United States Patent

[11] **3,630,369**

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[21] Appl. No. **37,569**
[22] Filed **May 15, 1970**
[45] Patented **Dec. 28, 1971**

[54] **MOP CLEANING DEVICE**
12 Claims, 7 Drawing Figs.

[52] **U.S. Cl.** **210/152,** 210/167, 210/186, 210/187, 210/241, 15/264
[51] **Int. Cl.** **B01d 35/02,** B01d 21/02
[50] **Field of Search** 15/98, 262, 264; 210/152, 167, 241, 194, 186, 187

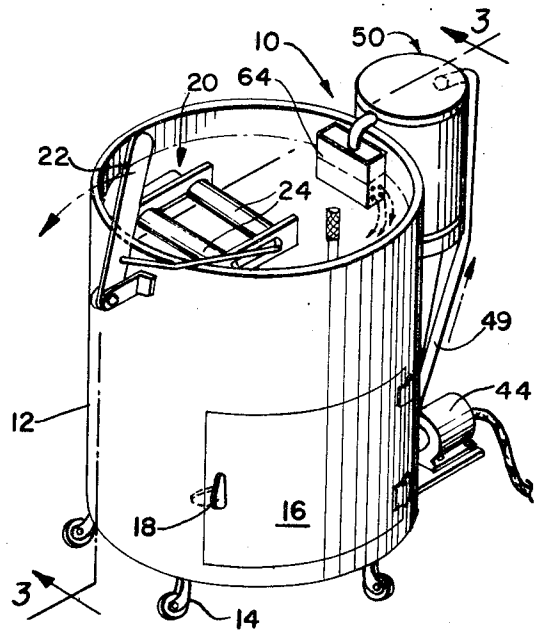
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ABSTRACT: A mop cleaning device wherein a supply of cleaning fluid is circulated through a container while sediment is separated from the fluid. A sloped wall extends from an upper portion of the container to a lower portion thereof, with a discharge opening extending through the wall, whereby heavy sediment from the cleaning fluid is collected on the wall and discharged through the opening.



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SHEET 1 OF 2

FIG. 1.

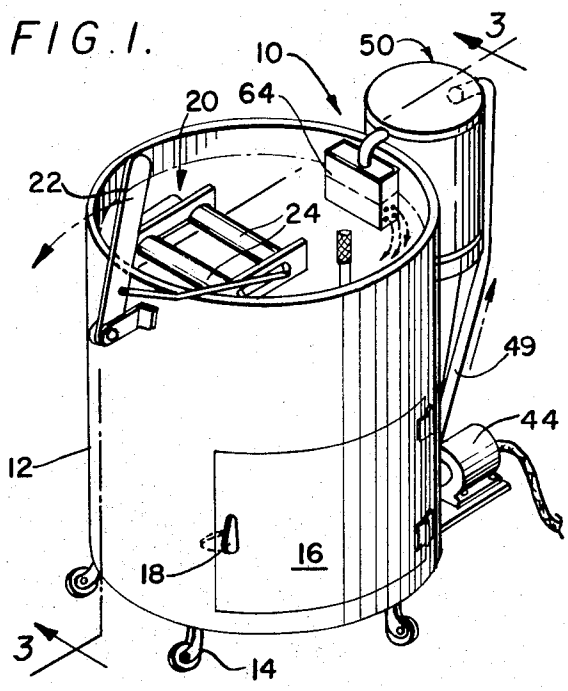


FIG. 2.

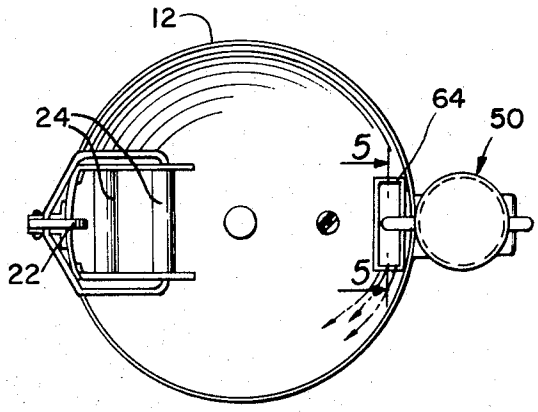


FIG. 3.

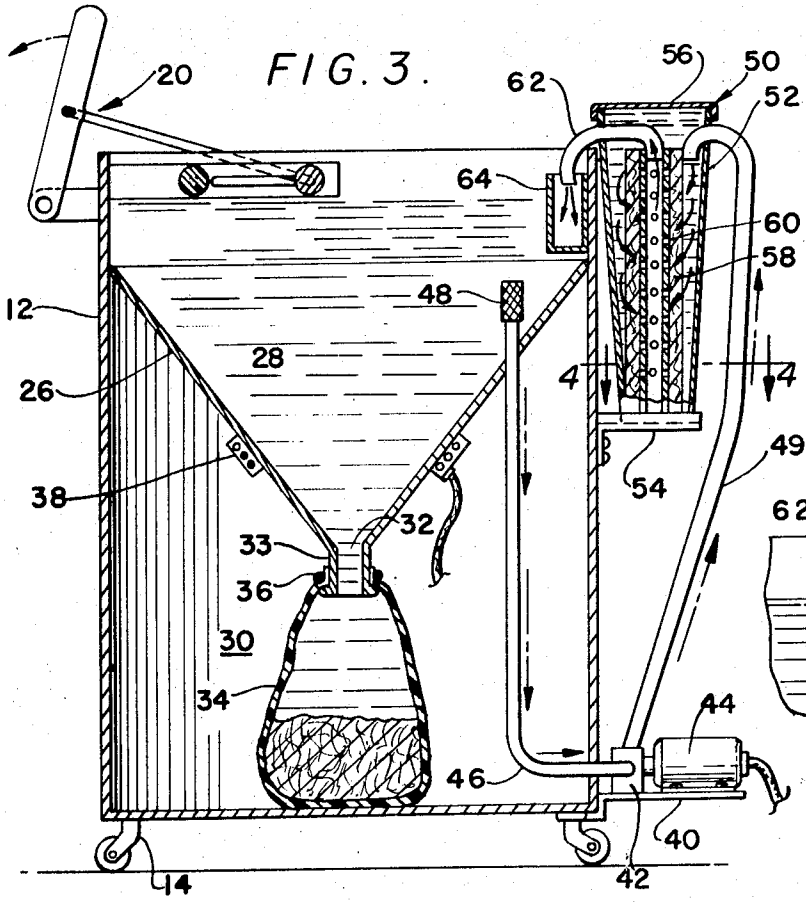


FIG. 4.

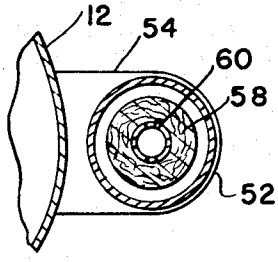
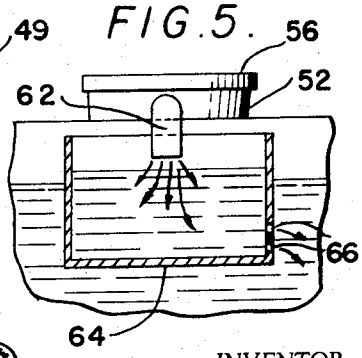


FIG. 5.



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FIG. 6.

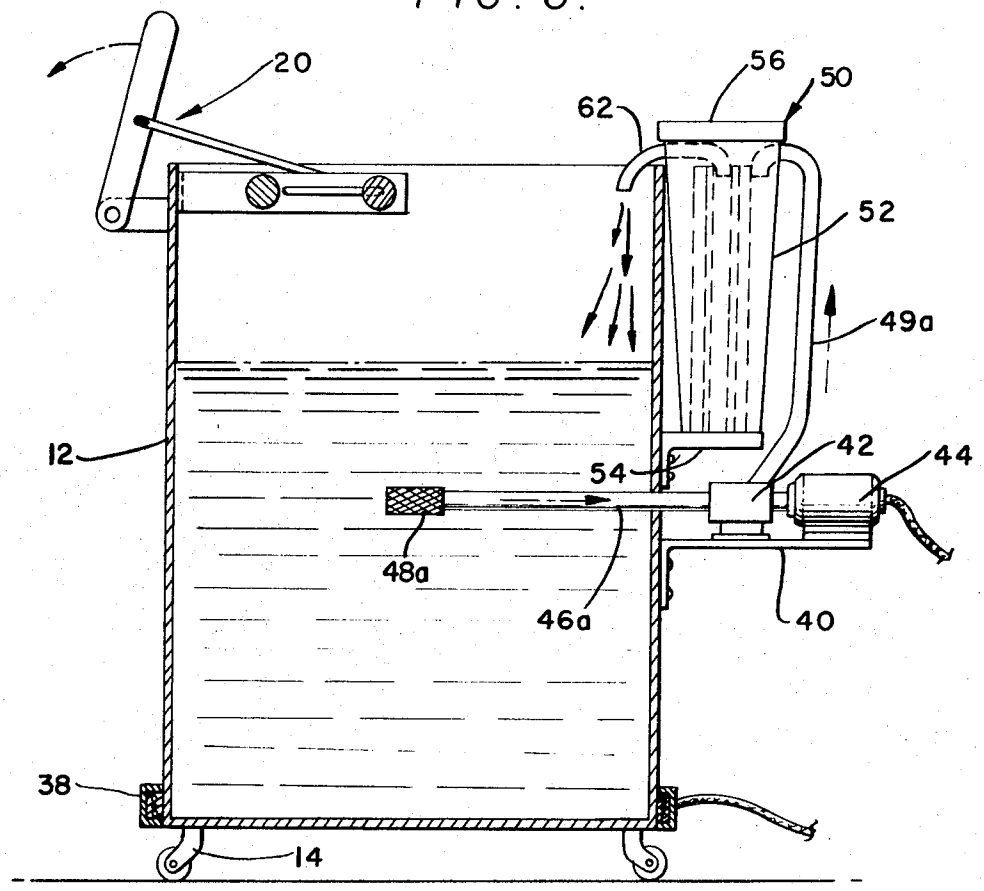
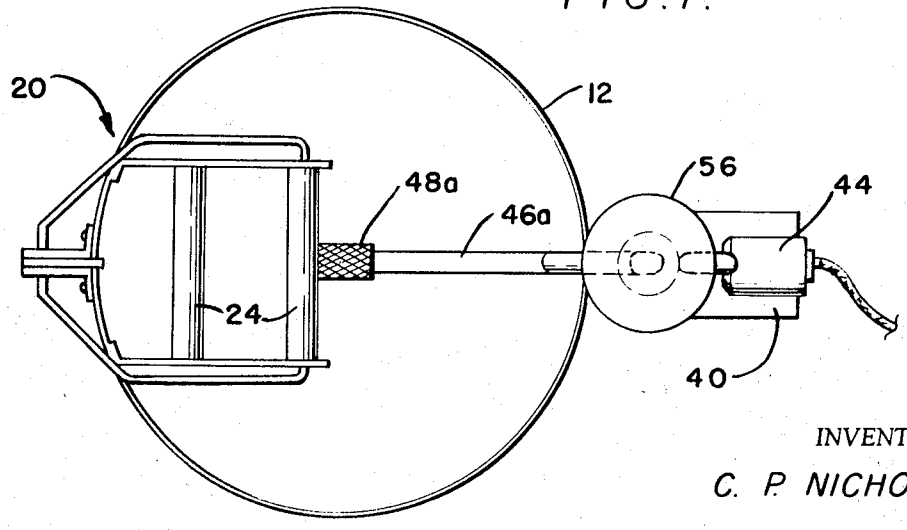


FIG. 7.



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MOP CLEANING DEVICE

BACKGROUND OF THE INVENTION

This present invention relates to a mop cleaning device and, more particularly, to such a device wherein sediment is continuously separated from a cleaning fluid in a container.

In home as well as in industrial floor-cleaning applications, the most popular method of cleaning a mop is to frequently dip the mop into a bucket, which is initially supplied with clean water. The sediment collected by the mop is deposited in the bucket and as a result, the bucket must be emptied and supplied with fresh clean water several times during a cleaning operation. This, or course, adds time and effort to the cleaning operation, and becomes a very expensive with respect to labor costs especially on a large-scale commercial cleaning basis.

Although several attempts have been made to eliminate the shutdown time involved in emptying a mop bucket, including those which feature the use of self-powered buckets, these systems involve complicated and expensive machinery.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a device for cleaning mops which is simple and inexpensive to operate, yet insures a fresh, clean readily available supply of water at all times without necessitating any shutdown time.

It is a further object of the present invention to provide a device for cleaning mops which reduces water pollution.

Toward the fulfillment of these objects the mop cleaning device of the present invention comprises a container for mop cleaning fluid, means carried by said container for separating relatively heavy sediment from the fluid in said container, and means carried by said container for separating relatively light sediment from said fluid.

BRIEF DESCRIPTION OF THE DRAWINGS

Reference is now made to the accompanying drawings for a better understanding of the nature and objects of the present invention. The drawings illustrate the best mode presently contemplated for carrying out the objects of the invention and are not to be construed as restriction or limitations on its scope. In the drawings:

FIG. 1 is a perspective view of the mop cleaning device of the present invention;

FIG. 2 is a top plan view of the device of FIG. 1;

FIG. 3 is an enlarged vertical cross-sectional view taken along the line 3—3 of FIG. 1;

FIG. 4 is a partial sectional view taken along the line 4—4 of FIG. 3;

FIG. 5 is a partial enlarged section view of the device of FIGS. 1–3;

FIG. 6 is a view similar to FIG. 3, but depicting an alternate embodiment of the present invention; and

FIG. 7 is a top plan view of the device of FIG. 6.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the embodiment of FIGS. 1–5, the reference numeral 10 refers in general to the mop cleaning device of the present invention which consists of a container 12 having a plurality of casters 14 mounted on the bottom thereof. A trap door 16 forms a portion of the container wall and is adapted to be secured in its closed position by means of a latch 18.

A mop wringer, shown in general by the reference numeral 20, is mounted on the container 12 and includes a manually actuatable handle 22 which, when moved in the direction indicated by the arrow in FIG. 1, causes a pair of rollers 24 to move toward each other to wring out the mop. Since this wringer is of a conventional design and does not form a portion of the present invention, it will not be described in any further detail.

As better shown in FIG. 3, an inner wall 26 in the shape of a circular cone is mounted within the container 12 and is attached thereto in any conventional manner, such as by welding. The wall 26 divides the container into an upper reservoir 28, and a lower void space 30. The reservoir 28 is adapted to contain a fixed supply of cleaning fluid for a mop, such as water treated with a soap.

A discharge opening 32 is formed at the apex of the wall 26 and is surrounded by a nipple 33 having a flanged end adapted to receive a disposable sediment bag 34 which extends in the void space 30, and is attached to the nipple by means of a rubber band 36. An alternating current operated electrical resistance heater 38 extends around the wall 26 for heating the cleaning fluid contained in the reservoir 28.

A mounting bracket 40 is mounted on the outer wall of the container 12 near the bottom thereof, and supports a pump 42 and an alternating current operated electrical motor 44 for driving the pump. A pipe 46 connects the inlet portion of the pump with the interior of the reservoir 28, and a wire screen 48 is wrapped around the end of the pipe to prevent large objects from passing through the pipe and possibly clogging the pump.

A pipe 49 connects the outlet of the pump to a filtering assembly shown in general by the reference numeral 50. The filtering assembly includes a filter container 52 which is mounted on a mounting bracket 54 attached to the container 12. A cap 56 is provided for covering the upper end of the container 52. A tubular filter 58 of a conventional material and design, extends over a rigid perforated tube 60 within the filter container 52. A discharge pipe 62 has one end extending within the upper end of the perforated tube 60 and the other end extending into a diffuser 64 mounted on the inner wall of the container 12 near the open end thereof.

As shown in FIG. 5, the diffuser 64 has a series of holes 66 extending through one side wall thereof so that water introduced into the diffuser from the discharge pipe 62 is directed outwardly from the diffuser and circumferentially with respect to the inner wall of the container 12 and the conical wall 26.

In operation, the reservoir 28 is at least partially filled with cleaning fluid, and the electrical motor 44 is actuated to drive the pump 42. As a mop is dipped into the reservoir 28 for cleaning purposes, the heavy sediment therefrom settles any gravity along the wall 26, and slides down the wall and through the discharge hole 32 into the plastic bag 34 where it is trapped for later disposal. The centrifugal action of the fluid discharging from the diffuser 64 in the immediate proximity to the inner surface of the wall 26 will speed up this gravity settling action.

Fluid in the reservoir 28 is circulated through the pipe 46, the pump 42, and the filtering assembly 50, whereby clean fluid is continuously discharged from the pipe 62 into the diffuser 64, and therefore into the reservoir 28.

According to another feature of the present invention, when the filter 58 becomes clogged with sediment, it can be cleaned by simply removing it from the container 52 and dipping it into the clean fluid contained in the reservoir 28. A good portion of the highly concentrated sediment which is thus removed from the filter 58 will sink into the plastic bag via the inner wall 26. The filter can be replaced with the container 52 and the operation resumed.

Thus, in use of the device of the present invention, the operator is assured of a continuous supply of clean fluid without having to stop periodically to replace the fluid in the reservoir 28. Also, the stop time to clean the filter 58 is even minimized. As a result, no sediment is returned to the sewage system, and consequently, to the rivers as in general mop bucket operations, but rather it is trapped in the disposable bags and can be returned to the ground as rich top soil Thus, in addition to having the commercial advantages set forth above, the device aids in the prevention of water pollution.

Since the embodiment of FIGS. 6 and 7 contains structure identical to that of the previous embodiment, the identical structure is given identical reference numerals.

According to the embodiment of FIGS. 6 and 7, the container 12 has the alternating current operated electrical re-

sistance heater 38 wrapped around its outer wall near the bottom thereof. The bracket 40, along with the pump 42 and the electric motor 44 are located at approximately the midpoint of the length of the container wall.

The inner conical wall of the previous embodiment is eliminated and the pipe 46*a* extends in a horizontal, or radial, direction into the container 12, with the outlet of the pump being connected with the filtering assembly 50 via a pipe 49*a*. The discharge pipe 62 discharges directly into the open end of the container 12.

In operation of the device of FIGS. 6 and 7, cleaning fluid is simply circulated through the container 12 and the filtering assembly 50 via the pipes 46*a*, 49*a* and 62, thereby insuring a continuous supply of clean fluid. This embodiment thus enjoys the advantages of the continuous circulating filtered fluid without the necessity of manufacturing a mop bucket containing the inner conical wall 26. Since no provision is made for a gravity settling of the sediment, the pipes 46*a*, 48*a* and 60, along with the pump and the filtering assembly may be designed to accommodate larger quantities and sizes of sediment.

It is understood that several variations of the above can be made without departing from the scope of the present invention. For example, the electric motor and/or the pump may be replaced by other means such as, for example, a manually actuatable system which would permit periodic circulation of the cleaning fluid through the container. Of course, still other variations of the specific construction and arrangement of the mop cleaning device disclosed above can be made by those skilled in the art without departing from the invention as defined in the appended claims.

I claim:

1. A mop cleaning device comprising a container; a mop wringer means connected to said container; said container having a chamber for mop cleaning fluid and an opening communicating with said chamber for receiving a mop, at least a portion of said chamber being defined by at least one wall which slopes relative to the longitudinal axis of said container for collecting sediment from said fluid, the lower portion of said sloping wall having an opening for permitting a continuous gravity discharge of said sediment from said chamber; a nipple registering with said opening; and means connected to said nipple for receiving the discharged sediment.

2. The device of claim 1 further comprising means for circulating said fluid through said chamber and filter means disposed in the path of said circulating fluid for filtering additional sediment from said fluid.

3. The device of claim 1 wherein said fluid is water, and further comprising means for heating said water.

4. The device of claim 2 wherein said means to circulate said fluid is adapted to introduce the fluid into said container in a generally circumferential direction with respect to said container and said sloping wall to promote the collection of sediment on said wall.

5. A mop cleaning device comprising a container; a mop wringer means connected to said container; said container having a chamber for mop cleaning fluid and an opening communicating with said chamber for receiving a mop, at least a portion of said chamber being defined by at least one wall which slopes relative to the longitudinal axis of said container for collecting sediment from said fluid; discharge means in the lower portion of said sloping wall for permitting a continuous gravity discharge of said sediment from said chamber; and a container detachably connected to said sloping wall and registering with said discharge means for receiving the discharged sediment.

6. The device of claim 5 further comprising means for circulating said fluid through said chamber and filter means disposed in the path of said circulating fluid for filtering additional sediment from said fluid.

7. The device of claim 6 wherein said means to circulate said fluid is adapted to introduce the fluid into said container in a generally circumferential direction with respect to said container and said sloping wall to promote the collection of sediment on said wall.

8. The device of claim 5 wherein said fluid is water, and further comprising means for heating said water.

9. A mop cleaning device comprising a substantially cylindrical container; a mop wringer means connected to said container; said container having a chamber for mop cleaning fluid and an opening communicating with said chamber for receiving a mop, at least a portion of said chamber being defined by at least one substantially conical wall which slopes relative to the longitudinal axis of said container for collecting sediment from said fluid; discharge means at the apex of said conical wall for permitting a continuous gravity discharge of said sediment from said chamber; and means connected to said discharge means for receiving the discharged sediment.

10. The device of claim 9 further comprising means for circulating said fluid through said chamber and filter means disposed in the path of said circulating fluid for filtering additional sediment from said fluid.

11. The device of claim 10 wherein said means to circulate said fluid is adapted to introduce the fluid into said container in a generally circumferential direction with respect to said container and said sloping wall to promote the collection of sediment on said wall.

12. The device of claim 9 wherein said fluid is water, and further comprising means for heating said water.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,630,369 Dated December 28, 1971

Inventor(s) C. Patrick Nichols

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 12, "or" should read --of--.

Column 1, line 37, "restriction" should read --restrictions--.

Column 1, line 46, "section" should read --sectional--.

Column 2, line 40, "any" should read --by--.

Column 3, line 18, "48a" should read --49a--.

Signed and sealed this 11th day of July 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents