United States Patent Application Publication	20250263883
Kind Code	A1
Publication Date	August 21, 2025
Inventor(s)	KANG; Heejin et al.

WASHING MACHINE WITH DRYING FUNCTION

Abstract

A washing machine with drying function may include a cabinet with a laundry insertion hole; a tub having a front opening and a back opening; a drum inside the tub, the laundry insertion hole, front opening, and drum being positioned so that laundry is insertable through the laundry insertion hole; a heated air supplying device with a heat exchange part above the tub, a front and back duct, and a blower fan to form an airflow, via the back and front duct, from the back opening to the heat exchange part, and then to the front opening; a lint filter in the back duct; a sensor to detect lint in the lint filter and produce a corresponding signal; a washing device to spray washing water toward the lint filter; and a processor to control the washing device to spray the washing water based on the signal produced by the sensor.

Inventors: **KANG; Heejin (Suwon-si, KR), KO; Bongjin (Suwon-si, KR), KIM; Younghyun (Suwon-si, KR), LEE; Seulgi (Suwon-si, KR), LEE; Jiyu (Suwon-si, KR), LEE; Hyounyoung (Suwon-si, KR), LIM; Seungil (Suwon-si, KR)**

Applicant: **SAMSUNG ELECTRONICS CO., LTD.** (Suwon-si, KR)

Family ID: **1000008578305**

Assignee: **SAMSUNG ELECTRONICS CO., LTD. (Suwon-si, KR)**

Appl. No.: **19/200028**

Filed: **May 06, 2025**

Foreign Application Priority Data

KR	10-2022-0027667	Mar. 03, 2022

Related U.S. Application Data

parent US continuation 18121329 20230314 parent-grant-document US 12312735 child US 19200028

parent WO continuation PCT/KR2023/001446 20230201 PENDING child US 18121329

Publication Classification

Int. Cl.: **D06F58/22** (20060101); **B01D46/00** (20220101); **B01D46/16** (20060101); **B01D46/44** (20060101); **B01D46/46** (20060101); **B01D46/69** (20220101); **D06F25/00** (20060101); **D06F34/20** (20200101); **D06F39/00** (20240101); **D06F39/08** (20060101); **D06F58/02** (20060101); **D06F58/20** (20060101); **D06F103/42** (20200101); **D06F105/02** (20200101); **D06F105/34** (20200101)

U.S. Cl.:

CPC **D06F58/22** (20130101); **B01D46/0086** (20130101); **B01D46/16** (20130101); **B01D46/442** (20130101); **B01D46/46** (20130101); **B01D46/69** (20220101); **D06F25/00** (20130101); **D06F34/20** (20200201); **D06F39/00** (20130101); **D06F39/088** (20130101); **D06F58/02** (20130101); **D06F58/206** (20130101); D06F2103/42 (20200201); D06F2105/02 (20200201); D06F2105/34 (20200201)

Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS [0001] This application a continuation application of U.S. application Ser. No. 18/121,329, filed on Mar. 14, 2023, which is a continuation application of PCT International Patent Application No. PCT/KR2023/001446, filed on Feb. 1, 2023 which is based on and claims priority under 35 U.S.C. § 119 to Korean Patent Application No. 10-2022-0027667, filed on Mar. 3, 2022 in the Korean Intellectual Property Office, the disclosure of each of which is incorporated by reference herein in its entirety.

BACKGROUND

1. Field

[0002] The disclosure relates to a washing machine with drying function, and more particularly to a washing machine with drying function which can effectively wash a lint filter.

2. Description of the Related Art

[0003] In general, washing machines which wash laundry and dryers which dry laundry are formed as separate devices. Accordingly, consumers dry laundry which has completed washing by using a dryer after washing the laundry using a washing machine.

[0004] However, in cases where the washing machine and the dryer are formed as separate devices as described above, there is an inconvenience of a user having to wait until the laundry is completed and then move the laundry which has completed washing to the dryer. To solve the inconvenience described above, a washing machine with drying function has been developed and is being used.

[0005] When drying the laundry, lint (fine fluff) generated from the laundry is included in air and discharged. A lint filter is disposed in a flow path and lint is prevented from blocking the flow path, but there is a problem of having to effectively wash the lint filter accumulated with lint.

SUMMARY

[0006] Aspects of embodiments of the disclosure will be set forth in part in the description which follows and, in part, will be apparent from the description, or may be learned by practice of the presented embodiments.

[0007] According to an embodiment of the disclosure, a washing machine with drying function may include a cabinet having a laundry insertion hole at a front surface of the cabinet; a tub inside

the cabinet and having a front opening and a back opening; a drum rotatably disposed inside the tub, wherein the laundry insertion hole, the front opening, and the drum are positioned so that laundry is insertable through the laundry insertion hole and then through the front opening to be received in the drum; a heated air supplying device including a heat exchange part above the tub, a front duct, a back duct, and a blower fan to form an airflow that flows, via the back duct and the front duct, from the back opening to the heat exchange part, and then to the front opening; a lint filter inside the back duct, and configured to filter lint in the airflow flowing through the back duct; a sensor fixed to the lint filter and configured to detect lint in the lint filter, and to produce a corresponding signal; a washing device configured to selectively spray washing water toward the lint filter; and a processor configured to control the washing device to spray the washing water toward the lint filter based on the signal produced by the sensor.

[0008] According to an embodiment of the disclosure, the sensor is disposed at a lower surface of the lint filter.

[0009] According to an embodiment of the disclosure, the sensor includes a first terminal, and a second terminal, wherein the first terminal and the second terminal are spaced apart from each other, and the first terminal and the second terminal are electrically connectable by lint collected in the lint filter.

[0010] According to an embodiment of the disclosure, the first terminal and the second terminal are disposed side by side along a longitudinal direction of the lint filter.

[0011] According to an embodiment of the disclosure, the processor is configured to control the washing device to spray the washing water toward the lint filter based on the signal produced by the sensor being in response to the first terminal and the second terminal being electrically connected by the lint that is collected in the lint filter.

[0012] According to an embodiment of the disclosure, the processor is configured to control the washing device to spray the water toward the lint filter based on the signal produced by the sensor being in response to a current flowing from the first terminal to the second terminal being greater than a preset value.

[0013] According to an embodiment of the disclosure, the washing machine with drying function further includes a water supply pipe connected with an external water supply source, wherein the washing device includes a washing pipe including a first end that is connected to the water supply pipe, and a plurality of nozzle holes formed at a lower surface of the washing pipe.

[0014] According to an embodiment of the disclosure, the washing pipe includes

[0015] a second end that is closed.

[0016] According to an embodiment of the disclosure, the washing pipe includes a second end, and is disposed to be inclined downward from the first end toward the second end.

[0017] According to an embodiment of the disclosure, the washing device includes a washing valve configured to selectively open and close the first end of the washing pipe.

[0018] According to an embodiment of the disclosure, the processor is configured to control the washing device to spray the washing water toward the lint filter by controlling the washing valve to be opened.

[0019] According to an embodiment of the disclosure, the lint filter includes a mesh net to filter the lint in the airflow flowing through the back duct, and a frame which surrounds and supports the mesh net.

[0020] According to an embodiment of the disclosure, the frame includes an inner circumferential surface that supports the mesh net, and an outer circumferential surface which is fitted to an inner surface of the back duct.

[0021] According to an embodiment of the disclosure, the back duct includes a rigid area including an upper end connected to the heat exchange part, and a lower end, and a flexible area connected to the lower end of the rigid area, and configured with a bellows shape, wherein the lint filter is disposed in the flexible area.

[0022] According to an embodiment of the disclosure, the washing machine further includes a water supply pipe connected with an external water supply source, wherein the washing device includes a washing pipe including an end that is connected to the water supply pipe, and a plurality of nozzle holes formed at a lower surface of the washing pipe, wherein the washing pipe is configured to extend through the rigid area.
[0023] According to an embodiment of the disclosure, the washing device is disposed above the lint filter.
[0024] Additional embodiments of the disclosure will be set forth in part in the description which follows and, in part, will be obvious from the description, or will be apparent from the disclosure.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
[0025] These and/or other embodiments of the disclosure will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings of which:
[0026] FIG. **1** is a cross-sectional view of a washing machine with drying function according to an embodiment of the disclosure;
[0027] FIG. **2** is a perspective view illustrating a heated air supplying device according to an embodiment of the disclosure;
[0028] FIG. **3** is a back view illustrating a heated air supplying device according to an embodiment of the disclosure;
[0029] FIG. **4** is a top plan view illustrating a heated air supplying device according to an embodiment of the disclosure;
[0030] FIG. **5** is a front view illustrating a heated air supplying device according to an embodiment of the disclosure;
[0031] FIG. **6** is a functional block diagram illustrating a washing machine with drying function according to an embodiment of the disclosure;
[0032] FIG. **7** is a perspective view illustrating a back duct according to an embodiment of the disclosure;
[0033] FIG. **8** is an exploded perspective view illustrating a back duct according to an embodiment of the disclosure;
[0034] FIG. **9** is a cross-sectional view illustrating a back duct according to an embodiment of the disclosure; and
[0035] FIG. **10** is a perspective view illustrating a washing device according to an embodiment of the disclosure.
DETAILED DESCRIPTION
[0036] Descriptions below, which takes into reference the accompanying drawings, is provided to assist in a comprehensive understanding of various embodiments of the disclosure as defined by the claims and its equivalent. Although various specific details are included to assist in the understanding herein, the above are to be understood as merely example embodiments. Accordingly, it will be understood by those of ordinary skill in the art that various modifications may be made to various embodiments described herein without departing from the scope and spirit of the disclosure. In addition, descriptions on well-known functions and configurations will be omitted for clarity and conciseness.
[0037] Terms and words used in the description below and in the claims are not limited to its bibliographical meaning, and are used merely to assist in a clear and coherent understanding of the disclosure. Accordingly, the description below on the various embodiments of the disclosure are provided simply as examples and it will be clear to those of ordinary skill in the art that the

example embodiments as defined by the appended claims and its equivalent are not for limiting the disclosure.

[0038] Terms such as first and second may be used in describing various elements, but the elements are not limited by the above-described terms. The above-described terms may be used only for the purpose of distinguishing one element from another element. For example, a first element may be designated as a second element, and likewise, a second element may be designated as a first element without exceeding the scope of protection.

[0039] The terms used in the embodiments of the disclosure may be interpreted to have meanings generally understood to one of ordinary skill in the art unless otherwise defined.

[0040] In addition, terms such as 'front end,' 'back end,' 'upper part,' 'lower part,' 'upper end,' 'lower end,' and the like used in the disclosure may be defined based on the drawings, and forms and locations of each element are not limited by these terms.

[0041] An embodiment addresses at least the above-mentioned problems and/or disadvantages, and provides a washing machine with drying function which can effectively wash a lint filter.

[0042] A washing machine with drying function **1** according to an embodiment will be described in detail below with reference to the accompanied drawings.

[0043] FIG. **1** is a cross-sectional view of a washing machine with drying function according to an embodiment.

[0044] Referring to FIG. **1**, the washing machine with drying function **1** according to an embodiment may include a cabinet **10**, a tub **20**, a drum **30**, and a heated air supplying device **40**.

[0045] The cabinet **10** may form an exterior of the washing machine with drying function **1**, and may be formed roughly in a rectangular parallelepiped shape. The cabinet **10** may include a front surface cover **11**, a back surface cover **12**, a left-side cover, a right-side cover, an upper cover **15**, and a lower cover **16**.

[0046] At a front surface of the cabinet **10**, a laundry insertion hole **18** may be provided to load and unload laundry to an inside of the cabinet **10**. That is, the laundry insertion hole **18** may be formed at the front surface cover **11** of the cabinet **10**.

[0047] At the laundry insertion hole **18**, a door **17** may be installed so as to be openable and closeable. At an upper part of the front surface cover **11** of the cabinet **10**, a control panel **19** which can control the washing machine **1** may be provided.

[0048] The control panel **19** may include a plurality of buttons for receiving a user input, and may be formed to output an electrical signal corresponding to the received user input to a processor **400** (referring to FIG. **6**).

[0049] The tub **20** may be installed at the inside of the cabinet **10**, and formed in a hollow cylindrical shape on which a front opening **21***a* is provided toward the laundry insertion hole **18** of the front surface cover **11**. The front opening **21***a* of the tub **20** may be formed to have a size corresponding to the laundry insertion hole **18**. At a back end of the tub **20**, a back surface plate **22** may be provided. At the back surface plate **22**, a back opening **22***a* (shown in FIG. **3**) through which air inside the tub **20** is discharged may be provided.

[0050] The tub **20** may contain water of a predetermined amount, that is washing water, necessary for washing. The tub **20** may be supported and fixed at an inner surface of the cabinet **10** by a tension spring, an oil damper, and the like.

[0051] Between the tub **20** and the front surface cover **11** of the cabinet **10**, a diaphragm **25** may be installed. The diaphragm **25** may be formed roughly in an annular shape. One end of the diaphragm **25** may be fixed to a front surface **21** of the tub **20** at which the front opening **21***a* is provided, and other end of the diaphragm **25** may be fixed to an inner circumference of the laundry insertion hole **18** of the front surface cover **11** of the cabinet **10**.

[0052] The diaphragm **25** may be configured such that the washing water contained in the tub **20** is not leaked to an outside of the tub **20**, and may form a pathway through which the laundry passes. In addition, the diaphragm **25** may block vibration which is generated when the drum **30** is rotated

from being transferred to the front surface cover **11** of the cabinet **10** through the tub **20**.
[0053] The drum **30** may be installed at an inside of the tub **20** to be rotatable, and may be formed roughly in a hollow cylindrical shape. At a front surface of the drum **30**, a drum opening **31***a* corresponding to the laundry insertion hole **18** of the cabinet **10** and the front opening **21***a* of the tub may be provided, and at a back end of the drum **30**, a back surface plate **32** may be provided.
[0054] At a side surface **33** of the drum **30**, a plurality of through-holes **33***a* through which the washing water can pass may be provided. The back surface plate **32** of the drum **30** may be provided with a plurality of through-holes. Accordingly, air inside the drum may be discharged to a space between the drum **30** and the tub **20** through the plurality of through-holes **33***a* formed at the side surface **33** of the drum **30** and the plurality of through-holes formed at the back surface plate **32**.
[0055] In addition, at an inner circumferential surface of the drum **30**, a plurality of lifts **34** which can raise the laundry may be provided. The drum **30** may rotate about a central axis by a driving device which includes a driving motor **35** installed at the back surface plate **32**.
[0056] A water supplying device for supplying water to the tub **20** may be provided above the tub **20**, and a water draining device for draining water from the tub **20** to the outside may be disposed below the tub **20**.
[0057] The water supplying device may include a water supply pipe **27** connected with an external water supply source and a water supply valve **92** configured to open and close the water supply pipe **27**. One end of the water supply pipe **27** may be connected to the diaphragm **25**. The water supply pipe **27** may be provided with a detergent intake part. The water supply pipe **27** may be branched to connect to a washing device **300** which will be described below.
[0058] The water draining device may be formed to discharge the washing water contained in the tub **20** to the outside of the washing machine with drying function **1**. The water draining device may be installed below the tub **20**, and may include a water drain pump and a water drain pipe. When the water drain pump is operated, the washing water contained in the tub **20** may be discharged to the outside of the washing machine **1** through the water drain pipe.
[0059] At an upper side of the tub **20**, the heated air supplying device **40** may be installed to dry the laundry which was washed by a rotation of the drum **30**. The heated air supplying device **40** may be formed to generate heated air by heating and drying air discharged from the tub **20** and to circulate the heated air through the inside of the tub **20** so as to dry the laundry contained inside of the drum **30**. In the description below, heated air may refer to air heated and dried by the heated air supplying device **40**.
[0060] FIG. **2** is a perspective view illustrating a heated air supplying device according to an embodiment. FIG. **3** is a back view illustrating a heated air supplying device according to an embodiment. FIG. **4** is a top plan view illustrating a heated air supplying device according to an embodiment. FIG. **5** is a front view illustrating a heated air supplying device according to an embodiment.
[0061] Referring to FIG. **2** to FIG. **5**, the heated air supplying device **40** according to an embodiment may include an upper duct **50** provided at the upper side of the tub **20**, a front duct **54** provided at the front surface of the tub **20**, a back duct **55** provided at a back surface of the tub **20**, a blower fan **41** which circulates air, and a heat exchange part which removes moisture included in the air and heats the air.
[0062] The back duct **55** may be provided at the back surface, that is the back surface plate **22**, of the tub **20**, and formed to guide air being discharged from the tub **20** toward the upper side of the tub **20**. At the back surface plate **22** of the tub **20**, the back opening **22***a* through which air is discharged may be provided. An inlet of the back duct **55** may be connected with the back opening **22***a* of the tub **20**. That is, the back duct **55** may be configured to communicate the back opening **22***a* with the heat exchange part of the tub **20**.
[0063] An outlet of the back duct **55** may be connected with an inlet **51***a* of an inlet duct **51**. The

outlet of the back duct **55** may be formed to a size and shape corresponding to the inlet **51***a* of the inlet duct **51**. Accordingly, air which is discharged from the back opening **22***a* of the tub **20** may be introduced to the inlet duct **51** through the back duct **55**.

[0064] The back duct **55** may be installed to lean toward one side to the back surface plate **22** of the tub **20**. Accordingly, the outlet of the back duct **55** may be provided to lean toward one side from the back surface of the tub **20**.

[0065] At an inside of the back duct **55**, a lint filter **100**, a sensor **200**, and a washing device **300** may be disposed. Detailed structures of the lint filter **100**, the sensor **200**, and the washing device **300** will be described below.

[0066] The upper duct **50** may be formed to connect the back duct **55** and the blower fan **41** which is installed at the front side of the tub **20**. The upper duct **50** may be formed roughly in an L-shape. At a back surface of the upper duct **50**, an inlet port through which air that is discharged from the tub **20** is introduced may be provided, and at a front surface of the upper duct **50**, an outlet port through which air is discharged may be provided. Here, the front surface and the back surface of the upper duct **50** may respectively mean surfaces corresponding to the front surface cover **11** and the back surface cover **12** of the cabinet **10**.

[0067] The upper duct **50** may be formed such that a flow of air, that is the airflow, which is introduced from the back side is bent in a right-angle direction, moved in a straight line for a certain distance, and then bent again in the right-angle direction to be discharged to the outside toward the front side of the cabinet **10**. That is, the upper duct **50** may form an upper flow path which guides the airflow such that the airflow introduced from the back side is bent in a right-angle direction, moved in a straight line for a certain distance, and then bent again in the right-angle direction to be discharged to the outside toward the front side of the cabinet **10**.

[0068] The upper duct **50** may be installed adjacent to the front surface **21** of the tub **20**. Accordingly, a space **44** in which a compressor **71** of the heat exchange part is disposed may be provided between the back surface of the tub **20** and the upper duct **50** above the tub **20**. Here, the front surface **21** of the tub **20** may refer to a surface at which the front opening **21***a* is formed. One side of the tub **20** may refer to a left side or a right side based on the front surface **21** of the tub **20**, and the other side of the tub **20** may refer to the opposite side of the one side of the tub **20** based on the front surface **21** of the tub **20**.

[0069] The inlet **51***a* of the upper duct **50** may be provided to be adjacent to the one side and the back surface of the tub **20**. The inlet **51***a* of the upper duct **50** may be in communication with the outlet port of the back duct **55**. Accordingly, the air that is discharged from the tub **20** may be introduced into the upper duct **50** in a direction from the back side of the tub **20** toward the front side of the tub **20**.

[0070] An outlet **53***b* of the upper duct **50** may be provided to be adjacent to the other side and the front surface **21** of the tub **20**. Accordingly, the air that is discharged from the upper duct **50** may be discharged toward the front side of the tub **20**.

[0071] The inlet **51***a* and the outlet **53***b* of the upper duct **50** may be provided in a diagonal direction above the tub **20**. In other words, the inlet **51***a* of the upper duct **50** may be provided at one side edge of the tub **20**, and the outlet **53***b* of the upper duct **50** may be provided at other side edge of the tub **20** which is positioned at an opposite side in the diagonal direction.

[0072] At the outlet **53***b* of the upper duct **50**, the blower fan **41** may be installed. The blower fan **41** may be contained inside a front duct **54** which connects the upper duct **50** and the tub **20**. The blower fan **41** may form an airflow which flows from the back duct **55**, passing the heat exchange part, toward the front duct **54**.

[0073] An inlet **54***a* of the front duct **54** may be formed so as to suction air that is being discharged from the outlet **53***b* of the upper duct **50** toward the front side, and an outlet **54***b* of the front duct **54** may be provided to discharge the airflow toward the diaphragm **25**.

[0074] The upper duct may include an inlet duct **51**, a heat exchange duct **52**, and a supply duct **53**.

[0075] The inlet duct **51** may be provided to be adjacent to the one side of the tub **20** above the tub **20**, and formed for the airflow which is discharged from the back opening **22***a* of the back surface plate **22** of the tub **20** to be introduced. The inlet duct **51** may be formed so that the introduced airflow flows in a straight line.
[0076] The inlet **51***a* of the inlet duct **51** may be connected with an outlet of the back duct **55**. The inlet **51***a* of the inlet duct **51** may form the inlet **51***a* of the upper duct **50**.
[0077] The inlet **51***a* of the inlet duct **51** may be provided at the back end of the inlet duct **51**, and an outlet **51***b* of the inlet duct **51** may be provided at one side surface of the inlet duct **51**, that is, the side surface that contacts the heat exchange duct **52**. Accordingly, the outlet **51***b* of the inlet duct **51** may form a right-angle with the inlet **51***a* of the inlet duct **51**.
[0078] The outlet **51***b* of the inlet duct **51** may be formed to be greater than the inlet **51***a*. For example, the outlet **51***b* of the inlet duct **51** may be formed to be greater by two times or more than the inlet **51***a* of the inlet duct **51**.
[0079] The inlet duct **51** may have a rectangular cross-section, and the back end thereof may be connected to the back duct **55**. That is, the inlet **51***a* may be provided at the back surface of the inlet duct **51**. The inlet duct **51** may be installed to be adjacent to the one side of the tub **20** above the tub **20**. A front surface of the inlet duct **51** may be adjacent to the front surface **21** of the tub **20**, and the back surface thereof may be installed to be adjacent to the back surface plate **22** of the tub **20**.
[0080] The outlet **51***b* may be provided at the one side surface of the inlet duct **51**. The outlet **51***b* of the inlet duct **51** may be formed to have a shape and size that corresponds to an inlet **52***a* of the heat exchange duct **52**.
[0081] The outlet **51***b* of the inlet duct **51** and the inlet **52***a* of the heat exchange duct **52** may be formed in a rectangular shape. The outlet **51***b* of the inlet duct **51** may be formed to be the same as or greater than the size of the inlet **52***a* of the heat exchange duct **52**. A width of the outlet **51***b* of the inlet duct **51** may be smaller than a length of the inlet duct **51**.
[0082] The airflow introduced into the inlet **51***a* of the inlet duct **51** may be introduced into the inlet **52***a* of the heat exchange duct **52** after passing the outlet **51***b*.
[0083] The heat exchange duct **52** may be provided at a right-angle with respect to the inlet duct **51** above the tub **20**, and connected at one side of the inlet duct **51**. The heat exchange duct **52** may be formed so that the introduced airflow flows in a straight line.
[0084] A width of the heat exchange duct **52** may be maximized as much as possible to maximize a heat transfer area. However, the width of the heat exchange duct **52** may be smaller than the length of the inlet duct **51**. For example, the width of the heat exchange duct **52** may be formed to be greater than or equal to half of a length of the tub **20**. Accordingly, a part of the inlet duct **51** may protrude from a back surface of the heat exchange duct **52** toward the back surface cover **12** of the cabinet **10**.
[0085] The inlet **52***a* of the heat exchange duct **52** may be provided at one end of the heat exchange duct **52**, and an outlet **52***b* of the heat exchange duct **52** may be provided at the other end of the heat exchange duct **52**. That is, the inlet **52***a* and the outlet **52***b* of the heat exchange duct **52** may be provided to face each other in a straight line. The inlet **52***a* and the outlet **52***b* of the heat exchange duct **52** may be formed to be the same as the cross-section of the heat exchange duct **52**.
[0086] The inlet **52***a* of the heat exchange duct **52** may be connected with the outlet **51***b* of the inlet duct **51**. The outlet **51***b* of the inlet duct **51** may be formed to have a shape and size that corresponds to the inlet **52***a* of the heat exchange duct **52**.
[0087] The heat exchange duct **52** may have a rectangular cross-section, and both side ends thereof may be opened. The heat exchange duct **52** may be formed to have a widest possible cross-section area so as to fully maximize the heat transfer area.
[0088] The heat exchange duct **52** may be connected at a right-angle with the inlet duct **51**. That is, a center line in a length direction of the heat exchange duct **52** and a center line in a length direction of the inlet duct **51** may be connected to form a right-angle.

[0089] The heat exchange duct **52** may be installed above the tub **20** so that the front surface thereof is adjacent to the front surface **21** of the tub **20**. The back surface of the heat exchange duct **52** may be spaced apart by a certain distance from the back surface of the tub **20**.
[0090] At an inside of the heat exchange duct **52**, an evaporator **73** and a condenser **72** may be installed. Accordingly, the airflow that flows through the heat exchange duct **52** may sequentially pass the evaporator **73** and the condenser **72**.
[0091] The supply duct **53** may be provided to be adjacent to the other side of the tub **20** above the tub **20**, and formed to discharge the airflow introduced from the heat exchange duct **52** to the blower fan **41**. The supply duct **53** may be connected with the heat exchange duct **52** at a right-angle. The supply duct **53** may be formed for the inlet airflow to flow in a straight line.
[0092] An inlet **53***a* of the supply duct **53** may be connected with the outlet **52***b* of the heat exchange duct **52**. The inlet **53***a* of the supply duct **53** may be provided at one side surface of the supply duct **53**, that is, a side surface which contacts the heat exchange duct **52**. The inlet **53***a* of the supply duct **53** may be formed to have a shape and size that corresponds to the outlet **52***b* of the heat exchange duct **52**.
[0093] An outlet **53***b* of the supply duct **53** may be formed at a front surface of the supply duct **53**, and provided at a right-angle with the inlet **53***a* of the supply duct **53**. The outlet **53***b* of the supply duct **53** may be connected with a suction hole of the blower fan **41**, that is, the inlet **54***a* of the front duct **54**. The outlet **53***b* of the supply duct **53** may form the outlet **53***b* of the upper duct **50**.
[0094] The outlet **53***b* of the supply duct **53** may be formed to discharge air toward the front side of the tub **20**. Accordingly, the air may be discharged from the outlet **53***b* of the supply duct **53** in a direction that is roughly perpendicular to the front surface of the cabinet **10**.
[0095] For example, the outlet **53***b* of the supply duct **53** and the suction hole of the blower fan **41** which is installed at the front side of the tub **20**, that is, the inlet **54***a* of the front duct **54**, may be formed for the airflow that is discharged from the outlet **53***b* of the supply duct **53** to be suctioned into the blower fan **41** in a straight line.
[0096] The supply duct **53** may have a rectangular cross-section, and a front end thereof may be connected with the blower fan **41**. That is, the outlet **53***b* may be provided at the front end of the supply duct **53**. The outlet **53***b* of the supply duct **53** may be formed to have a shape and size that corresponds with the suction hole of the blower fan **41**.
[0097] The supply duct **53** may be installed to be adjacent to the other side of the tub **20** above the tub **20**. The front surface of the supply duct **53** may be adjacent to the front surface **21** of the tub **20**, and the back surface thereof may be installed to be spaced apart at a certain distance from the back surface of the tub **20**.
[0098] The supply duct **53** may be connected at a right-angle with the heat exchange duct **52**. That is, the center line in the length direction of the heat exchange duct **52** and a center line in a length direction of the supply duct **53** form a right-angle.
[0099] The inlet **53***a* may be provided at the one side surface of the supply duct **53**. The inlet **53***a* of the supply duct **53** may be formed to have a shape and size that corresponds to the outlet **52***b* of the heat exchange duct **52**. For example, the inlet **53***a* of the supply duct **53** and the outlet **52***b* of the heat exchange duct **52** may be formed in a rectangular shape. The supply duct **53** may be formed to have a length that is roughly the same as the width of the heat exchange duct **52**.
[0100] The back surface and other side surface **53***d* of the supply duct **53** may be connected by an inclined surface **53***d***1**. Based on the above, the airflow introduced into the inlet **53***a* of the supply duct **53** may collide with the inclined surface **53***d***1** and be discharged through the outlet **53***b* of the supply duct **53**. When the inclined surface **53***d***1** is installed at the supply duct **53** as described above, the airflow introduced into the supply duct **53** may be effectively guided to the outlet **53***b*. In another example, the inclined surface **53***d***1** of the supply duct **53** may be formed as a curved surface which can guide the airflow introduced into the inlet **53***a* to the outlet **53***b*.
[0101] At an inside of the supply duct **53**, a heater **80** may be installed. The heater **80** may be

formed to heat the air that passes through the supply duct **53**.
[0102] The front surface of the inlet duct **51**, a front surface of the heat exchange duct **52**, and the front surface of the supply duct **53** may be positioned on roughly a same plane. In addition, between the one side surface of the inlet duct **51**, the back surface of the heat exchange duct **52**, a back surface of the supply duct **53**, and the back surface of the tub **20**, the space **44** may be formed. In the space **44**, the compressor **71**, an expansion valve, and a refrigerant pipe **75** may be installed.
[0103] The blower fan **41** may be formed to form a flow of air, that is, an airflow so that the air that is discharged from the supply duct **53** may be supplied to the front opening **21***a* of the tub **20**.
[0104] The blower fan **41** may be installed at the front surface **21** of the tub **20**. The blower fan **41** may be formed for the airflow to be introduced into the back surface thereof and discharged through a lower surface thereof. That is, the blower fan **41** may be formed for a discharge direction of the airflow to roughly form 90 degrees with an inlet direction of the airflow. Accordingly, when the blower fan **41** is operated, the air which is discharged from the outlet **53***b* of the supply duct **53** toward the front side of the tub **20** may be introduced into the blower fan **41**, and the air may be discharged downwards from the blower fan **41** toward the diaphragm **25**.
[0105] The blower fan **41** may be contained at an inside of the front duct **54**. The front duct **54** may be installed at the front surface **21** of the tub **20**, and connect the supply duct **53** and the diaphragm **25**. Accordingly, the air that is discharged from the supply duct **53** may be supplied to an inside of the diaphragm **25** through the front duct **54**.
[0106] The front duct **54** may be formed for the airflow that is discharged from the blower fan **41** to be supplied to the diaphragm **25** positioned below. The front duct **54** may be formed for the airflow that is formed by the blower fan **41** to be supplied in a straight line to the inside of the diaphragm **25**.
[0107] The inlet **54***a* of the front duct **54** may be provided at the back surface thereof, and form the suction hole of the blower fan **41**. The inlet **54***a* of the front duct **54** may be connected with the outlet **53***b* of the supply duct **53**. The inlet **54***a* of the front duct **54** and the outlet **53***b* of the supply duct **53** may be positioned in a straight line. That is, the inlet **54***a* of the front duct **54** may be directly connected to the outlet **53***b* of the supply duct **53**.
[0108] The front duct **54** may communicate a back opening **22***a* of the tub **20** with the heat exchange part. That is, the outlet **54***b* of the front duct **54** may be provided at a lower surface of the front duct **54**, and connected with an inlet port **25***a* of the diaphragm **25**. The outlet **54***b* of the front duct **54** and the inlet port **25***a* of the diaphragm **25** may be positioned in a straight line. That is, the outlet **54***b* of the front duct **54** may be directly connected to the inlet port **25***a* of the diaphragm **25**.
[0109] At an upper part of the diaphragm **25**, a connecting part **26** to which the front duct **54** is connected may be provided. The connecting part **26** may be formed to have a shape and size that corresponds to the lower surface of the front duct **54**, and the inlet port **25***a* corresponding to the outlet **54***b* of the front duct **54** may be provided inside thereof.
[0110] Accordingly, the airflow that is discharged by the blower fan **41** may be introduced into the inside of the diaphragm **25**, that is, the inside of the drum **30**, in a straight line through the front duct **54** and the connecting part **26**.
[0111] As the blower fan **41**, a sirocco blower fan may be used.
[0112] When the blower fan **41** rotates, the air may be suctioned into the inlet of the front duct **54** and then discharged through the outlet **54***b* provided on the lower surface of the front duct **54**. Accordingly, the direction of the airflow discharged from the outlet **54***b* of the front duct **54** may roughly form 90 degrees with the direction of the airflow which is suctioned into the inlet **54***a* of the front duct **54**.
[0113] The heat exchange part may be formed to remove moisture from the air that passes the heat exchange duct **52** and heat the air, thereby generating dried air in high temperature. The heat exchange part may be formed as a heat pump.
[0114] The heat exchange part may include the compressor **71**, the evaporator **73**, the condenser **72**,

and the expansion valve. In addition, the heat exchange part may include the refrigerant pipe **75** through which the refrigerant circulates by connecting the compressor **71**, the evaporator **73**, the condenser **72**, and the expansion valve.

[0115] The heat exchange part may be formed to remove the moisture contained in the air and heat the air through heat exchange between the refrigerant and the air while the refrigerant circulates through the condenser **72**, the expansion valve, and the evaporator **73** by the compressor **71**.

[0116] The evaporator **73** and the condenser **72** may be installed at the heat exchange duct **52**. The evaporator **73** and the condenser **72** may be installed at an inside of the heat exchange duct **52** to be spaced apart at a certain distance, and the condenser **72** may be installed downstream of the evaporator **73** in a circulating direction of the airflow.

[0117] The evaporator **73** may be installed to be adjacent to the inlet duct **51**, and may remove the moisture by cooling humid air that is discharged from the tub **20**.

[0118] The condenser **72** may be installed to be adjacent to the supply duct **53**, and may heat the air that passed the evaporator **73**. Accordingly, the dried air having a high temperature may be discharged into the diaphragm **25** by the blower fan **41**.

[0119] The compressor **71** may be installed at an outer side of the upper duct **50**, that is, the supply duct **53** above the tub **20**. That is, the compressor **71** may be installed in the space **44** between the supply duct **53** and the back surface of the tub **20**. A refrigerant pipe **75** may be installed in the space **44** that is formed by the inlet duct **51**, the heat exchange duct **52**, the supply duct **53**, and the back surface of the tub **20** above the tub **20**.

[0120] The back duct **55**, the inlet duct **51**, the heat exchange duct **52**, the supply duct **53**, and the front duct **54** may respectively form a back flow path, an inlet flow path, a heat exchange flow path, a supply flow path, and a front flow path.

[0121] For example, an inner space of the inlet duct **51** may form the inlet flow path, an inner space of the heat exchange duct **52** may form the heat exchange flow path, and an inner space of the supply duct **53** may form the supply flow path. In addition, an inner space of the back duct **55** may form the back flow path, and an inner space of the front duct **54** may form a front flow path.

[0122] The inlet flow path, the heat exchange flow path, and the supply flow path may form an upper flow path which is provided at the upper side of the tub **20**. Accordingly, the tub **20**, the back flow path which is provided at the back surface of the tub **20**, the upper flow path which is provided at the upper side of the tub **20**, and the front flow path which is provided at the front surface of the tub **20** may form a circulating flow path.

[0123] Accordingly, when the blower fan **41** which is disposed in the blow flow path is operated, the air inside the drum **30** may circulate along the circulating flow path.

[0124] A drying cycle of the washing machine with drying function **1** according to an embodiment having the structure as described above will be described in detail below.

[0125] The washing machine with drying function **1** according to an

[0126] embodiment may perform a washing cycle, a rinsing cycle, a spin drying cycle, and the like in the same manner as a washing machine of the related art. Accordingly, descriptions thereof will be omitted.

[0127] If the drying cycle is started, the blower fan **41** and the compressor **71** of a heat exchange part **70** may be operated.

[0128] When the compressor **71** is operated, the refrigerant may circulate between the compressor **71**, the condenser **72**, the expansion valve, and the evaporator **73**. At this time, the evaporator **73** and the condenser **72** may be installed at the heat exchange duct **52**, and the condenser **72** may be installed downstream of the evaporator **73** in the circulating direction of air.

[0129] When the blower fan **41** is operated, the air inside of the drum **30** may circulate through the back duct **55**, the inlet duct **51**, the heat exchange duct **52**, a discharge duct **53**, the blower fan **41**, and the front duct **54**, and the laundry may be dried.

[0130] Specifically, the humid air of the drum **30** may be discharged to a space between a back

surface plate **32** of the drum **30** and the back surface plate **22** of the tub **20** through a plurality of through-holes at the back surface plate **32** of the drum **30**. The humid air that is discharged between the back surface plate **32** of the drum **30** and the back surface plate **22** of the tub **20** may be introduced to the back duct **55** through the back opening **22***a* of the tub **20**.

[0131] The humid air introduced to the back duct **55** may be discharged to the inlet duct **51** through the outlet of the back duct **55**.

[0132] Air A**1** introduced to the inlet **51***a* of the inlet duct **51** may flow in a direction perpendicular to the front surface cover **11** of the cabinet **10**, that is, the front surface **21** of the tub **20**. The air introduced to the inlet duct **51** may be discharged to the heat exchange duct **52**.

[0133] The air introduced to the inlet **52***a* of the heat exchange duct **52** may flow in a direction parallel to the front surface cover **11** of the cabinet **10**. That is, air A**2** that flows through the heat exchange duct **52** may form a right-angle with air Al that flows through the inlet duct **51**.

[0134] The air introduced to the inlet **52***a* of the heat exchange duct **52** may be removed of moisture as the air passes the evaporator **73**. The air removed of moisture by the evaporator **73** may be heated as it passes the condenser **72**. Accordingly, at the outlet **52***b* of the heat exchange duct **52**, the dried air having a high temperature may be discharged to the supply duct **53**.

[0135] The air introduced to the inlet **53***a* of the supply duct **53** and heated by the condenser **72** may flow in a direction perpendicular to the front surface cover **11** of the cabinet **10**. That is, air A**3** that flows through the supply duct **53** may form a right-angle with the air A**2** that flows through the heat exchange duct **52**, and may be formed to be in parallel with the air Al that flows through the inlet duct **51**.

[0136] The air that is discharged from the outlet **53***b* of the supply duct **53** may be introduced into the suction hole of the blower fan **41**, that is, the inlet **54***a* of a front duct **54**. At this time, because the outlet **53***b* of the supply duct **53** and the inlet **54***a* of the front duct **54** are disposed in a straight line, a flow resistance of air that is introduced into the blower fan **41** may be minimized.

[0137] The front duct **54** may discharge the dried air having a high temperature suctioned into the inlet **54***a* downward to the diaphragm **25** through the outlet **54***b*. At this time, the direction of air that is discharged from the outlet **54***b* of the front duct **54** may form a right-angle with the direction of air that is suctioned into the inlet **54***a*.

[0138] The dried air having a high temperature, that is, heated air from the outlet **54***b* of the front duct **54**, may be introduced into the inside of the diaphragm **25** through the connecting part **26**. At this time, because the outlet **54***b* of the front duct **54** and the connecting part **26** are disposed in a straight line, the heated air that is discharged by the blower fan **41** may be introduced into the inside of the diaphragm **25** in a straight line.

[0139] Because the diaphragm **25** is in communication with the drum opening **31***a* provided at a front surface **31** of the drum **30**, the heated air may be introduced into the inside of the drum **30** through the diaphragm **25**.

[0140] The heated air introduced into the inside of the drum **30** may dry the laundry by contacting the laundry. The heated air, that is, dried air having a high temperature, may become humid air in low temperature due to the drying of the laundry.

[0141] The humid air in the drum **30** may continue the above-described circulation by being discharged to the back duct **55** through the plurality of through-holes of the back surface plate **32** of the drum **30**.

[0142] FIG. **6** is a functional block diagram illustrating a washing machine with drying function according to an embodiment. FIG. **7** is a perspective view illustrating a back duct according to an embodiment. FIG. **8** is an exploded perspective view illustrating a back duct according to an embodiment. FIG. **9** is a cross-sectional view illustrating a back duct according to an embodiment. FIG. **10** is a perspective view illustrating a washing device according to an embodiment.

[0143] Referring to FIG. **6** to FIG. **10**, the washing machine with drying function **1** according to an embodiment may include a lint filter **100**, a sensor **200**, a washing device **300**, and a processor **400**.

[0144] The lint filter **100** may be disposed at the inside of the back duct **55**, and may filter lint included in the air which passes the back duct **55**. The lint filter **100** may have a cross-section area which corresponds with the back duct **55**. The lint filter **100** may be fitted in the inner surface of the back duct **55**.
[0145] The lint filter **100** may be disposed to be horizontal, and disposed to filter the vertical the airflow that rises within the back duct **55**. As the drying cycle is carried out, lint may be accumulated at a lower surface **101** of the lint filter **100**.
[0146] The sensor **200** may be fixed to the lint filter **100** and sense filtered lint in the lint filter **100**. The sensor **200** may be disposed at the lower surface **101** of the lint filter **100**, and sense the accumulated lint at the lower surface **101** of the lint filter **100**.
[0147] The washing device **300** may be disposed at an upper side of the lint filter **100**, and selectively spray washing water toward the lint filter **100**.
[0148] The processor **400** may control, based on identifying that lint is collected in the lint filter **100** based on a signal received from the sensor **200**, the washing device **300** for the washing water to be sprayed toward the lint filter **100**.
[0149] A washing machine with drying function of the related art has problems of a user having to inconveniently change a lint filter to wash the lint filter, the washing water being unnecessarily used because it could not sense whether or not lint is collected in the lint filter, or drying performance being deteriorated as the lint filter is blocked according to excessive accumulation of lint collected in the lint filter.
[0150] The washing machine with drying function **1** according to an embodiment may solve the above-described problems as the lint filter **100** is cleaned by the sensor **200** sensing the accumulation of lint collected in the lint filter **100**, and the washing device **300** automatically spraying the washing water toward the lint filter **100**.
[0151] That is, the washing machine with drying function **1** according to an embodiment may more actively remove the lint collected in the lint filter **100**, and have an effect of the drying function being maintained even if the user does not directly change the lint filter **100** or remove the lint collected in the lint filter **100**.
[0152] The sensor **200** may be a touch sensor which transmits a signal indicating lint accumulation to the processor **400** when in contact with lint. The sensor **200** may be disposed as two terminals spaced apart with one another, and may include a first terminal **210** and a second terminal **220** which are electrically connectable by the lint collected in the lint filter **100** selectively.
[0153] Because lint contain moisture, the first and second terminals **210** and **220** may be electrically connected with each other. That is, when the lint is spread at the lower surface **101** of the lint filter **100** and connects the first terminal **210** with the second terminal **220**, the sensor **200** may transmit the signal for lint accumulation to the processor **400**.
[0154] The processor **400** may identify, based on the first terminal **210** and the second terminal **220** being electrically connected by lint, that the lint is collected in the lint filter **100**.
[0155] The first terminal **210** and the second terminal **220** may be disposed side by side along a length direction of the lint filter **100**. The first and second terminals **210** and **220** may be disposed symmetrically based on a center of the lint filter **100**. A cross-section of the lint filter **100** may have a rectangular shape, and the first and second terminals **210** and **220** may be disposed along a diagonal direction of the lint filter **100**. The first and second terminals **210** and **220** may be disposed diagonally based on the center of the lint filter **100**.
[0156] Accordingly, the first and second terminals **210** and **220** may cover most of the area from among the lower surface **101** of the lint filter **100**. Even if lint is collected at only some areas of the lint filter **100**, the sensor **200** may easily sense whether there is the accumulation of lint.
[0157] The processor **400** may identify, based on a current greater than a preset value flowing from the first terminal **210** to the second terminal **220**, that the lint is collected in the lint filter **100**.
[0158] An amount of lint which connects the first terminal **210** and the second terminal **220** and

current which flows from the first terminal **210** to the second terminal **220** may be proportional. That is, as more lint is accumulated in the lint filter **100**, more current may flow from the first terminal **210** to the second terminal **220**.
[0159] Accordingly, the processor **400** may wash, based on identifying that much lint is sufficiently accumulated in the lint filter **100**, the lint filter **100** by controlling the washing device **300**.
[0160] The lint filter **100** may include a mesh net **110** through which lint is filtered and a frame **120** which surrounds and supports the mesh net **110**. The mesh net **110** may have a net shape, include a plurality of through-holes, pass only air from among the air which includes lint, and filter the lint.
[0161] The frame **120** of the lint filter **100** may include an inner circumferential surface **121** which supports the mesh net **110** and an outer circumferential surface **122** which is fitted at an inside surface of the back duct **55**. Accordingly, the mesh net **110** may be stably supported by the frame **120**, and the frame **120** may be stably supported by the back duct **55**.
[0162] The back duct **55** may include a rigid area **55***a* which includes a front end that connects to the heat exchange part and a flexible area **55***b* which connects to a lower end of the rigid area **55***a* and is of a bellows shape.
[0163] Even if the tub **20** vibrates up and down or left and right, the flexible area **55***b* may absorb vibration of the tub **20** as the flexible area **55***b* is extended or compressed in an upward and downward direction, and prevent the rigid area **55***a* which is rigid and the tub **20** from being damaged.
[0164] The lint filter **100** may be disposed in the flexible area **55***b*. The lint filter **100** may be fitted inside of the flexible area **55***b*.
[0165] The washing machine with drying function **1** according to an embodiment may further include a water supply pipe **27** connected with an external water supply source. In addition, the washing device **300** may include a washing pipe **310** which includes a first end **311** that connects to the water supply pipe **27** and a plurality of nozzle holes **313** that is formed at a lower surface **314**.
[0166] The washing pipe **310** may have a hollow cylindrical shape, and washing water may flow inside thereof. The washing water may flow along a length direction of the washing pipe **310**, and then arrive at the lint filter **100** by being dropped downward through the nozzle holes **313**.
[0167] A second end **312** of the washing pipe **310** may be formed to be closed. Accordingly, the washing water introduced to the first end **311** of the washing pipe **310** may all fall toward the lint filter **100**.
[0168] The washing pipe **310** may be disposed to be inclined downward from the first end **311** toward the second end **312**. The washing water introduced to the first end **311** of the washing pipe **310** may have a speed in a length direction of the washing pipe **310**. That is, the washing water that flows along the downward inclined washing pipe **310** may have a speed in a downward direction.
[0169] Accordingly, the washing water that falls through the nozzle holes **313** of the washing pipe **310** may fall in a vertical downward direction without falling at a slant. The lint may not be adhered to the inner surface of the back duct **55**, and fall in a vertical downward direction from the lint filter **100**.
[0170] The washing pipe **310** may pass through the rigid area **55***a* of the back duct **55**. The second end **312** of the washing pipe **310** may be floated in air. The washing pipe **310** may be stably supported by the rigid area **55***a*.
[0171] The washing device **300** may include a washing valve **320** configured to selectively open and close the first end **311** of the washing pipe **310**. The processor **400** may control, based on identifying that the lint is collected in the lint filter **100** based on a signal received from the sensor **200**, the washing valve **320** to open the first end **311** of the washing pipe **310**.
[0172] When the first end **311** of the washing pipe **310** is opened, the washing water flows from the water supply pipe **27** to the inside of the washing pipe **310** through the washing valve **320**, and then the washing water which passed the nozzle holes **313** may wash the lint filter **100**.
[0173] The washing machine with drying function **1** according to an embodiment of the disclosure

as described above may solve the above-described problems as the lint filter **100** is cleaned based on the sensor **200** detecting the accumulation of lint collected in the lint filter **100** and the washing device **300** automatically spraying the washing water toward the lint filter **100**.
[0174] That is, the washing machine with drying function **1** according to an embodiment may have an effect in drying performance being maintained without the user having to directly change the lint filter **100** or remove the lint collected in the lint filter **100** by more actively removing the lint collected in the lint filter **100**.
[0175] While the disclosure has been illustrated and described with reference to various example embodiments thereof, it will be understood that the various example embodiments are intended to be illustrative, not limiting. It will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the true spirit and full scope of the disclosure, including the appended claims and their equivalents.

Claims

1. A washing machine with drying function, comprising: a cabinet; a tub inside the cabinet and having a front opening and a back opening; a drum rotatably disposed inside the tub, wherein laundry is insertable through the front opening of the tub to be received in the drum; a heated air supplying device including: an upper duct disposed above the tub, and including a heat exchange part, a front duct disposed above the front opening of the tub, and connected to the upper duct, a back duct connected to the back opening of the tub and the upper duct, and a blower fan to form a circulation airflow that flows from the drum to the heat exchange part via the back duct, and then to the drum via the front duct; a lint filter inside the back duct, and configured to filter lint in the airflow flowing through the back duct; a sensor configured to detect lint filtered by the lint filter, and to produce a corresponding signal; a washing device inside the back duct, and configured to selectively spray washing water toward the lint filter; and a processor configured to control the washing device to spray the washing water toward the lint filter based on the signal produced by the sensor, wherein the washing device includes a washing pipe, which is inclined related to the lint filter in a longitudinal direction of the lint filter.
2. The washing machine with drying function of claim 1, wherein the washing pipe disposed above the lint filter and being inclined toward the lint filter.
3. The washing machine with drying function of claim 1, wherein the sensor is disposed at a lower surface of the lint filter.
4. The washing machine with drying function of claim 1, wherein the sensor includes: a first terminal, and a second terminal, wherein the first terminal and the second terminal are spaced apart from each other, and the first terminal and the second terminal are electrically connectable by lint collected in the lint filter.
5. The washing machine with drying function of claim 4, wherein the first terminal and the second terminal are disposed side by side along the longitudinal direction of the lint filter.
6. The washing machine with drying function of claim 4, wherein the processor is configured to control the washing device to spray the washing water toward the lint filter based on the signal produced by the sensor being in response to the first terminal and the second terminal being electrically connected by the lint that is collected in the lint filter.
7. The washing machine with drying function of claim 6, wherein the processor is configured to control the washing device to spray the water toward the lint filter based on the signal produced by the sensor being in response to a current flowing from the first terminal to the second terminal being greater than a preset value.
8. The washing machine with drying function of claim 1, further comprising: a water supply pipe connected with an external water supply source, wherein the washing pipe includes: a first end that is connected to the water supply pipe, and a plurality of nozzle holes formed at a lower surface of

the washing pipe.
9. The washing machine with drying function of claim 8, wherein the washing pipe includes a second end that is closed.
10. The washing machine with drying function of claim 8, wherein the washing pipe includes a second end, and is disposed to be inclined downward from the first end toward the second end.
11. The washing machine with drying function of claim 8, wherein the washing device includes a washing valve configured to selectively open and close the first end of the washing pipe.
12. The washing machine with drying function of claim 11, wherein the processor is configured to control the washing device to spray the washing water toward the lint filter by controlling the washing valve to be opened.
13. The washing machine with drying function of claim 1, wherein the lint filter includes: a mesh net to filter the lint in the airflow flowing through the back duct, and a frame which surrounds and supports the mesh net.
14. The washing machine with drying function of claim 13, wherein the frame includes: an inner circumferential surface that supports the mesh net, and an outer circumferential surface which is fitted to an inner surface of the back duct.
15. The washing machine with drying function of claim 1, wherein the back duct includes: a rigid area including an upper end connected to the heat exchange part, and a lower end, and a flexible area connected to the lower end of the rigid area, and configured with a bellows shape, wherein the lint filter is disposed in the flexible area.
16. The washing machine with drying function of claim 15, further comprising: a water supply pipe connected with an external water supply source, wherein the washing pipe includes: an end that is connected to the water supply pipe, and a plurality of nozzle holes formed at a lower surface of the washing pipe, wherein the washing pipe is configured to extend through the rigid area.
17. The washing machine with drying function of claim 1, wherein the washing device is disposed above the lint filter.
18. A washing machine with drying function, comprising: a cabinet; a tub inside the cabinet and having a front opening and a back opening; a drum rotatably disposed inside the tub, wherein laundry is insertable through the front opening of the tub to be received in the drum; a heated air supplying device including: an upper duct disposed above the tub, and including a heat exchange part, a front duct disposed above the front opening of the tub, and connected to the upper duct, a back duct connected to the back opening of the tub and the upper duct, and a blower fan to form an circulation airflow that flows from the drum to the heat exchange part via the back duct, and then to the drum via the front duct; a lint filter inside the back duct, and configured to filter lint in the airflow flowing through the back duct; a sensor configured to detect lint filtered by the lint filter, and to produce a corresponding signal; a washing device inside the back duct, and configured to selectively spray washing water toward the lint filter; and a processor configured to control the washing device to spray the washing water toward the lint filter based on the signal produced by the sensor, wherein the washing device includes: a washing pipe including a first end that is connected to the water supply pipe and a second end that is closed, the second end of the washing pipe being inclined toward the lint filter.
19. The washing machine with drying function of claim 18, wherein the washing pipe includes a plurality of nozzle holes formed at a lower surface of the washing pipe.