Feb. 17, 1942. B. BARON 2,273,170

CLEANING APPARATUS

Filed March 13, 1940 2 Sheets-Sheet 1

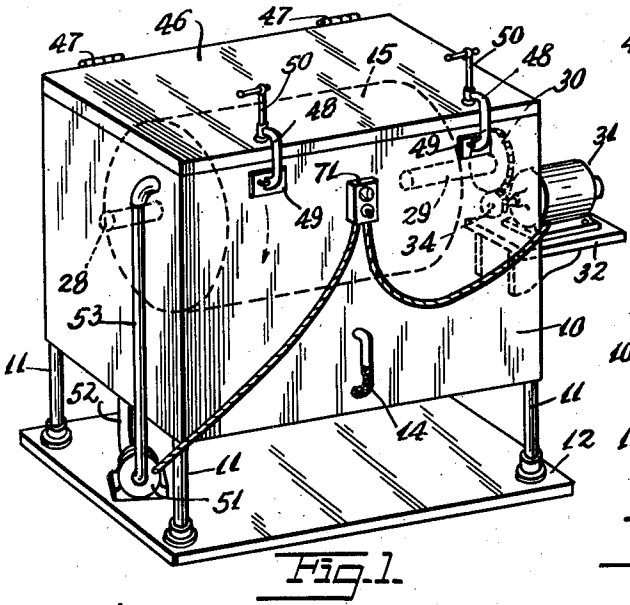

Fig. 1.

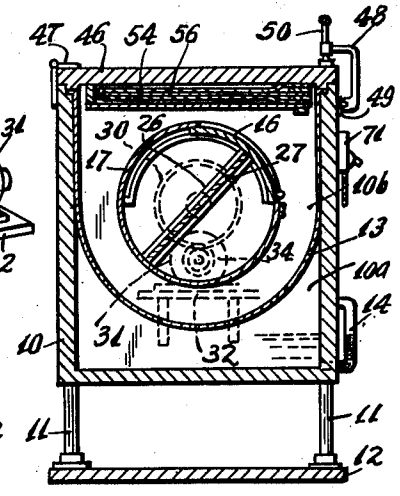

Fig. 3.

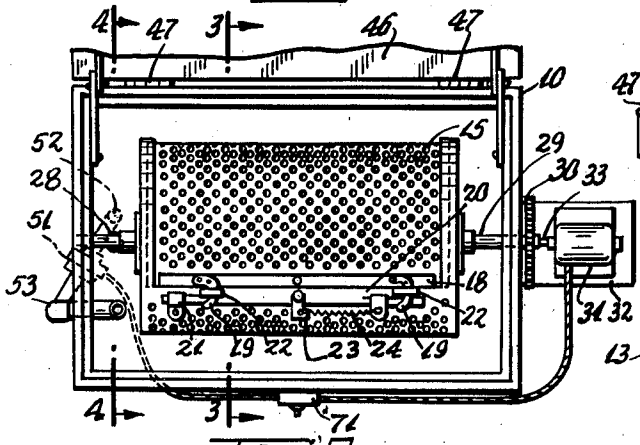

Fig. 2.

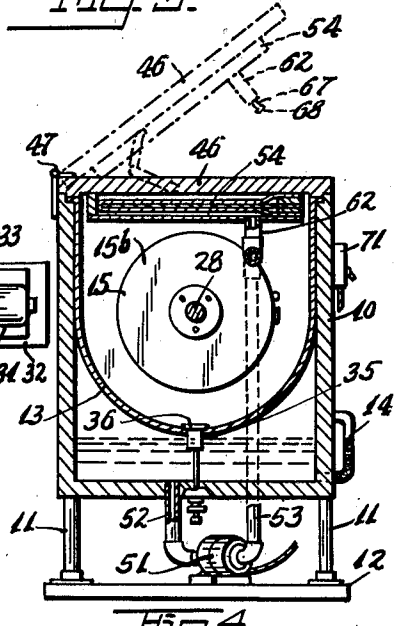

Fig. 4.

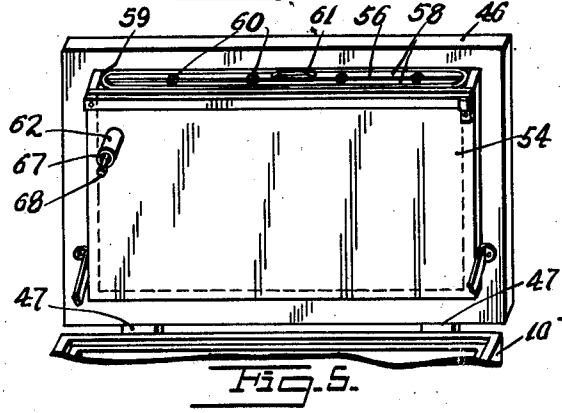

Fig. 5.

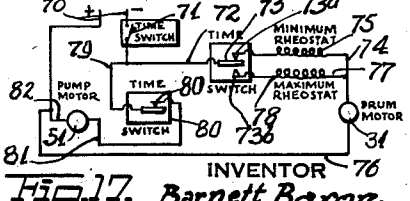


Fig. 17.

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CLEANING APPARATUS

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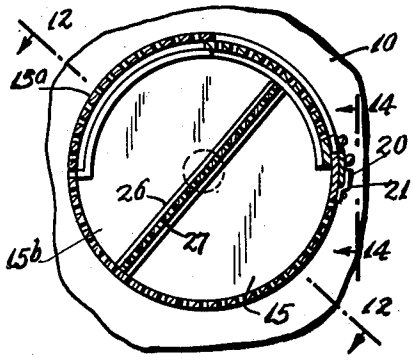


Fig. 11.

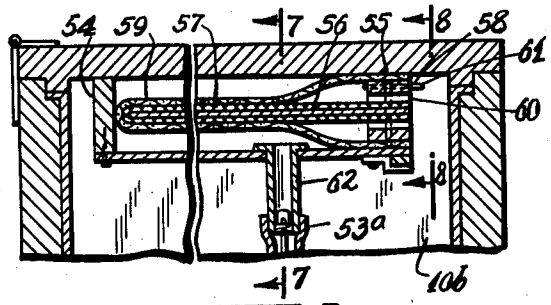


Fig. 6.

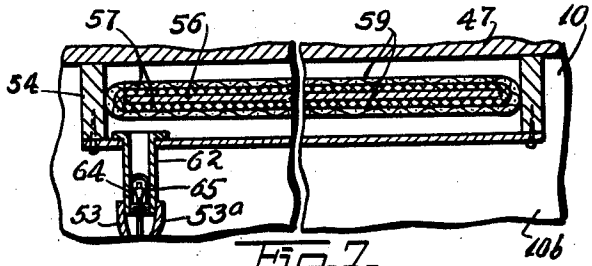


Fig. 7.

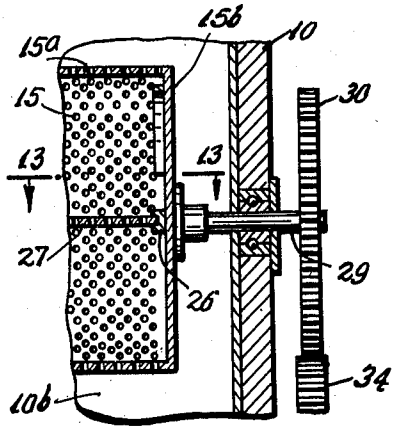


Fig. 12.

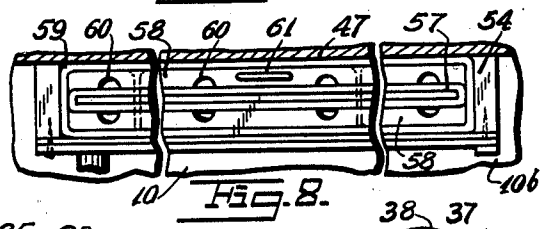


Fig. 8.

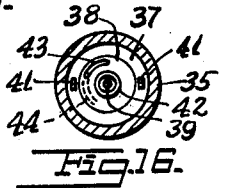


Fig. 16.

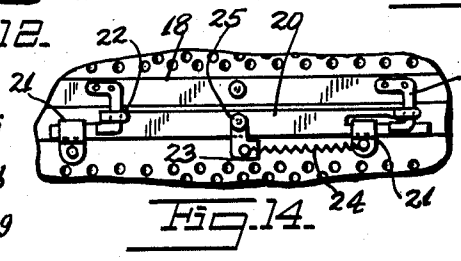


Fig. 14.

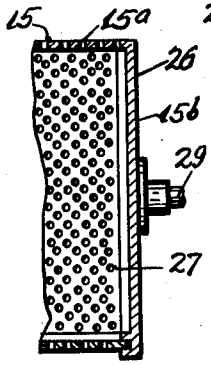


Fig. 13.

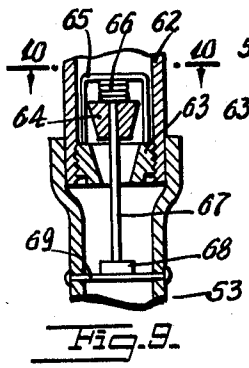


Fig. 9.

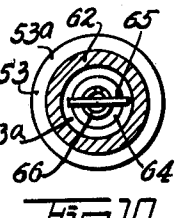


Fig. 10.

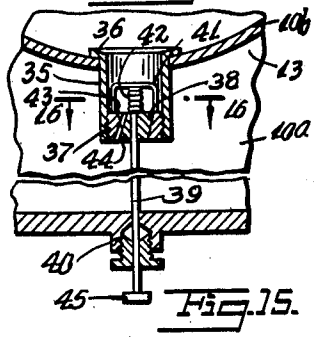


Fig. 15.

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2,273,170

# UNITED STATES PATENT OFFICE

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## CLEANING APPARATUS

Barnett Baron, New York, N. Y.

Application March 13, 1940, Serial No. 323,777

7 Claims. (Cl. 68—18)

This invention relates to new and useful improvements in a cleaning apparatus.

The invention has for an object the construction of a cleaning apparatus characterized by the provision of a housing having a partition located therein for dividing the same into a reservoir chamber for cleaning fluid within the bottom portion thereof, and a cleaning fluid chamber in the top portion thereof and within which a perforated drum is rotatively mounted and arranged in a manner to receive the clothing to be cleaned.

Still further it is proposed to provide a pumping system for pumping the cleaning fluid from the reservoir to the cleaning fluid chamber and arranged to pump the fluid to the cleaning fluid chamber at a greater speed than bypass permits the cleaning fluid to flow back into the reservoir from the cleaning fluid chamber.

Still further it is proposed to characterize the pumping system by a removable strainer between the pump and the cleaning fluid chamber to strain all of the cleaning fluid from the cleaning fluid chamber.

Still further it is proposed to construct the device in such a manner that the drum will rotate at a given speed while the cleaning fluid is being circulated through the device and to stop the circulation of the fluid to permit all of the fluid to drain from the cleaning fluid chamber into the reservoir, and to then step up the rotation of the drum to centrifugally throw as much of the cleaning fluid as possible out of the clothing at the completion of the cleaning process.

Still further it is proposed to arrange an adjustable valve between the cleaning fluid chamber and the reservoir which is adapted to be adjusted as desired for controlling the rate of flow of the cleaning fluid from the cleaning fluid chamber to the reservoir.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a perspective view of a cleaning apparatus constructed in accordance with this invention.

Fig. 2 is an elevational view of Fig. 1 with the cover in the open position.

Fig. 3 is a vertical sectional view on the line 3—3 of Fig. 2.

Fig. 4 is a vertical sectional view on the line 4—4 of Fig. 2.

Fig. 5 is a perspective view of the cover in the open position.

Fig. 6 is an enlarged detailed view of a portion of Fig. 4.

Fig. 7 is a sectional view on the line 7—7 of Fig. 6.

Fig. 8 is a sectional view on the line 8—8 of Fig. 6.

Fig. 9 is an enlarged detailed view of a portion of Fig. 6.

Fig. 10 is a horizontal sectional view on the line 10—10 of Fig. 9.

Fig. 11 is an enlarged view of the drum.

Fig. 12 is a sectional view on the line 12—12 of Fig. 11.

Fig. 13 is a sectional view on the line 13—13 of Fig. 12.

Fig. 14 is an enlarged detailed view looking in the direction of the line 14—14 of Fig. 11.

Fig. 15 is an enlarged detailed view of a portion of Fig. 4.

Fig. 16 is a horizontal sectional view on the line 16—16 of Fig. 15.

Fig. 17 is a schematic wiring diagram of the device.

The cleaning apparatus, according to this invention, includes a housing 10 having an open top. This housing 10 is supported by several legs 11 which rest upon a base 12 which is adapted to be secured to a floor or similar surface. The interior of the housing 10 is subdivided into a bottom reservoir chamber $10^a$ and a top cleaning fluid chamber $10^b$. The division of the interior of the housing 10 is accomplished by means of a partition 13 having a U-shaped cross section and attached to the interior faces of the walls of the housing. The reservoir $10^a$ is adapted to contain a cleaning fluid of the type commonly used for cleaning clothes.

This housing 10 is further provided with a gauge 14 for indicating the amount of cleaning fluid in the reservoir $10^a$. This gauge 14 comprises a U-shaped glass tube having the ends of its free arms connected with the interior of the reservoir $10^a$. The intermediate arm of the glass tube 14 extends vertically along the outside face of the housing 10. Due to the fact that liquid normally seeks its own level, a quantity of the fluid will pass into the tube 14 from within the reservoir $10^a$ and indicate the level of cleaning fluid within the reservoir.

A perforated drum 15 is rotatively mounted within the cleaning fluid chamber $10^b$ and is

adapted to receive the material or clothing to be cleaned. This drum comprises a circular body portion 15a closed at its ends by means of solid discs 15b. The body portion 15a has an open side closed by means of a door 16 which is also perforated throughout. This door 16 is slidably mounted within tracks 17 formed on the inside faces of the discs 15b. A novel means is provided for holding the door 16 in its closed position. This means comprises a strip 18 attached to the free edge of the door 16 and is provided with a pair of downwardly extending hooks 19. The adjacent edge of the drum body 15a is provided with a strip 20 slidably mounted in bearings 21 fixedly attached to the drum body 15a. This strip 20 is provided with a pair of hooks 22 which are adapted to engage the hooks 19 and prevent the door 16 from being moved to an open position.

A means is provided for resiliently urging the strip 20 into a position in which the hooks 22 will be continuously engaged with the hooks 19. This means comprises a downwardly extending projection 23 mounted upon the strip 20. A spring 24 of the contraction type operates between the strip 20 and one of the bearings 21 for urging the strip 20 into a position in which the hooks 22 will engage the hooks 19. A knob 25 is mounted upon the projection 23 and is adapted to be manually grasped for sliding the strip against the holding action of the spring 24 to disengage the hooks 22 from the hooks 19 and permit the door 10 to be moved to an open position.

The interior of the drum 15 is further provided on the discs 15b with a pair of diametrically extending tracks 26. A perforated shelf 27 is adapted to be engaged within the tracks 26 by being passed through the opening formed in the drum and provides a member upon which hats or other similar articles not to be crushed are adapted to be mounted to permit them to be conveniently cleaned. This shelf 26 is removable and is adapted to be slid from the interior of the drum 15 when articles of wearing apparel such as suits, dresses and the like are to be cleaned by the apparatus.

One end of the drum 15 is rotatively supported by means of a shaft 28. The other end of the drum 15 is rotatively supported by means of a shaft 29 which extends to the exterior of the housing 10 and carries a large gear 30. A means is provided for rotating the gear 30 to correspondingly rotate the drum 15. This means comprises a motor 31 fixedly mounted on a shelf 32 attached to the end wall of the housing beneath the gear 30. The drive shaft 33 of the motor 31 carries a small gear 34 which meshes with the gear 30. As the motor 31 is operating the drive shaft 33 will be turned and rotations thereof will be transmitted to the drum 15 through the medium of the gears 30 and 34.

A bypass capable of being regulated is arranged between the cleaning fluid chamber and the reservoir 10a for controlling the flow of the cleaning fluid from the chamber 10b to the reservoir 10a. This bypass comprises a tubular member 35 mounted through the partition 13. This tubular member 35 is provided with an outwardly extending top flange 36 by which it is securely attached to the top face of the partition 13. An element 37 is threadedly engaged into the bottom end of the tubular member 35 and is provided with a conical shaped opening. A conical shaped member 38 engages into the conical shaped opening in the element 37. A stem 39 extends from the conical shaped member 38 through the bottom wall of the housing 10. A packing gland 40 is provided on the bottom wall of the housing 10 and engages around the stem 39 for preventing the loss of cleaning fluid therethrough.

A bridging element 41 has its ends attached to the face of the element 37 and extends across the top face of the conical shaped member 38 and is spaced therefrom. A spring 42 operates between the bridging element 41 and the top face of the conical shaped member 38 for urging the conical shaped member into the conical shaped opening forming in the element 37. The conical shaped member 38 is formed with an opening 43 which is adapted to be aligned with a complementary opening 44 formed in the element 37. These openings 43 and 44 are arranged in an arc about the stem 39 as a center. The extended end of the stem 39 is provided with a handle 45 by which the stem 39 may be conveniently turned to align and disalign the openings 43 and 44 to control the flow of the cleaning fluid from the cleaning fluid chamber 10b to the reservoir 10a.

A cover 46 is provided for closing the open top of the housing 10. This cover 46 has one of its edges pivotally supported by means of a pair of hinges 47. A means is provided for tightly clamping the cover 46 in its closed position.

This means comprises a pair of spaced U-shaped members 48 which have one of their arms pivotally attached to plates 49 securely attached to the front face of the housing 10. The free ends of the brackets 48 are adapted to be pivoted to extend across the top edge portion of the cover 46. Each of these free ends is provided with a screw 50 which is adapted to be tightened to bear agains a top face of the cover 46 and to hold the same in a tightly closed position.

A pumping system is provided for drawing the cleaning fluid from the reservoir 10a and discharging the same into the cleaning fluid chamber 10b. More specifically, this pumping system is characterized by a centrifugal pump 51 mounted upon the base 12. A pipe 52 connects with the interior of the reservoir 10a and with the pump 51 for permitting the operation of the pump to draw the cleaning fluid from the reservoir 10a. A second pipe 53 connects the pump 51 with the interior of the cleaning fluid chamber 10b for discharging the cleaning fluid into the cleaning fluid chamber 10b. The pump 51 is electrically operated and is capable of supplying the cleaning fluid to the cleaning fluid chamber 10b at a speed greater than the bypass is capable of permitting the fluid to pass from the chamber 10b back into the reservoir 10a.

The discharge end of the pipe 53 is connected with a strainer mounted upon the bottom face of the cover 46 for straining all of the cleaning fluid before it enters the chamber 10b. This strainer is characterized by a flat container 54 mounted on the inside face of the cover 46 and which has an open side 55. A removable strainer is adapted to be engaged into the container 54 through the open side 55. More specifically, this strainer is characterized by a metallic plate 56 extending from the open side of the container 54 to a position adjacent the opposite side thereof.

A piece of cloth 57 is engaged around the plate 56 and is securely held in position by means of bars 58 securely attached to the opposite faces of the metallic plate 56. A second strip of cloth material 58 is engaged around the cloth material 57 and has its free edges securely attached to the outside faces of the bars 58. The bars 58

are provided with openings 60 arranged in a manner to require the cleaning fluid to pass through the filter strip of cloth material 59 before it may pass into the cleaning fluid chamber 10b.

One of the bars 58 is provided with a handle 61 which is adapted to be grasped for pulling the strainer from within the container 54 for permitting the pieces of cloth material 57 and 59 to be interchanged when they become clogged with dirt strained from the cleaning fluid. A novel means is also provided for connecting the interior of the container 54 with the discharge end of the pipe 53. This means comprises a small section of pipe 62 which connects with the interior of the container 54. This pipe 62 is adapted to engage into an enlarged opening 53a formed on the free end of the pipe 53. The cleaning fluid passing up the pipe 53 will enter the pipe 62 and pass into the container 54 through the pieces of filter cloth 57 and 59 and discharge through the openings 60.

The pipe 62 is also provided with a novel means for closing the end thereof when the cover 46 is moved to an open position to prevent any cleaning fluid remaining therein from dripping therefrom. This means comprises a valve having an element 63 rotatively extended into the bottom of the passage 62. This element 63 has a conical shaped opening and a conical shaped member 64 is adapted to engage into the conical shaped opening for closing the same. A bridging element 65 is attached to the element 63 and extends across the top face of the conical shaped member 64 and is spaced therefrom.

A spring 66 operates between the bridging element 65 and the top face of the conical shaped member for urging the same into a closed position when the cover 46 is in an open position. However, when the pipe 62 is engaged into the end of the pipe 53 a means is provided for urging the conical shaped member 64 into an open position as shown in Fig. 9 to permit the cleaning fluid to pass therethrough. This means comprises a stem 67 extending from the conical shaped member 64 and which is provided with an enlarged head 68. A pin 69 is diametrically across the interior of the pipe 53. When the pipe 62 is engaged into the pipe 53 the head 68 is adapted to strike the pin 69 and urge the conical shaped member 64 into an open position against the holding action of the spring 66.

A novel electrical means is provided for controlling the operation of the pump motor 51 and the drum motor 31. The electrical connections for this novel operation are shown in Fig. 17 and comprise a pair of leads 70 which are connected with a source of power. One of the leads 70 is provided with a main time switch 71 which is adapted to be manually closed for completing the electric circuit.

The electrical connection for the drum motor 31 will first be given. This means comprises a lead 72 extending from the time switch 71 and which connects with a second time switch 73. This time switch 73 has a pair of spaced contacts 73a and 73b. A lead 74 extends from the contact 73a and connects with one pole of the drum motor 31. This lead 74 carries a minimum rheostat 75. A lead 76 connects with the other pole of the motor 31 and back to the source of power. A lead 77 connects with the other contact 73b of the time switch 73 and the lead 74. This lead 77 carries a maximum rheostat 78.

The connection of the pump motor 51 is as follows:

A lead 79 connects with the lead 72 between the time switch 71 and the time switch 73 and is connected with a third time switch 80 having a contact 80a. The contact 80a of the time switch 80 has a lead 81 connected therewith and which is also connected with one pole of the pump motor 51. A lead 82 connects with the other pole of the pump motor 51 and carries back to the source of power.

When the main time switch 71 is closed electric current will pass through the time switch 80 and supply current to the electric pump motor 51 for pumping the cleaning fluid from the reservoir 10a to the cleaning fluid chamber 10b. Current will also pass through the lead 72 and the contact 73a of the time switch 73 and through the minimum rheostat 75 to provide a minimum of electric current to the drum motor 31 to turn the drum 15 slowly while the cleaning fluid is being circulated through the cleaning apparatus for cleansing the clothes contained within the drum 15. After the pump motor 51 has been in operation for a given period of time, controlled by the switch 80, the switch 80 will open and the pump will no longer circulate the fluid through the cleaning apparatus.

The drum 15 will continue to rotate slowly for a given amount of time, permitting all the cleaning fluid within the chamber 10b to pass through the bypass and into the reservoir 10a. After all the fluid has passed from the cleaning fluid chamber the time switch 73 will switch to cause the current to pass through the contact 73b and maximum rheostat 78 to step up the rotation of the drum motor 31. This will cause the drum 15 to rotate at a much greater speed to permit centrifugal force to throw off the cleaning fluid from the clothes within the drum 15. After the drum 15 has rotated at this high speed for a given amount of time, the time switch 71 will automatically open and the cleaning operation will be complete.

The operation of this invention is as follows:

The cover 46 is moved to its open position and the cover 16 of the drum 15 is also opened to permit the clothing to be engaged within the perforated drum 15. The cover 16 is then closed and the cover 46 is also closed. The apparatus is then ready for cleaning clothes. The same is accomplished by manually closing the time switch 71 mounted upon the face of the housing 10. The closing of the time switch 71 will cause the time switches 73 and 80 to automatically operate to circulate the cleaning fluid through the cleaning apparatus to stop the circulation and step up the rotation of the drum 15 to centrifugally throw off the cleaning fluid from the clothing and to stop the rotation of the drum when the cleaning fluid is all thrown therefrom. After the cleaning operation has been completed the cover 46 is again opened and the cover 16 is also opened and the cleaning clothing is removed from the drum 15.

It is to be understood that one or more filter units may be used with the same outlet, in this device, of any desired shape.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patents is:

1. A cleaning apparatus, comprising an open top housing, said housing being partitioned to form a reservoir chamber in its bottom portion and a cleaning fluid chamber above said reservoir chamber and in the top portion thereof, a perforated drum rotatively mounted in said cleaning fluid chamber for receiving and holding material to be cleaned, means for rotating said drum, a regulated by-pass to allow cleaning fluid to flow from said cleaning fluid chamber to said reservoir chamber, a cover for said housing, a removable strainer for said cleaning fluid mounted on the bottom face of said cover, and a pumping system for drawing cleaning fluid from said reservoir chamber and discharging it through said strainer into said cleaning fluid chamber.

2. A cleaning apparatus, comprising an open top housing, said housing being partitioned to form a reservoir chamber in its bottom portions and a cleaning fluid chamber above said reservoir chamber and in the top portion thereof, a perforated drum rotatively mounted in said cleaning fluid chamber for receiving and holding material to be cleaned, means for rotating said drum, a regulated by-pass to allow cleaning fluid to flow from said cleaning fluid chamber to said reservoir chamber, a cover for said housing, a removable strainer for said cleaning fluid mounted on the bottom face of said cover, and a pumping system for drawing cleaning fluid from said reservoir chamber and discharging it through said strainer into said cleaning fluid chamber, said by-pass comprising a valve arranged between said cleaning fluid chamber and said reservoir and having a control stem extending to the exterior of said housing.

3. In a cleaning apparatus, an open top housing, a rotatively mounted perforated drum mounted in said housing for receiving and holding material to be cleaned, a cover for closing the open top of said housing, a container mounted on the bottom face of said cover, a strainer for said cleaning fluid mounted within said container, a pumping system for drawing said cleaning fluid from said housing and discharging it through said strainer again into said housing, said pumping system, comprising a pump, a pipe extending between the bottom of said housing and the intake of said pump, a second pipe having one of its ends connected to the discharge side of said pump and its free end projected into said housing and vertically upwards to a position slightly below the bottom wall of said container, a short pipe extending from said container and into the free end of said second pipe causing said cleaning fluid to pass through said container before re-entering said housing, and a valve for closing the open end of said short pipe in the open position of said cover.

4. In a cleaning apparatus, an open top housing, a rotatively mounted perforated drum mounted in said housing for receiving and holding material to be cleaned, a cover for closing the open top of said housing, a container mounted on the bottom face of said cover, a strainer for said cleaning fluid mounted within said container, a pumping system for drawing said cleaning fluid from said housing and discharging it through said strainer again into said housing, said pumping system, comprising a pump, a pipe extending between the bottom of said housing and the intake of said pump, a second pipe having one of its ends connected to the discharge side of said pump and its free end projected into said housing and vertically upwards to a position slightly below the bottom wall of said container, a short pipe extending from said container and into the free end of said second pipe causing said cleaning fluid to pass through said container before re-entering said housing, and a valve for closing the open end of said short pipe in the open position of said cover, said valve, comprising an element having a concentric conical shaped opening mounted within the end of said short pipe, a conical shaped member engageable into said conical shaped opening, resilient means urging said conical shaped member into a closed position in the open position of said cover, and means urging said conical shaped member into an open position against the action of said resilient means in the closed position of said cover.

5. In a cleaning apparatus, an open top housing, a rotatively mounted perforated drum mounted in said housing for receiving and holding material to be cleaned, a cover for closing the open top of said housing, a container mounted on the bottom face of said cover, a strainer for said cleaning fluid mounted within said container, a pumping system for drawing said cleaning fluid from said housing and discharging it through said strainer again into said housing, said pumping system, comprising a pump, a pipe extending between the bottom of said housing and the intake of said pump, a second pipe having one of its ends connected to the discharge side of said pump and its free end projected into said housing and vertically upwards to a position slightly below the bottom wall of said container, a short pipe extending from said container and into the free end of said second pipe causing said cleaning fluid to pass through said container before re-entering said housing, and a valve for closing the open end of said short pipe in the open position of said cover, said valve, comprising an element having a concentric conical shaped opening mounted within the end of said short pipe, a conical shaped member engageable into said conical shaped opening, resilient means urging said conical shaped member into a closed position in the open position of said cover, and means urging said conical shaped member into an open position against the action of said resilient means in the closed position of said cover, said resilient means, comprising an inverted U-shaped bridging element having the ends of its side arms attached to the top face of said element having said conical shaped opening, said bridging element having its intermediate arm spaced from the top face of said element having said opening, and an expansion spring operating between the adjacent faces of the intermediate arm of said bridging element and said conical shaped member.

6. In a cleaning apparatus, an open top housing, a rotatively mounted perforated drum mounted in said housing for receiving and holding material to be cleaned, a cover for closing the open top of said housing, a container mounted on the bottom face of said cover, a strainer for said cleaning fluid mounted within said container, a pumping system for drawing said cleaning fluid from said housing and discharging it through said strainer again into said housing, said pumping system, comprising a pump, a pipe extending between the bottom of said housing

and the intake of said pump, a second pipe having one of its ends connected to the discharge side of said pump and its free end projected into said housing and vertically upwards to a position slightly below the bottom wall of said container, a short pipe extending from said container and into the free end of said second pipe causing said cleaning fluid to pass through said container before re-entering said housing, and a valve for closing the open end of said short pipe in the open position of said cover, said valve, comprising an element having a concentric conical shaped opening mounted within the end of said short pipe, a conical shaped member engageable into said conical shaped opening, resilient means urging said conical shaped member into a closed position in the open position of said cover, and means urging said conical shaped member into an open position against the action of said resilient means in the closed position of said cover, said latter-mentioned means, comprising a vertical stem extending from the bottom face of said conical shaped member, a pin mounted diametrically across the interior of said second pipe at a point spaced from the bottom end of said short pipe when projected into said second pipe, and an enlarged head mounted on the bottom end of said stem and engageable against said pin when said short pipe is extended into said second pipe for opening said valve.

7. In a cleaning apparatus, an open top housing, a rotatively mounted perforated drum mounted in said housing for receiving and holding material to be cleaned, a cover for closing the open top of said housing, a container mounted on the bottom face of said cover, a strainer for said cleaning fluid mounted within said container, a pumping system for drawing said cleaning fluid from said housing and discharging it through said strainer again into said housing, said pumping system, comprising a pump, a pipe extending between the bottom of said housing and the intake of said pump, a second pipe having one of its ends connected to the discharge side of said pump and its free end projected into said housing and vertically upwards to a position slightly below the bottom wall of said container, a short pipe extending from said container and into the free end of said second pipe causing said cleaning fluid to pass through said container before re-entering said housing, and a valve for closing the open end of said short pipe in the open position of said cover, said second pipe having its free end enlarged permitting said short pipe to be engaged therein.

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