



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
20.12.2017 Bulletin 2017/51

(51) Int Cl.:
D06F 33/02 (2006.01) D06F 58/28 (2006.01)

(21) Application number: **16174132.7**

(22) Date of filing: **13.06.2016**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

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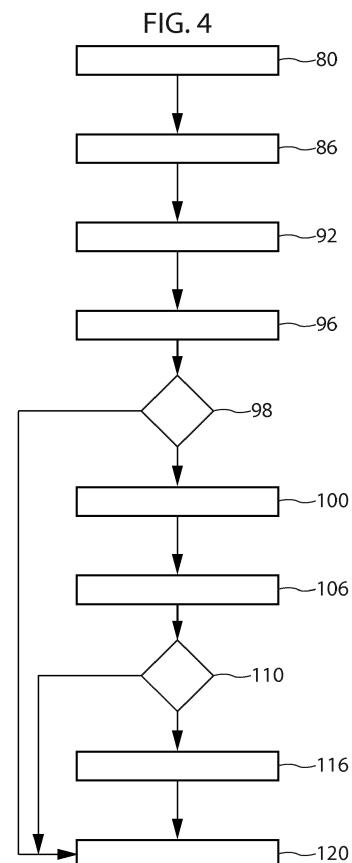
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(54) **METHOD FOR OPERATING A LAUNDRY TREATMENT APPLIANCE AND LAUNDRY TREATMENT APPLIANCE**

(57) Method for operating a laundry treatment appliance (2), comprising a rotatable drum (36) into which laundry can be loaded and which is rotated by a motor (68), whereby a closable door (24) is provided which gives access to said drum (36); with the steps of

- a) selecting a laundry treatment process;
- b) loading laundry into said drum (36);
- c) starting said laundry treatment process;
- d) estimating the amount of laundry load;
- e) issuing a notification if the amount of laundry is larger than a laundry load threshold value;
- f) if the amount of laundry is larger than said laundry load threshold value, waiting for a prescribed waiting amount of time before prosecuting said laundry treatment process, thereby allowing the user to access the drum (36) for changing the amount of laundry load;
- g) If the laundry treatment process is prosecuted with the laundry load being larger than said laundry load threshold value, maintaining said notification and/or issuing another notification that the amount of laundry is larger than said laundry load threshold value

- during said laundry treatment process;
- during a final phase of said laundry treatment process;
- at and/or after the end of said laundry treatment process.



Description

Field of the invention

[0001] The present invention concerns the field of laundry treating techniques. In particular, the present invention refers to a method for operating a laundry treatment appliance and to a laundry treating appliance operating according to such method.

Background Art

[0002] Nowadays the use of laundry treatment machines, like "simple" laundry washing machines (i.e. laundry washing machines which can only wash and rinse laundry), laundry washing-drying machines (i.e. laundry washing machines which can also dry laundry) and laundry dryers (i.e. laundry machines which can only dry laundry without washing it), is widespread.

[0003] In the present description the term "laundry treatment appliance" will refer to simple laundry washing machines, laundry washing-drying machines and laundry dryers. Laundry treatment appliances generally comprise an external casing provided with a rotatable drum where the laundry to be treated is placed. Laundry washing machines and laundry washing-drying machines comprise a washing tub wherein a perforated drum is rotatable contained. A loading/unloading door ensures access to the drum. Laundry treatment appliances able to perform a washing process typically comprise a water supply unit and a products supply unit, preferably a drawer, for the introduction of water and washing/rinsing products (i.e. detergent, softener, rinse conditioner, etc.) into the tub. Known laundry treatment appliances are also provided with water draining devices that may operate during different phases of the washing program to drain the dirty water.

[0004] According to the known technique, and with reference to a laundry treatment appliances able to perform a washing process, a complete laundry treating program or progress typically includes different phases during which the laundry to be washed is subjected to adequate treatments. A treating cycle usually comprises a main washing phase during which the laundry is treated by means of water and a detergent. The water is typically heated to a predetermined temperature based on the washing program selected by the user. It is also possible that hot water is introduced into the tub from the hot water mains. During the main washing phase the drum is rotated, so as to apply also a mechanical cleaning action on the laundry. At the end of the main washing phase the drum is typically rotated at high rotational speed, so in such a way that dirty washing liquid (i.e. water mixed with detergent) is extracted from the laundry, and this dirty washing liquid is drained to the outside by the water draining devices.

[0005] A successive step of the cycle typically comprises a rinsing phase which usually comprises one or

more rinsing cycles/steps. In a rinsing cycle, clean rinse water may be first added to the laundry. The rinse water is absorbed by the laundry and the rinse water removes from the laundry detergent and/or dirty water not previously removed by washing liquid in the main washing cycle. The drum is then rotated to extract water and dirty water/detergent from the laundry. The dirty water extracted is drained from the tub to the outside by the water draining devices.

[0006] After a rinsing phase, one or more final spinning phases may be provided for the extraction of the residual water contained in the wet laundry. The water extracted during the spinning phase is drained towards the outside by means of the water draining devices (during or after the spinning phase).

[0007] Laundry dryers are household appliances built for drying clothes and comprise a drying chamber or drum into which the clothes to be dried are introduced. The drying chamber is rotatable supported within a cabinet and made to rotate by means of a driving motor, typically consisting of an electric motor connected to the drying chamber via a belt.

[0008] In a combined washer/dryer, the drying chamber is the drum and tub assembly, and one or more drying phases are added which typically commence after the rinsing phases. The drying phase may involve spinning the drum and applying hot air to the laundry.

[0009] The quality of the washing and/or drying process depends on several factors. One important factor is the amount of laundry actually loaded into the drum compared to the maximum amount of laundry for which each of the selectable treatment processes available in the laundry treatment appliance is designed to operate with proven quality and/or efficiency. If the drum is overloaded with an excessive amount of laundry, the various laundry pieces can not perform an appropriate tumbling motion and their mutual contact can prevent detergent and/or drying air to homogeneously reach all surfaces. The user, who may not be aware of such causal relationship, will note that the treating process performed on an actually excessive amount of laundry has not been properly effective on the laundry, with the consequence that the appliance is considered as being working improperly or even damaged.

[0010] The document WO 01/71085 A1 describes performing a wash cycle in a laundry treatment appliance. At the end of the wash cycle the machine notifies the user that she or he has overloaded the machine.

Summary of the invention

[0011] The aim of the invention is to provide a method for operating a laundry treatment appliance which optimizes the quality of the laundry treatment process.

[0012] It is a further aim of the invention to provide a laundry treatment appliance which allows performing an optimized laundry treatment process.

[0013] In a first aspect, the invention relates to method

for operating a laundry treatment appliance, comprising a rotatable drum into which laundry can be loaded and which is rotated by a motor, whereby a closable door is provided which gives access to the drum; with the steps of

- a) selecting a laundry treatment process;
- b) loading laundry into the drum;
- c) starting the laundry treatment process;
- d) estimating the amount of laundry load;
- e) issuing a notification if the amount of laundry is larger than a laundry load threshold value;
- f) if the amount of laundry is larger than the laundry load threshold value, waiting for a prescribed waiting amount of time before prosecuting the laundry treatment process, thereby allowing the user to access the drum for changing the amount of laundry load;
- g) if the laundry treatment process is prosecuted with the laundry load being larger than the laundry load threshold value, maintaining the notification and/or issuing another notification that the amount of laundry is larger than the laundry load threshold value

- during the laundry treatment process;
- during a final phase of the laundry treatment process;
- at and/or after the end of the laundry treatment process.

[0014] Preferred embodiments of the invention are described in relation to the dependent claims and the description of the enclosed drawings.

[0015] The invention is based on the consideration that the performance of a laundry treatment appliance can be improved if the amount of laundry to be treated is adequately chosen. The effectiveness of a laundry treatment cycle depends on the ratios of water, detergent and laundry in the tub, the freedom of laundry to move in the drum and other factors. These factors can depend on the specific laundry treatment cycle chosen. An overload of the laundry can prevent the laundry from getting in contact with water and detergent in a homogenous way. In the case of a drying operation, an overload can prevent hot air to reach all surfaces of the laundry in a homogeneous way. The user, however, usually typically does not precisely know the optimal amount of laundry that should be loaded and tends to wash as many items as possible at once, which will overload the machine. If the message is not visible to the user at the end of the laundry treatment cycle, she or he may have forgotten the initial overload condition and may wonder about the reduced quality.

[0016] Applicant has found that an overloading of laundry into the drum and performing the treatment cycle with this overload condition can be prevented by communicating to the user an overload condition and to allow the user to change the amount of laundry essentially before the laundry treatment phases in which the laundry is treated by water and/or air is being started. When the overload indication is maintained during the laundry treatment

process or displayed again at the end of the process, it can be assured that the user gets notified. The user then can understand that the washing and/or drying effects are probably less than optimal due to the overload.

[0017] The steps a) and b) can be performed in the order a), b), so that first the laundry treatment process is selected and then laundry is loaded into the drum. These two steps can also be performed in the reverse order, where first laundry is loaded into the drum and then the process is selected. It is also possible that, in both orders, these two steps overlap at least partially in time.

[0018] The term "steps" is used in a general manner and can comprise steps as such as well as decisions. Moreover, a decision can contain at least one step, and a step can contain comprise substeps.

[0019] Preferably, the laundry treatment process is started when a specific user interaction with the appliance takes place. Preferably, it is started when the user presses a start button.

[0020] In a preferred embodiment, the method comprises the steps of:

- h) determining if an interaction occurred which is linked to a possible access of laundry in the drum;
- i) if this interaction did not occur, prosecuting the laundry treatment process with one set of operational parameters;
- j) if this interaction has occurred, performing one of the following:

- prosecuting the laundry treatment process with the one set of operational parameters, or
- prosecuting the laundry treatment process with another set of operational parameters different from the one set of operational parameters, or
- performing steps d) to j) up to a prescribed number of times.

[0021] Preferably, the set of operational parameters for performing the treatment process on laundry is chosen dependent on one or more of:

- the interaction;
- the estimation of the amount of laundry performed in step d);
- the laundry treatment process selected in step a).

[0022] Advantageously, the interaction comprises opening and subsequent closing of the door of the appliance, whereby the set of operational parameters is depending on the time interval between the opening and closing of the door.

[0023] The operational parameters are preferably set to the one set of operational parameters if the time interval is smaller than a threshold time interval or the estimations of the amount of laundry performed in two subsequent iterations of step d) result in substantially the same laundry amount. In these cases, it is highly prob-

able that no or no considerable change of the laundry amount has happened. The user may, for instance, only have checked if the door is really closed.

[0024] The notification is advantageously maintained until the laundry treatment process has finished and/or the door is opened and/or a user interaction with the appliance has occurred. The last alternative assures that the user can see the indication since this interaction means that the user is interacting with the machine and therefore can sense indications given by the appliance.

[0025] The indication is preferably made on a display of the appliance. In this way, a visual indication is made which can conveniently be recognized by the user.

[0026] In a preferred embodiment, an indication related to the amount of laundry load is made on the display. In a first preferred variant, the amount of laundry is indicated. In a second preferred embodiment, a load range of the laundry is visually indicated. For example, the load range can be indicated by using the terms "small load", "medium load", and "large load", whereby each term refers to weight range of the laundry.

[0027] The laundry load threshold value preferably corresponds to the maximum amount of laundry expected to be treated for the selected laundry treatment process. In this way, an overload condition means that the laundry can not be treated in an optimal way and reductions of quality and/or efficiency of the laundry treatment process are to be expected.

[0028] Preferably on a display of the appliance, it is signaled that the amount of laundry can be changed. Preferably, during the time interval during which the user can change the laundry in the drum a message is displayed indicating that a change of laundry is possible and/or advantageous. The message can, for instance, be "Drum overload, please remove laundry".

[0029] Advantageously, during the laundry treatment process, it is indicated on the display if the current laundry load is below the laundry load threshold value, and whereby this indication is preferably maintained. It is preferably maintained until the laundry treatment process has finished and/or until a user interaction occurs after the laundry treatment process has finished.

[0030] The waiting amount of time is preferably between 10 and 60 seconds. Preferably, the waiting amount of time is 30 seconds.

[0031] Advantageously, step d) is performed without and/or before supplying water in a tub of the appliance in which said drum is rotatable arranged. In this way, uncertainties which can result from an unknown amount of water in the tub are avoided during the determination of the amount of laundry.

[0032] In a preferred embodiment, in step d) the laundry load amount is determined by rotating said drum and measuring electrical and/or mechanical parameters related to said motor. These parameters are preferably electrical parameters, preferably from the group current, power, power voltage, and/or mechanical parameters, preferably from the group rotation speed or rotor position.

[0033] The laundry load threshold value advantageously depends on the selected laundry treatment process and/or the kind or type of laundry communicated to the appliance by the user or estimated by the appliance.

The appliance can, for instance, be configured such that the kind or type of laundry can be inputted as additional and separate information. The appliance can also be configured to recognize or assess the kind of laundry.

[0034] Preferably the laundry treatment appliance is a washing machine, a dryer or a combined washer/dryer.

[0035] In a preferred embodiment, the laundry treatment appliance is a combined washer/dryer, whereby the laundry treatment process is a combined washing and drying cycle, and whereby the laundry load threshold value of step e) is a threshold value based on the maximum laundry load that can be dried in the combined washing and drying cycle. The amount of laundry that can be dried in a combined washing-drying process is usually lower compared to the amount of laundry that can be washed with a desired quality. By choosing the threshold value in the described way, it can be assured that in both washing and drying phases, the desired quality of the treatment process can be achieved.

[0036] In the combined washing and drying cycle, the drying operations are preferably performed after a rinsing step of a washing treatment. Preferably, the drying operations are performed after the last or final rinsing step of the washing operations. Preferably the drying process starts during the last spinning phase of the washing phases.

[0037] In a second aspect, the invention is related to a laundry treatment appliance, comprising a rotatable drum into which laundry is loaded and which is rotated by a motor, with a control unit configured and/or programmed to perform a method described above. In a preferred embodiment, the laundry treatment appliance comprises a tub in which the drum is arranged in a rotatable manner.

[0038] Preferably, the laundry treatment appliance is built as a front-loading washing machine or combined washer/dryer.

[0039] Preferably, the display is arranged on a user interface. A user interface is a dedicated area on the appliance for interaction of the user with the appliance. The user will expect to control the appliance by this interface and also receive messages or warnings from the machine on the user interface.

[0040] The advantages of the invention are as follows. The method according to the invention improves the quality of the treatment of laundry by allowing optimizing the amount of laundry in the drum, thereby preventing insufficient or inhomogeneous contact of detergent with the laundry or, in the case of a drying cycle, insufficient or inhomogeneous contact with hot air. By determining again the amount of laundry after it has changed, it is possible to further optimize the loaded amount. The issuing of a warning or notification allows the user to take action and change the amount of laundry accordingly.

The displaying of a warning or notification on a display makes it convenient for the user to recognize the overload condition. By maintaining the overload indication or showing it at the end of the process, the user obtains the distinct message that a loss of quality of the laundry treatment process is related to the overload condition. This can prevent the user from relating this quality loss to the appliance in general.

Brief description of the drawings

[0041] Further features and advantages of the present invention shall become clearer from the following detailed description of some of its preferred embodiments, made with reference to the attached schematic drawings and given as an indication and not for limiting purposes.

[0042] In particular, the attached drawings are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification. The drawings together with the description explain the principles of the invention. In the drawings, corresponding characteristics and/or components are identified by the same reference numbers. In these drawings:

- FIG. 1 shows a front loading washing machine in a preferred embodiment;
- FIG. 2 shows the front loading washing machine of FIG. 1 in a frontal perspective view with the casing removed;
- FIG. 3 shows the front loading washing machine of FIG. 1 in a perspective rear view;
- FIG. 4 shows a flow chart of a method for operating a laundry treatment appliance in a first preferred embodiment; and
- FIG. 5 shows a flow chart of a method for operating a laundry treatment appliance in a second preferred embodiment.

[0043] In FIGs. 1-3, a laundry treatment appliance 2 is shown which is built as a front-loading washing machine and comprises housing or casing 6 with a preferable parallelepiped shape, the casing 6 comprising a front wall 10, two side walls 14, a cover plate 20 and a rear wall (not shown). Front wall 10 and side walls 14 are preferably part of a cabinet. A front door 24 is provided which can be opened for loading or unloading laundry through an opening 28 into a washing drum and which can be closed. Door 24 can be preferably operated, especially opened and closed, by a handle 26.

[0044] Advantageously a washing tub 30 is contained within casing 6, whereby a rotatable and perforated (perforation is not shown) drum 36 is contained by the washing tub 30. Both washing tub 30 and drum 36 have a substantially cylindrical shape. Advantageously the tub

30 is suspended in a floating manner inside casing 6 by means of a number of coil springs 44 and shock absorbers 46. The drum 36 is rotated by an electric motor 68, which transmits the rotating motion of a motor shaft to the drum by a belt/pulley system 70. In a different embodiment of the invention, the motor can be directly associated with the shaft of the drum 36. The tub 30 is preferable connected to casing 6 by means of an elastic bellows 52 or gasket. Tub 30 preferably comprises two complementary hemi-shells 64, 66 structured for being reciprocally coupled to form tub 30.

[0045] Alternatively, the laundry appliance can be a combined washer and dryer or a dryer, in latter case the tub is not provided.

[0046] The preferred washing machine shown in FIG. 1 on a front panel 40 comprises a drawer 42 with a front plate 34 and a handle 36 for pulling out and pushing back in drawer 42. Drawer 42 comprises at least one compartment for detergent or washing additives. Adjacent to drawer 42, preferably a rotatable or rotary knob 38 is arranged for selecting a laundry treatment program and/or at least one parameter of a laundry treatment program. Preferably, knob 38 has also a push-functionality and can be pressed for selected and/or confirmation of selected options. Knob 38 is provided on a user interface 62 which can provide further indicating and/or control elements (not shown). Knob 38 is preferably arranged on front panel 40 adjacent to drawer 42.

[0047] On front panel 40, a display 50 is arranged on user interface 62. Display 50 comprises a dedicated area 54. A control unit 56 is indicated schematically which is configured to conduct a method which will be described below.

[0048] In FIG. 4, a method according to the invention in a first preferred embodiment is shown as a flow chart and is discussed in connection with the appliance 2 shown in FIGs. 1-3. In a step 80, a laundry treatment process is selected. In a step 86, laundry is loaded into the drum 36. Both steps can be performed in the order described or in reverse order. They can also at least partially overlap in time in any of the described orders. In a step 92, the selected laundry treatment process is started. This is preferably done when a user interaction with the appliance 2 is performed. Especially preferred is the user pressing a dedicated button such as a start button.

[0049] In a step 96, the amount of laundry / laundry load in the drum is estimated. In the current embodiment, this laundry load estimation is performed by rotating the drum and measuring electrical and/or mechanical parameters such as current or voltage of the motor, or angular velocity, position or motor torque. This step is performed after the steps 80, 86, and 92. In another preferred embodiment, the laundry load estimation can be performed by a weight sensor which measures the weight of the laundry which is arranged in the drum. In this case, the step 96 can at least partially overlap with the step 86.

[0050] In a decision 98, it is decided if the estimated amount of laundry is larger than a laundry load threshold

value. If this is not the case, the method branches to a step 120, in which the laundry process is continued and finished.

[0051] If the estimated laundry amount is larger than the threshold value, the method branches from decision 98 to a step 100. In step 100, a notification is issued. The notification notifies the user that the amount of laundry loaded into the drum is larger than a threshold value. The notification is preferably issued on a the display 50, most preferably on the dedicated area 56 of the display 50. The laundry load threshold value depends in the present embodiment on the selected laundry treatment process. It can also depend on the kind or type of laundry loaded in the drum which can be determined by the appliance 2 or which can be inputted by the user as a separate option.

[0052] A step 106 is performed after step 100. In step 106, if the amount of loaded laundry is larger than the laundry threshold value, the appliance does not continue with the laundry treatment process but waits for a waiting amount of time, which allows the user to access the drum 36 and adjust the amount of laundry by removing laundry from the drum 36. The waiting amount of time is preferably between 10 and 60 seconds.

[0053] In a decision 110, the method decides if the laundry treatment process is continued with a laundry load amount which is larger than the threshold value. If not the case, i.e. the laundry load amount estimated in step 96 has been changed in step 106 to be smaller or equal to the threshold value, the method branches to step 120 in which the laundry treatment process is prosecuted and finished. If the process has continued with an overload condition, i.e. the estimated amount of laundry is larger than the threshold value, the method continues in a step 116, in which the notification of step 100 is maintained. In the preferred embodiment shown, the notification is shown during the whole laundry treatment process, making it at any time during the process possible for the user to recognize that the laundry treatment process is conducted with an overload condition, which can lead to an non-optimal treatment of the laundry. Thereby the user can recognize that the non-optimal treatment of the laundry is not related to a low quality and/or malfunction of the appliance. She or he recognizes that an enhancement of the laundry treatment quality can be achieved by not overloading the drum 36 with laundry.

[0054] In another preferred variant, instead of or additionally keeping the notification of step 100, another notification can be issued. The new notification can preferably be issued in the final phase of the laundry treatment process and/or after the end of the laundry treatment process in step 120. The user can therefore when returning back to the appliance take note of the notification and learn that her or his laundry has been treated while being in an overload decision. As described above, in step 120, the laundry process is continued and finished. The method described is preferably conducted by the control unit 56.

[0055] A method in a second preferred embodiment

according to the invention is shown in FIG. 5 in a second preferred embodiment. In a step 80, a laundry treatment process is selected. In a step 86, laundry is loaded into the drum. Both steps can be performed in the order described or in reverse order. They can also at least partially overlap in time in any of the described orders. In a step 92, the selected laundry treatment process is started. This is preferably done when a user interaction with the appliance 2 is performed. Especially preferred is the user pressing a dedicated button such as a start button.

[0056] In a step 96, the amount of laundry / laundry load in the drum is estimated. In the current embodiment, this laundry load estimation is performed by rotating the drum and measuring electrical and/or mechanical parameters such as current or voltage of the motor, or angular velocity, position or motor torque. This step is performed after the steps 80, 86, and 92. In another preferred embodiment, the laundry load estimation can be performed by a weight sensor which measures the weight of the laundry which is arranged in the drum. In this case, the step 96 can at least partially overlap with the step 86.

[0057] In a decision 98, it is decided if the estimated amount of laundry is larger than a laundry load threshold value. If this is not the case, the method branches to a step 120, in which the laundry process is continued and finished.

[0058] If the estimated laundry amount is larger than the threshold value, the method branches from decision 98 to a step 100. In step 100, a notification is issued. The notification notifies the user that the amount of laundry loaded into the drum is larger than a threshold value. The notification is preferably issued on a display 50, preferably on dedicated area 56 of the display 50. The laundry load threshold value depends in the present embodiment on the selected laundry treatment process. It can also depend on the kind or type of laundry loaded in the drum which can be determined by the appliance 2 or which can be inputted by the user as a separate option.

[0059] A step 106 is performed after step 100. In step 106, if the amount of loaded laundry is larger than the laundry threshold value, the appliance does not continue with the laundry treatment process but waits for a waiting amount of time, which allows the user to access the drum and adjust the amount of laundry by removing laundry from the drum. The waiting amount of time is preferably between 10 and 60 seconds.

[0060] In a decision 108, it is determined if an interaction with the appliance 2 occurred which is linked to a possible access of laundry in the drum 36. In the current preferred embodiment of the method, this interaction is the process of opening the door 24 and subsequent closing again the door 24. Both the opening and the closing of door 24 are detected by a door sensor of appliance 2. If the appliance 2 has a weight sensor, changes in the measured weight of the laundry loaded into drum 36 are alternatively or in addition to the sensing of the door status the described interaction linked to a possible change of the laundry.

[0061] If the user interaction has not occurred, the method continues with a step 126 in which the selected laundry treatment process is prosecuted and then finished with one set of operational parameters. In step 126, the notification of step 100 is either maintained and/or a new notification is issued as described in connection with the embodiment of FIG. 4. The operational parameters can depend on the interaction and/or the estimation of the laundry amount in step 96 and/or the laundry treatment process selected in step 80.

[0062] If the user interaction has occurred, the method continues from decision 108 with one of the steps 140, 142, 144. In step 140, the method prosecutes the laundry treatment process with the set of operational parameters of step 126. Preferably, this step 140 is chosen if the time interval between opening the door 24 and closing the door 24 is smaller than a predefined minimum time interval. In this case, the time span is assumed to be too short of a laundry change at all or a considerable change of laundry that would make an accurate determination of the current laundry necessary again. In this case, the operational parameters do not need to be changed.

[0063] In step 142, the laundry treatment process is prosecuted with operational parameters which are different from the previously chosen operational parameters. The operational parameters can depend on the interaction and/or the estimation of the laundry amount in step 96 and/or the laundry treatment process selected in step 80. In a step 144, the steps 96 to 108 are repeated for a prescribed number of times.

[0064] The laundry treatment can be performed as known in the art. Water is introduced into the tub and one or more washing, rinsing spinning phases are performed.

[0065] In a further preferred variant of the method, the notification is removed again before the method reaches step 126. The notification is then given again at the end of step 126, i.e. after the laundry treatment cycle has finished. Also in this way, with a large probability the user will recognize the notification. Preferably the notification of the overload condition is in two stages of the method made visible on the display 50. It is issued in step 100 after the estimation of the current laundry load and - if an overload condition still persists - is either maintained until step 126 or issued again in step 126.

[0066] In still further preferred embodiment, the methods described in connection with FIGs. 4 and 5 are performed in the control unit of a combined washer/dryer. The laundry load threshold value in these further preferred embodiments is set as the maximum amount of laundry which can be dried in the combined washing and drying process. This threshold value is usually smaller than the value of an amount of laundry that can be washed. By choosing this value in the combined process, it is reliably assured that both the washing phases and the drying phases can be effectively performed.

[0067] The invention thus conceived can be subjected to numerous modifications and variants all falling within the scope of the inventive concept. In addition, all details

can be replaced by other technically equivalent elements. In practice, all the materials used, as well as the shapes and contingent dimensions, may vary depending on the requirements without departing from the scope of protection of the following claims.

Claims

1. Method for operating a laundry treatment appliance (2), comprising a rotatable drum (36) into which laundry can be loaded and which is rotated by a motor (68), whereby a closable door (24) is provided which gives access to said drum (36); with the steps of

- a) selecting a laundry treatment process;
- b) loading laundry into said drum (36);
- c) starting said laundry treatment process;
- d) estimating the amount of laundry load;

characterized in the steps of

- e) issuing a notification if the amount of laundry is larger than a laundry load threshold value;
- f) if the amount of laundry is larger than said laundry load threshold value, waiting for a prescribed waiting amount of time before prosecuting said laundry treatment process, thereby allowing the user to access the drum (36) for changing the amount of laundry load;
- g) If the laundry treatment process is prosecuted with the laundry load being larger than said laundry load threshold value, maintaining said notification and/or issuing another notification that the amount of laundry is larger than said laundry load threshold value

- during said laundry treatment process;
- during a final phase of said laundry treatment process;
- at and/or after the end of said laundry treatment process.

2. Method according to claim 1 further comprising the steps of:

- h) determining if an interaction occurred which is linked to a possible access of laundry in the drum (36);
- i) if said interaction did not occur, prosecuting said laundry treatment process with one set of operational parameters;
- j) if said interaction has occurred, performing one of the following:

- prosecuting said laundry treatment process with said one set of operational parameters, or
- prosecuting said laundry treatment process with another set of operational param-

eters different from said one set of operational parameters, or
 - performing steps d) to j) up to a prescribed number of times.

3. Method according to claim 2 whereby the set of operational parameters for performing the treatment process on laundry is chosen dependent on one or more of:

- said interaction;
- the estimation of the amount of laundry performed in step d);
- the laundry treatment process selected in step a).

4. Method according to one of the claims 1 to 3, whereby said interaction comprises opening and subsequent closing of said door (24), and whereby said set of operational parameters is depending on the time interval between said opening and said closing of said door (24) .

5. Method according to claim 4, whereby said operational parameters are set to said one set of operational parameters if said time interval is smaller than a threshold time interval or if the estimations of the amount of laundry performed in two subsequent iterations of step d) result in substantially the same laundry amount.

6. Method according to one of the claims 1 to 5, whereby said notification is maintained until said laundry treatment process has finished and/or said door (24) is opened and/or a user interaction with said appliance (2) has occurred.

7. Method according to one of the claims 1 to 6, whereby said laundry load threshold value corresponds to the maximum amount of laundry expected to be treated for said selected laundry treatment process.

8. Method according to one of the claims 1 to 7, whereby said notification is made on a display (50) of said appliance (2).

9. Method according to claim 8, whereby an indication related to said amount of laundry load is made on said display (50).

10. Method according to claim 8 or 9, whereby on said display (50), it is signaled that the amount of laundry can be changed.

11. Method according to one of the claim 8 to 10, whereby during said laundry treatment process, it is indicated on said display (50) if the current laundry load is below said laundry load threshold value, and

whereby this indication is maintained until said laundry treatment process has finished and/or until a user interaction occurs after said laundry treatment process has finished.

12. Method according to one of the claims 1 to 11, whereby said waiting amount of time is between 10 and 60 seconds.

13. Method according to one of the claims 1 to 11, whereby step d) is performed without and/or before supplying water in a tub (30) of said appliance (2) in which said drum (36) is rotatable arranged.

14. Method according to one of the claims 1 to 13, whereby in step d) the laundry load amount is determined by rotating said drum (36) and measuring electrical and/or mechanical parameters related to said motor (68).

15. Method according to one of the claims 1 to 14, whereby said laundry load threshold value depends on said selected laundry treatment process and/or type of laundry communicated to said appliance (2) by the user or estimated by said appliance (2).

16. Method according to one of the claims 1 to 15, whereby said laundry treatment appliance (2) is a washing machine, a dryer or a combined washer/dryer.

17. Method according to claims 1 to 15, whereby said laundry treatment appliance (2) is a combined washer/dryer, whereby said laundry treatment process is a combined washing and drying cycle, and whereby said laundry load threshold value of step e) is a threshold value based on the maximum laundry load that can be dried in said combined washing and drying cycle.

18. Laundry treatment appliance (2), comprising a rotatable drum (36) into which laundry is loaded and which is rotated by a motor (68),

characterized by

a control unit (56) configured and/or programmed to perform a method according to one of the previous claims.

FIG. 1

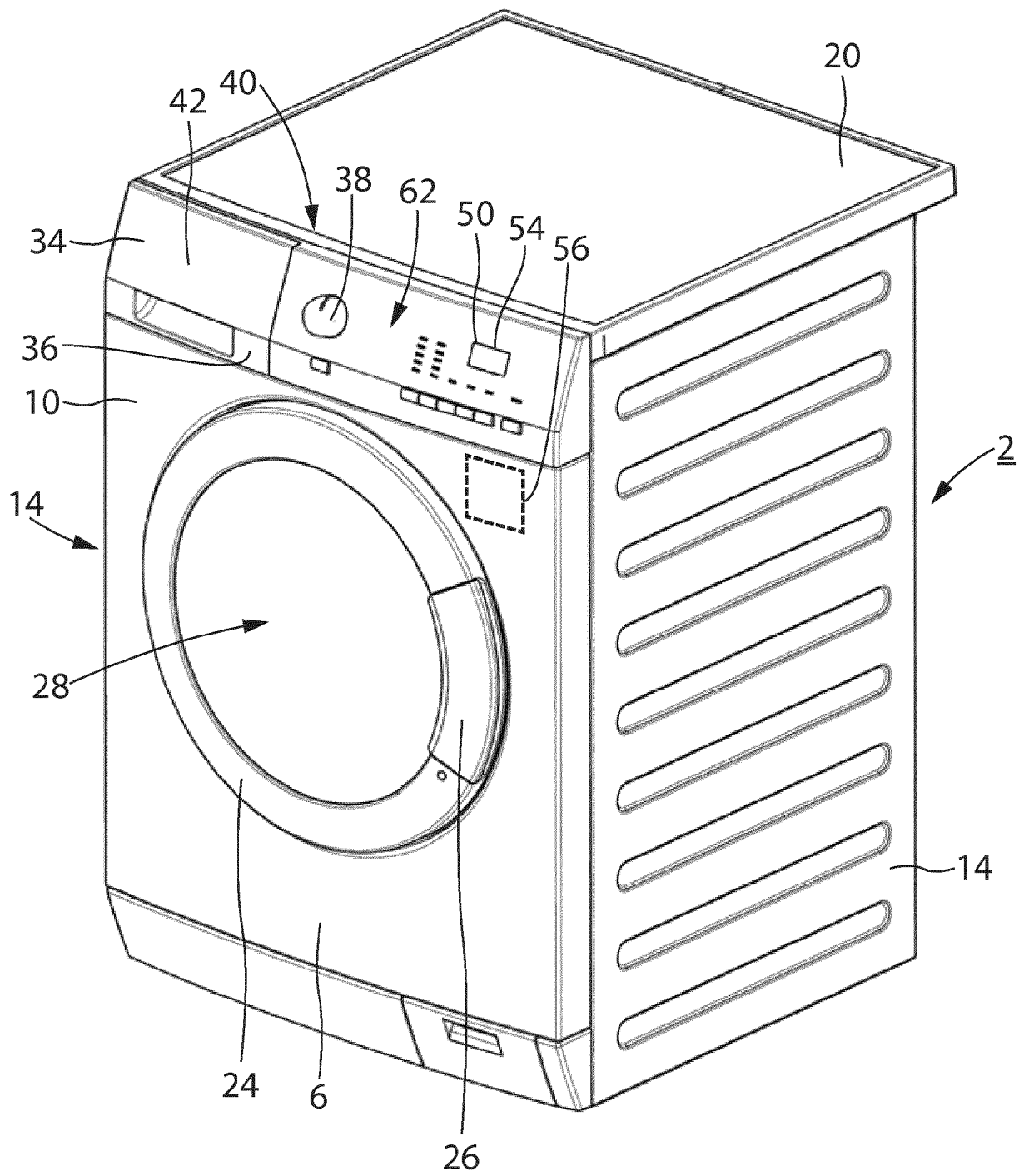


FIG. 2

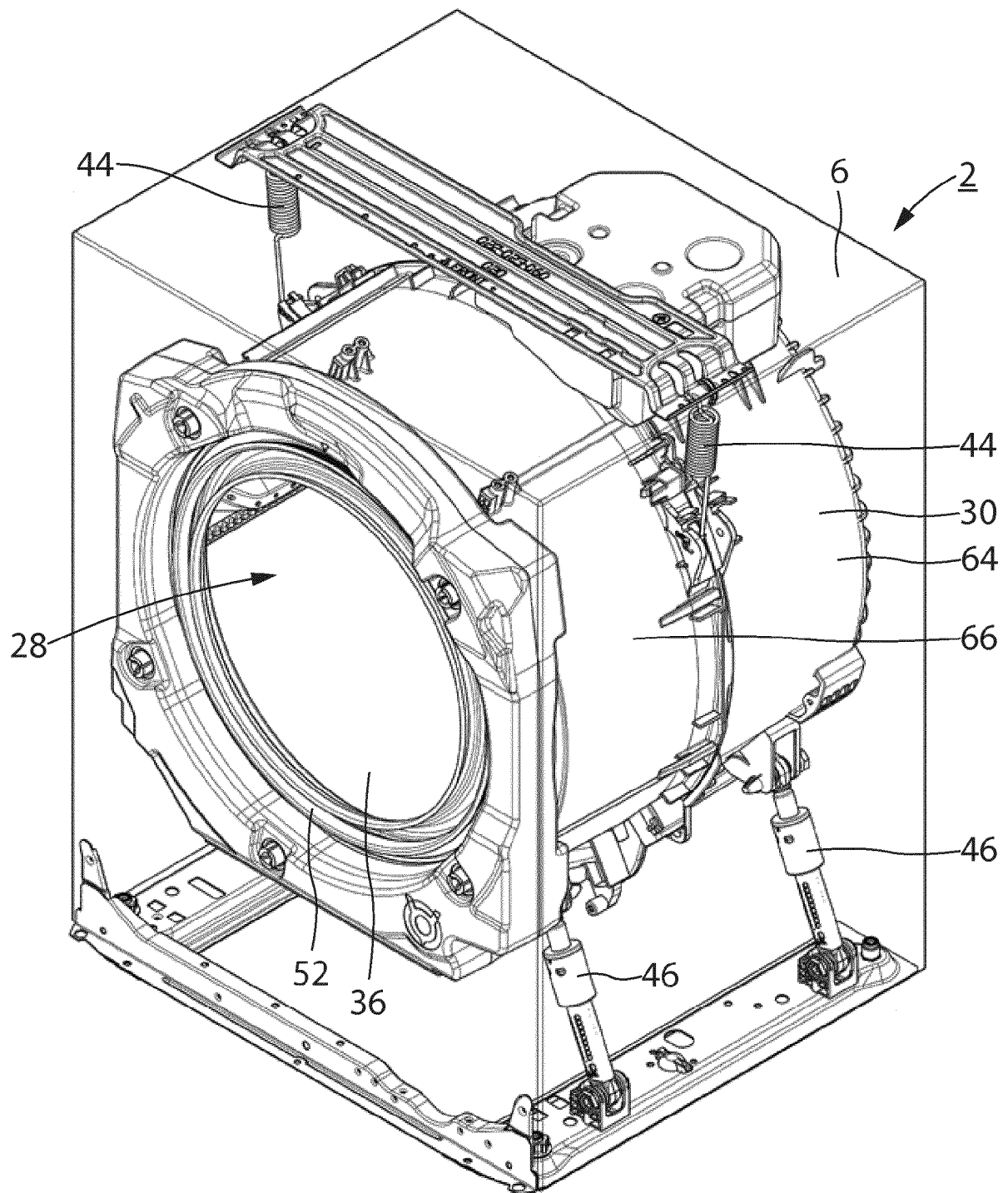


FIG. 3

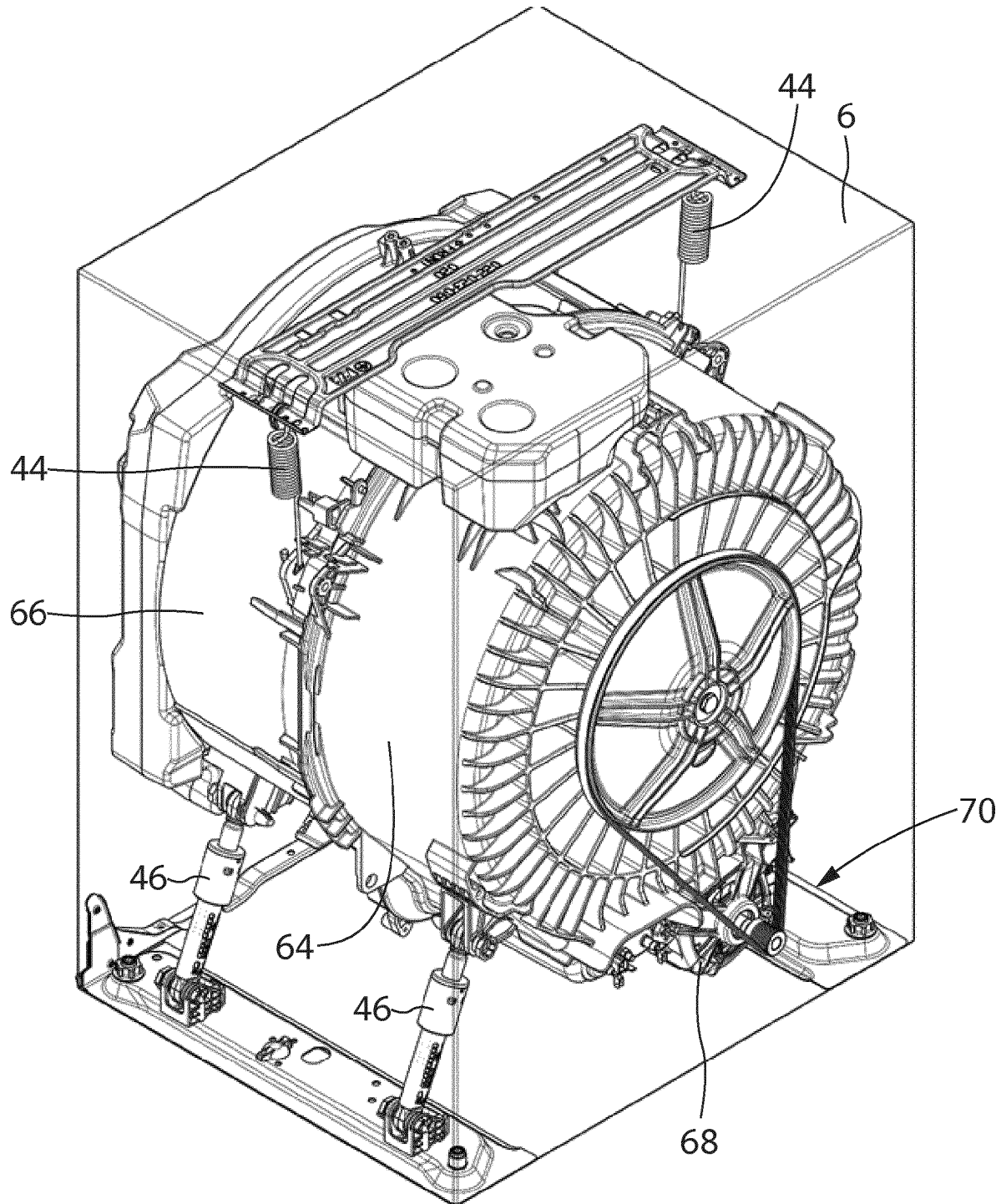


FIG. 4

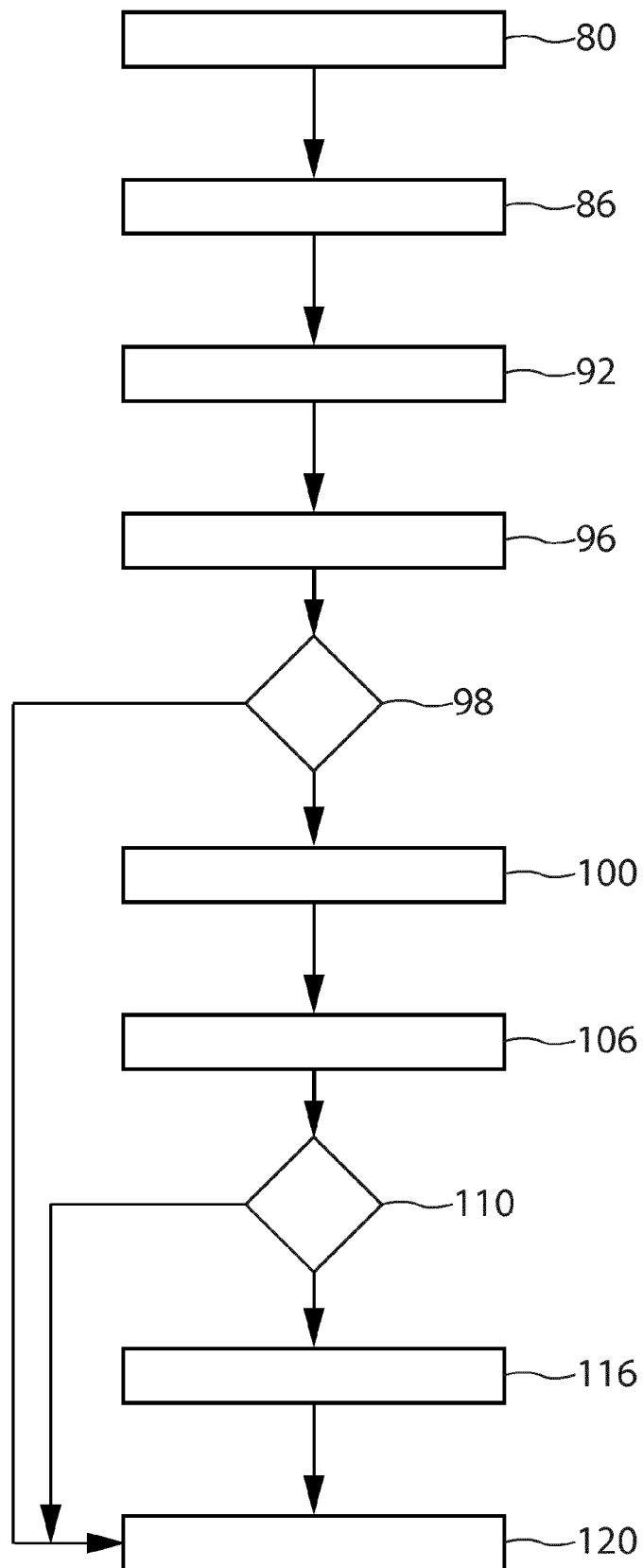
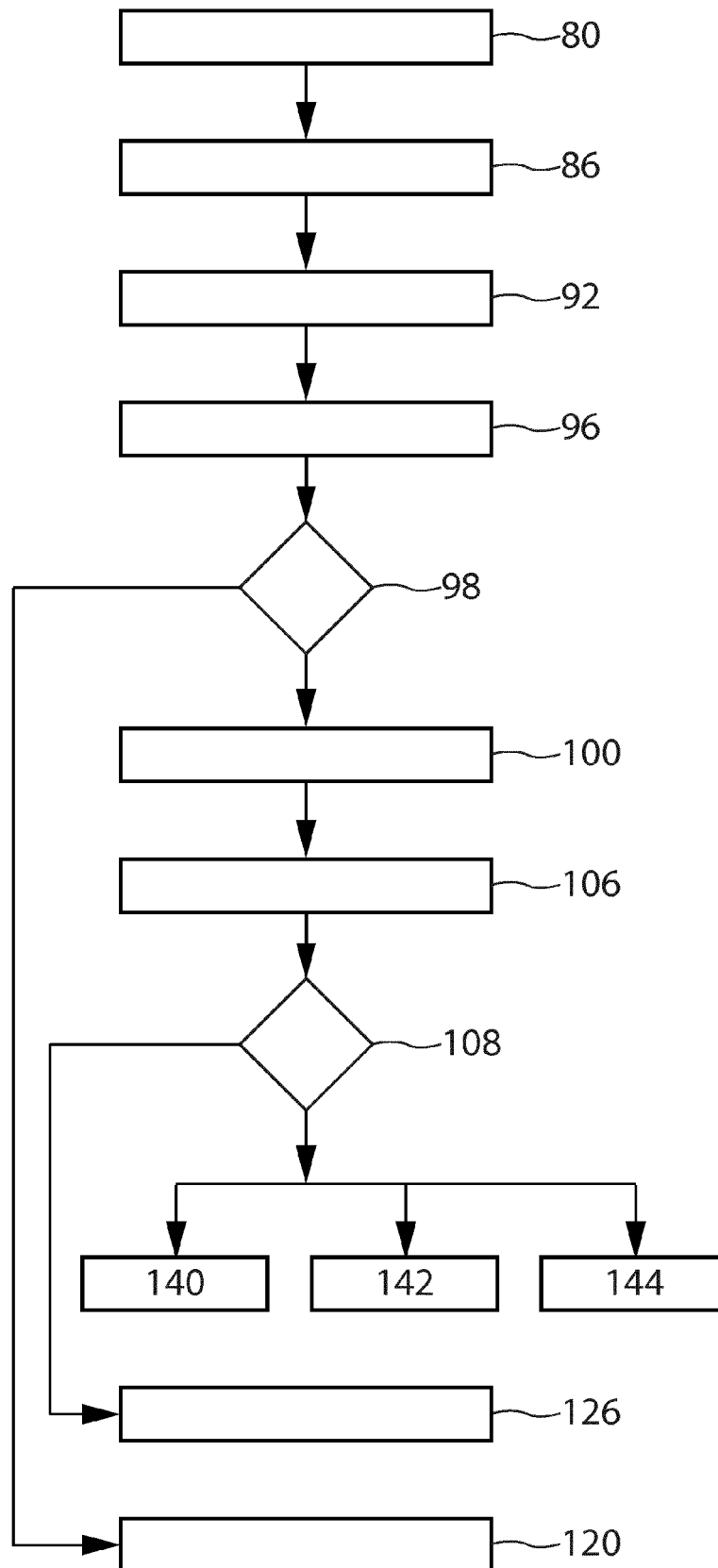


FIG. 5





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