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(72) Inventor: **Fumagalli, Silvano**
20052 Monza-Milano (IT)

(74) Representative: **Pezzoli, Ennio et al**
Jacobacci & Perani S.p.A.
Via Senato, 8
20121 Milano (IT)

(71) Applicant: **CANDY S.p.A.**
I-20052 Monza (Milano) (IT)

(54) **A filtering unit for a washing machine**

(57) A unit (4) for filtering the washing liquid in a washing machine comprising means (6) for filtering the washing liquid, the filtering means (6) being disposed in a housing chamber (23) which can be occupied by the liquid, and the filtering means being removable from the housing chamber. The filtering unit also comprises a duct (24) through which the filtering means can pass and which is connected to the housing chamber to enable the filtering means to be removed from/inserted in the chamber. The filtering unit according to the invention is characterized in that the duct has a first end which opens into the housing chamber and a second end having an access opening (14) which can be positioned in the washing machine at a level higher than at least the maximum level that the inert liquid can reach inside the duct. The filtering unit according to the invention prevents discharge of the washing liquid during the removal of the filtering means from the housing chamber.

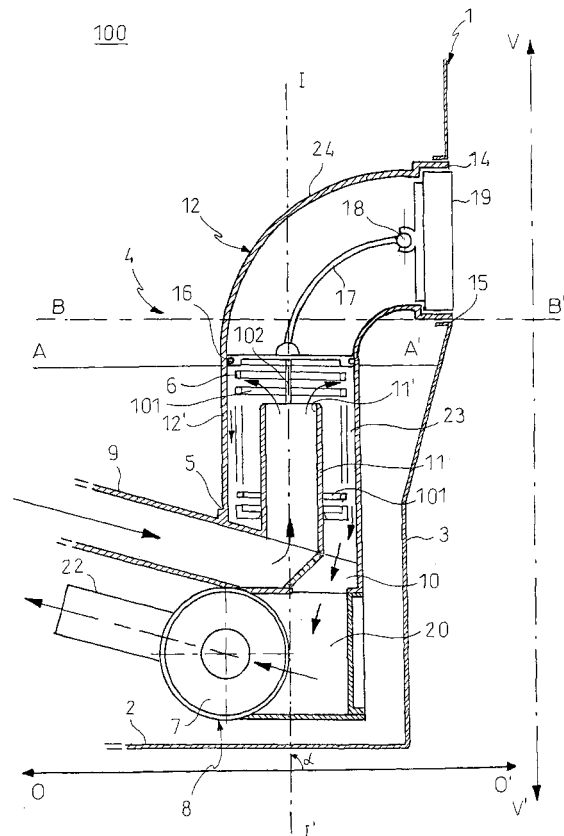


FIG.1

Description

[0001] The present invention relates to units for filtering the washing liquid in washing machines. In particular, it relates to filtering units usable in domestic washing machines.

[0002] In general, a washing machine has a water circuit suitable for discharging the washing liquid present in a washing tub. Typically, this water circuit uses a pump, for example, a centrifugal pump, which draws the liquid from the washing tub through a pipe. The washing liquid thus drawn out passes through a filtering unit comprising a chamber which is normally disposed upstream of the pump and which houses a filter such as, for example, a conventional labyrinth, grid or screen filter which prevents impurities or residues from being transported by the liquid towards the pump. After the washing liquid has passed through the chamber containing the filter, it is expelled by the pump towards a waste pipe and hence towards an external drainage system.

[0003] Filtering of the impurities present in the washing liquid is also provided for when the liquid, or some of it, is not sent directly to the external drainage system but is sent to a recirculation circuit which enables it to be reused for subsequent washing stages.

[0004] In conventional washing machines, the chamber which houses the filter is arranged in the vicinity of the base of the washing machine, beneath the washing tub, whereas the waste pipe is normally connected to the external drainage system at a level higher than that at which the housing chamber lies.

[0005] As is known, because impurities and residues transported by the washing liquid accumulate in the filter, periodic cleaning of the filter is necessary.

[0006] Cleaning is performed after the filter has been removed from the chamber housing it. To allow the filter to be removed, known housing chambers have an access opening disposed in a front wall of the washing machine and having a removable cap.

[0007] Typically, the filter is removed in rest conditions, that is, when the washing machine is not in operation and, in particular, when the pump is not being operated.

[0008] Nevertheless, it has been noted that, in conventional washing machines and in domestic washing machines in particular, when the cap is removed from the opening for access to the chamber housing the filter and when the filter is removed, there is an undesired discharge of washing liquid from the opening.

[0009] The washing liquid which is discharged from the access opening is not only constituted by liquid which has collected in the housing chamber but is also due to the fact that, because of the above-mentioned level difference, all of the liquid present in the waste pipe or in the pipe which connects the chamber to the washing tub pours into the chamber. The amount of liquid discharged may therefore be considerable, making the operation to remove the filter for cleaning particularly un-

pleasant.

[0010] The object of the present invention is to provide a filtering unit for washing machines which enables the filter to be removed from the chamber housing it, whilst substantially preventing discharge of washing liquid.

[0011] The object of the present invention is achieved by a unit for filtering the washing liquid in a washing machine, comprising:

means for filtering the washing liquid, the filtering means being disposed in a housing chamber which can be occupied by the liquid in use, and the filtering means being removable from the housing chamber, and

a duct through which the filtering means can pass and which is connected to the housing chamber to enable the filtering means to be removed from/inserted in the chamber,

characterized in that the duct has a first end which opens into the housing chamber and a second end having an access opening which can be positioned in the washing machine in use, at a level higher than at least the maximum level that can be reached by the inert liquid inside the filtering unit.

[0012] The characteristics and the advantages of the present invention will become clear from a reading of the following detailed description of a preferred embodiment thereof, provided purely by way of nonlimiting example with the aid of the appended drawings, in which:

Figure 1 shows schematically a lateral section of a lower portion of a washing machine comprising a filtering unit according to the invention,

Figure 2 shows schematically a front view of a portion of a washing machine comprising a filtering unit similar to that of Figure 1,

Figure 3 shows schematically an embodiment of a filtering unit according to the invention, which is an alternative to that of Figure 1, and

Figure 4 shows schematically a washing machine comprising the filtering unit of Figure 1.

[0013] Figure 1 shows a section through a lower portion 100 of a washing machine according to the invention.

[0014] The portion 100 of the washing machine shown in Figure 1 comprises an outer housing or casing 1 of which it is possible to see a base wall 2 arranged parallel to a horizontal surface (parallel to the floor), indicated by the line O-O', and a side wall 3 such as, for example, a front wall of the washing machine. A vertical axis V-V' perpendicular to the horizontal line O-O' is also indicated in Figure 1.

[0015] The casing 1 houses a unit 4 for filtering the washing liquid of the washing machine, the filtering unit comprising a body 5, for example, made of moulded plastics material, including a removable filter 6 of the

labyrinth or grid type and two axially aligned cylindrical housings 8 of which only one is visible in Figure 1 and each of which can house a centrifugal pump 7.

[0016] It is pointed out that the labyrinth filter 6 is a particular example of filtering means usable in the present invention. Other filtering means suitable for the present invention comprise, for example, screen filters. It should also be noted that the labyrinth filter is preferred because it permits easier cleaning.

[0017] Each centrifugal pump 7 has a motor unit (not shown) for driving an impeller (not shown).

[0018] The body 5 of the filtering unit 4 comprises an intake opening 9 arranged in communication with a washing tub (not shown in Figure 1) of the washing machine, from which the washing liquid can be drawn.

[0019] The intake opening 9 is also in communication with a cylindrical inner duct 11 which extends inside a tubular element 12.

[0020] The tubular element 12 comprises a straight portion 12' which, together with the inner duct 11, which is arranged coaxially with the tubular element 12, defines a chamber 23 having the form of a tubular space for housing the filter 6.

[0021] In the embodiment of Figure 1, the straight portion 12', and hence the housing chamber 23, is arranged substantially vertically, that is, its axis I-I' is inclined at an angle α of between 85° and 95° , preferably about 90° , to the horizontal line O-O'.

[0022] The tubular element 12 comprises, in a curved portion thereof, a duct 24 through which the filter 6 can pass. The filter duct 24 is connected, at a lower end, to the housing chamber 23 and, at an upper end, has an access opening 14 which, in the embodiment shown, has a diameter larger than that of the filter duct 24. The duct 24 extends inside the casing 1 and, for example, is made of plastics material so as to be substantially rigid.

[0023] The filter duct 24 allows the removable filter 6 to be moved inside the duct 24 in order to remove the filter from the housing chamber 23 and/or to insert it therein. The filter duct 24 shown in Figure 1 extends towards the top of the washing machine and towards the side wall 3 of the casing 1.

[0024] The access opening is accessible from outside the washing machine by means of an opening 15 in the side wall 3 of the casing 1.

[0025] It is pointed out that the inner duct 11 has a mouth 11' for allowing the washing liquid drawn from the opening 9 to leave the inner duct 11 and occupy the housing chamber 23.

[0026] The filter 6 which, in the embodiment of Figure 1, is a labyrinth filter, has a cylindrical outer shape and is arranged in the housing chamber 23 so as to surround the duct 11. Moreover, in Figure 1, the filter 6 is arranged substantially vertically, that is, it has its longer side disposed substantially in the direction of the vertical axis V-V'. It is pointed out that the arrangement of the duct 11 inside the filter 6 enables the liquid coming out of the duct 11 to be distributed throughout the volume of the

filter 6 when the pumps 7 are in operation, making the filtering particularly efficient.

[0027] The filter 6 preferably has a conventional shape but, in contrast with known filters, is formed so as to be flexible in order to adapt to the shape of the filter duct 24. The filter 6 of Figure 1 comprises a plurality of elements 101 arranged so as to form a labyrinthine path for the liquid which passes through the filter, and a flexible central rod or rib 102.

[0028] In its upper portion, the filter 6 has a seal 16, for example, a sealing ring, to prevent the washing liquid which comes out of the inner duct 11 from entering the filter duct 24.

[0029] Moreover, the upper portion of the filter 6 is connected to an end of a flexible, rod-shaped element 17 made of resilient material. This flexible element 17 has another end connected, preferably by means of an articulated joint 18, to an inspection hand-grip 19, which also performs the function of closing the opening 14.

[0030] The hand-grip 19 and the flexible element 17 are special movement means which can be used for moving the filter 6 inside the filter duct 24.

[0031] The opening 14 and the hand-grip 19 preferably have, respectively, retaining teeth (not shown) for the bayonet engagement of the hand-grip 19, and ribs (not shown) cooperating with the teeth. It is pointed out that, by virtue of the presence of the seal 16, even if the hand-grip 19 is not fully closed, discharge of washing liquid from the opening 14 is prevented.

[0032] Moreover, when the hand-grip 19 is inserted in the opening 14, the flexible element 17 exerts a suitable force, for example, a resilient force, on the filter 6, favouring the retention of the filter in the appropriate position inside the chamber 23.

[0033] In the embodiment of Figure 1, the chamber 23 has a lower wall which is suitably inclined and is arranged in communication with an intermediate chamber 20, by means of a connecting chamber 10.

[0034] The intermediate chamber 20 is in communication with the cylindrical housings 8 of the centrifugal pumps 7.

[0035] The cylindrical housings 8 and hence the pumps 7 are in communication with two outlet openings 22 (of which only one is visible in Figure 1). These outlet openings may be a discharge opening for connection to the drainage system for the washing liquid, and an opening for the recirculation of the washing liquid, for connection to a suitable circuit for reusing the liquid.

[0036] In Figure 1, the maximum level of the inert liquid, that is, the maximum level that can be reached by the washing liquid inside the filtering unit 4 when the pumps are operated, assuming that the unit 4 does not contain a filter 6, is indicated by a horizontal line A-A'.

[0037] The maximum level of the inert liquid depends upon the water circuit as a whole in which the flow-diversion unit is connected and which comprises, for example, the tub of the washing machine, a pipe for connecting the tub to the intake opening 9, and a pipe for

connecting the outlet opening 22 to the external drainage system for the liquid.

[0038] The maximum level of the inert liquid may be within the housing chamber 23, as shown in the drawing, but may also be at a higher level inside the filter duct 24. The maximum level of the inert liquid can easily be determined by an expert in the art for each particular washing machine in which the filtering unit is used.

[0039] It is pointed out that the access opening 14 of the filter duct 24 is disposed at a level B-B' such as to be at least above the maximum inert-liquid level A-A'.

[0040] In particular, the opening 14 may be arranged so as to be above the maximum level that can be reached by the inert liquid, both when the tub of the washing machine is empty and when the tub contains liquid.

[0041] The opening 14 may advantageously be disposed above the maximum level that can be reached by the washing liquid when the washing machine is in operation and, in particular, during a rinsing stage which corresponds to a maximum quantity of liquid held in the tub.

[0042] According to a variant of the embodiment described up to now, the access opening 14 is not disposed in the side wall but in a top wall (not shown in Figure 1) of the washing machine, parallel to the base 2. In this case, the filter duct 24 may be substantially straight and, with reference to the particular housing chamber of Figure 1, it may form a vertical extension of the housing chamber.

[0043] The housing chamber 23, and hence the filter 6, may be arranged in various orientations inside the washing machine, for example, the chamber may be oriented horizontally or transversely, that is, so that its axis I-I' is arranged parallel to the horizontal plane or transverse the horizontal plane, respectively. The axis I-I' of the chamber 23 for housing the filter 6 is preferably inclined at an angle of inclination α of between 50° and 130° and, more preferably between 70° and 110° , to the horizontal plane.

[0044] It will be noted that the angles of inclination indicated above may lie in planes other than the plane corresponding to the side view of Figure 1. In this connection, reference is made to the embodiment illustrated in Figure 2. Figure 2 is a view of the front wall of a washing machine, that is, a view of the wall comprising the loading porthole (not shown) and the opening 14. The filtering unit 4 of Figure 2 is similar to that described above and the same reference numerals as in Figure 1 have been used to indicate identical or similar components in Figure 2.

[0045] According to this embodiment, the housing chamber 23 is arranged in a manner such that its axis I-I' is inclined at an angle α of about 105° to the line X-X' of the horizontal plane. This inclination advantageously enables the opening 14 and the hand-grip 19 to be spaced suitably from oscillating elements of the washing machine which are present in a central region thereof,

such as, for example, counterweights and shock-absorbers (not shown).

[0046] It is pointed out that, in contrast with the horizontal position adopted by the housing chamber of the prior art, the transverse position of the chamber housing the filter and, in particular, its position at one of the preferred inclinations indicated above optimizes the use of the spaces inside the washing machine, allowing a larger space to be allotted to oscillating components of the machine.

[0047] Moreover, in contrast with the conventional horizontal position of the chamber for housing the filter, the various possible transverse positions according to the invention allow the chamber also to adopt the role of a reservoir for holding the washing liquid which occupies it. In particular, the holding of the washing liquid by the housing chamber is maximized if the chamber is arranged substantially vertically.

[0048] According to the orientation selected for the chamber housing the filtering means, and insofar as overall space requirements allow, suitable geometrical characteristics and hence suitable shapes of the filter duct other than those shown in Figure 1 may be defined.

[0049] It should be noted that it is also possible for the filter duct not to be clearly distinguishable from the chamber housing the filtering means, as in the embodiment of Figure 1, but to include the chamber to the extent of substantially corresponding to it, or to correspond substantially to the portion of the opening 14 which houses the hand-grip 19.

[0050] When one of the two motor units is operated, the washing liquid present in the tub of the washing machine of Figure 1 is drawn from the intake opening 9 and passes through the inner duct 11 to occupy the housing chamber 23 which includes the filter 6. The liquid passes through the filter 6 and falls onto the lower wall of the housing chamber 23 and then reaches the intermediate chamber 20 through the connecting chamber 10. From the intermediate chamber 20, the liquid reaches the housing 8 from which the impellers of the pumps 7 expel it through the outlet openings 22.

[0051] It should be noted that the transverse arrangement and, in particular, the vertical arrangement of the housing chamber 23 is also especially advantageous because it allows the centrifugal pump 34 to operate with a greater active column of washing liquid, reducing the risks of cavitation.

[0052] In order to clean or replace the filter 6, the inspection hand-grip 19 is released from the opening 14 as a result, for example, of a rotation of the hand-grip 19. By virtue of the presence of the articulated joint 18, the rotation of the hand-grip 19 does not twist the flexible element 17.

[0053] The filter 6, which is advantageously flexible, is pulled along the filter duct 24 by the flexible element 17, as far as the opening 14.

[0054] During this stage of the removal of the filter 6, by virtue of the position in which the opening 14 is dis-

posed relative to the inert-liquid level A-A', discharges of the washing liquid present in the housing chamber 23 and coming from the washing tub and/or from a pipe connected to an outlet opening 22 are prevented.

[0055] It is pointed out that, if the filter becomes blocked during the operation of the washing machine, conventional programs for controlling the washing operations provide for the washing to be interrupted. This interruption may take place during a stage of the washing cycle preceding the discharge stage, for example the rinsing stage, in which the tub is full. In this event, in conventional washing machines, when access is gained to the chamber housing the filter in order to remove the impurities or residues which have caused the blockage, a considerable discharge of liquid takes place and, in order to limit the spillage of liquid outside the washing machine, it is necessary to use makeshift containers or to obtain the assistance of a skilled technician.

[0056] By virtue of the teachings of the present invention, this discharge of the washing liquid can be prevented, irrespective of the stage at which the blockage of the filter and the consequent interruption of the washing cycle occurred, and irrespective of the level reached by the washing liquid.

[0057] Moreover, it is pointed out that the seal 16 prevents the liquid from being brought into the filter duct 24 when the pumps are in operation and being drawn towards the opening 14 during the removal of the filter 6.

[0058] After the filter 6 has been cleaned, it is refitted. The flexible element 17 has a stiffness such as to enable the filter 6 to be pushed along the tubular element 12 until it is housed correctly in the housing chamber 23.

[0059] The teachings of the present invention may be applied to washing machines having filtering units of types other than that described with reference to Figure 1. For example, the present invention is applicable to washing machines which do not have circuits for recirculating the washing liquid.

[0060] Figure 3 shows a cross-section of a filtering unit 30 according to the invention which is an alternative to the filtering unit 4 described above and which does not provide for a connection to a washing-liquid recirculation circuit. The components of the filtering unit 30 of Figure 3 which are identical or similar to those described with reference to Figure 2 will be indicated by the same reference numerals.

[0061] The filtering unit 30 comprises the intake opening 9 communicating with a cylindrical housing chamber 31, including a screen filter 32.

[0062] The housing chamber 31 is in communication, through an opening 42, with a cylindrical pump housing 33 disposed beneath the chamber 31 and coaxial therewith.

[0063] In the pump housing 33, there is a centrifugal pump 34 which can be driven by a motor 35. The pump housing 33 is also in communication with the outlet opening 22.

[0064] The upper portion of the chamber 31 is con-

nected to a duct 36 which is provided with the opening 14 and through which the screen filter 32 can be moved by means of the hand-grip 19 and the flexible element 17.

5 **[0065]** The screen filter 32 comprises a cylindrical element 37 and a screen or diaphragm 38 which can face the communication opening 42 between the chamber 31 and the housing 33.

10 **[0066]** The pump 34 comprises an impeller 39 keyed to a suitable shaft 40 which can be connected to an end or shank 41 of a drive shaft of the motor 35. The shaft 40 can be connected to the shank 41 by coupling means 45 which enable the torque generated by the motor 35 to be transmitted from the shank 41 to the shaft 40. The coupling means 45 are preferably releasable so as to enable the shaft 40 to be fixed to and/or detached from the shank 41. For example, the coupling means comprise lugs 46 associated with an end of the shaft 40 for insertion in and/or removal from suitable openings or channels 47 provided on the shank 41 so as to form a male/female coupling.

15 **[0067]** The cylindrical body 37 of the filter 32 is connected to a support structure 43, for example, made of plastics material which, together with the body 5, defines the housing chamber 31 and the pump housing 33, as well as the opening 42.

20 **[0068]** The support structure 43 comprises a suitably shaped portion 48 which extends beneath the impeller 39 and has a hole in which the shaft 40 can extend and rotate, thus performing the function of a hub. This portion 48 also performs the function of an element for the engagement of the support structure 43 on the impeller 39.

25 **[0069]** Moreover, seals 44, for example sealing rings, are associated with the support structure 43, isolating the housing chamber 31 from the pump housing 33 and isolating the latter from the region occupied by the shank 41 connected to the motor 35.

30 **[0070]** The support structure 43 is connected to the flexible element 17 by means of an articulated joint 18 so that it can be removed and/or reinserted through the duct 36 by means of the hand-grip 19.

35 **[0071]** Action on the hand-grip 19 to remove the support structure 43 brings the portion 48 into abutment with the lower walls of the impeller 39 so as to engage the impeller 39. As a result of this engagement, the shaft 40 can be detached from the shank 41 and the impeller and the shaft 40 can be pulled along the housing chamber 31 and the filter duct 36 by suitable action on the support structure 43.

40 **[0072]** In other words, according to the embodiment of Figure 3, it is possible to remove not only the filter 32 but also the impeller of the pump 34.

45 **[0073]** When the support structure 43 is reinserted in the body 5 and the hand-grip 19 is suitably closed, the flexible element 17 exerts on the structure a resilient force which keeps it in the required position, compensating for any axial thrusts generated during the rotation

of the impeller 39.

[0074] It is pointed out that, if the filter duct is formed with a suitable width, it is possible to use a conventional screen filter 32, that is, a non-flexible filter.

[0075] Moreover, it will be noted that the facility to remove the impeller 39 which is offered by the embodiment of the invention shown in Figure 3 is particularly advantageous because it permits easy cleaning not only of the screen filter 32 but also of the impeller 39. In fact, without this facility, and particularly if the filter chamber were in a vertical position, it would be extremely difficult if not impossible to gain access to the chamber housing the impeller in order to clean the impeller.

[0076] The operation of the filtering unit 30 will be clear to an expert in the art from the foregoing description and from the appended drawings and will not therefore be described in detail.

[0077] As described for the filtering unit 4, in the filtering unit 30, the opening 14 is also disposed in the washing machine at least above the maximum level that can be reached by the inert liquid.

[0078] Moreover, with regard to the shape and orientation of the filter duct 36 and of the housing chamber 31 inside the washing machine, remarks similar to those made above with reference to the housing chamber 23 and to the filter duct 24 may be made.

[0079] Figure 4 shows extremely schematically a washing machine 300, for example, a domestic laundry-washing machine, of which the lower portion 100 including the filtering unit 4 has been described above with reference to Figure 1.

[0080] The washing machine 300 comprises the casing 1 which has support feet 1' and which houses a washing tub 50 for collecting the washing liquid coming from a pipe 52 connected to the external water mains and having a valve 52' such as, for example, a solenoid valve. The washing tub 50 encloses a drum 53 that has suitable holes for the inlet of the washing liquid and can hold the laundry to be washed which can be inserted through a porthole 54 connected to the tub 50 by means of a gasket 55.

[0081] The drum 53 can be rotated by means of a shaft 56 connected to a rotor 57 which can be driven by a motor 58, by means of a belt 59.

[0082] The washing drum 50 is in communication with a tube 60 connected to the intake opening 9 of the filtering unit 4. The outlet opening 22 is connected to a tube 61 connected to the drainage system for the washing liquid. Moreover, the washing machine 300 has a system, not shown in Figure 4, for recirculating the washing liquid in order to readmit the washing liquid filtered in the filtering unit 4 to the tub 50.

[0083] The washing machine 300 of Figure 4 enables the filter 6 to be removed as a result of the removal of the hand-grip 19 without any discharge through the opening 14 of the washing liquid present in the housing chamber 23 and coming from the tube 61 or from the washing tub 50, through the tube 60.

[0084] It is pointed out that the washing machine 300 shown by way of example in Figure 4 is of the front-loading type having a washing tub with a vertical axis and that the hand-grip 14 is advantageously accessible from the front. However, as will be clear to an expert in the art, the present invention is applicable to washing machines of other types such as, for example top-loading types and/or types with washing tubs having inclined axes.

[0085] It will also be noted that, as stated above, the opening 14 may also be arranged at a level higher than the maximum level that can be reached by the liquid held in the washing tub. In this case, the opening 14 is disposed above a line 1-1 tangential to a lower edge of the porthole 54.

Claims

1. A unit (4; 30) for filtering the washing liquid in a washing machine, comprising:

means (6; 32) for filtering the washing liquid, the filtering means being disposed in a housing chamber (23; 31) which can be occupied by the liquid in use, and the filtering means being removable from the housing chamber, and a duct (24; 36) through which the filtering means can pass and which is connected to the housing chamber to enable the filtering means to be removed from/inserted in the chamber,

characterized in that the duct has a first end which opens into the housing chamber and a second end having an access opening (14) which can be positioned in the washing machine in use, at a level higher than at least the maximum level that can be reached by the inert liquid inside the filtering unit.

2. A filtering unit (4; 30) according to Claim 1 in which the housing chamber (23) has a substantially cylindrical shape and is oriented inside the washing machine in a manner such that the axis (I-I') of the chamber is arranged transversely relative to a horizontal plane.
3. A filtering unit (4; 30) according to Claim 2 in which the housing chamber (23; 31) is oriented in a manner such that the axis (I-I') of the chamber is inclined at an angle of between 70° and 110° to the horizontal plane.
4. A filtering unit (4; 30) according to Claim 3 in which the housing chamber (23;31) is oriented in a manner such that the axis (I-I') of the chamber is substantially perpendicular to a horizontal plane.

5. A filtering unit (4; 30) according to Claim 1 in which the filtering means (6; 32) are operatively connected to movement means (17, 19) for moving the filtering means inside the duct.
6. A filtering unit (4; 30) according to Claim 5 in which the movement means (17, 19) comprise a flexible element (17) structurally associated with the filtering means and accessible through the access opening (14).
7. A filtering unit (4; 30) according to Claim 6 in which the movement means comprise a removable closure element (19) of the opening (14), operatively connected to the flexible element (17).
8. A filtering unit (4; 30) according to Claim 1 in which the duct (24; 36) comprises a curved portion which can extend towards a side wall (3) of the washing machine, so that the access opening (14) is disposed in the side wall.
9. A filtering unit (4; 30) according to Claim 1 in which the duct (24; 36) extends inside the washing machine in a manner such that the access opening (14) is disposed in a top wall of the washing machine.
10. A filtering unit (4; 30) according to Claim 1 in which a seal (16) is associated with the filtering means (6; 32) for isolating the housing chamber (23; 31) from the duct (24; 36) when the filtering means are disposed in the chamber.
11. A filtering unit (4; 30) according to Claim 1, further comprising:
a washing-liquid intake opening (9) in communication with the chamber (23; 31) for housing the filtering means (6; 32),
a housing (8; 33) for a pump (7; 34) for drawing the washing liquid through the chamber (23; 31) housing the filtering means (6; 32), and for expelling the washing liquid towards an outlet opening (22) arranged in communication with the housing.
12. A filtering unit (4; 30) according to Claim 1 in which the filtering means (6; 32) are of a type belonging to the group comprising: a labyrinth filter, a grid filter, and a screen filter.
13. A filtering unit according to Claim 1 in which the filtering means (6; 32) are formed so as to be flexible in order to adapt to the duct (24; 36).
14. A filtering unit (30) according to Claim 1, further comprising an impeller (39) of a centrifugal pump having means (45) for coupling with a motor for driving the impeller, the coupling means being releasable to enable the centrifugal-pump impeller to be fixed to/detached from the drive motor.
15. A filtering unit (30) according to Claims 5 and 14, further comprising a support structure (43) for the filtering means (6; 32), the support structure (43) being operatively connected to the movement means (17; 19) so as to be movable inside the duct (36) together with the filtering means, the support structure comprising an element (48) for engaging the impeller (39) during the movement of the support structure so as to detach the impeller from the drive motor (35) and to pull the impeller along the filter duct (36).
16. A washing machine (300), particularly a domestic washing machine, comprising a filtering unit (4; 30), **characterized in that** the filtering unit is formed in accordance with any one of Claims 1 to 15.
17. A washing machine (300) according to Claim 16, comprising a tub (50) for holding a washing liquid during a washing stage, the tub being able to be emptied of the washing liquid by means of a discharge stage.
18. A washing machine (300) according to Claim 17 in which the access opening (14) is disposed at a level higher than the maximum level that can be reached by the inert liquid when the tub (50) is emptied.
19. A washing machine (300) according to Claim 18 in which the opening is disposed at a level higher than the maximum level that can be reached by the inert liquid when the tub (50) contains the inert liquid.
20. A washing machine (300) according to Claim 19 in which the access opening (14) is disposed at a level higher than the maximum level that can be reached by the washing liquid when the washing machine is in operation.

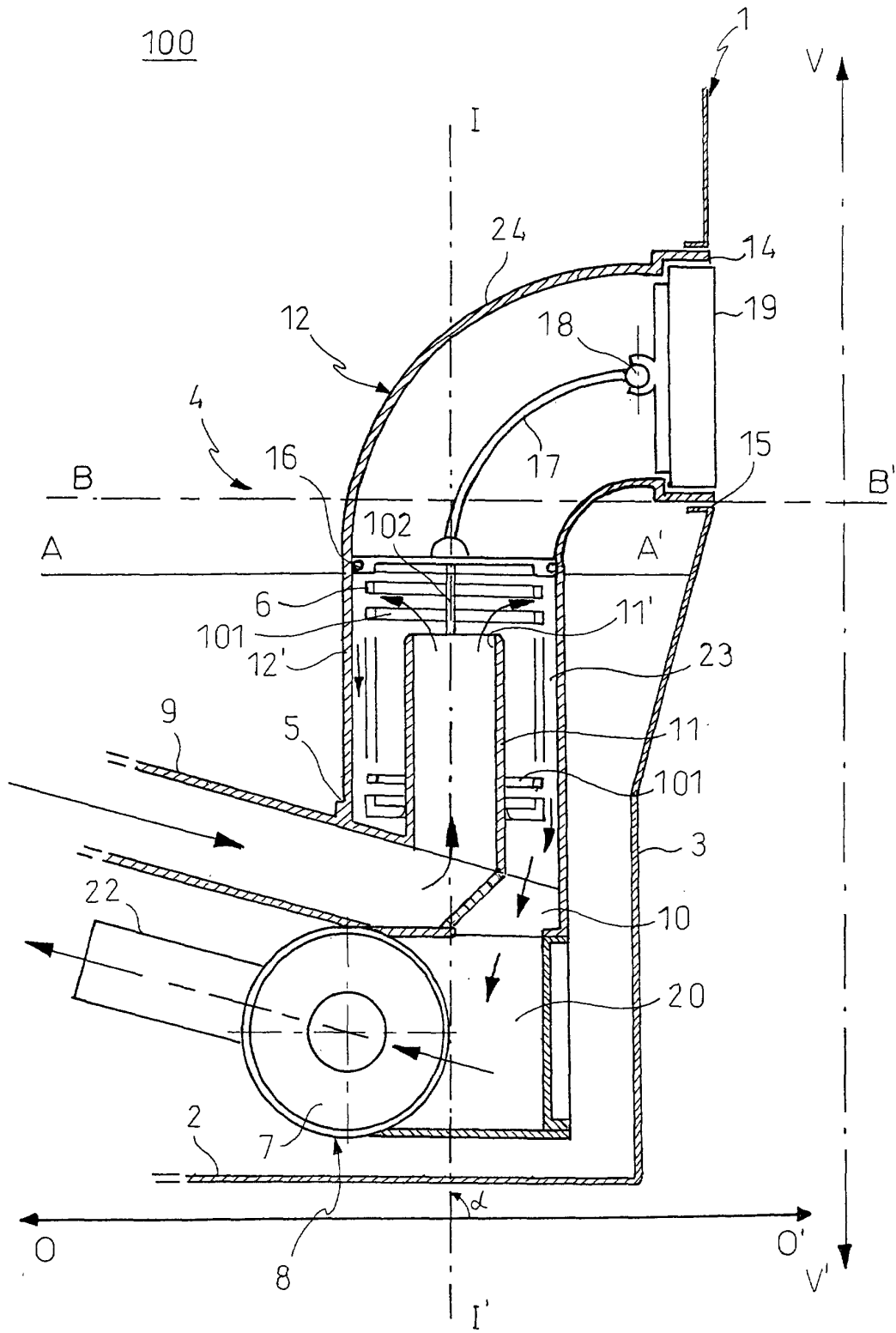


FIG.1

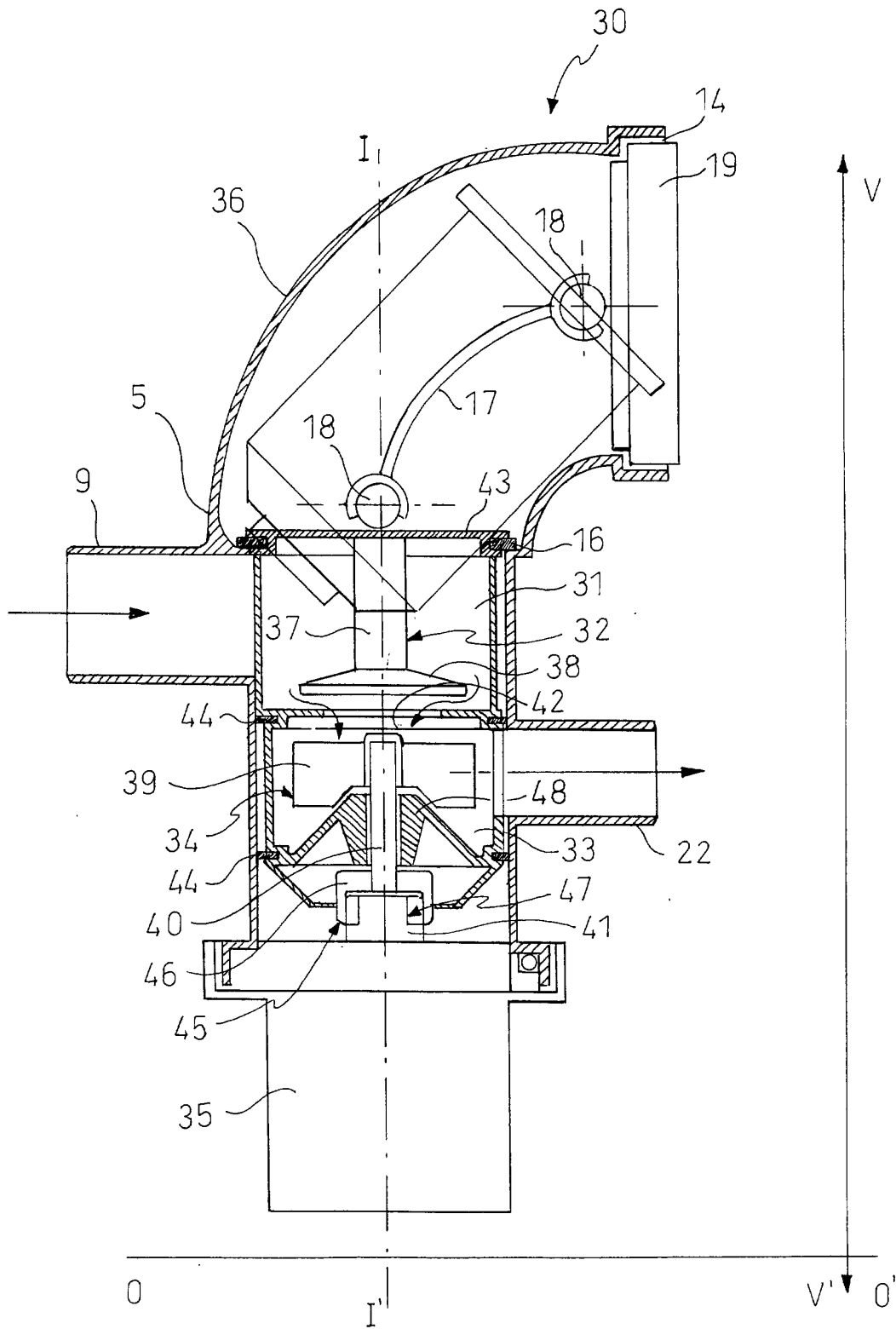


FIG. 3

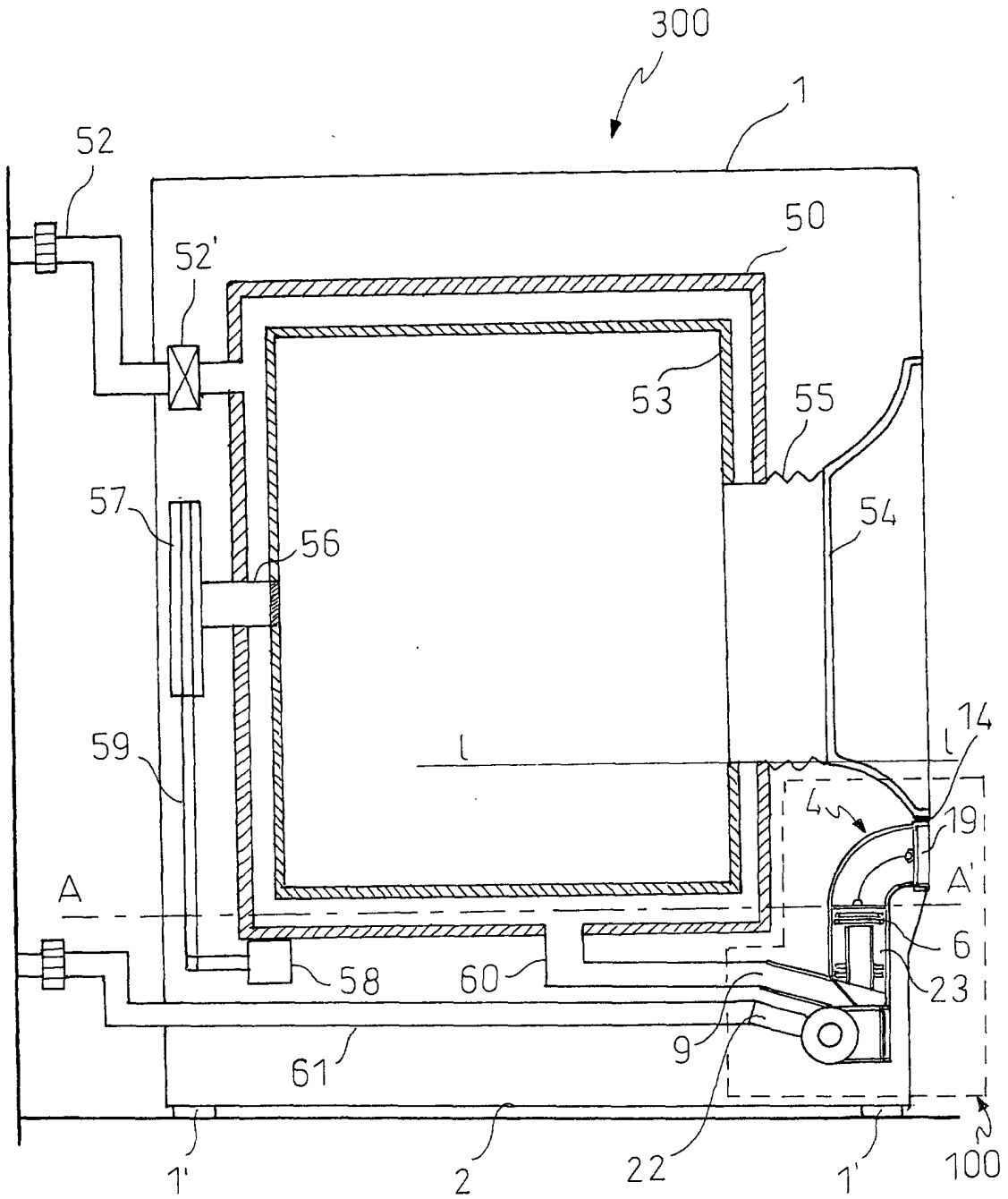


FIG. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 83 0717

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
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