

March 7, 1944.

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2,343,743

CLEANING APPARATUS

Filed April 10, 1941

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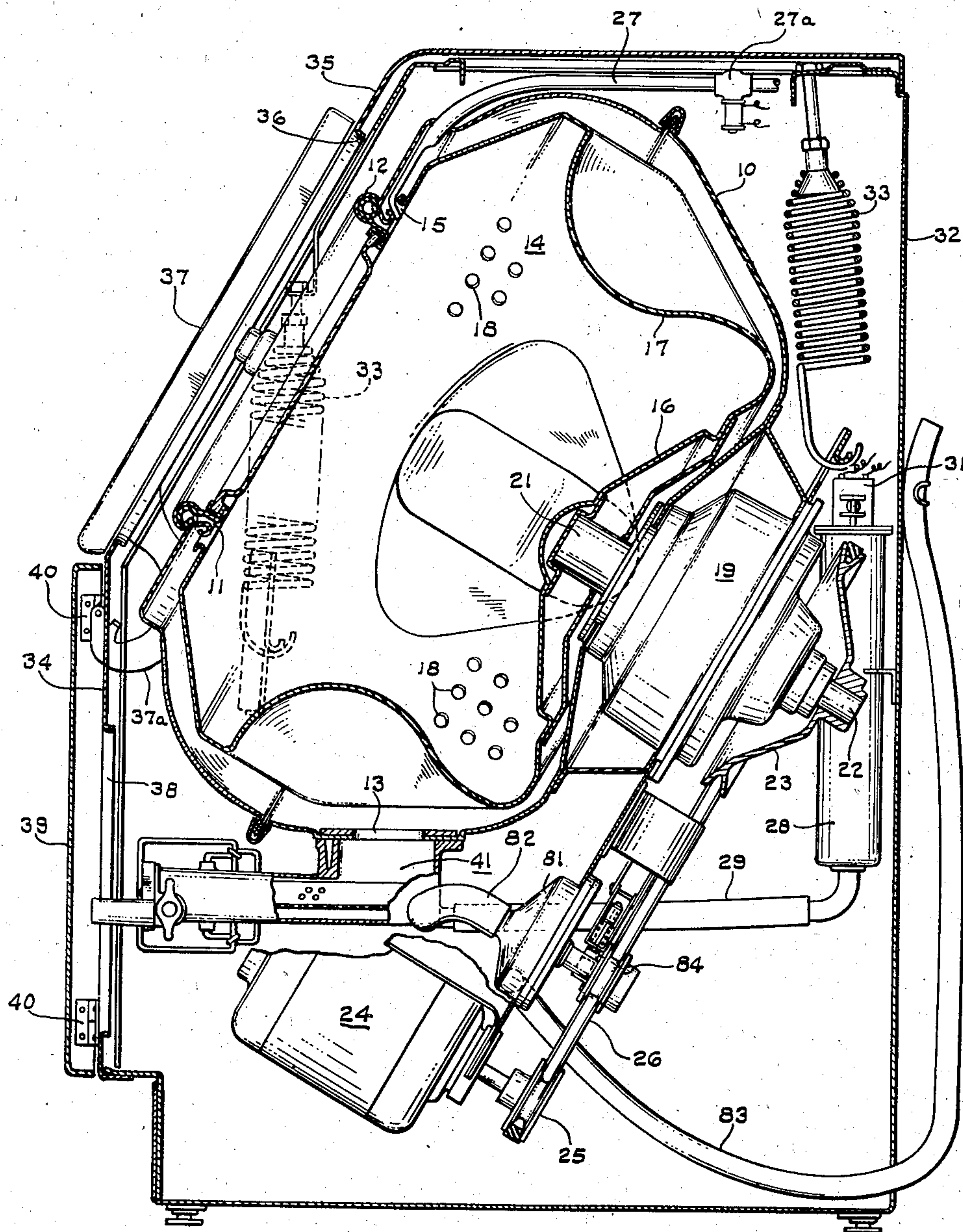


FIG. 1.

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3 Sheets-Sheet 2

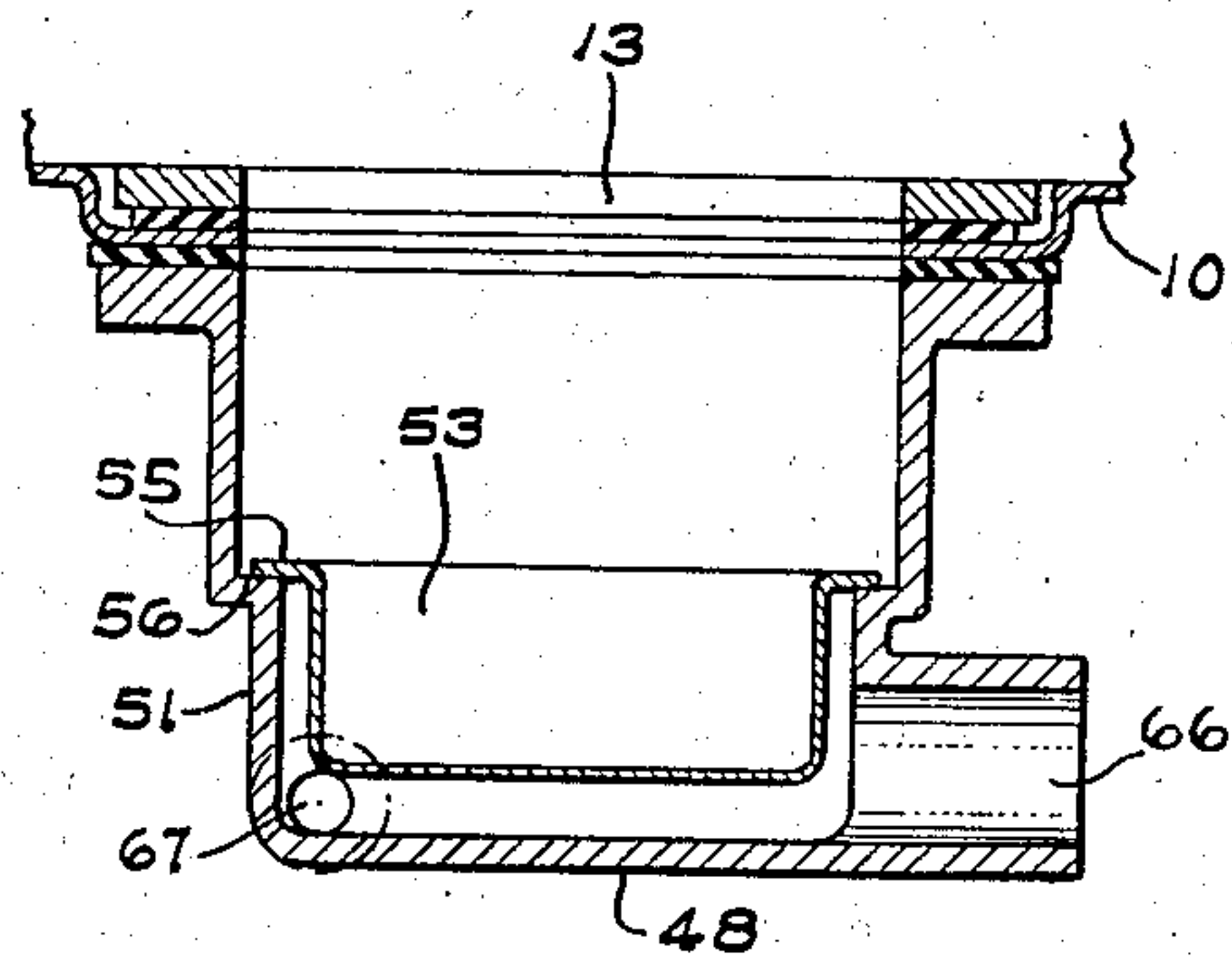
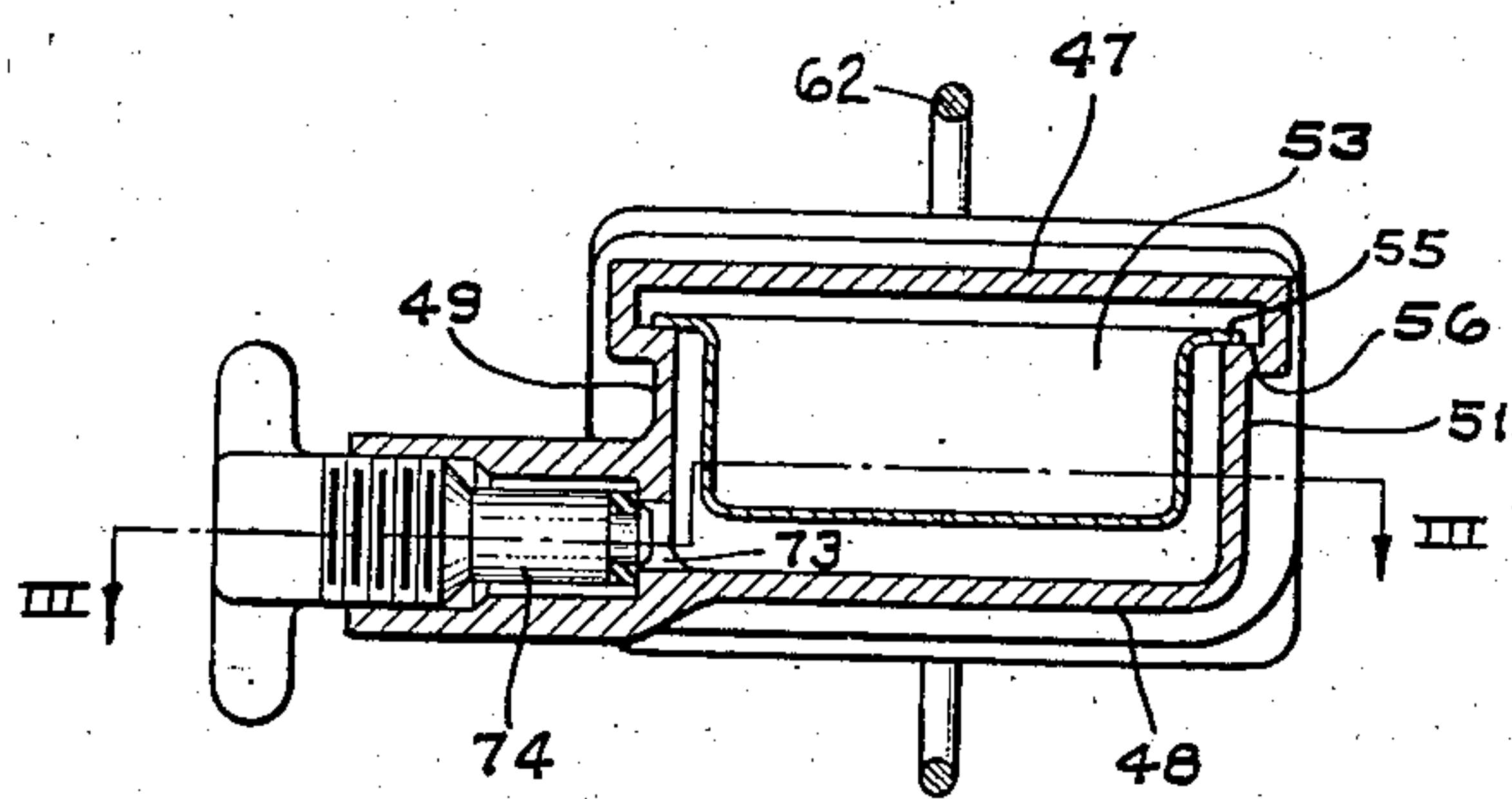
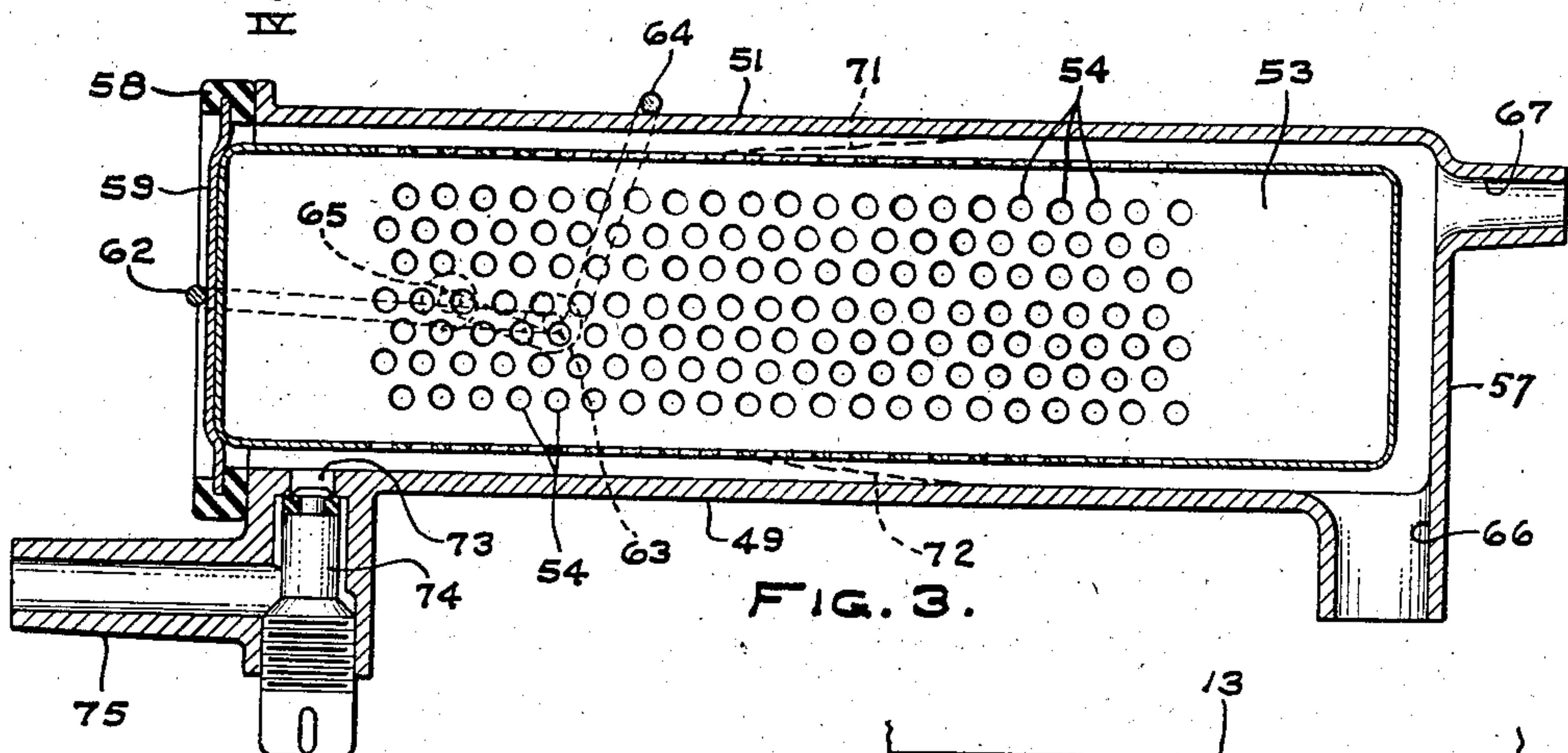
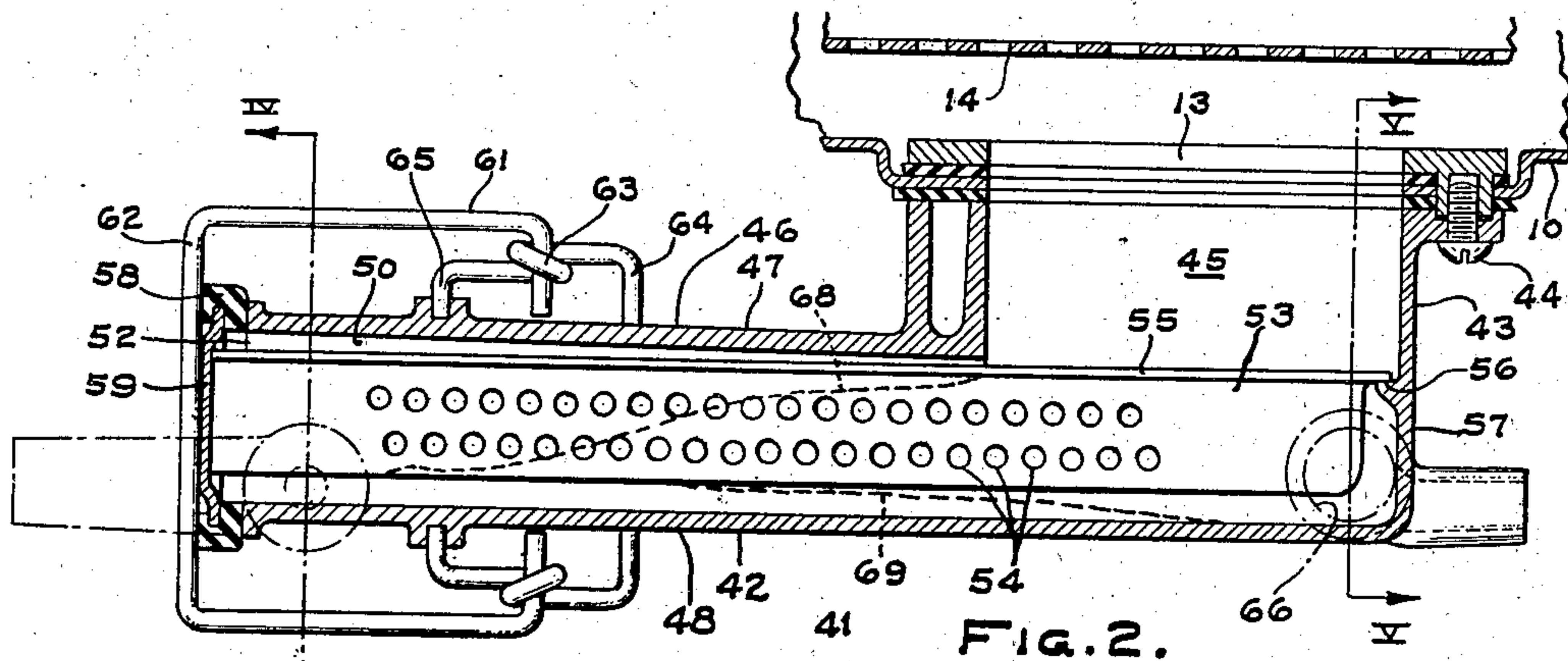


FIG. 4.

FIG. 5.

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3 Sheets-Sheet 3

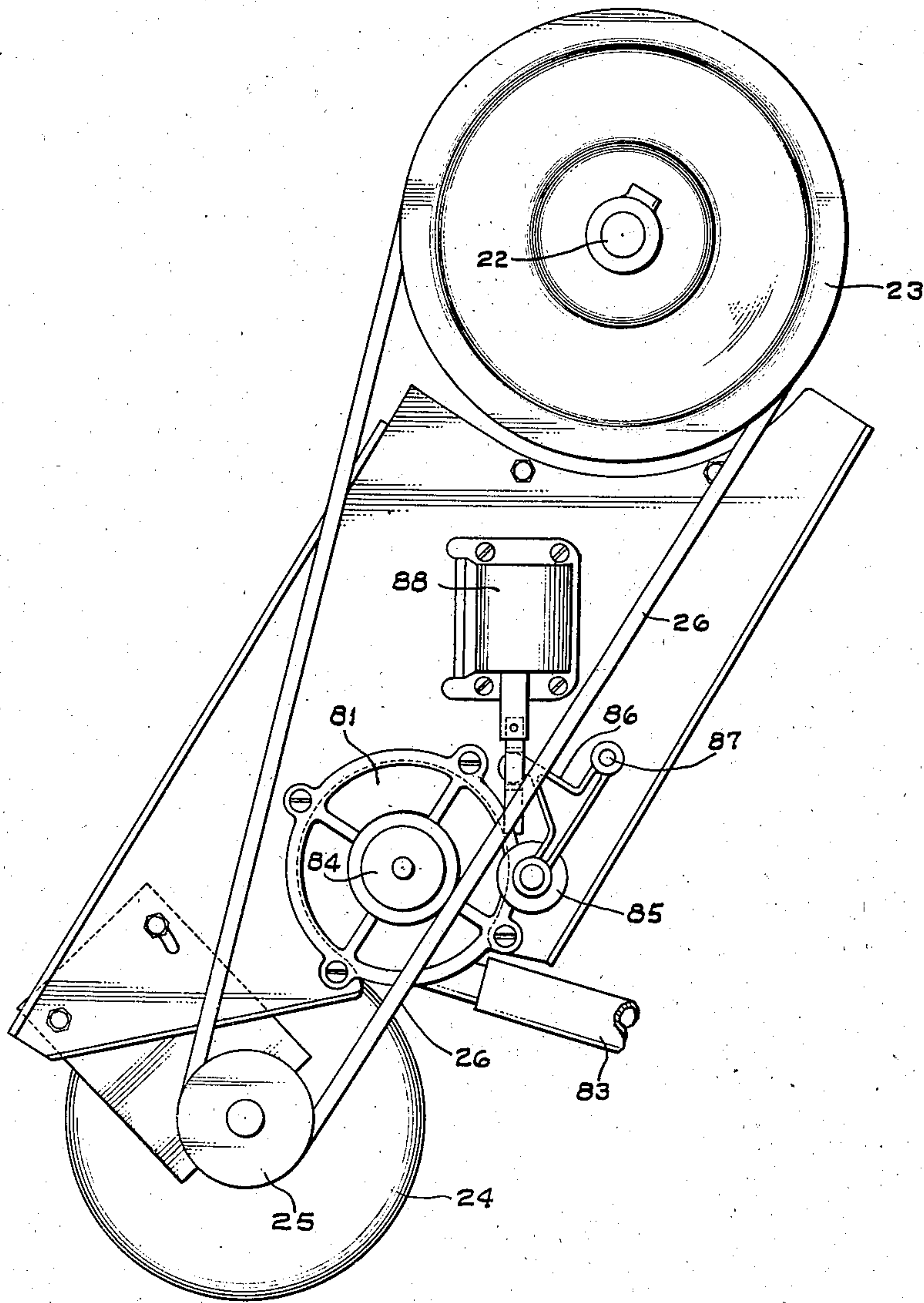


FIG. 6.

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## UNITED STATES PATENT OFFICE

2,343,743

## CLEANING APPARATUS

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pany, East Pittsburgh, Pa., a corporation of  
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Application April 10, 1941, Serial No. 387,822

2 Claims. (Cl. 210—149)

My invention relates to apparatus for cleaning fabrics or the like and has for an object to provide improved apparatus of this kind.

A further object of the invention is to provide improved means for removing vitiated fluid from a cleaning machine.

A further object of the invention is to provide an improved strainer construction for a cleaning machine which may be readily cleaned and which effectively prevents foreign material carried by the discharged fluid from reaching the fluid discharge pump or the drain.

It is a further object of the invention to provide improved strainer means for a washer having manually-operated means for draining the fluid from the washer in the event of a totally clogged strainer.

These and other objects are effected by my invention as will be apparent from the following description and claims taken in connection with the accompanying drawings, forming a part of this application, in which:

Fig. 1 is a vertical sectional view of one form of washing machine constructed and arranged in accordance with the invention;

Fig. 2 is an enlarged vertical sectional view of the strainer construction shown in Fig. 1;

Fig. 3 is a sectional view of a portion of the strainer construction taken along the line III—III of Fig. 4;

Figs. 4 and 5 are sectional views taken, respectively, along the lines IV—IV and V—V of Fig. 2; and

Fig. 6 is a partial view of the rear of the driving mechanism shown in Fig. 1 and showing the fluid discharge pump and the control therefor.

Referring now to the drawings, I have shown my invention applied to a washing and spinning machine of the type disclosed in my Patent No. 2,298,257, dated September 22, 1942, and assigned to the assignee of the present application. This form of washing and spinning machine includes a tub structure 10, at least a portion of which is generally of frusto-conical configuration. The forward end of the tub, which is of relatively large diameter, is provided with an opening 11 for the ingress and egress of the fabrics to be treated. The access opening 11 is closed by a suitable gasketed door 12 and the tub structure 10 is arranged with its axis inclined from the horizontal and the vertical so that the access opening 11 faces forwardly and upwardly. The tub 10 is provided with an outlet or drain opening 13 in the bottom portion thereof.

Arranged within the tub 10 is a basket struc-

ture 14 at least a portion of which is of frusto-conical configuration and which closely follows the lines of the tub 10. The basket 14 includes an access opening 15 which registers with the access opening 11 of the tub and the opposite end of the basket 14 is dished inwardly to provide a re-entrant wall or dome 16. A plurality of vanes 17 extend inwardly from the outer wall of the basket 14 for agitating the fabrics during the washing periods. The basket 14 is perforate throughout a substantial portion thereof, a number of the perforations being shown at 18.

Rotation of the basket during the washing periods at a relatively low speed of, for example, 52 R. P. M. and during the spinning periods at a relatively high speed of, for example, 500 R. P. M. is effected by a two-speed mechanism generally indicated at 19 and including a driven shaft or sleeve 21 which is secured to the basket 14 within the re-entrant wall 16. The two-speed mechanism 19 includes a driving shaft 22 which is driven by a pulley 23 at substantially constant speed. As the two-speed mechanism 19 forms no part of the present invention, it has not been shown in detail for the sake of brevity. A suitable two-speed mechanism for a machine of the type disclosed herein is disclosed in my copending application, Serial No. 305,512, filed November 21, 1939, and assigned to the assignee of the present application. It will be understood that the mechanism 19 is adjustable in any suitable manner for effecting the different speeds for the driven sleeve 21. A motor 24 is carried, preferably, by the tub 10 and drives the pulley 23 at constant speed by means of a pulley 25 and belt 26.

Washing water is admitted to the tub 10 through a conduit 27 which is connected to a suitable water supply and the delivery of water to the tub 10 is under control of an electrically-operated valve 27a connected in the conduit 27. The admission of water to the tub may be controlled in a well-understood manner by a float switch structure 28 which is connected by a flexible conduit 29 to the interior of the tub and which opens and closes a switch 31 in response to the level of the water in the tub. The switch 31 controls energization of the valve 27a so that admission of water to the tub through the conduit 27 is terminated when the float-actuated switch 31 is opened in response to the admission of a predetermined amount of water to the tub 10, all of which is well understood.

The tub 10, two-speed mechanism 19 and the motor 24 define major elements of a unitary washing and spinning structure which may be sup-



ported in any suitable manner. As shown, the unitary structure is carried by a casing 32 in a resilient manner, a plurality of tension springs 33 being supported by the casing 32 and connected to front and rear portions of the unitary structure. The front wall 34 of the casing 32 has the lower portion thereof extending substantially in a vertical plane and an upper portion shown at 35 inclined in a plane substantially normal to the axis of the tub 10 and basket 14, said inclined portion 35 including an opening 36 which is closed by a cover 37 when the apparatus is not in use. The cover 37 is carried by brackets, one of which is shown at 37a. The brackets 37a are pivoted or hinged to the casing front wall 34. The cover 37 may be swung downwardly to a horizontal position to provide a work shelf at the front of the casing as disclosed and claimed in the patent of William J. Russell, No. 2,296,295, dated September 22, 1942, and assigned to the assignee of the present invention. The lower vertical portion of the wall 34 is provided with a service opening 38 which is normally closed by a door or cover 39, hinged, as shown at 40, to the front wall 34 of the casing so that the cover may be swung outwardly. A spring latch (not shown) may be employed for retaining the cover 39 closed as is well understood.

In accordance with my invention, improved means are provided for straining foreign matter from the vitiated cleaning fluid discharged from the tub 10 through its drain opening 13. My improved strainer structure will now be described.

The strainer structure is generally shown at 41 in Fig. 1, and in detail in Figs. 2 to 5, inclusive. The structure 41 includes a body or fitting 42 having a vertically-extending neck portion 43 which is secured, by means of screws 44, to the tub structure 10 peripherally of the drain opening 13. The neck portion 43 encloses a vertically-extending passage 45 which communicates with the drain opening 13.

The fitting 42 also includes a forwardly-extending, horizontal portion 46 which is connected to the neck portion 43 and which terminates adjacent the opening 38 formed in the front wall 34 of the casing 32. The forwardly-extending portion 46 of the fitting 42 is defined by top and bottom walls 47 and 48 and side walls 49 and 51. The recited walls of the horizontally-extending portion 46 define an elongated chamber or sump 50 which communicates with the vertical passage 45 in the neck portion 43. The front end of the fitting 42 is open, as shown at 52, for the insertion and removal of a strainer pan 53.

The central portion of the side and bottom walls of the strainer pan 53 is perforate, as best shown in Figs. 2 and 3, a number of the perforations being indicated by the numeral 54. The ends of the side and bottom walls of the strainer pan 53 are imperforate, as best shown in Figs. 2 and 3, for a purpose to be referred to hereinafter. Support for the pan 53 within the fitting 42 is provided by a flange 55 extending outwardly from the top of the side and end walls of the pan 53. The flange 55 rests upon a ledge 56 which extends into the sump 50 from the side walls 49 and 51. Preferably, the ledge 56 extends transversely along an end wall 57 which forms a part of both the vertical neck portion 43 and the horizontally-extending portion 46.

The pan 53 is provided at its outer end with a resilient gasket 58 which is engageable with the end of the horizontally-extending portion 46 of the fitting 42 and defines therewith a water-tight

connection. The resilient gasket 58 is carried by a metal insert 59 which is secured in any well-understood manner, as by welding, to the front end of the pan 53.

During operation, the pan 53 is maintained within the sump 50 by a spring clamp 61 of the so-called fruit-jar type which compresses the resilient gasket 58. The clamp 61 includes a member 62, one end of which extends across and engages the resilient gasket 58 and the opposite end of the member 62 is pivotally connected as shown at 63, to a handle member 64. The handle 64 of the clamp 61 is pivoted, as shown at 65, in recesses formed in the respective top and bottom walls 46 and 48 of the fitting 42. Removal of the pan 53 from the sump 50 for cleaning is effected by manually actuating the handle 64 counterclockwise, as viewed in Fig. 3. After such movement, the member 62 may be swung about its pivotal connection 63 away from and clear of the gasket 58 so that the pan 53 may be withdrawn forwardly through the open end 52 of the sump 50. After cleaning, the pan 53 may be inserted in the sump 50 and the member 62 is then swung about the pivot 63 to the position shown in Fig. 3. The handle or clamping member 64 is then moved to the position shown in Fig. 3. As the pivot point 63 passes beyond a line extending through the center of the clamping member 62 and the pivotal connection 65, the handle member 64 will snap into place, as is well understood. When the pan 53 is assembled to the fitting 42, the resilient gasket will be maintained under compression by the clamping member 62.

The strained fluid passed to the sump 50 through the perforations 54 in the pan 53 is normally removed through an opening 66 formed in the wall member 49 of the fitting 42. Preferably, the outlet 66 is disposed opposite an imperforate portion of the pan 53 in order to prevent elongated objects, such as toothpicks, matches, etc., from passing through a perforation 54 and directly entering the opening 66. In this connection it will be understood that the perforate walls of the pan 53 are closely spaced with respect to corresponding opposing walls of the fitting 42 so that any elongated object which may enter a perforation 54 is restrained by the walls of the fitting 42 and prevented from leaving the pan. Preferably, the flexible conduit 29 which extends to the float switch structure 28 is also connected to a port 67 formed in the wall 57, said port 67 being arranged adjacent an imperforate region of the strainer pan 53 in order to prevent elongated objects from entering the conduit 29.

As the discharge of fluid from the sump 50 is normally through the outlet 66, foreign matter, such as lint, thread, soap curds, etc., would first collect in the strainer pan 53 adjacent its inner imperforate end. I have found that foreign matter collected by the pan 53 distributes itself mainly in the inner end of the pan 53 adjacent the discharge port 66 because the flow of fluid in the sump 50 is towards the discharge port 66. The body of collected matter builds up in the strainer pan 53 with the upper surface of the collected matter inclined downwardly and forwardly, as shown by the broken line 68. Certain fibrous portions of the collected matter extend through the openings in the strainer pan 53 and, if cleaning of the strainer is neglected, such matter may completely fill the space between the pan 53 and the walls 48, 49, and 51 so that a dam is defined by the collected matter



which prevents the passage of water to the outlet port 66. I have indicated at 69 a broken line which represents the bottom of the foreign matter which extends into the space between the pan 53 and the bottom wall 48. The foreign matter which extends through the perforations 54 will extend into the space between the pan 53 and the side walls 49 and 51, and the surfaces of the collected matter in these spaces are indicated by the broken lines 71 and 72 (see Fig. 3).

It will be apparent from the foregoing description that a dam is defined by the collected matter in the region of the sump 50 adjacent the outlet port 66 and may completely prevent the passage of fluid to the outlet port 66. I have found that this dam will form before all of the openings in the strainer become completely clogged and that the openings in the front end of the strainer 53 may be open while the openings in the rear end thereof are completely closed.

In order that the washing fluid remaining in the tub and the sump 50 may be removed when a complete stoppage of the strainer prevails, I provide a second outlet port 73 adjacent the front end of the fitting 42 and in a side wall 49 thereof. The port 73 is normally closed by a manually-operated valve 74. A projection or nozzle 75 is provided for directing the washing fluid passed by the valve 74 forwardly into a suitable receptacle which is positioned by the operator adjacent the opening 38 in the casing front wall, or a hose may be slipped over the nozzle 75 for the removal of the fluid to a suitable point of discharge. In either event, the tub 10 and the sump 50 are completely drained of fluid so that the strainer pan 53 may be removed without spillage of relatively large quantities of vitiated water upon the floor of the laundry. The auxiliary outlet port 73 is connected to the sump 50 on the downstream side of the strainer 53 so that fluid conveyed to the house drain through said opening is also strained. Furthermore, I prefer to locate the outlet port 73 opposite an imperforate portion of the pan 53 so that the passage of elongated objects to the port 73 and the house drain is prevented. The organization of strainer elements which I have disclosed heretofore provides for the location of the port 73 and valve 74 at the front of the strainer mechanism where they are accessible to the operator.

Preferably, the top wall 46 of the fitting 42 is sloped upwardly, as shown in Fig. 2, for facilitating the removal of the pan 53, it being understood that the pan 53 may be tilted upwardly slightly as it is being withdrawn from the fitting 42. Sloping of the wall 46 upwardly also facilitates the insertion of the flange 55 on the ledge 56 when the pan 53 is assembled to the fitting 42.

Removal of fluid from the sump 50 through the outlet port 66 is effected by a pump 81, the inlet of which is connected by means of a conduit 82 to the outlet port 66. The pump 81 discharges the fluid through a conduit 83 which extends through the rear of the casing 32 and upwardly to a point above the normal level of the water in the tub 10. Accordingly, the pump 81 is continuously flooded, it being understood that when the tub 10 contains a charge of water, the sump 50 and the pump 81 will also be filled and the conduit 83 partly so. The conduit 83 is adapted to be connected to a suitable point of discharge for the vitiated water, such as a stationary wash tub.

The pump 81 is provided with a driving pulley 75

84 which is normally maintained out of engagement with the belt 26, at which time the pump 81 is inactive. Operation of the pump 81 is effected by moving the belt 26 into engagement with the pulley 84 so that the pump 81 is driven at substantially constant speed by the motor 24. Movement of the belt 26 into engagement with the pump pulley 84 is effected by a roller 85 carried by an arm 86 which is pivoted at 87 to a suitable support. The arm 86 is moved in clockwise direction by an electro-magnet 88 when the latter is energized and such movement of the arm 86 effects engagement of the roller 85 with the belt 26 and engagement of the belt 26 with the pump pulley 84. When the electro-magnet is deenergized, the roller returns to the position shown in the drawings and operation of the pump 81 is terminated. It will be apparent from the foregoing that the pump 81 is driven at substantially constant speed by the constant speed belt 26 irrespective of whether the washer basket 14 is operated at low speed or high speed. In this connection it will be understood that during operation of a washing machine of the type described, water may be discharged by the pump 81 during both slow and high speed operation of the basket.

From the foregoing description, it will be apparent that I have provided improved apparatus for draining vitiated cleaning fluid from a cleaning machine and for separating foreign matter, carried in suspension, therefrom prior to the discharge of the fluid from the cleaning machine. It will be understood that my invention may be applied to various forms of cleaning machines and that the oblique axis, cylindrical basket type is shown merely by way of example.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In cleaning apparatus, the combination of a tub for containing cleaning fluid and having a drain opening therein, a fitting secured to the tub and having wall members defining a sump for receiving fluid passed through the drain opening, said sump having an inner rear portion arranged adjacent said drain opening and an outer forward portion extending laterally from beneath the drain opening, and being open at its outer end, a cover for closing the open end of the sump, spring means carried by the fitting and biasing said cover into engagement with the body, a ledge carried by said wall members within the sump, a pan having bottom and side walls and a flange disposed at the top of the side walls and resting on said ledge, said bottom and side walls of the pan having their inner rear portions imperforate and their outer forward portions perforate, said bottom and side walls of the pan being closely spaced from the wall members of the fitting, said fitting having first and second fluid discharge ports formed in the walls thereof for removing fluid from the downstream side of said pan, said first port being arranged opposite the imperforate region of said pan adjacent the drain opening and said second port being spaced therefrom and disposed adjacent the open end of the sump, a valve for closing the second port and manually operable for draining



the sump, and means for normally conveying fluid from said first port.

2. In cleaning apparatus, the combination of a tub for containing cleaning fluid and having a drain opening therein, a fitting carried by the tub and having wall members enclosing a sump, the inner rear portion of which extends vertically beneath said drain opening and the outer forward portion of which extends generally horizontally from the vertically-extending portion, said fitting having an access opening formed in the front thereof, a generally horizontal ledge carried by said wall members and disposed in part within said forward portion of the sump, a generally rectangular pan having side walls and a bottom wall, said side walls of the pan having

an outwardly-extending flange carried by the ledge, a closure for said access opening and secured to the front side wall of the pan, means for biasing the closure into engagement with the fitting, said side and bottom walls of the pan being spaced from the wall members of the fitting and being imperforate at their inner ends, the outer, forward portions of the side and bottom walls of the pan being perforate, said fitting having a first discharge port for fluid formed in the portion thereof opposite the imperforate portion of the walls of the pan and a second discharge port for fluid formed in the portion thereof adjacent said access opening and a valve member for closing the second discharge port.

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