite side of the chamber 15, thus causing a more efficient breaking up and finely spraying of the liquid particles within the chamber 15 than would otherwise be the case, and the spray or vapor which is thus created passes from both ends of the chamber 15 into the receptacle 5 and thence discharges therefrom through the outlet tube 7.

I wish it understood that my invention is not limited to any specific construction, form or arrangement of the parts, as it is capable of numerous modifications and changes without departing from the spirit of the claims.

Having thus described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. A device of the class described, comprising a casing forming a heating chamber, the top of said casing having a receptacle depending therefrom into the heating chamber, said receptacle being provided at its top with a discharge outlet, an air pressure supply tube entering the bottom portion of the receptacle through said chamber and having a discharge nozzle within the receptacle, a head cooperating with said discharge nozzle to form a chamber therearound in communication with the lower interior portion of the receptacle and also forming a liquid discharge opening from said surrounding chamber around the end of the nozzle and having a cross opening into which said air nozzle and liquid discharge openings have their discharge, whereby material contained in the receptacle is sprayed into said cross opening by the air discharge action and is finely broken up therein by contact with the wall of said cross opening and then discharged in spray form into the receptacle from the opposite ends of the cross opening.

2. In a device of the class described, a casing forming a heating chamber, means closing the upper end of the casing and forming a receptacle which extends down into the casing, said receptacle having a removable cover with a discharge tube carried thereby, an air pressure actuated liquid spraying device disposed within said receptacle and having a spray baffling part associated therewith for breaking up and directing the spray into the receptacle laterally from the spraying device, an air supply tube for said spraying device extending down into the heating chamber through the bottom of the receptacle and thence from the chamber, said tube forming a tying means for the receptacle and casing, an electric heating unit disposed around said tube within the heating chamber, and a switch in circuit with said coil controlled exteriorly of the casing.

3. In a spraying device, a liquid receptacle having a spray discharge tube therefrom,

an air pressure supply tube extending into the receptacle and having a discharge nozzle within the receptacle, a head separate from the discharge tube cooperating with said discharge nozzle to form a chamber thereabout in communication with the lower interior portion of the receptacle and also forming a discharge opening from said chamber aligned with the nozzle discharge and having a cross opening into which said discharge opening has its discharge, whereby material contained in the receptacle is sprayed into said cross opening by the air discharge action and is finally broken up therein by contact with the wall of said cross opening and then discharged in spray form into the receptacle from the opposite ends of the cross opening and at an angle to the discharge outlet from the receptacle.

4. In a spraying device, a liquid receptacle having a discharge outlet in its upper portion, an air pressure supply tube projected into the lower portion of the receptacle and having a discharge nozzle therein, a head mounted on said discharge nozzle within the receptacle separate from its outlet and having a mixing chamber into which the nozzle discharges and in communication with the lower interior portion of the receptacle to admit fluid from one to the other, said head having a cross discharge opening therein open at both ends and with restricted communication at one side with said chamber in the line of discharge of said nozzle, said cross opening being angularly disposed with respect to said discharge outlet.

5. In a spraying device of the class described, a casing forming a chamber therein, a liquid receptacle within the upper portion of the chamber having a discharge outlet from its upper portion, an air pressure supply tube projecting through said chamber and into the lower portion of said receptacle and having a spraying discharge means on said tube in communication with the lower interior portion of the receptacle to discharge liquid therefrom, and electrical means associated with the air tube within said chamber for heating the air passing through the tube.

6. In a spraying device of the class described, a casing forming a heating chamber, a receptacle for the liquid to be sprayed mounted in the upper portion of the casing and having a discharge tube extending to the outside of the chamber, an air pressure actuated liquid spraying device disposed within the receptacle, an air pressure supply tube for said spraying device extending from the bottom receptacle into the heating chamber, and an electrical heating unit associated with said tube within the heating chamber.

7. In a device of the class described, a casing forming a heating chamber, a receptacle for containing the liquid to be sprayed suspended within the upper portion of the casing and closing its top, said receptacle having a discharge passage at its top portion, an air pressure actuated liquid spraying device disposed within the receptacle, an air pressure supply tube for said spraying device extending down into the heating chamber through the bottom of the receptacle and thence from the chamber, said tube forming a tying means for the receptacle and casing, and an electric heating unit associated with said tube within the heating chamber.

In testimony whereof I have hereunto signed my name to this specification.

JOY B. SCHMITT.