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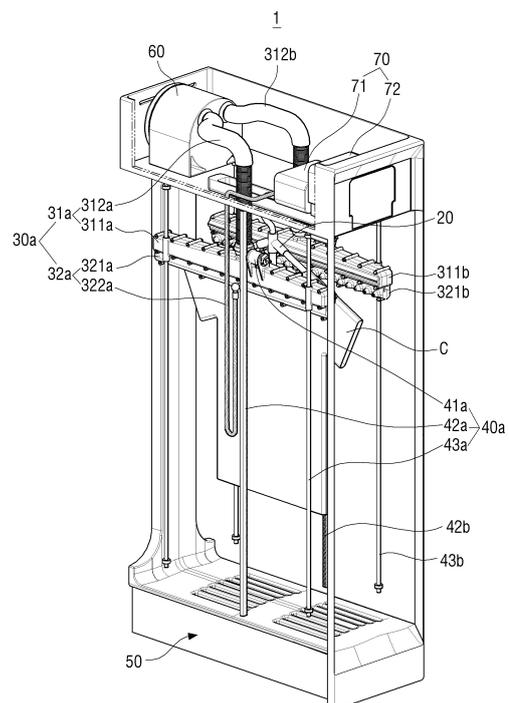
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(54) **CLOTHES-TREATMENT APPARATUS AND CONTROL METHOD THEREFOR**

(57) A clothes-treatment apparatus is disclosed. The clothes-treatment apparatus comprises: a case having a door; a clothes supporting unit supporting clothes and disposed in an accommodation space of the case; a steam spraying unit for spraying steam toward the clothes; and first and second air spraying units arranged to face each other around the clothes, moving simultaneously, and having air slits for allowing compressed air to be simultaneously sprayed therethrough at the front and rear surfaces of the clothes.

FIG. 2



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Description

[Technical Field]

[0001] Apparatuses and methods consistent with the disclosure relate to a clothes-treatment apparatus capable of improving a state of clothes, and a control method therefor.

[Background Art]

[0002] Generally, a washing machine has been widely used as an apparatus for washing articles made of fabrics, such as clothes or bedclothes. Because the washing machine washes the laundry through friction between washing water contained in a water tank and the laundry, separate dehydration and drying processes were additionally required.

[0003] Recently, clothes-treatment apparatuses having functions of removing wrinkles of clothes or removing dust or odors of clothes without using a separate washing process through the washing water have been used as apparatuses for easily treating or managing clothes than a conventional washing machine.

[0004] However, a conventional clothes-treatment apparatus softens a texture of the clothes through spraying of high-temperature steam to the clothes to flatten the wrinkles of the clothes, and then dry again the clothes to remove the wrinkles of the clothes, but an effect of the wrinkle removal was not high.

[0005] In addition, the conventional clothes-treatment apparatus removes the wrinkles by pressing the clothes through a separate pressing means having a flat plate shape to more effectively remove the wrinkles. However, a user should separately operate the pressing means, which is troublesome, and a volume of the clothes-treatment apparatus is increased due to the pressing means, which is disadvantageous.

[Disclosure]

[Technical Problem]

[0006] The disclosure provides a clothes-treatment apparatus capable of having a reduced size and having improved clothes treating and managing performance, and a control method therefor.

[Technical Solution]

[0007] According to an embodiment of the disclosure, a clothes-treatment apparatus includes: a case configured to include a door; a clothes supporting unit configured to support clothes and disposed in an accommodation space of the case; a steam spraying unit configured to spray steam toward the clothes; and first and second air spraying units disposed to face each other with the clothes interposed therebetween and configured to si-

multaneously spray compressed air to a front surface and a rear surface of the clothes while simultaneously moving and include air slits.

[0008] According to another embodiment of the disclosure, a control method of a clothes-treatment apparatus includes: disposing a clothes supporting unit supporting clothes in an accommodation space of a case; spraying steam to a front surface and a rear surface of the clothes through first and second steam spraying units disposed to face each other with the clothes interposed therebetween and simultaneously moving vertically along the accommodation space; and simultaneously spraying linear compressed air to the front surface and the rear surface of the clothes through first and second air spraying units disposed to face each other with the clothes interposed therebetween and simultaneously moving vertically along the accommodation space.

[Description of Drawings]

[0009]

FIG. 1 is a perspective view of a clothes-treatment apparatus according to an embodiment of the disclosure.

FIG. 2 is a perspective view illustrating an internal structure of the clothes-treatment apparatus which is illustrated in FIG. 1 and in which clothes is disposed.

FIG. 3 is a partially enlarged perspective view of the clothes-treatment apparatus illustrated in FIG. 2.

FIG. 4 is a side cross-sectional view illustrating a channel of the clothes-treatment apparatus illustrated in FIG. 2.

FIG. 5 is a front view of a spraying unit of the clothes-treatment apparatus illustrated in FIG. 2.

FIG. 6 is a partially enlarged perspective view of the spraying unit illustrated in FIG. 5.

FIG. 7 is a partially cut-away perspective view of the spraying unit illustrated in FIG. 6.

FIG. 8 is an exploded perspective view of a hot air circulating unit illustrated in FIG. 1.

FIG. 9 is a flowchart illustrating a control method for the clothes-treatment apparatus according to the embodiment of the disclosure.

[Best Mode]

[0010] Hereinafter, embodiments of the disclosure will be described in detail with reference to the accompanying drawings. Embodiments to be described below will be described on the basis of embodiments most appropriate for understanding technical features of the disclosure, and these embodiments do not limit the technical features of the disclosure, but exemplify that the disclosure may be implemented like these embodiments.

[0011] Therefore, the disclosure may be variously modified without departing from the technical scope of

the disclosure through embodiments to be described below, and these modifications will be to fall within the technical scope of the disclosure. In addition, to assist in the understanding of embodiments to be described below, components performing the same operations and related components in the respective embodiments will be denoted by the same or similar reference numerals throughout the accompanying drawings.

[0012] Although a clothes-treatment apparatus according to an embodiment of the disclosure to be described below will be described with respect to an example of treating a state of clothes, but the clothes-treatment apparatus is not limited thereto, and may improve states of various kinds of articles made of fabrics, such as bedclothes, in addition to the clothes.

[0013] FIG. 1 is a perspective view of a clothes-treatment apparatus 1 according to an embodiment of the disclosure.

[0014] Referring to FIG. 1, the clothes-treatment apparatus 1 according to the embodiment of the disclosure includes a case 10 having an accommodation space S formed therein, a clothes supporting unit 20 supporting or fixing and disposed in the accommodation space S in the case 10, a spraying unit 30 spraying steam and compressed air, a moving unit 40 vertically moving the spraying unit 30 within the case 10, and a hot air circulating unit 50 circulating hot air in the accommodation space S in the case 10.

[0015] The clothes supporting unit 20, the spraying unit 30, and the moving unit 40 are disposed in the accommodation space S of the case 10, and the hot air circulating unit 50 is disposed at a lower side of the accommodation space S.

[0016] The clothes supporting unit 20 is used to hang the clothes C in the accommodation space S, and may be drawn out from the accommodation space S in a state in which it is completely separated from the case 10. The clothes supporting unit 20 may be drawn into the accommodation space S through a door 11 disposed at one side of the case 10 in a state in which it supports the clothes C outside the case 10.

[0017] In addition, the clothes supporting unit 20 may be slidably coupled to an upper portion of an inner side of the case 10 to be drawn out from or drawn into the accommodation space S. In this case, the clothes C may be easily disposed in the accommodation space S of the case 10 by sliding and drawing out the clothes supporting unit 20 toward the outside of the case 10 in a state in which the door 11 is opened, allowing the clothes C to be supported by the clothes supporting unit 20, and then sliding the clothes supporting unit 20 to the accommodation space S in the case 10.

[0018] In addition, the clothes supporting unit 20 may have a general clothes hanger shape as illustrated in FIG. 1, but is not limited thereto, and may have any shape as long as it may stably support the clothes, the bedclothes, or the like.

[0019] As an example, the clothes supporting unit 20

includes a body 21, a pair of wings 22 disposed, respectively, at both sides of the body 21, and a hook 23 disposed at an upper end of the body 21. The pair of wings 22 are inserted into the clothes C to support or fix the clothes C in a state in which they flatten the clothes C. The hook 23 may be hooked to a ring portion (not illustrated) provided inside the case 10. That is, the clothes supporting unit 20 may support and fix the clothes C outside the case 10 as illustrated in FIG. 1 and hang the clothes C inside the case 10.

[0020] The spraying unit 30 is disposed to be vertically movable in the accommodation space S of the case 10, and sprays the steam and the compressed air toward the clothes C.

[0021] The moving unit 40 is installed to be vertically movable along the accommodation space S of the case 10. The spraying unit 30 may be coupled to the moving unit 40 to vertically move within the accommodation space S according to vertical movement of the moving unit 40.

[0022] In addition, the hot air circulating unit 50 is disposed at the lower side of the accommodation space S of the case 10.

[0023] The hot air circulating unit 50 may introduce the hot air into the accommodation space S and again suck the air introduced into the accommodation space S to continuously circulate the hot air in the accommodation space S. A detailed description for the hot air circulating unit 50 will be provided below.

[0024] FIG. 2 is a perspective view illustrating an internal structure of the clothes-treatment apparatus 1 in which the clothes C is disposed, FIG. 3 is an enlarged perspective view of some components centered on the spraying unit 30 of the clothes-treatment apparatus 1, and FIG. 4 is a side cross-sectional view illustrating a channel of the clothes-treatment apparatus 1.

[0025] In FIG. 2, a state in which a part of an external panel configuring the case 10 is removed is illustrated to show an internal structure of the clothes-treatment apparatus 1. In addition, in FIG. 4, channels of the compressed air and the steam sprayed toward the clothes C are denoted by arrows, and forms of first and second spraying units 30a and 30b moving from an upper portion of the accommodation space S to a lower portion of the accommodation space S are denoted by dotted lines.

[0026] Hereinafter, components of the clothes-treatment apparatus 1 will be described in detail with reference to FIGS. 2 to 4.

[0027] The spraying unit 30 includes an air spraying unit 31 spraying the compressed air toward the clothes C and a steam spraying unit 32 spraying the steam toward the clothes C.

[0028] As illustrated in FIG. 2, a compressed air generator 60 and a steam generator 70 are disposed at an upper side of the accommodation space S.

[0029] The compressed air generator 60 includes a compression motor, a compression pump, or the like, compressing air, and the compressed air generated from

the compressed air generator 60 may be supplied to the air spraying unit 31 and then sprayed to the clothes C at a high speed and a high pressure.

[0030] The steam generator 70 includes a heater 71 heating water to generate steam and a water tank 72 storing the water supplied to the heater 71.

[0031] The number of air spraying units 31 may be plural, and the air spraying units 31 may include a first air spraying unit 31a and a second air spraying unit 31b disposed to face each other with the clothes C interposed therebetween and simultaneously spraying the compressed air to a front surface and a rear surface of the clothes C.

[0032] The first and second air spraying units 31a and 31b may extend along a width direction of the accommodation space S, and thus spray the compressed air at a width corresponding to a width of the accommodation space S.

[0033] In detail, the first and second air spraying units 31a and 31b include, respectively, air slits 3111a and 3111b formed to spray the compressed air in a substantially linear form in a direction perpendicular to surfaces of the clothes.

[0034] The air slits 3111a and 3111b may spray the compressed air in a horizontal direction of the clothes C, and the first and second air spraying units 31a and 31b may vertically move by the moving unit 40 to vertically spray the compressed air to an entire region of the clothes S.

[0035] The number of steam spraying units 32 may be plural, and the steam spraying units 32 may include a first steam spraying unit 32a and a second steam spraying unit 32b disposed to face each other with the clothes C interposed therebetween and simultaneously spraying the steam to the front surface and the rear surface of the clothes C.

[0036] The first and second steam spraying units 32a and 32b may extend along the width direction of the accommodation space S, and thus spray the steam at the width corresponding to the width of the accommodation space S.

[0037] In addition, the first and second steam spraying units 32a and 32b may also be coupled to the moving unit 40 to vertically move, thereby spraying the steam to the entire region of the clothes C.

[0038] In addition, the first and second steam spraying units 32a and 32b may have a structure in which they are fixed to inner surfaces of opposite sides of the case 10, respectively, and spray the steam.

[0039] In addition, a single steam spraying unit 32 may spray the steam to fill the accommodation space S with the steam.

[0040] Hereinafter, operations of the first and second air spraying units 31a and 31b and the first and second steam spraying units 32a and 32b disposed to face each other with the clothes interposed therebetween will be described.

[0041] The first and second air spraying units 31a and

31b may simultaneously spray the compressed air to the front surface and the rear surface on the same position of the clothes C to apply a pressure to the front surface and the rear surface on the same position of the clothes C. In this case, the pressure of the compressed air sprayed from the first air spraying unit 31a and the pressure of the compressed air sprayed from the second air spraying unit 31b are the same as each other.

[0042] Therefore, the front surface and the rear surface on the same position of the clothes C may be compressed to each other to be flat flattened, and wrinkles of the clothes C may be removed.

[0043] In addition, the first and second air spraying units 31a and 31b vertically move by the moving unit 40 while spraying the compressed air. Therefore, the compressed air is sprayed over the entire areas of the front surface and the rear surface of the clothes C. As a result, the entire regions of the clothes C is sequentially compressed by the compressed air, such that the entire clothes C may be flat flattened, and the wrinkles of the entire clothes C may be removed.

[0044] In addition, the first and second air spraying units 31a and 31b may perform various functions of variously controlling a speed and a pressure of the sprayed air by a controller (not illustrated) to remove moisture or dust of the clothes C as well as spraying the high-speed and high-temperature compressed air to the clothes C to effectively remove the wrinkles of the clothes C.

[0045] The first and second steam spraying units 32a and 32b may spray high-temperature steam to the clothes C to change a fabric texture configuring the clothes C into a soft state through high-temperature hot air and moisture.

[0046] In addition, the first and second steam spraying units 32a and 32b may simultaneously spray the steam to the front surface and the rear surface on the same position of the clothes C to uniformly spray the steam to the front surface and the rear surface on the same position of the clothes C.

[0047] Further, after the fabric texture of the clothes C is changed into the soft state through the first and second steam spraying units 32a and 32b, the clothes C is compressed through the compressed air sprayed from the first and second air spraying units 31a and 32a, such that the wrinkles of the clothes C may be more effectively removed.

[0048] As illustrated in FIGS. 2 to 4, the first air spraying unit 31a and the first steam spraying unit 32a may be coupled integrally with each other, and the second air spraying unit 31b and the second steam spraying unit 32b may be coupled integrally with each other. Therefore, the first air spraying unit 31a and the first steam spraying unit 32a may simultaneously spray the compressed air and the steam to the front surface of the clothes C, and the second air spraying unit 31b and the second steam spraying unit 32b may simultaneously spray the compressed air and the steam to the rear surface of the clothes C.

[0049] In addition, the first air spraying unit 31a and the first steam spraying unit 32a may be separated from each other, and the second air spraying unit 31b and the second steam spraying unit 32b may also be separated from each other.

[0050] Detailed configurations of the first and second air spraying units 31a and 31b and the first and second steam spraying units 32a and 32b will be described below.

[0051] Meanwhile, the first and second air spraying units 31a and 31b may spray the high-pressure and high-temperature compressed air to the clothes C to detach dust, dirt, or the like, attached to the clothes C from the clothes C. The dust, the dirt, or the like, detached from the clothes C and floating in the accommodation space S may be agglutinated in the steam sprayed from the first and second steam spraying units 32a and 32b, and the agglutinated dust, dirt, or the like, may fall together with the steam to the bottom to be taken away.

[0052] The first and second steam spraying units 32a and 32b may spray a liquid or steam with which a detergent, a bleaching agent, a fabric softener, and the like, are mixed in addition to water to the clothes C to improve a state of the clothes C in various manners.

[0053] As described above, the first and second air spraying units 31a and 31b and the first and second steam spraying units 32a and 32b may be coupled to the moving unit 40 to simultaneously move vertically in the accommodation space S.

[0054] As illustrated in FIGS. 2 and 3, the moving unit 40 includes a first moving unit 40a and a second moving unit 40b.

[0055] The first moving unit 40a may be coupled to the first air spraying unit 31a and the first steam spraying unit 32a to vertically move the first air spraying unit 31a and the first steam spraying unit 32a.

[0056] The second moving unit 40b may be coupled to the second air spraying unit 31b and the second steam spraying unit 32b to vertically move the second air spraying unit 31b and the second steam spraying unit 32b.

[0057] The first moving unit 40a includes a first motor 41a, a first pinion gear 411a coupled to the first motor 41a to rotate, a first rack gear 42a engaged with the first pinion gear 411a, and a plurality of first guide members 43a guiding movement of the first air spraying unit 31a and the first steam spraying unit 32a.

[0058] The first motor 41a may be coupled to the first air spraying unit 31a or the first steam spraying unit 32a, and may be coupled to the first air spraying unit 31a and the first steam spraying unit 32a coupled integrally with each other as illustrated in FIG. 3.

[0059] The first rack gear 42a vertically extends in the accommodation space S. The first pinion gear 411a engaged with the first rack gear 42a rotates by the first motor 41a, such that the first air spraying unit 31a or the first steam spraying unit 32a may vertically move along the first rack gear 42a.

[0060] In addition, the plurality of first guide members

43a are disposed in parallel with the first rack gear 42a at both sides of the first rack gear 42a.

[0061] The first guide members 43a may extend in a vertical direction of the accommodation space S in a shape corresponding to the first rack gear 42a.

[0062] A plurality of first guide holes 33a are formed at positions corresponding to the plurality of first guide members 43a in the first air spraying unit 31a and the first steam spraying unit 32a coupled integrally with each other. The plurality of first guide members 43a are inserted into the plurality of first guide holes 33a.

[0063] Therefore, the first air spraying unit 31a or the first steam spraying unit 32a may vertically move along the plurality of first guide members 43a.

[0064] As described above, the first air spraying unit 31a or the first steam spraying unit 32a may be guided by and move along the plurality of first guide members 43a together with the first rack gear 42a to vertically move stably without being shaken.

[0065] The second moving unit 40b is disposed to face the first moving unit 40a described above.

[0066] The second moving unit 40b includes a second motor 41b, a second pinion gear 411b coupled to the second motor 41b to rotate, a second rack gear 42b engaged with the second pinion gear 411b, and a plurality of second guide members 43b guiding movement of the second air spraying unit 31b and the second steam spraying unit 32b, similar to the first moving unit 40a described above.

[0067] A configuration of the second moving unit 40b is the same as that of the first moving unit 40a, and a detailed description thereof is thus omitted.

[0068] In the embodiment of the disclosure, it has been described by way of example that the pinion gears of the first and second moving units 40a and 40b engaged with the rack gears of the first and second moving units 40a and 40b rotate to move the first and second air spraying units 31a and 31b and the first and second steam spraying units 32a and 32b. However, the moving units are not limited thereto, and may also be configured in various structures such as a cylinder, a chain structure, and the like.

[0069] In addition, it has been described by way of example that the first and second moving units 40a and 40b vertically move in the accommodation space S, but a moving direction and a moving manner of the first and second moving units 40a and 40b may be variously modified. For example, the moving unit may rotate along a circumference of the clothes C. Therefore, the first and second air spraying units 31a and 31b and the first and second steam spraying units 32a and 32b may uniformly spray the steam and the compressed air to the clothes C while rotating along the circumference of the clothes C.

[0070] In addition, the moving unit to which the first and second air spraying units 31a and 31b and the first and second steam spraying units 32a and 32b are coupled may vertically move within the case 10 while rotating the circumference of the clothes C. Therefore, the steam and

the compressed air may be more rapidly and uniformly sprayed to the entire region of the clothes C.

[0071] The first and second air spraying units 31a and 31b include first and second air blowing hoses 312a and 312b, respectively, and are connected to the compressed air generator 60 through the first and second air blowing hoses 312a and 312b.

[0072] As illustrated in FIG. 4, the first and second air blowing hoses 312a and 312b include extendable bellows that may extend according to vertical movement of the first and second air spraying units 31a and 32b.

[0073] In addition, it is preferable that the first and second air blowing hoses 312a and 312b are formed to be longer than a distance at which the first and second air spraying units 31a and 31b are furthest spaced apart from the compressed air generator 60 due to the movement, to smoothly transfer the compressed air.

[0074] The first and second steam spraying units 32a and 32b include first and second steam transferring hoses 322a and 322b, respectively, and are connected to the steam generator 70 through the first and second steam transferring hoses 322a and 322b.

[0075] In addition, the first and second steam transferring hoses 322a and 322b include extendable bellows that may extend according to vertical movement of the first and second steam spraying units 32a and 32b.

[0076] In addition, it is preferable that the first and second steam transferring hoses 322a and 322b are formed to be longer than a distance at which the first and second steam spraying units 32a and 32b are furthest spaced apart from the compressed steam generator 70 due to the movement, to smoothly transfer the compressed air.

[0077] FIG. 5 is a front view of the first spraying unit 30a, FIG. 6 is a partially enlarged perspective view of the first spraying unit 30a, and FIG. 7 is a partially cut-away perspective view of the first spraying unit 30a illustrated in FIG. 6.

[0078] Hereinafter, a configuration of the spraying unit including the air spraying unit and the steam spraying unit will be described in detail with reference to FIGS. 5 to 7.

[0079] Because a configuration of the first spraying unit 30a and a configuration of the second spraying unit 30b are the same as each other, a structure of the spraying unit will be described on the basis of the first spraying unit 30a, and a description for a structure of the second spraying unit 30b will be omitted.

[0080] As described above, the first spraying unit 30a includes the first air spraying unit 31a and the first steam spraying unit 32a.

[0081] As illustrated in FIG. 5, the first steam spraying unit 32a may be coupled to a lower portion of the first air spraying unit 31a. In this case, it is preferable that a channel through which the compressed air of the first air spraying unit 31a and a channel through which the steam of the first steam spraying unit 32a are blocked from each other.

[0082] The first air spraying unit 31a and the first steam

spraying unit 32a may simultaneously move vertically.

[0083] As illustrated in FIG. 4, when the first air spraying unit 31a and the first steam spraying unit 32a move from the upper portion of the accommodation space S to the lower portion of the accommodation space S, the first air spraying unit 31a and the first steam spraying unit 32a may simultaneously spray the compressed air and the steam toward the clothes C. Therefore, the compressed air may be continuously sprayed to the clothes C immediately after the steam is sprayed to the clothes C, such that the wrinkles of the clothes C may be more rapidly and effectively removed.

[0084] In addition, a configuration in which a plurality of first steam spraying units are coupled to upper and lower portions of the first air spraying unit 31a, respectively, is possible. In this case, only any one of the plurality of first steam spraying units may spray steam depending on a vertical movement direction. That is, when the first air spraying unit 31a moves from the upper portion of the accommodation space S to the lower portion of the accommodation space S, the steam is sprayed from the first steam spraying unit 32a disposed below the first air spraying unit 31a, and at the same time, the compressed air is sprayed from the first air spraying unit 31a, such that the compressed air may be continuously sprayed to the clothes C to which the steam is sprayed. In addition, when the first air spraying unit 31a moves from the lower portion of the accommodation space S to the upper portion of the accommodation space S, the steam is sprayed from the first steam spraying unit 32a disposed above the first air spraying unit 31a, and at the same time, the compressed air is sprayed from the first air spraying unit 31a, such that the compressed air may be continuously sprayed to the clothes C to which the steam is sprayed.

[0085] As described above, when the first and second air spraying units 31a and 31b and the first and second steam spraying units 32a and 32b move together with each other, the first and second air spraying units 31a and 31b may be disposed behind the first and second steam spraying units 32a and 32b to spray the compressed air while following the first and second steam spraying units 32a and 32b moving while spraying the steam.

[0086] As described above, the first steam spraying unit 32a and the first air spraying unit 31a spray the steam and the compressed air sequentially to the clothes C while moving together simultaneously with each other. Therefore, the pressure by the compressed air is continuously applied to the clothes C of which the fabric texture is softened through the steam, such that the wrinkles of the clothes C may be more efficiently removed.

[0087] In addition, after the first air spraying unit 31a does not spray the compressed air and the first steam spraying unit 32a sprays only the steam to the clothes C while the first air spraying unit 31a and the first steam spraying unit 32a move from the upper portion of the accommodation space S to the lower portion of the accommodation space S, the first steam spraying unit 32a

does not spray the steam and the first air spraying unit 31a sprays only the compressed air to the clothes C while the first air spraying unit 31a and the first steam spraying unit 32a again move from the lower portion of the accommodation space S to the upper portion of the accommodation space S, such that the wrinkles of the clothes C may be removed.

[0088] The movement of the first air spraying unit 31a and the first steam spraying unit 32a and the spraying of the compressed air and the steam through the first air spraying unit 31a and the first steam spraying unit 32a as described above may be controlled by a controller.

[0089] The first air spraying unit 31a includes a first air sprayer 311a extending along the width direction of the accommodation space S and the first air blowing hose 312a connecting the compressed air generator 60 and the first air sprayer 311a to each other.

[0090] The first air sprayer 311a includes a channel formed so that the compressed air transferred from the first air blowing hose 312a is sprayed in a width direction of the clothes C along a length direction of the first air sprayer 311a.

[0091] In addition, the compressed air introduced into the first air sprayer 311a is sprayed to the clothes C through first air slits 3111a.

[0092] The first air slits 3111a, which are holes formed on the first air sprayer 311a to extend along the width direction of the accommodation space S, extend along the length direction of the air sprayer 311a. For example, the first air slit 3111a may be a long hole having a rectangular shape.

[0093] The compressed air passing through the first air slits 3111a may be sprayed to the clothes C at a high speed and a high pressure, and the wrinkles of the clothes C may thus be more effectively removed.

[0094] As illustrated in FIGS. 5 to 7, the number of first air slits 3111a may be plural, and the plurality of first air slits 3111a may be arranged at regular intervals along the width direction of the accommodation space S.

[0095] Therefore, pressures and speeds of the compressed air sprayed from the first air slits 3111a may become uniform, and may be increased.

[0096] The first air slits 3111a may spray the compressed air in a linear form in the direction perpendicular to the surface of the clothes C.

[0097] In detail, the compressed air sprayed from the first air slits 3111a may be sprayed in a shape corresponding to that of the first air slits 3111a. Therefore, as illustrated in FIG. 7, the compressed air A may be sprayed in a linear shape corresponding to a length of the first air slits 3111a.

[0098] In addition, the compressed air A continuously sprayed in the linear shape from the first air slits 3111a may have a shape perpendicular to the surface of the clothes C.

[0099] Therefore, an entire shape of the compressed air sprayed from the plurality of first air slits 3111a is the linear shape corresponding to a length of the first air

sprayer 311a, and the compressed air sprayed from the plurality of first air slits 3111a may be sprayed perpendicular to the surface of the clothes C.

[0100] The linear compressed air sprayed from the plurality of first air slits 3111a applies a pressure to a front surface of the clothes C. A plurality of second air slits 3111b of the second air spraying unit 31b that face the first air slits 3111a applies a pressure to the rear surface of the clothes C corresponding to the front surface of the clothes C to which the pressure is applied from the first air slits 3111a, such that the clothes C may be compressed in a linear shape corresponding to the width direction of the accommodation space S.

[0101] In addition, as the first and second air spraying units 31a and 31b vertically move while spraying the compressed air, the compressed air compressing the clothes C in the linear shape may also be sprayed while vertically moving.

[0102] Therefore, the entire region of the clothes C may be sequentially compressed in the linear shape corresponding to the width direction of the accommodation space S, and the wrinkles of the entire clothes C may be effectively removed by the sequential compression of the entire region of the clothes C.

[0103] As described above, the clothes-treatment apparatus 1 according to the embodiment of the disclosure may simultaneously spray the linear compressed air to the front surface and the rear surface of the clothes C in the horizontal direction of the clothes C to compress the clothes C.

[0104] In addition, the linear compressed air compressing the front surface and the rear surface of the clothes C in the horizontal direction vertically moves, such that the entire region of the clothes C may be sequentially compressed. Therefore, the wrinkles of the clothes C may be removed.

[0105] Referring to FIG. 7, the first air sprayer 311a may include a first protrusion portion 3112a protruding toward the front surface of the clothes C along the length direction.

[0106] The first protrusion portion 3112a may form a channel having a size that becomes small from the inside of the first air sprayer 311a toward the outside of the first air sprayer 311a.

[0107] Therefore, a pressure of the compressed air passing through the first protrusion portion 3112a and sprayed to the outside of the first air sprayer 311a may be increased during a period in which the compressed air passes through the first protrusion portion 3112a. Therefore, the pressure applied to the surface of the clothes C may be increased.

[0108] The first protrusion portion 3112a includes a first downward inclined portion 31121a inclined downward toward the front surface of the clothes C and a first upward inclined portion 31122a disposed below the first downward inclined portion 31121a and inclined upward toward the front surface of the clothes C.

[0109] The first downward inclined portion 31121a and

the first upward inclined portion 31122a of the first protrusion portion 3112a are coupled to each other, such that a channel of the compressed air sprayed from the first air sprayer 311a has a size that becomes small from the inside of the first air sprayer 311a toward the outside of the first air sprayer 311a.

[0110] In addition, the plurality of first air slits 3111a are arranged along a tip of the first protrusion portion 3112a, such that the compressed air passing through the first protrusion portion 3112a to have the increased pressure may be sprayed perpendicular to the surface of the clothes C through the first air slits 3111a. Therefore, the wrinkles of the clothes C may be more effectively removed.

[0111] Further, the compressed air sprayed from the plurality of first air slits 3111a arranged at the tip of the first protrusion portion 3112a may be sprayed toward the clothes C in a direction and at an angle that are adjusted by adjusting inclinations of the first downward inclined portion 31121a and the first upward inclined portion 31122a, in addition to being sprayed in the direction perpendicular to the surface of the clothes C.

[0112] As described above, the configuration of the second spraying unit 31a is the same as that of the second spraying unit 31a, and linear compressed air may be sprayed to the rear surface of the clothes C in a direction perpendicular to the rear surface of the clothes C through the second air slits 3111b.

[0113] Again referring to FIGS. 5 to 7, a first steam sprayer 321a is disposed below the first air sprayer 311a, and is connected to the first steam transferring hose 322a connected to the steam generator 70.

[0114] The first steam sprayer 321a may extend along the width direction of the accommodation space S, and may have a shape corresponding to the length of the first air sprayer 311a.

[0115] In addition, the first steam sprayer 321a includes a plurality of first steam nozzles 3211a arranged along a length direction thereof.

[0116] Steam in the first steam sprayer 321a may be uniformly sprayed to the front surface of the clothes C along the length direction of the first steam sprayer 321a through the plurality of first steam nozzles 3211a.

[0117] The second steam spraying unit 32b, which has the same configuration as that of the first steam spraying unit 32a, may uniformly spray the steam to the rear surface of the clothes C through a plurality of second steam nozzles 3211b arranged along a length direction of a second steam sprayer 321b.

[0118] In addition, the first and second steam sprayers 321a and 321b may be coupled to the first and second moving units 40a and 40b, respectively, to spray the steam while vertically moving, thereby uniformly spraying the steam to the entire regions of the front surface and the rear surface of the clothes C.

[0119] FIG. 8 is an exploded perspective view of the hot air circulating unit 50 illustrated in FIG. 1.

[0120] Hereinafter, a structure of the hot air circulating

unit 50 will be described with reference to FIG. 8.

[0121] The hot air circulating unit 50 may be disposed at a lower side of the case 10, introduce hot air into the accommodation space S through first and second vent holes 101 and 102 formed in the bottom of the accommodation space S, and again discharge air of the accommodation space S to the outside of the accommodation space S, that is, toward the hot air circulating unit 50.

[0122] The hot air circulating unit 50 includes a first housing 51 forming an appearance, a second housing 52 coupled to a lower portion of the first housing 51, a hot air generator (not illustrated), and an air blowing unit 53 blowing hot air generated in the hot air generator to the accommodation space S.

[0123] An intake port 511 and an exhaust port 512 formed at positions corresponding to the first and second vent holes 101 and 102 are disposed in an upper surface of the first housing 51.

[0124] As illustrated in FIG. 8, the intake port 511 of the first housing 51 is disposed to be in communication with the first vent hole 101 of the case 10, and the exhaust port 512 of the first housing 51 is disposed to be in communication with the second vent hole 102 of the case 10.

[0125] First and second cover members 5111 and 5121 including a plurality of through-holes are coupled to the intake port 511 and the exhaust port 512, respectively, and may thus prevent other foreign materials from being introduced into the hot air circulating unit 50 or from being discharged from the hot air circulating unit 50.

[0126] Channels through which the air passing through the intake port 511 and the exhaust port 512 moves are formed in the second housing 52 coupled to the lower portion of the first housing 51.

[0127] In addition, the air blowing unit 53 and the hot air generator are disposed in the first housing 51.

[0128] The air blowing unit 53 includes an air blowing motor 531, a centrifugal fan 532 coupled to the air blowing motor 531 to rotate, and a guide fan 533 guiding air sucked from the centrifugal fan 532 to the accommodation space S.

[0129] The centrifugal fan 532 may be an axial-flow fan capable of sucking air in a direction parallel to the rotational axis.

[0130] The centrifugal fan 532 rotating by the air blowing motor 531 may be disposed to a position corresponding to the intake port 511 to suck the air of the accommodation space S into the second housing 52.

[0131] The air sucked through the centrifugal fan 532 may pass through the guide fan 533 and then move to the hot air generator.

[0132] The hot air generator may include a heating member that may heat the transferred air, and the heating member may be formed of, for example, a heat generation coil or the like.

[0133] The air heated through the hot air generator may be introduced into the accommodation space S through an exhaust port 512 and the second vent hole 102.

[0134] As described above, the hot air is introduced into the accommodation space S through the hot air circulating unit 50, and the air of the accommodation space S is again discharged to the hot air circulating unit 50, such that the hot air may be circulated in the accommodation space S.

[0135] Therefore, moisture remaining in the clothes C of which the wrinkles are removed may be removed through the first and second air spraying units 31a and 31b and the first and second steam spraying units 32a and 32b.

[0136] In addition, the hot air circulating unit 50 may maintain the accommodation space S at a high temperature to maintain the fabric texture of the clothes C in a soft state. Therefore, the wrinkles of the clothes C may be more effectively removed.

[0137] A configuration of the hot air circulating unit 50 is not limited to the configuration described above, and may be modified into various configurations in which the hot air may be circulated by blowing the hot air into the case 10 and again sucking the air in the case 10.

[0138] FIG. 9 is a flowchart illustrating a control method for the clothes-treatment apparatus 1 according to the embodiment of the disclosure.

[0139] Hereinafter, the control method for the clothes-treatment apparatus 1 and a sequence of the control method will be described with reference to FIG. 9.

[0140] First, the clothes supporting unit 20 supporting the clothes C is disposed in the accommodation space S of the case 10 (S10).

[0141] As described above, the clothes supporting unit 20 may be separated from the case 10, and a target clothes C to be treated and managed is supported by the clothes supporting unit 20 and is disposed in the accommodation space S to prepare the treatment of the clothes C through the clothes-treatment apparatus 1.

[0142] Then, the steam is sprayed to the front surface and the rear surface of the clothes C through the first and second steam spraying units 32a and 32b disposed to face each other with the clothes C interposed therebetween and simultaneously moving vertically along the accommodation space S (S20).

[0143] The first and second steam spraying units 32a and 32b may be disposed to face each other to simultaneously spray the steam to the front surface and the rear surface of the clothes C.

[0144] In addition, the first and second steam spraying units 32a and 32b may be coupled to the first and second moving units 40a and 40b, respectively, to spray the steam while vertically moving.

[0145] Therefore, the steam is uniformly sprayed to the entire clothes C, such that the fabric texture of the clothes C may be changed into the soft state.

[0146] Then, the linear compressed air is sprayed to the front surface and the rear surface of the clothes C through the first and second air spraying units 31a and 31b disposed to face each other with the clothes C interposed therebetween and simultaneously moving verti-

cally along the accommodation space S (S30).

[0147] The first and second air spraying units 31a and 31b may spray the compressed air to the front surface and the rear surface of the clothes C of which the fabric texture is changed into the soft state through the steam, thereby simultaneously applying a pressure to the front surface and the rear surface of the clothes C. Therefore, the clothes C may be compressed.

[0148] In addition, the first and second air spraying units 31a and 31b may be coupled to the first and second moving units 40a and 40b, respectively, to spray the compressed air while vertically moving. The compressed air compressing the clothes C may vertically move to sequentially compress the entire region of the clothes C and remove the wrinkles of the entire clothes C.

[0149] In addition, the compressed air may be sprayed in the direction perpendicular to the surface of the clothes C through the first and second spraying units 31a and 31b. Therefore, the pressure applied to the surface of the clothes C may be increased to more effectively remove the wrinkles of the clothes C.

[0150] In addition, in the spraying (S30) of the compressed air, the first and second air spraying units 31a and 31b and the first and second steam spraying units 32a and 32b move together with each other, and the first and second steam spraying units 32a and 32b and the first and second air spraying units 31a and 31b may simultaneously spray the steam and the compressed air to the clothes C in a state in which the first and second air spraying units 31a and 31b are disposed behind the first and second steam spraying units 32a and 32b when the first and second air spraying units 31a and 31b and the first and second steam spraying units 32a and 32b move together with each other.

[0151] That is, in a state in which the first and second air spraying units 31a and 31b are disposed behind the first and second steam spraying units 32a and 32b in a movement direction, the first and second steam spraying units 32a and 32b and the first and second air spraying units 31a and 31b may simultaneously spray the steam and the compressed air to the front surface and the rear surface of the clothes C while moving together with each other.

[0152] Therefore, the compressed air is continuously sprayed to the clothes C immediately after the steam is sprayed to the clothes C, such that the wrinkles of the clothes C may be more rapidly and effectively removed.

[0153] Then, the hot air may be circulated in the accommodation space S in which the clothes C is disposed (S40).

[0154] Because some moisture may remain in the clothes C of which the wrinkles are removed by spraying the steam and the compressed air, the moisture remaining in the clothes C may be evaporated by circulating the hot air in the accommodation space S. Therefore, the clothes C of which the wrinkles are removed may be dried.

[0155] In addition, the circulating (S40) of the hot air in

the accommodation space S may be performed simultaneously with the spraying (S20) of the steam and the spraying (S30) of the compressed air.

[0156] Therefore, in the accommodation space S in which the hot air is circulated, the steam is sprayed to the clothes C (S20), and the compressed air is sprayed to the clothes C (S30), such that the wrinkles of the clothes C may be removed through the compression of the compressed air in a state in which the fabric texture of the clothes C is softer. Therefore, an effect of removing the wrinkles of the clothes C may be improved.

[0157] In the control method for the clothes-treatment apparatus 1 described above, some of the steps may overlap each other, be performed in a changed sequence, or may be replaced with other steps.

[0158] The clothes-treatment apparatus 1 according to the embodiment of the disclosure described above may simultaneously spray the steam to the front surface and the rear surface of the clothes C and then spray the compressed air to the front surface and the rear surface on the same position of the clothes C to compress the clothes C, thereby effectively removing the wrinkles of the clothes C.

[0159] In addition, the air spraying units 31a and 31b and the steam spraying units 32a and 32b may spray the compressed air and the steam while moving, thereby removing the wrinkles of the entire clothes C.

[0160] In addition, the air spraying units 31a and 31b may simultaneously spray the linear compressed air corresponding to the horizontal direction of the clothes C through the air slits 3111a and 3111b to the front surface and the rear surface of the clothes C to more effectively compress the clothes C.

[0161] In addition, in a state in which the front surface and the rear surface of the clothes C are compressed through the compressed air sprayed from the air slits 3111a and 3111b, the air spraying units 31a 32b may vertically move to sequentially press the entire clothes C, thereby removing the wrinkles.

[0162] As described above, the clothes-treatment apparatus 1 according to the embodiment of the disclosure may simply and effectively remove the wrinkles of the entire clothes C.

[0163] Although the diverse embodiments of the disclosure have been individually described hereinabove, the respective embodiments are not necessarily implemented alone, and may also be implemented so that configurations and operations thereof are combined with those of one or more other embodiments.

[0164] Although the embodiments of the disclosure have been illustrated and described hereinabove, the disclosure is not limited to the specific embodiments described above, and may be variously modified by those skilled in the art to which the disclosure pertains without departing from the scope and spirit of the disclosure as claimed in the claims. These modifications should also be understood to fall within the technical spirit and scope of the disclosure.

Claims

1. A clothes-treatment apparatus comprising:

5 a case configured to include a door;
a clothes supporting unit configured to support clothes and disposed in an accommodation space of the case;
10 a steam spraying unit configured to spray steam toward the clothes; and
first and second air spraying units disposed to face each other with the clothes interposed therebetween and configured to include an air slit simultaneously spraying compressed air to a front surface and a rear surface of the clothes while simultaneously moving.

2. The clothes-treatment apparatus as claimed in claim 1, wherein the air slit extends along a width direction of the accommodation space and sprays the compressed air in a linear form in a direction perpendicular to a surface of the clothes.

3. The clothes-treatment apparatus as claimed in claim 2, wherein the air slit is comprises a plurality of the air slits, and the plurality of air slits are arranged at regular intervals along the width direction of the accommodation space.

4. The clothes-treatment apparatus as claimed in claim 1, further comprising a moving unit configured to be coupled to the first and second air spraying units to vertically move the first and second air spraying units.

5. The clothes-treatment apparatus as claimed in claim 1, wherein the steam spraying unit comprises a plurality of the steam spraying units, and the plurality of steam spraying units include first and second steam spraying units disposed to face each other with the clothes interposed therebetween and simultaneously spraying the steam toward the clothes while simultaneously moving.

6. The clothes-treatment apparatus as claimed in claim 5, wherein the first and second air spraying units and the first and second steam spraying units simultaneously spray the compressed air and the steam while moving together with each other, and the first and second air spraying units are disposed behind the first and second steam spraying units when the first and second air spraying units and the first and second steam spraying units move.

7. The clothes-treatment apparatus as claimed in claim 1, wherein each of the first and second air spraying units includes:

- an air blowing hose connected to a compressed air generator; and
 an air sprayer connected to the air blowing hose and extending along a width direction of the accommodation space, and
 the air slit is formed in the air sprayer. 5
8. The clothes-treatment apparatus as claimed in claim 7, wherein the air sprayer includes a protrusion portion protruding toward the clothes along a length direction thereof, and
 the air slit is arranged along a tip of the protrusion portion. 10
9. The clothes-treatment apparatus as claimed in claim 1, wherein the steam spraying unit includes: 15
- a steam transferring hose connected to a steam generator; and
 a steam sprayer connected to the steam transferring hose and extending along a width direction of the accommodation space, and
 the steam sprayer includes a plurality of steam nozzles arranged along a length direction thereof. 20 25
10. The clothes-treatment apparatus as claimed in claim 1, further comprising a hot air circulating unit configured to circulate hot air in the accommodation space. 30
11. The clothes-treatment apparatus as claimed in claim 10, wherein the hot air circulating unit includes: 35
- a hot air generator; and
 an air blowing unit blowing the hot air generated in the hot air generator to the accommodation space. 40
12. A control method of a clothes-treatment apparatus, comprising: 45
- disposing a clothes supporting unit supporting clothes in an accommodation space of a case; spraying steam to a front surface and a rear surface of the clothes through first and second steam spraying units disposed to face each other with the clothes interposed therebetween and simultaneously moving vertically along the accommodation space; and
 simultaneously spraying linear compressed air to the front surface and the rear surface of the clothes through first and second air spraying units disposed to face each other with the clothes interposed therebetween and simultaneously moving vertically along the accommodation space. 50 55
13. The control method of a clothes-treatment apparatus as claimed in claim 12, wherein in the simultaneous spraying of the linear compressed air, the compressed air is simultaneously sprayed to the front surface and the rear surface of the clothes in a direction perpendicular to a surface of the clothes.
14. The control method of a clothes-treatment apparatus as claimed in claim 12, further comprising circulating hot air in the accommodation space.
15. The control method of a clothes-treatment apparatus as claimed in claim 12, wherein in the simultaneous spraying of the linear compressed air, the first and second air spraying units and the first and second steam spraying units simultaneously spray the compressed air and the steam while moving together with each other, and the first and second air spraying units are disposed behind the first and second steam spraying units when the first and second air spraying units and the first and second steam spraying units move.

FIG. 1

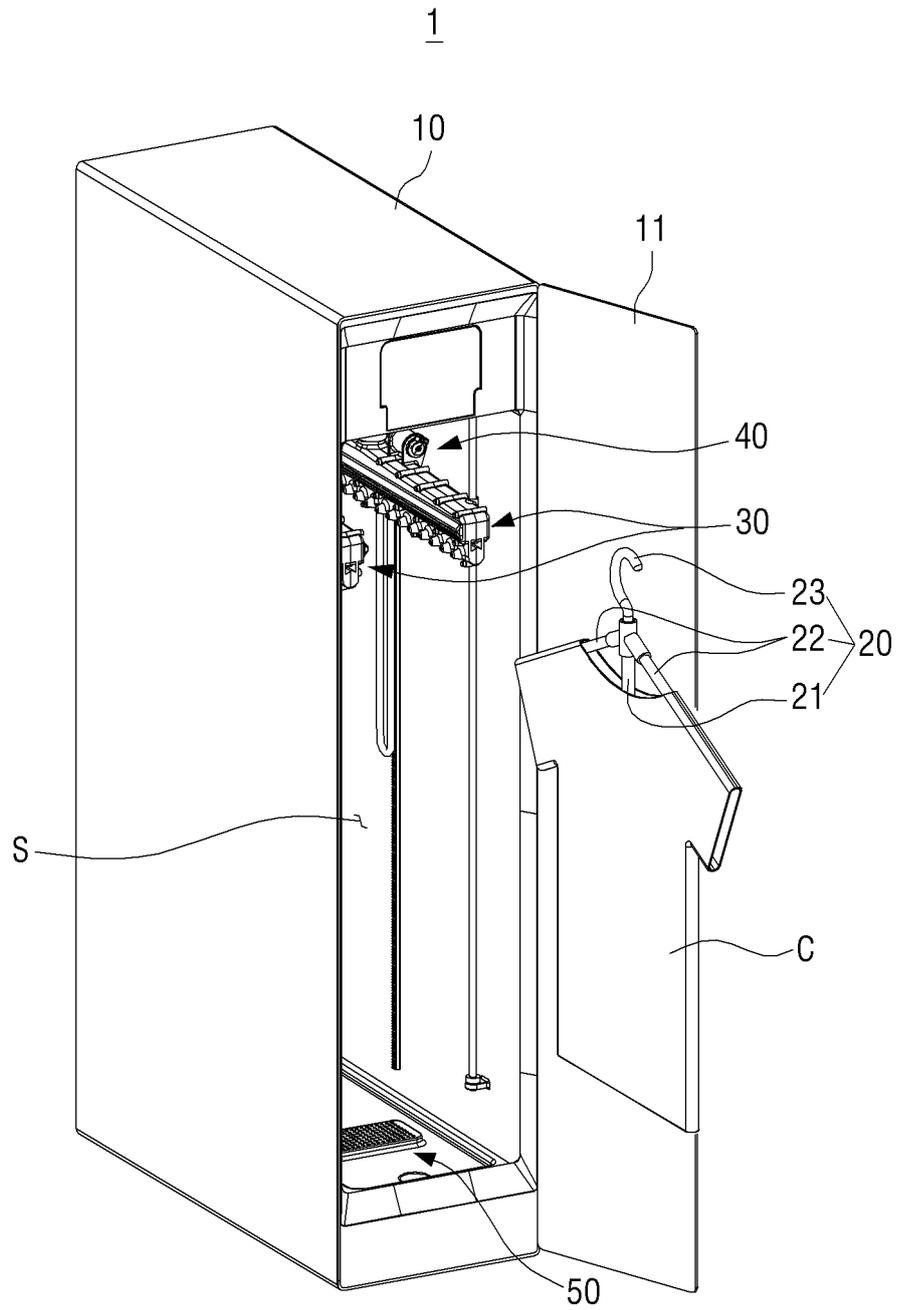


FIG. 2

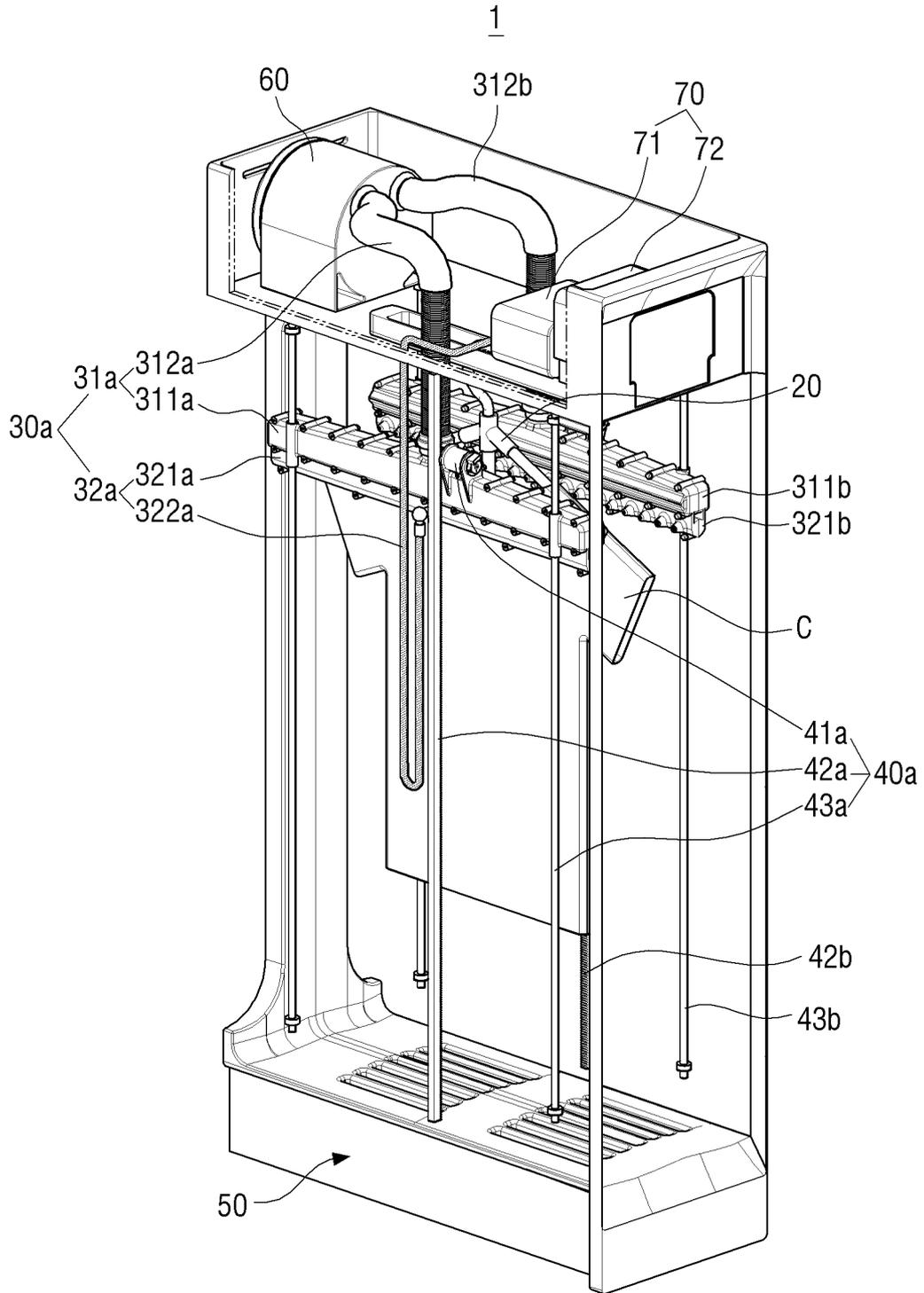


FIG. 3

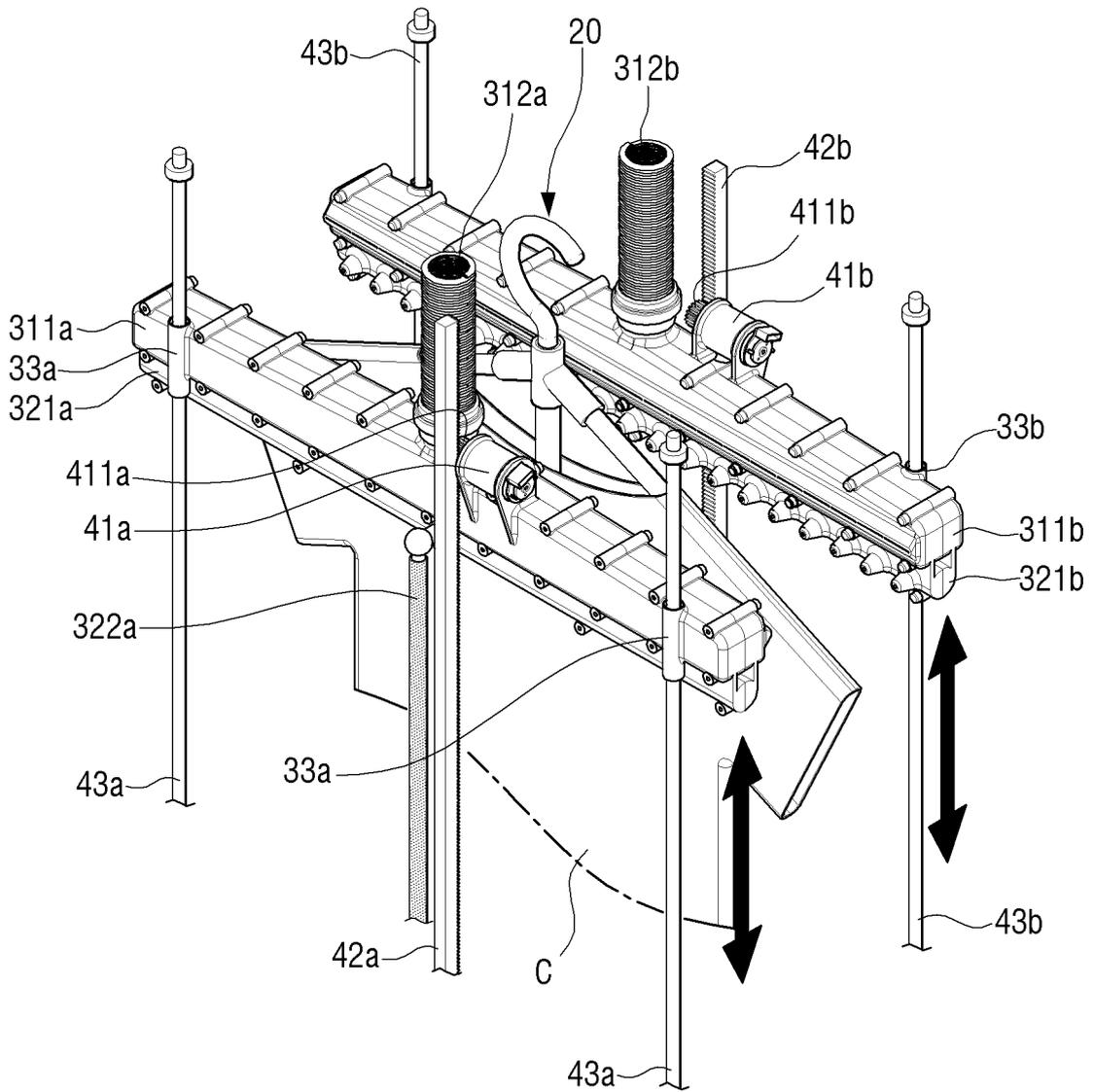


FIG. 4

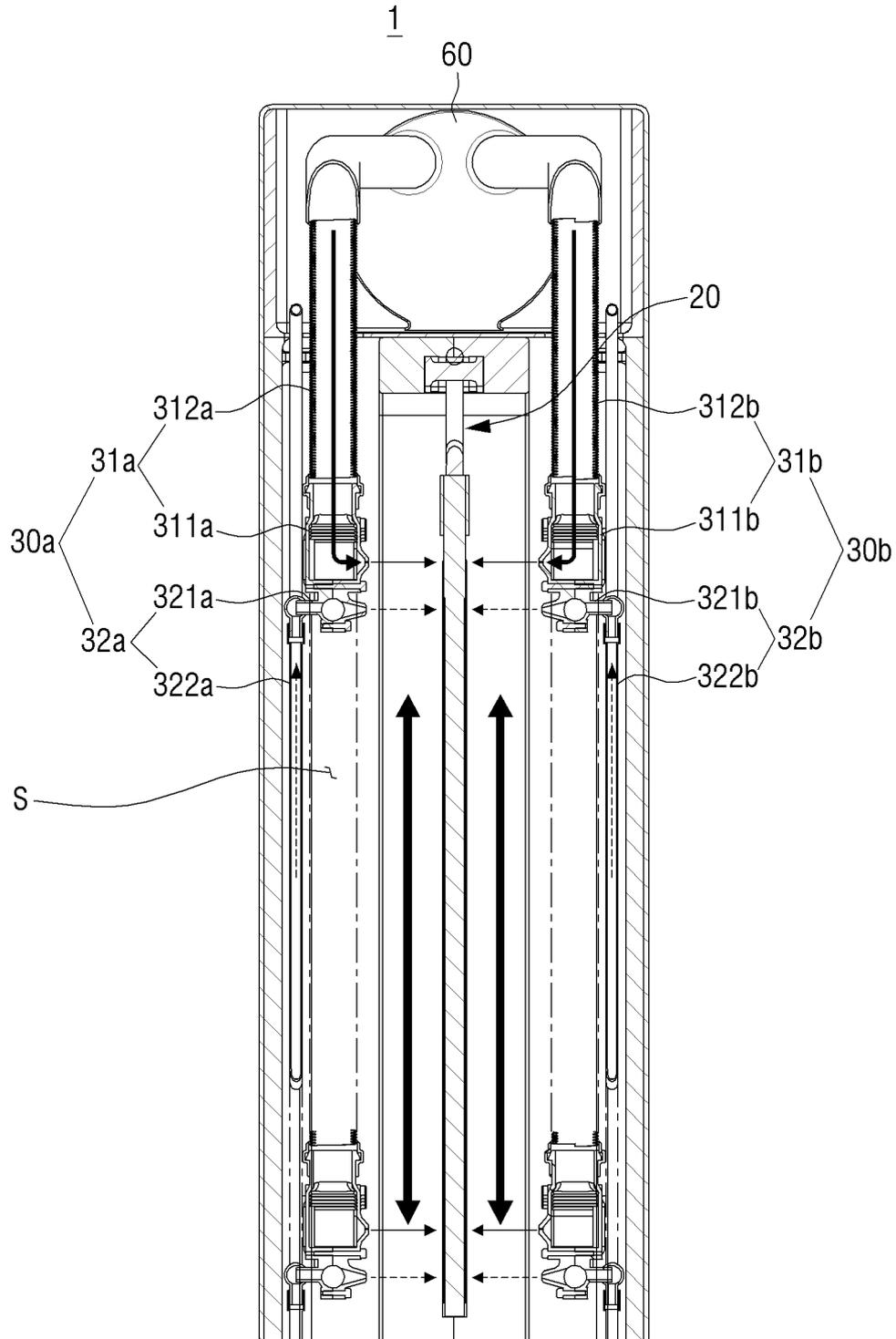


FIG. 5

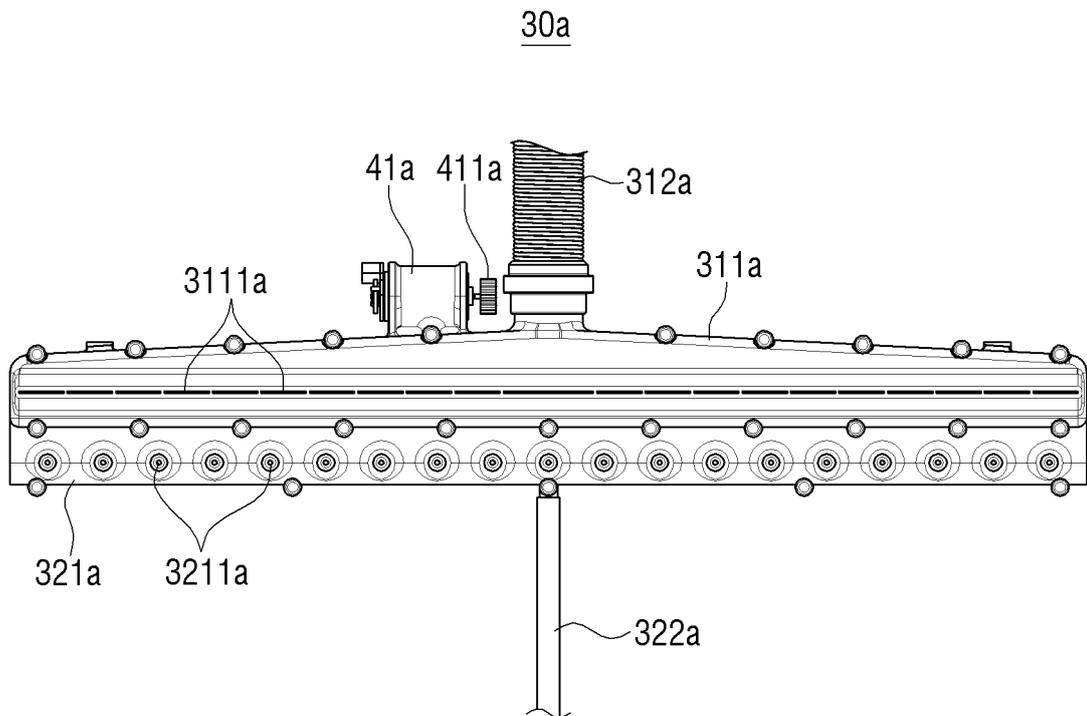


FIG. 6

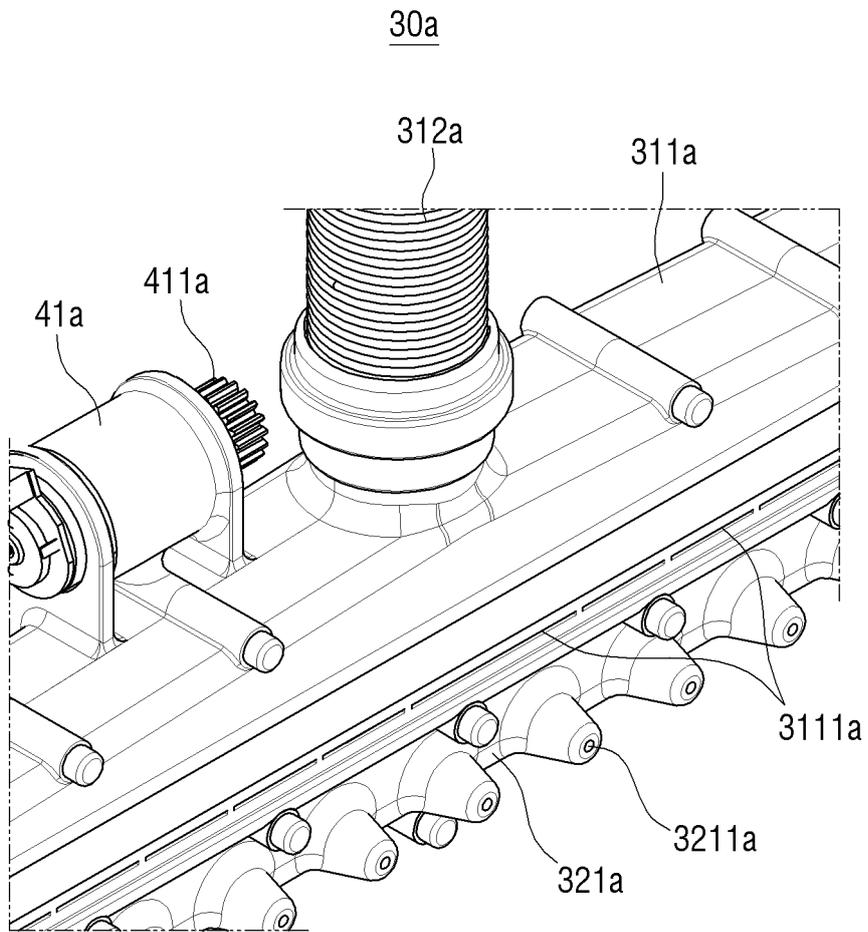


FIG. 7

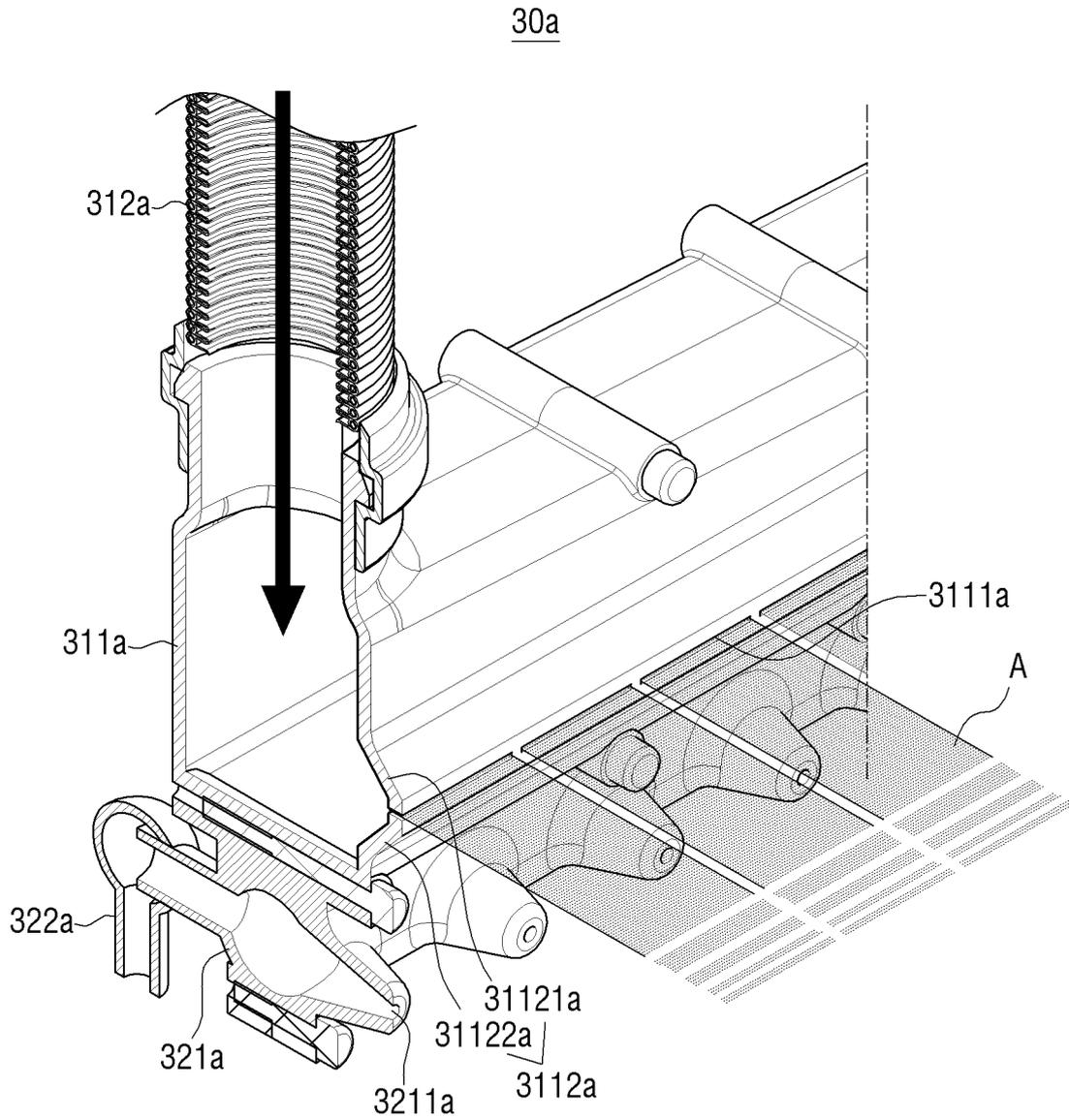


FIG. 8

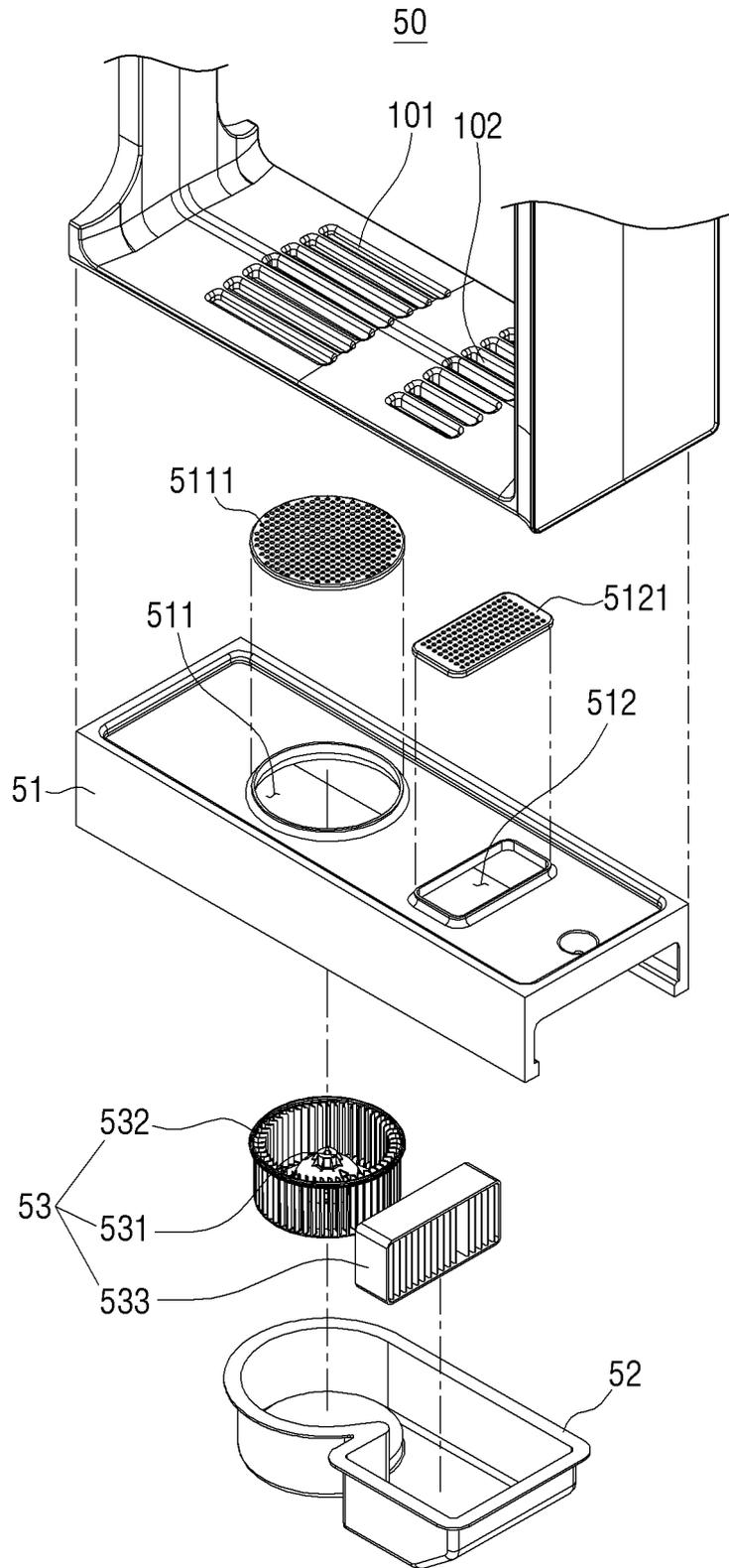
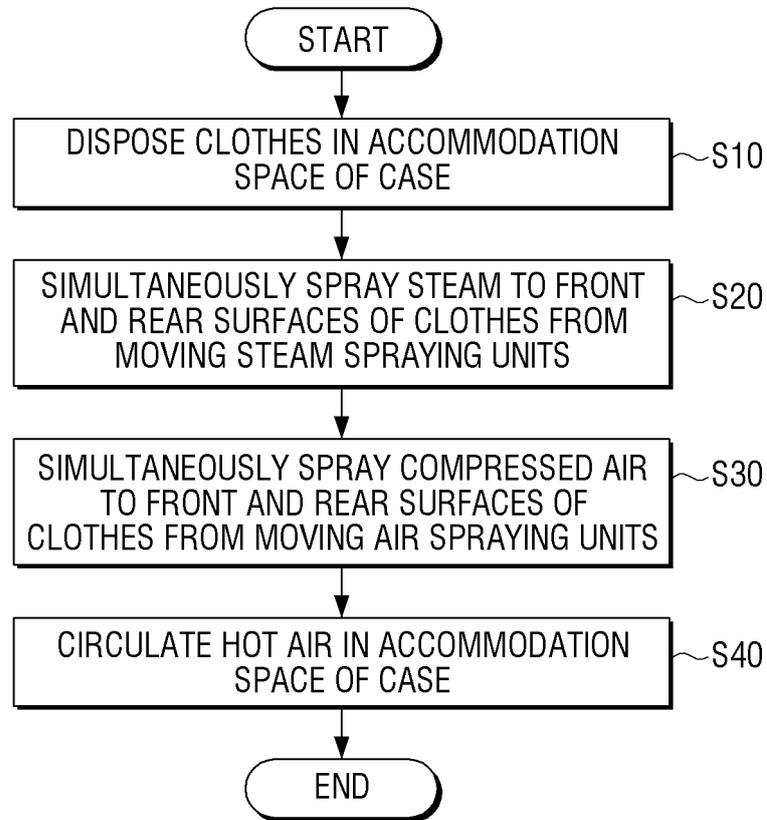


FIG. 9



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2017/010976

5	A. CLASSIFICATION OF SUBJECT MATTER <i>D06F 35/00(2006.01)i, D06F 58/10(2006.01)i, D06F 58/26(2006.01)i, D06F 33/02(2006.01)i, D06F 58/28(2006.01)i, D06F 59/02(2006.01)i, D06F 73/00(2006.01)i</i> According to International Patent Classification (IPC) or to both national classification and IPC	
	B. FIELDS SEARCHED	
10	Minimum documentation searched (classification system followed by classification symbols) D06F 35/00; D06F 33/02; D06F 58/20; D06F 59/00; D06F 58/10; B08B 3/02; D06F 58/26; D06F 58/28; D06F 59/02; D06F 73/00	
	Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Korean Utility models and applications for Utility models: IPC as above Japanese Utility models and applications for Utility models: IPC as above	
15	Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) eKOMPASS (KIPO internal) & Keywords: clothing-processing device, air spray, steam spray, compressed air, shifter, cabinet	
	C. DOCUMENTS CONSIDERED TO BE RELEVANT	
20	Category*	Citation of document, with indication, where appropriate, of the relevant passages
		Relevant to claim No.
25	Y	KR 10-2012-0074557 A (SAMSUNG ELECTRONICS CO., LTD.) 06 July 2012 See paragraphs [0003], [0034]-[0037], [0046]-[0047], [0053], [0066] and [0079]; claims 1 and 11; and figures 1-2.
30	Y	KR 10-1608655 B1 (LG ELECTRONICS INC.) 04 April 2016 See paragraphs [0028], [0035]-[0036], [0063], [0068], [0070]-[0074]; and figures 2-4, 10.
35	Y	KR 10-2011-0099912 A (LG ELECTRONICS INC.) 09 September 2011 See paragraphs [0013], [0015]-[0020] and [0024]-[0025]; and figures 1-2.
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45	A	KR 10-2014-0124240 A (LG ELECTRONICS INC.) 24 October 2014 See paragraph [0017]; claim 12; and figure 1.
50	A	KR 10-2014-0032821 A (PARK, Sung-Soo) 17 March 2014 See paragraphs [0011] and [0014]-[0017]; and claims 1-2.
55	<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.	
	* Special categories of cited documents:	“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
	“A” document defining the general state of the art which is not considered to be of particular relevance	“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
	“E” earlier application or patent but published on or after the international filing date	“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
	“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	“&” document member of the same patent family
	“O” document referring to an oral disclosure, use, exhibition or other means	
	“P” document published prior to the international filing date but later than the priority date claimed	
50	Date of the actual completion of the international search 26 DECEMBER 2017 (26.12.2017)	Date of mailing of the international search report 26 DECEMBER 2017 (26.12.2017)
55	Name and mailing address of the ISA/KR Korean Intellectual Property Office Government Complex-Daejeon, 189 Seonsa-ro, Daejeon 302-701, Republic of Korea Facsimile No. +82-42-481-8578	Authorized officer Telephone No.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

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