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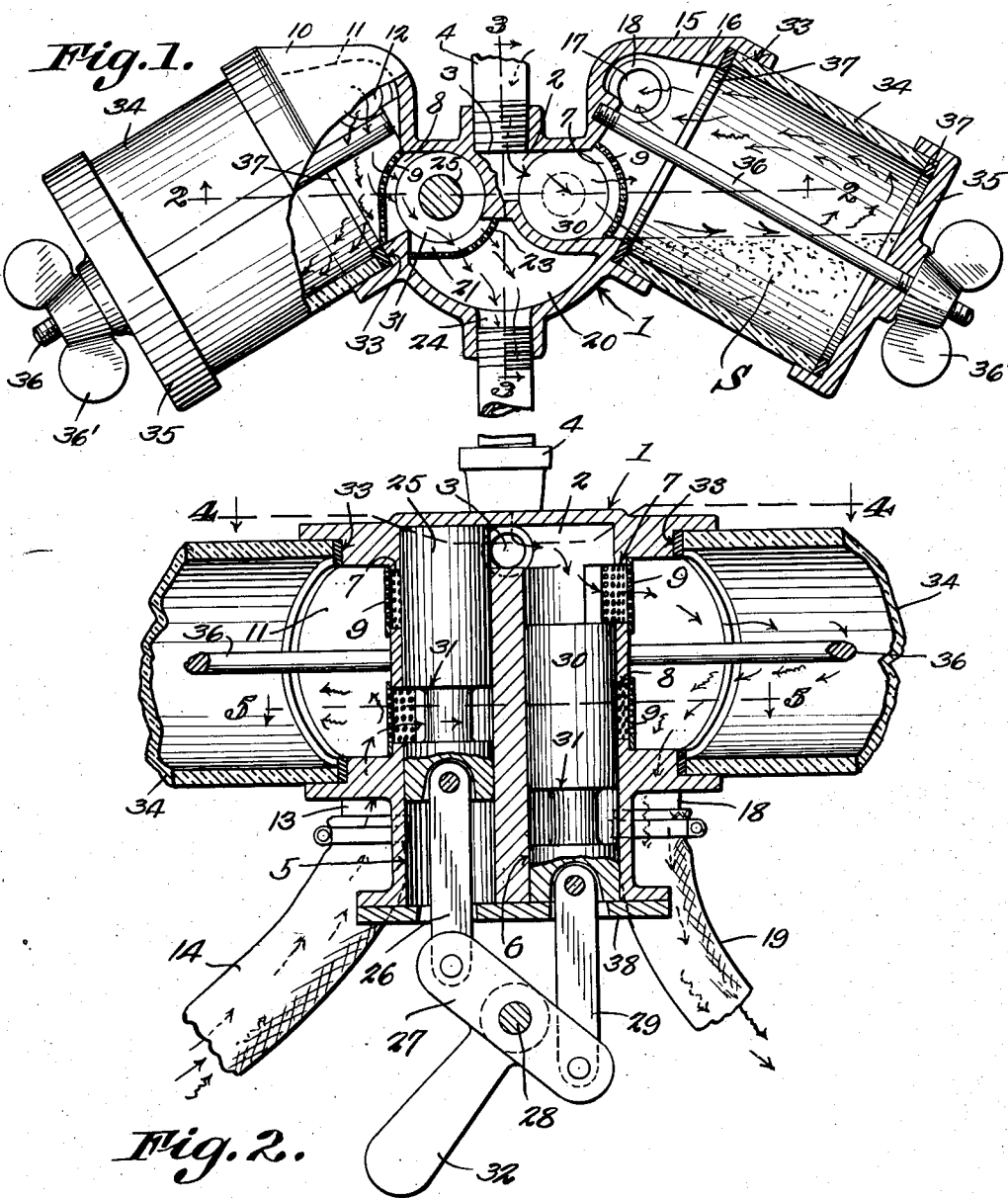
G. L. RENNEISEN

1,993,898

SCOURING MECHANISM

Filed Nov. 3, 1933

2 Sheets-Sheet 1



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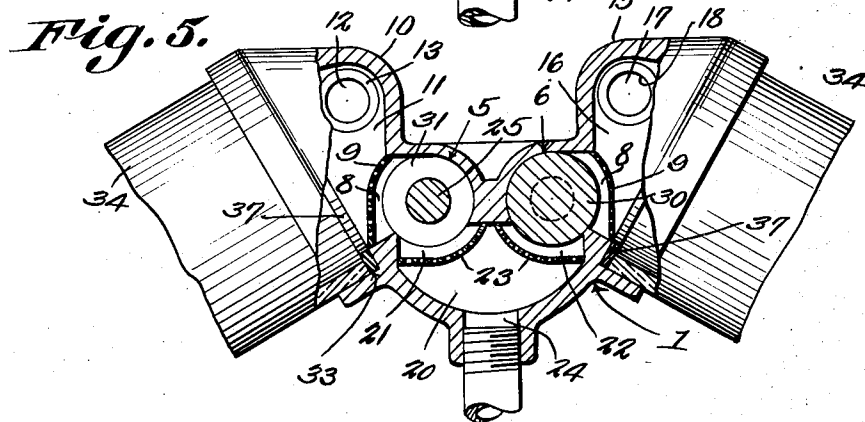
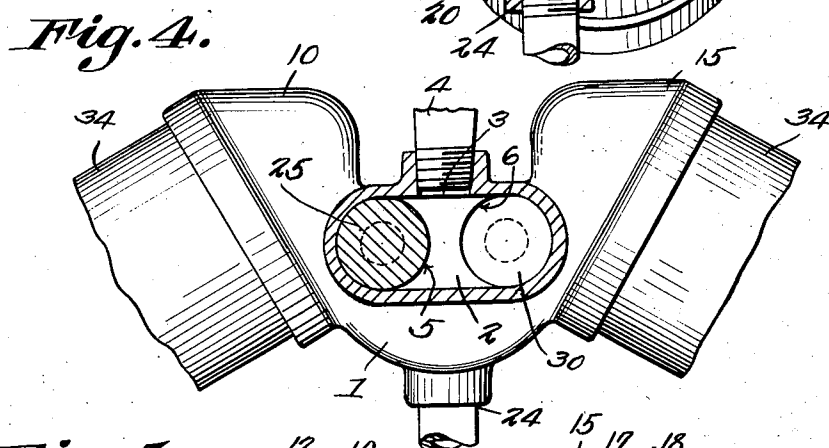
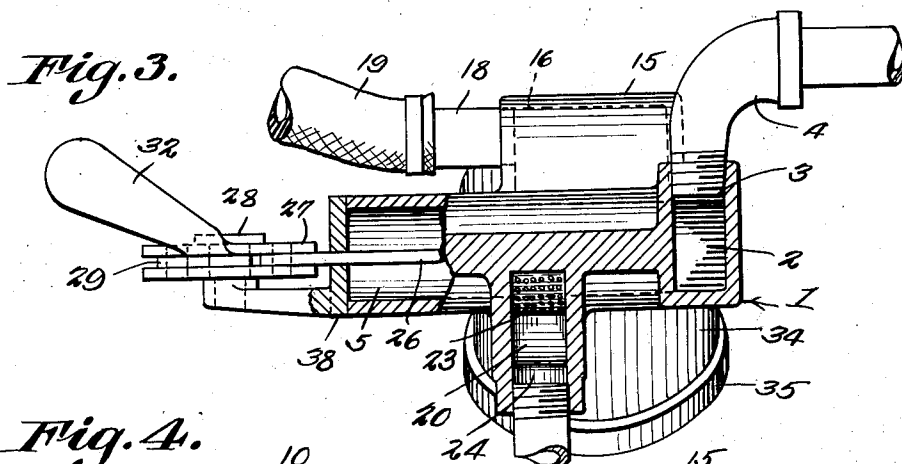
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UNITED STATES PATENT OFFICE

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SCOURING MECHANISM

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4 Claims. (CI 225-12)

This invention relates to mechanism for cleaning coils such as used for cooling and dispensing beer and other beverages and for keeping water, etc.

After the coils have been in use for some time, incrustations or sediments accumulate therein and for sanitary and other reasons it is essential that they be removed and the inner surfaces of the coils be kept clean.

It is an object of the present invention to provide a scouring apparatus designed primarily for utilizing comminuted glass, gravel, or other suitable granular material as a scouring agent, the construction of the apparatus being such as to set up a back and forth movement of the scouring agent within the coil or other structure being cleaned, the said agent being retained in the apparatus for repeated use while the sludge and other impurities will be carried off.

It is a further object to provide a novel form of double acting three-way valve for controlling the action of the scouring agent.

A still further object is to provide apparatus of this character which can be taken apart readily for the purpose of effecting necessary cleaning.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:

Figure 1 is a view partly in elevation and partly in section of the apparatus.

Figure 2 is a section on line 2-2, Figure 1.

Figure 3 is a section on line 3-3, Figure 1.

Figure 4 is a section on line 4-4, Figure 2.

Figure 5 is a section on line 5-5, Figure 2.

Referring to the figures by characters of reference 1 designates the main body member of the apparatus provided in one end portion with a receiving chamber 2 having an inlet 3 to which water or other fluid under pressure is adapted to be supplied through a pipe 4 or the like. Chamber 2 opens into one end of two parallel bores 5 and 6 each of which has a port 7 near one end and another port 8 near its other end. Both ports are covered with screens 9.

The ports 7 and 8 of one bore, 5, open into a recessed side member 10 made integral with the

body 1 and forming a retrieving chamber 11 having an outlet port 12. A nipple 13 is extended from this port and has a flexible tube 14 attached to it for connection with one end of the coil or other structure to be scoured.

The ports 7 and 8 leading from bore 6 open into a recessed side member 15 similar to the member 10 and providing a retrieving chamber 16 having a port 17 from which a nipple 18 extends. A flexible tube 19 is connected to this nipple and is adapted to be attached to the other end of the coil or the like to be scoured.

An outlet chamber 20 is provided in the body 1 and communicates, through ports 21 and 22 with the respective bores 5 and 6, each of these ports being screened as shown at 23. A drain opening 24 is provided in the wall of the chamber.

Slidably mounted in bore 5 is a cylindrical piston valve 25 one end of which is connected by a link 26 to one arm of an operating lever 27 suitably fulcrumed as at 28. The other arm of this lever is connected by a link 29 to one end of another piston valve 30 mounted for movement in the bore 6. Each piston valve has an annular by-pass 31 near one end so located that when the valve is at one extreme position and closing its port 7, the by-pass 31 of said valve will establish communication between its port 8 and its port 21 as shown for example at the left of Figure 1 and in Figure 5. However, when the valve is moved to its other extreme position communication between its ports 9 and 21 will be cut off as shown, for example, at the right of Figure 5 but at the same time communication will be established between the port 7 of said valve and the receiving chamber 2. As the two valves are connected to oppositely extended arms of a lever 27 they are movable in opposite directions respectively so that when ports 8 and 21 of one valve are in communication, the corresponding ports of the other valve are closed. Lever 27 can be operated manually by means of a handle 32 extending therefrom.

Each of the side members 10 and 15 is counter-bored at 33 to provide a seat for one end of a tubular container 34 the other end of which can be closed by a cap 35. A tie rod 36, which is detachably connected to each side member, extends axially through one of the containers 34 and its cap and is engaged by a nut 36' whereby the parts can be held together detachably. Packing washers or gaskets 37 can be interposed where desirable.

In practice comminuted scouring means such as glass, gravel or the like is placed in one of the containers 34 as indicated at S. Assuming that the various parts are properly assembled, and that

the scouring means is in the compartment 34 at the right of Figure 1, tube 19 is connected to one end of the coil or the like to be cleaned while tube 14 is connected to the other end thereof. Valve 14 is then shifted to the position shown in Figure 2 so as to establish communication between chamber 2 and port 7. Consequently valve 29 is positioned to close communication between chamber 2 and its port 7 but communication is established between its ports 8 and 21. Liquid or other fluid under pressure is then directed into chamber 2 through port 3 and thence past valve 30 and through port 7 into retrieving chamber 16. It then flows into the adjacent container 34 at an angle to the longitudinal axis of the container so that a swirling action is set up, the pressure being sufficient to agitate the scouring material S so that it will flow outwardly with the fluid through port 17 and nipple 18 to tube 19 and thence into and through the coil where a cleansing action will take place. Continuing through the coil the scouring material will return by way of tube 14 and port 12 to the retrieving chamber 11. Here the scouring material will be separated from the fluid by screen 9 so that it will be retained by the retrieving chamber and permitted to gravitate within the adjacent container 34. The fluid with the impurities removed from the coil will flow outwardly through screen 9 to the by-pass 31 in valve 25 and thence through port 21 to chamber 20 and its outlet 24.

After the desired amount of scouring material has been carried in one direction through the coil or the like being cleaned, lever 27 is shifted to reverse the positions of the piston valve. Thus the flow of fluid through the apparatus will be reversed promptly. Port 7 of bore 5 will be opened while its port 8 will be closed. At the same time port 7 of bore 6 will be closed while its ports 8 and 22 will be opened. Thus admission of fluid under pressure will set up a swirling action in the container at the left of Figure 1 to which the scouring material has been conveyed and this material will be carried outwardly through port 12 to tube 14 and in a reverse direction through the coil being cleaned. The material will be returned through tube 19 and port 17 to retrieving chamber 16 where the scouring material will be trapped while the sludge will pass off through ports 8 and 22 to the outlet chamber 20.

Obviously by shifting the valves from time to time as necessary, the desired back and forth flow of scouring material within the coil or the like can be maintained at will until the fluid escaping at port 24 appears clean. Thereupon it will be known that the coil has been cleaned and the operation can be discontinued.

For the purpose of cleaning the apparatus it is necessary merely to remove nuts 36' whereupon the parts 35 and 34 can be separated from each other and from the body of the apparatus. A cover plate 38, which closes the bores 5 and 6 at one end can be removed to permit removal of the pistons 25 and 30.

The tubular containers 34 are formed preferably of glass or other suitable transparent material so that the action of the cleansing material and fluid therein can be observed constantly.

What is claimed is:

1. Scouring mechanism including spaced containers for holding scouring material, ports communicating with the respective containers for connection with the respective ends of a coil or

the like to be scoured, a structure having a receiving chamber and an outlet chamber, means for directing fluid under pressure into the receiving chamber, screened ports joining the receiving chamber and the respective containers, screened ports connecting the outlet chamber and the respective containers, piston valves mounted for reciprocation within said structure for controlling the ports to the respective containers, and means for actuating the valves in opposite directions respectively to set up a circulation of fluid and scouring material from either container to one end of the structure being scoured and from said structure to the outlet chamber by way of the other container.

2. Scouring mechanism including a body structure having an inlet chamber, spaced bores leading therefrom, an outlet chamber and ports connecting the outlet chamber and the respective bores, separate containers carried by said member, screened ports providing communication between the inlet chamber and the respective containers, screened ports connecting the respective containers and the respective bores for communication with the outlet chamber, ports in communication with the containers for connection with the respective ends of a coil or the like to be scoured, piston valves within the respective bores, and means for moving the valves simultaneously in opposite directions respectively for controlling the ports between the chambers and the respective containers, thereby to permit circulation of fluid under pressure from the inlet chamber into either of the containers and from said container through the coil or the like being cleaned to the outlet chamber by way of the other container.

3. In apparatus of the class described a body structure having a receiving chamber, separate bores, and an outlet chamber, separate containers carried by said structure each having a port for connection to one end of a coil or the like to be cleaned, oppositely movable piston valves within the respective bores, ports controlled by the respective valves for establishing communication between the receiving chamber and either container and between either container and the outlet chamber, and means for actuating the valves to selectively open or close the several ports thereby to permit flow of fluid under pressure in either direction from the receiving chamber through one of the containers to the coil or the like being cleaned and thence to the outlet chamber by way of the other container.

4. In apparatus of the class described a body structure having a receiving chamber, spaced bores leading therefrom, an outlet chamber opening into the respective bores, spaced retrieving chambers, screened ports between the receiving chamber and the respective retrieving chambers, screened outlet ports between the respective retrieving chambers and bores, containers in communication with the respective retrieving chambers, means for connecting each retrieving chamber to one end of a coil or the like to be cleaned, piston valves mounted for reciprocation in the respective bores for controlling the ports of the respective retrieving chambers, each of said valves being constructed to close one port while opening the other, and means for actuating the valves simultaneously in opposite directions respectively.

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