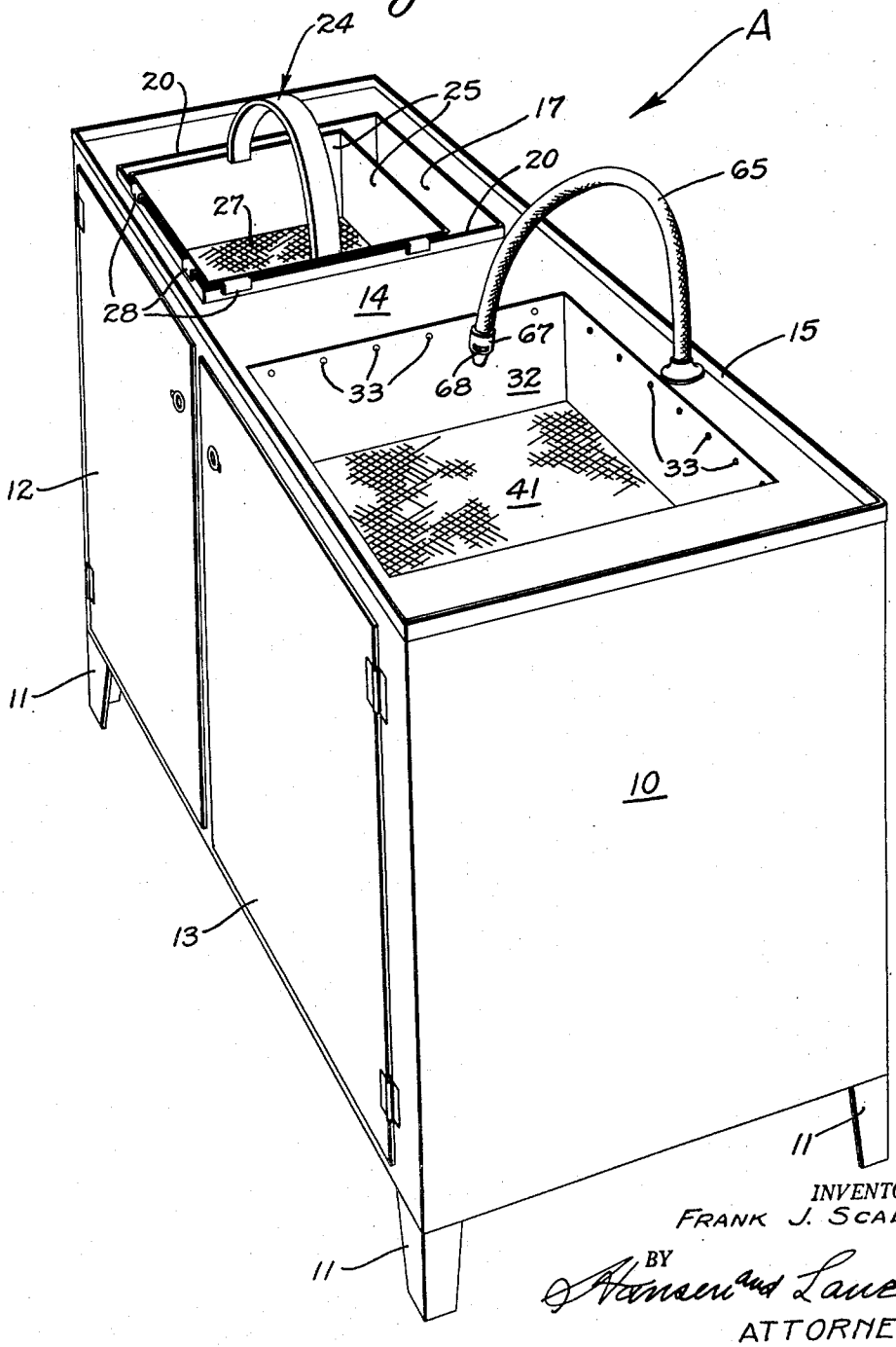
April 13, 1954 F. J. SCALES 2,675,012

WASHING APPARATUS FOR AUTOMOTIVE AND MACHINE PARTS AND ASSEMBLIES

Filed Oct. 18, 1952 2 Sheets-Sheet 1

Fig—1



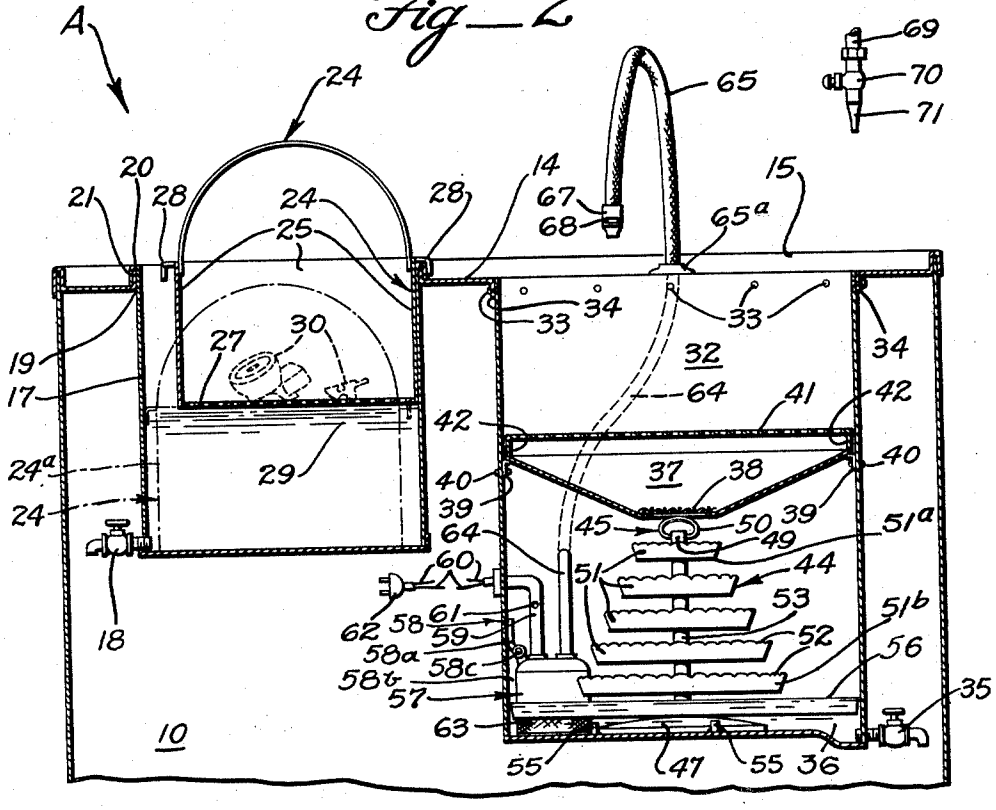
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WASHING APPARATUS FOR AUTOMOTIVE AND MACHINE PARTS AND ASSEMBLIES

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Fig_2



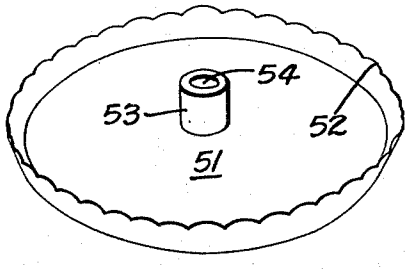


Fig_3

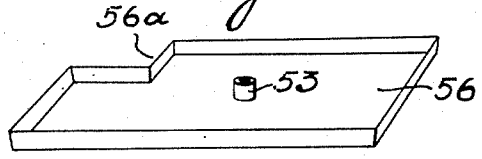


Fig_5

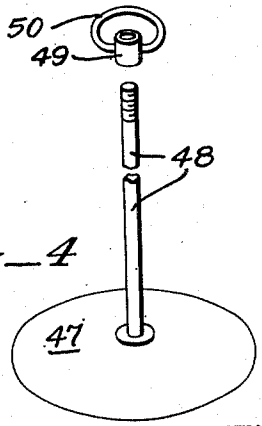


Fig_4

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WASHING APPARATUS FOR AUTOMOTIVE AND MACHINE PARTS AND ASSEMBLIES

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Application October 18, 1952, Serial No. 315,453

11 Claims. (Cl. 134—85)

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The present invention relates to cleaning apparatus, and pertains more particularly to a device for cleaning machine assemblies and parts such as the parts of carburetors for internal combustion engines.

In the cleaning of carburetors it is advisable to use two different types of cleaning liquid. One of these is a detergent in which to soak the parts for softening and loosening the film or crust-like coating which forms on the exposed exterior of the carburetor. This coating apparently is a combination of carbon, road dirt, gasoline coloring matter and solidified antiknock components. The other liquid is a solvent for rinsing off the softened coating material and for washing out the interiors and passages of some of the recessed or bored parts. The same general type of treatment is desirable for cleaning typewriters and typewriter parts.

The type and amount of sludge which is flushed off by the rinsing liquid, particularly when cleaning carburetor parts, would quickly clog ordinary liquid filters or screens if they were used to filter out the dirt and other impurities in the rinsing liquid. Also, ordinary settling tanks have been found inadequate to properly clarify the rinsing liquid which is used in carburetor cleaning operations, and most settling tanks are difficult to clean out when loaded with sludge or sediment.

The present invention contemplates the provision of improved apparatus for the washing of machine parts. Further, the invention provides a simple, compact parts washing apparatus having an initial soaking tank and a final stream washing arrangement, whereby the cleaning liquids are conserved, and dilution of the contents of the soaking tank by the stream liquid is prevented. A further object of the invention is to provide parts washing apparatus which facilitates the handling and processing of the parts to be cleaned and makes easy the cleaning out of the apparatus when necessary.

These and other objects and advantages of the invention will be apparent from the following description and the accompanying drawings, wherein:

Fig. 1 is a perspective view of a parts washer embodying the present invention.

Fig. 2 is a longitudinal vertical sectional view through the apparatus shown in Fig. 1.

Fig. 3 is an enlarged perspective view of a settling tray forming part of a liquid clarifying column embodied in the apparatus shown in Figs. 1 and 2.

Fig. 4 is a perspective view of a standard for

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supporting a plurality of superposed sludge settling trays of successively decreasing diameters.

In the drawings, a parts cleaning apparatus A comprises a sheet metal cabinet 10 having supporting legs 11, 11, 11 and access doors 12 and 13. If desired, for increased portability, castors or wheels, not shown, may be provided in a well known manner on two or more of the corners of the cabinet 10. A sheet metal top panel 14 (Figs. 1 and 2) is recessed into the upper end of the cabinet 10 to have a surrounding flange 15 which retains liquid which may be spilled onto the top panel 14. A rectangular sheet metal soaking tank 17, with a drain faucet 18 in its lower end, is mounted in an opening 19 in the top panel 14 at one side thereof. The tank 17 is secured to the cabinet top panel 14 by an upstanding seam 20 formed by reversely bending the upper edge portion of each side of the tank outwardly and downwardly to receive upwardly bent flanges 21 formed on the top panel 14 around the edges of the tank opening 19. The seam 20 preferably is soldered to make a liquid tight joint between the tank 17 and the top panel 14.

A rectangular parts basket 24 is formed with sheet metal side walls 25 and an open mesh bottom 27 which may be of expanded metal. The parts basket 24 is of smaller transverse dimensions than the soaking tank 17 so as to fit freely therein, and is provided, at its upper edge, with supporting hooks 28 on one or more sides thereof to hook onto the upstanding seams 20 and support the basket as shown in Figs. 1 and 2. The parts basket 24 is of substantially less height than the soaking tank 17 as shown in Fig. 2, so that with a supply of liquid 29 in the tank 17 of sufficient depth to immerse parts 30, indicated in broken lines in Fig. 2, the basket 24 may be raised and secured by the hooks 28 with its perforated bottom 27 and the parts 30 supported thereon above the level of the tank liquid 29 for draining. The basket 24 may be freed from its solid line position of Fig. 2 by raising it to detach the hooks 28 after which it may be lowered to the broken line position 24a shown in Fig. 2 for soaking the parts in the basket.

A second tank 32 for use in the performing of rinsing and drying operations is secured by flush rivets 33 and solder to downturned flanges 34 formed to surround an opening provided in the cabinet top panel 14 on the opposite side of the cabinet from the soaking tank 17. The second tank 32 also is provided with a faucet 35 at its lower end through which rinsing liquid 36 may be drained from the tank 32 when desired. The

upper edge of the second tank 32 is mounted flush with the top panel 14 which preferably is either level or slopes downwardly slightly toward the second tank 32 so that liquid spilled onto the cabinet top panel 14 will tend to drain into the second tank 32.

A funnel shaped drainage partition or baffle 37 is mounted to extend transversely of the second tank 32 well below its upper edge, and slopes toward a screened central opening 38 in the baffle 37. The baffle 37 is supported on bracket strips 39 of angle metal which are secured by rivets 40, one to each wall of the second tank 32 at the desired height of the baffle.

A perforated parts support shelf 41, which may be of expanded metal, has downturned flanges 42 formed marginally thereon. These flanges rest on the baffle 37 to support the shelf 41 in vertically spaced relation thereto. The shelf 41 and baffle 37 fit freely into the second tank 32 so as to be easily removable therefrom. A settling or liquid clarifying column 44 is mounted directly below the screened opening 38 in the baffle 37. The column 44 comprises a central standard 45, having a base support 47 with an upright rod 48 secured thereto. A cap nut 49 with a lifting ring 50 secured thereto is screwed onto the threaded upper end of the rod 48.

A plurality of settling trays 51 of successively smaller diameter from the bottom up, are threaded onto the rod 48. Each tray 51 is provided with a crimped or scalloped rim 52 and a hub portion 53 of greater axial length than the height of the rim 52. The uppermost tray 51*a* is of slightly larger diameter than the screened opening 38 in the baffle 37 so as to catch the rinsing liquid as it flows downwardly through this opening. Each tray hub portion 53 has a hole 54 (Fig. 3) axially therein of a size freely to receive the upright standard rod 48. A plurality of guide lugs 55 are secured to the bottom of the second tank 32 to surround the base 47 when placed in the tank 32 to facilitate centering the tray column 44 in the tank. A large bottom tray 56 (Figs. 1 and 5), of a size to fit freely within the rinsing tank 32, is mounted on the rod 48 just above the base 47. This lowermost tray 56 is notched out at 56*a* to clear a pump housing 57 when the column of trays is lifted from and replaced in the tank 32.

A pump housing 57 (Fig. 2) with a usual pump and electric drive motor, not shown, therein, is connected to a side wall of the tank 32 by a fitting 58. The fitting 58 is in the nature of a conventional butt hinge. One portion 58*a* of the fitting is secured to the tank, the other portion 58*b* is secured to the pump housing 57 and the two parts are secured together by a removable pintle pin 58*c*. A conduit 59 with electrical conductor wires 60, 60 therein is secured to the pump housing 57 and extends through a side wall of the tank 32 above the maximum contemplated liquid level therein. A vent hole 61 is provided in the conduit 59 to prevent any liquid which may tend to rise in the conduit from being discharged exteriorly of the tank 32. The conductor wires 60, 60 may be connected to a plug 62 of a conventional type for connecting to a suitable source of electricity such as a usual electrical wall outlet.

A screen 63 surrounds an inlet opening, not shown, in the lower end of the pump housing 57, and a tube 64 leads from the discharge outlet of the pump, through the wall of the tank 32 and is connected to a semi-rigid tube 65. The tube 65 is secured to a base flange 65*a* which in turn is mounted on the cabinet top panel 14 at the rear of the second tank 32.

To reduce splashing by a stream of liquid discharged therefrom, an aspirating nozzle 67 of a well known type commonly used on household sink faucets is provided on the end of the semi-rigid tube 65. The nozzle 67 has side openings 66 therein through which air is drawn in a well known manner to mix with the rinsing liquid as it is discharged from the nozzle 67.

A compressed air hose 68 with a manually controlled valve 70 and jet discharge nozzle 71 preferably is provided adjacent the apparatus for blowing excess rinsing liquid from the parts and for evaporating any liquid which may remain thereon after they have been rinsed.

The operation of the device is as follows: Assume that the conductor wires 60, 60 are connected to a suitable source of electrical energy, such as, for example, a six volt or other battery, or 110 volt alternating current. The compressed air hose 68 also is connected to a suitable source of compressed air. A required quantity of suitable detergent liquid 29 is present in the soaking tank 24, and a required supply of rinsing liquid 36 is present in the second tank 32, so that with all of the trays 51 filled, a sufficient amount of the liquid will remain in the pool thereof in the bottom of the second tank 32 to bring the liquid level therein above the screened inlet opening of the pump housing 57, but preferably approximately at, or slightly below the level of the top edge of the rim 52 of the lowermost settling tray 56.

A quantity of parts 31 to be cleaned are placed in the basket 24. The basket then is lowered to its broken line position 24*a* in the soaking tank 17 and is allowed to remain there for a length of time sufficient to soften the hardened deposits on the parts. The basket 24 then is raised to the solid line position of Fig. 2, with the hooks 28 engaging the upstanding seam 26 to elevate the parts 30 in the basket above the liquid 29 in the soaking tank.

After being allowed to drain for a required length of time, the parts are transferred to the second tank 32, either all together in the basket 24, or individually, as desired. If it is desired to transfer the entire first basket of parts into the second tank, a second similar basket may be provided if desired, so that a second basket of parts may be placed to soak in the soaking tank 17 while rinsing and drying the parts in the first basket. The parts in the second tank 32 then are subjected to a rinsing operation by energizing the pump motor, not shown, in the housing 57 to draw liquid 36 into the pump through the screen 63 and discharge it through the tube 64, the semi-rigid tube 65 and the aspirating nozzle 67.

The parts to be rinsed are manually presented to the stream of liquid discharged from the nozzle 67, to rinse off the scum and dirt loosened by immersion in the liquid 29 in the soaking tank 17, and to flush out any hollows or openings in the parts. The parts then are dried by subjecting them to a blast of air from the air nozzle 71. The air-charged stream of liquid from the nozzle 67 has little tendency to splash, and by holding the parts well down in the second tank 32 when rinsing and drying them, and by directing the air stream from the air nozzle 71 downwardly, the operator's clothes are protected from soiling. This is important since in most of the better carburetor service stations the service men wear white coats and it is desired to keep them clean as long as possible.

The liquid discharged by the nozzle 67 against the parts 30 drains down through the perforated shelf 41, and is deflected by the baffle 37 through the screened central opening 38 therein. The screen in the opening 38 is of sufficiently fine mesh to arrest any small screws or springs which inadvertently may be washed down through the openings in the shelf 41.

The rinsing liquid 36 flows through the screened central opening 38 into the uppermost settling tray 51*a*, from which it overflows into successive lower trays, until, from the lowermost tray 56 it overflows into the pool of liquid 36 in the bottom of the tank 32. Since the flow of liquid into the column 44 of trays is relatively slow compared to the total capacity of the trays, and since the crimped or scalloped edges of the tray rims 52 tend to divide the overflowing liquid into tiny streams, a combined settling and filtering effect is obtained which results in a high degree of clarification of the liquid. The large bottom tray 56 collects a large portion of the sludge which otherwise would collect on the bottom of the main tank. Thus the liquid may be used and reused for long periods of time, with only the addition of sufficient detergent liquid in the soaking tank 17 and solvent liquid in the second tank 32 to compensate for evaporation and carry over losses.

When the settling trays 51 and 56 become filled with sludge to a point where liquid replacement is considered desirable, the shelf 41 and baffle 37 are lifted out of the tank 32, and the tray column 44 is lifted out of the tank 32 in its entirety by means of the lifting ring 50. The tray column 44 then is disassembled by unscrewing the nut 49 and lifting off the trays 51 and 56. If the detergent in the tank 17 is drained at the same time, a stream of solvent from the nozzle 67 may be used to rinse out any sludge or dirt which may be present in the soaking tank 17. After the trays have been removed from the rod 48, they are cleaned out and the drain faucet 35 is opened to drain the old solvent from the second tank 32. The tray column 44 then is reassembled and replaced in the tank 32, and fresh rinsing solvent 36 is supplied in sufficient quantity to fill all of the trays 51 and 56 and to form a pool 36 in the bottom of the tank 32 to a desired depth. Then, upon replacing the baffle 37 and perforated shelf 41, and refilling the soaking tank 17 with detergent liquid to a proper depth, the apparatus again is ready for use.

The invention provides for the quick and easy cleaning of large quantities of carburetor or other parts and assemblies, is easily portable from one location to another, and is extremely economical, since the washing and rinsing liquid in the second tank 32 remains clear and useable even when the upper one or two trays 51 are completely filled with sludge.

While I have illustrated and described a preferred embodiment of the present invention, it will be understood however, that various changes and modifications may be made in the details thereof without departing from the spirit and scope of the invention as set forth in the appended claims.

Having thus described the invention, what I claim as new and desire to protect by Letters Patent is defined in the following claims.

I claim:

1. In a parts washer having a rinsing tank of substantial depth constructed to form a reservoir in the lower portion thereof, a liquid deflecting baffle disposed transversely of the tank intermediately of its top and bottom, a perforated parts supporting shelf mounted transversely of the tank to overlie the baffle, a series of sedimentation trays mounted in relatively superposed relation with the uppermost thereof disposed to catch liquid deflected by the baffle and disposed to drain successively into one another from the uppermost toward the lowermost thereof, means mounted to discharge liquid downwardly into said tank, and liquid circulating means mounted to draw liquid from the reservoir and to discharge it through said liquid discharge means.

2. In a parts washer having a rinsing tank of substantial depth constructed to form a reservoir in the lower portion thereof, a liquid deflecting baffle having a screened opening therein disposed transversely of the tank intermediately of its top and bottom, a perforated parts supporting shelf mounted transversely of the tank to overlie the baffle, a series of sedimentation trays mounted in relatively superposed relation with the uppermost thereof disposed to catch liquid deflected by the baffle and disposed to drain successively into one another from the uppermost toward the lowermost thereof, the lowermost of said trays being disposed at a height to drain into the reservoir at the lower end of said tank, a liquid discharge nozzle mounted to discharge liquid downwardly toward said perforated shelf, and liquid circulating means mounted to draw liquid from the reservoir and to discharge it through said nozzle.

3. In a parts washer having a rinsing tank of substantial depth constructed to form a reservoir in the lower portion thereof, a liquid deflecting baffle disposed transversely of the tank intermediately of its top and bottom, a perforated parts supporting shelf mounted in the tank to support parts above said baffle, a series of sedimentation trays each having a mounting lug portion thereon with a hole therethrough, a tray supporting rod mounted to extend upright in the tank and insertible in said tray mounting lugs removably to support the trays in relatively superposed relation with the uppermost thereof disposed to catch liquid deflected by the baffle, liquid discharge means mounted to discharge liquid downwardly into said tank, and liquid circulating means mounted to draw liquid from the reservoir and to discharge it through said liquid discharge means.

4. A parts washer comprising a tank adapted to contain liquid to a predetermined depth therein, a parts support mounted to drain into the tank, a column of relatively superposed sedimentation trays mounted in said tank with the uppermost one thereof positioned to catch liquid draining from said parts support, said trays being successively smaller from the bottom to the top of the column thereof, the trays being removable individually in succession from the top downward, and means for circulating liquid from the pool thereof in the tank onto the parts support.

5. An arrangement according to claim 4 wherein each of the trays has a corrugated rim, and wherein each of said trays except the lowermost is arranged to overflow into a lower one of the trays.

6. A parts washer comprising a tank adapted to contain liquid to a predetermined depth therein, a parts support mounted to drain into the tank, a tray support removably mounted in the tank, a plurality of sedimentation trays mounted in relatively superposed relation on said support, means for retaining the support in predetermined

position in the tank, with the uppermost of said trays positioned to catch liquid draining from said parts support, said trays being successively smaller from the bottom to the top thereof, a removable tray retaining element releasably secured on said support, said retaining element being constructed to form a handle for raising the support with the trays mounted thereon from the tank, and means for circulating liquid from the pool thereof in the tank onto the parts support.

7. A parts washer comprising a first tank adapted to contain a supply of detergent liquid to a predetermined level therein, a parts basket having a perforated bottom insertible in said first tank with the perforated bottom below the liquid level in said first tank, means for supporting the basket in the first tank with the perforated bottom above the liquid level in said first tank, a second tank of substantial depth mounted adjacent the first tank and adapted to contain a supply of solvent liquid therein, a perforated shelf mounted transversely of the second tank below the upper end thereof, a deflecting baffle mounted in the second tank below the perforated shelf to deflect falling liquid toward a predetermined zone of said tank, a plurality of laterally offset relatively superposed settling trays mounted in said tank below said baffle, the uppermost of said trays being positioned to catch liquid deflected by the baffle, a liquid pump having an inlet and an outlet mounted in said second tank with its inlet below the liquid level in said second tank, and conduit means connected from the outlet of said pump to discharge liquid from a point above said second tank downwardly into said second tank.

8. A parts washer comprising a first tank adapted to contain a supply of detergent liquid to a predetermined level therein, a parts basket having a perforated bottom insertible in said first tank with the perforated bottom below the liquid level in said first tank, a second tank of substantial depth mounted adjacent the first tank and adapted to contain a supply of solvent liquid therein, a screened deflecting baffle mounted in the second tank to deflect falling liquid toward a predetermined zone of said tank, a plurality of laterally offset relatively superposed settling trays mounted in said tank below said baffle, said trays being positioned to receive liquid deflected by the baffle, a liquid pump having an inlet and an outlet mounted in said second tank with its inlet below the liquid level in said second tank, and conduit means connected from the outlet of said pump to discharge liquid from a point above said second tank downwardly into said second tank.

9. A parts washer comprising a frame, a flat, liquid-tight, top member on said frame, said top member having a pair of tank receiving openings therein, a soaking tank mounted in one of the openings in the top member to extend upwardly therefrom, a parts basket having a perforated bottom insertible in said soaking tank, support means mounted releasably to support the parts basket above a predetermined liquid level in the soaking tank, a rinsing tank flush-mounted in the second opening in the top member to contain a pool of liquid of a predetermined depth therein, a perforated shelf mounted transversely of the rinsing tank intermediate the upper and lower ends thereof, a liquid deflecting baffle having an opening therein mounted below the perforated shelf, a column of settling trays mounted beneath the opening in the deflecting baffle to receive liquid flowing downwardly therethrough, a liquid circulating pump mounted in said rinsing tank, said pump having an inlet and an outlet, the inlet being below a predetermined liquid level in the rinsing tank, drive means for actuating said pump, a semi-rigid tube mounted to extend above said rinsing tank and connected to the pump outlet, and a nozzle mounted on the discharge end of said semi-rigid tube to maintain the nozzle in adjusted position for discharging a stream of liquid onto parts in the rinsing tank.

10. An arrangement according to claim 9 wherein each settling tray has a central boss with an opening therein, and a rod is mounted on the bottom of said rinsing tank to extend upwardly therefrom, the openings in said trays being of a size to receive the rod therein.

11. An arrangement according to claim 9 wherein the lowermost settling tray is substantially co-extensive with the clear area of the tank bottom.

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