

Nov. 26, 1957

L. L. STEVENSON
RAPID HAND SANITIZER

2,814,081

Filed April 27, 1955

3 Sheets-Sheet 1

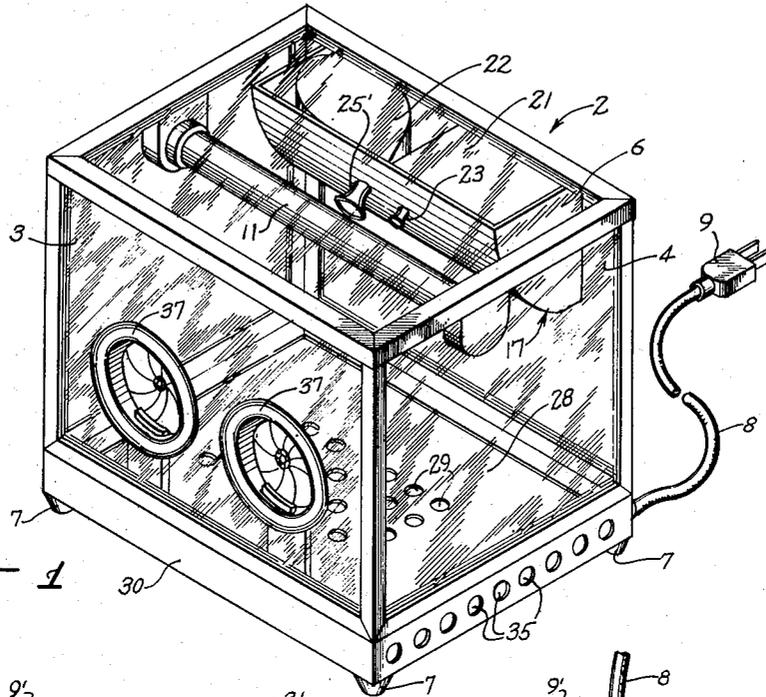


Fig. 1

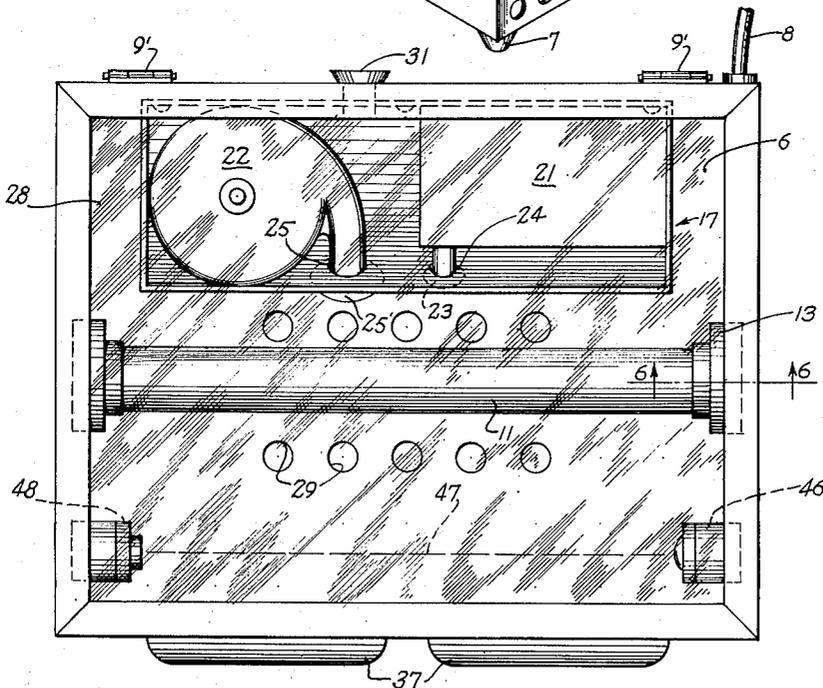


Fig. 2

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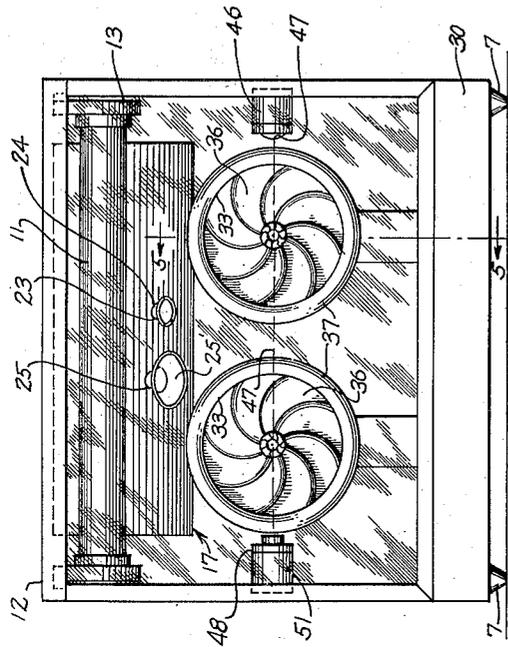


FIG. 4

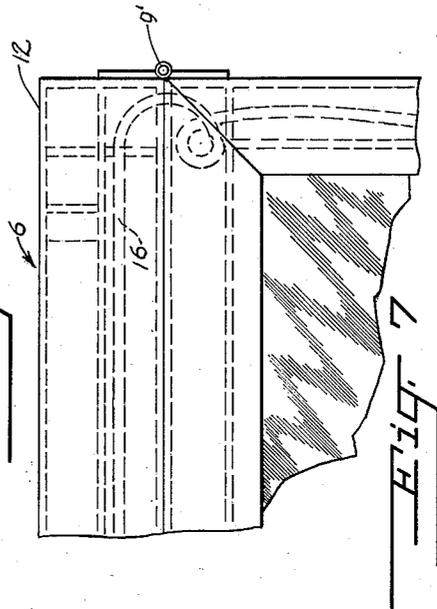


FIG. 7

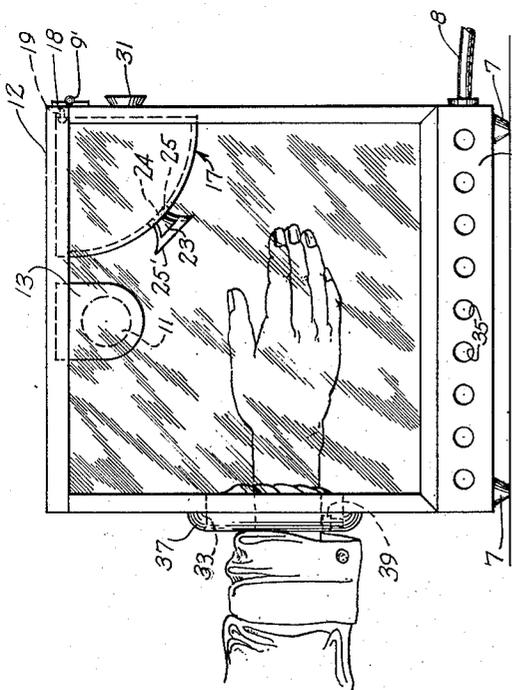


FIG. 5

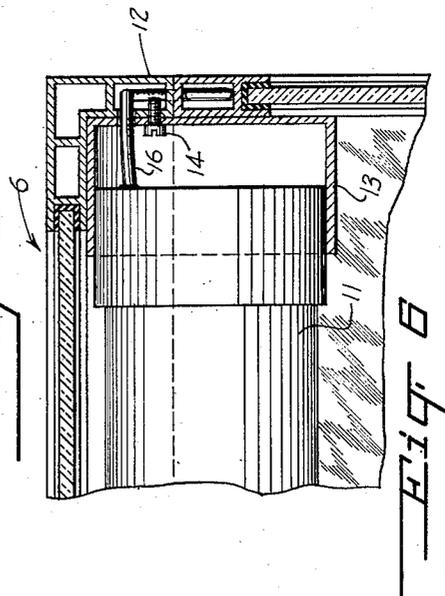


FIG. 6

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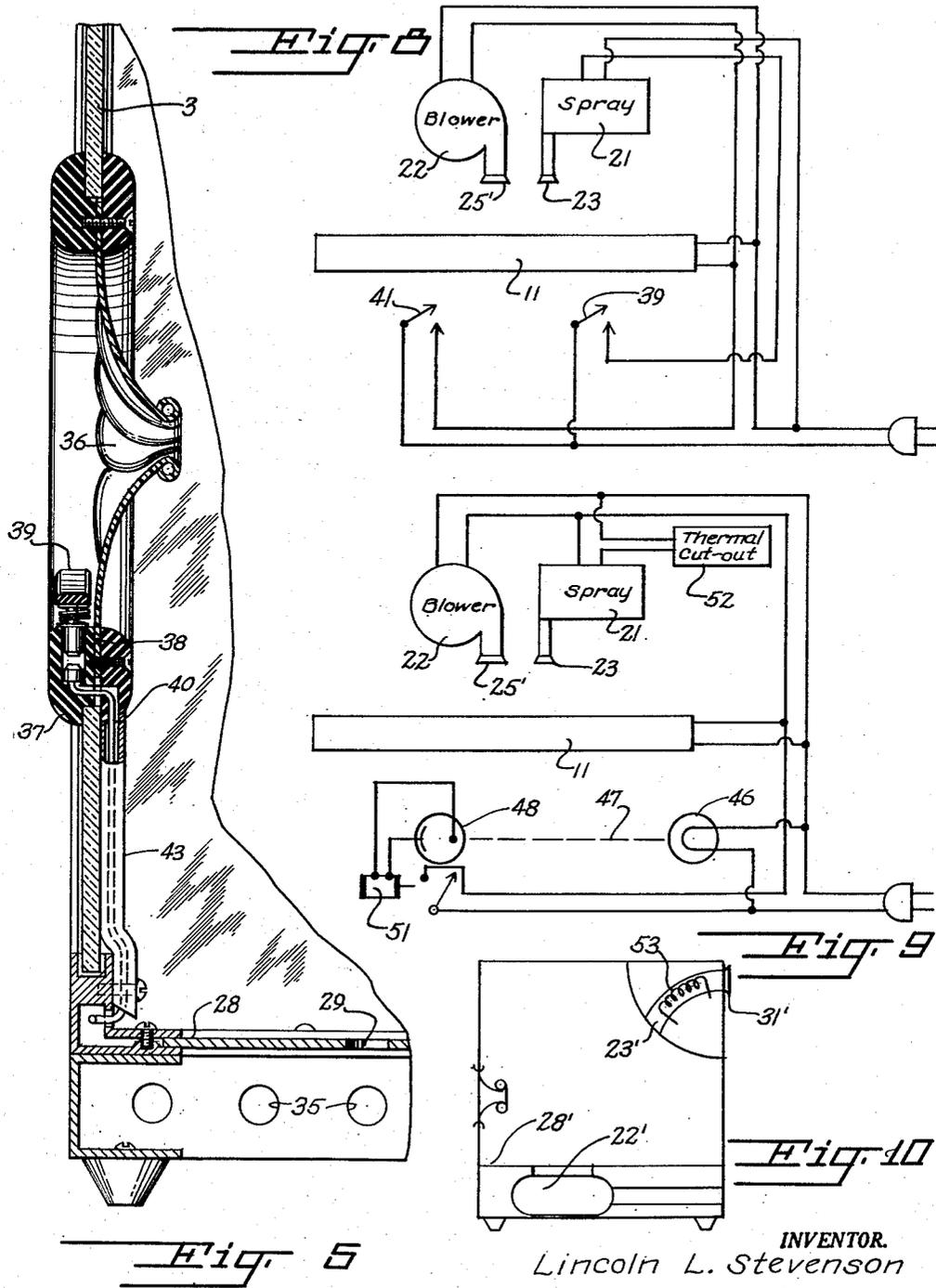
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RAPID HAND SANITIZER

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Application April 27, 1955, Serial No. 504,195

5 Claims. (Cl. 21—91)

This invention relates to a device for quickly and efficiently rendering the hands sanitary and is intended particularly for use by persons such as those who handle food publicly, render personal services, etc. It is a primary object of the invention to provide a unitary device which can be attractively housed for public use, which enables the user to sanitize his hands in a few seconds and which does not require the attachment of plumbing or the use of towels.

It is a matter of everyday observation that people handling foods and similar products in public, as at lunch counters, drug stores, etc., often pick up objects from the floor, touch their hair, and otherwise soil their hands, then immediately pick up and handle food or other supplies. This is both unsanitary and objectionable to the patrons, yet it has been found impracticable to require such personnel to wash and dry their hands at an ordinary washstand prior to serving each patron, chiefly for the reason that the operation is too time-consuming. Also, it is usually not convenient or practical to provide the necessary plumbing for such facilities in a convenient location, so that still more time and steps would be wasted in going to and from the washstand, and with impatient customers waiting to be served, the temptation is very great to omit such washing. Furthermore, repeated washings in soap and water is very hard on the skin and especially on the nail polish of female employees, who therefore will refuse to perform such continual ablutions.

It is a major object of the invention to provide a hand sanitizer which overcomes the above disadvantages and which employees can be readily persuaded to use as often as necessary. It is a further object to provide such a device which is decorative and is adapted for conspicuous display, so that the patrons will see that the server is sterilizing his hands before serving them, or at frequent intervals.

Another object is the provision of a hand sanitizer which requires no attachment to plumbing, and which is entirely enclosed, so there is no danger of either splashing other objects or of being contaminated by other objects. Still another object is to provide a hand sanitizer which is very fast, yet is antiseptic and efficient in its operation, and which leaves the skin of the hands hygienic, soft and supple so that the users have no objection to repeated use of the device and, in fact, are glad to do so because it improves the condition of the hands.

Still another object is the provision of a device which is substantially or entirely automatic in its operation and which is economical of supplies, since the utilization of material is very efficient.

The specific nature of the invention, as well as other objects and advantages thereof, will clearly appear from a description of a preferred embodiment as shown in the accompanying drawings, in which:

Fig. 1 is an isometric front view of a complete embodiment of the invention, showing its general appearance;

Fig. 2 is a plan view of the structure of Fig. 1;

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Fig. 3 is a side elevation of the sanitizing cabinet;

Fig. 4 is a front elevation of the same device;

Fig. 5 is a sectional view of the front panel taken on line 5—5 of Fig. 4, showing a hand aperture using manual or wrist control;

Fig. 6 is a sectional corner detail taken on line 6—6 of Fig. 2;

Fig. 7 is a detail view of the hinge end of the top cover;

Fig. 8 is a wiring diagram of the modification using wrist control; and

Fig. 9 is a wiring diagram of the modification using automatic control.

Referring to Fig. 1, the hand sterilizer 2 is shown as housed in a cabinet having glass walls 3, 4, and a glass top 6, so that the action and use of the apparatus can be observed at all times. The cabinet can be suitably mounted on rubber or felt feet 7 and provided with an electric cord 8 and plug 9 for connection to any suitable electric outlet.

The top 6 of the cabinet is hinged as best shown at 9' in Fig. 7 so that it can be raised for cleaning and servicing. Fastened to top 6 and movable therewith is an ultra-violet sterilizing lamp 11 of a commercially available type. The glass panel of top 6 is supported and reinforced by a molding 12, to which the hinge 9' is attached and to which the housing of ultra-violet lamp 11 is also attached as shown at 13 in Fig. 6, by screws 14, or in any other convenient fashion. The electric supply wire 16 for the lamp may be concealed in the molding 12, as shown in Figs. 6 and 7.

In the upper back corner of the cabinet, a housing 17 is provided, which may be in the form of a quarter cylinder as best seen in Fig. 3, which is attached to the back wall of the cabinet in any suitable fashion, e. g., by screwing it to the upper back molding 18 as indicated at 19. Housing 17 contains two items: an electrically operated fine spray device 21 and a hot air blower-drier 22. The sprayer 21 may be of any suitable commercial type having a container for the solution to be sprayed and a spray nozzle 23. A suitable aperture 24 is provided in housing 17 for the spray nozzle, which is oriented to deliver its fine spray diagonally downward as shown in Fig. 3. Another aperture 25 is provided for the blower-drier 22 whereby a stream of hot air is also delivered preferably in the same general direction as the spray. The bottom 28 of the cabinet is preferably made of sheet metal, e. g., stainless steel, and provided with a number of apertures 29 for the exit of air from the blower to the bottom of the cabinet. An inlet aperture 31 is provided for the blower at the back of the cabinet.

The bottom of the cabinet is raised above the surface on which the cabinet is placed by the height of legs 30 plus the height of a skirt 32, providing a base for the cabinet. Skirt 32, which is preferably made of stainless steel, is provided with apertures along the sides and back to facilitate the exhaust of air from the cabinet.

The front wall 3 of the cabinet is provided with two apertures 33, for the hands of the user. Each aperture is normally closed by a flexible closure 36; preferably made of neoprene or similar material, after the fashion of the well-known self-closing tobacco pouch, so that when the hand is thrust through closure 36, the flexible material gives way to permit the hand to pass into the cabinet, but when the hand is withdrawn, the closure automatically recovers the aperture. Alternative constructions for the closures would include a split flexible sheet or any other construction which permits the hands to be thrust through the apertures, yet shields the wrists and sleeves of the user from the spray. The flexible closure 36 is retained by a grommet molding 37 as shown in Figs. 5 and 1. The

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molding is preferably made of sufficiently massive construction to accommodate at least one switch 38, operated by arcuate switch actuator 39, which can be pressed by the wrist or arm of the user when inserted into the cabinet without interfering with limited movement of the hands to expose them to the spray.

A suitable switching and control circuit for the device is shown in Fig. 8. It will be seen that left-hand switch 41 controls the ultra-violet lamp and blower, while the right-hand switch controls the spray, thus permitting the use of a choice of sterilizing action. It will be apparent that a third similar switch can be provided at the side of one of the apertures to independently control the blower and the sprayer if desired. However, there is an advantage in operating the blower and the spray together, since the blower blast thus carries down all the spray particles which do not strike the hands, and deposits them on the bottom or out through the bottom apertures, thus preventing the glass walls from being misted by the fine spray particles.

The spray which I prefer to use is a compound including lanolin, pure grain alcohol, perfume, and possibly a slight amount of additional disinfectant added if necessary for any particular use, although ordinarily the alcohol is sufficient to provide the desired disinfectant action. The lanolin or similar emollient leaves the hands in smooth and supple condition, and is not present in sufficient quantity to render the hands appreciably oily. The alcohol evaporates very quickly in the blast of warm air from the blower, so that in a very few seconds the hands can be withdrawn. The ultra-violet lamp adds to the disinfectant action not only on the hands, but also keeps the interior of the cabinet sterile and kills any germs which are transferred from the hands to the interior of the cabinet. In some installations, it may be preferable to keep the ultra-violet lamp continually in operation. The blower usually takes about as long to fully warm up as the duration of the spray, so that when the spray cycle is finished, if both devices have been started simultaneously, the heated air is fully effective to very quickly dry the hands of the volatile solvent which is used, with the minimum delay.

The timer may be a thermal switch, or if the device is likely to be used so often that a thermal switch would not have time to recover between successive uses, any form of known mechanical or electromechanical timer may be used which shuts off the spray after a few seconds and keeps it shut off until the switch is again operated, such devices being commercially available.

An alternative form of the invention is shown in Figs. 2 and 4. In this case, a photoelectric cell is used to control the elements of the cabinet by interruption of a light beam when the hands are thrust into the apertures. A lamp housing 46, as shown in Fig. 4, is mounted on one side of the cabinet to project a collimated or otherwise directed beam of light 47 across the two apertures into a photocell 48 mounted in housing 49. Also mounted in the housing is a microamp relay 51 controlled directly by the output of photocell 48, so that when the beam of light is interrupted, the circuit is turned on. Such photocell operated relays are commercially available, and require no vacuum tube relay circuits, although the latter could, of course, also be used if desired.

A typical circuit for use with the photocell control is shown in Fig. 9. In this case the lamp is turned on at the same time as the spray and the blower, the spray being again turned off by timer 52, after a few seconds. The lamp is supplied from the same circuit as the other components, so that whenever the device is plugged in, it is ready for operation; if desired, a main shut-off switch can be provided.

An alternative form of the invention has the blower mounted in the base as a suction device, and a heating coil 53 provided adjacent the air inlet 31', as schematically

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shown in Fig. 10. The advantage of this arrangement is that it more effectively withdraws all of the excess spray particles without permitting them to lodge on the glass sides.

It is thus seen that an apparatus is provided which accomplishes all of the objects of the invention. While surgical sterility of the hands is not produced by the use of this apparatus for the period contemplated (10-15 seconds), it will remove or render harmless the great majority of surface bacteria to the degree where the handling of food, etc., shortly after use of the sterilizer is rendered very much safer than is otherwise possible. Since the apparatus is rapid and pleasant in its use and effects, there is no problem in enforcing its reasonable use. The patrons, too, are reassured by seeing the service personnel use the apparatus and are encouraged to continue their patronage, which makes it easier to persuade the shop operators to enforce the use of the device.

It will be apparent that the embodiments shown are only exemplary and that various modifications can be made in construction and arrangement within the scope of my invention as defined in the appended claims.

I claim:

1. A rapid hand sanitizer comprising an enclosed cabinet having an aperture for insertion of the hands, a liquid sprayer adapted to contain a highly volatile germicidal spray solution, an electrically operated air blower for blowing air into said cabinet, means for directing a controlled amount of germicidal spray from said sprayer toward the inserted hands in said cabinet, and actuating means adapted upon insertion of a hand through said aperture into said cabinet to concurrently actuate said blower and said liquid sprayer timing means for terminating operation of the blower after a predetermined time interval, and means for terminating operation of the sprayer prior to terminating operation of the blower.

2. The invention according to claim 1, and normally closed cover means across said aperture yieldable to hand pressure to permit hand insertion and withdrawal.

3. A rapid hand sanitizer comprising in combination, a cabinet having a front wall, side walls, a top wall and a bottom, one of said walls being hinged to provide access to the interior, hand apertures in the front wall, photoelectric switch means adjacent said hand apertures for operation during hand insertion in said cabinet, an electrically operated liquid sprayer adapted to contain a highly volatile sanitizing spray solution and controlled by said switch means for delivering a sanitizing spray into said cabinet toward the inserted hands, electrically operated blower-heater means, means under control of said switch means for concurrently delivering a downwardly-directed stream of heated air from said blower-heater means to the interior of said cabinet, said bottom wall being provided with outlet aperture means for exhausting spray-and-vapor laden air from the cabinet, and timing means for first terminating operation of the liquid sprayer and subsequently terminating operation of the heater-blower.

4. The invention according to claim 3, and cover means for said apertures, said cover means being adjustable to hand pressure to permit hand insertion into said apertures.

5. The invention according to claim 3, said blower-heater means comprising an exhaust blower connected to said outlet aperture means for exhausting air from said cabinet by suction, an air inlet for said aperture and an electric heating coil in said inlet for heating air drawn into said cabinet.

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