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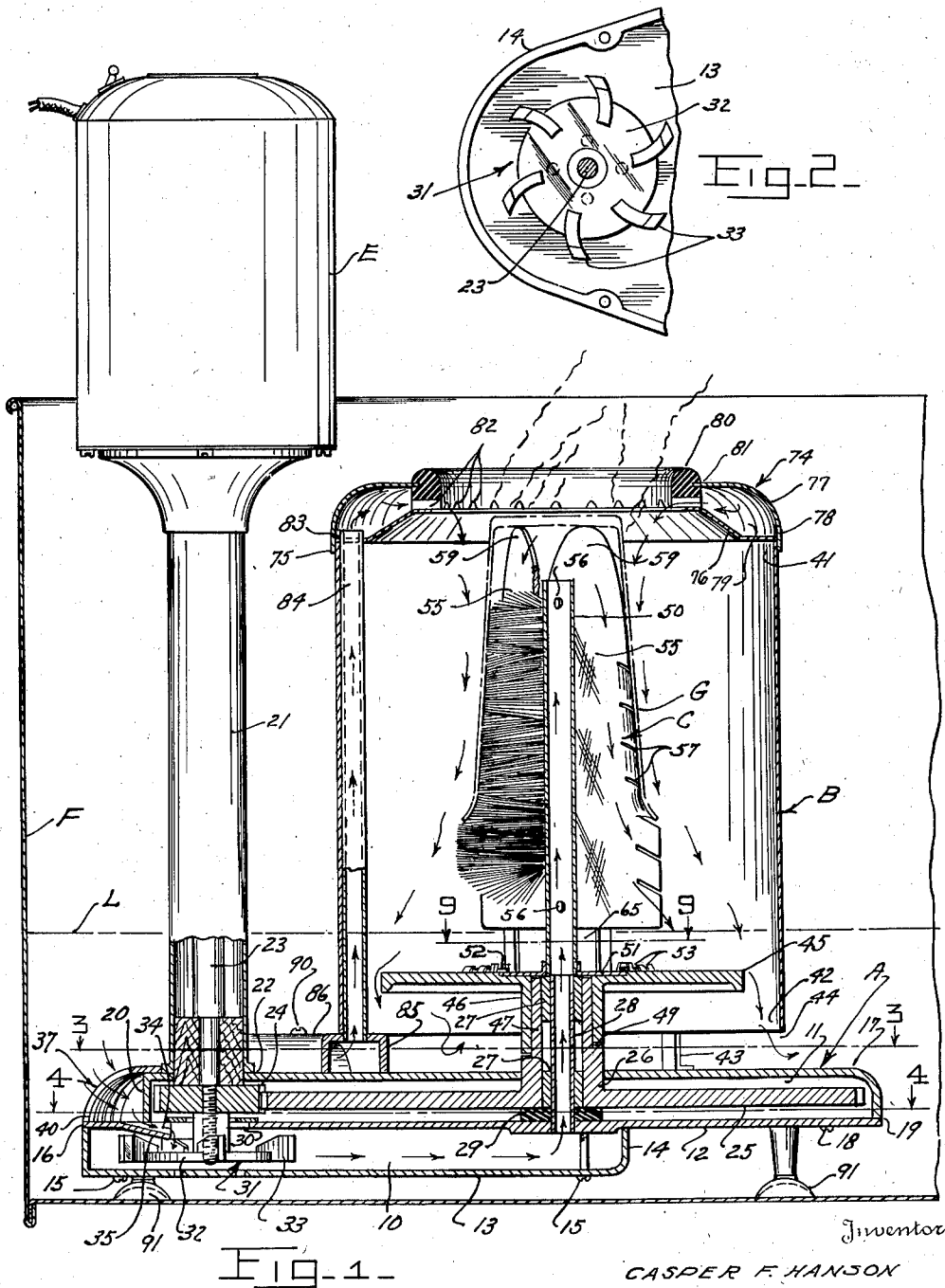
C. F. HANSON

2,263,807

GLASS WASHING MACHINE

Filed May 3, 1939

3 Sheets-Sheet 1



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Fig. 3-

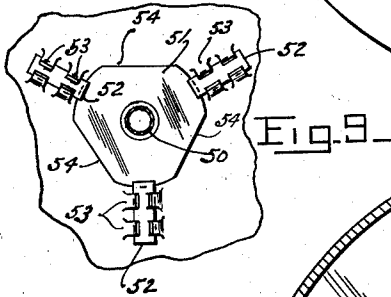
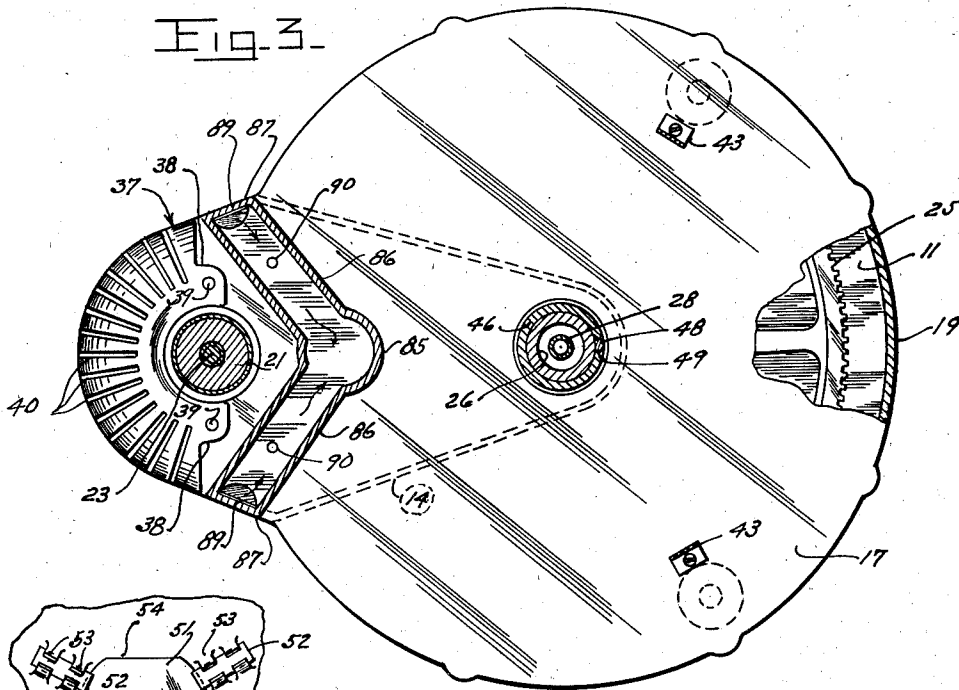


Fig. 3-

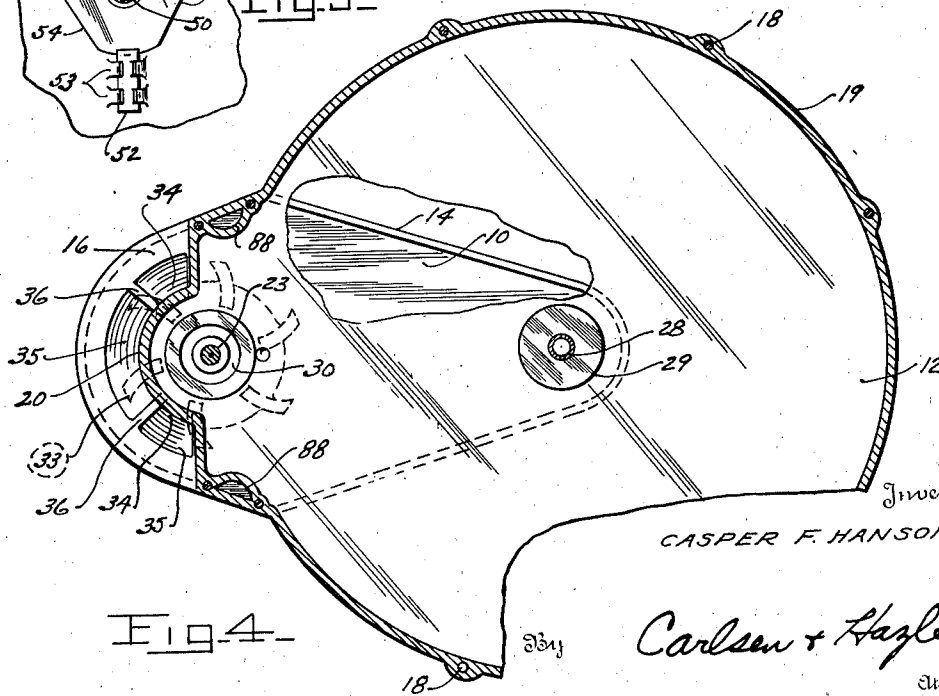


Fig. 4-

Inventor

CASPER F. HANSON

Carlson & Hagle

Attorneys

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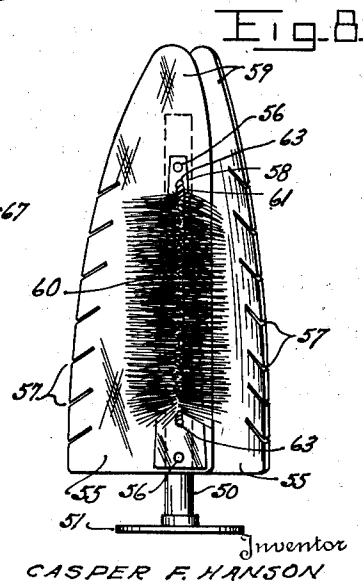
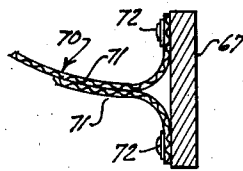
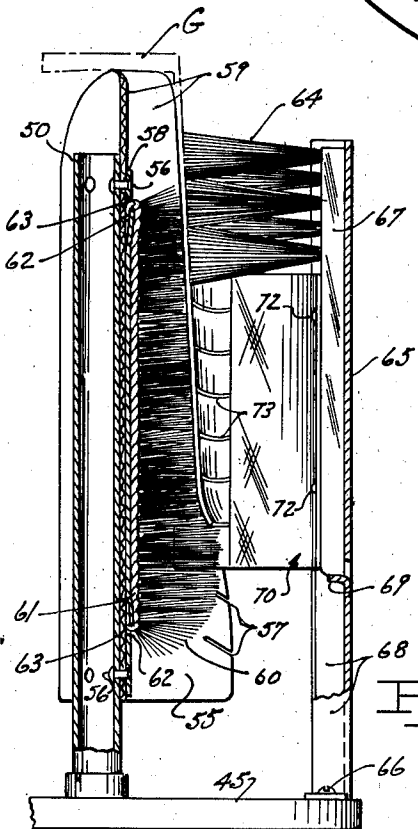
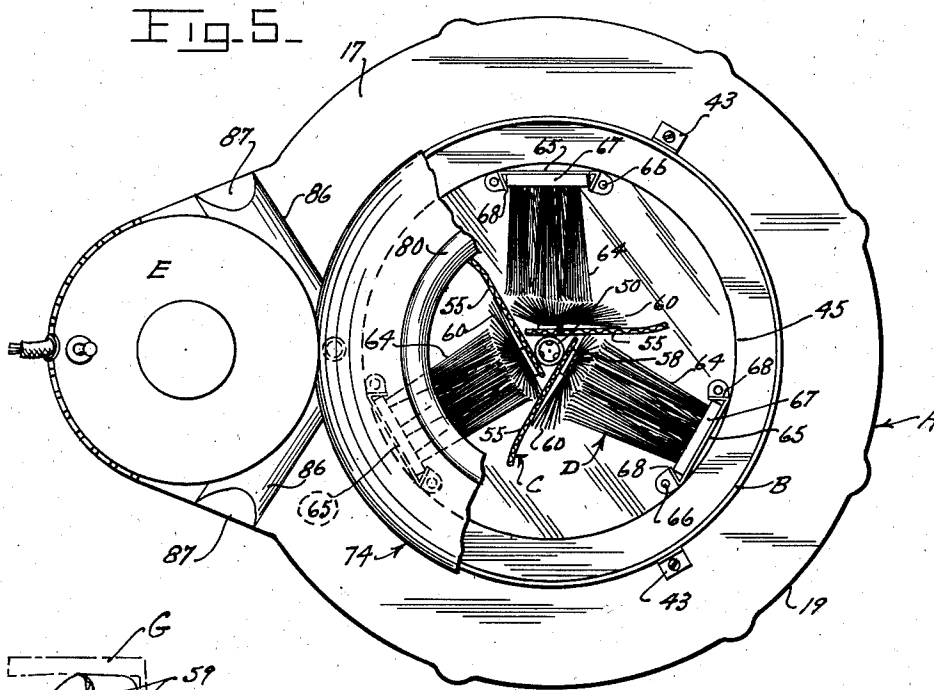
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Inventor
CASPER F. HANSON

By *Carsen & Hazle*

Attorneys

UNITED STATES PATENT OFFICE

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GLASS WASHING MACHINE

Casper F. Hanson, Albert Lea, Minn., assignor to
Olson Manufacturing Company, Albert Lea,
Minn., a corporation of Minnesota

Application May 3, 1939, Serial No. 271,480

17 Claims. (Cl. 15—75)

This invention relates to machines for washing and cleaning glasses, tumblers, and similar small containers.

The primary object of the invention is to provide in a portable, compact, simple, and efficient form, a power actuated machine by the use of which glasses and tumblers of all kinds may be quickly and thoroughly washed and cleaned of all foreign matter and film from both inner and outer surfaces. Another object is to provide a machine of this kind particularly suitable for commercial usage in restaurants, soda fountains, and the like, and which requires no special or additional equipment and space but may be set into any usual washing tub or sink and there used to rapidly clean the glasses as required. A further object is to provide a machine of this kind which will operate in relatively shallow water in the container in which it is seated, and in fact with a water level so low that, when not in use, the brushes or cleaning elements of the machine will stand clear of the water for rapid drying. Still a further object is to provide a machine employing a minimum number of working and wearing parts but which nevertheless embodies water pumping and distributing means effective to circulate and discharge the water over both interior and exterior surfaces of the glasses while simultaneously subjecting those surfaces to rotary scrubbing and brushing action.

These and other more detailed and specific objects will be disclosed in the course of the following specification, reference being had to the accompanying drawings, in which—

Fig. 1 is a vertical cross sectional view through my improved machine, showing a portion of a container for its reception, and showing in broken lines a glass in the process of being cleaned; the outer brush elements being removed.

Fig. 2 is a fragmentary plan view of the lower housing member showing the pumping element or impeller.

Fig. 3 is a horizontal sectional view along the line 3—3 in Fig. 1.

Fig. 4 is a similar view taken along the line 4—4 in Fig. 1.

Fig. 5 is a top plan view, with a portion of the upper water distributing member broken away to better disclose the construction of the cleaning element.

Fig. 6 is an enlarged fragmentary vertical section through one central and lateral portion of the glass cleaning device, showing a glass in cleaning position, this view also showing a modified form of outer cleaning brush.

Fig. 7 is a horizontal cross sectional view through the lower portion of the outside brush shown in Fig. 6.

Fig. 8 is a side elevation of the inner cleaning device alone and on the same scale as the showing in Fig. 1.

Fig. 9 is a fragmentary, horizontal section along the line 9—9 in Fig. 1.

Referring now more particularly and by reference characters to the drawings, my invention comprises a base unit or base housing A, a cleaning cylinder or casing B containing the inner cleaning unit C and outer cleaning units D, and the motor E for actuating said cleaning units and other parts.

The base unit A includes a lower pump chamber 10 and upper gear chamber 11 and includes a flat base plate 12 as its main supporting element. Below this plate 12 the chamber 10 is defined and enclosed by a pump housing 13 of elongated, substantially ovate shape as shown, and which is secured with its marginal upwardly turned walls 14 in upward abutting relationship with the underside of the base plate, by means of screws 15. The base plate is generally circular in shape, viewed from the top, but at one side has a rounded extension 16. Said pump housing 13 fits beneath this extension 16 and runs radially inward therefrom to terminate beneath, and enclose upwardly, the central portion of the plate, as clearly shown in the drawings.

A gear housing 17 similar in shape to the base plate 12 is secured by screws 18 to the upper side thereof with its marginal walls 19 in contact with the marginal portions of the plate. This is true except over the extension 16 of the base plate where a part thereof is left clear by the shortened and rounded extension wall 20 of the gear housing.

The motor E is supported atop a vertical, tubular standard or column 21 which is rigidly secured at its lower end at 22 to the gear housing 17 or formed integrally therewith at a point at which the enclosed drive shaft 23 from the motor will depend into and through the gear chamber 11 centrally with respect to the extended side of the housing A formed as described. A drive pinion 24 is screwed or otherwise fastened on this drive shaft within the extended wall 20 of the gear housing 17 and meshes with a large cleaning unit drive gear 25 which has its hub 26 journaled by bearings 27 upon a tubular shaft 28. Said shaft 28 is secured rigidly in an upright position to the center of the base plate 12 and opens downwardly therethrough into the pump chamber 10 as clearly shown. A bearing

washer 29 supports the gear in alignment with the drive pinion.

The drive shaft 23 depends further below the drive pinion 24 through a large opening 30 in the base plate 12 and downwardly into the pump chamber 10. A pump rotor or impeller 31 is secured to this lower end of the drive shaft within the outer end portion of the pump chamber 10 and, as shown best in Fig. 2, this rotor comprises a hubbed disk 32 provided with angularly turned and arcuately formed fins or blades 33. The base plate 12 has water intake openings 34 formed around the outer portion of the shaft opening 30 so as to be exposed when the gear housing wall 20 covers this shaft opening, and water may thus enter and flow downwardly to the center of the pump rotor 31 for discharge radially therefrom by the rotary action of the pump. The intake openings 34 are defined by downwardly and inwardly pressed and inclined portions 35 of the plate 12 to guide the water to the center of the pump rotor, and which portions are supported by radial, tapered fins 36 as shown. A removable strainer or grill 37 is provided and has apertured ears 38 for detachable connection with studs 39 on the gear housing 17. This strainer encloses that area of the base plate 12 left free by the gear housing 17, and which area of course is provided with the intake openings 34, and narrow slots or notches 40 in the strainer permit the inlet of water to the pump while straining out at least the larger particles of foreign matter which may be in the water.

The housing or casing B is cylindrical in form open at both upper and lower ends 41 and 42 and is supported upon legs 43 on the gear housing in a position concentric or coaxial with the drive gear 25. These legs 43 space the lower end of the housing from the top of the base A as indicated at 44. Extended upwardly in the center of this housing B are the glass cleaning elements C and D. A base disk or carrier member 45 forms the main support for these cleaning devices and it is provided centrally with a depended tubular collar 46 which fits nicely down over the upwardly extended and diametrically reduced neck 47 of the drive gear hub 26. A key 48 formed on this hub engages a notch 49 in the collar 46 and forms a driving connection such that the gear 25 will rotate and support the disk 45 while the disk may at any time be removed simply by lifting it clear of the hub. The parts are so arranged that this disk 45 will operate in a horizontal plane adjacent the lower end of the housing B, as seen in Fig. 1.

The center brush or cleaning element C comprises a tubular body or spindle 50 provided at its lower end with a diametrically extended flat base flange 51 adapted to seat flatly on the upper center portion of the disk 45 so that the bore through the spindle will register and communicate with the bore through the shaft 28. To releasably retain the spindle in this position, I provide locking members or latches 52 which are secured to the upper surface of the disk 45 by means of lugs 53 cast thereon, or by other suitable means; and these latches are arranged to radially engage and overlie the margins of the base flange 51. This flange, intermediate the latches 52, is cut off straightly as indicated at 54 so that by turning the spindle a part of one revolution, these straight portions will move toward and clear the latches and permit the entire center brush assembly to be removed.

Mounted on the spindle 50 as thus formed are three scrubbing elements or fins 55 of rubberized fabric or other suitable material, and which extend vertically and are secured tangentially to the sides of the spindle by means of rivets 56. The outer edges and upper ends of the fins 55 are thus left free to flex and bend as may be necessary in the operation of the device, and to increase the flexibility of these edges they are provided with slits at intervals, as shown at 57. The inner edge portions of the cleaning elements 55 are held rigid by upwardly tapering mounting plates 58 anchored at their ends by the said rivets 56. The cleaning elements are mounted adjacent their inner edges and also taper in width upwardly toward the rounded upper ends 59, and these ends extend, as shown, some distance above the upper end of the spindle 50.

Inner cleaning brushes 60 are secured to the outer surfaces of the scrubbing elements 55 and have their bristle tufts anchored in a twisted wire member 61 having its upper and lower ends 62 turned through openings 63 in the mounting plates 58, and clamped thereunder as shown. The bristles thus radiate from the mounted portions of the scrubbing elements and are disposed between the flexible outer edges thereof.

The outer cleaning device D comprises three brushes 64 which are supported in the channelled brush holders 65 so that the bristle tufts extend inwardly into commingling engagement with the brushes 60 and to a point inwardly of and between the outer flexible edges of the scrubbing elements 55. The brush holders are secured in upright positions at 66 to the disk 45 near the margins thereof and the brush backs 67 are slidably mounted within the inwardly turned vertical margins 68 of the brush holders and drop downwardly therein until they come to rest upon stop lugs 69 turned inwardly from the brush holders as best shown in Fig. 6. The brushes are thus readily removable and replaceable as will be evident.

The outer brushes 64 may have bristle tufts from top to bottom or, as shown in Figs. 6 and 7, they may have a series of bristles at their upper ends and then the lower inwardly turned scrubbing elements or fins 70, similar in material and use to the aforesaid scrubbing elements 55. These fins 70 comprise separate pieces or strips 71 secured at one margin by rivets 72 to the brush backs 67 and extended inwardly therefrom in mutually engaging and supporting relation. One strip extends beyond the other and is provided with slits 73 to lend added flexibility to the edge which engages the glass or article to be cleaned.

The upper end 41 of the casing B is fitted with a removable annular and hollow cap member or cap ring 74 provided with a marginal downwardly turned flange 75 for frictionally engaging the casing. This cap member comprises inner and outer shells 76 and 77 which are joined or welded together at 78 with a liquid tight fit and together define an annular water chamber 79. A soft rubber guard ring 80 is seated by its exterior groove 81 over the inner margin of the outer shell and rests downwardly upon the further extended inner margin of the inner shell, this lower surface of the guard ring being provided with a series of spaced notches 82 which constitute water discharge openings.

The outer marginal portion of the inner cap shell 76 has an opening 83 adapted to fit over and receive the upper end of a water tube or

duct member 84 secured vertically within the wall of the casing B on the side thereof toward the motor E and standard 21. The lower end of the water tube is rigidly affixed to the junction 85 of a pair of V-shaped water circulating duct members or legs 86 which are hollow as shown and with the interior of which the said tube communicates. These legs 86 act also as supporting legs for the side of the casing B and extend in diverging relation out over the gear housing 17 to terminate in outwardly closed ends 87, at each side of the standard 21, where the said ends communicate with passages or ducts 88 formed vertically through the housing 17 and communicating through openings 89 in the base plate 12 with the interior of the pump chamber 10. Screws 90 secure the legs 86 to the gear housing 17.

In operation the machine is seated in a washing tank or sink F and the same is filled with hot water up to the water line L (Fig. 1) which falls at a level just below the cleaning devices C and D. For supporting the machine I provide rubber suction cups 91 on its base portion as shown. The motor E is then connected to an outlet and set in operation causing the pinion 24 to rotate the gear 25 and the connected assembly of the disk 45 and inner and outer cleaning devices C and D. At the same time the pump impeller 31 is rotated and the water taken in from the tank F through the strainer 37 and the intake openings 34 is discharged forcibly by the pump and flows upwardly through the tubular shaft 28 and center spindle 50, as well as upwardly through the openings 89, ducts 88, legs 86, and water tube 84, where it enters the cap ring 74 and is discharged inwardly and radially through the notches 82. This action continues as long as the machine operates, and the water discharged at the top of the machine of course returns to the tank through the space 44 beneath the casing B, causing a continual circulation in the tank.

The glass G to be cleaned is inverted and passed downwardly within the guard ring 80, which protects it from chipping or breaking, and is forced downwardly over the scrubbing members 55 and inwardly of the outer brushes 64. The glass is held against rotation in the manner shown and the rotating brushes and scrubbing elements will thus quite obviously thoroughly clean and scrub the inner and outer surfaces of the glass. Meanwhile hot water is discharged from the upper end of the spindle 50 over the inside of the glass, and from the notches 82 over the outside, so that a continual stream flows over the parts to thoroughly wash away all foreign matter dislodged by the brushes.

The various brushes 60 and 64, as well as the flexible scrubbing elements 55 and 70, all have sufficient flexibility to accommodate themselves to glasses or tumblers of any usual shape and to clean all surfaces thereof. The extended ends 59 of the inner elements 55 are capable of folding and collapsing as necessary to reach all portions of the bottom of the glass. The scrubbing elements are particularly beneficial in completely cleaning the glasses of all film and leave the glasses in sparkling condition. It will be noted that the inner and outer cleaning elements nest or intermesh as viewed from the top, thus assuring that they will effectively engage and clean the glasses.

When the machine is not in use the water drains from the cleaning elements allowing them

to dry and preventing undue deterioration of the material used in their fabrication. The machine is thus seen to require the use of a minimum of water in its operation and effects a further saving thereby.

It is understood that suitable modifications may be made in the structure as disclosed, provided such modifications come within the spirit and scope of the appended claims. Having now therefore fully illustrated and described my invention, what I claim to be new and desire to protect by Letters Patent is:

1. A glass cleaning machine adapted for operation while partially immersed in a cleansing liquid comprising, a base unit, inner and outer glass cleaning devices supported above the base unit and operative for cleaning the inner and outer surfaces of a glass inverted and placed in operative engagement therewith, power actuated means in the base unit for pumping cleansing liquid upwardly for discharge over the inner surface of the glass, a tubular member extended upwardly alongside the glass cleaning devices and connected to said liquid pumping means for carrying a part of the liquid therefrom upwardly, and an annular water discharge member removably connected with the said tubular member and communicating therewith for discharging the liquid inwardly over the outer surface of the glass.

2. A glass cleaning device for operation in a cleansing liquid and comprising a base unit, a casing supported above the base unit, glass cleaning devices arranged in the casing and operative for cleaning inner and outer surfaces of a glass placed in engagement therewith through the upper end of the casing, a liquid pumping means in the base unit, duct means for carrying liquid upwardly from the pumping means, and a removable annular member on the upper end of the casing connected to said duct means and having discharge openings for discharging liquid over the outer surfaces of the glass and over said outer cleaning devices.

3. A glass cleaning device for operation in a cleaning liquid and comprising a base unit, a casing supported above the base unit, glass cleaning devices arranged in the casing and operative for cleaning inner and outer surfaces of a glass placed in engagement therewith through the upper end of the casing, a liquid pumping means in the base unit, duct means for carrying liquid upwardly from the pumping means, and a removable annular member on the upper end of the casing connected to said duct means and having discharge openings for discharging liquid over the outer surfaces of the glass and over said outer cleaning devices, the said annular member having an inner diameter smaller than that of the casing and the said discharge openings being located immediately over glass engaging portions of the said outer cleaning devices.

4. A glass cleaning device for operation in a cleansing liquid and comprising a base unit, a casing supported above the base unit, glass cleaning devices arranged in the casing and operative for cleaning inner and outer surfaces of a glass placed in engagement therewith through the upper end of the casing, liquid pumping means, a duct element extending upwardly along one side of the casing and connected to said pumping means for conducting liquid upwardly therefrom, an annular hollow cap member removably fitted over the upper end

of the casing and communicating with the said duct element, and a resilient guard ring extending around the inner diametrical margin of the cap member and having openings for discharging liquid from the cap member over the glass.

5. A glass cleaning device, comprising a base unit, a casing, legs supporting one side of the casing, glass cleaning devices operatively mounted in the casing, a liquid pump in the base unit, means for conducting liquid discharged from the pump upwardly through the casing said means including a duct member on the casing, and hollow leg members communicating with the pump and duct member and supporting one side of the casing opposite to the said legs.

6. A glass cleaning machine comprising a base unit, a liquid pump in the base unit, the said pump having outlet means opening through the upper side of the base unit, glass cleaning devices supported above the base unit, a hollow conducting member removably mounted above the base unit and in communication with the said pump outlet means, a duct member leading upwardly from the said conducting member for carrying liquid from the pump to the glass cleaning devices, and a casing mounted over the glass cleaning devices and supported in spaced relation to the base unit in part by the said members carrying the liquid from the pump.

7. In a glass cleaning machine, the combination including a base unit, glass cleaning devices supported thereon, the said base unit comprising a base plate and a superimposed housing member arranged to leave a portion of the base plate exposed, liquid inlet openings formed in the exposed area of the base plate, liquid pumping means for supplying liquid to the cleaning devices, the said pumping means being located beneath the base plate and communicating with said inlet openings, and a strainer removably mounted on the housing and enclosing the exposed portion of the base plate.

8. In a glass cleaning machine, a base unit comprising superimposed pump and gear housings, the said pump housing extending outwardly at one side from beneath the gear housing, inlet means in the exposed portion of the pump housing, outlet means communicating with the pump housing, a pump in the housing for drawing in a cleansing liquid through the inlet means and discharging the liquid from the outlet means, glass cleaning devices arranged above the base unit, means in the gear housing for operating the said devices, and means for conducting cleansing liquid from the said outlet means to the cleaning devices.

9. In a glass cleaning machine, a base unit comprising superimposed pump and gear housings, the said pump housing extending outwardly at one side from beneath the gear housing, inlet means in the exposed portion of the pump housing, outlet means communicating with the pump housing, a pump in the housing for drawing in a cleansing liquid through the inlet means and discharging the liquid from the outlet means, a strainer secured to the gear housing and supported over the said inlet means, glass cleaning devices arranged on the base unit, means including gears in the gear housing for operating the cleaning devices, and means connected to the said outlet means for discharging cleansing liquid over the cleaning devices.

10. In a glass cleaning and scrubbing machine, a base unit comprising a pump housing, and a gear housing superimposed thereon, a pump-

ing element in the pump housing, gears in the gear housing, glass scrubbing devices operatively connected to one of the gears, a motor standard supported by and above the housings, a motor supported on the standard and connected to both the pumping element and gears, fluid inlet means in the pump housing adjacent the said motor standard, and outlet means in the pump housing communicating with at least one of the scrubbing devices to supply fluid thereto.

11. In a glass cleaning and scrubbing machine, a base unit comprising a pump housing and a gear housing superimposed thereon, gears in the gear housing, glass scrubbing devices operatively connected to the gears, a pump in the pump housing, means for operating the gears and pump, inlet means for the pump housing, outlet means extending through and forming a part of the gear housing and communicating with the pump housing, and means for conducting a liquid from the said outlet means to the glass scrubbing devices.

12. A glass cleaning machine adapted for operation while partially immersed in a cleansing liquid comprising, a base unit, inner and outer glass cleaning devices supported above the base unit and operative for cleaning the inner and outer surfaces of a glass inverted and placed in operative engagement therewith, power actuated means in the base unit for pumping cleansing liquid upwardly for discharge over the inner surface of the glass, a tubular member connected to said liquid pumping means for carrying a part of the liquid therefrom upwardly, and an annular water discharge member connected with the said tubular member to receive liquid therefrom and for discharging the liquid over the outer surface of the glass.

13. A glass cleaning machine comprising a base unit for operation in a body of cleansing liquid, a casing supported on the base unit to project above the liquid level, glass cleaning devices arranged in the casing and operative for cleaning inner and outer surfaces of a glass placed in engagement therewith through the upper end of the casing, a liquid pumping means in the base unit, duct means for carrying liquid upwardly from the pumping means, and a removable annular member on the upper end of the casing connected to said duct means and having discharge openings for discharging liquid to the outer surfaces of the glass and to said outer cleaning devices.

14. A glass cleaning machine comprising a base unit for operation while submerged in a body of cleansing liquid, said base unit having a pump chamber with an inlet opening through which liquid may pass from said body, a pump in the chamber, a casing mounted on the base unit to project above the surface of the liquid body, inner and outer glass cleaning devices arranged in the casing for cleaning inner and outer surfaces of a glass placed in engagement therewith, and separate conduit means for conducting cleansing liquid from the pump chamber to the respective inner and outer cleaning devices.

15. A glass cleaning machine comprising a base unit for operation in the lower part of a receptacle containing cleansing liquid to an approximate predetermined level, a pump in the base unit having an inlet through which liquid may pass from the liquid in the receptacle, a casing mounted on the base unit to project above said liquid level, inner and outer glass cleaning devices arranged within the casing and above

the level of said liquid in the receptacle, means for simultaneously operating said cleaning devices and pump, and means for separately conducting cleansing liquid from the pump to the respective inner and outer cleaning devices.

16. A glass cleaning machine comprising a base unit for operation in the lower part of a receptacle containing cleansing liquid to an approximate predetermined level, a pump in the base unit having an inlet through which liquid may pass from the liquid in the receptacle, a casing mounted on the base unit to project above said liquid level, inner and outer glass cleaning devices arranged within the casing and above the level of said liquid in the receptacle, means for simultaneously operating said cleaning devices and pump, means for conducting cleansing liquid from the pump upwardly through the inner cleaning device to the inner surface of the glass to be cleaned, and tubular means for conducting cleansing liquid from the pump to a point above the aforesaid liquid level and then discharging

it so that it will pass downwardly over the outer surface of the glass to be cleaned and into the outer cleaning element.

17. A glass cleaning machine comprising a base unit for operation while submerged in a body of cleansing liquid, said base unit having a pump chamber and a gear chamber disposed thereover, said pump chamber having an inlet through which cleansing fluid may enter, a pump element in the pump chamber and gears in the gear chamber, drive means for said pump element and gears, a casing mounted on the base to project above the normal surface level of the said cleansing liquid, inner and outer cleaning elements rotatably arranged in the casing and connected for rotation by said gears, and separate conduit means connected directly to the pump chamber to receive cleansing liquid therefrom and deliver it respectively to said inner and outer cleaning elements.

CASPER F. HANSON.