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RADIANT ENERGY STERILIZER

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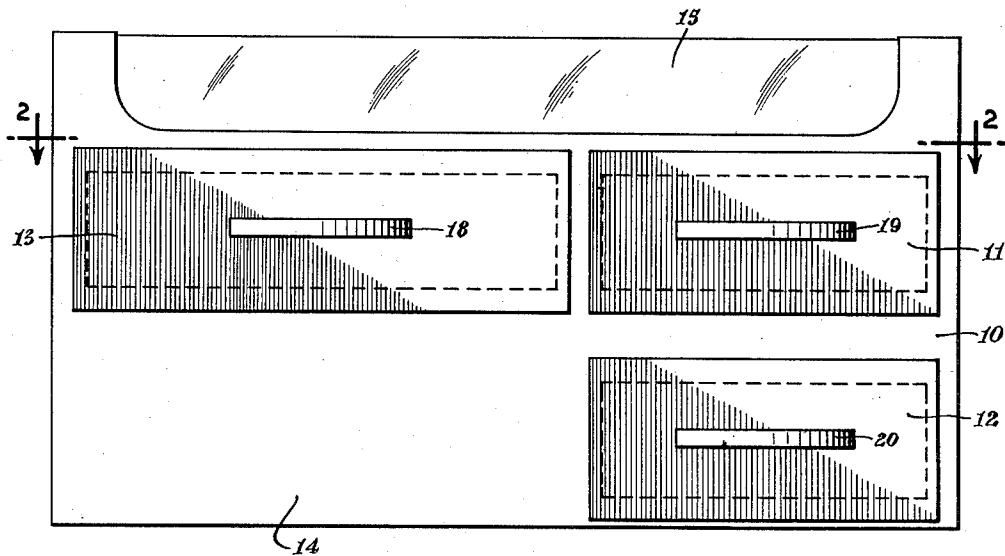


Fig. 1

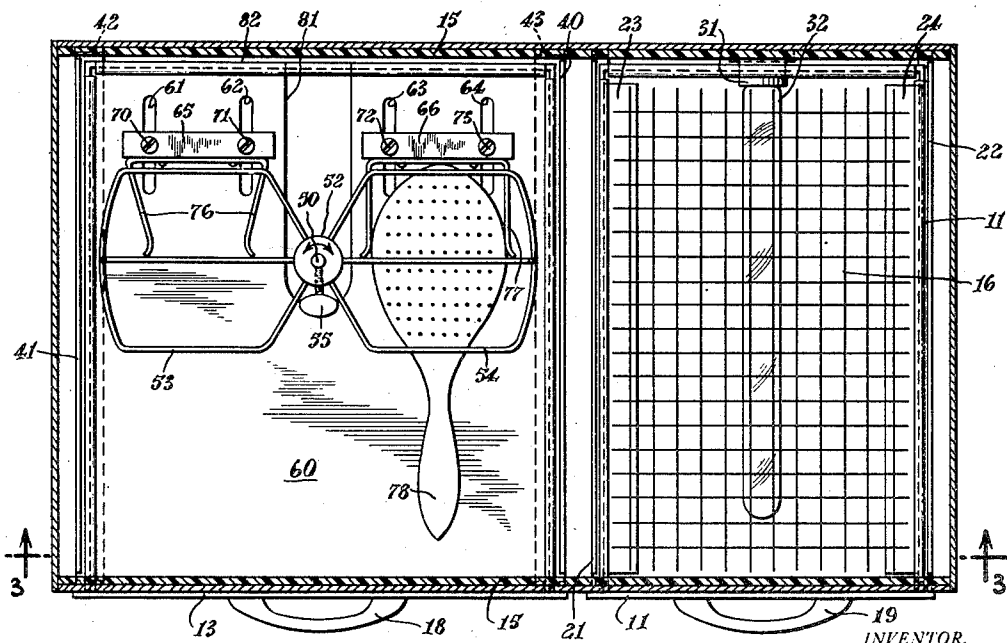


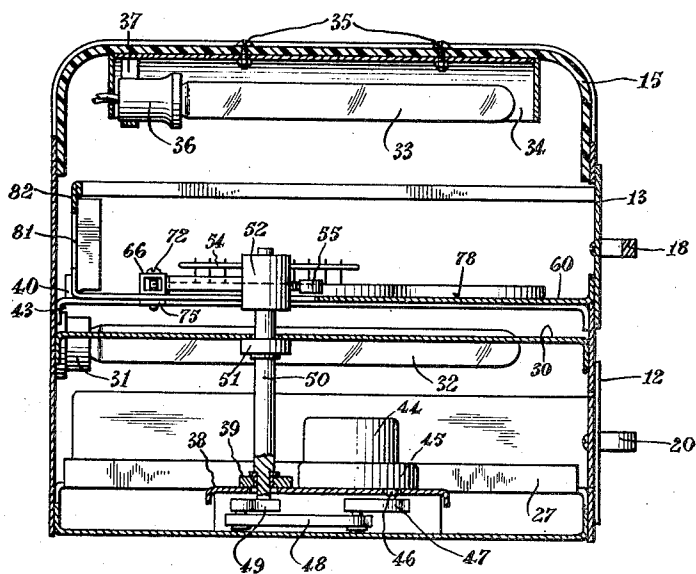
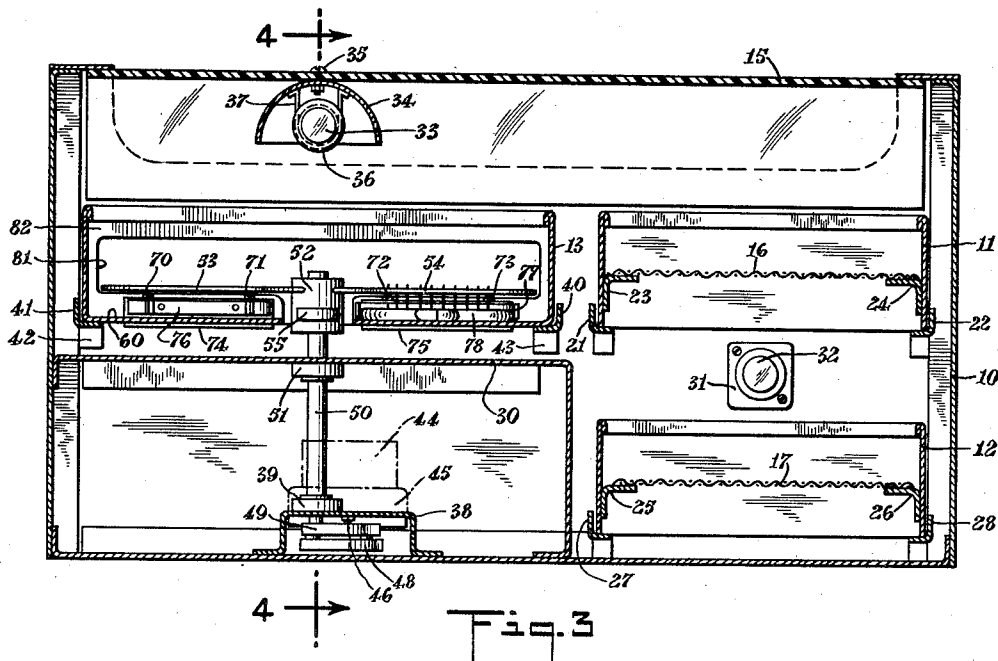
Fig. 2

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RADIANT ENERGY STERILIZER

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4 Claims. (Cl. 21-102)

1

This invention relates to a radiant energy sterilizer. More particularly it relates to a sterilizer for brushes, combs and similar barber's tools which may contain protected areas difficult to reach by radiation.

Lamp bulbs adapted to radiate ultraviolet rays with wave lengths known to destroy bacteria and fungi are well known and such sources of radiant energy have been suggested for sterilizing brushes, combs and various other instruments. One of the difficulties associated with such sterilizing devices is that certain portions of brushes, for example, are protected or shielded so that they can not be directly radiated. It is well-known, for example, that radiation to be most effective should be directed as nearly perpendicular to the area to be radiated as is possible. In a brush, for example, rays perpendicular to the back of the brush will be parallel to the bristles so that the bristles will be inadequately radiated. The bristles can not be radiated from the side as the outside bristles would stop all radiation to the inner bristles. Furthermore, the bristles tend to cling together especially when damp and prevent the penetration and thorough exposure of the bristles next to the back. While it is necessary to sterilize the back of the brush, it is also necessary and essential to sterilize the bristles.

The invention may also apply to the teeth of a comb and other articles having flexible parts and protected areas difficult to reach by radiation from one or two ultraviolet lamps.

An object of this invention, therefore, is to provide an apparatus for radiating the back of a brush and for simultaneously separating, flattening and radiating the bristles of the brush.

Another object of the invention is to provide an enclosed radiating apparatus containing means for moving parts of the articles being radiated during the radiation process.

Another object of the invention is to provide a means for radiating all types of tools such as barber's tools from several sides simultaneously so that no part of the tool is protected or shielded from the radiation.

These objects and others ancillary thereto are obtained by providing an enclosed radiating means containing suitable sterilizing lamps and a plurality of drawers adapted to contain the instruments to be sterilized. At least one of the drawers is slotted so as to admit a moving mechanism adapted to change the position of certain parts of the instruments inserted in the drawer without interfering with the radiation from the

2

lamp bulbs. One or more of the drawers are provided with porous supports for the objects to be sterilized so that the latter may be treated simultaneously from at least two sides.

The novel features characteristic of this invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of specific embodiments when read in connection with the accompanying drawings in which:

Figure 1 is a front view of the device of the present invention.

Figure 2 is a cross-sectional view taken on line 2-2 of Figure 1 showing a plan view of the drawers inside of the device.

Figure 3 is a front cross-sectional view taken on line 3-3 of Figure 2.

Figure 4 is a side cross-sectional view taken on line 4-4 of Figure 3.

In the drawings the device comprises a metal housing 10 containing drawers 11, 12 and 13. Suitable handles 18, 19 and 20 are provided for the drawers. Beneath the drawer 13 a space 14 is provided to contain the moving mechanism for the device. Preferably the housing 10 has an opening in the top which is filled with transparent material 15 so that it can be determined when the sterilizing lamps are operating and so as to present an attractive appearance when the lamps are operating.

As shown in Figure 3, the drawer 11 contains a mesh bottom 16 which is supported by the angles 23 and 24 which are suitably attached to the side of the drawer. Likewise, the drawer 12 contains a mesh bottom 17 supported by the angles 25, 26 attached to the side of the drawer. The drawer 11 rests on angle supports 21, 22 and similarly the drawer 12 rests on angle supports 27, 28 between the two drawers 11 and 12. A bulb 31 is fitted in the socket 32 located between the drawers 11 and 12.

A suitable switch, not shown, is provided for the lamp bulb 32. The socket 32 is attached to the rear of the casing 10. No reflector is provided for the lamp 31 since it is desirable to have it radiate in all directions, that is, to both drawers 11 and 12. The drawers 11 and 12 may be made interchangeable. Since the sides of the drawers 11 and 12 and the casing 10 are preferably made of aluminum the rays from the lamp 31 are reflected in all directions to expose all sides of the

instruments by the walls of the drawers and the casing 10, etc.

An essential feature of the present invention is the mechanism and arrangement of the various parts associated with the drawer 13. The drawer 13 is shown as being radiated from above by the lamp 33 behind which is the reflector 34, although the exact position of the lamp 33 is not an essential part of the invention. It is also obvious that one or more lamps 33 may be employed at different positions within the housing 10. The reflector 34 is attached to the transparent top 15 by a screw 35. The reflector 34 also has the socket 36 attached thereto by means of the bracket 37.

The drawer 13 is supported by angle pieces 40 and 41 which in turn are attached to the casing 10 by ears 42, 43. The ears 42, 43 may be attached to the housing or casing 10 by welding, by rivetting, by screws or in any known way. To box in and protect the rotating and motor mechanism and to furnish additional support for the bearing structure of the moving mechanisms, a strengthening partition 30 is provided about the space 14. The box behind the space 14 contains the motor 44 and suitable speed reducing gearing 45 which are shown diagrammatically. A second housing 38 supports the motor 44 and reducing gear 45 and contains an oscillating mechanism. This oscillating mechanism is connected to the reducing gear 45 through shaft 46. The shaft 46 is adapted to rotate the arm 47 which in turn gives a transitory motion to the link 48. The other end of the link 48 being connected through the arm 49 which is attached to the shaft 50. Thus the motor and reducing gear imparts oscillating motion to the shaft 50. The shaft 50 is held in place for rotation by the bearings 39 attached to housing 38 and by the bearing 51 attached to the partition 30. To the upper end of the shaft 50 the hub 52 is attached. The hub 52 contains the bristle separating and flattening means 53 and 54. The height of the hub 52 from the bottom 60 of the drawer 13 can be adjusted by means of the winged nut 55. The structure of the drawer 13 enables the drawer, containing brushes or other articles to be radiated, to be inserted in the field of the flattening means 53, 54 without disturbing the moving mechanism to any great extent. The bottom 60 of the drawer 13 contains a plurality of slots 61, 62, 63 and 64 for adjustably holding the square tubular elements 65 and 66. These tube elements 65 and 66 are adjustably held in the slots 61, 62, or 63, 64 by screws 70, 71, 72 and 73 which attach to the threaded bars 74 and 75 located beneath the bottom 60 of the drawer 13. Attached to the sides of the tubular members 65 and 66 are spring clamp members 76 and 77. These clamp members 76 and 77 are adapted to hold a brush 78 securely while the bristles of the brush are being flattened by the members 53 and 54.

The bottom 60 also contains a large open slot 80 extending from the rear thereof and of sufficient size to admit the hub 52. Continuous with the slot 80 of the bottom 60 is the T-shaped slot 81 in the back 82 of the drawer 13. Slot 81 is T-shaped so as to admit the bristle flattening members 53, 54. The members 53, 54 are fanned out to cover a considerable area but are made of material of relatively small diameter so as not to cut off any substantial amount of radiation from the lamp 33.

In operation, the drawer 13 is first removed and a brush 78 or other article to be sterilized is

placed in the holding clamp 76 or 77 or other appropriately shaped holding means, the drawer is then moved into its closed position along the angle supports 40, 41. The slots 80 and 81 permit the hub 52 and the members 53 and 54 to move into the inside of the drawer above the bristles of the brush 78 to be sterilized. No adjustment of the bristle flattening means is necessary as this means moves automatically into its operating position with respect to the drawer when the drawer is closed.

The sterilizing lamps are then turned on and the bristle flattening means is started. The time required for the complete sterilizing of the brush and bristles is considerably reduced because the rays fall perpendicular on the flattened bristles as the fingers of the bristle flattening members 53, 54 pass to and fro over the bristles. Since the bristles are brushed in both directions, both sides of the bristles are sterilized and as the members of the flattened means 53 and 54 pass over the bristles they are permitted to snap back and separate from each other. Suitably arranged separating means may be provided for the parts of other articles, for example, teeth of combs. Other barber's tools such as scissors, clippers, combs, etc. may be placed in one or the other of the drawers 11 or 12 and sterilized alternatively from the top and bottom thereof.

I claim:

1. In a radiation type of sterilizing apparatus for sterilizing brushes with flexible bristles and similar articles, the combination comprising a housing, a lamp within said housing for radiating sterilizing rays, a drawer open at the top and moveable into the area exposed to the rays of said lamp; at least two brush holding clamps secured within said drawer, a bristle flattening and separating means comprising at least one finger spaced above said brush holding clamps, when the latter is moved into the lamp-exposure area but projecting into and across the bristle field of a brush held by said brush holding clamps, means for providing rotary motion, means for translating said rotary motion into oscillating motion and means for conveying said oscillating motion to said bristle flattening and separating means.

2. In a radiation type of sterilizing apparatus for sterilizing brushes with flexible bristles and similar articles the combination comprising a housing, a lamp within said housing for radiating sterilizing rays, a drawer moveable into said housing into an area exposed to the rays from said lamp, brush holding means secured to the bottom of said drawer, a bristle flattening and separating means comprising at least one finger spaced above said brush holding means when said drawer is moved into said housing but projecting across the bristle field of a brush held by said brush holding means, means for moving said finger of the bristle flattening and separating means back and forth across the bristles of said brush.

3. In a radiation type of sterilizing apparatus for sterilizing brushes with flexible bristles and similar articles, the combination comprising a housing, a lamp within said housing for radiating sterilizing rays, a drawer moveable into the area exposed to the rays of said lamp, at least two brush holding clamps secured within said drawer, bristle flattening and separating means comprising at least one finger spaced above said brush holding clamps when the latter is moved into the lamp-exposure area but projecting into

5

and across the bristle field of a brush held by said brush holding clamps, a shaft extending at right angles to said finger away from the lamp bulb so as not to interfere with the rays from the said bulb, means for securing the bristle flattening and separating means to said shaft, means for oscillating said shaft so as to move the finger of the bristle flattening and separating means back and forth across the bristles of said brush.

4. In a radiation type of sterilizing apparatus for sterilizing brushes with flexible bristles and similar articles, the combination comprising a housing, a lamp within said housing for radiating sterilizing rays, a drawer moveable into said housing into an area exposed to the rays from said lamp, brush holding means in said drawer, a bristle flattening and separating means comprising at least one finger spaced above said brush holding means when said drawer is moved into said housing but projecting across the bristle field of a brush held by said brush holding means, a shaft extending at right angles to said finger

6

and away from said lamp bulb so as not to interfere with the rays from the said bulb, means for securing the bristle flattening and separating means to said shaft, means for oscillating said shaft to move the finger of the bristle flattening and separating means back and forth across the bristles of said brush, said drawer having a slot in the bottom thereof adapted to straddle said shaft and a cooperating slot in the side adjacent the end of the bottom slot adapted to admit the bristle flattening and separating means.

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