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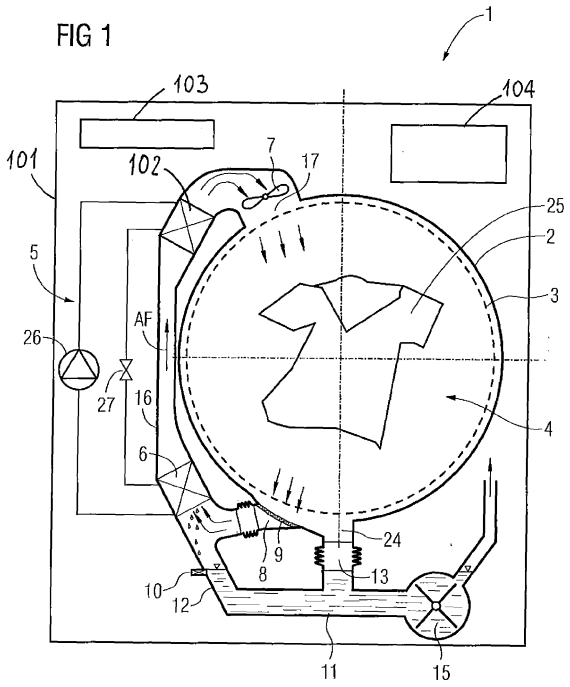
(54) **Washer-dryer machine with a heat pump**

(57) The present invention is related to a washer-dryer machine (1) comprising: a tub (2) forming a laundry treatment chamber (4) and containing a rotatable drum (2) wherein laundry (25) can be loaded and submitted to a washing cycle and/or to a drying cycle; an air duct (16), for circulating hot air in the laundry treatment chamber (4); a heat pump (5) comprising an evaporator (6), arranged in the air duct (16) for cooling and dehumidifying hot air exiting the laundry treatment chamber (4), and a condenser (102), arranged in the air duct (16), downstream of the evaporator (6), for heating air before admitting it into the laundry treatment chamber (4); a draining channel (11), fluidly connected to the laundry treatment chamber (4) and comprising a draining pump (15), for draining washing liquid from the laundry treatment chamber (4). The draining channel (11) and the air duct (16) are in fluid communication with one another, in such a way that moisture condensed in the evaporator (6) can be drained via the draining channel (11). The evaporator (6) is arranged in such a way that during a washing cycle the washing liquid present inside the tub (2) and/or inside the air duct (16) and/or draining channel (11) at least partially submerges the evaporator (6), so as to at least partially wash the latter and at least partially remove fluff/lint from the evaporator (6).

FIG 1



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Description

[0001] The present invention relates to a washer-dryer machine comprising a heat pump for realising a drying function.

[0002] Washer-dryer machines combine a laundry washing machine and a laundry drying machine in one appliance having the size of a stand-alone washing machine.

[0003] There are known washer-dryer machines using heat pump technology for dehumidifying the process air; these known washer-dryer machines comprise a heat pump provided with an evaporator, arranged in the air duct for cooling and dehumidifying hot air exiting a laundry treatment chamber, and with a condenser, arranged in the same air duct, downstream of the evaporator, for heating air before admitting it into the laundry treatment chamber.

[0004] A drawback of these known washer-dryer machines is that lint/fluff removed from the laundry by the process air can settle on the evaporator, reducing its heat-exchanging surface, and therefore its performances. There is also the risk that lint/fluff settled on the evaporator could catch fire due to the high temperature of the air flux exiting the laundry treatment chamber and passing through the evaporator.

[0005] In order to try to reduce this drawback, some known washer-dryer machines using heat pump technology are provided with a lint/fluff filter placed in the air duct, upstream of the evaporator, in order to catch lint/fluff carried by process air, so as to try to avoid that this lint/fluff can reach the evaporator.

[0006] However some lint/fluff, in particular small fibres and particles, may cross the filter without being trapped, in which case this lint/fluff may settle on the evaporator, with the above mentioned risks.

[0007] In these known washer-dryer machines there is therefore the need of periodically cleaning the evaporator, and also, if provided, the lint/fluff filter; however this may be not easy, since typically the evaporator is positioned inside the air duct, in a position in which it is not or at least not-easily accessible by a user. Also the filter, if provided, is typically not easily accessible, and therefore its maintenance is not very comfortable.

[0008] It is the aim of the present invention to provide a washer-dryer machine using a heat pump system with ensures that the evaporator of the heat pump is kept clean from lint/fluff.

[0009] It is a further object of the present invention to allow keeping the lint/fluff filter (if provided) clean from lint/fluff.

[0010] It is a still further object of the present invention to provide additional comfort and easy maintenance for a user of the washer-dryer machine.

[0011] It is a further object of the present invention to provide easy access to the lint/fluff filter (if provided).

[0012] The aim and objects of the present invention are achieved by a washer-dryer machine according to the invention.

[0013] In particular applicant has found that by providing a washer-dryer machine comprising a heat pump for treating (i.e. heating and also cooling and dehumidifying) process air, in which the evaporator of the heat pump is arranged in such a way that during a washing cycle the washing liquid present in the machine at least partially submerges the evaporator, so as to at least partially wash the latter and at least partially remove fluff/lint from this evaporator, the latter is kept free/clean from lint/fluff, without requiring a manual cleaning performed by the user.

[0014] The above aim and objects are achieved by a washer-dryer machine comprising:

- a tub forming a laundry treatment chamber and containing a rotatable drum wherein laundry can be loaded and submitted to a washing cycle and/or to a drying cycle;
- an air duct, for circulating hot air in the laundry treatment chamber;
- a heat pump comprising an evaporator, arranged in the air duct for cooling and dehumidifying hot air exiting the laundry treatment chamber, and a condenser, arranged in the air duct, downstream of said evaporator, for heating air before admitting it into the laundry treatment chamber;
- a draining channel, fluidly connected to the laundry treatment chamber and comprising a draining pump, for draining washing liquid from the laundry treatment chamber;

wherein the draining channel and the air duct are in fluid communication one another, in such a way that moisture condensed in the evaporator can be drained via the draining channel.

[0015] The evaporator is arranged in such a way that during a washing cycle the washing liquid present inside the tub and/or inside the air duct and/or draining channel at least partially submerges the evaporator, so as to at least partially wash the latter and at least partially remove fluff/lint from the evaporator.

[0016] Therefore during the washing cycle, the washing liquid reaches the evaporator and cleans it from the lint or fluff. A very comfortable, easy and secure cleaning of the evaporator is therefore possible.

[0017] Advantageously, the evaporator is arranged in such a way that during a drying cycle the liquid optionally present inside the tub and/or inside the air duct and/or the draining channel does not submerge the evaporator.

[0018] Thus, in the drying cycle, the evaporator can carry out its function properly. The process air passes the evaporator, where liquid contained in process air condenses. The condensed liquid drops back into the draining channel.

[0019] Preferably, the washer-dryer machine comprises a lint/fluff filter arranged in such a way to trap fluff or lint exiting the laundry treatment chamber and moving towards the evaporator through the air duct, wherein the

filter is arranged in such a way that during a washing cycle the washing liquid present inside the tub and/or inside the air duct and/or the draining channel at least partially submerges the filter, so as to at least partially wash the latter and at least partially remove fluff/lint from the filter. During the washing cycle, therefore, the liquid level reaches the filter and covers it, washing away and cleaning the filter from lint or fluff which was collected there during the drying mode. When the washing liquid is drained, the fluff or lint is transported away. In this way, the filter is cleaned after each washing cycle.

[0020] Preferably, the filter is arranged in such a way that during a drying cycle the liquid optionally present inside the tub and/or inside the air duct and/or the draining channel does not submerge the filter.

[0021] During the drying cycle, therefore, the filter carries out its function without being impeded or covered by the washing liquid.

[0022] In an advantageous embodiment, the washer-dryer machine comprises a level sensor, connected to a control device of the washer-dryer machine, for detecting the liquid level inside the draining channel and/or inside the air duct.

[0023] Preferably, the control device is configured in such a way that, if, during a drying cycle, the liquid level inside the draining channel and/or inside the air duct reaches a prefixed threshold value, the control device activates the draining pump for draining at least part of the liquid present inside the draining channel.

[0024] In an advantageous embodiment, the laundry treatment chamber is connected to the draining channel via a first coupling joint, the draining channel and the coupling joint being arranged in such a way that, once a liquid has entered the draining channel and has at least partially filled the first coupling joint, the latter can't be fully emptied by operating the draining pump, so that liquid present in the coupling joint impedes air contained in the laundry treatment chamber from reaching the draining channel via the first coupling joint.

[0025] In a preferred embodiment the washer-dryer machine comprises also an auxiliary cleaning system adapted for washing one or more components (e.g. the evaporator and/or, if provided, the filter) of the washer-dryer machine.

[0026] In this case the auxiliary cleaning system may advantageously comprise an auxiliary duct coupled in fluid connection with a first nozzle arranged such that a jet of liquid sprayed from the first nozzle cleans the evaporator.

[0027] If the washer-dryer machine comprises a lint/fluff filter, the auxiliary cleaning system may advantageously comprise an auxiliary duct coupled in fluid connection with a second nozzle arranged such that a jet of liquid sprayed from the second nozzle cleans the filter.

[0028] Providing an auxiliary cleaning system allows cleaning the evaporator and/or, if provided, the filter, independently from performing the washing cycle. The cleaning procedure can be carried out at each desired time, when it is necessary. Further the cleaning procedure can be carried out using tap water.

[0029] In an advantageous embodiment, the control device of the washer-dryer machine is configured for providing an alarm signal to inform a user about the necessity to clean the filter after the washer-dryer machine has performed a prefixed number of consecutive drying cycles.

[0030] Thus, additional comfort is achieved. The user is informed automatically about the status of the machine.

[0031] In a further advantageous embodiment, the control device is configured for automatically loading a washing liquid inside the tub, so as to at least partially submerge the evaporator and at least partially wash the latter in such a way to at least partially remove fluff/lint from the evaporator, after the washer-dryer machine has performed a prefixed number of consecutive drying cycles.

[0032] In a further advantageous embodiment, in which the washer-dryer machine is provided with a lint/fluff filter, the control device is configured for automatically loading a washing liquid inside the tub, so as to at least partially submerge the filter and at least partially wash the latter in such a way to at least partially remove fluff/lint from the filter, after the washer-dryer machine has performed a prefixed number of consecutive drying cycles.

[0033] In a further advantageous embodiment, the drum comprises, on its lateral surface, an opening arranged in such a way that it can face the filter when the drum is in a prefixed angular position, wherein the opening allows accessing the filter for its manual maintenance, and wherein the opening is closed by a removable closure device.

[0034] Thus, the filter can be reached manually for being cleaned manually or for being detached from its seat in the air inlet channel. Easy and comfortable access is provided to the filter in this way.

[0035] In this case the removable closure device may advantageously be a lifter adapted to engage the laundry during the rotation of the drum, which can be pivoted with respect to the drum for providing access to the opening.

[0036] The invention will be described in further detail with reference to the drawings, in which

FIG 1 schematically illustrates a washer-dryer machine according to the invention during a drying cycle;

FIG 2 schematically illustrates the washer-dryer machine of FIG 1 during a washing cycle;

FIG 3 schematically illustrates a further embodiment of a washer-dryer machine according to the invention during a manual maintenance phase;

FIG 4 schematically illustrates a further embodiment of a washer-dryer machine according to the in-

vention, having an auxiliary cleaning system.

[0037] FIG 1 illustrates a schematic drawing of a washer-dryer machine according to the invention, during a drying cycle. A washer-dryer machine shall be understood as a washing machine with drying function.

[0038] Washer-dryer machine 1 comprises a casing 101 enclosing a washing tub 2 (called also simply tub), defining a laundry treatment chamber 4 containing a rotatable drum 3 wherein the laundry 25 to be washed and dried is placed. The drum 3 rotates during operation of a washing and/or drying cycles of the washer-dryer machine 1 and, thus, the laundry 25 placed within the drum 3 is rotated or tumbled, respectively.

[0039] For carrying out the drying function, the washer-dryer machine 1 comprises an air duct 16 (which may be a single duct or may comprise a plurality of ducts fluidly connected one another) for circulating hot air in the laundry treatment chamber 4, and in particular inside the drum 3, and comprises also a heat pump 5 comprising an evaporator 6, arranged in the air duct 16 for cooling and dehumidifying hot air exiting the laundry treatment chamber 4, and a condenser 102, arranged in the air duct 16, downstream of the evaporator 6, for heating air before admitting it into the laundry treatment chamber 4.

[0040] Heat pump 5 also preferably comprises a compressor 26 and a lamination valve 27 which are commonly known and will not be described in detail.

[0041] The air duct 16 is fluidly connected to the tub 2, and therefore to the laundry treatment chamber 4, by an air inlet 17 and an air outlet 8, through which air respectively enters and exits the tub 2.

[0042] Advantageously a fan 7 is arranged in the air duct 16 for creating an air flow that passes through the evaporator 6, then through the condenser 102, then enters the tub 2 via the air inlet 17 (so as to contact the laundry 25 contained in the drum 3 and removing the moisture from such laundry 25), and exits the tub 2 via the air outlet 8.

[0043] Preferably, a lint/fluff filter 9 is provided at the air outlet 8 for trapping fluff or lint exiting the laundry treatment chamber 4 and moving towards evaporator 6; filter 9 may have also a different position in the air duct 16, provided that it is placed upstream the evaporator 16, i.e. in a position in which air exiting laundry treatment chamber 4 passes through the filter 9 before contacting the evaporator 6.

[0044] However, even if the filter 9 is provided, some fluff or lint which has passed the filter 9 incidentally, e.g. fluff or lint with smaller size than the passage openings of the filter 9, may reach the evaporator 6.

[0045] Washer-dryer machine 1 comprises also a washing liquid inlet circuit, not illustrated, adapted to bring a washing liquid (i.e. water or water mixed with a washing/rinsing product, for example a detergent or a laundry softener) into the tub 2. Washing liquid inlet circuit may advantageously comprise a series of ducts connectable to the water mains, valves, a detergent drawer, etc.

[0046] Advantageously the washer-dryer machine comprises also a draining channel 11, fluidly connected to the laundry treatment chamber 4, i.e. to the tub 2, and comprising a draining pump 15, for draining washing liquid from the laundry treatment chamber 4.

[0047] Advantageously, the draining channel 11 is fluidly connected to the tub 2 via a coupling joint 13, preferably comprising a flexible or rigid conduit.

[0048] The coupling joint 13 is preferably coupled to the tub 2 at the lowermost position of the tub 2 or the tub shell adjacent to a sump 24 advantageously formed in the tub 2. Thus, liquid which is collected in the lowermost position of the tub 2 or in the sump 24 (if provided) flows through the coupling joint 13 into the draining channel 11. Advantageously the draining channel 11 and the air duct 16 are in fluid communication one another, in such a way that moisture condensed in the evaporator 6 during the drying cycle goes in the draining channel 11 and can be drained away via the latter.

[0049] Advantageously, washer-dryer machine 1 comprises also a level sensor 10 (for example a floating level sensor), connected to a control device of the washer-dryer machine 1, schematically represented in enclosed figures and numbered 103 (connection is not represented in enclosed figures), adapted for detecting the liquid level inside the draining channel 11 and/or inside the air duct 16 (which, being fluidly connected to the draining channel 11, can be partially filled with washing liquid and/or condensed liquid). Preferably, level sensor 10 is arranged in a conduit 12 connecting the draining channel 11 to the aid duct 16. Preferably, the control device 103 is configured in such a way that, if, during a drying cycle, the liquid level detected by the level sensor 10 is higher than a prefixed threshold value (which may be memorized in the control device 103), the control device 103 activates the draining pump 15 for draining at least part of the liquid present inside the draining channel 11. In this way, by presetting a suitable liquid level threshold value, it is ensured that during the drying cycle the air duct 16 is free from water at least in such a way that air can freely circulate from the laundry treatment chamber 4 to the evaporator 6. Thus, the process air can pass into the evaporator 6 and from there into condenser 102, and again into the laundry treatment chamber 4.

[0050] Passing the evaporator 6, the moisture or humidity that is absorbed or dissolved in the process air condenses and regains a liquid state. Following the force of gravity, the moisture or humidity that has become fluid now drops down into the draining channel 11 via the conduit 12. The process air passes the air duct 16 in the direction of the air flow AF and is redirected to the air outlet 17 again. Advantageously, the passage which is formed by the coupling joint 13 serves as a sort of siphon for avoiding that during a drying cycle a part of the process air can be drained outside the machine via the draining channel 11.

[0051] This is obtained by arranging the draining channel 11 and the coupling joint 13 in such a way that, once

a liquid has entered the draining channel 11 (for example during a previous washing cycle, or due to the condensation of moisture contained in the process air during a previous or the current drying cycle), and has at least partially filled the coupling joint 13, the latter can't be fully emptied by operating the draining pump 15, so that liquid present in the coupling joint 13 impedes air contained in the laundry treatment chamber 4 from reaching the draining channel 11 via the coupling joint 13. In the embodiment of FIG 1, this is obtained by positioning at least part of the pump 15 at a level at least slightly higher than the outlet region (i.e. the region connected to the draining channel 11).

[0052] FIG 2 schematically illustrates the washer-dryer machine 1 during a washing cycle.

[0053] Evaporator 6 is arranged in such a way that during a washing cycle the washing liquid (water or water mixed with washing/rinsing products) present inside the tub 2 and/or inside the duct 16 and/or the draining channel 11 at least partially submerges the evaporator 6, so as to at least partially wash the latter and at least partially remove fluff/lint from this evaporator 6.

[0054] Preferably, the evaporator 6 is arranged in such a way that during a drying cycle the liquid optionally present inside the tub 2 and/or inside the air duct 16 and/or the draining channel 11 does not submerge the evaporator 6, so as to allow the whole surface of the evaporator 6 to be exposed to process air.

[0055] Advantageously, if a lint/fluff filter 9 is provided, it is arranged in such a way that during a washing cycle the washing liquid present inside the tub 2 and/or inside the air duct 16 and/or the draining channel 11 at least partially submerges the filter 9, so as to at least partially wash the latter and at least partially remove fluff/lint from the filter 9.

[0056] Preferably, the filter 9 is arranged in such a way that during a drying cycle the liquid optionally present inside the tub 2 and/or inside the air duct 16 and/or the draining channel 11 does not submerge the filter 9.

[0057] During the draining of the washing liquid, the fluff or lint removed by the washing liquid is transported into the draining channel 11 and from there it is drained outside the washer-dryer machine 1.

[0058] Preferably, during the washing operation, the fan 7 does not rotate and thus does not convey or ventilate air in the air duct 16.

[0059] In an advantageous embodiment of the invention, the control device 103 is configured in such a way that it controls the introduction of washing liquid into the tub 2 (by controlling the washing liquid inlet circuit), so that heat exchanger 6 (and, if provided, preferably also filter 9) is cleaned at the beginning of a washing cycle or during some phases of a drying cycles.

[0060] In a further advantageous embodiment, the control device 103 is configured for providing an alarm signal (for example a sound and/or a visual message displayed via the user interface 104 of the machine, etc.) to inform a user about the necessity to clean the filter 9 after the washer-dryer machine 1 has performed a prefixed number of consecutive (i.e. not spaced out by a washing cycle, in which washing liquid would have washed the evaporator 6 and the filter 9) drying cycles.

[0061] In a further advantageous embodiment, the control device 103 is configured for automatically loading washing liquid inside the tub 2 (e.g. by controlling the washing liquid inlet circuit), so as to at least partially submerge the evaporator 6 (and preferably, if provided, also the filter 9) and at least partially wash the latter (and preferably, if provided, also the filter 9) in such a way to at least partially remove fluff/lint from the evaporator 6 (and preferably, if provided, also the filter 9), after the washer-dryer machine 1 has performed a prefixed number of consecutive (i.e. not spaced out by a washing cycle, in which washing liquid would have washed the evaporator 6 and the filter 9) drying cycles.

[0062] FIG 3 schematically illustrates a further embodiment of a washer-dryer machine 1 according to the invention during a manual maintenance phase.

[0063] In this embodiment the drum 3 comprises, on its lateral surface 3a, an opening 105 arranged in such a way that it can face the filter 9 when the drum 3 is in a prefixed angular position; in this position, therefore, opening 105 allows accessing filter 9 for its manual maintenance (filter 9 may be removable or not).

[0064] Opening 105 may be closed by a removable closure device.

[0065] Advantageously removable closure device comprises a lifter 18 adapted to engage the laundry during the rotation of the drum 3, which can be pivoted with respect to the drum 3 for providing access to opening 105. Lifter 18 is placed on the interior side of the lateral surface 3a of the drum 3. Lifters 18 take and lift the laundry 25 in the washing process and/or drying process when the drum 3 rotates, so that the laundry 25 is moved during the washing process. When the drum 3 is rotated in a position where the lifter 18 is placed adjacent to the filter 9, the lifter 18 can be pivoted and a user can manually reach the filter 9. The filter 9 can preferably be provided detachably, such that the user can take it out and clean it from fluff or lint and re-install it.

[0066] FIG 4 schematically illustrates a further embodiment of a washer-dryer machine 1 according to the invention, having an auxiliary cleaning system 19 adapted for washing one or more components (for example the evaporator 6 and/or, if provided, preferably also the filter 9), of the washer-dryer machine 1.

[0067] Preferably, the auxiliary cleaning system 19 comprises an auxiliary pump 20 which can supply the cleaning system 19 with water or washing liquid. Advantageously the auxiliary cleaning system 19 can be connected to the water supplying mains via an electro-valve, not illustrated; in this case the auxiliary pump can be not provided.

[0068] Advantageously the auxiliary cleaning system 19 may comprise an auxiliary duct 21 coupled in fluid connection with a first nozzle 22 arranged such that a jet

of liquid sprayed from this first nozzle 22 cleans the evaporator 6. Thereby, the first nozzle 22 is oriented in a direction in which a jet sprayed from the first nozzle 22 touches the condensing surfaces of the evaporator 6 and removes lint or fluff which is collected therein.

[0069] Preferably, if the filter 9 is provided, the auxiliary cleaning system 19 may comprise a second nozzle 23, preferably coupled in fluid connection with the auxiliary duct 21 (or with a further auxiliary duct, not illustrated), arranged such that a jet of liquid sprayed from this second nozzle 23 cleans the filter 9.

[0070] The second nozzle 23 is advantageously arranged adjacent to the filter 9 and oriented in a direction parallel to the interior surface of the filter 9. Thus, a jet sprayed from the nozzle 22 rinses or cleans the interior surface of the filter 9 from fluff or lint.

[0071] Advantageously, the auxiliary cleaning system 19 can be activated by means of the control device 103 at the beginning of a washing cycle or during some phases of drying cycles. It is also possible that a user activates the auxiliary cleaning system 19 manually.

[0072] In a further advantageous embodiment, the control device 103 is configured for automatically activating the auxiliary cleaning system 19 (for example by activating the auxiliary pump 20, if provided, or by opening the electro-valve connecting the auxiliary duct 21 to the water supply means), after the washer-dryer machine 1 has performed a prefixed number of consecutive (i.e. not spaced out by a washing cycle, in which washing liquid would have washed the evaporator 6 and the filter 9) drying cycles.

Claims

1. Washer-dryer machine (1) comprising:

- a tub (2) forming a laundry treatment chamber (4) and containing a rotatable drum (2) wherein laundry (25) can be loaded and submitted to a washing cycle and/or to a drying cycle;
- an air duct (16), for circulating hot air in said laundry treatment chamber (4);
- a heat pump (5) comprising an evaporator (6), arranged in said air duct (16) for cooling and dehumidifying hot air exiting said laundry treatment chamber (4), and a condenser (102), arranged in said air duct (16), downstream of said evaporator (6), for heating air before admitting it into said laundry treatment chamber (4);
- a draining channel (11), fluidly connected to said laundry treatment chamber (4) and comprising a draining pump (15), for draining washing liquid from said laundry treatment chamber (4);

wherein said draining channel (11) and said air duct (16) are in fluid communication one another, in such a way that moisture condensed in said evaporator (6) can be drained via said draining channel (11), **characterized in that** said evaporator (6) is arranged in such a way that during a washing cycle the washing liquid present inside said tub (2) and/or inside said air duct (16) and/or inside said draining channel (11) at least partially submerges said evaporator (6), so as to at least partially wash the latter and at least partially remove fluff/lint from said evaporator (6).

2. Washer-dryer machine (1) according to claim 1, wherein said evaporator (6) is arranged in such a way that during a drying cycle the liquid optionally present inside said tub (2) and/or inside said air duct (16) and/or inside said draining channel (11) does not submerge said evaporator (6).

3. Washer-dryer machine (1), according to claim 1 or 2, comprising a lint/fluff filter (9) arranged in such a way to trap fluff or lint exiting said laundry treatment chamber (4) and moving towards said evaporator (6) through said air duct (16), wherein said filter (9) is arranged in such a way that during a washing cycle the washing liquid present inside said tub (2) and/or inside said air duct (16) and/or said draining channel (11) at least partially submerges said filter (9), so as to at least partially wash the latter and at least partially remove fluff/lint from said filter (9).

4. Washer-dryer machine (1) according to claim 3, wherein said filter (9) is arranged in such a way that during a drying cycle the liquid optionally present inside said tub (2) and/or inside said air duct (16) and/or said draining channel (11) does not submerge said filter (9).

5. Washer-dryer machine (1) according to one of the preceding claims, comprising a level sensor (10), connected to a control device (103) of said washer-dryer machine (1), for detecting the liquid level inside said draining channel (11) and/or inside said air duct (16).

6. Washer-dryer machine (1) according to claim 5, wherein such control device (103) is configured in such a way that, if, during a drying cycle, the liquid level inside said draining channel (11) and/or inside said air duct (16) reaches a prefixed threshold value, said control device (103) activates said draining pump (15) for draining at least part of the liquid present inside said draining channel (11).

7. Washer-dryer machine (1) according to one of the preceding claims, wherein said laundry treating chamber (4) is connected to said draining channel (11) via a coupling joint (13), said draining channel (11) and said coupling joint (13) being arranged in

such a way that, once a liquid has entered said draining channel (11) and has at least partially filled said coupling joint (13), the latter can't be fully emptied by operating said draining pump (15), so that liquid present in said coupling joint (13) impedes air contained in said laundry treatment chamber (4) from reaching said draining channel (11) via said coupling joint (13).

8. Washer-dryer machine (1) according to one of the preceding claims, comprising an auxiliary cleaning system (19) adapted for cleaning from lint/fluff one or more component of said washer-dryer machine (1).

9. Washer-dryer machine (1) according to claim 8, wherein said auxiliary cleaning system (19) comprises an auxiliary duct (21) coupled in fluid connection with a first nozzle (22) arranged such that a jet of liquid sprayed from said first nozzle (22) cleans said evaporator (6).

10. Washer-dryer machine (1) according to claim 8 when depending on claim 3, wherein said auxiliary cleaning system (19) comprises an auxiliary duct (21) coupled in fluid connection with a second nozzle (23) arranged such that a jet of liquid sprayed from said second nozzle (23) cleans said filter (9).

11. Washer-dryer machine (1) according to claim 3 or to one or more of claims 4 to 10 when depending on claim 3, wherein the control device (103) of said washer-dryer machine (1) is configured for providing an alarm signal to inform a user about the necessity to clean said filter (9) after said washer-dryer machine (1) has performed a prefixed number of consecutive drying cycles.

12. Washer-dryer machine (1) according to one or more of previous claims, comprising a control device (103) configured for automatically loading a washing liquid inside said tub (2), so as to at least partially submerge said evaporator (6) and at least partially wash the latter in such a way to at least partially remove fluff/lint from said evaporator (6), after said washer-dryer machine (1) has performed a prefixed number of consecutive drying cycles.

13. Washer-dryer machine (1) according to claim 3 or to one or more of claims 4 to 12 when depending on claims 3, comprising a control device (103) configured for automatically loading a washing liquid inside said tub (2), so as to at least partially submerge said filter (9) and at least partially wash the latter in such a way to at least partially remove fluff/lint from said filter (9), after said washer-dryer machine (1) has performed a prefixed number of consecutive drying cycles.

14. Washer-dryer machine (1) according to claim 3 or one or more of claims 4 to 13 when depending on claim 3, wherein said drum (3) comprises, on its lateral surface (3a), an opening (105) arranged in such a way that it can face said filter (9) when said drum (3) is in a prefixed angular position, wherein said opening (105) allows accessing said filter for its manual maintenance, and wherein said opening is closed by a removable closure device (18).

15. Washer-dryer machine (1) according to claim 14 wherein said removable closure device (18) is a lifter (18) adapted to engage the laundry during the rotation of said drum (3), which can be pivoted with respect to said drum (3) for providing access to said opening (105).

FIG 1

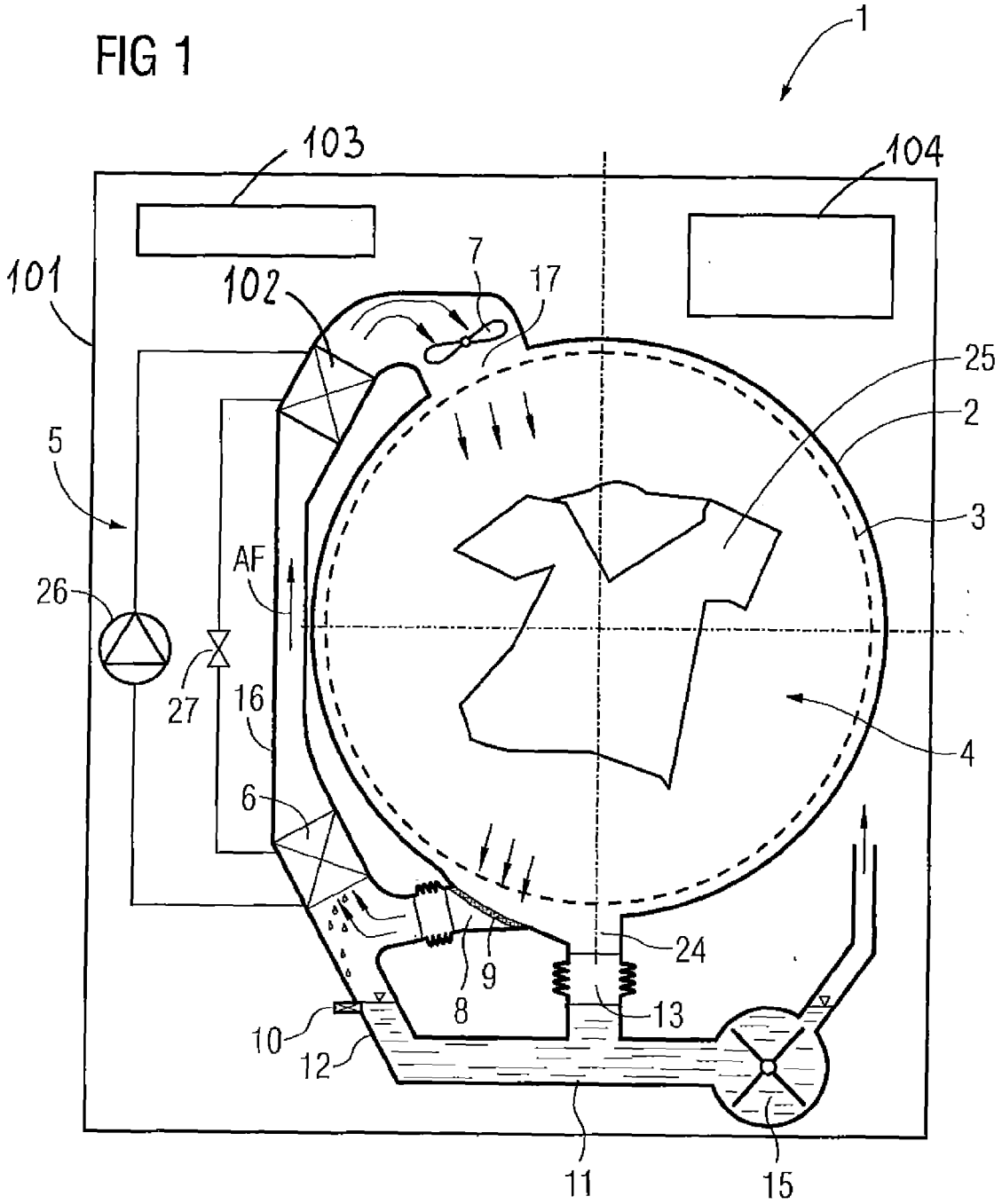


FIG 2

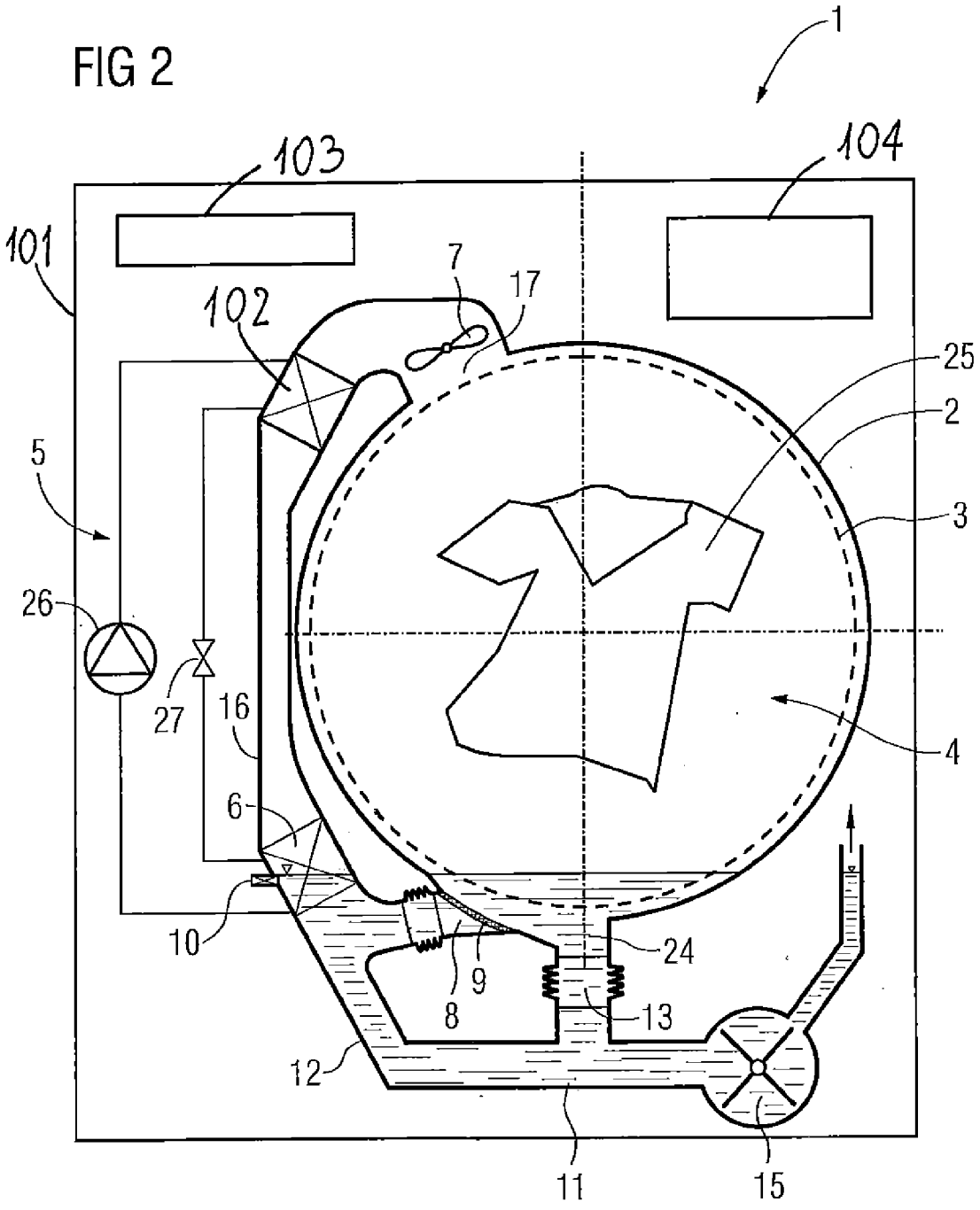


FIG 3

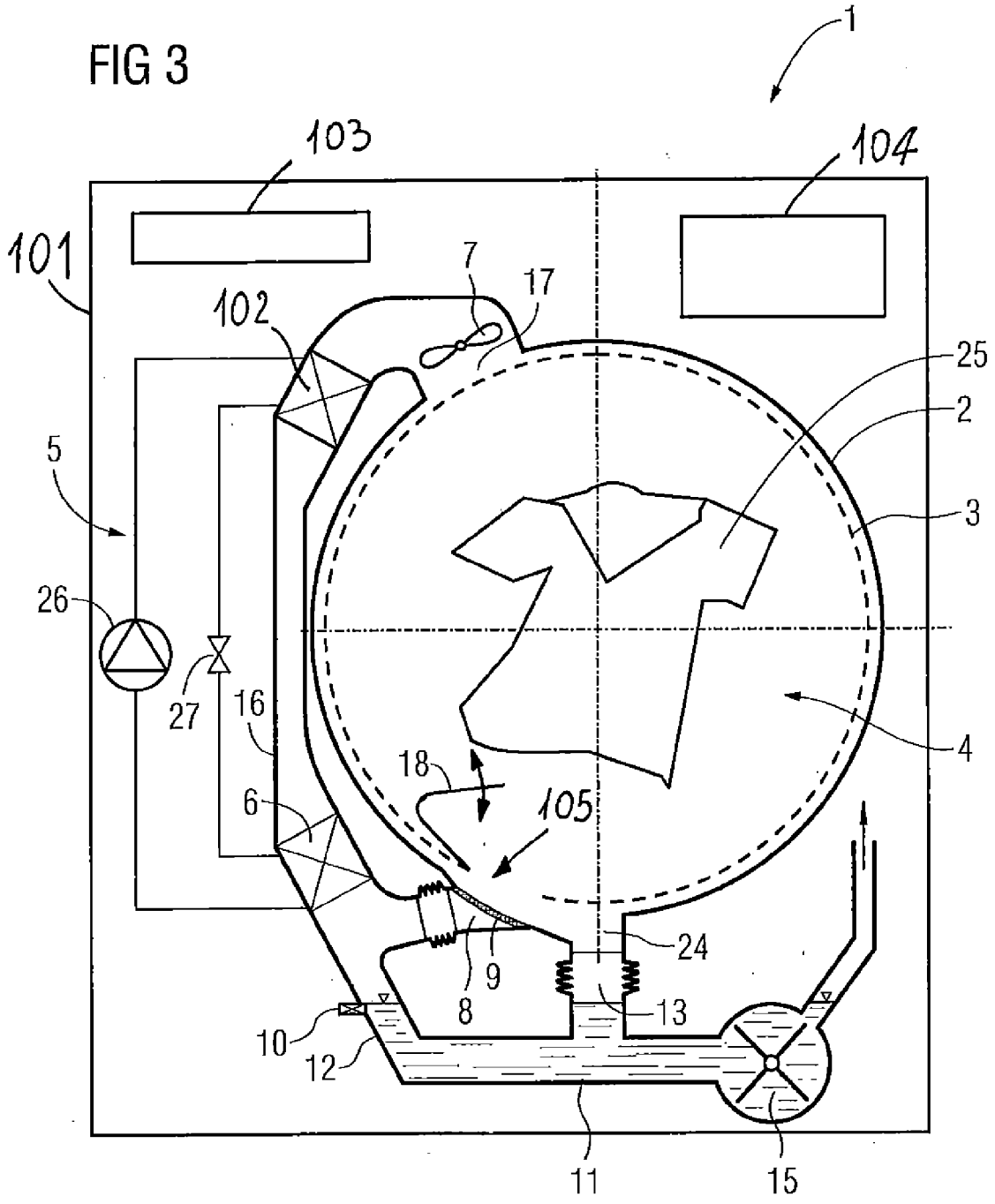
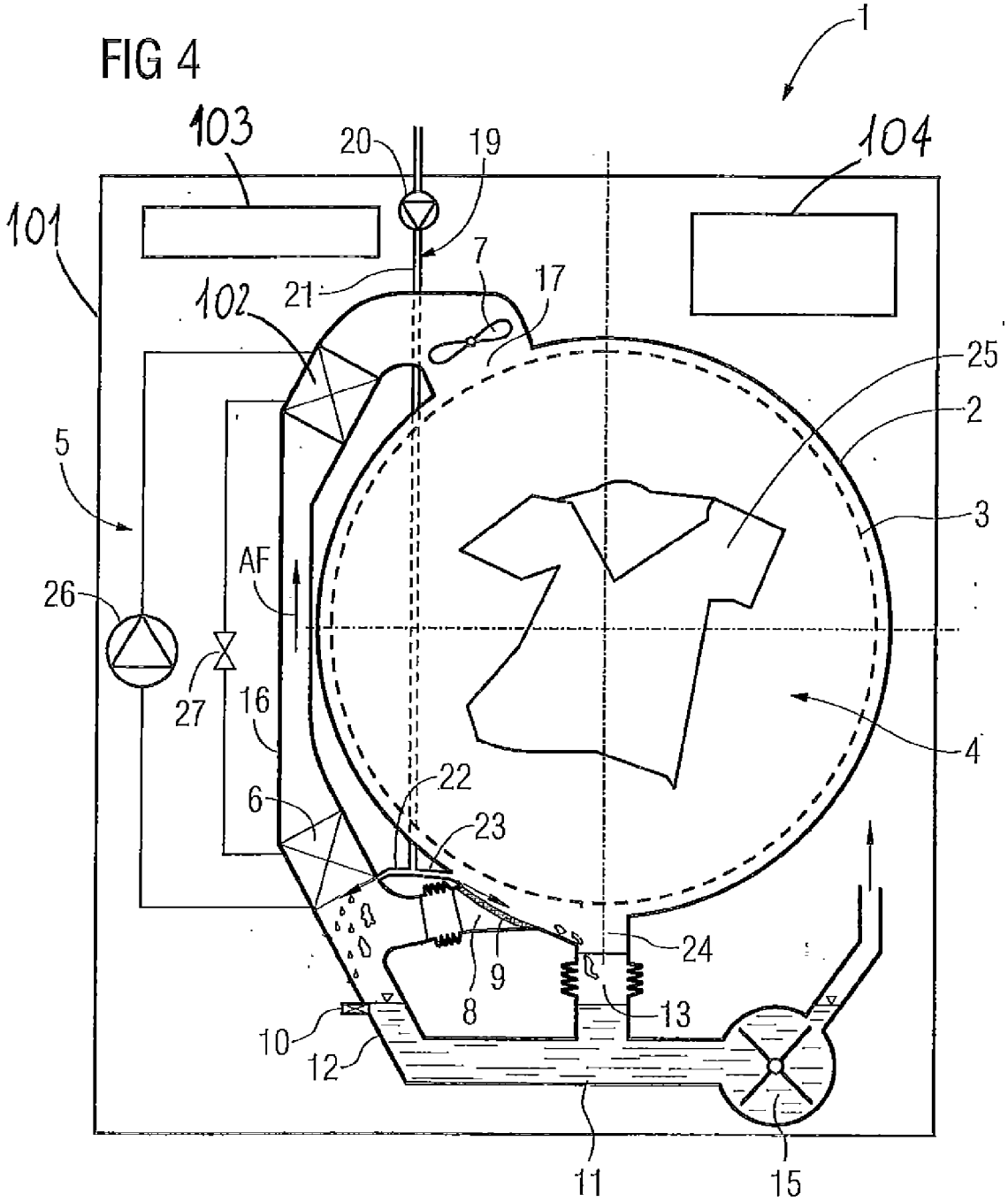


FIG 4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