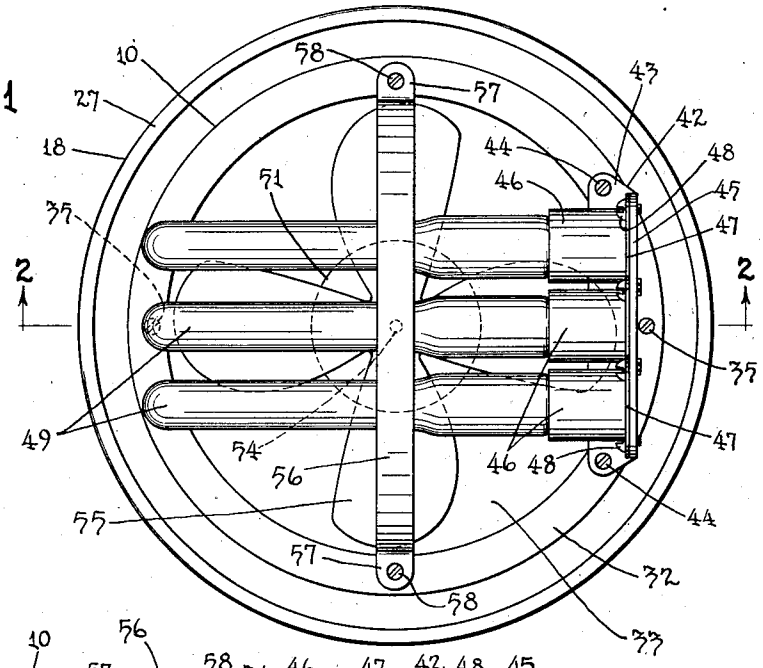
Aug. 1, 1944. W. E. LAW 2,354,817

STERILIZER

Filed Jan. 26, 1942

Fig. 1



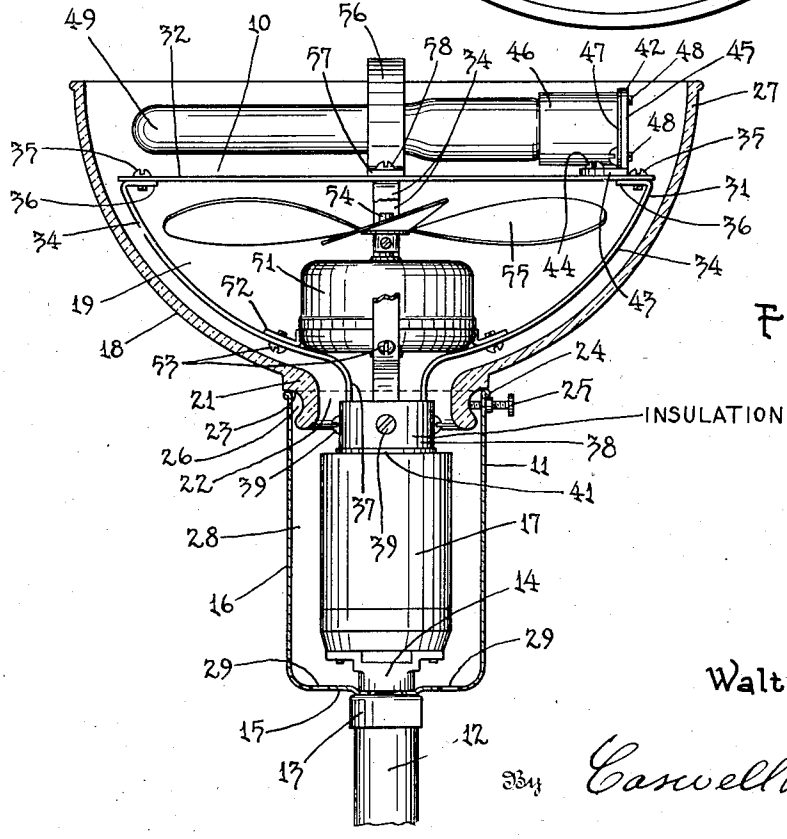


Fig. 2

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STERILIZER

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8 Claims. (Cl. 250—43)

My invention relates to sterilizers and has for an object to provide a sterilizer capable of sterilizing the air in rooms and other similar chambers.

An object of the invention resides in providing an electric sterilizer by means of which the air is rapidly and effectively sterilized with a minimum consumption of electric current.

Another object of the invention resides in providing a sterilizer which is portable and may be readily placed wherever desired to permit of sterilization of the air at certain localities.

Another object of the invention resides in providing a sterilizer producing middle ultraviolet rays and in providing a construction in which but a minimum amount of the rays are lost by absorption.

A feature of the invention resides in providing a sterilizer utilizing a germicidal lamp in which the lamps are shielded from the eyes of the occupants of the room, to prevent eye strain or injury.

Another object of the invention resides in providing a sterilizing unit capable of being installed in an ordinary floor lamp and forming in conjunction therewith a highly efficient sterilizer.

A feature of the invention resides in providing a housing in the shape of a bowl having a chamber open at the upper end thereof and in disposing in the upper end of the chamber one or more germicidal lamps arranged in coplanar relation.

An object of the invention resides in disposing within the chamber a motor situated below the germicidal lamp and a fan carried by the motor and disposed between the motor and lamp and in providing an air inlet in the lowermost portion of the housing for conducting air to said fan.

A feature of the invention resides in providing a frame conforming in configuration to the interior of the housing and supported at its lower end by an electric plug adapted to be screwed into the socket of the floor lamp.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawing:

Fig. 1 is a plan view of a sterilizer illustrating an embodiment of my invention.

Fig. 2 is an elevational sectional view taken substantially on line 2—2 of Fig. 1.

In the use of sterilizers employing germicidal lamps, the customary practice has been to install the lamps in special reflectors suspended from the ceiling or located in a special wall construction forming part of the building or in placing the same in suitable air ducts for circulating the air through the room in which sterilization is desired. Such installation requires special wiring and incurs considerable expense, thus making extensive use of sterilizers impractical. The present invention overcomes these disadvantages by providing a sterilizing unit which may be installed in an ordinary floor lamp of the inverted type, whereby the same may be made portable and available for instant use without the expense and inconveniences enumerated.

My invention comprises a sterilizing unit 10, which may be mounted in an inverted type floor lamp 11. These parts will now be described in detail.

Inasmuch as the construction of floor lamps is well known in the art, the floor lamp 11 has not been shown in its entirety, and only so much as is essential to the present invention has been shown in detail. The floor lamp 11 comprises a standard 12 which is mounted on a hollow base, not shown. This standard has attached to the upper end thereof a collar 13. A tubular case 16 is mounted on the upper end of the standard 12. This case is provided with a base 15 through which the standard extends and rests upon the collar 13. The end of the standard 12 is threaded to receive a threaded fitting 14 which screws down upon the base 15 of case 16, clamping it against the collar 13, whereby said case is supported in upright position at the upper end of the standard 12. The fitting 14 has attached to it an electric socket 17 which may receive a standard screw plug or which may receive the larger type of screw plug frequently referred to in the trade as a "Mogul" plug.

The case 16 is spaced from the socket 17 and provides an air passageway 28 therebetween. A number of air inlets 29 in the base 15 of case 16 communicate with the passageway and conduct air through the sterilizer as will be hereinafter more fully described.

Attached to the upper end of the case 16 is a shade 18 which is in the shape of a bowl providing a chamber 19 within the same. This shade is constructed at its lower end with a neck 21 having a passageway 22 therein communicating with the chamber 19. The neck 21 is constructed with a shoulder 23 which rests upon a bead 24 formed on the upper edge of the tubular case 16. A number of screws 25 screwed into the housing 16 are received in a groove 26 in the neck 21 of shade 18 and hold the shade attached to the case

16. The rim 27 of the shade 18 flares outwardly from the neck 21 and the chamber 19 within said shade is open to the exterior at the upper end thereof. The shade 18 forms a housing for the sterilizing unit 10, as will presently become apparent.

The sterilizing unit 10 comprises a frame 31 which consists of an annular frame member 32 constructed from a sheet of material in the form of a disk having a central opening 33 therein. This disk has attached to the marginal portions thereof a number of depending arms 34 which are secured to said disk by means of screws 35 and 58 extending through said disk and threaded into lugs 36 bent inwardly from the upper ends of said arms. The arms 34 converge at their lower ends and have parallel portions 37 which are received within a sleeve 38 constructed of insulating material. The arms 34 are attached to the sleeve 38 by means of screws 39 which extend through said sleeve and are threaded to the ends 37 of said arms. The sleeve 38 is secured to an electric plug 41 which is adapted to be screwed in the electric socket 17.

Extending across and mounted on the frame member 32 is a bracket 42 formed with a base 43 resting upon said frame member and attached thereto by means of screws 44 which extend through said base and are threaded into the frame member 32. This bracket has a flange 45 projecting upwardly therefrom. Attached to this flange are a number of electric sockets 46, which have bases 47 projecting outwardly therefrom. These bases are secured to the flange 45 of bracket 42 by means of screws 48 which extend through said bases and are threaded into the flange 45. Mounted in the sockets 46 are germicidal lamps 49 which are disposed in coplanar relation above the disk 32. These lamps are spaced from the said disk and extend across the opening 33 therein.

Within the confines of arms 34 is mounted an electric motor 51 which is attached to said arms by means of clips 52 secured to the case of said motor. These clips are attached to said arms by means of screws 53 which extend through the arms and are threaded into said clips. The armature shaft 54 of the motor 51 extends upwardly above the same and has attached to it a fan 55. When the motor 51 is energized, air is drawn into the case 16 through the inlets 29 in the base thereof. The air so entering the case passes along the passageway 28 in said case, through the passageway 22 in the neck 21 of shade 18 into the chamber 19 of said shade and through the opening 33 in the disk 32 and past the lamps 49, being discharged from the device through the upper open end of the shade 18. In this manner, air is circulated through the sterilizer and past the lamp, so that sterilized air is discharged from the sterilizer.

Sockets 46 and electric motor 51 have connected to them suitable conductors which have not been shown in the drawing, but which extend along one of the arms 34 of frame 31 and which are connected to the terminals of the plug 41. Thus, when the plug 41 is screwed in socket 17, both the motor 51 and germicidal lamps 49 are energized.

Any of the germicidal lamps now on the market which are capable of emanating ultraviolet rays, ranging between 2000 and 3000 Angstrom units and which are particularly efficient in the vicinity of 2537 units, may be used. Certain of these lamps are now available for use with 110 volt ordinary house lighting current and may be connected directly to a 110 volt line. Other of these lamps require transformers, reactors and other accessories, such as starters, which, if desired, may be located in the base of the lamp.

My invention may be sold as a unit for installation in an existing floor lamp, or the same may be mounted in a suitable housing, similar to the shade of a floor lamp and sold as a complete sterilizer. In either case, the sterilizer produces an upward circulation of air which reduces the inefficiency of the lamps through absorption of the downwardly directed rays. However, where the sterilizer is sold as a complete unit, the housing therefor may be constructed with a polished aluminum surface or with a polished chrome plated surface to reduce absorption of the downwardly directed rays and cause reflection thereof. In either case, the blades of the fan 55 are constructed with such surfaces to reflect the rays impinging thereon.

For the purpose of handling the unit 10, a handle 56 is employed which extends over the lamps 49 and which is formed at its ends with ears 57 secured to the annular frame member by means of screws 58.

When the unit 10 is mounted within the shade 18, the lamps 49 thereof are disposed beneath the upper edge of the rim 27 of shade 18, so that if the floor lamp is at a sufficient elevation, the rays emanating from the lamps are directed away from the eyes of the occupants of the room, so that eye strain or eye injury is eliminated.

The use of the invention is obvious. Where the sterilizer is furnished as a unit for use in connection with a floor lamp, the same is attached to the lamp by screwing the plug 41 into the socket 17. This is accomplished by rotating the unit through the handle 56. When properly installed, the current is turned on by means of the switch furnished with the floor lamp, which has not been shown in the drawing, and both the motor and lamps 41 are energized. Where lamps utilizing special accessories are employed, the same are started in accordance with the instructions furnished therewith. Thereafter, the sterilizing device proceeds to circulate air through the various passageways and chamber therein, the air so circulated being sterilized in its passage through the device. Air is delivered upwardly and flows to various portions of the room in which the sterilizer is installed, and which may be remotely positioned with reference thereto.

The advantages of my invention are manifest. Sterilized air may be procured with my invention at a minimum expense. The device is small and compact and is readily portable. With one form of the invention, the sterilizing unit may be installed in an inverted type of floor lamp without alteration or reconstruction thereof. My invention does not require special wiring or special building construction to adapt the same thereto. When the sterilizer is in use, the sterilized air is directed upwardly and descends to remote portions of the room in which the same is installed. The germicidal lamps used with my invention are arranged so that all of the upwardly directed light rays emanate directly into the room, so that the length of travel is great before they reach the walls of the room, thus the efficiency of the lamps is not appreciably reduced by absorption. The downwardly light rays act on the bacteria in the air passing through the device and thus produce the desired affect before reaching the surface of the hous-

ing capable of absorbing the same. Where the device is constructed as a complete unit, the surface of the housing is constructed as a reflector to reflect these rays back into the room, thereby further increasing the efficiency of the sterilizer. My invention may be constructed at a nominal cost and is extremely practical and effective for the desired purpose.

Changes in the specific form of my invention, as herein described, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A sterilizer comprising a horizontally disposed disk having a central opening therein, a lamp socket attached to said disk at the margin thereof and exteriorly of the confines of said opening, a germicidal lamp carried by said socket and extending across said disk in proximity to said opening, a frame depending from said disk, a motor carried by said frame and a fan operated by said motor and disposed beneath said disk in proximity to the opening therein for forcing air through said opening and past said lamp and an electric plug attached to said frame for supporting the same.

2. A sterilizer comprising an annular frame member having an opening therein, a socket secured to said frame member exteriorly of the confines of said opening, a germicidal lamp mounted in said socket and extending across said frame member in proximity to said opening, depending arms secured to said frame member and arranged in converging relation, a motor carried by said arms at the converging ends thereof, a fan mounted on said motor and operating beneath said annular frame member to force air through the same and past said lamp, and an electric plug for supporting the frame attached to the lowermost ends of said arms.

3. A sterilizer comprising a bowl-shaped housing open at the top and having an air inlet at its lower end; an annular frame member at the upper end of said housing, having an opening therein a socket secured to said frame member disposed exteriorly of the confines of said opening, a germicidal lamp mounted in said socket and extending across said frame member in proximity to said opening, depending arms secured to said frame member and arranged in converging relation, a motor carried by said arms at the converging ends thereof, a fan mounted on said motor and operating beneath said annular frame member between the divergent portions of said arms to force air through said frame member and past said lamp, an electric plug secured to the lower ends of said arms for supporting said frame, and conductors extending between said lamp, motor and said plug for energizing said lamp and motor when the plug is connected to a suitable source of electric current.

4. A sterilizer comprising a standard, a tubular case secured to the standard, an electric socket within said case spaced from the walls thereof and supported by said standard, said case having an air inlet at the lowermost end thereof, said socket being spaced from said case to provide an air passageway therebetween communicating with said air inlet, a bowl-shaped housing having a chamber therein open at the upper end thereof, said housing being provided with a neck at the lowermost end thereof received within said case and supported thereby, said neck having an air passageway therein communicating with the air passageway in said case and said chamber, an electric plug mounted in said socket, a frame carried by said electric plug, a motor having a fan mounted on said frame and a germicidal lamp carried by said frame and disposed above said fan, said fan causing circulation of air through the passageways in said case and neck and into said chamber and about said lamp, causing the same to discharge from the upper open end of the housing.

5. A sterilizer comprising a housing in the form of a bowl open at the upper end thereof, a frame within said housing, a screw type socket at the lower end of said housing, a screw plug received within said socket and attached to the lower end of said frame, said frame having a portion situated in proximity to the rim of the housing, a second socket attached to said last named portion of the frame and a germicidal lamp disposed at the rim of said housing and carried by said second named socket.

6. A sterilizer comprising a housing in the form of a bowl open at the upper end thereof, a frame within said housing, a screw type socket at the lower end of said housing extending axially of the housing, a screw plug received within said socket and attached to the lower end of said frame, said frame having a portion situated in proximity to the rim of the housing, a second socket attached to said last named portion of the frame and arranged with its axis extending transversely of the axis of the housing and a germicidal lamp disposed at the rim of said housing and carried by said second named socket.

7. A sterilizer comprising a standard, a tubular case secured to the standard, an electric socket within said case spaced from the walls thereof and supported by said standard, a bowl-shaped housing having a chamber therein open at the upper end thereof, said housing being provided with a neck at the lowermost end thereof received within said case and supported thereby, means for conducting air into said bowl-shaped housing, an electric plug mounted in said socket, a frame carried by said electric plug, a motor having a fan mounted on said frame and a germicidal lamp carried by said frame and disposed above said fan, said fan causing circulation of air around and about the said germicidal lamp and discharging the air out of the upper end of the housing.

8. A sterilizer comprising a standard, an electric socket mounted at the upper portion of the standard, a plug mounted in said standard, a frame carried by said plug, a motor having a fan mounted on said frame, and a germicidal lamp carried by said frame and disposed outwardly of said fan, housing means open at one end, carried by said standard at its other end and enclosing said socket, frame, motor, fan and germicidal lamp, said housing means being free from said plug, frame, motor, fan and germicidal lamp and being divergent away from said socket, said housing means being disposed in close proximity to said socket, motor, fan and germicidal lamp, means for conducting air into said housing means, said fan causing circulation of air around and about said germicidal lamp and discharging the air out of the open end of the housing means, said plug, frame, motor, fan and germicidal lamp being removable as a unit from said housing means through the open end thereof.

WALTER E. LAW.