Dec. 4, 1962 L. H. O. STOBBE 3,066,336

SANITARY DEVICE FOR CLEANSING THE HANDS AND ARMS

Filed Aug. 16, 1961 2 Sheets-Sheet 1

Fig. 1

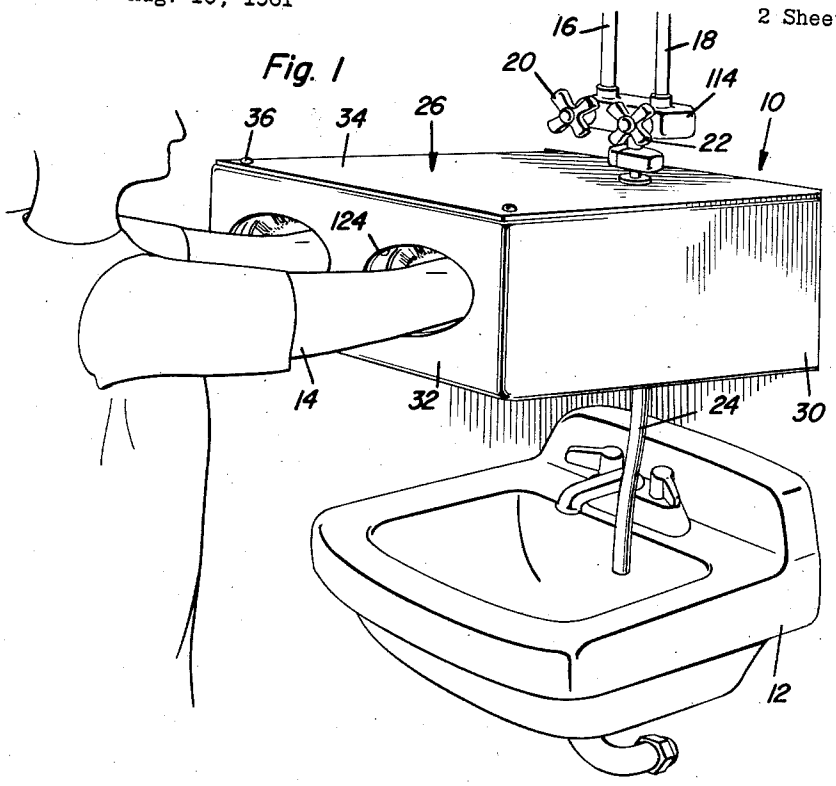
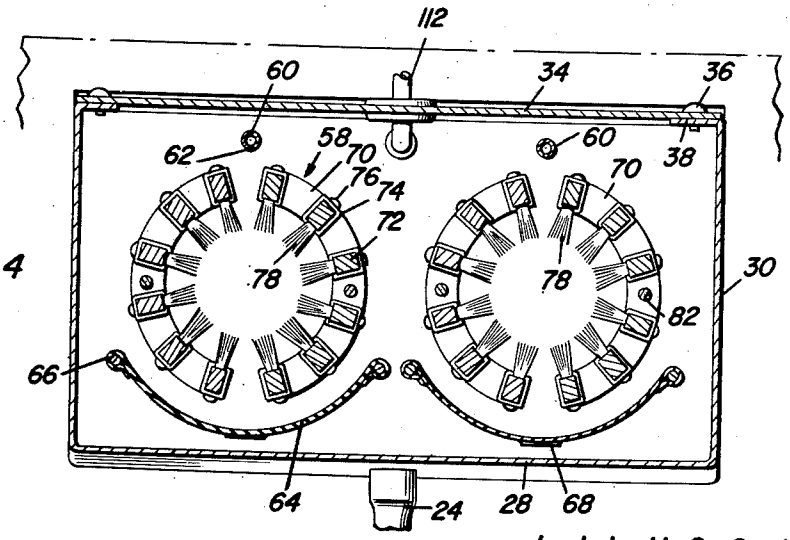


Fig. 4



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2 Sheets-Sheet 2

Fig. 2

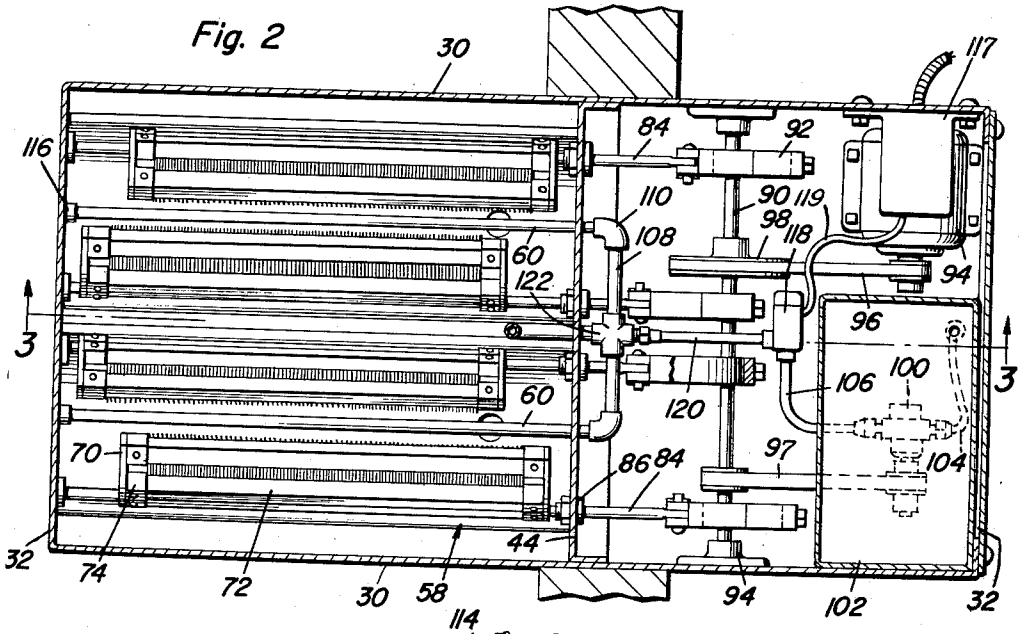
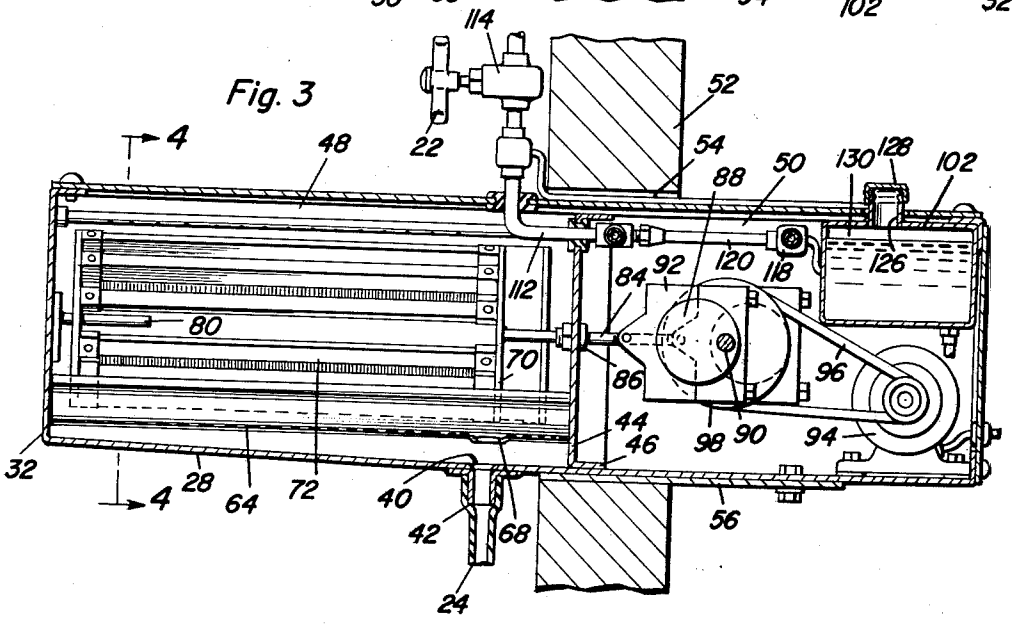


Fig. 3



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3,066,336

SANITARY DEVICE FOR CLEANSING THE HANDS AND ARMS

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6 Claims. (Cl. 15—21)

The present invention generally relates to a cleaning device and more particularly to a device for cleansing the hands and arms of a surgeon, doctor, nurse or the like and the present invention includes novel improvements over that structure shown in prior Patent No. 2,248,205 issued July 8, 1941 for Sanitary Device for Cleansing the Hands and Arms.

In hospitals, there is normally provided a special room where nurses, surgeons and the like "scrub up" in preparation for an operation upon a patient. This procedure is quite time consuming and usually is conducted by each individual manually scrubbing their hands and arms with a brush and a cleaning material in an endeavor to render the hands and arms as sterile as possible. However, there are many dangers of contamination from such manual operation and it is the primary object of the present invention to provide a device to cleanse the skin of a person's hands and arms to an extremely sterile condition in a very short time.

Another important object of the present invention is to provide a sanitary device in accordance with the preceding objects having a novel structural arrangement together with an automatic timer which will operate the machine for a predetermined period of time after the hands and arms have been placed therein and then automatically stop the machine.

Another feature of the present invention is to provide a cleaning or scrubbing machine having a water mixer for mixing hot and cold water to a desired modulated temperature.

Still another object of the present invention is to provide a cleaning or scrubbing machine for the hands and arms which includes reciprocating brush assemblies and an automatic sprayer which discharges the cleaning solution onto the brushes and hands and arms during reciprocation of the brushes. The brushes are arranged with their longitudinal axes parallel to the axis of the arm thus causing the brushes to move longitudinally of the arm surfaces for thorough cleaning thereof.

A further important feature of the present invention is to provide a cleaning or scrubbing machine capable of cleaning both the hands and arms or only the hands which may be all that is required in certain instances.

Another very important feature of the present invention is to provide a cleaning or scrubbing machine for the hands and arms which is extremely simple in construction, efficient in operation, long lasting and dependable and generally inexpensive to manufacture.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of the sanitary device of the present invention illustrating the manner of use thereof;

FIGURE 2 is a top plan view of the machine with the top of the cabinet removed illustrating the relationship of the various components;

FIGURE 3 is a longitudinal, sectional view taken substantially upon a plane passing along section line 3—3 of FIGURE 2 illustrating further structural details of the invention; and

FIGURE 4 is a transverse, sectional view taken substantially upon a plane passing along section line 4—4 of FIGURE 3 illustrating the particular construction of the brush assemblies and the sprayers above the brush assemblies and the drain trough below the brush assemblies.

Referring now specifically to the drawings, the numeral 10 generally designates the sanitary device of the present invention for scrubbing or cleaning the hands and arms. As illustrated in FIGURE 1, the machine may be mounted in a wall surface in any suitable manner above a sink 12 or the like at a convenient height so that a person may insert his hands and arms 14 into the interior of the machine. The cleaning machine or scrubbing machine 10 is connected with hot and cold water inlet pipes 16 and 18 in a conventional manner and manual control valves 20 and 22 are provided for cutting off the flow of water to the machine. Depending from the machine 10 is a drain tube or pipe which may be in the form of a flexible hose 24 which extends into the sink 12. While the device has been illustrated as being mounted on a wall surface above a sink 12, it is also contemplated that the device may be installed at any convenient location with the drain tube or pipe being connected to a suitable water drain thus eliminating any possible interference with the sink 12 and enabling the machine to be installed wherever desired.

The cleaning or scrubbing machine itself includes a cabinet generally designated by the numeral 26 and which includes a bottom wall 28, side walls 30,, end walls 32 and a removable top 34 held in place by removable screw threaded fasteners 36 or the like which extend through an inwardly extending flange 38 on the side walls and on the end walls for forming a support means for the removable top member 34. This construction defines a hollow cabinet which may be constructed of any suitable material such as sheet metal, plastic or the like and the particular dimensions of the cabinet may vary as desired as may the color characteristics and other physical appearance features thereof.

The bottom 28 inclines downwardly and to the center thereof where there is provided a drain opening 40 having a depending tubular nipple or fitting 42 attached thereto. The drain hose 24 is connected with the nipple 42 for draining water and cleaning solution from the interior of the cabinet for discharge down the drain of the sink.

Extending transversely of the cabinet, there is provided a partition wall 44 having a peripheral flange 46 engaging the inner surface of the bottom, side and top walls and being rigidly affixed thereto in any suitable manner. The partition 44 divides the cabinet into two compartments, namely, a brush compartment 48, and a motor or driving mechanism compartment 50. The partition 44 is generally in alignment with the wall 52 in which the cabinet 26 is mounted by virtue of extending through an opening 54 therein and being secured thereto in any suitable manner such as by virtue of a mounting plate 56 or the like.

Disposed in the brush compartment 48 is a pair of brush assemblies each being generally designated by reference numeral 58. Disposed over each brush assembly 58 is a longitudinal tube 60 having a plurality of longitudinally spaced discharge openings or orifices 62 along the bottom edge thereof for discharge of cleaning solution onto the brush assemblies. The orientation of the tube 60 in relation to the brush assemblies 58 is clearly illustrated in FIGURE 4.

Underlying each brush assembly 58, there is provided a generally U-shaped trough member 64 supported on longitudinal support rods 66 and having the lower surface thereof provided with an opening 68 generally in alignment with the opening 40 but latterally spaced therefrom whereby cleaning solution will be discharged onto

the upper surface of the trough and will be discharged through the opening **68** for subsequent drainage through the opening **40** and tube **24**.

Each brush assembly includes arcuate segmental end rings **70** which are interconnected by a plurality of brush members **72** received in tubular sockets **74** on the ring **70** with fastening means **76** securing the brush members **72** in place. Each of the brush members **72** is provided with inwardly extending bristles **78** in which the inner ends thereof terminate in a manner illustrated in FIGURE 4 whereby a generally circular area is defined by the inner edges of the bristles so that upon the insertion of the hand or arm into the central open area, the entire peripheral surface of the hand and arm will be effectively scrubbed by the reciprocating action of the brush assemblies. Rods **80** rigidly mounted on the end wall **32** project through the segmental ring **70** and form a support guide therefor. The apertures receiving the guide rods **80** are designated by reference numeral **82** as shown in FIGURE 4. The other end of each segmental ring is rigidly attached to a reciprocating rod **84** which extends through a supporting grommet and seal **86** in the partition wall. As illustrated in FIGURE 2, one of the segmental rings **70** in each pair is moving forwardly while the other of the segmental rings is moving rearwardly due to the actuating rods **84** being connected with eccentric cams **88** carried by a transverse drive shaft **90**. The operating rods **84** are connected to the cams **88** by virtue of a bearing assembly **92** pivotally connected to the longitudinally reciprocating rod **84** thus preventing any mechanical binding of the structure. The transverse shaft **90** is journalled in bearings **94** mounted on the side walls **30** for rotatably journalling the drive shaft **90**.

The drive shaft **90** is connected to a driving motor **94** driving the shaft **90** with a V-belt drive **96** engaging a large pulley **98** connected with the shaft **90** adjacent the center thereof for driving the shaft **90** at a desirable rotational speed whereby the two central brush segments operate in unison and the two outer brush segments operate in unison thus forming an axial reciprocating scrubbing action on the surfaces of the hands and arms when the opposed surfaces of the brushes reciprocate in relation to each other and in engagement with opposite surfaces of the hands and arms thus further facilitating the cleaning operation thereof.

Also driven from the shaft **90** is a V-belt drive **97** which drives a pump **100** located under a cleaning solution tank **102** and having an inlet pipe **104** extending to the cleaning solution tank **102** and having an outlet pipe **106**. The tube **106** is connected with a transverse manifold **108** having the longitudinal tube **60** connected to the ends thereof by elbows **110** thus forming communication with the brush assemblies for discharging material thereon. A forwardly extending central pipe **112** (see FIGURE 3) is provided which turns upwardly and is connected with the valve housing **114** which in turn is connected with the water inlet pipes **16** and **18**. The ends of the pipes **60** are supported by grommets or sockets **116** and similar grommets are employed for supporting the brushes which will maintain the solution in the brush compartment during reciprocation thereof.

The hot and cold water are mixed in the mixing chamber of the valve body **114** and disposed above the motor **94**. Also, there is provided a timer which will cut-off the machine after the passage of a predetermined time interval and will maintain the machine on for a predetermined length of time depending upon the adjustable timer **117** which may be varied to suit the individual requirements. The pump **100** discharges the cleaning solution through a control valve **118** operated by the timer **117** through conductor **119** in order to release the cleaning solution through the tubular member **120** into the manifold **108** by virtue of a cross fitting **122**. The pipe **112** is screwed into the opposite side of the fitting **122** and the manifold **108** also is screwed into

the fitting **122** thus forming a suitable connection for the purpose of admitting the mixed hot and cold water which will be at a predetermined temperature. The mixed water will be mixed with the cleaning solution discharged into the manifold by the pump **100** thus discharging from the spray tube a cleaning solution including water and a cleaning material. The timer is of the type which will operate for a predetermined period of time and this period of time may be varied by an adjustment provided on the timer. The timer is of conventional construction and the details thereof form no part of the present invention except that the timer does determine the time for the washing cycle to be operated.

The end wall **32** is provided with a pair of enlarged oval-shaped openings **124** which serve as openings for receiving the arms **14** and the hand so that the arms may be inserted into the cylindrical area defined by the inner end of the bristles **78** for engagement by the bristles **78** during reciprocation of the brush assemblies.

For facilitating the cleaning and sterilization of the brush assemblies and the brush compartment, the various components thereof may be readily removable and capable of being sterilized for purposes of maintaining the brushes in sterile condition. Also, the tank **102** may be provided with a filler neck **126** and cap **128** therefore by which a liquid soap or cleaning solution **130** may be provided in the tank **102** for subsequent pumping by the pump **100**.

The present invention facilitates the positioning of the device over any sink and connection of the device to present plumbing or it could be partly built in an embedded condition in a wall above the sink. The spray pipes **60** are perforated and preferably of brass or the like and spray a mixture of liquid soap and water. If desired, a separate water pump may be provided for producing high pressure water and liquid soap discharge. The scrubbing operation is quite thorough and by the person moving his arms slightly and then moving his fingers, the entire surface area of the hands and arms may be thoroughly scrubbed by using the device of the present invention with it requiring very little time to carry out the scrubbing operation. The motor and timer may be connected to any suitable electrical outlet and a suitable switch may be provided for starting the cycle of operation. All the plumbing fixtures are incorporated by using standard plumbing techniques and procedures and this is also true of the installation of the device and the drainage assembly therefor.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A device for cleaning and scrubbing the hands and arms of a person comprising a casing having openings in one wall thereof for insertion of the hands and arms, a pair of brush assemblies disposed in the casing, each brush assembly including a plurality of rows of bristles extending inwardly with the inner ends of the bristles defining a generally cylindrical area whereby the bristles will engage substantially the complete peripheral surface of the hands and arms when inserted into the cylindrical area, means for reciprocating the brush assemblies in a direction parallel to the axis of the cylindrical area, means in said casing for discharging liquid cleaning solution onto the brushes, hands and arms, and drain means for said casing for draining the liquid solution therefrom after use.

2. The structure as defined in claim 1 wherein each of said brush assemblies includes opposed pairs of substantially semi-circular rings having longitudinally facing

sockets thereon, said sockets receiving bristle mounting members therein with the bristle mounting members extending between the rings, each bristle mounting member having a row of bristles thereon, said means for reciprocating the brush assemblies including means for reciprocating the pairs of semi-circular rings in alternate relation to each other whereby the opposed surfaces of an arm and hand inserted into the cylindrical areas will have the opposed surfaces thereof brushed in opposite alternating directions.

3. The structure as defined in claim 2 wherein said means for supplying liquid cleaning solution includes an elongated pipe disposed in overlying relation to each of the brush assemblies, said pipe having a plurality of longitudinally spaced orifices therein for discharge of the cleaning solution centrally in the cylindrical area defined by the brush bristles.

4. The structure as defined in claim 3 wherein the bottom of said casing is inclined, said drain means including a drain opening at the lowest point in the bottom of the casing for draining liquid solution from the casing, an arcuate trough underlying each brush assembly and generally conforming to and being spaced from the periphery of the brush assembly for guiding the majority of the liquid solution to the end of the casing having the drain opening therein.

5. The structure as defined in claim 1 wherein said means for reciprocating the brush assemblies includes a crank shaft with cam members thereon, means connecting the cam members to the brush assemblies for reciprocation of the brush assemblies upon rotation of the shaft, electric motor means for driving the crank shaft, a liquid cleaning solution container, a pump communicated with the liquid solution container and with the liquid cleaning solution discharge means in overlying relation to the brush assemblies, said pump being driven from the crank shaft, and a timer for limiting the period of operation of the pump whereby the pump will only operate for a predetermined length of time after the machine has been turned on, a water supply means communicated with the cleaning solution supply means for mixture with the cleaning solution when discharged onto the brush assemblies.

6. The structure as defined in claim 5 wherein said water supply means includes means for automatically mixing the hot and cold water to discharge a modulated temperature water into the interior of the casing.

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