June 27, 1944. V. N. ALBERTSON 2,352,356

AUTO PARTS WASHER

Filed May 7, 1941 2 Sheets-Sheet 1

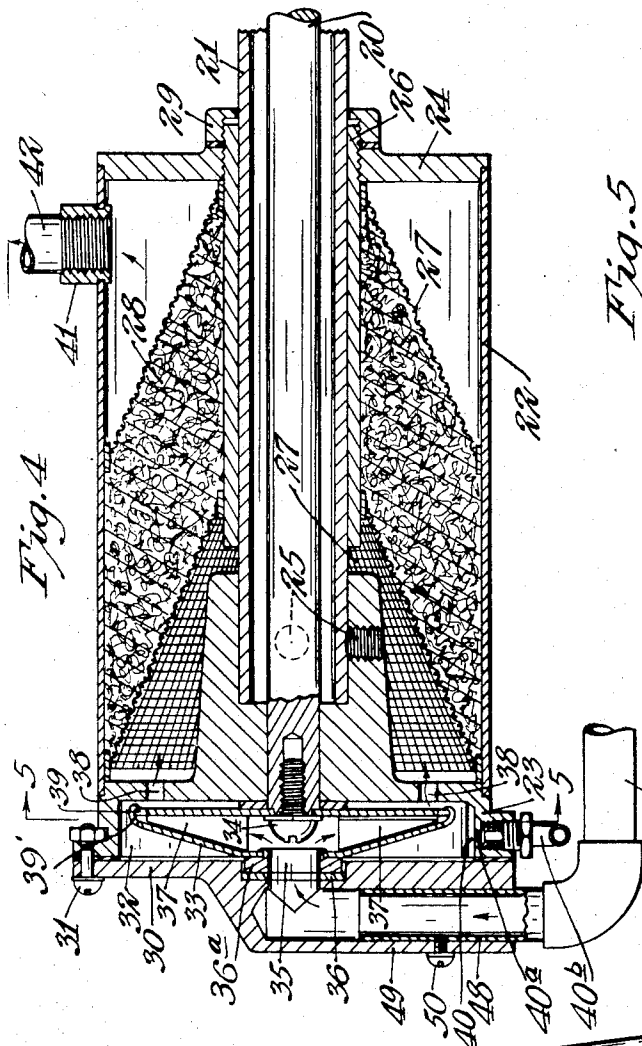

Fig. 4

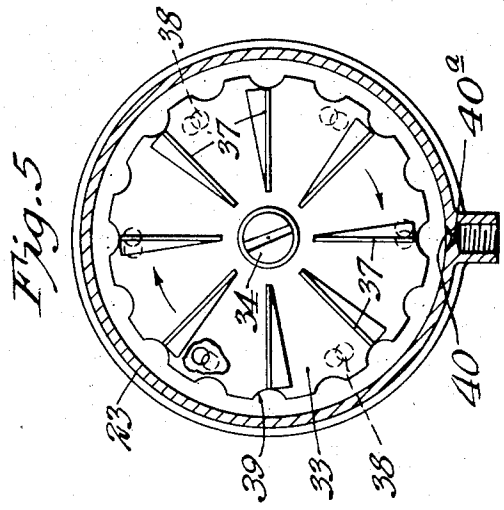

Fig. 5

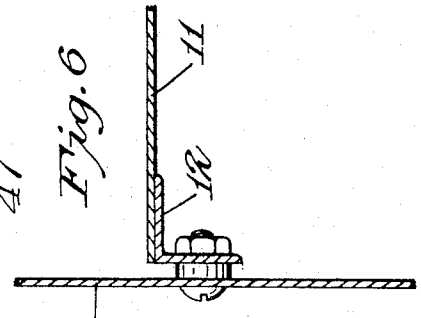

Fig. 6

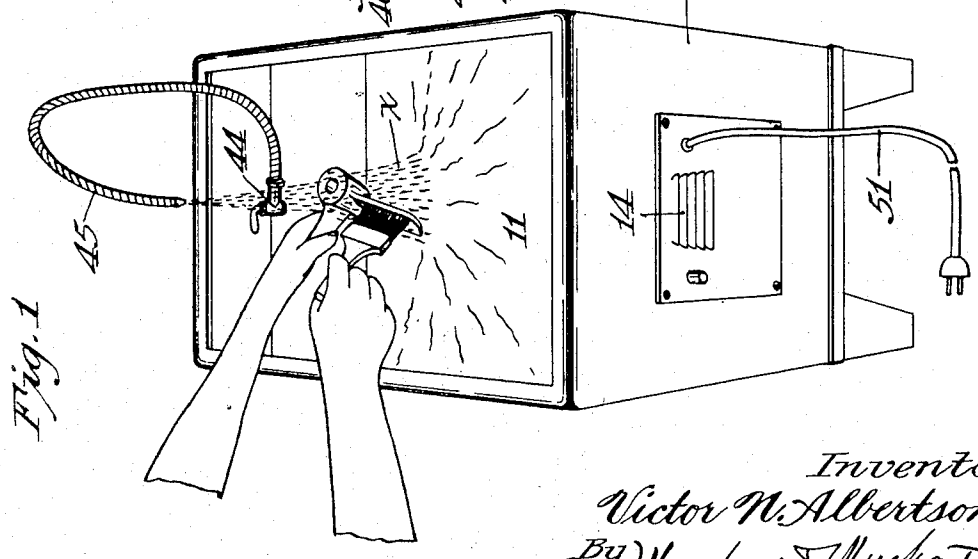

Fig. 1

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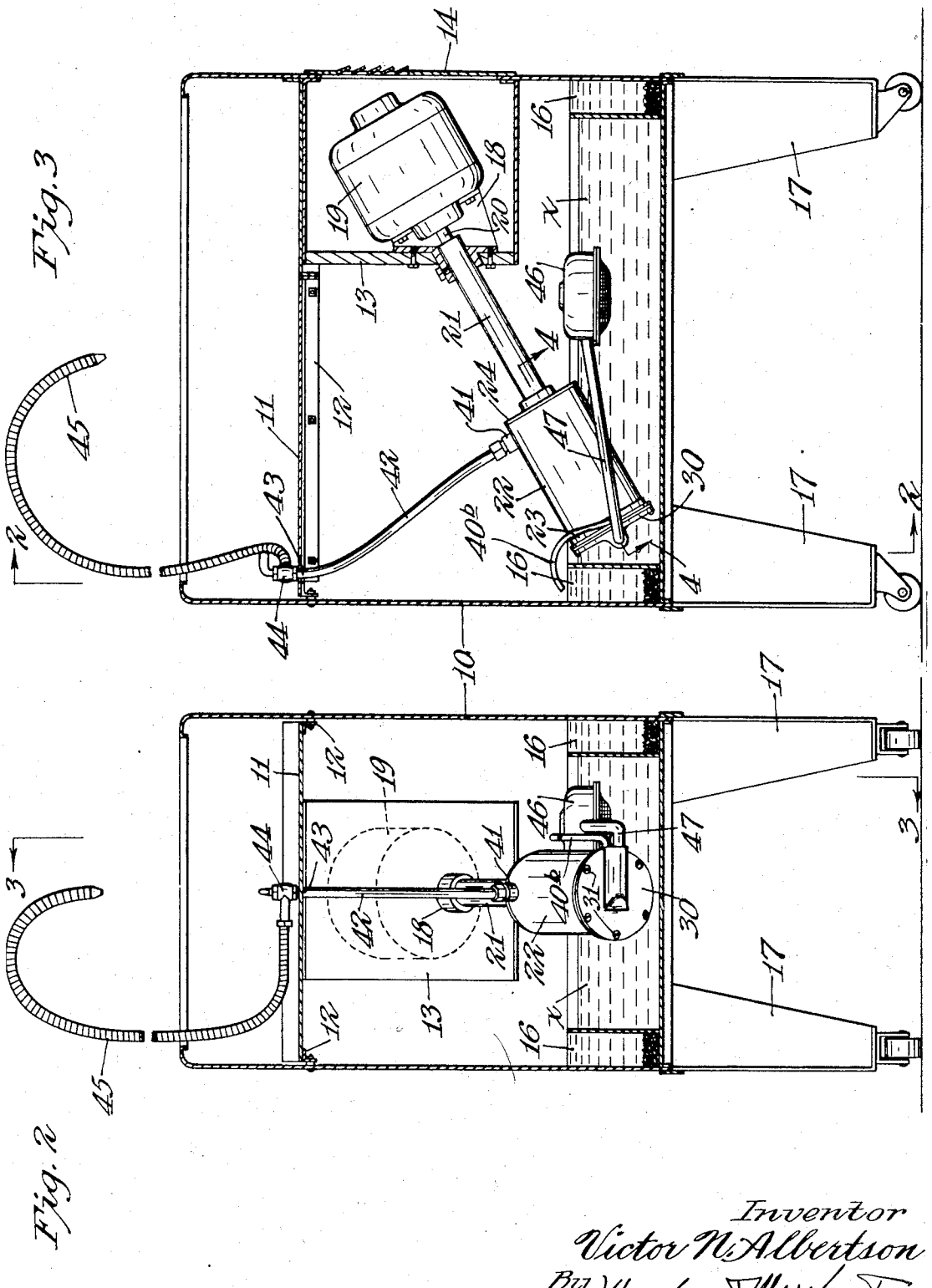

Fig. 3

Fig. 2

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UNITED STATES PATENT OFFICE

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AUTO PARTS WASHER

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Application May 7, 1941, Serial No. 392,267

3 Claims. (Cl. 141—1)

My invention provides an improved power-actuated washing machine especially designed and particularly adapted for the washing of greasy auto parts and the like and, generally stated, the invention consists of the novel devices, combinations of devices, and arrangement of parts hereinafter described and defined in the claims.

More specifically stated, the present invention comprises a tank or container for washing fluid (usually gasoline or other efficient grease solvent), a work deck or table located adjacent the upper portion of the container and above the fluid sump therein with leakage passages therebetween and the edges of the container, and fluid circulating connections from the interior of the fluid container and terminating above the work table or deck, said circulating connections involving a suitable pump mechanism and having the intake end thereof located in the fluid sump of the container under the intermediate portion of the table and remote from the side walls of the container. With this type of machine, dirty and greasy machine parts and the like are washed preparatory to inspection and repair by placing the same on or locating the same above the work table or deck and subjecting the same to a stream of cleaning fluid circulated from the underlying fluid container, and in some instances this process is speeded up by the use of a brush, rag or the like. The dirty cleaning fluid draining off of the part or parts being cleaned runs over the deck and through the leakage passages therebetween and the walls of the casing and flows down adjacent the side walls of the casing into the fluid body. Due to the fact that the intake to the fluid circulating connections is under the central portion of the work table, the heavier particles of dirt and other foreign matter carried from the parts being washed will settle to the bottom of the container near the edges thereof and remote from the intake to the circulating connections. Hence, by this simple expedient, re-circulated fluid is maintained largely free of foreign matter such as sand, metal, and the like.

Also disclosed herein is an improved centrifugal pump mechanism which serves also to further separate foreign substance such as sand, metal particles, and the like for the cleaning fluid, but this has been made subject matter of a continuation-in-part application filed by me on May 27, 1942 under S. N. 444,616.

A commercial form of the improved device is illustrated in the accompanying drawings where-in like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a view in perspective looking downward on the tank or container and illustrating a manner of using the same in the cleaning of articles such as stated;

Fig. 2 is a transverse vertical section taken approximately on the line 2—2 of Fig. 3;

Fig. 3 is a vertical section taken approximately on the line 3—3 of Fig. 2;

Fig. 4 is a transverse axial section taken substantially on the line 4—4 of Fig. 3, some parts being shown in full and some parts being broken away;

Fig. 5 is a section taken approximately on the line 5—5 of Fig. 4, some parts being broken away and some being shown in full; and

Fig. 6 is a fragmentary section showing means for supporting the work table from the casing or tub near but below the open top thereof.

In this preferred arrangement the tank for containing the washing fluid is a rectangular structure 10 preferably formed of sheet metal having a slightly inturned upper edge rim. At a point far above the bottom of the tub, and considerably below the open top thereof, is a work table or deck, preferably in the form of a flat metal plate 11 that rests loose upon brackets 12 or the like secured to the walls of the tub. This table 11 is of slightly less area than the horizontal cross-section of the tank. At one end of the tank 10 and separated from the interior thereof is an inset box-like motor containing compartment 13 that is open to atmosphere and the circulation of air through suitable openings, such as in a grill plate 14. This motor compartment is just below the work table and the grill plate 14 will, by screws or the like, be detachably secured to the casing but readily removable for access to the motor.

The main deck 11 is preferably made removable but the complete deck structure includes a plate or section 11' that is permanently fixed to and overlies the motor compartment 13 so that the washing fluid will not drip onto the motor or get into the motor compartment 13. The deck 11 is of such area that there will be a narrow space or flat passage between its edges and the walls of the tank for the dripping or flowing of the washing fluid from the table back into the main compartment of the tank, all as will presently appear.

The tank 10, along the ends and sides, is pro-

vided with a sediment trough 16 for a purpose which will presently more fully appear. In the structure illustrated, the tank is shown as supported by roller-equipped legs 17.

Located within the motor chamber and supported from the inner wall thereof by a bracket 18 is a motor housing 19 within which is the customary armature, the rotor shaft 20 of which extends obliquely into the main compartment of the tank and is passed through an oblique tubing 21 that is rigidly fixed to the hub of the brackets 18. The lower end of the tube 21 extends into a filtering chamber formed by a shell or casing 22, the cylindrical portion of which is provided with heads 23 and 24. The head 23, by set-screws 25 or the like, is rigidly secured to the lower end of tube 21 and thus all of the elements of the separating shell or casing are supported and fixed against rotation.

Located within the casing of the filter chamber of the shell 22 and rigidly secured on the tube 21 is a supplemental tube or sleeve 26 which, in this particular structure, supports coarse conical screens 27 that hold suitable fibrous filtering material 28. The head 24 is shown as screw-threaded onto the extended end of sleeve 26 and an annular nut or clamping ring 29 is also screwed onto the projecting end of sleeve 26.

A supplemental head 30, by means of nut-equipped bolts 31 or the like, is rigidly but detachably secured to the head 23. Head 23 is formed with a pump cavity 32 of cylindrical form that is closed by the head 30. The power supplying motor shaft 20 is extended completely through tube 21 and is extended through and journaled in the hub of the head 23.

Located within the pump chamber 32 and fixed to the extended end of motor shaft 20 is a centrifugal acting pump head 33 of shell-like form. The head 33 is, as preferably formed, made up of a disc-like plate and conical plate, the former of which is rigidly secured to the shaft 20 by a machine screw 34 or the like, while the conical plate of said head is formed with an axial fluid intake passage that registers with a fluid inlet port 35, as best shown in Fig. 4.

To form a substantially fluid-tight joint with the rotary pump head, a packing in the nature of a fiber sealing ring 36 is inserted in the head 30 and has frictional contact with a tubular hub 36*a* of the conical plate of said head immediately surrounding its axial fluid intake passage. Internally the shell-like pump head is provided with circumferentially spaced radial flanges or webs 37 that cause the fluid entering the head to rotate with the head and hence be subject to centrifugal force.

Radially inwardly of peripheral wall of pump chamber 32 and the perimeter of the rotary head 33, the wall of the head 23 is provided with circumferentially spaced ports of passages 38 leading to the filter chamber. The hollow rotary pump head 33 is provided, at its peripheral portion and radially inwardly of ports 38, with circumferentially spaced passages afforded by connected discharge ports 39 and 39' that are respectively formed in the flat and conical plates of said head. The ports 39 open laterally into the pump chamber toward the wall thereof formed with the ports 38 and the ports 39' open radially into the interior of the pump chamber 32 toward the peripheral wall thereof.

The peripheral wall of the pump chamber 32 is formed with a foreign substance collecting groove 40 and foreign substance discharge port or passage 40*a* that intersect the transverse collecting groove 40.

The pump head 33 is intended to rotate in a clockwise direction, in respect to Fig. 5, and attention is here called to the fact that preferably the ports 38 are circumferentially oblique and are backwardly directed with respect to the direction of rotation so that the direction of travel of the fluid will be rapidly reversed and heavy foreign substance largely rejected before the fluid enters the ports 38. Preferably, a small tube or pipe 40*b* is provided to deliver contaminated fluid from the port 40*a* to the sediment trough 16.

The casing 22 of the filtering chamber is shown as provided with an outlet sleeve or nipple 41 into which is connected the receiving end of a circulating pipe 42, the delivery end 43 of which, as shown, extends through a notch in the deck 11 and is provided with a manually operated valve 44. This valve 44 is connected to the receiving end of a flexible discharge pipe 45. This pipe 45 is preferably of the type known as flexible metal hose or tubing made up of frictionally interlocked spiral sections. A hose of this kind, as is well known, may be quite readily bent to any desired form but there is sufficient friction in the sections to cause it to be self-sustaining against action of gravity in any form in which it may be bent. This is important as will be noted in the description of the operation.

The washing fluid *x* is drawn from the lower portion of the container through a vertically adjustable intake device which, preferably, and as shown, involves a head 46, the bottom of which is open or screened and the body of which is connected to a metal pipe 47 having an offset sleeve-like end 48 that is telescoped into sleeve-like portion 49 of head 30. The interior of this sleeve 49 is in communication with the intake port 35. By means of set-screw 50 or the like applied with threaded engagement through sleeve 49 and impinging on the sleeve 48, the intake head 46 may be adjusted and held at any desired level. The washing fluid may be of any of the well known mixtures which will dissolve or remove grease or other dirt accumulated on the objects to be cleaned and it may be supplied to the tank in any suitable way.

In Fig. 1 the numeral 51 indicates a cable containing wire and electrical connections leading to the motor.

Operation

It is here important to note that by placing the combined pump and motor units and their connecting shaft obliquely, the operative end of pump mechanism is submerged in the washing fluid while the motor is positioned high above the fluid level. Also, by locating the motor in a separate compartment within the casing or container the whole operative mechanism is brought within the casing.

When the motor is in operation the centrifugal pump head 33 will, of course, be rotated at high speed and the cleaning fluid will be drawn into the interior of the rotary pump head through pipe 47—48 and port 35. Under this rotation of the pump head, the webs or vanes 37 will cause the fluid to rotate at very high velocity with the pump head with the result that the fluid will be rapidly circulated through the pump head and will be discharged therefrom at high velocity through the ports or passages 39 and 39' into the radial outer portion of the pump chamber 32.

The fluid ejected from the peripheral ports 39' will be directed toward the peripheral wall of the

pump chamber, whereas that portion of the fluid discharged from the head through the lateral ports **39** will be discharged more or less laterally in the direction of the wall of the pump chamber containing ports **38**. Under centrifugal action most of the heavier particles of foreign matter contained in the fluid entering the pump head will be discharged through the peripheral ports **39'** and directed toward the peripheral wall of the pump chamber, thereby performing a high degree of separation of foreign substance from the cleaning fluid at this point.

The particles of foreign substance thus thrown to the periphery of the pump chamber will rotate thereagainst at high velocity until intercepted by the transverse groove **40** in which they are collected and delivered to the port **40***a* through which and the pipe or tube **40***b* a relatively small percentage of the total fluid subject to circulation will be delivered to the sediment trough **16**. Upon being emptied into the sediment trough **16** the foreign substance in the contaminated fluid will largely settle into the bottom of the sediment trough, whereas the cleaner fluid will overflow the same to replenish the fluid in the main tank **10**. Most of the fluid discharged from the rotary pump head will be delivered through the ports **38** into the filter chamber and passed through the filtering medium **28** therein. As previously stated, the fluid delivered into the filter chamber will be freed of most of its foreign matter and all of the heavier foreign particles so that the filtering medium **28** can be expected to retain a high degree of porosity for a long period of normal operation. However, upon being passed through the filtering medium any further grit or particles that may be present in the fluid will be removed by the filtering medium and only relatively very clean fluid will be delivered through the pipe **42**, valve **44**, and the flexible hose or tube **45** from which tube the fluid is delivered onto the table or deck **11**, as best shown in Fig. 1.

Here it will be noted that with the flexible tube, set for example as shown in Fig. 1, a fixed point of discharge of the washing fluid will be accomplished without using the hands to hold the said discharge tube or hose. Fig. 1 illustrates the manner in which, by the use of a brush or the like on an auto part, for example, held in one hand under the downwardly discharged fluid, such objects may be very quickly and conveniently cleaned by removal of all grease, dirt and the like. The cleaning fluid with the greasy, granular, or other materials removed from the cleaned object will, of course, drop onto the table **11** and from thence will run back into the container. Here it is further important to note that the soiled or dirty cleaning fluid will be caused to run down the walls of the container and into the trough **16** where the heavy sediments will settle while the lighter and cleaner parts of the fluid will overflow into the main body of the container.

In the above specification I have treated as synonymous terms as follows:

Fluid container, tank or tub; washer or cleaner; flexible discharge hose or tube; work deck or table; separating shell or casing; and ports or passages.

In accordance with the patent statutes I have illustrated and described a working embodiment of my invention, at present believed to be the best commercial form thereof; but it will be understood that various alterations and changes therein may be made within the spirit of the invention and scope of the appended claims.

What I claim is:

1. In a washer of the kind described, a fluid container having a work table located therein with clearance between its edges and the walls of said container, whereby washing fluid utilized for cleaning work over the table will be caused to run down or adjacent to the walls of said container, said container having a catch trough located below said table along the interior of the wall of said container and adapted to initially catch the relatively dirty washing fluid and retain sediment thereof.

2. In a washer of the kind described, a fluid container having a work table located within said container with leakage passages between its edges and adjacent walls of said container, whereby washing fluid utilized for cleaning work over the table will be caused to run down or adjacent to the walls of said container, and a circulating pump having an intake located in said container under the intermediate portion of said table remote from the walls of said container and having a discharge conduit leading to a point above said table for the discharge of washing fluid onto articles placed on said table.

3. In a washer of the kind described, a substantially rectangular container having an imperforate work table located within said container and supported from opposite walls thereof by connections affording leakage passages at the edges of said table adjacent said walls, whereby the fluid circulated within said container and utilized for cleaning work over the table will be caused to run down the adjacent walls thereof, and a circulating pump in said container below said table having an intake located under the intermediate portion of said table and at the intermediate portion of said container remote from the walls thereof, said pump having a discharge conduit leading to a point above said table for the discharge of washing fluid onto articles placed on said table.

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