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(54) **Washing machine with improved filtering device**

Waschmaschine mit Filtervorrichtung

Machine à laver avec dispositif de filtration

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Description

[0001] The present invention refers to a washing machine with improved filtering device, more in particular for a laundry washing machine. Even more particularly this invention refers to a washing machine for domestic use, particularly but not exclusively for a front load type washing machine.

[0002] In traditional washing machines, the action of filtration of the water outflowing from the washing tank is carried out by a structure external to the same washing tank. By means of a tubular mean the washing water, primarily during the centrifugal stage, is introduced in a filtering cartridge device in which a proper rigid filter suitable to eliminate the various deposits and impurities found in the washing water is present. Subsequently the latter is sucked by an appropriate hydraulic pump and it is expelled on the outside through an appropriate drain pipe.

[0003] In modem washing machines, the filtering device is positioned in the lower zone of the structure of the piece of furniture that contains the washing machine, mainly for esthetical needs. As known, a frequently performed operation consists in the inspection and cleaning of the filter. Such operation becomes onerous since it obliges the user to preventively recover, with means of emergency, all the water contained in the drain circuit.

[0004] Currently, in order to avoid these complications inherent the operation of inspection and cleaning of the filter and its possible substitution, in some washing machines the filtering device is positioned at a certain height of the piece of furniture. A vertical tank suitable to contain the volume of backflow water of the drain pipe is connected to such device. Or instead, for esthetical needs, this tank is made with a wide surface but a small containment column, and it is then covered with a plastic cover.

[0005] In view of the state of the art herein described, object of the present invention is to provide a washing machine provided with a filtering device that is both aesthetically and functionally more advantageous than the known technology.

[0006] According to the preamble of claim 1, there is provided a washing machine contained in a piece of furniture, said washing machine comprising a washing tank, a hydraulic drain circuit of the washing liquid in the tank and filtration means that are hydraulically connected with the hydraulic drain circuit. Such a washing machine is known from WO 9 425 661. The present invention is characterized in that said filtration means are hydraulically connected with said hydraulic drain circuit by extendible hydraulic connection means, so that said filtration means are extractable from the piece of furniture containing the washing machine, and said extendible hydraulic connection means serve as a tank for the washing liquid that is present in the hydraulic drain circuit.

[0007] Owing to the present invention it is possible to realise a washing machine with a filtering device in which the operation of inspection can be carried out with greater convenience and effectiveness, without any danger for the outflow of the liquid present in the filtering cartridge. In addition, such device, meets the aesthetical requirements, since it can be located in the lower zone of the piece of furniture containing the washing machine, without compromising the easiness of the inspection and/or substitution of the filter.

[0008] The characteristics and the advantages of the present invention will become evident from the following detailed description of some embodiments thereof, that are illustrated as non limiting examples in the enclosed drawings, in which:

Figure 1 is a sectional view of the filtering device according to the invention, according to a first embodiment;
Figure 2 is a sectional view of the filtering device according to the invention, according to a second embodiment;
Figure 3 is a sectional view of the filtering device according to the invention, according to a third embodiment;
Figure 4 is a sectional view of the filtering device according to an alternative solution of the embodiments of the device of Figure 2, 3;
Figure 5 is a sectional view of the filtering device according to the invention, according to a fifth embodiment;
Figure 6 is a sectional view of the filtering device of figure 5, with the filtering cartridge device extracted from its housing;
Figure 7 is a sectional view of the filtering device according to the invention, according to a sixth embodiment;
Figure 8 is a sectional view of the filtering device of figure 7, with the filtering cartridge extracted from its housing.

[0009] In Figure 1 a first embodiment of the invention is shown. The filtering device 50 is housed in the lower zone of the structure of the piece of furniture 51 containing the washing machine. Such device is made up of a filtering cartridge 1, for instance with rectangular section, inside which a filter 2 comprising two annular concentric filtering walls with chequered pattern passages is housed in an extractable way and, externally, of a traditional type handle 25 of the with clutch closing. Such filtering cartridge 1 is connected with a tubular mean 3, made, for instance, of PVC or of rubber, that is corrugated in such a way so as to make it extendible, for instance up to three times its length, and it partially contains within itself a tubing 7, coaxial to it, connected, at one of its ends, with a washing tank 5 more or less centrally. The washing water coming from the tank 5 flows through the tubing 7 toward the filter 2 that provides to hold back filaments or other impurities. The other end

of the tubing 7 is inserted inside the filtering cartridge 2, in order not to allow that the non-filtered washing water mixes with the filtered one that instead flows out through the tubular mean 3. The latter is connected to a hydraulic pump 8, that provides to suck the filtered washing water and it allows its expulsion outside through the drain pipe 9.

[0010] In the case in which the washing machine is at the end of the stage of wash-rinse, a considerable quantity of washing water backflowing from the drain pipe 9, remains inside the system consisting of the filtering device 50 and of the hydraulic pump 8. In order to avoid that this water flows outside during the operation of inspection or substitution of the filter 2, the filtering cartridge 1 is drawn out of the housing and it is lifted by means of the extension of the tubular mean 3. Said tubular mean 3, by increasing its volume, for instance from 100cc to 300cc, serves as a tank for the washing water contained in the system made up of the hydraulic pump 8 and of the filtering device 50, thus preventing the outflow of water.

[0011] In order to facilitate the operation of opening of the knob of the filtering cartridge 2, once it has been extracted from the housing, the filtering device 50 is preferably put in vertical position, and it is maintained in this position by means of the action of support of a lever 4 that is fixed on one end to the filtering cartridge 1 and on the other end connected with said cartridge by means of a spring. After the inspection or possible substitution of the filter 2, the filtering cartridge device is easily placed back in its housing due to the spring effect of the tubular mean 3. It must be noticed that, when the tubular mean 3 is in the compressed condition, its inside-surface is substantially homogeneous, therefore no losses of hydraulic load take place.

[0012] In Figure 2 there is shown a second embodiment of the invention that even though following the scheme of operation of the embodiment shown in Figure 1, provides different solutions. The tubing 7, has a greater length than the previous case, and it is connected with the washing tank 5 in a further back position. The tubular mean 3, coaxial to the tubing 7, also has a better extension. In this way a filtering cartridge device 11, of different typology as compared with the filtering cartridge device used previously, drawn out of its relative housing, is brought in vertical position up to a height that is greater than the maximum level that the washing mixture can reach inside the washing tank 5, and it is hooked to the washing machine by means of a hook 40. In this way the inspection of the filter 2 can take place while the washing machine is in operation even in the wash-rinse or centrifugal stage, thus favouring the intervention of the technicians of the service centres in the case of a sudden block of the filter 2 even at full load. In addition the housing of the filtering cartridge device 11 is provided with a pipe 100 serving as an inlet that facilitates the introduction of the same filtering cartridge device in its housing.

[0013] A variation of this second embodiment, provides the realisation in plastic corrugated material for both the tubular mean 3, and the tubing 7. This allows to position the hydraulic pump 8, in completely different positions, even not in axis with the filtering cartridge device 11, thus using up the spaces available inside the piece of furniture containing the washing machine in a better way.

[0014] In Figure 3 there is shown a third embodiment of the invention that provides for the use of the filtering cartridge 11 and of a different typology of filter 20, the latter of the so-called head type. The washing water coming from the tank flows through the tubing 30 inside the filtering cartridge device 11 and, once filtered, it flows out through the tubular mean 70, coaxial and internal to the tubing 30, toward the hydraulic pump 8 that provides for its expulsion through the drain pipe 9. Both the tubular mean 70, and the tubing 30 are made of corrugated plastic material, thus allowing to position the hydraulic pump in a position that is not in line with the filtering cartridge device 11. As a variation the tubular mean 70 can be a not corrugated pipe, but in this case, the hydraulic pump 8 must be placed at an axis with the filtering cartridge 11. The operation of extraction of the filtering cartridge device 11 from its housing remains the same as the previous embodiment.

[0015] In Figure 4 there is shown a different solution that can be adopted both in the second as well as in the third embodiment. This solution provides for a connection of the hydraulic pump 8 directly with the washing tank 5, thus eliminating additional openings used in the previous embodiment. In this case it is though necessary that both the tubular mean 3, 70 of connection with the pump 8, and the tubing 7, 30 coaxial to the first one and of connection with the washing tank 5, are made of corrugated plastic material.

[0016] In Figures 5 and 6, there is shown a fourth embodiment of the invention, that provides the use of a filtering cartridge 10 with curved section, in which a tubular filter 21 that is provided with through passages or with rectangular section is housed, like several filters currently in use. The tubular mean 3 and the tubing 7, that respectively allow the outflow and the inflow of the washing water, are coaxial and both made of in extendible material, for instance corrugated plastics, and naturally connected with the filtering cartridge device 10. The latter can rotate around a fixed pin 15 that is hooked to the structure of the piece of furniture 51. The operation of inspection of the filter, shown in Figure 6, provides the extraction of the filtering cartridge device 10 in rotary sense and, preferably, the use of a lock not visible in the figures, in order to make said cartridge 10 stay in vertical position. Inside the filtering cartridge device also a spherical joint 18 is present that connects the knob 25 with the filter 21, and allows an easier extraction of the filter 21 from its housing after a rotation of the same knob. The sizing of the extendible part of the filtering device 50 (pipes 3 and 7), is carried out considering the

operation of rotation as also the quantity of washing water present in the filtering cartridge 10.

[0017] In Figures 7 and 8, there is shown a sixth embodiment of the invention, that provides for the use of pipes that are not coaxial, but separate, for the inflow and the outflow of the washing water from the filtering cartridge. The filtering device 50, as in the case of the previous figure, has a filtering cartridge 10, with curved section, that can rotate around a pin 15 hooked to the piece of furniture 51 containing the washing machine. The tubing 71 made of extendible material, for instance corrugated plastic, takes the washing water coming from the tank, directly to the filter 22 that in this case is of the "bucket" type. The filtered washing water is then sucked by the hydraulic pump 8 through the tubular mean 31, extendible too, and drained outside through the drain pipe 9. The operation of inspection of the filter, shown in Figure 8, similarly to the previous embodiment, provides the extraction in rotary sense of the filtering cartridge 10 and, preferably, the use of a retainer in order to make said cartridge 10 stay in vertical position.

[0018] As already pointed out with reference to the first embodiment, in the other embodiments too the extendible pipes or tubular means in the form of corrugated pipes, when compressed have a substantially homogeneous inside surface, which prevents losses in hydraulic load.

Claims

1. Washing machine contained in a piece of furniture (51), said washing machine comprising a washing tank (5), a hydraulic drain circuit of the washing liquid in the tank (5) and filtration means (50) hydraulically connected to the hydraulic drain circuit, **characterized in that** said filtration means are hydraulically connected with said hydraulic drain circuit by extendible hydraulic connection means, so that said filtration means (50) are extractable from the piece of furniture (51) containing the washing machine, and said extendible hydraulic connection means serve as a tank for the washing liquid present in the hydraulic drain circuit.

2. Washing machine according to claim 1, **characterised in that** said filtration means (50) comprise a filtering cartridge (1; 10; 11) inside which a filter (2; 20; 21; 22) is housed in an extractable way, said filtering cartridge (1; 10; 11) is housed in a respective housing made in the piece of furniture (51).

3. Washing machine according to claim 2, **characterised in that** said hydraulic connection means comprise a tubular mean (3; 31) which connects the filtering cartridge (1; 10; 11) with a hydraulic pump (8) which sucks the filtered washing water and allows its expulsion through a drain pipe (9).

4. Washing machine according to claim 2, **characterised in that** said hydraulic connection means comprise a tubing (30) which connects the filtering cartridge (11) with the washing water (5) and it allows the inflow of washing water inside the filtering cartridge (11).

5. Washing machine according to claim 3, **characterised in that** a tubing (7; 71) is provided having an end connected with the washing tank (5) and the other end inserted in the filtering cartridge (1; 10; 11) in order to allow the inflow of washing water inside the filtering cartridge (10) in such a way that said washing water does not mix with the filtered washing water.

6. Washing machine according to claim 4, **characterised in that** a tubular mean (70) is provided that connects the filtering cartridge (11) with a hydraulic pump (8), in such a way so as to allow the outflow of washing water and its expulsion trough a drain pipe (9).

7. Washing machine according to claim 5, **characterised in that** said tubing (7) is partly contained inside said tubular mean (3) and it is coaxial to it, and the end of the same is inserted in the filtering cartridge (1; 10; 11) in an uncouplable manner.

8. Washing machine according to claim 5, **characterised in that** said tubing (7) and said tubular mean (31) are separate.

9. Washing machine according to claim 7, **characterised in that** said filtering cartridge (1; 11), for example with rectangular section, is extracted from its housing during the operation of inspection of the filter (2), and it can be placed in a vertical position and maintained there through the action of a retainer (4; 40).

10. Washing machine according to claim 9, **characterised in that** said tubular mean (3), being made of corrugated plastic material, contains backflow water from the drain pipe (9) thus preventing said water to outflow during the operation of inspection of the filter (2), and after the aforesaid operation, it allows an easier positioning back in its housing of said filtering cartridge (1; 11), by means of its spring effect, having said tubular mean-a substantially homogeneous inside surface, when in the compressed condition.

11. Washing machine according to claim 10, **characterised in that** said filter (2) to retain possible filaments or other impurities present in the washing water is a filter made up of two annular concentric filtering walls with chequered pattern passages.

12. Washing machine according to claim 11, **characterised in that** said tubing (7) is connected with the washing tank (5) in a central point.

13. Washing machine according to claim 12, **characterised in that** said filtering cartridge (1), once it has been extracted from its housing, is kept in a vertical position by the supporting action of a lever (4) that is fixed to said filtering cartridge (1) at one end and is connected with said cartridge (1) by a spring at the other end.

14. Washing machine according to claim 11, **characterised in that** said tubing (7) is long enough so as to be connected with the washing tank (5) in a further back point of the same.

15. Washing machine according to claim 14, **characterised in that** said tubular mean (3) is long enough so as to allow that said filtering cartridge (11), once extracted from its housing, is brought up to a height greater than the maximum level that the washing mix can reach inside the washing tank (5), is hooked to the piece of furniture containing the washing machine by means of a hook (40), in vertical position, so that the inspection of the filter (2) can take place also with the washing machine in operation during the wash-rinse or centrifugal stage, thus favouring the intervention of technicians of the service centres in case of a sudden block of the filter (2) even at full load.

16. Washing machine according to claim 15, **characterised in that** the filtering cartridge housing (1) is provided with a duct (100) serving as an inlet, in order to facilitate the introduction of the filtering cartridge (1) in its housing.

17. Washing machine according to claim 16, **characterised in that** both the tubing (7) and the tubular mean (3) are made of corrugated plastic material, in order for the hydraulic pump (8) to be placed in completely different positions and not at an axis with the filtering cartridge (11), thus using up the spaces available inside the piece of furniture (51) containing the washing machine in a better way.

18. Washing machine according to claim 6, **characterised in that** said filter (20) is a head shape filter housed inside said filtering cartridge (11), for example with rectangular section, said filtering cartridge (11) is extracted from its housing during the operation of inspection of the filter (20), and it can be placed in a vertical position and maintained there through the action of a block (40).

19. Washing machine according to claim 18, **characterised in that** said tubing (30) partly internally contains said tubular mean (70) and is coaxial thereto, said tubing (30) is as long as to allow that said filtering cartridge (11), once extracted from its relative housing, is brought upward to a height greater than the maximum level that the washing mix can reach inside the washing tank (5), and it is hooked to the piece of furniture (51) containing the washing machine by means of a hook (40), in vertical position, so that the inspection of the filter (20) can take place even with the washing machine in operation during the wash-rinse or centrifugal stage, thus favouring the intervention of technicians of the service centres in case of a sudden block of the filter (20) even at full load, said tubing (30) being made of corrugated plastic material, contains the water of backflow from the drain pipe (9), thus preventing that said water outflows during the operation of inspection of the filter (20), and after the aforementioned operation, it allows an easier positioning back of said filtering cartridge (11)in its housing, by means its spring effect.

20. Washing machine according to claim 17 or 19, **characterised in that** both the tubing (7; 30) and the tubular mean (3; 70) are made of corrugated plastic material, in order for the hydraulic pump (8) to be placed in completely different positions and not in axis with the filtering cartridge (11), thus using up the spaces available inside the piece of furniture (51) containing the washing machine in a better way.

21. Washing machine according to claim 20, **characterised in that** said hydraulic pump (8) is directly connected with the washing tank (5) in order to eliminate additional openings.

22. Washing machine according to claim 7 or 8, **characterised in that** said filtering cartridge (10) has a curved section and it can rotate around a fixed pin (15) that is hooked to the piece of furniture containing the washing machine, said cartridge is connected with a tubing (7; 71) and with a tubular mean (3; 31) both extensible, and a rotary sense extraction of said filtering cartridge (11) is provided as well as the use of a retainer so as to keep said filtering cartridge (10) in a vertical position.

23. Washing machine according to claim 22, in that it depends on claim 7, **characterised in that** said filter (21) is a tubular type filter provided with pierced through passages or with rectangular section.

24. Washing machine according to claim 23, **characterised in that** it provides a spherical coupling (18) that connects the knob to the filter (21) and allows an easier extraction of the filter (21) from its housing after a rotation of the same knob .

25. Filtering device according to claim 22, in that it depends on claim 8, **characterised in that** said filter (22) is of the bucket type filter.

Patentansprüche

1. Waschmaschine, die in einem Möbelstück (51) enthalten ist, wobei die Waschmaschine einen Waschbehälter (5), einen hydraulischen Ablaufkreis für die Waschflüssigkeit im Behälter (5) und eine Filtriereinrichtung (50), die hydraulisch an dem hydraulischen Ablaufkreis angeschlossen ist, aufweist, **dadurch gekennzeichnet, dass** die Filtriereinrichtung (50) durch eine ausdehnbare hydraulische Anschlusseinrichtung hydraulisch an dem hydraulischen Ablaufkreis angeschlossen ist, so dass die Filtriereinrichtung (50) aus dem die Waschmaschine enthaltenden Möbelstück (51) herausziehbar ist und die ausdehnbare hydraulische Anschlusseinrichtung als Behälter für die in dem hydraulischen Ablaufkreis vorhandene Waschflüssigkeit dient.

2. Waschmaschine nach Anspruch 1, **dadurch gekennzeichnet, dass** die Filtriereinrichtung (50) eine Filterpatrone (1; 10; 11) aufweist, innerhalb welcher ein Filter (2; 20; 21; 22) auf eine herausziehbare Weise untergebracht ist, wobei die Filterpatrone (1; 10; 11) in einem jeweiligen im Möbelstück (51) ausgebildeten Gehäuse untergebracht ist.

3. Waschmaschine nach Anspruch 2, **dadurch gekennzeichnet, dass** die hydraulische Anschlusseinrichtung eine rohrförmige Einrichtung (3; 31) aufweist, die die Filterpatrone (1; 10; 11) mit einer Hydraulikpumpe (8) verbindet, die das gefilterte Waschwasser ansaugt und seine Ausstoßung über ein Ablaufrohr (9) zulässt.

4. Waschmaschine nach Anspruch 2, **dadurch gekennzeichnet, dass** die hydraulische Anschlusseinrichtung eine Rohrleitung (30) aufweist, die die Filterpatrone (11) mit dem Waschwasser (5) verbindet und das Hineinfließen von Waschwasser in die Filterpatrone (11) zulässt.

5. Waschmaschine nach Anspruch 3, **dadurch gekennzeichnet, dass** eine Rohrleitung (7; 71) vorgesehen ist, die ein Ende mit dem Waschbehälter (5) verbunden und das andere Ende in die Filterpatrone (1; 10; 11) eingefügt hat, um das Hineinfließen von Waschwasser in die Filterpatrone (10) auf solche Weise zuzulassen, dass sich das Waschwasser nicht mit dem gefilterten Waschwasser mischt.

6. Waschmaschine nach Anspruch 4, **dadurch gekennzeichnet, dass** eine rohrförmige Einrichtung (70) vorgesehen ist, die die Filterpatrone (11) auf solche Weise mit einer Hydraulikpumpe (8) verbindet, dass das Ausfließen von Waschwasser und seine Ausstoßung über ein Ablaufrohr (9) zugelassen ist.

7. Waschmaschine nach Anspruch 5, **dadurch gekennzeichnet, dass** die Rohrleitung (7) teilweise innerhalb der rohrförmigen Einrichtung (3) enthalten ist und sie koaxial zu ihr ist und das Ende derselben in der Filterpatrone (1; 10; 11) auf eine abkuppelbare Weise eingefügt ist.

8. Waschmaschine nach Anspruch 5, **dadurch gekennzeichnet, dass** die Rohrleitung (7) und die rohrförmige Einrichtung (31) getrennt sind.

9. Waschmaschine nach Anspruch 7, **dadurch gekennzeichnet, dass** die Filterpatrone (1; 11) während der Untersuchungsoperation des Filters (2) beispielsweise mit einem rechteckigen Abschnitt aus ihrem Gehäuse herausgezogen wird, und sie in einer vertikalen Position platziert und durch die Aktion eines Halters (4; 40) in dieser gehalten werden kann.

10. Waschmaschine nach Anspruch 9, **dadurch gekennzeichnet, dass** die rohrförmige Einrichtung (3), die aus gewelltem Plastikmaterial hergestellt ist, Rückflusswasser vom Ablaufrohr (9) enthält, um dadurch zu verhindern, dass während der Untersuchungsoperation des Filters (2) Wasser ausfließt, und sie nach der vorgenannten Operation mittels ihres Federeffekts eine einfachere Positionierung der Filterpatrone (1; 11) zurück in ihr Gehäuse zulässt, wobei die rohrförmige Einrichtung im Wesentlichen eine homogene Innenfläche hat, wenn sie im komprimierten Zustand ist.

11. Waschmaschine nach Anspruch 10, **dadurch gekennzeichnet, dass** das Filter (2) zum Zurückhalten möglicher Fasern oder anderer Unreinheiten, die im Waschwasser vorhanden sind, ein Filter ist, das aus zwei kreisringförmigen konzentrischen Filterwänden mit Durchgängen mit kariertem Muster aufgebaut ist.

12. Waschmaschine nach Anspruch 11, **dadurch gekennzeichnet, dass** die Rohrleitung (7) mit dem Waschbehälter (5) bei einer zentralen Stelle verbunden ist.

13. Waschmaschine nach Anspruch 12, **dadurch gekennzeichnet, dass** die Filterpatrone (1), wenn sie einmal aus ihrem Gehäuse herausgezogen worden ist, durch die Stützaktion eines Hebels (4) in einer vertikalen Position gehalten wird, der an der Filterpatrone (1) an einem Ende fixiert ist und mit der Patrone (1) durch eine Feder am anderen Ende ver-

bunden ist.

14. Waschmaschine nach Anspruch 11, **dadurch gekennzeichnet, dass** die Rohrleitung (7) lang genug ist, um mit dem Waschbehälter (5) bei einer weiteren Rückseitenstelle desselben verbunden zu werden.

15. Waschmaschine nach Anspruch 14, **dadurch gekennzeichnet, dass** die rohrförmige Einrichtung (3) lang genug ist, um zuzulassen, dass die Filterpatrone (11), wenn sie einmal aus ihrem Gehäuse herausgezogen ist, zu einer Höhe nach oben gebracht wird, die größer als das maximale Ausmaß ist, welches die Waschmischung innerhalb des Waschbehälters (5) erreichen kann, und an das die Waschmaschine enthaltende Möbelstück mittels eines Hakens (40) bei einer vertikalen Position angehakt wird, so dass die Untersuchung des Filters (2) auch stattfinden kann, wenn die Waschmaschine während der Waschspül- oder Schleudergangs in Betrieb ist, um dadurch für die Intervention von Technikern der Servicezentren im Fall eines plötzlichen Blockierens des Filters (2) selbst bei einer vollen Ladung günstig zu sein.

16. Waschmaschine nach Anspruch 15, **dadurch gekennzeichnet, dass** das Filterpatronen-Gehäuse (1) mit einer Durchführung (100) versehen ist, die als Einlass dient, um das Einführen der Filterpatrone (1) in ihr Gehäuse zu erleichtern.

17. Waschmaschine nach Anspruch 16, **dadurch gekennzeichnet, dass** sowohl die Rohrleitung (7) als auch die rohrförmige Einrichtung (3) aus gewelltem Plastikmaterial hergestellt sind, damit die Hydraulikpumpe (8) bei vollständig unterschiedlichen Positionen und nicht in Achsenrichtung mit der Filterpatrone (11) angeordnet werden kann, um dadurch die Räume auf eine bessere Weise auszunutzen, die innerhalb des die Waschmaschine enthaltenden Möbelstücks (51) verfügbar sind.

18. Waschmaschine nach Anspruch 6, **dadurch gekennzeichnet, dass** das Filter (20) ein Kopfformfilter ist, das innerhalb der Filterpatrone (11) untergebracht ist, beispielsweise mit einem rechteckigen Querschnitt, die Filterpatrone (11) während der Untersuchungsoperation des Filters (20) aus ihrem Gehäuse herausgezogen wird und sie bei einer vertikalen Position angeordnet und durch die Aktion einer Blockierung (40) in dieser gehalten werden kann.

19. Waschmaschine nach Anspruch 18, **dadurch gekennzeichnet, dass** die Rohrleitung (30) die rohrförmige Einrichtung (70) teilweise intern enthält und koaxial zu dieser ist, die Rohrleitung (30) so lang ist, dass zugelassen wird, dass die Filterpatrone (11), wenn sie einmal aus ihrem relativen Gehäuse herausgezogen ist, zu einer Höhe in Richtung nach oben gebracht wird, die größer als das maximale Ausmaß ist, welches die Waschmischung innerhalb des Waschbehälters (5) erreichen kann, und sie mittels eines Hakens (40) bei einer vertikalen Position an das die Waschmaschine enthaltende Möbelstück (51) gehakt wird, so dass die Untersuchung des Filters (20) selbst während des Wasch-, Spül- oder Schleudergangs in Betrieb der Waschmaschine stattfinden kann, um dadurch für die Intervention von Technikern der Servicezentren im Fall eines plötzlichen Blockierens des Filters (20) selbst bei einer vollen Ladung günstig zu sein, die Rohrleitung (30), die aus gewelltem Plastikmaterial hergestellt ist, das Wasser eines Rückflusses vom Ablaufrohr (9) enthält, um dadurch zu verhindern, dass das Wasser während der Untersuchungsoperation des Filters (20) ausfließt, und sie nach der vorgenannten Operation mittels ihres Federeffekts eine einfachere Positionierung der Filterpatrone (11) zurück in ihr Gehäuse zulässt.

20. Waschmaschine nach Anspruch 17 oder 19, **dadurch gekennzeichnet, dass** sowohl die Rohrleitung (7; 30) als auch die rohrförmige Einrichtung (3; 70) aus gewelltem Plastikmaterial hergestellt sind, damit die Hydraulikpumpe (8) bei vollständig unterschiedlichen Positionen und nicht in Achsenrichtung mit der Filterpatrone (11) angeordnet werden kann, um dadurch die Räume auf eine bessere Weise auszunutzen, die innerhalb des die Waschmaschine enthaltenden Möbelstücks (51) verfügbar sind.

21. Waschmaschine nach Anspruch 20, **dadurch gekennzeichnet, dass** die Hydraulikpumpe (8) direkt mit dem Waschbehälter (5) verbunden ist, um zusätzliche Öffnungen zu eliminieren.

22. Waschmaschine nach Anspruch 7 oder 8, **dadurch gekennzeichnet, dass** die Filterpatrone (10) einen gekrümmten Querschnitt hat und sie sich um einen fixierten Stift (15) drehen kann, der an dem die Waschmaschine enthaltenden Möbelstück gehakt ist, die Patrone mit einer Rohrleitung (7; 71) und mit einer rohrförmigen Einrichtung (3; 31) verbunden ist, die beide ausdehnbar sind, und eine Drehrichtungs-Extraktion der Filterpatrone (11) sowie die Verwendung eines Halters vorgesehen ist, um die Filterpatrone (10) in einer vertikalen Position zu halten.

23. Waschmaschine nach Anspruch 22, wenn er vom Anspruch 7 abhängt, **dadurch gekennzeichnet, dass** das Filter (21) ein Filter vom rohrförmigen Typ ist, das mit durchgestoßenen bzw. durchbohrten

Durchgängen oder mit einem rechteckförmigen Querschnitt versehen ist.

24. Waschmaschine nach Anspruch 23, **dadurch gekennzeichnet, dass** sie eine sphärische Kopplung (18) zur Verfügung stellt, die den Griff an das Filter (21) anschließt und nach einer Drehung desselben Griffs ein einfacheres Herausziehen des Filters (21) aus seinem Gehäuse zulässt.

25. Filtervorrichtung nach Anspruch 22, wenn er vom Anspruch 8 abhängt, **dadurch gekennzeichnet, dass** das Filter (22) ein Filter vom Typ eines Förderschachts ist.

Revendications

1. Machine à laver contenue dans une garniture (51), ladite machine à laver comprenant une cuve de lavage (5), un circuit de vidange hydraulique du liquide de lavage dans la cuve (5) et des moyens de filtration (50) hydrauliquement reliés au circuit de vidange hydraulique, **caractérisée en ce que** lesdits moyens de filtration sont hydrauliquement reliés audit circuit de vidange hydraulique par des moyens de connexion hydrauliques étirables, de sorte que lesdits moyens de filtration (50) sont extractibles de la garniture (51) contenant la machine à laver et lesdits moyens de connexion hydrauliques étirables agissent comme une cuve pour le liquide de lavage présent dans le circuit de vidange hydraulique.

2. Machine à laver selon la revendication 1, **caractérisée en ce que** lesdits moyens de filtration (50) comprennent une cartouche de filtration (1 ; 10 ; 11) dans laquelle un filtre (2 ; 20 ; 21 ; 22) est placé de façon extractible, ladite cartouche de filtration (1 ; 10 ; 11) étant placée dans un logement respectif fabriqué dans la garniture (51).

3. Machine à laver selon la revendication 2, **caractérisée en ce que** lesdits moyens de connexion hydrauliques comprennent un moyen tubulaire (3 ; 31) qui relie la cartouche de filtration (1 ; 10 ; 11)à une pompe hydraulique (8) qui aspire l'eau de lavage filtrée et permet son expulsion au travers d'un tuyau d'écoulement (9).

4. Machine à laver selon la revendication 2, **caractérisée en ce que** lesdits moyens de connexion hydrauliques comprennent un tuyau (30) qui relie la cartouche de filtration (11) à l'eau de lavage (5) et permet l'entrée de l'eau de lavage à l'intérieur de la cartouche de filtration (11).

5. Machine à laver selon la revendication 3, **caractérisée en ce qu'**un tuyau (7 ; 71) est muni d'une extrémité reliée à la cuve de lavage (5) et l'autre extrémité insérée dans la cartouche de filtration (1 ; 10 ; 11), afin de permettre l'entrée de l'eau de lavage à l'intérieur de la cartouche de filtration (10) de telle sorte que ladite eau de lavage ne se mélange pas avec l'eau de lavage filtrée.

6. Machine à laver selon la revendication 4, **caractérisée en ce qu'**un moyen tubulaire (70) est proposé qui relie la cartouche de filtration (11) à une pompe hydraulique (8), de sorte à permettre l'écoulement de l'eau de lavage et son expulsion au travers d'un tuyau d'écoulement (9).

7. Machine à laver selon la revendication 5, **caractérisée en ce que** ledit tuyau (7) est partiellement contenu à l'intérieur dudit moyen tubulaire (3) dont il est coaxial, et l'extrémité de ce dernier est insérée dans la cartouche de filtration (1 ; 10 ; 11) d'une manière impossible à découpler.

8. Machine à laver selon la revendication 5, **caractérisée en ce que** ledit tuyau (7) et ledit moyen tubulaire (31) sont séparés.

9. Machine à laver selon la revendication 7, **caractérisée en ce que** ladite cartouche de filtration (1 ; 11), par exemple avec une section rectangulaire, est retirée de sa garniture pendant l'opération d'inspection du filtre (2) et qu'elle peut être placée dans une position verticale et maintenue dans cette position par le biais d'un moyen de retenue (4 ; 40).

10. Machine à laver selon la revendication 9, **caractérisée en ce que** ledit moyen tubulaire (3), fabriqué en plastique ondulé, contient de l'eau refoulée du tuyau d'écoulement (9) empêchant ainsi ladite eau de s'écouler pendant l'opération d'inspection du filtre (2), et après l'opération susmentionnée, il permet une remise en place plus facile dans son logement de ladite cartouche de filtration (1 ; 11), au moyen de son effet de ressort, ledit moyen tubulaire ayant une surface interne considérablement homogène, lorsqu'il est à l'état compressé.

11. Machine à laver selon la revendication 10, **caractérisée en ce que** ledit filtre (2) pour retenir d'éventuels filaments ou autres impuretés présents dans l'eau de lavage est un filtre comprenant deux parois de filtration concentriques annulaires avec des passages en forme de damier.

12. Machine à laver selon la revendication 11, **caractérisée en ce que** ledit tuyau (7) est relié à la cuve de lavage (5) au niveau d'un point central.

13. Machine à laver selon la revendication 12, **carac-**

térisée en ce que ladite cartouche de filtration (1), une fois qu'elle a été retirée de son logement, est conservée dans une position verticale par l'action de support d'un levier (4) qui est fixé à ladite cartouche de filtration (1) à une extrémité et relié à ladite cartouche (1) par un ressort à l'autre extrémité.

14. Machine à laver selon la revendication 11, **caractérisée en ce que** ledit tuyau (7) est suffisamment long pour être relié à la cuve de lavage (5) en un point situé davantage à l'arrière de cette dernière.

15. Machine à laver selon la revendication 14, **caractérisée en ce que** ledit moyen tubulaire (3) est suffisamment long pour permettre que ladite cartouche de filtration (11), une fois retirée de son logement, soit élevée jusqu'à une hauteur supérieure au niveau maximum que le mélange de lavage peut atteindre à l'intérieur de la cuve de lavage (5), soit fixée à la garniture contenant la machine à laver au moyen d'un crochet (40), dans une position verticale, de sorte que l'inspection du filtre (2) peut aussi avoir lieu avec la machine à laver en fonctionnement lors de la phase de rinçage ou d'essorage, favorisant ainsi l'intervention des techniciens des centres de maintenance dans le cas d'un blocage soudain du filtre (2), même à pleine charge.

16. Machine à laver selon la revendication 15, **caractérisée en ce que** le logement de la cartouche de filtration (1) est muni d'un conduit (100) servant d'arrivée, pour faciliter l'introduction de la cartouche de filtrage (1) dans son logement.

17. Machine à laver selon la revendication 16, **caractérisée en ce que** le tuyau (7) et le moyen tubulaire (3) sont fabriqués en plastique ondulé, pour que la pompe hydraulique (8) soit placée dans des positions complètement différentes et non à un axe avec la cartouche de filtration (11), utilisant ainsi entièrement les espaces disponibles à l'intérieur de la garniture (51) contenant la machine à laver de manière plus appropriée.

18. Machine à laver selon la revendication 6, **caractérisée en ce que** ledit filtre (20) est un filtre en forme de tête logé à l'intérieur de ladite cartouche de filtration (11), par exemple avec une section rectangulaire, ladite cartouche de filtration (11) est retirée de son logement pendant l'opération d'inspection du filtre (20), et peut être placée dans une position verticale et maintenue en place par l'action d'un bloc (40).

19. Machine à laver selon la revendication 18, **caractérisée en ce que** ledit tuyau (30) contient en partie intérieurement ledit moyen tubulaire (70) et y est coaxial, ledit tuyau (30) est suffisamment long pour permettre que ladite cartouche de filtration (11), une fois retirée de son logement relatif, soit élevée jusqu'à une hauteur supérieure au niveau maximum que le mélange de lavage peut atteindre à l'intérieur de la cuve de lavage (5), et soit fixée à la garniture (51) contenant la machine à laver au moyen d'un crochet (40), dans une position verticale, de sorte que l'inspection du filtre (20) peut avoir lieu même lorsque la machine à laver est en fonctionnement lors de la phase de rinçage ou d'essorage, favorisant ainsi l'intervention des techniciens des centres de maintenance dans le cas d'un blocage soudain du filtre (20), même à pleine charge, ledit tube (30) étant fabriqué en plastique ondulé, contient l'eau du refoulement du tuyau d'écoulement (9), empêchant ainsi que ladite eau s'écoule lors de l'opération d'inspection du filtre (20), et après l'opération susmentionnée, il permet un positionnement plus facile à l'arrière de ladite cartouche de filtration (11) dans son logement, au moyen de son effet de ressort.

20. Machine à laver selon la revendication 17 ou 19, **caractérisée en ce que** le tuyau (7 ; 30) et le moyen tubulaire (3 ; 70) sont fabriqués en plastique ondulé, pour que la pompe hydraulique (8) soit placée dans des positions complètement différentes et non dans l'axe de la cartouche de filtration (11), utilisant ainsi entièrement les espaces disponibles à l'intérieur de la garniture (51) contenant la machine à laver de manière plus appropriée.

21. Machine à laver selon la revendication 20, **caractérisée en ce que** ladite pompe hydraulique (8) est directement reliée à la cuve de lavage (5) pour supprimer des ouvertures supplémentaires.

22. Machine à laver selon la revendication 7 ou 8, **caractérisée en ce que** ladite cartouche de filtration (10) a une section incurvée et peut tourner autour d'un axe fixe (15) qui est fixé à la garniture contenant la machine à laver, ladite cartouche est reliée à un tuyau (7 ; 71) et à un moyen tubulaire (3 ; 31) tous deux extensibles, et une extraction du mouvement rotatif de ladite cartouche de filtration (11) est proposé ainsi que l'utilisation d'un moyen de retenue afin de conserver ladite cartouche de filtration (10) en position verticale.

23. Machine à laver selon la revendication 22, en ce qu'elle dépend de la revendication 7, **caractérisée en ce que** ledit filtre (21) est un filtre de type tubulaire muni d'orifices perforés ou d'une section rectangulaire.

24. Machine à laver selon la revendication 23, **caractérisée en ce qu'**elle fournit un accouplement sphérique (18) qui relie le bouton au filtre (21) et permet une extraction plus facile du filtre (21) de

son logement après la rotation du même bouton.

25. Moyen de filtration selon la revendication 22, en ce qu'il dépend de la revendication 8, **caractérisé en ce que** ledit filtre (22) est un filtre de type filtre à piston.

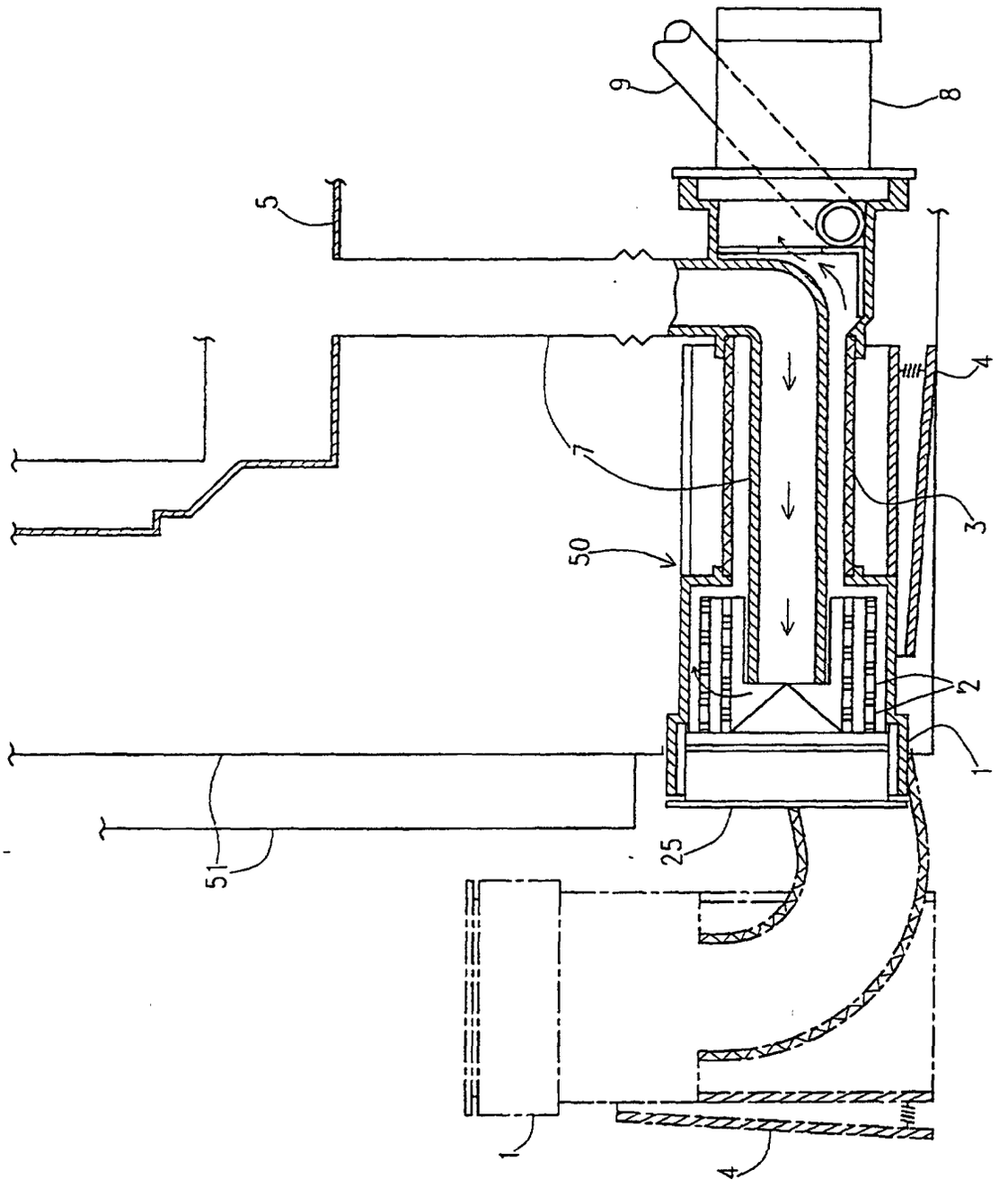


Fig.1

Fig.2

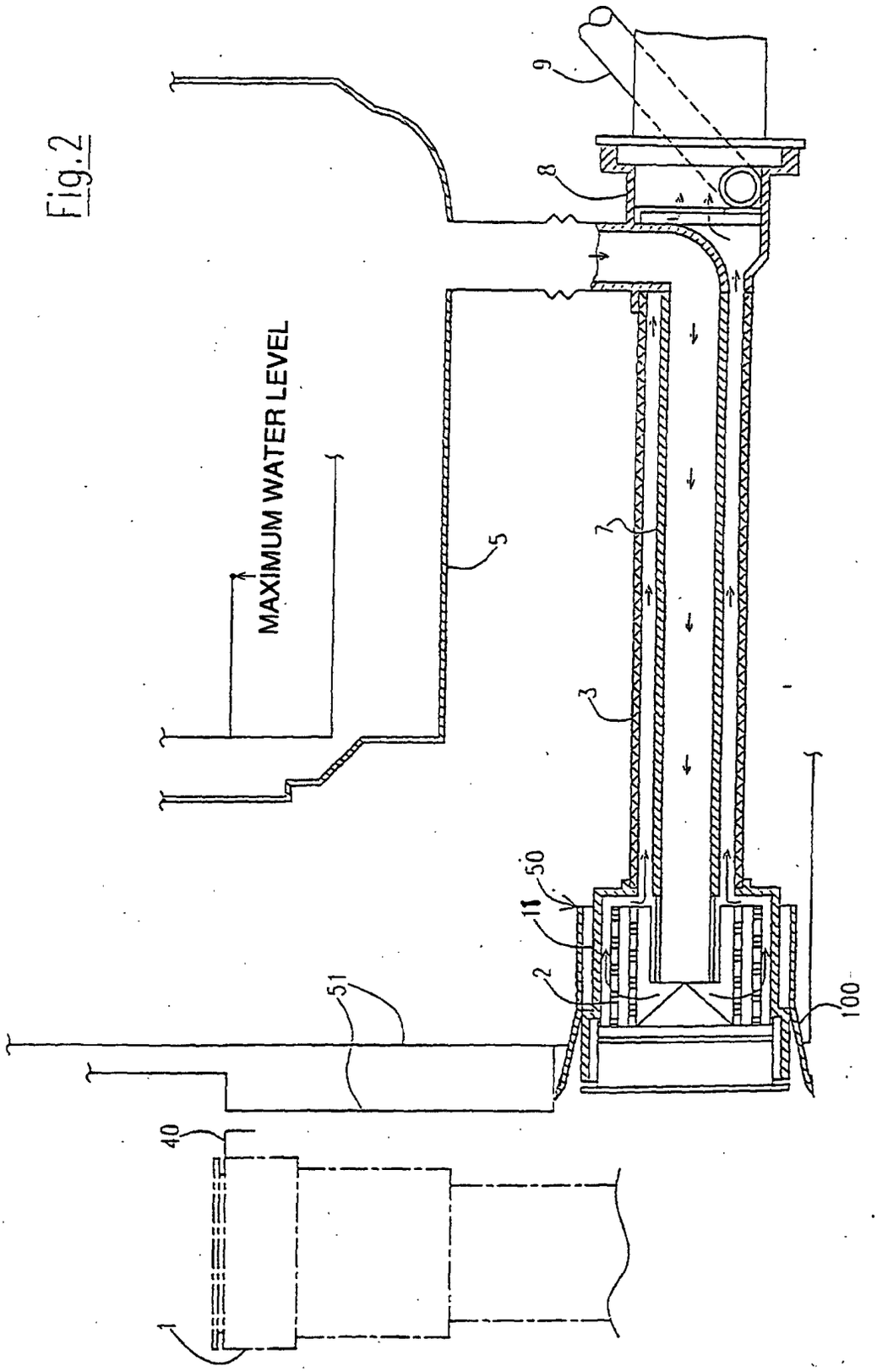


Fig.3

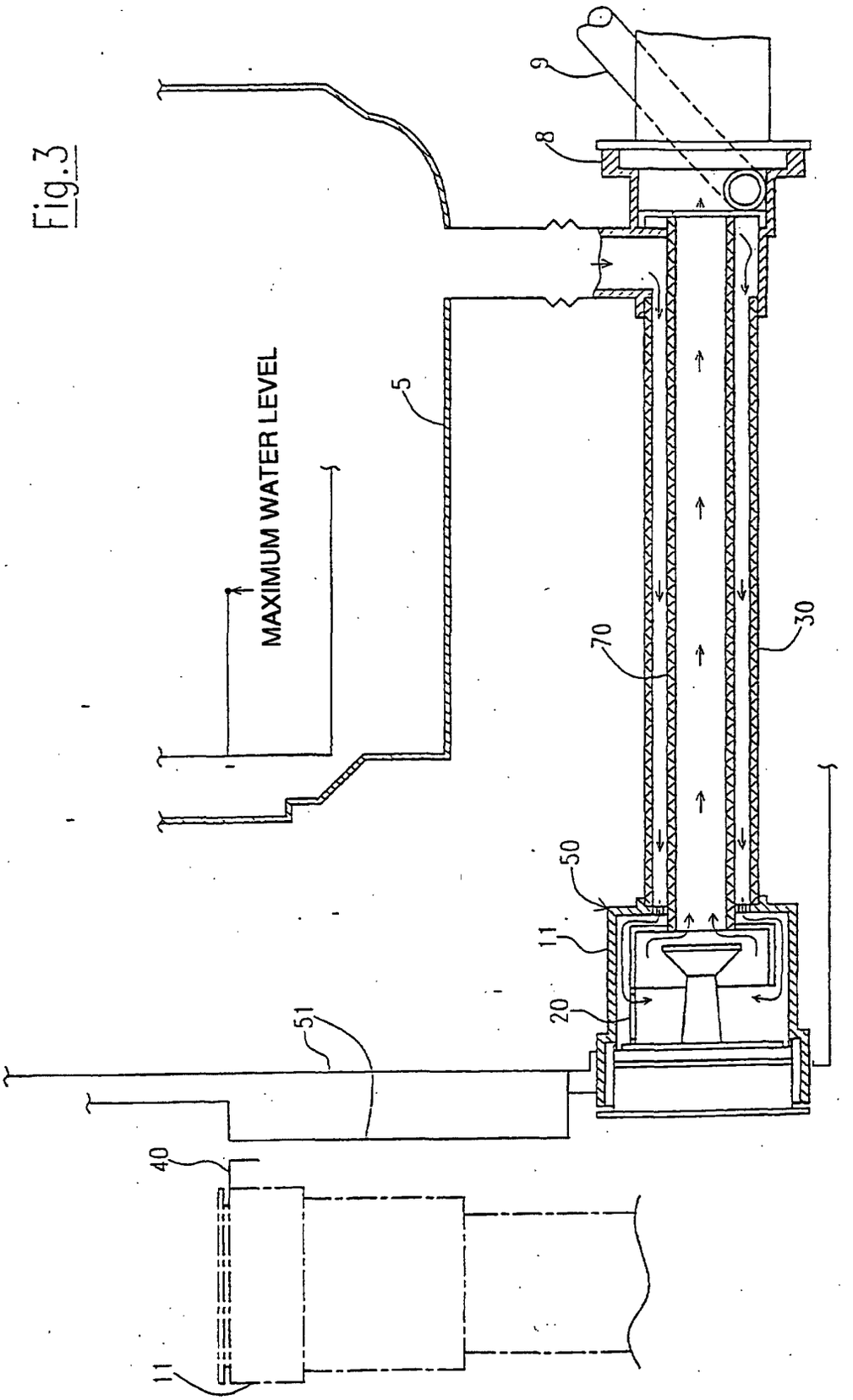


Fig.4

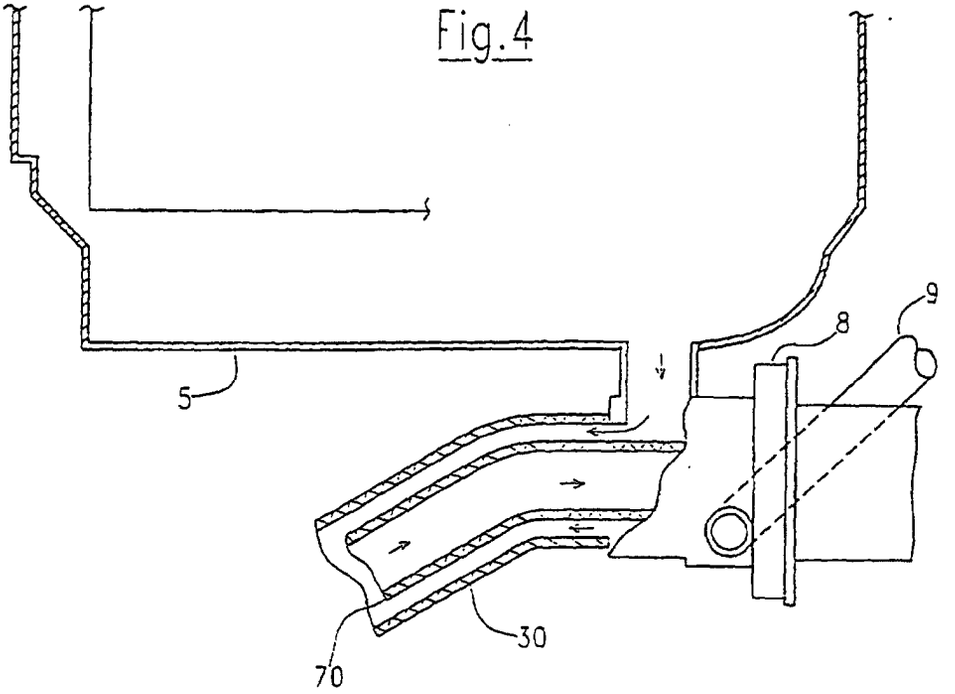


Fig.6

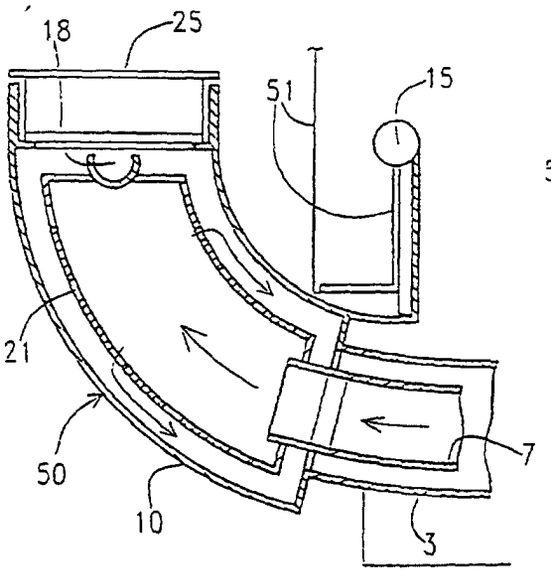


Fig.5

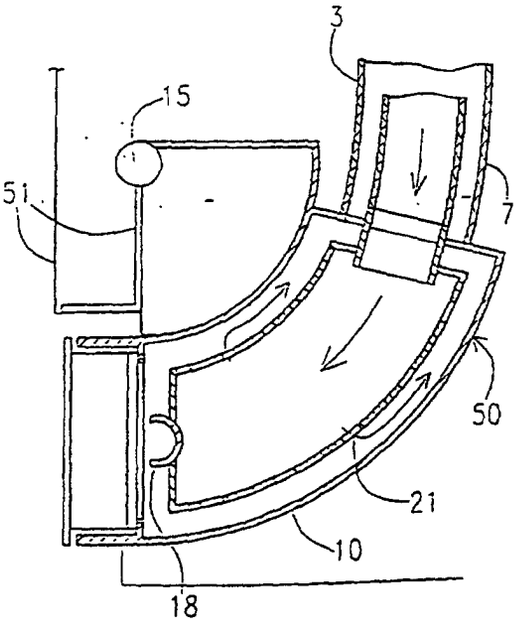


Fig.7

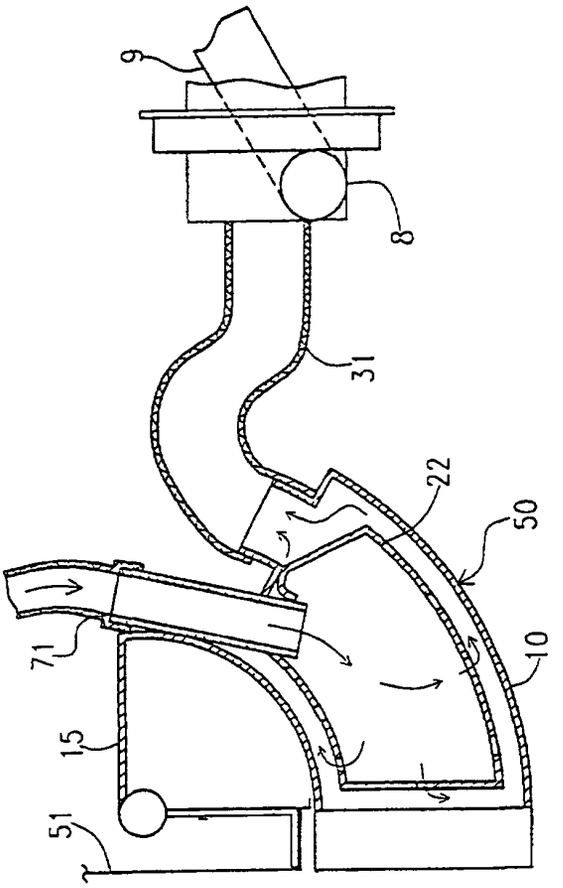


Fig.8

