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(54) **METHOD AND APPARATUS FOR CLOTHES DRYER, ELECTRONIC DEVICE, STORAGE MEDIUM, AND CLOTHES DRYER**

(57) The present invention provides a method and apparatus for a clothes dryer, an electronic device, a storage medium, and a clothes dryer. The clothes dryer includes a drying circuit and an ozone generating unit, and a drying program adapted to dry a load through the drying circuit is set in the clothes dryer. The drying program includes a main drying phase and a cooling phase located after the main drying phase, and the ozone generating unit is adapted to generate ozone in the drying circuit. The method for a clothes dryer includes: running the drying program; periodically enabling and disabling the ozone generating unit in the main drying phase, so that the drying circuit has a first ozone concentration; and periodically enabling and disabling the ozone generating unit in the cooling phase, so that the drying circuit has a second ozone concentration. By using the present invention, the ozone generating unit may be controlled, in each of the main drying phase and the cooling phase of the drying program, to generate ozone with a specific concentration, and the ozone enters a drum of the clothes dryer with a drying airflow, thereby improving the odor of the load after being dried through the clothes dryer.

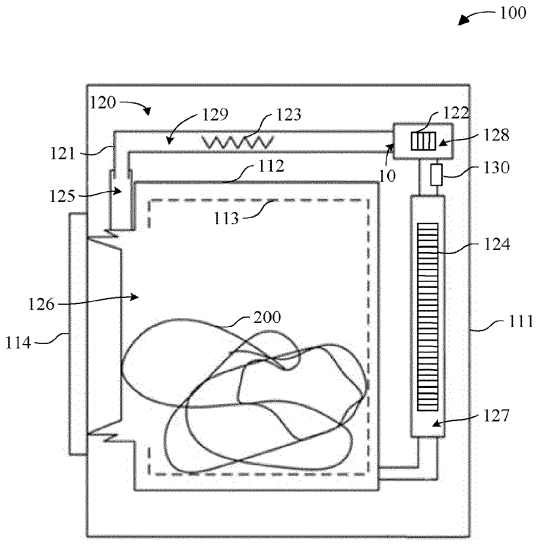

FIG. 1

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Description

[0001] The present invention relates to the field of household appliance technologies, and in particular, to a method and apparatus for a clothes dryer, an electronic device, a storage medium, and a clothes dryer.

[0002] Generally, direct exposure of loads (such as clothes) to the sun for drying is considered to be clean and hygienic, and the sun-dried loads have a special fresh odor, that is, the so-called "odor of the sun". However, loads after being dried through clothes dryers often have a variety of unpleasant odors such as a rubber odor, a plastic odor, and even a musty odor.

[0003] An objective of the present invention is to provide a method and apparatus for a clothes dryer, an electronic device, a storage medium, and a clothes dryer.

[0004] A clothes dryer provided in an embodiment of the present invention includes a drying circuit and an ozone generating unit, and a drying program adapted to dry a load through the drying circuit is set in the clothes dryer. The drying program includes a main drying phase and a cooling phase located after the main drying phase, and the ozone generating unit is adapted to generate ozone in the drying circuit. A method for a clothes dryer provided in an embodiment of the present invention includes: running the drying program; periodically enabling and disabling the ozone generating unit in the main drying phase, so that the drying circuit has a first ozone concentration; and periodically enabling and disabling the ozone generating unit in the cooling phase, so that the drying circuit has a second ozone concentration.

[0005] Optionally, the periodically enabling and disabling the ozone generating unit in the main drying phase includes: running and enabling the ozone generating unit for a first duration; determining whether the main drying phase ends; determining, when the main drying phase does not end, whether a current remaining main drying time is greater than a second duration; returning, when the current remaining main drying time is greater than the second duration, to the step of running and enabling the ozone generating unit for a first duration after waiting for the second duration, until the main drying phase ends; and returning, when the current remaining main drying time is less than or equal to the second duration, to the step of determining whether the main drying phase ends.

[0006] Optionally, the method includes: determining, when the main drying phase ends, whether the ozone generating unit is enabled; and disabling the ozone generating unit when the ozone generating unit is enabled.

[0007] Optionally, the periodically enabling and disabling the ozone generating unit in the cooling phase includes: running and enabling the ozone generating unit for a third duration; determining whether the cooling phase ends; determining, when the cooling phase does not end, whether a current remaining cooling time is greater than a fourth duration; returning, when the current remaining cooling time is greater than the fourth duration, to the step of running and enabling the ozone generating unit for a third duration after waiting for the fourth duration, until the cooling phase ends; and returning, when the current remaining cooling time is less than or equal to the fourth duration, to the step of determining whether the cooling phase ends.

[0008] Optionally, the method includes: disabling the ozone generating unit before the cooling phase ends.

[0009] Optionally, in a period of periodically enabling and disabling the ozone generating unit in the main drying phase, a duration for enabling the ozone generating unit is the first duration, and a duration for disabling the ozone generating unit is the second duration; and in a period of periodically enabling and disabling the ozone generating unit in the cooling phase, a duration for enabling the ozone generating unit is the third duration, and a duration for disabling the ozone generating unit is the fourth duration, where the third duration is greater than or equal to the first duration; and the fourth duration is equal to the second duration.

[0010] Optionally, both the second duration and the fourth duration are in [5 min, 10 min].

[0011] Optionally, both the first duration and the third duration are less than the second duration or the fourth duration.

[0012] Optionally, both the first duration and the third duration are adjusted based on a weight of the load, and a heavier load indicates both a longer first duration and a longer third duration.

[0013] Optionally, the first ozone concentration is equal to the second ozone concentration.

[0014] Optionally, both the first ozone concentration and the second ozone concentration are in [0.3 ppm, 1.5 ppm].

[0015] Optionally, the drying program is run so that a final moisture content of the load is less than or equal to 1%.

[0016] An embodiment of the present invention further provides an apparatus for a clothes dryer. The clothes dryer includes a drying circuit and an ozone generating unit, and a drying program adapted to dry a load through the drying circuit is set in the clothes dryer. The drying program includes a main drying phase and a cooling phase located after the main drying phase, and the ozone generating unit is adapted to generate ozone in the drying circuit. The apparatus includes: a first processing module, configured to run the drying program; a second processing module, configured to periodically enable and disable the ozone generating unit in the main drying phase, so that the drying circuit has a first ozone concentration; and a third processing module, configured to periodically enable and disable the ozone generating unit in the cooling phase, so that the drying circuit has a second ozone concentration.

[0017] An embodiment of the present invention further provides an electronic device. The electronic device includes: a processor; and a memory, storing a computer program executable on the processor, where the computer program, when executed by the processor, imple-

ments the steps of the method for a clothes dryer according to the embodiments of the present invention.

[0018] An embodiment of the present invention further provides a storage medium. The storage medium stores a computer program. The computer program, when executed, implements the steps of the method for a clothes dryer according to the embodiments of the present invention.

[0019] An embodiment of the present invention further provides a clothes dryer. The clothes dryer includes a drying circuit, and a drying program adapted to dry a load through the drying circuit is set in the clothes dryer. The drying program includes a main drying phase and a cooling phase located after the main drying phase. The clothes dryer further includes an ozone generating unit adapted to generate ozone in the drying circuit and a control unit. The control unit is adapted to perform the steps of the method for a clothes dryer according to the embodiments of the present invention.

[0020] Compared with the related art, the technical solutions of the embodiments of the present invention have the following beneficial effects.

[0021] For example, an ozone generating unit may be controlled, in each of a main drying phase and a cooling phase of a drying program, to generate ozone with a specific concentration in a drying circuit, and the ozone enters a drum of a clothes dryer with a drying airflow, so that a load in the drum has an "odor of the sun" because of carrying the ozone with the specific concentration, thereby improving the odor of the load after being dried through the clothes dryer.

[0022] In another example, a duration for enabling the ozone generating unit may be adjusted based on a weight of the load, so that loads with different weights can all carry the "odor of the sun" after drying ends.

[0023] In another example, a final moisture content of the load after being dried is caused to be less than or equal to 1%, so that the load is helped to have the "odor of the sun".

[0024] In another example, the ozone generating unit may be disabled in a period of time before the drying program ends, so that the ozone concentration in the drum can be attenuated to some extent before the drying program ends. Therefore, residual ozone in the drum can be attenuated to a range safe for human health when the drying program ends.

[0025] Other features of the present invention are shown in the claims, accompanying drawings, and description of the accompanying drawings. The features and feature combinations described in the foregoing description and the features and feature combinations described in the description of the following accompanying drawings and/or simply shown in the accompanying drawings can not only be presented by the described combination manners, but also be presented by other combinations or separately without departing from the scope of the present invention. The embodiments of the present invention that are not described and not specifically shown in the accompanying drawings but can be thought of from the detailed description of the embodiments and that can be obtained from combinations of various features shall be considered to be included and disclosed.

FIG. 1 is a schematic structural diagram of a clothes dryer according to an embodiment of the present invention;

FIG. 2 is a schematic flowchart of a method for a clothes dryer according to an embodiment of the present invention;

FIG. 3 is a schematic flowchart of periodically enabling and disabling an ozone generating unit in a main drying phase according to an embodiment of the present invention;

FIG. 4 is a schematic flowchart of periodically enabling and disabling an ozone generating unit in a cooling phase according to an embodiment of the present invention; and

FIG. 5 is a principle block diagram of an apparatus for a clothes dryer according to an embodiment of the present invention.

[0026] In the related art, loads after being dried through clothes dryers often have a variety of unpleasant odors such as a rubber odor, a plastic odor, and even a musty odor.

[0027] Different from the related art, embodiments of the present invention provide a method and apparatus for a clothes dryer, an electronic device, a storage medium, and a clothes dryer. The clothes dryer includes a drying circuit and an ozone generating unit, and a drying program adapted to dry a load through the drying circuit is set in the clothes dryer. The drying program includes a main drying phase and a cooling phase located after the main drying phase, and the ozone generating unit is adapted to generate ozone in the drying circuit. The method for a clothes dryer includes: running the drying program; periodically enabling and disabling the ozone generating unit in the main drying phase, so that the drying circuit has a first ozone concentration; and periodically enabling and disabling the ozone generating unit in the cooling phase, so that the drying circuit has a second ozone concentration.

[0028] Compared with the related art, the technical solutions provided in the embodiments of the present invention have the following beneficial effects. For example, an ozone generating unit may be controlled, in each of a main drying phase and a cooling phase of a drying program, to generate ozone with a specific concentration in a drying circuit, and the ozone enters a drum of a clothes dryer with a drying airflow, so that a load in the drum has an "odor of the sun" because of carrying the ozone with the specific concentration, thereby improving the odor of the load after being dried through the clothes dryer.

[0029] To make the objectives, features, and beneficial

effects of the present invention more comprehensible, the specific implementations of the present invention are described in detail with reference to the accompanying drawings. It may be understood that specific implementations described below are only used to explain the present invention, but not to limit the present invention. Moreover, descriptions of elements, features, and effects in the related art may be omitted. In addition, for ease of description, the accompanying drawings only show parts relevant to the present invention rather than the entire structure. An embodiment of the present invention provides a clothes dryer.

[0030] In some embodiments, the clothes dryer may include a dryer with a single function.

[0031] In some other embodiments, the clothes dryer may also include a washing and drying integrated machine with a drying function.

[0032] FIG. 1 is a schematic structural diagram of a clothes dryer according to an embodiment of the present invention.

[0033] Referring to FIG. 1, a clothes dryer 100 provided in this embodiment of the present invention includes a case body 111, a tub 112 fixedly mounted in the case body 111, a drum 113 rotatably mounted in the tub 112, and a door body 114 mounted on the tub 112 and adapted to open or close the tub 112 and the drum 113.

[0034] In a specific implementation, the clothes dryer 100 further includes a drying system 120 located between the case body 111 and the tub 112, and a drying program adapted to control the drying system 120 to perform an operation of drying a load 200 is set in the clothes dryer.

[0035] Specifically, the drying system 120 includes a drying pipeline 121, and a fan 122, a heating pipe 123, and a condenser 124 that are located in the drying pipeline 121.

[0036] Both ends of the drying pipeline 121 are separately in communication with the drum 113, so that an inner space of the drying pipeline 121 and an inner space of the drum 113 are in communication with each other and then form a drying circuit 125 together.

[0037] The drying circuit 125 may include a drying section 126, a condensation section 127, a fan section 128, and a heating section 129 that are sequentially connected. The drying section 126 is formed by the inner space of the drum 113, and the condensation section 127, the fan section 128, and the heating section 129 are all formed by the inner space of the drying pipeline 121.

[0038] The fan 122 is located in the fan section 128, and is adapted to drive air in the drying circuit 125 to flow to form a circulating drying airflow. The heating pipe 123 is located in the heating section 129, and is adapted to heat cold air in the heating section 129 to form hot air. The condenser 124 is located in the condensation section 127, and is adapted to cool hot and humid air from the drying section 126 to form cold air.

[0039] In a specific implementation, cold air in the drying circuit 125 flows under the driving of the fan 122, and is heated by the heating pipe 123 when passing through the heating section 129 to form hot air. The hot air enters the drum 113 (namely, the drying section 126) under the driving of the fan 122, and performs heat exchange with the load 200 in the drum 113 to form hot and humid air. The hot and humid air enters the condensation section 127 under the driving of the fan 122, and forms cold air under the action of the condenser 124. The cold air enters the heating section 129 again under the driving of the fan 122 and is heated to form hot air, and the hot air enters the drum 113 again to perform heat exchange with the load 200. The operations are such repeated cyclically that the load 200 is dried.

[0040] Still referring to FIG. 1, the clothes dryer 100 provided in this embodiment of the present invention further includes an ozone generating unit 130 adapted to generate ozone in the drying circuit 125.

[0041] In some embodiments, the ozone generating unit 130 may include a conventional ozone generator.

[0042] In some other embodiments, the ozone generating unit 130 may further include an ultraviolet light source with a center wavelength of about 185 nm. When the ultraviolet light source irradiates dry oxygen gas, some oxygen molecules may be activated and dissociated into oxygen atoms, and the oxygen atoms combine with oxygen molecules to form ozone molecules.

[0043] In a specific implementation, the ozone generating unit 130 may be arranged at an air outlet of the condensation section 127.

[0044] When the ozone generating unit 130 is enabled, ozone generated by the ozone generating unit 130 is adapted to flow in the drying circuit 125 together with the drying airflow driven by the fan 122 in the drying circuit 125. When the ozone reaches the drum 113 with the drying airflow, the ozone may diffuse to the load 200 located in the drum 113, so that the load 200 carries ozone with a specific concentration. Therefore, the load 200 can have a specific odor, that is, an "odor of the sun".

[0045] It is found through research that, the so-called "odor of the sun" means that oxygen gas carried by the load 200 is activated by ultraviolet rays and forms ozone with a specific concentration. Moreover, when there is the "odor of the sun", the concentration of the ozone is in [0.3 ppm, 1.5 ppm].

[0046] In this embodiment of the present invention, the ozone generating unit 130 may generate ozone whose concentration is in the range of [0.3 ppm, 1.5 ppm], so that the load 200 has the "odor of the sun" when the ozone with the concentration diffuses to the load 200 located in the drum 113.

[0047] In a specific implementation, the clothes dryer 100 may further include an ozone sensor for acquiring an ozone concentration in the drum 113.

[0048] In a specific implementation, the drying program of the clothes dryer 100 may include a main drying phase and a cooling phase located after the main drying phase.

[0049] In a specific implementation, the ozone gener-

ating unit 130 may be controlled, in each of the main drying phase and the cooling phase, to generate the ozone with the specific concentration, so that the load 200 in the drum 113 has the "odor of the sun".

[0050] An embodiment of the present invention further provides a method for a clothes dryer 100.

[0051] FIG. 2 is a schematic flowchart of a method for a clothes dryer according to an embodiment of the present invention.

[0052] Referring to FIG. 2, a method 300 for a clothes dryer provided in this embodiment of the present invention may include the following steps.

S310. Run the drying program.

S320. Periodically enable and disable the ozone generating unit 130 in the main drying phase, so that the drying circuit 125 has a first ozone concentration.

S330. Periodically enable and disable the ozone generating unit 130 in the cooling phase, so that the drying circuit 125 has a second ozone concentration.

[0053] In a specific implementation, to cause the load 200 to have the "odor of the sun", both the first ozone concentration and the second ozone concentration may be in a specific concentration range.

[0054] In some embodiments, the specific concentration range may be [0.3 ppm, 1.5 ppm].

[0055] In some embodiments, the first ozone concentration may be equal to the second ozone concentration, and both the first ozone concentration and the second ozone concentration may be in [0.3 ppm, 1.5 ppm].

[0056] In a specific implementation, durations for enabling and disabling the ozone generating unit 130 may be controlled so that both the first ozone concentration and the second ozone concentration are in the specific concentration range.

[0057] To prevent an unpleasant odor from being generated due to an excessively high ozone concentration resulting from an excessively long duration for enabling the ozone generating unit 130, the ozone generating unit 130 may be disabled for a period of time after being enabled for a period of time.

[0058] However, after the ozone generating unit 130 is disabled, the concentration of the ozone attached to the load 200 may decrease due to continuous diffusion of the ozone, and there is not the "odor of the sun" anymore. Therefore, the ozone generating unit 130 may be enabled again after the ozone generating unit 130 is disabled for a period of time.

[0059] Specifically, the ozone generating unit 130 may be periodically enabled and disabled in each of the main drying phase and the cooling phase.

[0060] In a period of periodically enabling and disabling the ozone generating unit 130 in the main drying phase, a duration for enabling the ozone generating unit 130 may be a first duration, and a duration for disabling the ozone generating unit 130 may be a second duration.

[0061] In a period of periodically enabling and disabling the ozone generating unit 130 in the cooling phase, a duration for enabling the ozone generating unit 130 may be a third duration, and a duration for disabling the ozone generating unit 130 may be a fourth duration.

[0062] In a specific implementation, both the first duration and the third duration may be adjusted based on a weight of the load 200, and a heavier load 200 indicates both a longer first duration and a longer third duration. This is because a heavier load 200 indicates more ozone required to cause the load to have the "odor of the sun".

[0063] In a specific implementation, both the first duration and the third duration may also be adjusted based on a volume of the drying circuit 125, and a larger volume of the drying circuit 125 indicates both a longer first duration and a longer third duration. This is because a larger volume of the drying circuit 125 indicates more ozone required to cause the load 200 inside the drying circuit to have the "odor of the sun".

[0064] In a specific implementation, for drying circuits 125 of different volumes and loads 200 of different weights, first durations and third durations for enabling the ozone generating unit 130 may be obtained respectively when the corresponding loads 200 have the "odor of the sun".

[0065] In some embodiments, for a drying circuit 125 whose volume is in [55 L, 75 L], when a weight of a load 200 is in [1 kg, 2 kg], both the first duration and the third duration may be in [10s, 90s]; when a weight of a load 200 is in [2 kg, 4 kg], both the first duration and the third duration may be in [30s, 180s]; and when a weight of a load is in [4 kg, 6 kg], both the first duration and the third duration may be in [60s, 300s].

[0066] In some embodiments, concentrations of ozone generated in the main drying phase and the cooling phase may be the same or close. In this case, the third duration may be greater than the first duration. This is because, compared with the main drying phase, a temperature of the cooling phase is lower, and a generation rate of ozone is lower. Therefore, an enabling time of the ozone generating unit 130 in a period of the cooling phase may be longer, so that the concentration of the ozone generated in the cooling phase is the same as or close to that of the ozone generated in the main drying phase.

[0067] In some other embodiments, the concentrations of the ozone generated in the main drying phase and the cooling phase may be different. In this case, the third duration may be equal to the first duration.

[0068] In some embodiments, both the first duration and the third duration may be less than the second duration or the fourth duration. For example, both the first duration and the third duration may be less than the second duration. In another example, both the first duration and the third duration may alternatively be less than the fourth duration.

[0069] In some other embodiments, both the first duration and the third duration may be less than a smaller one of the second duration and the fourth duration.

[0070] In still some other embodiments, the first dura-

tion may be less than the second duration, and the third duration may be less than the fourth duration.

[0071] It can be seen based on the above content that, in either of a period of the main drying phase and a period of the cooling phase, the duration for enabling the ozone generating unit 130 may be less than the duration for disabling the ozone generating unit 130. This is because an excessively long duration for enabling the ozone generating unit 130 may cause a higher ozone concentration, and consequently an unpleasant odor is generated.

[0072] In some embodiments, the second duration may be equal to the fourth duration.

[0073] In some embodiments, both the second duration and the fourth duration may be in [5 min, 10 min].

[0074] In some embodiments, the step S310 of running the drying program may include running the drying program so that a final moisture content of the load 200 after being dried is less than or equal to 1%. When the final moisture content of the load 200 is less than or equal to 1%, the load is better helped to adsorb ozone. In this way, the load 200 is also better helped to have the "odor of the sun".

[0075] FIG. 3 is a schematic flowchart of periodically enabling and disabling an ozone generating unit in a main drying phase according to an embodiment of the present invention.

[0076] Referring to FIG. 3, the step S320 of periodically enabling and disabling the ozone generating unit 130 in the main drying phase may include the following steps.

S321. Run and enable the ozone generating unit 130 for a first duration.

S322. Determine whether the main drying phase ends, and perform step S323 when the main drying phase does not end.

S323. Determine whether a current remaining main drying time is greater than a second duration; perform step S324 when the current remaining main drying time is greater than the second duration; and return to step S322 when the current remaining main drying time is less than or equal to the second duration.

S324. Return to step S321 after waiting for the second duration, until the main drying phase ends.

[0077] It can be seen based on the above content that, in the main drying phase, the ozone generating unit 130 may be enabled for the first duration and disabled for the second duration periodically.

[0078] After the ozone generating unit 130 is enabled for the first duration, it may be determined whether it is necessary to continue to enable the ozone generating unit 130 for the first duration subsequently based on the remaining main drying time.

[0079] Specifically, when the current remaining main drying time is greater than the second duration, the process may return to step S321 after waiting for the second duration, to continue to run and enable the ozone generating unit 130 for the first duration. When the current remaining main drying time is less than or equal to the second duration, it is not necessary to enable the ozone generating unit 130 again in the main drying phase. In this case, the process may return to step S322 to continue to determine whether the main drying phase ends.

[0080] Still referring to FIG. 3, in some embodiments, the step S320 of periodically enabling and disabling the ozone generating unit 130 in the main drying phase may further include the following steps.

S325. Determine, when the main drying phase ends, whether the ozone generating unit 130 is enabled; and perform step S326 when the ozone generating unit 130 is enabled.

S326. Disable the ozone generating unit 130.

[0081] In this way, the ozone generating unit 130 may be disabled in time after the main drying phase ends, to help perform subsequent operations of the main drying phase smoothly.

[0082] FIG. 4 is a schematic flowchart of periodically enabling and disabling an ozone generating unit in a cooling phase according to an embodiment of the present invention.

[0083] Referring to FIG. 4, the step S330 of periodically enabling and disabling the ozone generating unit 130 in the cooling phase may include the following steps.

S331. Run and enable the ozone generating unit 130 for a third duration.

S332. Determine whether the cooling phase ends, and perform step S333 when the cooling phase does not end.

S333. Determine whether a current remaining cooling time is greater than a fourth duration; perform step S334 when the current remaining cooling time is greater than the fourth duration; and return to step S332 when the current remaining cooling time is less than or equal to the fourth duration.

S334. Return to step S331 after waiting for the fourth duration, until the cooling phase ends.

[0084] It can be seen based on the above content that, in the cooling phase, the ozone generating unit 130 may be enabled for the third duration and disabled for the fourth duration periodically.

[0085] After the ozone generating unit 130 is enabled for the third duration, it may be determined whether it is necessary to continue to enable the ozone generating unit 130 for the third duration subsequently based on the remaining cooling time.

[0086] Specifically, when the current remaining cooling time is greater than the fourth duration, the process may return to step S331 after waiting for the fourth duration, to continue to run and enable the ozone generating unit 130 for the third duration. When the current remaining cooling time is less than or equal to the fourth duration,

it is not necessary to enable the ozone generating unit 130 again in the cooling phase. In this case, the process may return to step S332 to continue to determine whether the cooling phase ends.

[0087] In some embodiments, the cooling phase is a last phase of the drying program. After the cooling phase ends, the drying program ends. If the ozone generating unit 130 is disabled only when the cooling phase ends, excessive residual ozone in the drum 113 may cause harm to human health when a user opens the door body 114 to take the load 200.

[0088] In a specific implementation, the ozone generating unit 130 may be disabled in a period of time before the cooling phase ends, so that the ozone concentration in the drum 113 can be attenuated to some extent before the drying program ends. Therefore, residual ozone in the drum 113 can be attenuated to a range safe for human health when the drying program ends.

[0089] In some embodiments, the step S330 of periodically enabling and disabling the ozone generating unit 130 in the main drying phase may further include disabling the ozone generating unit 130 before the cooling phase ends.

[0090] Still referring to FIG. 4, during specific implementation, the step S330 of periodically enabling and disabling the ozone generating unit 130 in the main drying phase may further include the following steps.

S335. Determine, when the cooling phase does not end, whether an end time of the cooling phase is less than or equal to a time threshold; perform step S336 when the end time of the cooling phase is less than or equal to the time threshold; and continue to determine whether the end time of the cooling phase is less than or equal to the time threshold when the end time of the cooling phase is greater than the time threshold.

S336. Determine whether the ozone generating unit 130 is enabled; perform step S337 when the ozone generating unit 130 is enabled; and end when the ozone generating unit 130 is not enabled.

S337. Disable the ozone generating unit 130.

[0091] In a specific implementation, the ozone concentration in the drum 113 can be attenuated to a range safe for human health in a duration less than or equal to the time threshold, thereby avoiding damage caused by the ozone to human health.

[0092] In some embodiments, the clothes dryer 100 provided in this embodiment of the present invention may further include a control unit.

[0093] The control unit is adapted to perform the steps of the method 300 for a clothes dryer 100 according to the embodiments of the present invention. An embodiment of the present invention further provides an apparatus for a clothes dryer 100.

[0094] FIG. 5 is a principle block diagram of an apparatus for a clothes dryer according to an embodiment of the present invention.

[0095] Referring to FIG. 5, an apparatus 400 for a clothes dryer 100 provided in this embodiment of the present invention may include a first processing module 410, a second processing module 420, and a third processing module 430.

[0096] Specifically, the first processing module 410 is configured to run a drying program. The second processing module 420 is configured to periodically enable and disable the ozone generating unit 130 in the main drying phase, so that a drying circuit 125 has a first ozone concentration. The third processing module 430 is configured to periodically enable and disable the ozone generating unit 130 in the cooling phase, so that the drying circuit 125 has a second ozone concentration.

[0097] In a specific implementation, the first processing module 410, the second processing module 420, and the third processing module 430 may be implemented based on the method 300 for a clothes dryer 100 provided in the embodiments of the present invention. For description of more technical details of the first processing module 410, the second processing module 420, and the third processing module 430, reference may be made to the description of the method for a clothes dryer 100 in the embodiments of the present invention, and details are not repeated herein.

[0098] An embodiment of the present invention further provides an electronic device.

[0099] Specifically, the electronic device may include a processor and a memory. The memory stores a computer program executable on the processor. The computer program, when executed by the processor, implements the steps of the method 300 for a clothes dryer 100 according to the embodiments of the present invention.

[0100] An embodiment of the present invention further provides a storage medium.

[0101] Specifically, the storage medium stores a computer program. The computer program, when executed, implements the steps of the method 300 for a clothes dryer 100 according to the embodiments of the present invention.

[0102] In some embodiments, the storage medium may include a computer-readable storage medium. For example, the storage medium may include a ROM, a RAM, a magnetic disk, an optical disc, or the like.

[0103] Although specific implementations are described above, the implementations are not intended to limit the scope disclosed in the present invention, even if only a single implementation is described relative to a specific feature. The feature examples provided in the present invention are intended to be illustrative rather than limiting, unless different expressions are made. In a specific implementation, according to an actual requirement, in a technically feasible case, the technical features of one or more dependent claims may be combined with the technical features of the independent claims, and the technical features from the corresponding independent

claims may be combined in any appropriate way instead of using just specific combinations listed in the claims.

[0104] Although the present invention is disclosed above, the present invention is not limited thereto. Any person skilled in the art can make various changes and modifications without departing from the spirit and the scope of the present invention. Therefore, the protection scope of the present invention should be subject to the scope defined by the claims.

Claims

1. A method (300) for a clothes dryer (100), wherein the clothes dryer (100) comprises a drying circuit (125), a drying program adapted to dry a load (200) through the drying circuit (125) is set in the clothes dryer, and the drying program comprises a main drying phase and a cooling phase located after the main drying phase, **characterized in that** the clothes dryer (100) comprises an ozone generating unit (130) adapted to generate ozone in the drying circuit (125); and the method (300) comprises:

   running the drying program;
   periodically enabling and disabling the ozone generating unit (130) in the main drying phase, so that the drying circuit (125) has a first ozone concentration; and
   periodically enabling and disabling the ozone generating unit (130) in the cooling phase, so that the drying circuit (125) has a second ozone concentration.

2. The method (300) according to claim 1, **characterized in that** the periodically enabling and disabling the ozone generating unit (130) in the main drying phase comprises:

   running and enabling the ozone generating unit (130) for a first duration;
   determining whether the main drying phase ends;
   determining, when the main drying phase does not end, whether a current remaining main drying time is greater than a second duration;
   returning, when the current remaining main drying time is greater than the second duration, to the step of running and enabling the ozone generating unit (130) for a first duration after waiting for the second duration, until the main drying phase ends; and
   returning, when the current remaining main drying time is less than or equal to the second duration, to the step of determining whether the main drying phase ends.

3. The method (300) according to claim 2, **characterized by** comprising:

   determining, when the main drying phase ends, whether the ozone generating unit (130) is enabled; and
   disabling the ozone generating unit (130) when the ozone generating unit (130) is enabled.

4. The method (300) according to claim 1, **characterized in that** the periodically enabling and disabling the ozone generating unit (130) in the cooling phase comprises:

   running and enabling the ozone generating unit (130) for a third duration;
   determining whether the cooling phase ends;
   determining, when the cooling phase does not end, whether a current remaining cooling time is greater than a fourth duration;
   returning, when the current remaining cooling time is greater than the fourth duration, to the step of running and enabling the ozone generating unit (130) for a third duration after waiting for the fourth duration, until the cooling phase ends; and
   returning, when the current remaining cooling time is less than or equal to the fourth duration, to the step of determining whether the cooling phase ends.

5. The method (300) according to claim 4, **characterized by** comprising:
   disabling the ozone generating unit (130) before the cooling phase ends.

6. The method (300) according to any one of claims 1 to 5, **characterized in that** in a period of periodically enabling and disabling the ozone generating unit (130) in the main drying phase, a duration for enabling the ozone generating unit (130) is the first duration, and a duration for disabling the ozone generating unit (130) is the second duration; and in a period of periodically enabling and disabling the ozone generating unit (130) in the cooling phase, a duration for enabling the ozone generating unit (130) is the third duration, and a duration for disabling the ozone generating unit (130) is the fourth duration, wherein the third duration is greater than or equal to the first duration; and the fourth duration is equal to the second duration.

7. The method (300) according to claim 6, **characterized in that** both the second duration and the fourth duration are in [5 min, 10 min].

8. The method (300) according to claim 6, **characterized in that** both the first duration and the third duration are less than the second duration or the fourth

duration.

9. The method (300) according to claim 6, **characterized in that** both the first duration and the third duration are adjusted based on a weight of the load (200), and a heavier load (200) indicates both a longer first duration and a longer third duration.

10. The method (300) according to any one of claims 1 to 9, **characterized in that** the first ozone concentration is equal to the second ozone concentration.

11. The method (300) according to any one of claims 1 to 10, **characterized in that** both the first ozone concentration and the second ozone concentration are in [0.3 ppm, 1.5 ppm].

12. The method (300) according to any one of claims 1 to 11, **characterized in that** the drying program is run so that a final moisture content of the load (200) is less than or equal to 1%.

13. An apparatus (400) for a clothes dryer (100), wherein the clothes dryer (100) comprises a drying circuit (125), a drying program adapted to dry a load (200) through the drying circuit (125) is set in the clothes dryer, and the drying program comprises a main drying phase and a cooling phase located after the main drying phase, **characterized in that** the clothes dryer (100) comprises an ozone generating unit (130) adapted to generate ozone in the drying circuit (125); and the apparatus (400) comprises:

a first processing module (410), configured to run the drying program;
a second processing module (420), configured to periodically enable and disable the ozone generating unit (130) in the main drying phase, so that the drying circuit (125) has a first ozone concentration; and
a third processing module (430), configured to periodically enable and disable the ozone generating unit (130) in the cooling phase, so that the drying circuit (125) has a second ozone concentration.

14. An electronic device, **characterized by** comprising:

a processor; and
a memory, storing a computer program executable on the processor, wherein
the computer program, when executed by the processor, implements the steps of the method (300) according to any one of claims 1 to 12.

15. A storage medium, storing a computer program, **characterized in that** the computer program, when executed, implements the steps of the method (300) according to any one of claims 1 to 12.

16. A clothes dryer (100), wherein the clothes dryer (100) comprises a drying circuit (125), a drying program adapted to dry a load (200) through the drying circuit (125) is set in the clothes dryer, and the drying program comprises a main drying phase and a cooling phase located after the main drying phase, **characterized in that** the clothes dryer (100) comprises an ozone generating unit (130) adapted to generate ozone in the drying circuit (125) and a control unit, and the control unit is adapted to perform the steps of the method (300) according to any one of claims 1 to 12.

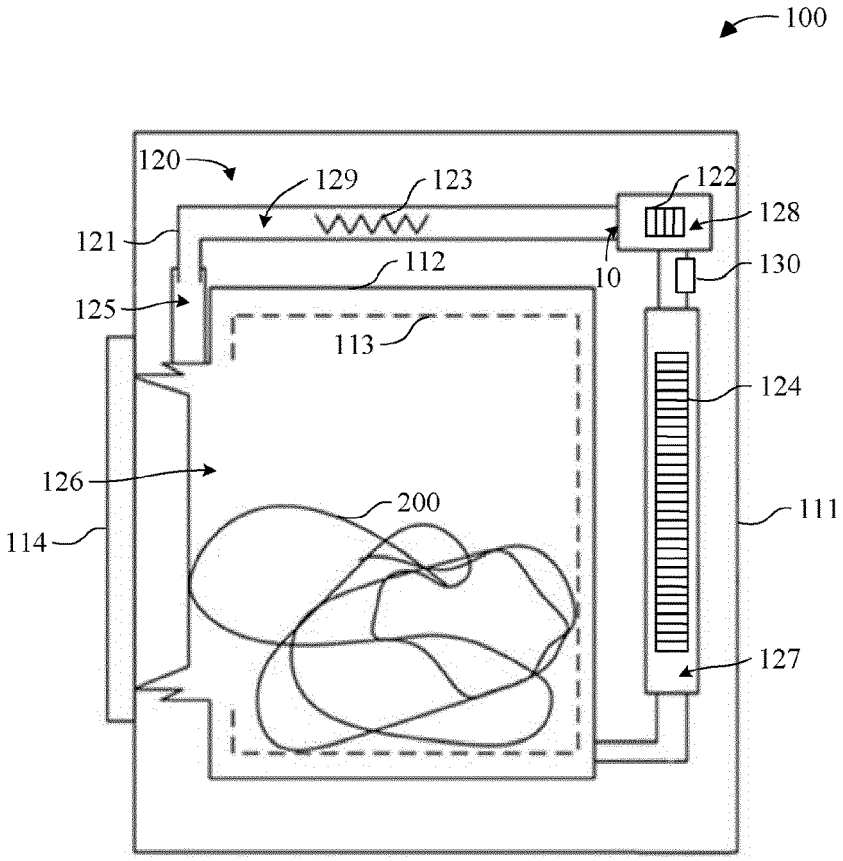
100
120
129
123
122
128
121
112
10
130
125
113
124
126
200
111
114
127

FIG. 1

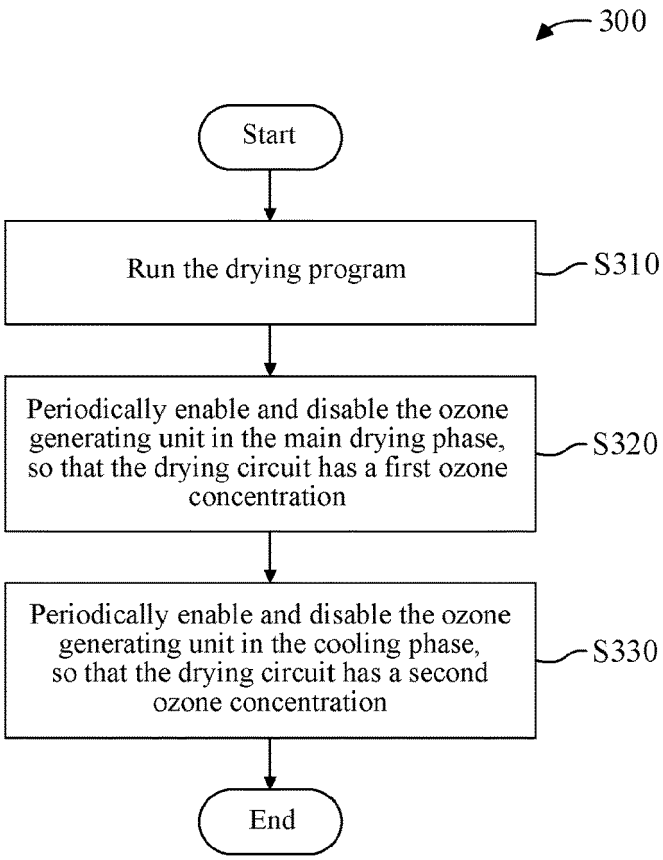
300
Start
Run the drying program
S310
Periodically enable and disable the ozone generating unit in the main drying phase, so that the drying circuit has a first ozone concentration
S320
Periodically enable and disable the ozone generating unit in the cooling phase, so that the drying circuit has a second ozone concentration
S330
End

FIG. 2

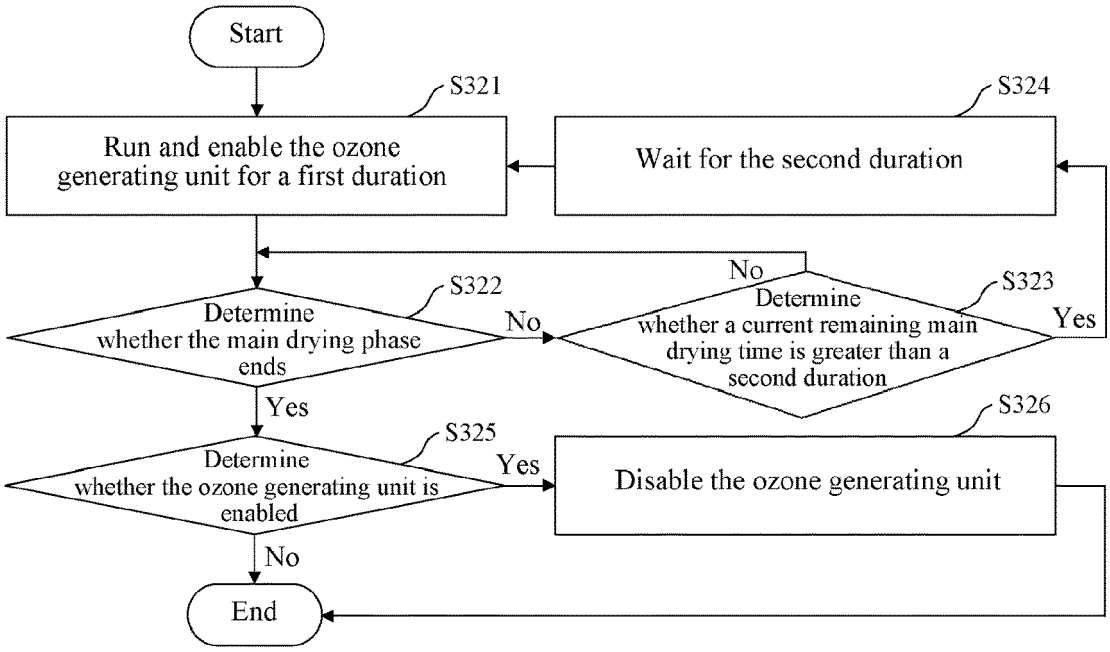
Start
S321
Run and enable the ozone generating unit for a first duration
S324
Wait for the second duration
S322
Determine whether the main drying phase ends
No
Yes
S323
Determine whether a current remaining main drying time is greater than a second duration
No
Yes
S325
Determine whether the ozone generating unit is enabled
Yes
No
S326
Disable the ozone generating unit
End

FIG. 3

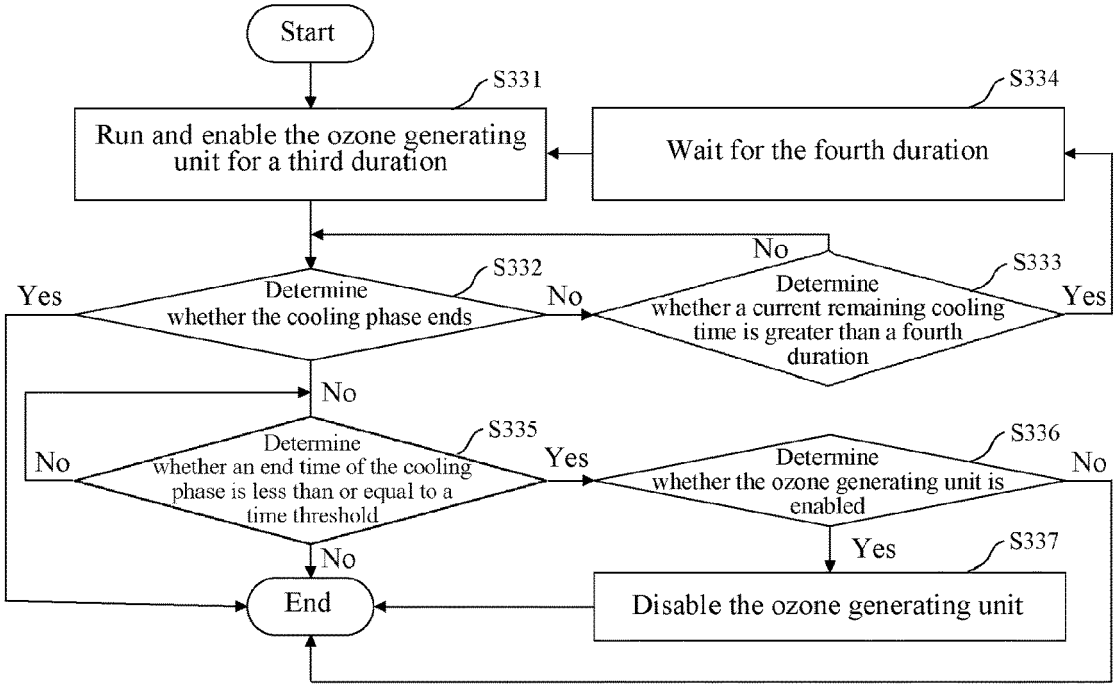
Start
S331
Run and enable the ozone generating unit for a third duration
S334
Wait for the fourth duration
S332
Determine whether the cooling phase ends
Yes
No
No
S333
Determine whether a current remaining cooling time is greater than a fourth duration
Yes
No
S335
Determine whether an end time of the cooling phase is less than or equal to a time threshold
No
Yes
S336
Determine whether the ozone generating unit is enabled
No
Yes
S337
Disable the ozone generating unit
End

FIG. 4

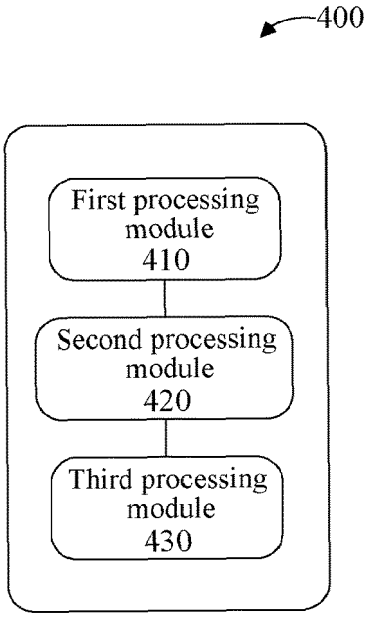
400
First processing module 410
Second processing module 420
Third processing module 430

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 22 18 4756

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			D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	21 December 2022	Stroppa, Giovanni

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