Feb. 25, 1964 A. LEE 3,122,324

SPRAYING MECHANISM

Filed Feb. 16, 1962 2 Sheets-Sheet 1

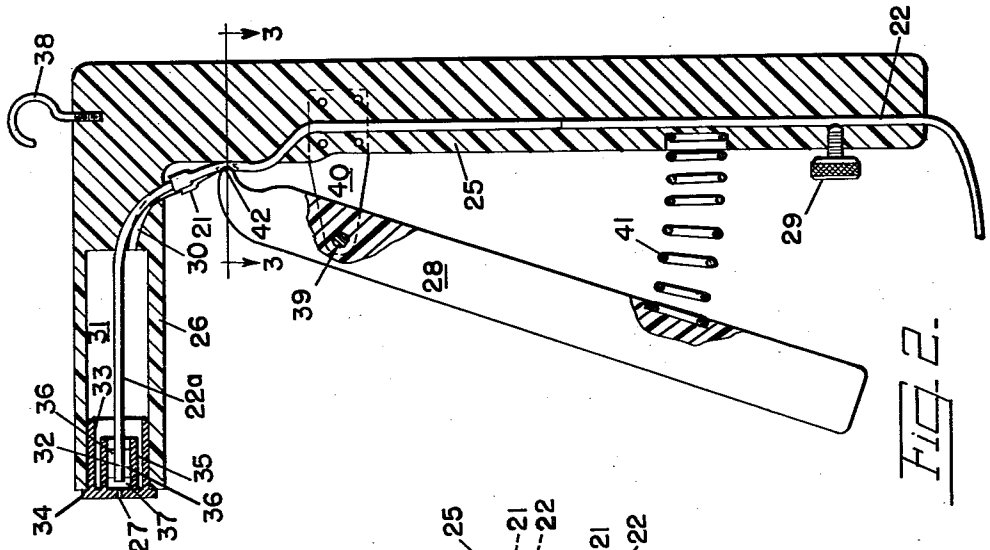



FIG. 2.

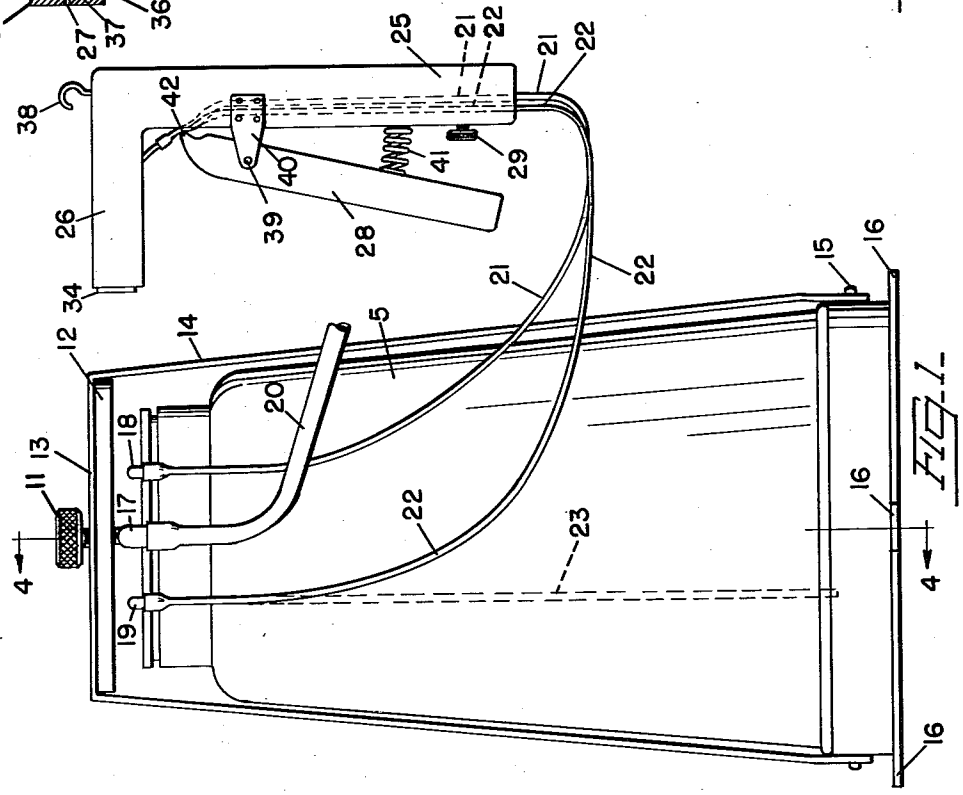



FIG. 1.

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Filed Feb. 16, 1962 2 Sheets-Sheet 2

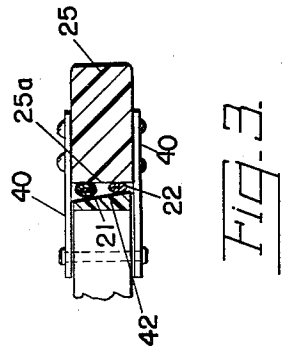



Fig. 3

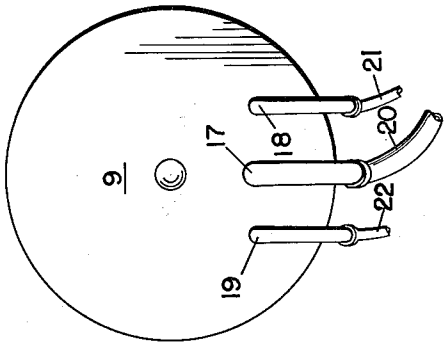



Fig. 5

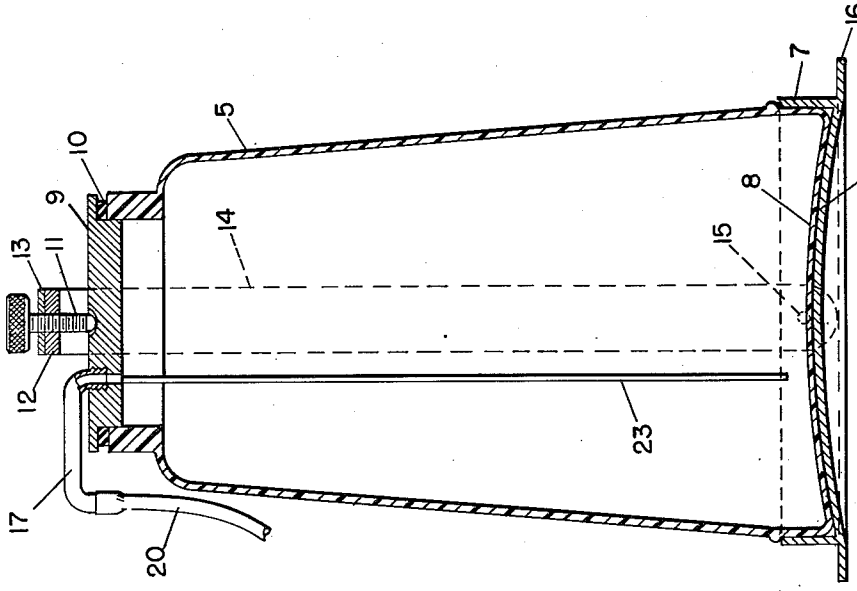



Fig. 4.

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3,122,324

# SPRAYING MECHANISM

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This invention relates to a spraying mechanism and more particularly to a spraying apparatus for the use of operators in beauty parlors.

Broadly stated, the object of the invention is to provide means through which the application of hair-treating and hair setting substances may be applied to the hair of beauty parlor customers in a more economical, efficient and uniform way than is possible with the devices and methods now employed. The way in which these objects are achieved will be best understood and appreciated after a consideration of the accompanying drawings in which:

FIG. 1 is a side elevation of one form of spraying mechanism, constructed in accordance with the invention.

FIG. 2 is an enlarged, vertical sectional view of the hand-grasped spray gun of the invention.

FIG. 3 is a sectional view through the tube compressing end of the operating lever of the spray gun, upon line 3—3 of FIG. 2.

FIG. 4 is a transverse, vertical sectional view of the container jar taken at right angles to the showing in FIG. 1, and

FIG. 5 is a top or plan view of the closure cap and associated parts, hereinafter described.

Like numerals designate corresponding parts in all of the figures of the drawings.

In the drawings, 5 designates a container jar in which a hair setting liquid is received. While any suitable liquid can be dispensed from jar 5 by my device, the field in which this invention is of especial use is in dispensing liquids of the conventional hair setting type. These usually consist of a small amount of shellac, denatured or isopropyl alcohol and a suitable perfuming ingredient.

In some beauty parlors the spraying of the liquid is effected by ordinary, hand-operated atomizers comprising a small container for the spray material, and a rubber bulb adapted to be held in the hand and to be alternately compressed and released to discharge air and spray material from a nozzle and upon the hair being treated. A later form of sprayer, now more commonly used, consists of the well known Aerosol cans. These are widely employed to spray all sorts of material, such as paints, insecticides, medications of various sorts, and the like. In the beauty parlor industry they are used to discharge the hair setting material from the can under the action of a propellant gas, such as Freon. The liquid is discharged as a spray when a valve upon the can is pressed by a finger of the operator. The manner in which the device of my invention achieves results markedly superior to these two known methods will be hereinafter more fully set forth.

The container 5 is preferably formed of plastic and it seats in a relatively shallow, pan-like base comprising a bottom 6 and an upstanding ring 7. The bottom 6 is slightly convex and conforms in curvature to the concave bottom 8 of jar 5. The diameter of the bottom portion of the jar conforms closely to the diameter of ring 7. The forming of the jar 5 of a strong plastic material guards against such accidental breakage as might occur if a glass jars were used. The highly frictional nature of the plastic of the jar and its close conformity to the diameter of ring 7 causes the jar to seat very snugly in the base with its concave bottom engaging the convex bottom of the base in a way to resist any tendency of the jar bottom to be



forced outwardly by the operating air pressure in the jar when the apparatus is in use.

The top of the jar is closed by a metal cap 9, which carries a rubber-like gasket 10, upon its under side. This gasket is forced into sealing position upon the upper edge of jar 5 by a thumb screw 11. This screw 11 is threaded through a relatively stiff bar 12, said bar being carried by the top member 13 of a yoke. The lower ends of the legs 14 of the yoke are pivotally connected at 15 to ring 7. This ring may, if desired, be provided with outwardly projecting feet 16 to increase stability and guard against accidental upsetting of the jar. It will be observed that the thumb screw 11 not only forces the gasket 10 into air-tight engagement with the upper edge of the jar but at the same time forces the jar downwardly into the ring 7 and upon the convex bottom thereof. Three goose-neck-like metallic tubes 17, 18 and 19 pass through cap 9 and are rigidly affixed to the cap, as by soldering, brazing, welding or the like. All of these tubes have their outer ends of a size to receive elongated, flexible plastic tubes 20, 21 and 22.

The flexible tube 20 which is slipped upon the outer end of goose neck 17 constitutes the air supply line to the jar 5 and merely delivers a low pressure air supply through the cap and into the upper portion of jar 5. The tube 21, which is merely slipped upon and frictionally held on goose neck 18, receives air from the upper portion of the interior of the jar and delivers it to the spray gun, hereinafter described. The tube 22 constitutes the spray material supply line. It is connected to the outer end of goose neck 19 and extends therefrom to the spray gun. A flexible plastic tube 23 extends from the inner end of goose neck 19 downwardly through the hair treating spray material therein to a point near the bottom of the jar and delivers the spray material to tube 22 through goose neck 19.

It is common practice to supply low pressure air to a plurality of air using stations, as for example in the use of air brushes where a number of artists may be receiving the air supply for their brushes from the same air supply line. Also in medical buildings there is usually found a low pressure air supply line from which a number of dentists or doctors may receive operating air for the drills, grinders or other tools of their professions. The air supply tube 20 may in like manner constitute a common air supply line for the operating stations of several, or indeed ten or a dozen beauty parlor operators, each of whom has at her station a jar such as 5 with its complemental devices as described herein.

From each jar 5 of an operator's station the air outlet, flexible spraying air line 21 and the spray material line 22 lead to the bottom of and upwardly through the shank 25 of a spray gun. The spray gun consists of this shank 25, an upper forwardly projecting portion 26, at the terminal end of which the spray nozzle orifice 27 is located, and a control handle 28, by which the flow of spraying air and spray material, is controlled. The shank carries an adjusting screw 29, the inner end of which may compress the spray material tube 22 when desired, whereby the amount of material being sprayed may be accurately controlled.

The tubes 21 and 22 pass out of the shank 25 of the gun at a point near the inner lower part of the forwardly projecting portion 26 and lie side-by-side against the outer plane face 25*a* of the shank (as shown in FIG. 3). Air tube 21 is slipped upon the exposed end of a short nipple 30, which nipple extends from the rear end of an air chamber 31. The spray material tube comprises a portion 22*a* which passes lengthwise through air chamber 31 and its terminal end 32 enters and is supported in a nipple 33. This nipple comprises a head 34 through which the nozzle constituting orifice 27 is formed; a cylin-

drical sleeve 35, and a plurality of spaced, radially disposed lugs 36, projecting inwardly from the sleeve 35 and engaging and positioning the spray material tube 22*a*. The end of the material tube 22*a* terminates a short distance from the spray nozzle orifice and the space between the orifice and the end of the tube constitutes a mixing chamber 37. Air from chamber 31 passes to the mixing chamber 37 along the outside of tube 22*a* and mixes with the spray material in said chamber. The air and the spray material in atomized form are discharged through spray nozzle orifice 27.

Air from the air chamber 31 passes between lugs 36 and along the outside of tube 22*a* mixing in chamber 37 with the spray material the whole being discharged through orifice 27 in the form of a mist or fine spray. An eyelet 38, or equivalent structure provides means by which the spray gun may be hung up temporarily, whereby to release both hands of the operator while brushing or combing the customer's hair.

The flow, through both the air and spray material lines is controlled by handle 28 in a very novel and efficient way. This handle 28 is pivoted at 39 upon a pivot which is carried by supporting plates 40. These plates project from shank 25. The handle has its lower portion spring actuated away from shank 25 by a stout spring 41. A snub-nosed end 42 of the handle is positioned to press upon and shut off flow of both air and spray material through their respective lines under the action of the spring and the leverage is such that this shutting off action is quite powerful and positive. Further, as is shown in FIG. 3, the engaging face of this snub nose end is so slanted that the flow of the spray material is shut off before the shutting off of the air is completed. This prevents undesirable residual drip from the nozzle and it prevents clogging of the gun by utilizing the air flow, which continues after the flow of the spray material ceases, to blow the last of the spray material out of the mixing chamber 37.

Since the air tube is merely slipped upon the nipple 30 it follows that if the air tube should be worn out by having the shutoff handle repeatedly squeezing the same, said tube could in effect be completely renewed by cutting a short piece off of its end, pulling the tube a little higher in the shank and slipping the fresh end of the tube on to the nipple.

In like manner, if the spray material line should be worn through by continual squeezing thereof by the snub nosed end of the handle, the worn piece may be cut off and the freshly cut end may be slipped upon the end of the end portion as in 22*a* of the spray material line.

In use, the shank and handle are grasped in the hand of the operator. Whenever the operator releases her grip upon the handle, the spring acts to shut off the spray, comprising the mixed air and spray material, by compressing the collapsible tubes against the plane face 25*a* of the shank.

The points in which the construction presents such marked advantages over the described known structures are many; among which may be mentioned the fact that the operator may discharge either a light or heavy spray according to the setting of screw 29. Some operators like to use a heavy spray while others prefer a light spray. Where the old style atomizer is used; the pressure exerted when the ball is full of air is much greater than when the ball is almost completely collapsed. This prevents uniformity of spray discharge. In my invention, complete uniformity may be had.

The use of the Aerosol can is undesirable not only because the pressure gas Freon is evaporated into the air and lost, but beacuse the operator must support the weight of the can and its contents. With, say, a 16-oz. can this becomes most tiresome during a day's work. Also, since the operator must either open or close the discharge valve of the Aerosol can with the thrust of a single finger, it follows that she gets all or nothing in the way of a spray, when she presses upon the discharge valve.



In my structure the great leverage presented by the operating handle of considerable length, together with the fact that this handle is gripped in the whole hand and is under control of several fingers, makes it possible to increase or diminish the force of the spray at will, while the adjusting screw determines the amount of spray material being delivered.

A further advantage resides in the great economy effected by the use of this invention in that the spray material may be purchased in bulk, and used in the jars of a number of operators as the call for it arises. This is not the case with the Aerosol cans in which the spray liquid and the propellant gases must be placed in the cans at the factory.

Further, it is well known that the ball type of atomizers are unreliable, in that they frequently clog up and their orifices must be freed with the use of a fine wire or by flushing them with ammonia water. Also, it should be noted that with these atomizer devices, the constant pumping with the ball becomes very fatiguing in a long day's use. In my device, the operator does not have to supply the power to discharge the spray.

She gets it from the constant pressure air supply line 20.

Since, by the device of this invention, the women operators are relieved of so much physical effort, it follows that many more customers may be handled in a day. This yields greater profit to both operators and beauty parlor owners, and this in turn makes for greater economy in all directions. It takes less time for an operator to finish with her patrons than is the case with the known devices described.

Any suitable materials may be employed in the construction of the device. However, I prefer the conventional plastic materials because they are non-corrosive, light in weight and relatively low in cost. The air and spray material lines are of plastic tubing that is elastic, very flexible and quite strong. The elasticity of this tubing is such that it can be slipped upon a goose neck as described or even slipped for a short distance upon another piece of said tubing where its elasticity and adhesiveness cause it to constitute a connection that is leak proof under low pressure such as exists in the air supply line 20, and this without the use of threaded connections. The pressure employed is usually about 20 pounds per square inch and may be derived from a conventional air compressor, compressed air tank or otherwise.

It is to be understood that the invention is not limited to the particular structure shown because modification may be made without departure from the basic principles recited.

Thus, it is to be understood that the invention includes within its purview whatever changes fall within either the terms or the spirit of the appended claims.

I claim:

1. A spraying device for the use of hair treating operators comprising a container for the material to be sprayed, a low pressure air line connected to and delivering a continuous supply of low pressure air into the container, a spray gun, a spraying air line and a spray material line leading from the container to the spray gun, and a control handle carried by the spray gun, the spray gun and handle being so dimensioned as to be grasped as a unit in the palm of the hand of the operator, said spraying air line and said spray material line being composed of elastic and compressible tubes which lie side by side against a plane portion of the spray gun, said handle having an end portion which overlaps and bears upon both of said tubes, a spring acting upon the handle to move the same to shut off flow through said tubes, said end portion being shaped to act upon and shut off the flow through the spray material line slightly ahead of its shutting off action upon the spraying air line.

2. A spraying device for the use of hair treating oper-

ators comprising a container for the material to be sprayed, a low pressure air line connected to and delivering a continuous supply of low pressure air into the container, a spray gun, a spraying air line and a spray material line leading from the container to the spray gun, and a control handle carried by the spray gun, the spray gun and handle being so dimensioned as to be grasped as a unit in the palm of the hand of the operator, said spraying air line and said spray material line being composed of elastic and compressible tubes which lie side by side against a plane portion of the spray gun, said handle having an end portion which overlaps and bears upon both of said tubes, a spring acting upon the handle to move the same to shut off flow through said tubes, said end portion being shaped to act upon and shut off the flow through the spray material line slightly ahead of its shutting off action upon the spraying air line, the shape of said end portion also being such as to permit flow of air through the air line slightly ahead of the beginning of flow through the spray material line.

3. A spraying apparatus of the character described comprising a spray material container jar, an air supply line leading into the upper portion of the container, a spray material line extending from a low point in the container, a spraying air line leading from a point in the container above the level of the spray material therein, a spraying gun adapted to be grasped in the palm of the hand of a user and comprising a shank, said spraying air line and the spray material line leading to and through said shank and being exposed side by side at a plane point on the outer face of the shank, and a control handle pivotally mounted upon the shank and having a compressing snub-nose portion which engages both the air line and the spray material line, and a spring means engaging said control handle in a manner to urge its snub nose end toward squeezing engagement with said lines to cut off the flow therethrough.

4. A structure as recited in claim 3 wherein the said control handle is of a dimension to be also grasped in the palm of the hand and to be actuated against the tension of said spring by a plurality of the fingers of the operator.

5. A structure as recited in claim 3 wherein the pivoting of the control handle upon the shank is at a point to leave the snub nose end of the handle projecting beyond said pivot in a direction away from the actuating spring of the handle, the distance from said spring to the pivoting point of the handle being so much greater than the distance from said pivoting point to said snub nose end that the resultant leverage causes the spring to exert such a powerful movement of the snub nose end against the air and spray material tubes as to completely shut off the flow of material through said tubes when the handle is released to permit said spring to act.

6. A structure as recited in claim 3 wherein the pivoting of the control handle upon the shank is at a point to leave the snub nose end of the handle projecting beyond said pivot in a direction away from the actuating spring of the handle, the distance from said spring to the pivoting point of the handle being so much greater than the distance from said pivoting point to said snub nose end that the resultant leverage causes the spring to exert such a powerful movement of the snub nose end against the air and spray material tubes as to completely shut off the flow of material through said tubes, said snub nose end being so shaped as to act upon and close the spray material line ahead of the closing of the air line under the action of the spring.

7. In a spraying mechanism of the character described;



a container for spray material, means for supplying air to said container, a pair of elastic, flexible and compressible tubes leading from said container, a spray gun comprising a shank of a size to be grasped in the hand of a user and a forwardly projecting upper end portion, one of the compressible, elastic tubes constituting a spraying air tube and the other of said tubes constituting a spray material tube, means comprising a mixing chamber and a spray nozzle orifice carried at the forward end of said forwardly projecting upper end portion, said pair of tubes passing through said shank to said upper end portion and delivering air and spray material to said mixing chamber, and said tubes at one point in such passage lying side by side and against a plane outer face of the shank, a manually operable control handle pivotally connected to the shank at a point much nearer its upper end than to its lower end, said handle being of a size to be grasped in the hand of a user along with the shank, spring means disposed to force the lower portion of the handle away from the shank, a tube engaging snub nose constituting the upper end of the operating handle, said nose being of a size and shape to overlap and compress both of said tubes against the plane portion of the shank to thereby shut off the flow of air and spray material through said tubes under the action of said spring.

8. In a spraying mechanism of the character described; a container for spray material, means for supplying air to said container, a pair of elastic, flexible and compressible tubes leading from said container, a spray gun comprising a shank of a size to be grasped in the hand of a user and a forwardly projecting upper end portion, one of the compressible, elastic tubes constituting a spraying air tube and the other of said tubes constituting a spray material tube, means comprising a mixing chamber and a spray nozzle orifice carried at the forward end of said forwardly projecting upper end portion, said pair of tubes passing through said shank to said upper end portion and delivering air and spray material to said mixing chamber, and said tubes at one point in such passage lying side by side and against a plane outer face of the shank, a manually operable control handle pivotally connected to the shank at a point much nearer its upper end than to its lower end, said handle being of a size to be grasped in the hand of a user along with the shank, spring means disposed to force the lower portion of the handle away from the shank, a tube engaging snub nose constituting the upper end of the operating handle, said nose being of a size and shape to overlap and compress both of said tubes against the plane portion of the shank to thereby shut off the flow of air and spray material through said tubes under the action of said spring, said snub nose portion having a tube engaging face disposed at such an angle with respect to said plane portion of the shank that compressing of the spray material tube to closed position will be completed slightly ahead of the compression of the air tube to its completely closed position.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,686,003 | Hottinger | Oct. 2, 1928 |
| 2,356,865 | Mason | Aug. 29, 1944 |
| 2,361,818 | Brightwell | Oct. 31, 1944 |
| 2,474,748 | McMurray | June 28, 1949 |
| 2,511,626 | Einbecker | June 13, 1950 |
| 2,584,178 | Abbott et al. | Feb. 5, 1952 |
| 2,606,072 | Mantle | Aug. 5, 1952 |
| 3,033,404 | Adell | May 8, 1962 |
| 3,033,405 | Adell | May 8, 1962 |