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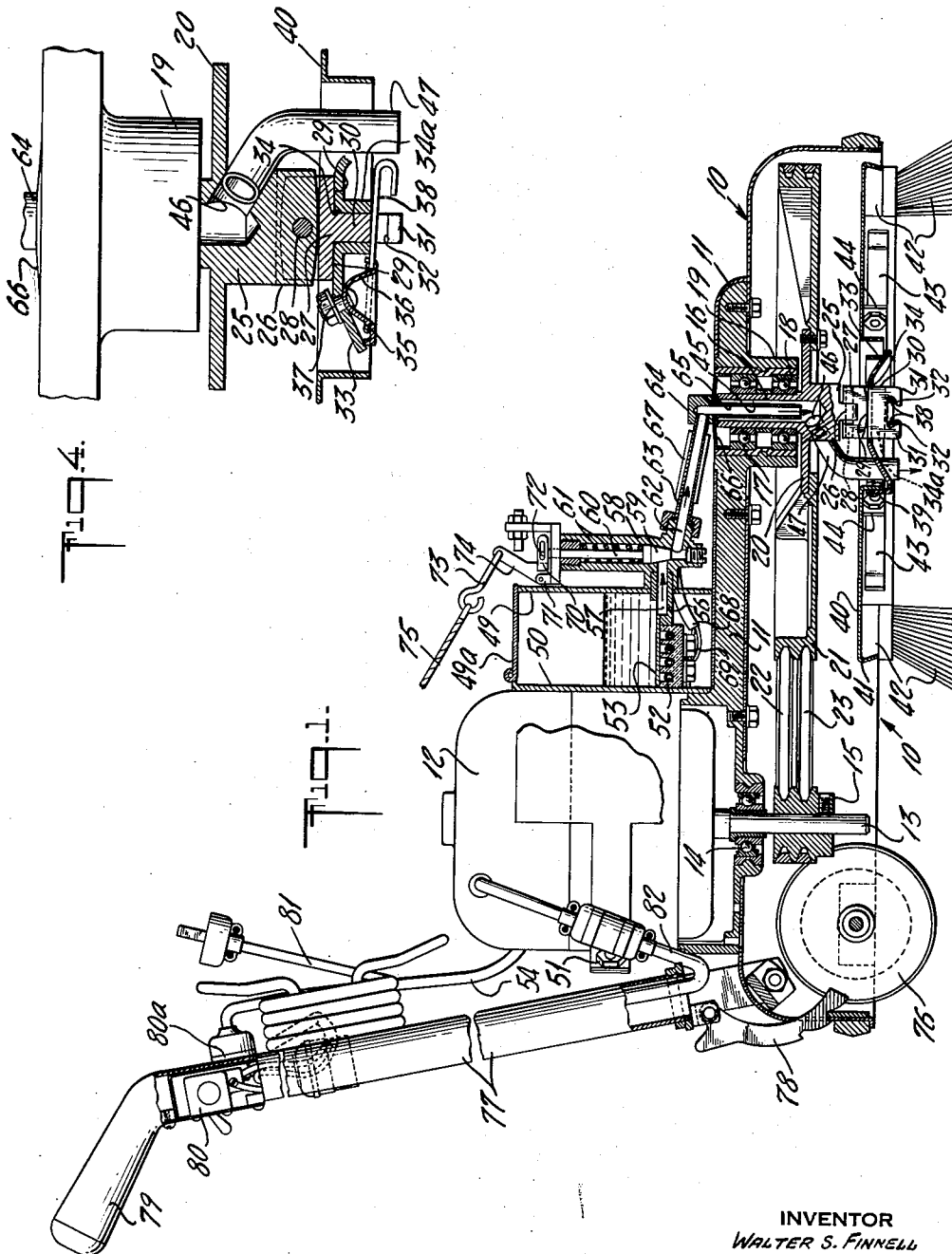
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2,600,233

FLOOR PROCESSING APPARATUS

Filed March 12, 1949

3 Sheets-Sheet 1



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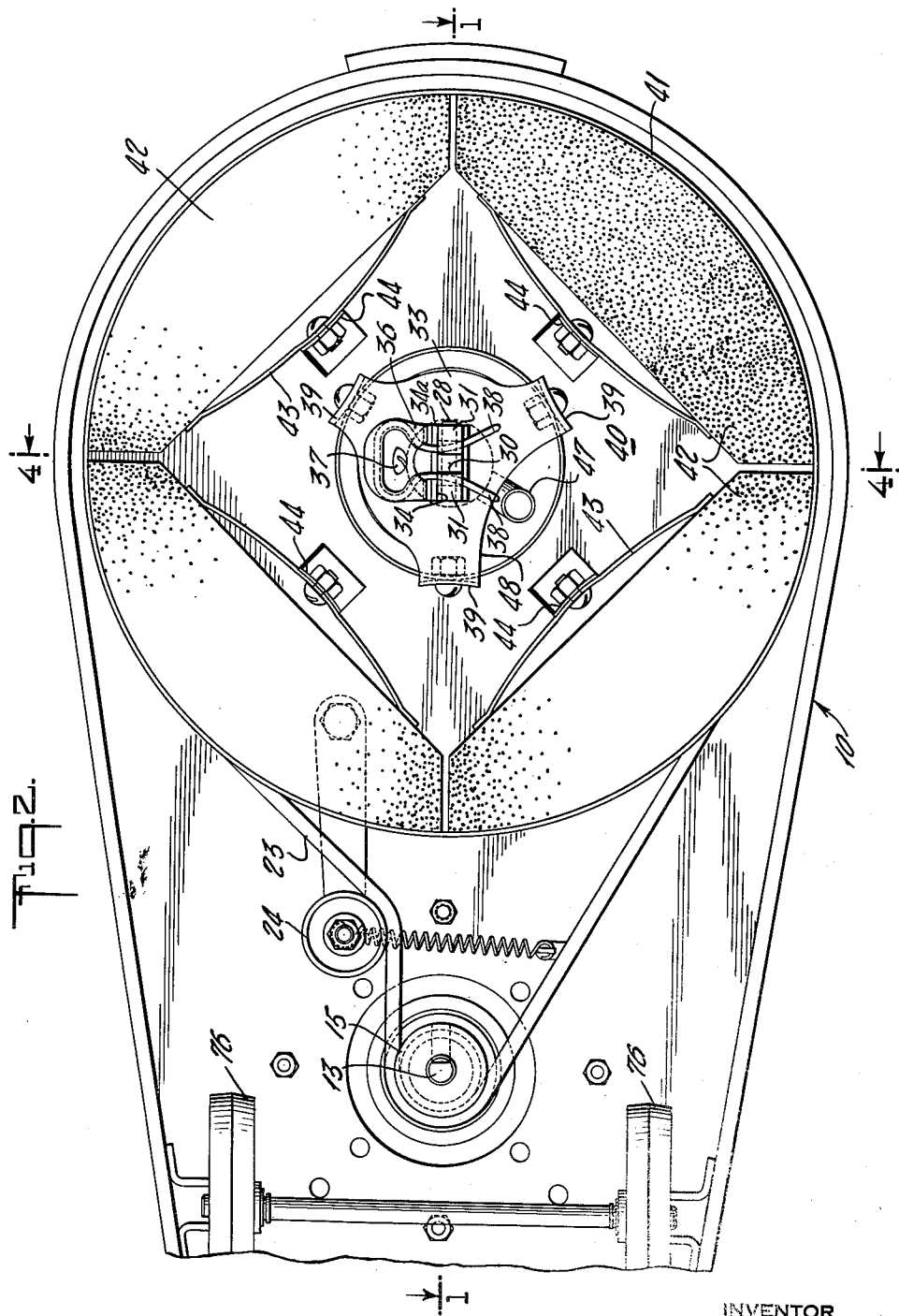
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3 Sheets-Sheet 2



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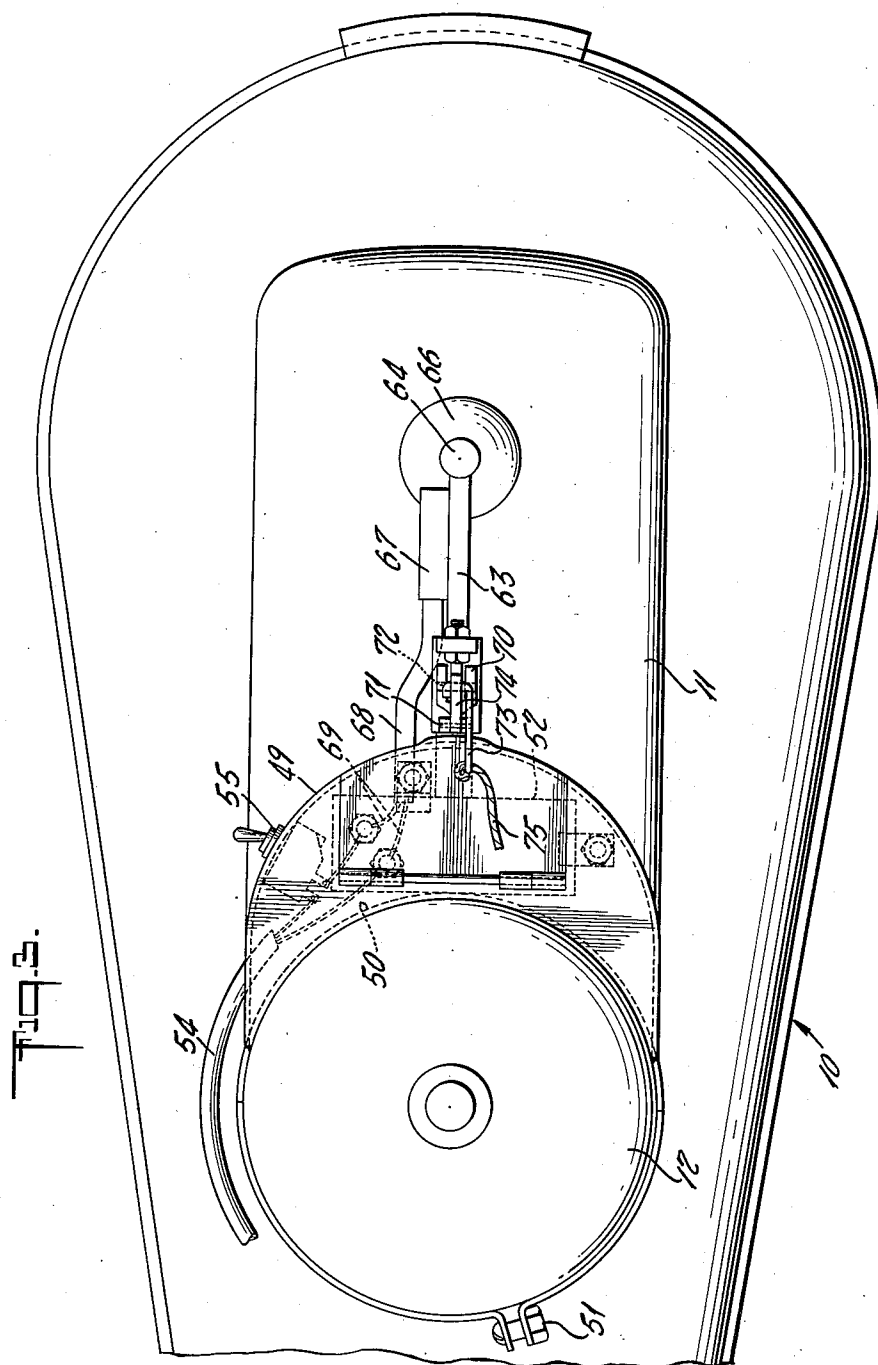
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FLOOR PROCESSING APPARATUS

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Application March 12, 1949, Serial No. 81,035

4 Claims. (Cl. 15—50)

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The present invention pertains to improvements in floor-processing apparatus.

In my co-pending application Serial No. 783,185, filed October 30, 1947, now Patent No. 2,541,812, of which the present application is a continuation in part, is described and claimed a floor processing machine having a motor-driven hollow shaft and means to feed water, melted wax or other processing fluid through the shaft to the center of the rotary brush member.

An object of the present invention is to provide a floor-processing machine in which the processing fluid, instead of being fed directly to the center of the brush member, is distributed rotarily around the center but within the circle of the brushing surfaces.

Another object is to provide a machine of the above type including improved universal joint mounting and driving means for the brush member, together with means to direct the processing fluid around and clear of the mounting means.

Another object is to provide improved wax heating means adapted to utilize the heat of the driving motor to keep the wax in a fluid state.

Other objects and advantages of the invention will become evident during the course of the following description in connection with the accompanying drawings, in which;

Figure 1 is a vertical longitudinal sectional view of a preferred form of the invention;

Figure 2 is a bottom view of the same;

Figure 3 is a plan view showing the motor and wax-heating apparatus; and

Figure 4 is a detail vertical sectional view of the brush-mounting means and related parts.

Referring to Figure 1, the numeral 10 designates a downwardly open casing on the top of which is secured a mounting plate 11. A vertical motor 12, mounted on the rear end of the plate 11, has a downwardly extending shaft 13 provided with a ball-bearing 14 in the plate and carrying a small double-grooved V-pulley 15.

A vertical spindle 16 is journaled in ball-bearings 17 and 18 secured in a boss 19 extending downward from the forward part of the plate 11. The spindle 16 has an integral flange 20 thereon below the bearing 18. A large double-grooved V-pulley 21 is bolted to the flange 20 and is connected to the small pulley 15 by means of V-belts 22 and 23. A spring-pressed idler 24, Figure 2, is provided to take up slack of the belts and to ensure adequate arcs of belt engagement on the small pulley 15.

The lower end of the spindle 16 comprises an enlarged portion 25 having a central cross rib

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or hinge extension 26. A hub 27 is pivotally mounted on the extension 26 by means of a cross pin 28. The hub 27 is formed with two downwardly convex shoulders 29 lying on either side of a central portion 30 of rectangular horizontal section, the long dimension of the rectangle being parallel to the hinge pin 28.

The bottom of the rectangular hub portion 30 is cross grooved to form two hooks 31 having inwardly directed curved recesses 32.

A downwardly dished plate 33 has a rectangular central opening 34 loosely fitting on the hub portion 30, the upper face of the plate 33 being in rocking engagement with the convex hub shoulders 29. Downwardly directed tabs 34a on the two sides of the opening 34 embrace the sides of the rectangular hub portion 30 as shown in Figure 4. A latch spring 35, retained on the plate 33 by a clip 36 and screw 37 has two prongs 38 which engage the curved recesses 32.

Three lugs 39 on the plate 33 have bolted thereto an annular brush ring 40, Figures 1 and 2. The ring 40 has an inwardly inclined circumferential lip 41 adapted to be engaged by the inclined outer surfaces of a plurality of segmental brush members 42. Leaf springs 43, secured to lugs 44 on the ring 40 as shown in Figure 2, clamp the brush members 42 firmly in engagement with the lip 41. It will be noted from Figure 2 that the segmental members 42 have straight inner sides, so that when clamped to the ring 40 as shown, they form a rotary processing assembly having a circular exterior and a polygonal interior shape.

Referring to Figures 1 and 4, it will be seen that the spindle 16 has an interior passage 45 extending from the top thereof to a juncture with an inclined hole 46 leading downwardly and out through the side of the enlarged portion 25. A tubular nozzle 47 is secured in the hole 46, the outer or delivery end of the nozzle being bent downward in registry with an arcuate opening 48 in the dished plate 33, Figure 2.

A wax heating tank 49, Figures 1 and 3, has an arcuate rear wall 50 embracing the front side of the motor 12 in heat-conducting relationship. The tank 49 may be detachably clamped to the motor 12 by means of a bolt 51, Figure 3.

An electric heating unit 52 underlies the bottom 53 of the tank 49, being provided with a current supply cable 54 and a control switch 55. A stud 56, secured to the front and bottom of the tank 49, has a horizontal passage 57 leading into a valve body 58. A tapered valve head 59, provided with a stem 60, is normally seated in

the body by means of a spring 61 to close off the passage 57 from an outlet duct 62.

An inclined outlet tube 63 is secured to the valve body 58 in communication with the outlet passage 62. A small cylindrical elbow fitting 64 connects the tube 63 with a vertical pipe 65 which extends downward within the passage 45 in the spindle 16. A stationary collar 66 supports the pipe 65 concentrically in the passage.

A small auxiliary electric heater 67, disposed against the inclined tube 63, is supported on a metallic tubular member 68, which latter is secured to the lower part of the tank 49 and which serves as a conduit for the wires 69 of the heater 67. The main heater unit 52 and the auxiliary heater 67 are preferably connected in parallel so that both are controllable by the switch 55.

A bell crank yoke 70, pivotally mounted on a bracket 71 on top of the valve body 58, engages a cross pin 72 in the top of the valve stem 60. An eye-link 73 in the upper arm 74 of the bell-crank yoke 70 has attached thereto a cord 75 by means of which the operator is enabled to control the opening and closing of the wax-valve.

The wax tank 49 is equipped with a hinged filler lid 49a.

A pair of wheels 76, journaled under the rear of the casing 10, supports the major portion of the weight of the motor 12. A tubular handle shank 77 is horizontally pivoted to the rear end of the casing 10, and is adapted to be retained in different angular positions by means of an adjustable notched latch 78. An operating handle 79 is secured in the top of the shank 77. A switch 80, located in convenient operating position below the handle 79, is adapted to control the electrical connection between an attachment cable 81 and the motor supply cable 82. The latter cable 82 is led downward within the hollow shank 77. An outlet 80a is located adjacent the switch 80 to provide a convenient separable connection for the wax heater cable 54, the outlet 80a being wired directly to the supply cable 81 to permit heating the wax without running the motor 12.

When it is desired to use the machine for applying hot wax to a floor, the wax is placed in the tank 49 and the switch 55 is turned on to energize the main heating unit 52 and the auxiliary unit 67. The unit 52 heats the wax in the tank 49 to the desired temperature and liquid consistency. At the same time the auxiliary unit 67 pre-heats the outlet tube 63 and connected parts, thus liquifying any residue of wax which may have remained therein from a prior operation and ensuring against any tendency toward chilling of the new wax charge in the delivery system when feed is started.

The wax having been heated as described, the operator closes the switch 80 to start the motor 12. The latter, acting through the pulley 15, the belts 22 and 23, and the pulley 24, revolves the spindle 16 and the attached rotary processing assembly. The operator then pulls the cord 75 to raise the valve 59 from its seat. Liquid wax flows from the tank 49 through the valve passage to the outlet tube 63, thence through the elbow fitting 64, vertical pipe 65 and spindle passage 45 to the nozzle 47. As the nozzle 47 sweeps about the axis of the spindle 16, the liquid is impelled out through the nozzle by a combination of gravity and centrifugal force, and is distributed or sprayed in an even rotary path on the floor within the processing ring.

The operator pushes the machine along the

floor, causing the rotating processing members 42 to engage the deposited wax and apply it to the floor under pressure provided by the weight of the forward portion of the machine. The even rotary spreading effect of the revolving nozzle 47 causes the processing members 42 to receive the wax with a high degree of uniformity resulting in maximum smoothness and efficiency of application. The even working of the wax under the brushing surfaces is assisted by the polygonal interior shape of the rotary brushing assembly which causes the wax to be readily swept under the individual members 42 without any tendency to damming up against the rear of the assembly.

When the machine has been in operation for sufficient time to allow the motor 12 to heat up to its normal operating temperature, the switch 55 may be opened, de-energizing the heating units 52 and 67. Thereafter the portion of the motor heat transmitted through the arcuate rear wall 50 of the tank 49 is normally sufficient to maintain the wax at proper processing temperature, the flow of hot wax through the delivery conduits also keeping the latter hot enough to ensure proper fluidity therein. Thus by utilizing the motor heat to keep the wax heated, consumption of electric current is reduced and the life of the heating units is prolonged.

In order that the rotary processing assembly may bear evenly on the floor when wear of the members 42 or differences in applied working pressure cause changes in the vertical position of the front of the machine, it is essential that the attachment of the brush ring plate 33 be such as to allow angular rocking after the manner of a universal joint. For this purpose the hinge pin 28 permits the hub 27 to rock in one plane, while the resilience of the spring prongs 38 and the curved shape of the recesses 32 permit the plate 33 to rock on the convex hub shoulders 29 in the second plane parallel to the pin 28. It will be seen that this combination of motions provides the required universal joint action. At the same time the structure, while providing positive drive between the rectangular hub portion or extension 30 and the plate 33, also permits easy removal or attachment of the entire brush plate assembly by pressing the spring prongs 38 together.

The angular discharge nozzle 47, in addition to its function of providing even rotary wax deposit as described, also serves to by-pass the wax or other processing fluid around the attaching means for the processing ring, thus keeping the joints and pivots free of fluid.

While the invention has been described in preferred form, it is not limited to exact structures illustrated, as various changes and modifications may be made without departing from the scope of the appended claims.

What is claimed is:

1. In a floor processing machine, in combination, a casing, a vertically mounted motor supported on the rear portion of said casing, a tank secured to said motor in heat-exchange relation therewith, electrical means to pre-heat wax in said tank, a rotary vertical spindle in the forward portion of said casing, said spindle having a downwardly extending central passage therein and an outwardly and downwardly inclined passage in communication with the bottom of said central passage, a hub rockably attached to the lower end of said spindle, a brush ring plate hav-

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ing therein an opening radially spaced from the center thereof, an annular brush ring secured to said plate, resilient means to movably latch said ring plate to said hub and spindle laterally and vertically in universal-joint driving relation, a nozzle secured in said inclined passage and extending vertically downward through said opening clear of said resilient securing means but within said brush ring, a stationary pipe extending downward within said vertical passage, an outlet valve in communication with the bottom of said tank, a conduit connecting said valve with said vertical pipe, and drive means operatively connecting said motor to said spindle.

2. In a floor-processing machine, in combination, a rotary vertical spindle having therein a downwardly extending passage and an outwardly extending passage in communication with the lower end of said first passage, a transverse pin in the lower end of said spindle, a hub pivotally mounted on said pin, said hub having a substantially rectangular downward extension and a pair of downwardly convex shoulders adjacent the long sides of said rectangular extension, the planes of said long sides being parallel to the axis of said pin, a pair of inwardly directed hooks on the bottom of said extension, a centrally apertured brush ring plate movably embracing said rectangular hub extension, said plate having a second aperture spaced radially from the center thereof, spring latching means engaging said hooks and adapted to retain said plate in rock-

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able engagement with said shoulders, and a nozzle secured in said second spindle passage and extending outward and vertically downward through said second aperture, to a point beyond the extent of said hooks.

3. The combination claimed in claim 2 including a pair of wear tabs on said plate in bearing engagement with said long sides of said rectangular extension.

4. The combination claimed in claim 2 including a brush ring attached to said plate, and adapted to engage a floor, means to feed a processing fluid through said first and second passages, and means to rotate said spindle, said nozzle feeding said fluid by gravity and centrifugal force to said floor in a circular path within said ring but clear of said hub, plate, and latching means.

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