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VACUUM CLEANING AND MOPPING APPARATUS

Filed Aug. 18, 1960

2 Sheets-Sheet 1

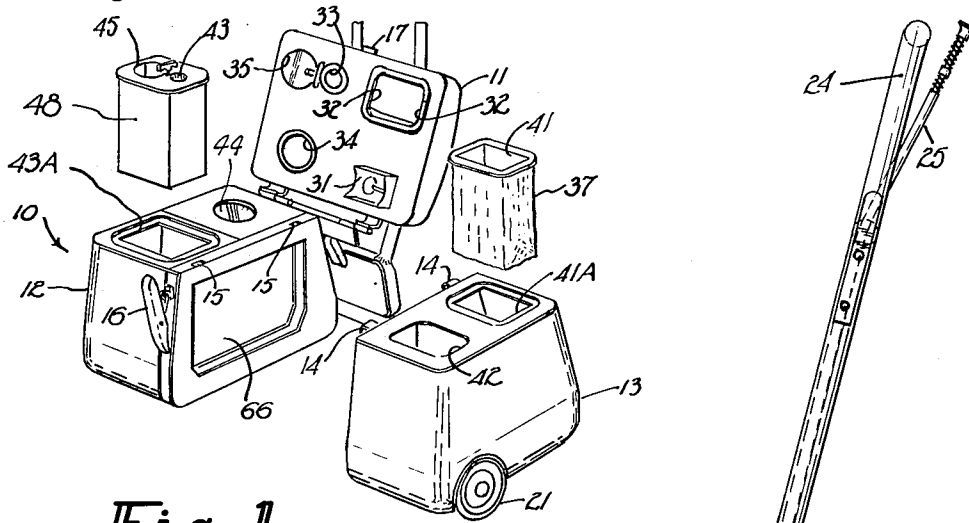


Fig. 1

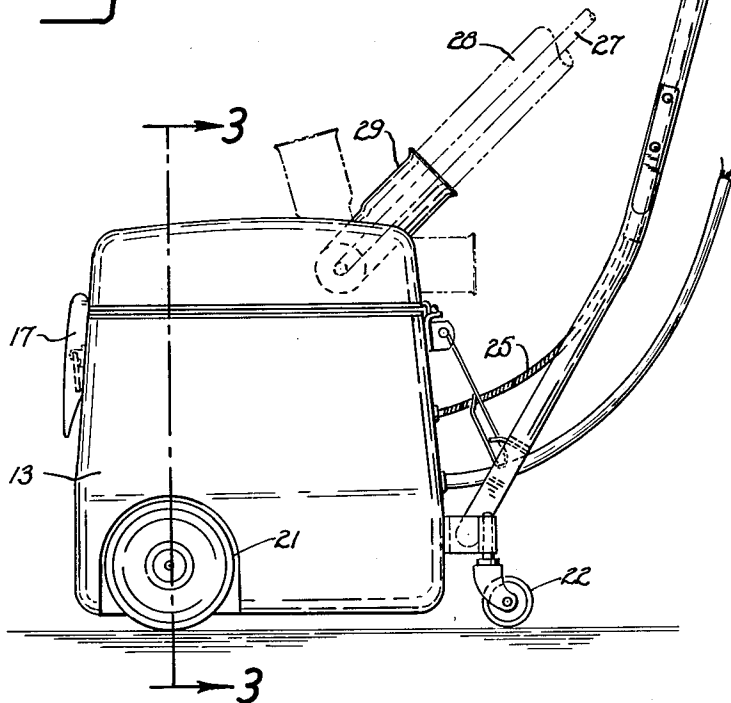


Fig. 2

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2 Sheets-Sheet 2

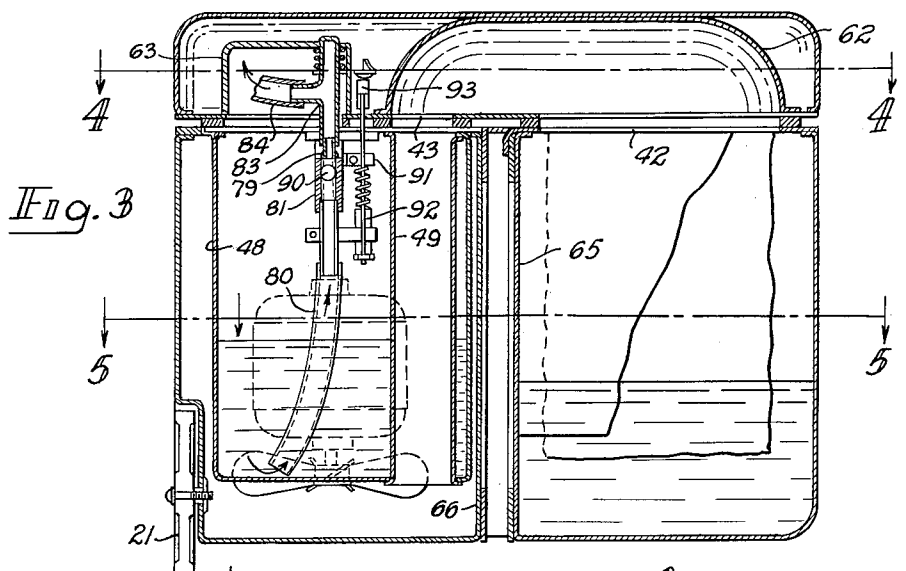
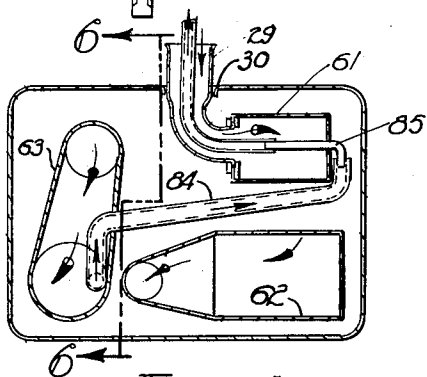


Fig. 4

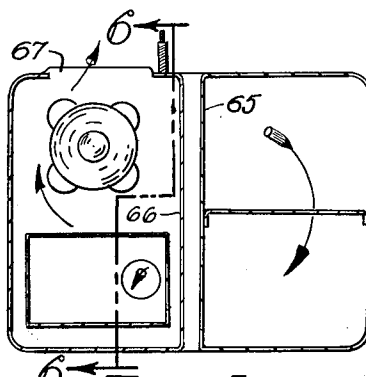


Fig. 5

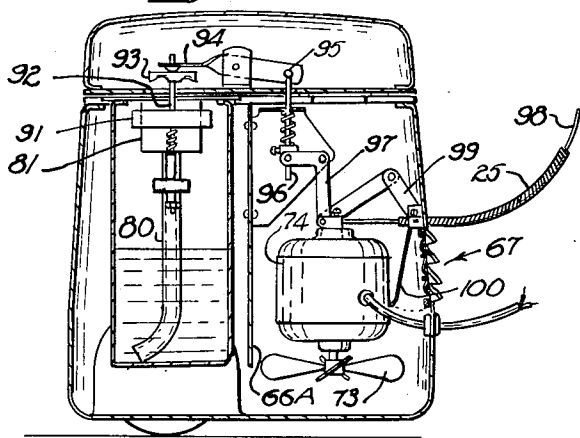


Fig. 6

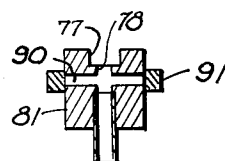


Fig. 7

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VACUUM CLEANING AND MOPPING APPARATUS

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This invention relates to apparatus for use in connection with floor mopping means wherein wash water and vacuum are alternately applied to the floor tool or the like.

A broad object of the present invention is to provide improved floor cleaning apparatus for supplying clean water to flexible hose means leading to a floor tool and for exhausting dirt and water-laden air from separate flexible hose means leading from the floor tool and for containing the dirt and water so exhausted. The flexible hose means which supplies clean water may be contained within the flexible hose means which contains the exhaust air which is laden with dirt and water.

A more specific object of the invention is to provide apparatus of the above type in which the clean water is subjected to superatmospheric pressure by means of the same blower or fan means which is employed to establish the cleaning vacuum.

A still more particular object of the invention is to provide an organization of elements which accomplishes feeding of clean water by the application of superatmospheric pressure to the surface of the clean water when it is held in a reservoir within the apparatus to thereby establish a siphoning action from the reservoir to the floor tool and to interrupt the siphoning action when the desired amount of clean water is removed from the apparatus.

In the accompanying drawings:

FIGURE 1 is a perspective view of apparatus embodying the invention with the various sub-assemblies of the apparatus being separated from each other.

FIGURE 2 is a side elevation of apparatus embodying the invention.

FIGURE 3 is a view taken on the plane of line 3—3 in FIGURE 2.

FIGURES 4 and 5 are, respectively, views taken from the planes of lines 4—4 and 5—5 in FIGURE 3.

FIGURE 6 is a view taken from the plane of line 6—6 in FIGURES 4 and 5.

FIGURE 7 is a fragmentary sectional detail view of a portion of the apparatus.

In the particular apparatus which is illustrated, there is provided a housing generally indicated by the reference numeral 10 having a hollow lid 11 and body portions 12 and 13. As may be seen in FIGURE 1, the body portions are separable and are joined by hanger hooks 14 on the body portion 13 which are received in openings 15 on the body portion 12. With the two body portions joined in this manner, the hollow lid 11 may be closed and the entire assembly held in closed position by the latch handle 16 on the body portion 12. The latch handle 16 on the body portion 12 engages the latch detent 17 on the hollow lid 11.

The housing 10 is provided with a pair of side wheels 21 and a center wheel or caster 22 and also with a handle 24. Mounted on the handle 24 is a push-pull cable 25 (FIGURES 2 and 6). Leading from the apparatus is a first flexible hose means 27 for supplying clean water to a floor mopping and vacuuming tool (not shown). There is also provided a second flexible hose means which is relatively large and which leads from the same floor tool and which contains the exhausted dirt and water-laden air from the floor tool. In the particular apparatus illustrated, the first flexible hose means 27 is relatively

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small in diameter and is contained within the second flexible hose means 28. The flexible hose means are connected to the housing 10 through a flexible socket 29 which is pivotally attached to the hollow lid 11 through a suitable slotted opening 30 (FIGURE 4).

A number of mouths or ports are formed in the several housing members and in elements associated with the housing members. Thus there are provided on the bottom face of the hollow lid 11 the mouths or ports 31—35. Corresponding mouths or ports 41—45 are located as follows: The mouth 41 is provided at the top of a dust bag 37 which in turn is received in a well 41A in the body portion 13. The mouth 41 registers with the mouth 31 in assembled position. A mouth 42 is provided in the body portion 12 and registers with the mouth 32 when the apparatus is in assembled condition. A mouth 43 is formed in a reservoir container 48 which in turn is received in the well 43A formed in the body portion 11. The mouth 43 registers with the mouth 33 when the apparatus is in assembled condition. A mouth 44 is formed in the body portion 12 and registers with the mouth 34 when the apparatus is in assembled condition. A mouth 45 is formed in the reservoir container 48 and communicates with the interior of the reservoir container 48. The mouth 45 is in register with the mouth 35 when the apparatus is in assembled condition. The reservoir container 48 has formed therein a tube 49 leading from the mouth or port 43 to and through the bottom wall of the container 48.

Wall means 61 (FIGURE 4) is provided in the hollow lid 11 to define a passageway from the swiveling socket 29 to the mouth 31. Wall means 62 is provided in the hollow lid 11 for defining a passageway from the mouth 32 to the mouth 33. Wall means 63 is provided in the hollow lid 11 for defining a passageway from the mouth 34 to the mouth 35. In the body portion 13 is provided walled means including the exterior walls of the body portion 13 together with the wall means 65 (FIGURE 5) to define a passageway or chamber establishing communication from the well 41A to the mouth 42. In the body portion 12 is provided walled means including the exterior walls of the body portion 12 together with the wall means 66 (FIGURE 5) to define a passageway or chamber establishing communication from the well 43A to the mouth 44. Further provided in the body portion 12 is an air exhaust aperture 67 (FIGURES 5 and 6).

It will be understood that the dust bag 37, together with the walled means which includes the wall means 65 as above described, defines means for separating from the dirt and water-laden air exhausted from the second flexible hose means 28 the dirt and water contained therein. The interior of the body portion 13 functions as a container for the dirty water, and the dirty water may be readily dumped after removing the body portion 13 from the portion 12 and removing the dust bag 13 from the well 41A. It will also be understood that the swiveling socket 29 and the walled means which includes the wall means 61, 62, 49 and 66 together with certain exterior walls of the body portion 12 defines a path of flow from the second flexible hose means 28 through the above-mentioned separating means and thence through a fan means 73 powered by a fan motor 74. Finally, it will be understood that the interior wall means 66A (FIGURE 6) together with certain exterior wall portions of the body portion 12 and the wall means 63 define a path of communication from the output side of the fan means 73 to the top of the reservoir container 48.

There is provided water conduit means leading, in the assembled condition of the apparatus, from the bottom of the reservoir 48 upwardly therefrom and communicating with the first flexible hose means 27. Such

water conduit means includes a dip hose 80 which leads to a valve body 81, both associated with the reservoir container 48. The water conduit means also includes a member 83 (FIGURE 3) positioned within the hollow lid 11 and having a lipped plastic tube insert 79 adapted to register with the output end 78 of the water conduit passage of the member 81 when the lid is closed onto the reservoir container 48. In the particular valve body shown, the output end 78 opens into a notch or cutout 77 (FIGURE 7) formed in the valve body, and the lip of the plastic tube or insert 79 seats against the face formed by the bottom of this notch or cutout. The member 83 is connected to a tube 84 (FIGURES 3 and 4) which leads to a small pipe 85, which in turn is connected to the first flexible hose means 27 in such a manner that the members 85 and 27 extend along the axis of pivoting of the swiveling hose socket 29.

The member 81 (FIGURES 3 and 6) is provided with ports 90 which are adapted to be covered by a sliding member 91 (FIGURES 3 and 6) which is actuated by a linkage including a spring-loaded rod 92 having a handlelike head 93. The rod 92 and the spring-loading mounting therefor are carried bodily within the container 48 as indicated in the drawings.

Within the hollow lid 11 is located a lever 94 having a sideways extending pin 95 adapted to be operatively engaged in pushing relationship by a spring rod 96, carried within the body portion 12 and adapted to be actuated by a bell crank 97, which in turn is actuated by the wire 98 of the push-pull cable 25. The actuating wire 98 is also connected to the bell crank 99 which is linked to the damper or door 100. The damper or door 100 is adapted to close off or open up the air exhaust aperture 67.

The linkages are so related that the sliding member 91 operates to close off the air exhaust aperture 67 at the same time that the sliding member 91 operates to close off the vents 90 in the water conduit means, and, conversely, that the air exhaust aperture 67 and the vents 90 are opened together, such opening and closing being effected by operation of the push-pull cable 25.

An example of the invention is described above in some detail. It should be apparent that the scope of the invention is not reasonably to be limited to all the specific details set forth in such description, since many of such details are given merely by way of example. The scope of the invention is defined in the following claims.

What is claimed is:

1. Floor cleaning apparatus for supplying clean water to first flexible hose means leading to a handled floor tool and for exhausting dirt or water-laden air from second flexible hose means leading from said floor tool and for containing the dirt and water so exhausted, said apparatus comprising means for separating from the air

so exhausted the dirt and water contained therein, fan means, first walled means defining a path of flow from said second flexible hose means through said separating means and thence through said fan means, a reservoir for clean water, second walled means defining a path of communication from the output side of said fan means to the top of said reservoir, an air-exhaust aperture in said second walled means, and water conduit means leading from the bottom of said reservoir upwardly therefrom and communicating with said first flexible hose means, damping means for closing off said air exhaust aperture to thereby subject the surface of water held in said reservoir to superatmospheric pressure sufficient to establish a siphoning action through said water conduit means and first flexible hose means, bleed valve means in said water conduit means and above said reservoir, and control means for opening said bleed valve means when said damping means is opened, whereby said siphoning action may be interrupted in a positive manner when superatmospheric pressure is no longer applied to the surface of water held in said reservoir.

2. Floor cleaning apparatus for supplying clean water to first flexible hose means leading to a handled floor tool and for exhausting dirt or water-laden air from second flexible hose means leading from said floor tool and for containing the dirt and water so exhausted, said apparatus comprising means for separating from the air so exhausted the dirt and water contained therein, fluid pump means, first walled means defining a path of flow from said second flexible hose means through said separating means and thence to said fluid pump means, a reservoir for clean water, second walled means defining a path of communication from said fluid pump means to said reservoir for imposing on water in said reservoir superatmospheric pressure developed at said fluid pump means, an air-exhaust aperture in said second walled means, water conduit means leading from the bottom of said reservoir upwardly therefrom and communicating with said first flexible hose means, said superatmospheric pressure being sufficient to establish a siphoning action through said water conduit means and first flexible hose means, bleed valve means in said water conduit means and above said reservoir, and control means for opening said bleed valve means, whereby said siphoning action may be interrupted in a positive manner.

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