

(19)



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(11)

EP 0 873 712 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
28.10.1998 Bulletin 1998/44

(51) Int Cl.⁶: **A47L 9/20**(21) Application number: **98850044.3**(22) Date of filing: **25.03.1998**

(84) Designated Contracting States:
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE**

Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **17.04.1997 SE 9701436**

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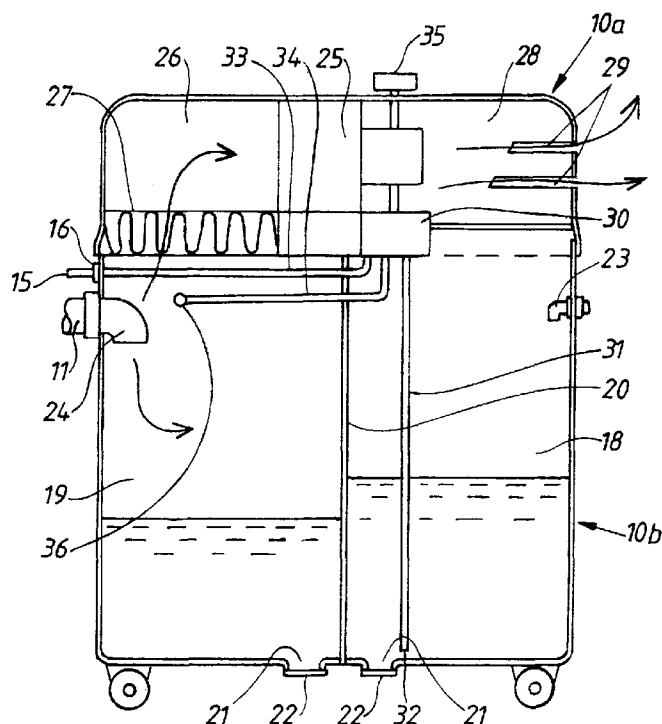
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(54) Filter cleaning device for wet suction cleaner

(57) A wet suction cleaner including a container (19) for holding dirty liquid, a suction nozzle (12), a vacuum source (25), and an air passage (26). The vacuum source draws dirty liquid through the suction nozzle and into the container. The vacuum source communicates with the container via the air passage. The air passage

holds a filter (27) which separates dirt particles from the air flowing through the air passage. A filter cleaning nozzle (36) is disposed below and close to the filter (27). Cleaning liquid flows through the filter cleaning nozzle and is sprayed onto the filter to clean collected particles therefrom. The particles cleaned from the filter flow with the liquid downwardly into the container.

**FIG. 2**

Description

The present invention relates to a wet suction cleaner comprising a container for dirty liquid which, via a suction nozzle, is removed from a surface and a vacuum source which, via an air passage, communicates with the container and wherein the air passage includes a filter for separating dirt particles from the air flowing through the air passage and for collecting particles in the container.

Wet suction cleaners of the aforementioned type are previously known. Such cleaners usually also include a tank for cleaning liquid which, by means of a pump and a spray nozzle, is directed toward and applied on the floor. The liquid is then removed from the floor by the suction nozzle and is collected in the container. Different methods have been proposed for cleaning a wet suction cleaner filter without removing the filter from the suction cleaner.

For example, as shown in SE 410386, it is previously known to reverse the direction of air flow through the filter in order to blow the dirt particles on the filter down into the container. It has also been suggested, as shown in DE 4235745, to mechanically act on the filter by different methods, such as vibrating the filter, to release the particles from the filter. It has, however, been difficult to achieve a good filter cleaning result by means of these methods since the dirt particles have a tendency to stick very hard to the filter. Poor cleaning of the filter causes the filter to prematurely clog, and necessitates frequent replacement of clogged filter which, of course, is expensive.

It is also known to clean a filter which is placed in a gas flow channel in order to separate particles from the gas flow, as shown in EP-A-497732. The filter cleaning arrangement taught by EP-A-497732 comprises a spray nozzle placed on one side of the filter and a suction tube placed on the other side of the filter. The nozzle and the suction tube are moved simultaneously over the filter area. Air and liquid flows through the filter material from the nozzle to the suction tube thereby bringing the particles which have been collected in the filter to the suction tube. This arrangement is rather complicated and is not suitable for a wet suction cleaner since the filters used for such cleaners are water tight.

Accordingly, there exists a need in the art for a simple and efficient arrangement for cleaning a wet suction cleaner filter. There also exists a need in the art for a wet suction cleaner filter having an increased useful life.

The present invention is directed toward a filter cleaning arrangement for a wet suction cleaner which is simple and considerably more efficient than previously known filter cleaning arrangements, and which also increases the useful life of the filter.

In accordance with the present invention, a wet suction cleaner includes a container, a vacuum source, a suction nozzle, and an air passage. The vacuum source communicates with the container via the air passage.

Dirty liquid is drawn through the suction nozzle by the vacuum source and is deposited in the container.

In further accordance with the present invention, the air passage receives an air filter which separates dirt particles from air flowing through the air passage. The wet suction cleaner includes a filter cleaning nozzle disposed close to the filter and at a side of the filter facing the container such that liquid sprayed onto the filter by the filter cleaning nozzle flows down and is collected in the container.

These and further features of the invention will be apparent with reference to the following description and drawings, wherein:

FIG. 1 is a side view of the wet suction cleaner, and; FIG. 2 is a vertical section through the suction cleaner shown in FIG. 1.

With reference to FIG. 1, a wet suction cleaner is shown to include a vacuum cleaner housing 10 to which a suction hose 11 is connected. The suction hose 11 communicates with a wet cleaning suction nozzle 12 by means of a tube shaft 13 and a tube handle 14. A liquid supply hose 15 is supported by and extends parallel to the hose 12. One end of the liquid supply hose 15 is connected to a joint 16 arranged on the vacuum cleaner housing 10. The other end of the hose 15 is connected to a spray nozzle 17 which is directed toward the floor. Cleaning liquid flows through the hose 15 and the nozzle 17 toward the floor.

With reference to FIG. 2, the vacuum cleaner housing 10 is shown to include a first container 18 for cleaning liquid and a second container 19 for dirty liquid. The first and second containers are separated by an intermediate wall 20. Each container 18, 19 has, at its lower part, an outlet 21 with a shut off device 22 which is accessible from the outside of the housing.

An inlet tube 23 is provided at the upper part of the first container 18. A hose (not shown) can be connected to the inlet tube 23 in order to supply liquid to the first container 18, for instance from a water main. A tube bend 24 is provided at the upper part of the second container 19 to direct incoming dirty liquid toward a bottom of the second container 19. The suction hose 11 is connected to the tube bend 24, as illustrated.

The vacuum cleaner housing 10 also comprises a vacuum source, such as a fan unit 25, whose inlet side is connected to an air inlet channel 26 in which a filter 27 is arranged. The filter 27 is preferably a membrane-type filter consisting of a material which does not absorb liquid. The outlet side of the fan unit 25 is connected to an air outlet channel 28 from which filtered air escapes to atmosphere via outlet openings 29.

The vacuum cleaner housing 10 also encloses a pump 30 which is connected to a suction conduit 31 and first and second pressure conduits 33, 34. The suction conduit 31 has an inlet opening 32 placed at the lower part of the first container 18. A control means 35, by op-

eration of a valve (not shown), selectively controls or directs the flow of cleaning fluid from the pump 30 to the pressure conduits 33, 34. The first pressure conduit 33 is connected to the liquid supply hose 15 via the joint 16. The second pressure conduit 34 is connected to a spray or filter cleaning nozzle 36 arranged closely below the filter 27.

The spray nozzle 36 is directed such that the liquid flowing through the nozzle 36 is sprayed toward the filter 27. The spray nozzle 36 is preferably provided with several nozzle openings which are directed to supply cleaning liquid over the entire surface of the filter 27. Alternatively, means may be provided to move the spray nozzle 36 relative to the filter 27. Also, it is contemplated that the filter 27 may be oriented obliquely relative to the horizontal plane and liquid could be sprayed from the nozzle 36 onto the upper part of the filter such that the liquid flowing downwardly across the filter surface would clean the lower parts of the filter.

The vacuum cleaner housing 10 comprises an upper and a lower part 10a, 10b, as illustrated. The upper part 10a is removably secured to the lower part 10b. The fan unit 25, the filter 27 and the pump 30 with its electrical equipment are arranged in the upper part 10a. The two containers 18, 19 constitute the lower part 10b. The interior of the containers 18, 19 are accessible when the upper part 10a is removed from the lower part 10b. As will be apparent to those skilled in the art, the wet suction vacuum cleaner, of course, comprises the necessary control means, electric components and electric connection means.

The wet suction cleaner according to the present invention operates in the following manner. The upper part 10a of the housing 10 is removed from the lower part 10b, and the first container 18 is filled with cleaning liquid. Alternatively, cleaning fluid can be introduced into the first container via the inlet tube 23 without removing the upper part 10a from the lower part 10b. When cleaning is started, the pump 30 is activated by the operator which causes liquid in the container 18 to be drawn by the pump 30 into the suction conduit 31.

With the user-selected setting of the control means 35 in a floor cleaning position, cleaning fluid is distributed to the floor via the first pressure conduit 33, the hose 15, and the spray nozzle 17. When the operator then activates the fan unit 25, the liquid and dirt particles on the floor are drawn through the suction nozzle 12 and suction hose 11 into the second container 19. Due to gravity, the liquid and most dirt particles fall down into the container 19, while the air escapes to atmosphere through the filter 27, the inlet channel 26, the fan unit 25, the outlet channel 28, and the openings 29. Smaller and light particles are entrained in the air flowing toward the fan unit and are separated from the air by the filter 27.

When the filter 27 is to be cleaned, the control means 35 is activated by the user to a filter cleaning position in which the second pressure conduit 34 is con-

nected to the suction conduit 31. When the pump 30 is started, the cleaning liquid flows through the spray nozzle 36 toward the filter 27, thereby cleaning the filter 27 while the liquid and removed particles are collected in the second container 19.

It should be mentioned that it, of course, is possible during the filter cleaning stage to desist from using the pump 30 and, instead, use a tube connection (not shown) between the inlet tube 23 and the conduit 34 in order to establish a direct communication from a water hose connected to the water main to the inlet tube 23 and to the nozzle 36. In such a manner the pressure in the water main can serve as a driving means for the water flowing out from the nozzle 36.

While the preferred embodiment of the present invention is shown and described herein, it is to be understood that the same is not so limited but shall cover and include any and all modifications thereof which fall within the purview of the invention.

Claims

1. A wet suction cleaner comprising a container (19), a vacuum source (25), a suction nozzle (12), and an air passage (26), dirty liquid is drawn through the suction nozzle (12) by said vacuum source (25) and deposited in the container (19), the vacuum source (25) communicates with the container via said air passage (26), said air passage receiving an air filter (27) which separates dirt particles from air flowing through said air passage (26), **characterized in** that the wet suction cleaner includes a filter cleaning nozzle (36) disposed close to the filter (27) and at a side of said filter facing said container such that liquid sprayed onto the filter by the filter cleaning nozzle (36) flows down and is collected in the container.
2. A wet suction cleaner according to claim 1, **characterized in** that an additional container (18) is provided which holds cleaning liquid, and a pump (30) which, via conduits (31, 34), supplies cleaning liquid from the additional container to said filter cleaning nozzle (36).
3. A wet suction cleaner according to claim 2, **characterized in** that the pump is connected to a further conduit (33) through which cleaning liquid is supplied to a spray nozzle (17) arranged close to the suction nozzle (12).
4. A wet suction cleaner according to any of the preceding claims, **characterized in** that the filter (27) is formed from a material which does not absorb liquid.
5. A wet suction cleaner according to any of the pre-

ceding claims, **characterized in** that at least a portion of the filter is vertically above the filter cleaning nozzle (36).

6. A wet suction cleaner according to claim 1, **characterized in** that the filter cleaning nozzle (36) is connected to a conduit which may be connected to a water main by means of a hose.

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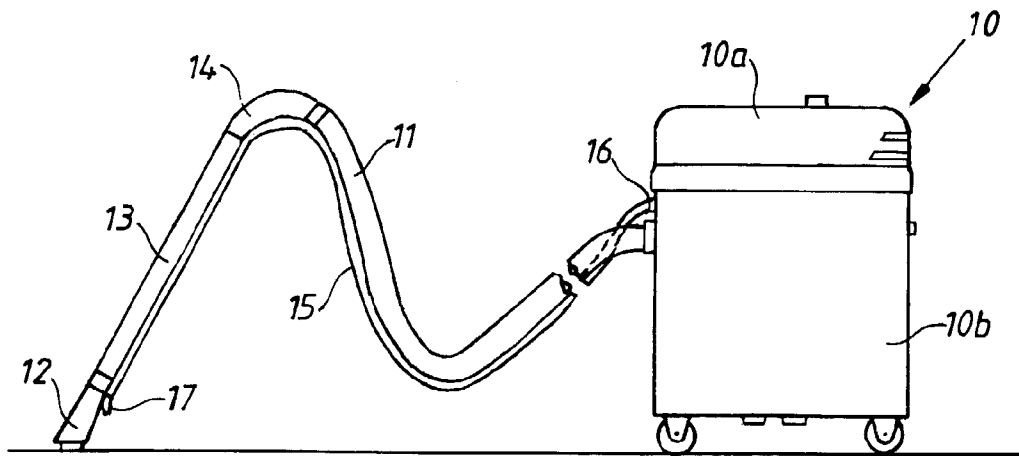


FIG. 1

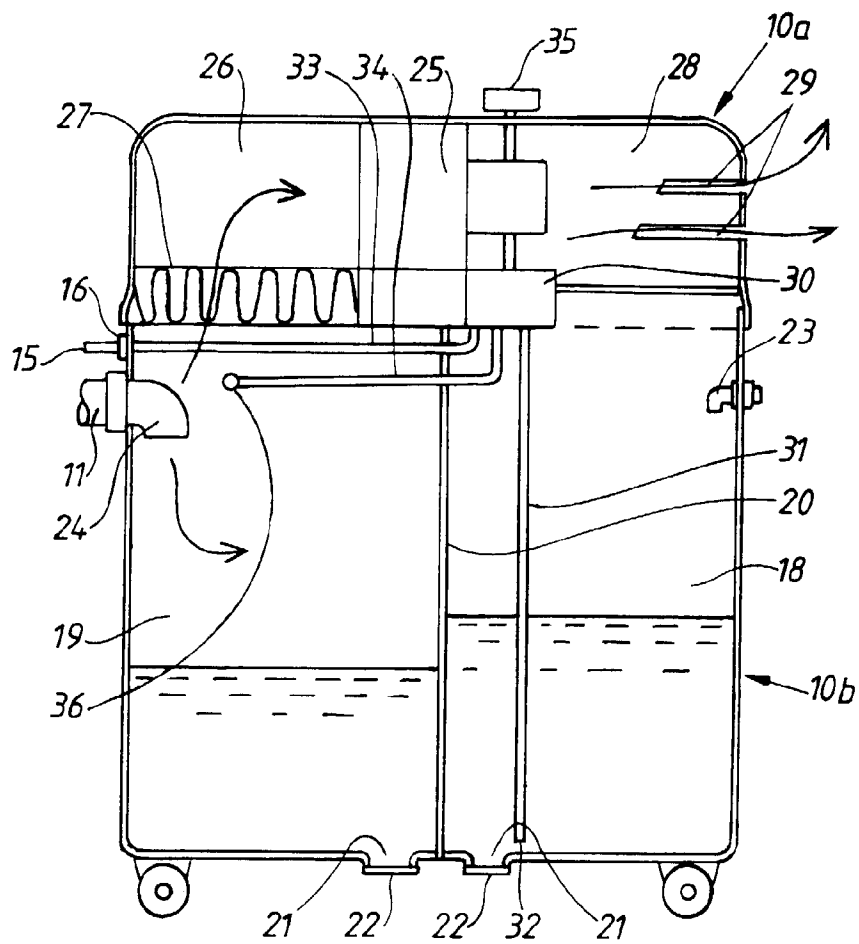


FIG. 2