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 [21] Appl. No. **839,029**
 [22] Filed **July 3, 1969**
 [45] Patented **Oct. 12, 1971**
 [32] Priority **July 3, 1968**
 [33] **Switzerland**
 [31] **9929/68**

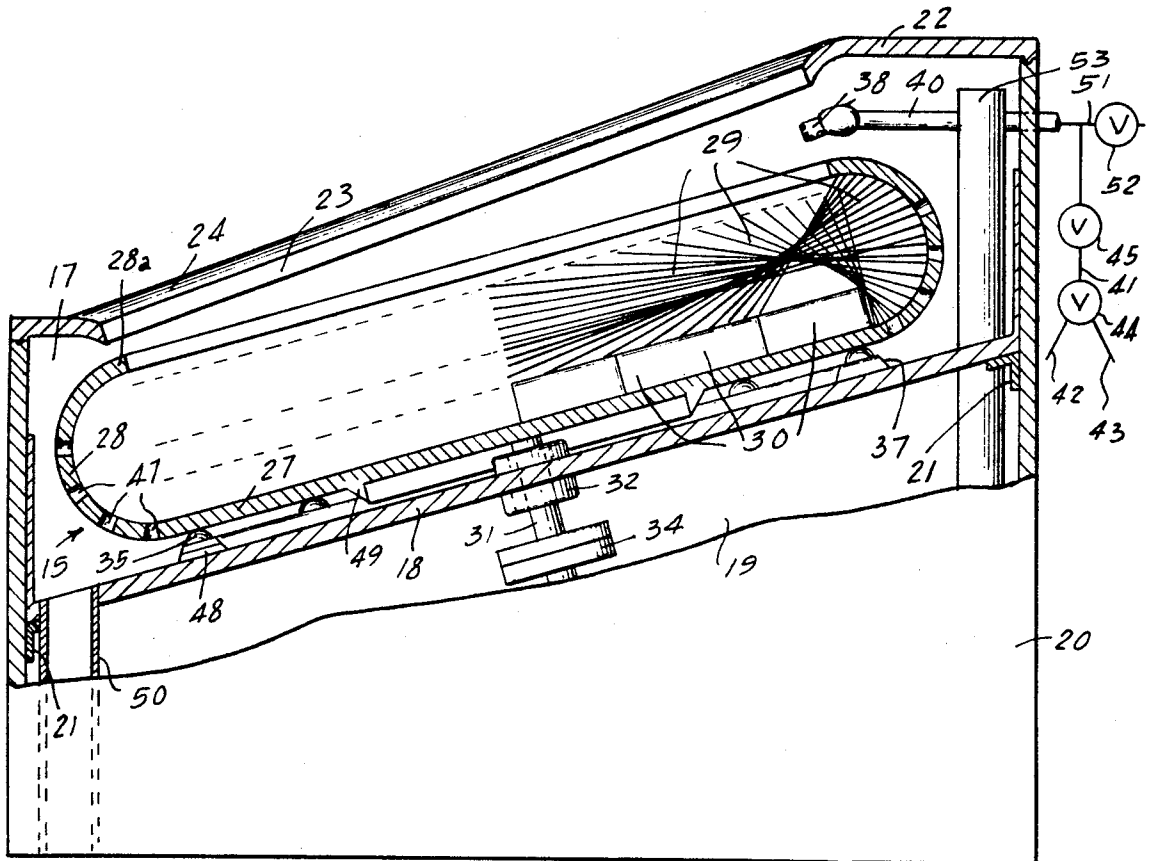
[56] **References Cited**
UNITED STATES PATENTS
 2,953,805 9/1960 Sevenich 15/310
 3,276,060 10/1966 Stokes et al..... 15/21 R
 3,378,009 4/1968 Peplin 128/266

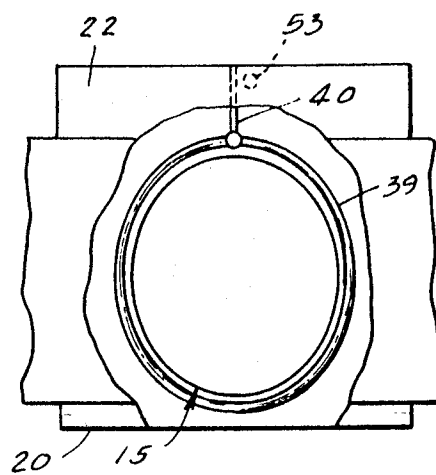
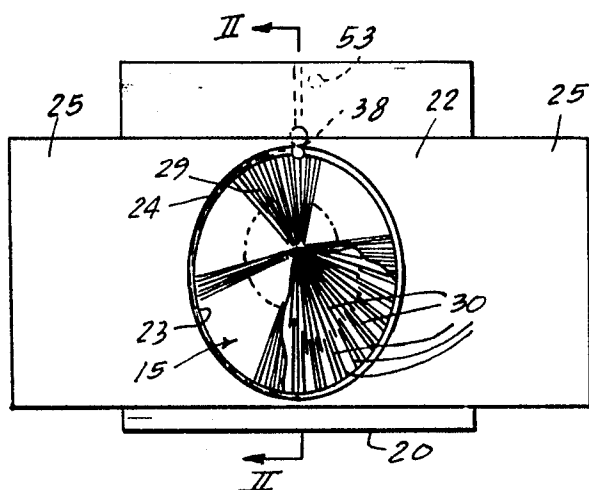
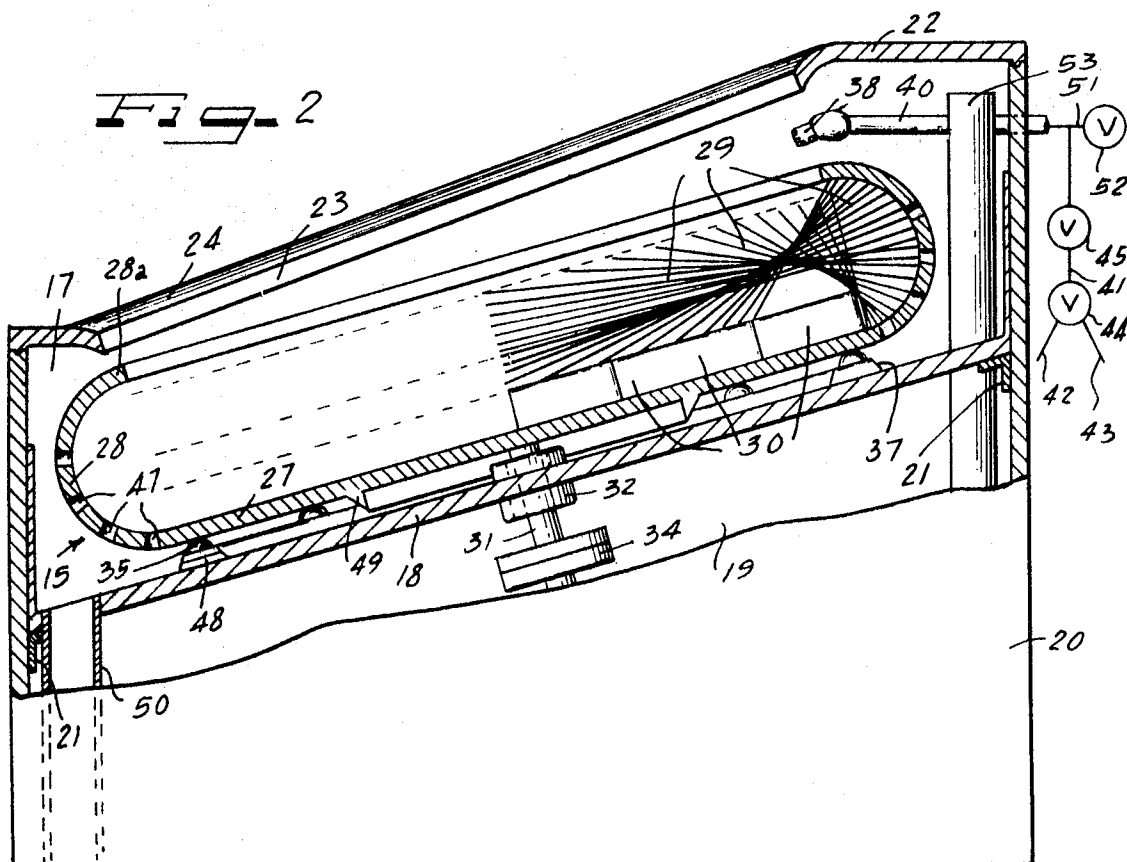
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[54] **APPARATUS FOR PEDICURE**
12 Claims, 11 Drawing Figs.

[52] U.S. Cl. **128/260,**
 4/182, 15/302
 [51] Int. Cl. **A61m 35/00,**
 A47k 3/022
 [50] Field of Search **128/260,**
 256, 382, 402, 582; 401/6; 5/30, 34, 36, 302, 310,
 311; 4/182; 15/21

ABSTRACT: A rotary foot treatment brush is mounted within an open topped treatment chamber within which medicated fluid and rinse water are supplied to the brushing area, as well as drying air following liquid treatment, and means are provided for programming a treating cycle.





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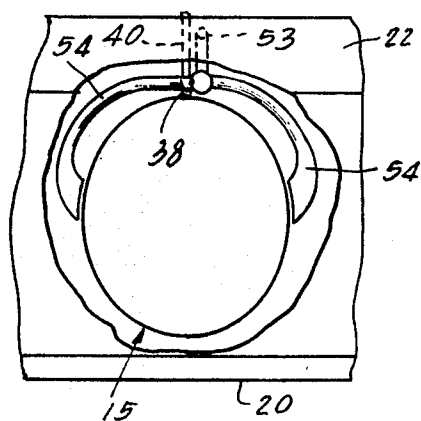


Fig. 4

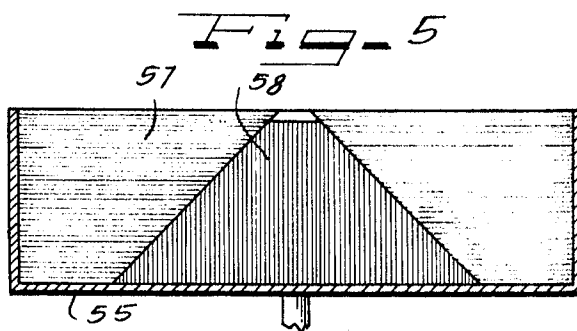


Fig. 5

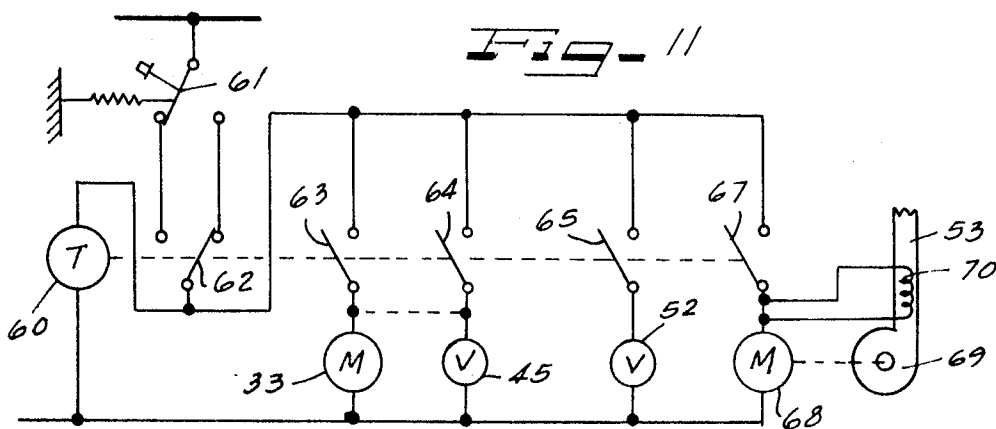
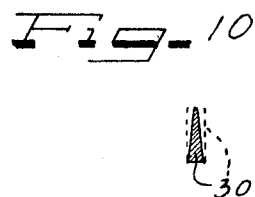
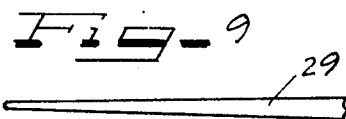
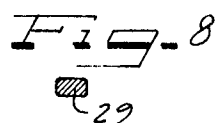
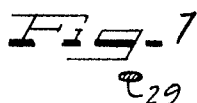
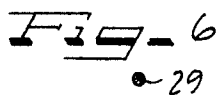


Fig. 11

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APPARATUS FOR PEDICURE

This invention relates to the art of pedicure, and more particularly concerns new and improved apparatus and method for foot treatment through a washing and drying cycle.

Heretofore there has not been provided apparatus which will enable convenient pedicure, and in particular washing and drying of the feet in an automatic cycle.

According to the present invention, there is provided a rotary foot treatment brush within an open topped compartment having therein means for supplying water and also desirably medicament, the brush being equipped with a pan or tub for at least partial immersion of the foot while undergoing brushing treatment. Drying air is introduced into the compartment to effect drying of the foot or feet after liquid treatment is terminated.

An important object of the present invention is to provide a novel pedicure apparatus and method.

Another object of the invention is to provide a novel pedicure apparatus operable through an automatic treatment cycle.

A further object of the invention is to provide novel pedicure apparatus for brushing and liquid treatment of the feet.

Still another object of the invention is to provide novel pedicure apparatus operative through an automatic brushing, liquid treatment and drying cycle.

A yet further object of the invention is to provide a new and improved rotary foot treatment brush structure.

Other objects, features and advantages of the invention will be readily apparent from the following description of certain preferred embodiments thereof, taken in conjunction with the accompanying drawings, although variations and modifications may be effected without departing from the spirit and scope of the novel concepts of the disclosure, and in which:

FIG. 1 is a top plan view of apparatus according to the invention;

FIG. 2 is an enlarged fragmentary vertical sectional detail view taken substantially along the line II—II of FIG. 1;

FIG. 3 is a fragmentary top plan view of the apparatus disclosing a modification in the liquid delivery means;

FIG. 4 is a fragmentary top plan view of the apparatus showing a modification in the drying air delivery means;

FIG. 5 is a vertical sectional view through a modified brush structure;

FIGS. 6, 7 and 8 show various brush bristle sections;

FIG. 9 is a side elevational view of a brush bristle;

FIG. 10 is a transverse sectional view of a lamella or fin employed in the brush; and

FIG. 11 is a schematic view of a cyclical automatic control means for the apparatus.

Referring to FIGS. 1 and 2, a foot treatment brush 15 is mounted within an open topped treating chamber 17 which is desirably separated by a bottom tray 18 from a lower apparatus compartment 19 within a housing 20. Preferably, the tray 18 is removably mounted within the housing as by means of supporting brackets 21. On top of the housing 20 a preferably removable cover 22 is provided with an opening 23, defined by a down-turned inwardly sloping rim 24, aligned with the brush 15 to receive one foot or both feet for treatment within the chamber 17. Preferably, one or both sides of the cover 22 may have a foot rest extension leaf platform 25 which is especially useful for consecutive treatment of each foot. Any suitable means may be employed for removably securing the cover 22 in place. The tray 18, housing 20 and cover 22 may be made from any suitable material such as metal, preferably stainless or rustproof steel, ceramics, glass, or a suitable plastic material such as macromolecular organic compounds of which Bakelite is representative, amino plastics of which polystyrene and commercially available products known as Polloplas, Trolitul and Styroflex are representative, polyesters of which Plexiglas and Perspex are representative, polyvinylchloride of which Vonylit, and Igelit are representative, polyvinylidenechloride, hard rubber, and the like.

Although the brush 15 may be of any of various shapes and contours, in a desirable construction it comprises a tub, pan or basin 27 having a preferably flat bottom wall of substantial diameter, e.g., 290 to 320 mm. In one desirable construction, the basin 27 has an annular wall 28 extending upwardly from the bottom wall on a concave, convex vertical cross section terminating in an in-turned lip 28a. An especially advantageous shape for the wall 28 is a semicircle having a diameter of from 50 to 70 mm. The inside dimensions of the brush basin 27 are such as to enable the reception of one or both feet with ample room to move about therein during treatment.

Within the brush basin 27 is provided an arrangement of flexible elements comprising bristles 29 and/or lamellas or fins 30. These flexible elements may be made from any suitable material having the desired strength, resilient flexibility, smoothness and moisture and chemical resistance adequate for the purpose, and among which may be mentioned caoutchouc, chlorocaoutchouc, polyacrylnitrile and polymethacrylnitrile such as Pan Fiber, Dynel, Orlon and Acrilan, polyamides such as nylon and Grilon, polybutadiene such as Buna, polyethylene such as Alkathen, Alathon, Lupolen and Polythen, halogenated polyethylene such as Teflon and Fluon, polyisobutylene such as Oppanol and Vistanex, polyurethanes such as Perlon, polyvinylchloride such as Vonylit, Igelit, Pe-Ce-Fiber, PVC and Vinifol, and the like. The surface texture should be as even as possible and the coloring is preferably a white tint, desirably matching the similar tint of the casing or housing.

Within the brush basin 27, attachment of the flexible elements may be effected in any suitable manner, either directly to the basin or by means of a suitable carrier engaged within the basin. If preferred, all bristles may be used in the brush. On the other hand, all fins may be used in the brush. In a preferred arrangement, the bristles 29 are mounted on the curved sidewall 28 while the fins 30 are mounted on the flat bottom 27. Whereas the bristles 29 may be of generally cylindrical cross section (FIG. 6), they may also be of any other preferred cross-sectional shape such as oval (FIG. 7), generally quadrilateral (FIG. 8). While the bristles 29 may be of uniform diameter throughout their length, they may and preferably are of a tapered length wider at their base toward thinner tips. By having the bristles extend inwardly generally on the radius of the inner surface of the wall 28, and of varying length suitable for their location, a desirable pattern of the bristles for highest efficiency is attained. In diameter the bristles 29 may be of from 0.1 to 4 mm. and in length from 40 to 100 mm. on the sidewall, and if bristles are also used on the bottom wall they may be from 5 to 30 mm., where the diameter of the brush is from 290 to 320 mm.

In respect to the fins 30, they may be of desirable length ranging up to about 150 mm. where they are mounted to extend radially from the center to the perimeter of the bottom wall of the basin 27, to shorter lengths filling in between the convergently related fins. In height the fins 30 may range from 4 to 12 mm. The fins may be of upwardly tapered form (FIG. 10), or rectangular cross section as shown in dash outline in FIG. 10.

Within the treating chamber 17, the brush 15 is preferably disposed on a convenient oblique or slanting angle sloping downwardly forwardly at for example 20° to 45° so that a person sitting in front of the housing or cabinet 20 may conveniently insert one or both feet into the brush. The bottom of the pan 18 is disposed in a corresponding slanting plane. Desirably the portion of the cover 22 having the opening 23 therein is disposed in about the slanting plane although it may be at a somewhat greater angle such as about 60° inclination. This inclination will depend on the construction of the apparatus, especially on the height of the opening 23 above the floor and also on the height of the seating facilities desirably employed in association with the apparatus. A desirable height for the cabinet 20 is about 250 to 360 mm., depending upon the height of the associated seat.

Rotary mounting of the brush 15 is by means of an axle shaft 31 extending on an axis normal to the plane of the bottom wall of the pan 18 through a packing 32, suitably attached to the center of the bottom wall of the brush pan 27 and by which the brush is adapted to be rotated at a suitable speed such as from 5 to 15 turns per minute. Power for driving the brush may be derived from a suitable motor 33 (FIG. 11) drivingly connected to the shaft 31 within the housing 20. For safety purposes, the shaft 31 is preferably provided with a slip clutch 34 between the brush and the motor. To stabilize the brush and avoid distorting stresses on the shaft 31 or the packing 32, antifriction bearing means are provided under the perimeter of the bottom wall of the basin 27 such as at least three circumferentially spaced ball bearings 35 mounted in suitable sockets such as may be provided by a sole ring 37 on the pan bottom concentrically about the shaft axis.

In the use of the apparatus, it is desirable to have the brush basin 27 at least partially filled with a washing solution such as water or water with any desirable medicament. For supplying water a sprinkler or shower head 38 is desirably mounted adjacent to the uppermost edge of the brush rim 28 under the cover 22 in such manner that the water jets are directed into the brush opening defined by the lip 28a and in as spreading a manner as practicable, directed to the inside of the sidewall 28 and in part into the inner and central portion of the basin brush. Instead of a shower head 38, an encircling sprinkler tube 39 may be provided (FIG. 3) having jet or sprinkler holes at uniform intervals in its inner perimeter directed into the opening into the brush basin. The sprinkler head is mounted on a water supply pipe 40 projecting inwardly from the upper portion of the rear wall of the cabinet 20 and connected by a suitable conduit 41 to a water supply which may comprise hot water delivered through a branch 42 and cold water delivered through a branch 43 and connected with the conduit 41 through a mixing valve 44 by which the hot and cold water can be suitably mixed and the water pressure adjusted to suit preferences. In addition, the conduit 41 has a control valve 45 by which the water can be turned on for any preferred cycle of operation. For drainage, the brush basin 27 is provided with suitable drain holes 47 in the sidewall 28 and the adjacent portion of the bottom wall of the basin 27 and preferably radially outwardly from the bearings 35. Water that may get onto the bottom of the pan 18 within the ring 37 may drain off through one or more drain holes 48 therethrough at the lowest point. A drip ring 49 may be located concentrically on the underside of the bottom of the basin 27. Drainage from the pan 18 is through a drain pipe 50 communicating with the lowest point of the pan.

The water supply is advantageously connected to a dosing device or medicament supply which may be connected to the pipe 40 through a conduit 51 which may join the conduit 41 and is under the control of a valve 52. The medicament supply may be connected to supply medicament into the water when the water flow is started and may comprise any one or more of surface-active cleaning agents or lubricating agents, for example, sodium carboxymethylcellulose which will diminish friction of the flexible elements of the brush on the foot skin surface; complexing agents such as sodium tripolyphosphate, sodium hexamethaphosphate, tetrasodium ethylenediaminetetracetate and trisodium nitrilotriacetate which will avoid or dissolve scale formation in the treating chamber and on the brush; disinfectants such as chlorinated phenols, chlorinated isocyanuric acid, quaternary long chain alkyl ammonium salts which are efficient against fungi found on the feet, deodorants, and the like. If preferred, of course, the medicament dosing device may be mounted above the brush such as by placing it on or in the rim surrounding the chamber opening, but the direct infusion into the water supply pipe is convenient and easy of accomplishment.

After medication and possibly rinsing in the treatment cycle, drying of the foot or feet is desirably accomplished by blowing heated air into the treating chamber 17. This may be accomplished by directing the heated air through a feed pipe

53 which may have a diameter of for example 30 to 50 mm. and has its outlet just below the top 22 in the highest portion of the treating chamber 17 such as about 5 to 20 mm. below the top of the chamber such that the down-turned and inwardly oblique rim 24 will advantageously direct the drying air toward the inside of the brush 15 and the foot or feet therein. The drying operation occurs after the water supply has been turned off and the water in the brush has drained away. It will be observed that the heated air outlet is above the water nozzle 38 and is behind the same so that it will be protected against receiving water therinto. Further, the hot air outlet is above the highest point that the water may reach in the cabinet 17 should the drain pipe 50 for any reason become stopped up, in which case the water would run out of the lower portion of the access opening 23 before reaching a height which would endanger the heated air outlet. If instead of the slanted disposition of the brush and access opening, a horizontal disposition is preferred, then safety overflow openings would be provided below the level of the air supply outlet. If preferred, the air supply pipe 53 may be provided with relatively adjustable branch nozzle tubes 54 (FIG. 4) which have their discharge ends directed inwardly and are adjustable to swing toward or away from the central portion of the brush 15 as desired.

Instead of the particular curved rim pan 27 for the body of the brush 15, one or several brushes may be provided having cylindrical, conic, truncated cone, barrel shape or bobbin shape. In any event the brush body may be made from suitable synthetic plastic material. For example, in one geometric form of the brush a generally cylindrical pan body 55 (FIG. 5) may be provided in which flexible elements 57 and 58, either bristles or lamella-fins, may be disposed in generally conic arrangement, substantially as shown having radially and axially extending cooperating groups of the flexible elements.

In the use of the apparatus, it is mounted on the floor or in a suitable alcove in a wall or merely up against a wall on the floor. Placing of the apparatus on or near a wall is advantageous in that operating handle or switch means for activating the apparatus may conveniently be mounted on the wall in an accessible position. One or both feet may be placed in the brush before or during rotation of the brush and due to the relatively slow rate of rotation and the softness of the flexible elements this may be accomplished with comfort. Although the slip clutch 34 will resist ordinary and safe pressures against the brush to maintain the shaft coupled with the motor, any unusual resistance will cause the clutch to release yieldably and thus avoid any danger of spraining or bruising the ankles or toe joints.

Means are preferably provided for automatically programming a treatment cycle. For this purpose, a program switching device or timer 60 (FIG. 11) is adapted to be activated by closing a two-way manual switch 61 to complete a timer-energizing circuit through a timer contact 62 which then throws the contact 62 to a holding circuit through the normal position of the switch 61 and closes a contact 63 to energize the brush driving motor 33. At the same time or in any suitable sequential time interval, a solenoid for opening the water supply valve 45 may be energized. This may be effected through closing of a timer contact 64, or may be effected simultaneously with closing of the contact 63 for the motor circuit, as indicated by the dash line connection between that circuit and the valve circuit. With opening of the water valve 45, the medicament valve 52 may be opened by energizing of a control solenoid by closing of timer contact 65. After a suitable time interval, the contact 65 may automatically open and a rinsing continue by holding of the water valve 45 open. Then in the continuation of the cycle, the water valve 45 is closed and at the same time, if desired, the motor 33 may be stopped, although the motor may continue to run for a suitable time interval after the water valve has been closed. After the water valve 45 has closed, a timer contact 67 closes a circuit to energize a fan motor 68 to operate a blower fan 69 discharging into the drying air pipe 53. Upon energizing the motor, or in timed

relation prior to starting of the motor 68, a heating element 70 suitably located to heat the air in or supplied to the drying air pipe 53 is energized. After a suitable drying interval, the contact 67 is opened by the timer 60 to discontinue the drying air supply and the contact 62 switches to the starting position to deactivate the timer. Thereafter an automatic treating cycle can again be started by momentarily pressing the actuating button for the manual switch 61. All of the motors, the blower, and the electrical mechanism may be housed within the compartment 19 of the cabinet or housing 20.

I claim as my invention:

1. Apparatus for pedicure, in particular for washing and drying of the feet, comprising:

a generally upwardly opening rotatably mounted basin having flexible brush elements corotatably fastened therein, and adapted to receive therein at least one foot to be acted upon by said brush elements;

means for rotatably driving said basin to move said brush elements in contact with a foot therein;

means for supplying water into said basin;

means for receiving and drawing waste water from said basin; and

said water supplying means, said basin, and said means for receiving and draining waste water being related to one another to maintain the brush elements at least partially immersed while the water is supplied into the chamber.

2. Apparatus according to claim 1, said basin having a bottom wall and an annular sidewall, said flexible elements comprising bristles mounted on said sidewall and fins mounted in radial relation on said bottom wall.

3. Apparatus according to claim 1, said brush elements being disposed in generally conic arrangement including radially and axially extending cooperating groups of the flexible elements.

4. Apparatus according to claim 1, including means for supplying medicament to the wash water,

5. Apparatus according to claim 1, including drain holes through said basin for controlled release of wash water.

6. Apparatus according to claim 5, in which said drain holes are located in an area of the basin substantially spaced from a central area thereof, said means for rotatably driving said basin comprising a shaft located axially relative to the underside of the basin, a drip ring located concentrically on the underside of the basin, a sole ring under said basin between said drip ring and said holes concentric relative to the shaft axis, and antifriction bearing means carried by the sole ring and providing support for the basin.

7. Apparatus according to claim 1, comprising means providing a treatment chamber in which said basin is mounted and having a cover over the chamber with a foot clearance opening therethrough aligned with the upwardly opening basin, said chamber having a bottom inclined with respect to the horizontal in a rear-to-front direction to facilitate use of the basin, and said means for receiving and draining waste water being located at the low point of said bottom.

8. Apparatus according to claim 7, including means for introducing drying air into said chamber after the water supply has been interrupted and comprising a pipe discharging into said chamber under said cover beyond the highest point of said opening, and said cover having an annular rim turned generally downwardly and toward the opening in the basin and adapted to deflect the air toward the basin opening.

9. Apparatus according to claim 8, said pipe having swingably movable nozzles on branches therefrom directed generally toward said basin opening.

10. Apparatus according to claim 7, including footrest platform means along at least one side of said cover and extending laterally beyond said chamber-providing means.

11. Apparatus according to claim 7, said bottom comprising a pan, said chamber being provided by a housing for which said cover provides top with said opening therein into said chamber, means removably supporting said pan in said housing under said basin and with a compartment under said pan, said driving means comprising an axle shaft journaled through said pan and drivingly connected with said basin, means in said compartment for driving said shaft, said shaft having a slip clutch for safety release of the basin.

12. Apparatus for pedicure, in particular for washing and drying of the feet, comprising:

an open treatment chamber;

a rotary brush in said chamber and adapted to be engaged by at least one foot introduced into said chamber;

means for driving said brush;

means for supplying water into said chamber;

means for draining water from said chamber;

said water supply means, said brush, and said outlet being related to one another to maintain the brush at least partially immersed while the water is supplied into the chamber; and

means introducing drying air into the chamber after the water supply has been interrupted, comprising an air supply pipe having swingably movable nozzles on branches therefrom directed generally toward the treatment area of the brush.

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