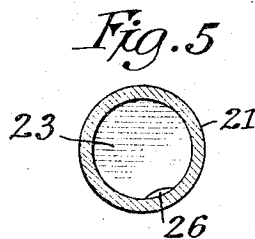
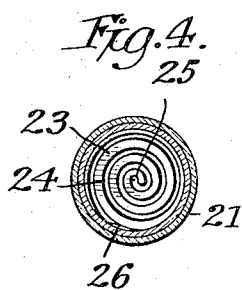
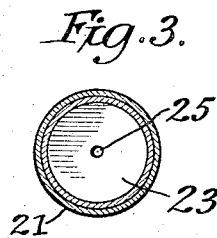
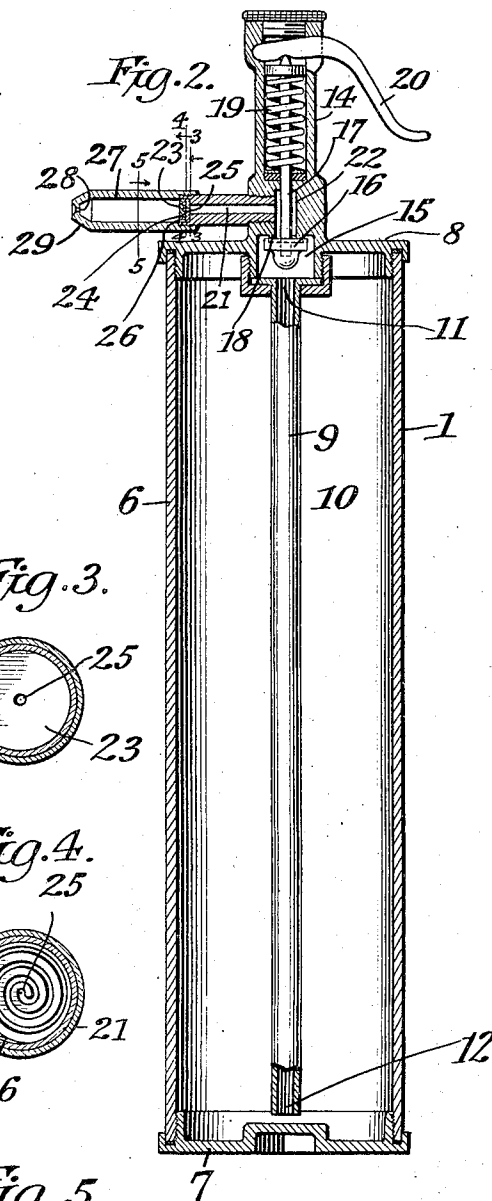
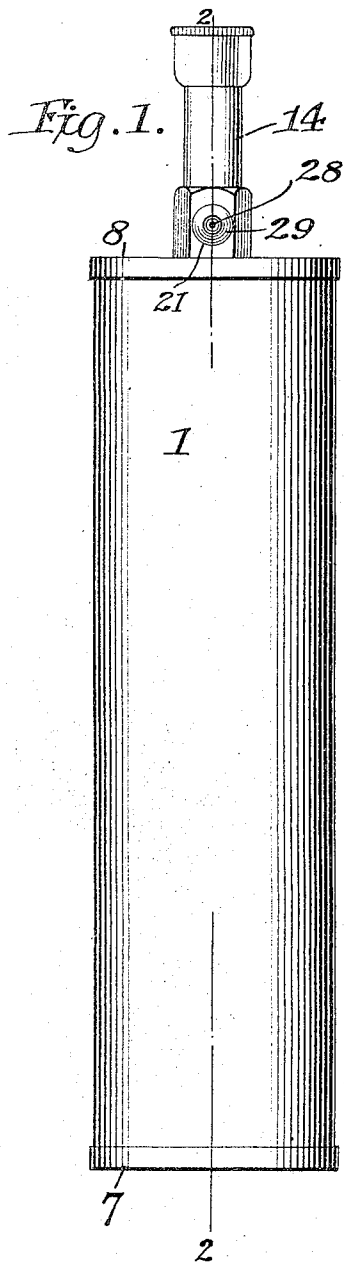


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METHOD OF APPLYING LIQUID ANTISEPTICS.
APPLICATION FILED JULY 19, 1919.

1,378,481.

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METHOD OF APPLYING LIQUID ANTISEPTICS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LEWIS KEMPTON MOBLEY, a citizen of the United States, and resident of New York, in the county and State of New York, have invented certain new and useful Improvements in Methods of Applying Liquid Antiseptics, of which the following is a specification.

This invention relates to methods of applying liquid antiseptics, and it has for its object to provide an improved method under which the application can be made at high pressures in a more effective, convenient, simplified and economical operation effecting the pressure discharge as an atomized spray.

My improved method is especially adapted to conditions related to the use of a small hand spraying device for convenient service and operation by individual users in the application of antiseptics or medicinal solutions under pressure to affected parts, and also in dental and analogous practices where a simple and easily-handled medium is desired for the effective treatment of cavities or other parts by an antiseptic or medicated atomized spray discharged under high pressure.

In the particular purposes to which my invention relates the common method of applying antiseptics has been by the employment of an elastic bulb constituting a container for the liquid and operating by hand compression to force the antiseptic through an atomizing nozzle extending from the compressible elastic bulb. These conditions are comparatively ineffective, can produce only an intermittent spray, and are deficient in the continuous and uniform and high degrees of pressure which are a desideratum in the application of antiseptics in the circumstances for which my improved method is adapted. The elastic compression-bulb means is furthermore disadvantageous in that it employs rubber in contact with the antiseptic solution and is not durable.

Other methods of applying antiseptics have involved the use of an air pump to supply air under pressure to the container and thus force the liquid contents thereof through the discharge nozzle, in which circumstances repeated operation of the air pump is essential to maintain the requisite air supply and pressure conditions. In other air-pressure methods the air has been stored under pressure in a reservoir and sup-

plied by action of control means from the reservoir to the container to force the liquid contents thereof through the discharge nozzle, and in these conditions the air must be pumped into the initial reservoir to supply and maintain the requisite pressure therein. All such air-pressure methods involving the employment of pumps and reservoirs and independent air-control mechanism require complicated and comparatively expensive apparatus not adapted for service or use as a simple and convenient and small and inexpensive hand device.

The disadvantages and inconvenient conditions as just set forth are obviated in my improved method, which enables the application of antiseptics by the employment of a simple and inexpensive hand device and is especially adapted to the requirements of individual users and conditions of convenience to produce the effective discharge of the antiseptic as an atomized spray and under high pressure without the manipulation or control of any auxiliary mechanism or devices for establishing or maintaining an air-pressure supply.

In the accompanying drawings, I have shown one form of simple hand device by which my improved method may be employed.

Figure 1 is a side elevation showing the complete hand device constituting the container and discharge means.

Fig. 2 is a vertical cross-sectional view on the line 2—2, Fig. 1.

Figs. 3, 4 and 5 are detail cross-sections, on an enlarged scale, respectively on the lines 3—3, 4—4 and 5—5, Fig. 2.

Corresponding parts in all the figures are denoted by the same reference characters.

In carrying out the improved method which constitutes my present invention, the antiseptic liquid solution is placed in a container in combination with carbonic acid gas, the proportions of the antiseptic being in suitable volume or quantity adapted to the size of the container and the carbonic acid gas being in sufficient volume to carbonate the antiseptic liquid to the desired degree of pressure. The charged carbonated antiseptic solution is maintained in the container under normal hermetically-sealed conditions, and is discharged therefrom in desired volume and pressure under the action of the carbonic acid gas by suitable

valve control. The discharged volume of carbonated antiseptic liquid as it leaves the container is then converted into a jet within an outlet tube and the passage of the discharge jet under pressure is retarded in the tube, and simultaneously with the passage and retarding of the antiseptic converted jet in combination with and under pressure of the carbonic acid gas it is deflected and atomized within the tube and finally ejected therefrom at a terminal orifice into the outer air in the converted form of an atomized antiseptic carbonated spray.

My improved method thus enables the application of liquid antiseptics in an effective, convenient and simplified operation under high pressures in a continuous uniform discharge and in the form of an atomized spray, in conditions in which the antiseptic solution is at all times ready for discharge in the desired volume and under the desired pressure without the manipulation or control of any auxiliary means for establishing or maintaining the pressure action.

I have illustrated herein a mechanism merely as a showing of one form or construction of simple hand device adaptable to the conditions of the method of applying liquid antiseptics which is the subject-matter of my present invention, it being understood that the improved method is not limited to nor dependent upon any specific or particular structural details of the device employed. In the construction illustrated, 1 designates the body of the device, which constitutes the container and is preferably cylindrical and elongated vertically to provide a narrow and relatively-deep interior reservoir in which the liquid antiseptic and carbonic acid gas is retained. The body reservoir or container is of a construction which will be normally hermetically sealed, having closed side walls, 6, a closed bottom, 7, and a closed top, 8, from which latter depends an outlet tube, 9, extending longitudinally within the reservoir chamber, 10, to a point near the bottom, 7, and open at both its top and bottom ends, 11 and 12. The top 8 carries means for controlling the discharge of the liquid antiseptic under pressure from the hermetically-sealed container, which means comprises in general a normally-closed valve, means for operating said valve, and a discharge tube for retarding the pressure jet released by said valve and converting it into an atomized spray. The discharge-controlling means comprises a tubular cap, 14, extending upwardly from the top 8 and having at its base an internal chamber, 15, into which the top end 11 of the tube 9 opens, and in which operates a valve-head, 16, carried at the lower end of an upwardly-extending plunger-rod, 17, said valve-head bearing with

relation to a valve-seat, 18, at the top of the chamber 15. The plunger-rod is operatively guided in the cap 14, and its action is controlled by a suitably-disposed spring, 19, exerting its tension to maintain the plunger-rod in normal position holding the valve 16 to its seat, and by a lever or handle, 20, operatively adapted to depress the plunger-rod against the tension of the controlling spring and cause the desired degree of operation of the valve 16.

The foregoing construction provides a simple, inexpensive and convenient hand device of light weight and of suitable contour and dimensions, especially adapted to the conditions of my improved method, and the main parts may all be constructed of metal or other durable and non-pliable material which will not affect the antiseptic contents, the preferable conditions of structure being such that the top and cap-piece 8-14 and the bottom 7 can be conveniently separated from the body-container 1.

The outlet means, in the device as herein illustrated, comprises a discharge tube, 21, preferably having a detachable connection with the cap 14, which tube opens at its inner end to a chamber, 22, within the cap and immediately above and opening to the valve-seat 18, said chamber being preferably of narrow dimensions slightly in excess of the diameter of the plunger-rod 17 which passes through it, and thus operating to control or check the degree or volume of flow of the antiseptic liquid under pressure from the container to the discharge tube. It is desirable, in the class of devices for carrying out my improved method, that the dimensions of the supplementary chamber 22 be such that its area under operative conditions is very slight, and that the bore of the discharge tube 21 be also of slight diameter, the relative size or dimensions of said supplementary chamber 22 and outlet tube 21 as shown in the accompanying drawings being magnified in scale for the purpose of clearer illustration. These relatively small dimensions, to afford a very slight operative area under the conditions of operation as related to my method, in which the discharge of the combined medicated and carbonated solution is effected, and the medicinal solution is applied, by the pressure action of the combined gas, serve to preclude an "after-flow" of the combined medicated and carbonated solution, when the valve control is suddenly closed, after the valve is operated to shut off further passage of the solution to said valve-controlled chamber 22, it being desirable, under the conditions afforded by my improved method for the direct and definite application of the combined solution by the pressure action of the combined gas, that the flow or discharge spray of the medicament instantly cease upon operation

of the valve. Within the outlet tube 21, which extends laterally from the cap 14 a short distance beyond the plane of the wall of the container 1, are provided means for
 5 retarding the jet of antiseptic liquid forced by the pressure conditions of my improved method to said tube and for converting the pressure jet into an atomized spray. Said
 10 conversion and retarding means, as herein shown, consists of a block-partition, 23, mounted within the tube at a point a short distance from its outlet end and having an internal spiral channel, 24, of narrow diam-
 15 eter, extending from a small orifice, 25, at the center of the inlet face of the block 23, to a small outlet orifice, 26, adjacent the periphery of the outlet face of the block. The pressure jet entering from the tube is thus retarded and converted into a spirally-rotat-
 20 ing jet of lesser volume but of high speed and under high pressure, which is ejected into a terminal tube chamber, 27, beyond the converting block, and moves therein spirally and forwardly to the point of final ejection
 25 at a small orifice, 28, centrally provided in the end wall, 29, of the tube, from which it passes in a fine whirling atomized spray under high pressure.

I do not desire to be understood as lim-
 30 iting myself to the detail features of the method as herein illustrated and described, nor to any particular constructions for carrying out the method, but reserve the right to all such variations as are within the scope
 35 of my invention and improvements as defined in the terms of the following claims.

Having thus described my invention, I claim and desire to secure by Letters Patent:

1. The method of applying liquid medicinal solutions, which consists in placing a
 40 liquid medicament in combination with a volume of carbonic acid gas sufficient to carbonate the solution to the desired degree of pressure in the reservoir chamber of a nor-
 45 mally hermetically-sealed container, discharging a volume of the combined solution from said container under the said pressure whereby the liquid medicament is applied
 50 by action of the gas, and simultaneously with said gas-pressure discharge converting the combined solution at the point of ejection into the outer air and by the pressure action of the combined gas into a medicated carbonated spray.

2. The method of applying liquid medicinal solutions, which consists in placing a
 55 liquid medicament in combination with a volume of carbonic acid gas sufficient to carbonate the solution to the desired degree of pressure in the reservoir chamber of a nor-
 60 mally hermetically-sealed container, discharging a volume of the combined solution from said container under the said pressure whereby the liquid medicament is applied
 65 by action of the gas, atomizing the combined

medicated and carbonated solution during its discharge passage under pressure, and simultaneously with said atomizing and gas-pressure discharge converting the combined solution at the point of ejection into the
 70 outer air and by the pressure action of the combined gas into an atomized medicated carbonated spray.

3. The method of applying liquid medicinal solutions, which consists in placing a
 75 liquid medicament in combination with a volume of carbonic acid gas sufficient to carbonate the solution to the desired degree of pressure in the reservoir chamber of a nor-
 80 mally hermetically-sealed container, discharging a volume of the combined solution from said container under the said pressure whereby the liquid medicament is applied by
 85 action of the gas, converting the combined volume of the discharge into a jet, retarding said jet in its passage under the pressure action of the combined gas, and simulta-
 90 neously with said retarded passage and gas-pressure discharge converting said jet of the combined solution at the point of ejection into the outer air and by the pressure action of the combined gas into a medicated carbonated spray.

4. The method of applying liquid medicinal solutions, which consists in placing a
 95 liquid medicament in combination with a volume of carbonic acid gas sufficient to carbonate the solution to the desired degree of pressure in the reservoir chamber of a
 100 normally hermetically-sealed container, discharging a volume of the combined solution from said container under the said pressure whereby the liquid medicament is applied by
 105 action of the gas, converting the combined volume of the discharge into a jet, deflecting said jet in its passage under the pressure action of the combined gas, and simultaneously with said deflection and gas-
 110 pressure discharge converting said jet of the combined solution at the point of ejection into the outer air and by the pressure action of the combined gas into a medicated carbonated spray.

5. The method of applying liquid medicinal solutions, which consists in placing a
 115 liquid medicament in combination with a volume of carbonic acid gas sufficient to carbonate the solution to the desired degree of pressure in the reservoir chamber of a
 120 normally hermetically-sealed container, discharging a volume of the combined solution from said container under the said pressure whereby the liquid medicament is applied by
 125 action of the gas, converting the combined volume of the discharge into a jet, retarding said jet in its passage under the pressure action of the combined gas, atomizing the combined medicated and carbonated solution during its discharge under pressure, and simultaneously with said retarded pas-
 130

sage and atomizing and gas-pressure discharge converting said jet of the combined solution to the point of ejection into the outer air and by the pressure action of the combined gas into an atomized medicated carbonated spray.

6. The method of applying liquid medicinal solutions, which consists in placing a liquid medicament in combination with a volume of carbonic acid gas sufficient to carbonate the solution to the desired degree of pressure in the reservoir chamber of a normally hermetically-sealed container, discharging a volume of the combined solution from said container under the said pressure whereby the liquid medicament is applied by action of the gas, converting the combined volume of the discharge into a jet, deflecting said jet in its passage under the pressure action of the combined gas, atomizing the combined medicated and carbonated solution during its discharge under pressure, and simultaneously with said deflection and atomizing and gas-pressure discharge converting said jet of the combined solution at the point of ejection into the outer air and by the pressure action of the combined gas into an atomized medicated carbonated spray.

7. The method of applying liquid medicinal solutions, which consists in placing a liquid medicament in combination with a volume of carbonic acid gas sufficient to carbonate the solution to the desired degree of pressure in the reservoir chamber of a normally hermetically-sealed container, discharging a volume of the combined solution from said container by valve control and

under the said pressure whereby the liquid medicament is applied by action of the gas, converting the combined volume of the discharge into a jet within an outlet tube, retarding the passage of the discharge jet under the said pressure action of the combined gas within the tube, and ejecting the combined solution from said tube at a terminal orifice into the outer air by the said pressure action of the gas and in the converted form of a medicated carbonated spray.

8. The method of applying liquid medicinal solutions, which consists in placing a liquid medicament in combination with a volume of carbonic acid gas sufficient to carbonate the solution to the desired degree of pressure in the reservoir chamber of a normally hermetically-sealed container, discharging a volume of the combined solution from said container by valve control and under the said pressure whereby the liquid medicament is applied by action of the gas, converting the combined volume of the discharge into a jet within an outlet tube, retarding and deflecting said jet in its passage under the said pressure action of the combined gas within the tube, atomizing the combined medicated and carbonated solution during its discharge under pressure, and ejecting the combined solution from said tube at a terminal orifice into the outer air by the said pressure action of the gas and in the converted form of an atomized medicated carbonated spray.

In testimony whereof I have signed the foregoing specification.

LEWIS KEMPTON MOBLEY.