



US00RE49371E

(19) **United States**
(12) **Reissued Patent**
Ahn et al.

(10) **Patent Number:** **US RE49,371 E**
(45) **Date of Reissued Patent:** ***Jan. 17, 2023**

(54) **FABRIC TREATING APPARATUS**

(71) Applicant: **LG ELECTRONICS INC.**, Seoul
(KR)

(72) Inventors: **Jaehyun Ahn**, Seoul (KR); **Youngjin Doh**, Seoul (KR); **Sunyoung Kim**, Seoul (KR)

(73) Assignee: **LG ELECTRONICS INC.**, Seoul
(KR)

(*) Notice: This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/797,762**

(22) Filed: **Feb. 21, 2020**

Related U.S. Patent Documents

Reissue of:

(64) Patent No.: **10,138,586**
Issued: **Nov. 27, 2018**
Appl. No.: **14/972,454**
Filed: **Dec. 17, 2015**

U.S. Applications:

(63) Continuation of application No. 16/797,187, filed on Feb. 21, 2020, which is an application for the reissue of Pat. No. 10,138,586.

(30) Foreign Application Priority Data

Dec. 19, 2014 (KR) 10-2014-0184787

(51) **Int. Cl.**
D06F 58/20 (2006.01)
D06F 25/00 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC **D06F 58/203** (2013.01); **D06F 25/00** (2013.01); **D06F 39/008** (2013.01); **D06F 58/10** (2013.01); **D06F 58/20** (2013.01); **D06F 58/206** (2013.01)

(58) Field of Classification Search

CPC D06F 58/203; D06F 39/008; D06F 58/10;
D06F 58/20; D06F 25/00; D06F 58/206
See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

5,146,693 A * 9/1992 Dottor D06F 58/24
34/604
5,305,484 A 4/1994 Fitzpatrick et al.
(Continued)

FOREIGN PATENT DOCUMENTS

CN 102733160 10/2012
DE 202012103881 1/2013
(Continued)

OTHER PUBLICATIONS

U.S. Office Action dated Mar. 15, 2022 issued in U.S. Appl. No. 16/797,725.

(Continued)

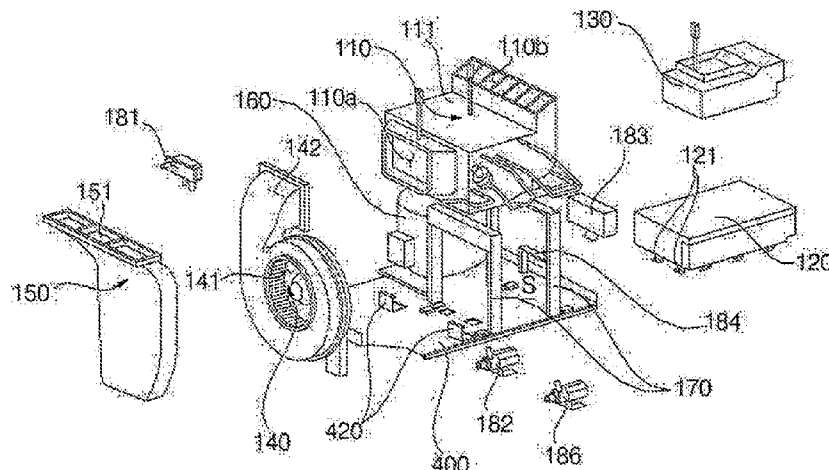
Primary Examiner — Krisanne M Jastrzab

(74) *Attorney, Agent, or Firm* — KED & Associates, LLP

(57) ABSTRACT

A fabric treating apparatus includes a casing that includes a treating chamber and a machinery room that is located below the treating chamber. The fabric treating apparatus further includes a base that is located at a bottom of the machinery room. The fabric treating apparatus further includes a heat pump module that is configured to condition air supplied to the treating chamber. The fabric treating apparatus further includes at least one supporter that is configured to support the heat pump module and that defines a space between the base and the heat pump module. The fabric treating apparatus further includes a steam generating module that is located in the space and that is configured to generate steam and supply steam to the treating chamber. The fabric treating apparatus further includes a controller

(Continued)



that is configured to control at least one of the heat pump module or the steam generating module.

20 Claims, 7 Drawing Sheets

(51) **Int. Cl.**

D06F 39/00 (2020.01)

D06F 58/10 (2006.01)

(56)

References Cited

U.S. PATENT DOCUMENTS

5,685,623 A * 11/1997 Katz D06F 39/12
312/263
6,381,874 B1 * 5/2002 Floyd D06F 58/04
34/250
8,468,718 B2 6/2013 Favret et al.
2001/0015918 A1 8/2001 Bhatnagar
2008/0155757 A1 7/2008 Kim et al.
2009/0158784 A1 6/2009 Kim
2010/0132130 A1 * 6/2010 Moon D06F 58/10
8/137
2010/0218566 A1 9/2010 Moon et al.
2011/0030147 A1 * 2/2011 Yoo D06F 58/10
8/137
2012/0247157 A1 * 10/2012 Park D06F 58/203
68/4

FOREIGN PATENT DOCUMENTS

EP 0 821 096 1/1998
EP 2 514 863 10/2012
EP 2 514 865 10/2012
JP S39843 1/1964
JP H1-165808 11/1989
JP H5-154299 6/1993
JP H8-126798 5/1996
JP S52-109659 8/1997

JP H 11-300088 11/1999
JP 2005-253589 9/2005
JP 2008-264165 11/2008
JP 2011-136074 7/2011
JP 2012-52571 3/2012
JP 2013-252240 12/2013
JP 2014-140463 8/2014
KR 10-0782375 12/2007
KR 10-0782377 12/2007
KR 10-2008-0081497 9/2008
KR 10-2009-0013981 2/2009
KR 10-2009-0016917 2/2009
KR 10-2009-0069755 7/2009
KR 10-2009-0102402 9/2009
KR 10-2011-0019095 2/2011
KR 10-2011-0067834 6/2011
KR 10-2011-0067887 6/2011
KR 10-1120902 4/2012
KR 10-2012-0074557 7/2012
KR 10-2014-0108454 9/2014
KR 10-1435823 9/2014
KR 10-2014-0124240 10/2014

OTHER PUBLICATIONS

Extended European Search Report issued in European Application No. 15201313.2 on Apr. 25, 2016, 8 pages.
United States Office Action dated Jul. 13, 2021 issued in co-pending related Application No. 16/797,892.
U.S. Appl. No. 16/797,187, filed Feb. 21, 2020.
U.S. Appl. No. 16/797,725, filed Feb. 21, 2020.
U.S. Appl. No. 16/797,836, filed Feb. 21, 2020.
U.S. Appl. No. 16/797,864, filed Feb. 21, 2020.
U.S. Appl. No. 16/797,892, filed Feb. 21, 2020.
Korean Office Action dated May 30, 2022 issued in KR Application No. 10-2022-0024508.
International Search Report and Written Opinion in International Application No. PCT/KR2015/013987, dated Apr. 18, 2016, 8 pages.
Japanese Office Action in Japanese Application No. 2017-532995, dated Jul. 17, 2018, 5 pages.

* cited by examiner

FIG. 1

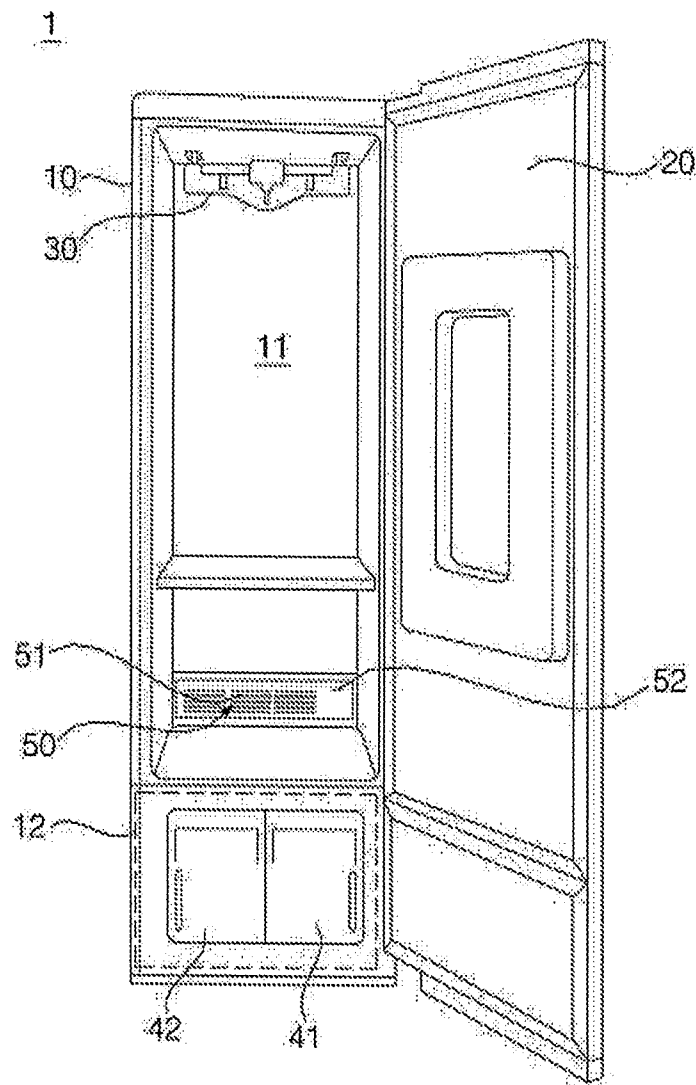


FIG. 2

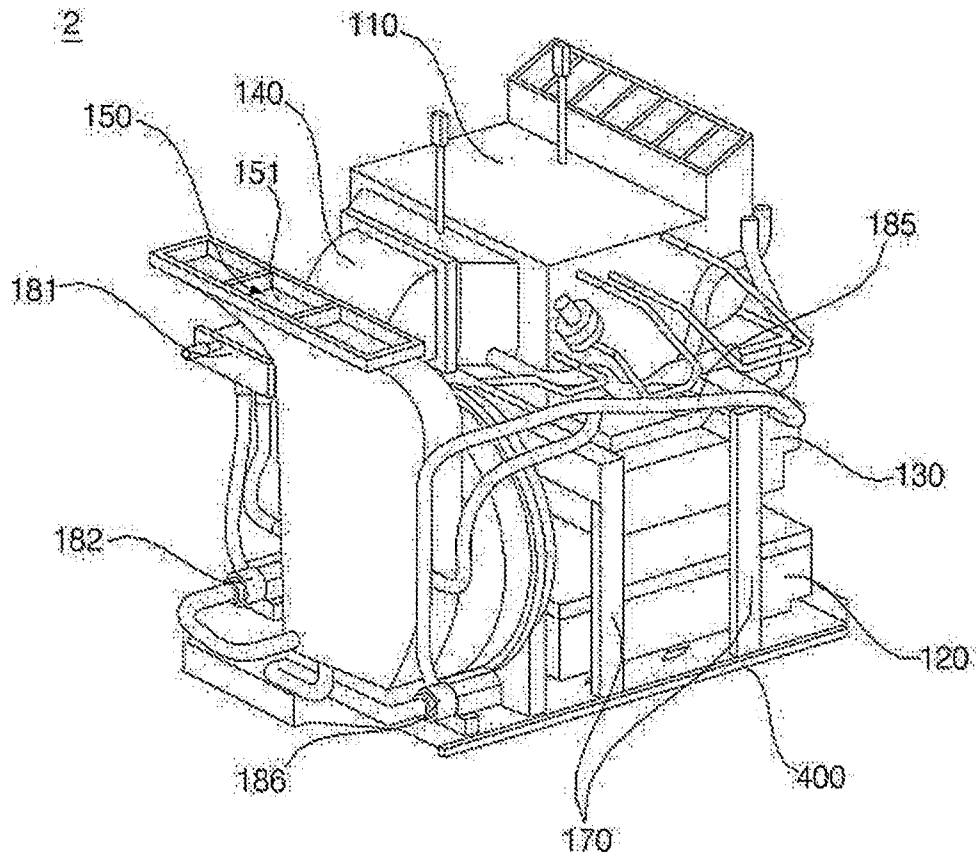
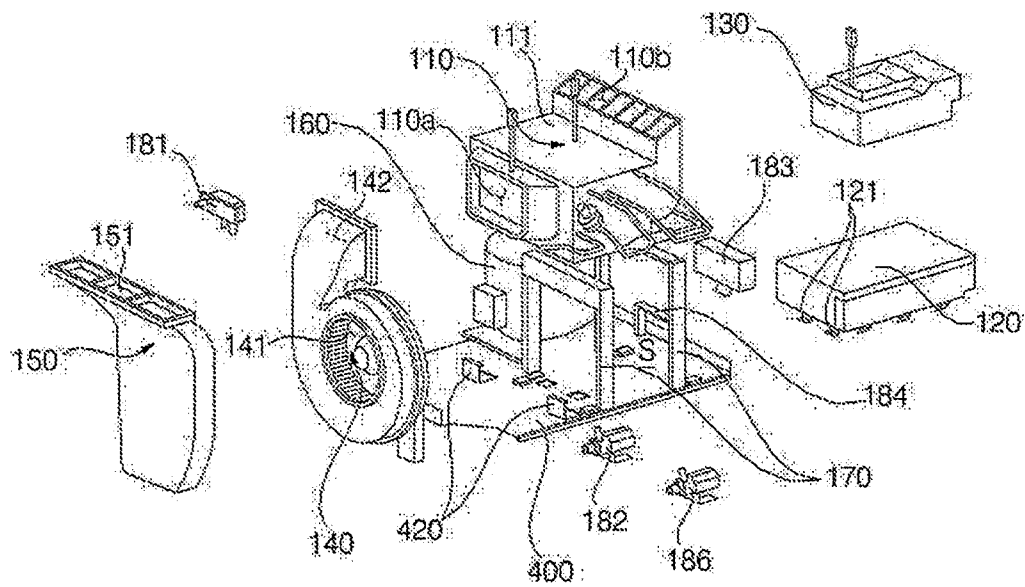


FIG. 3



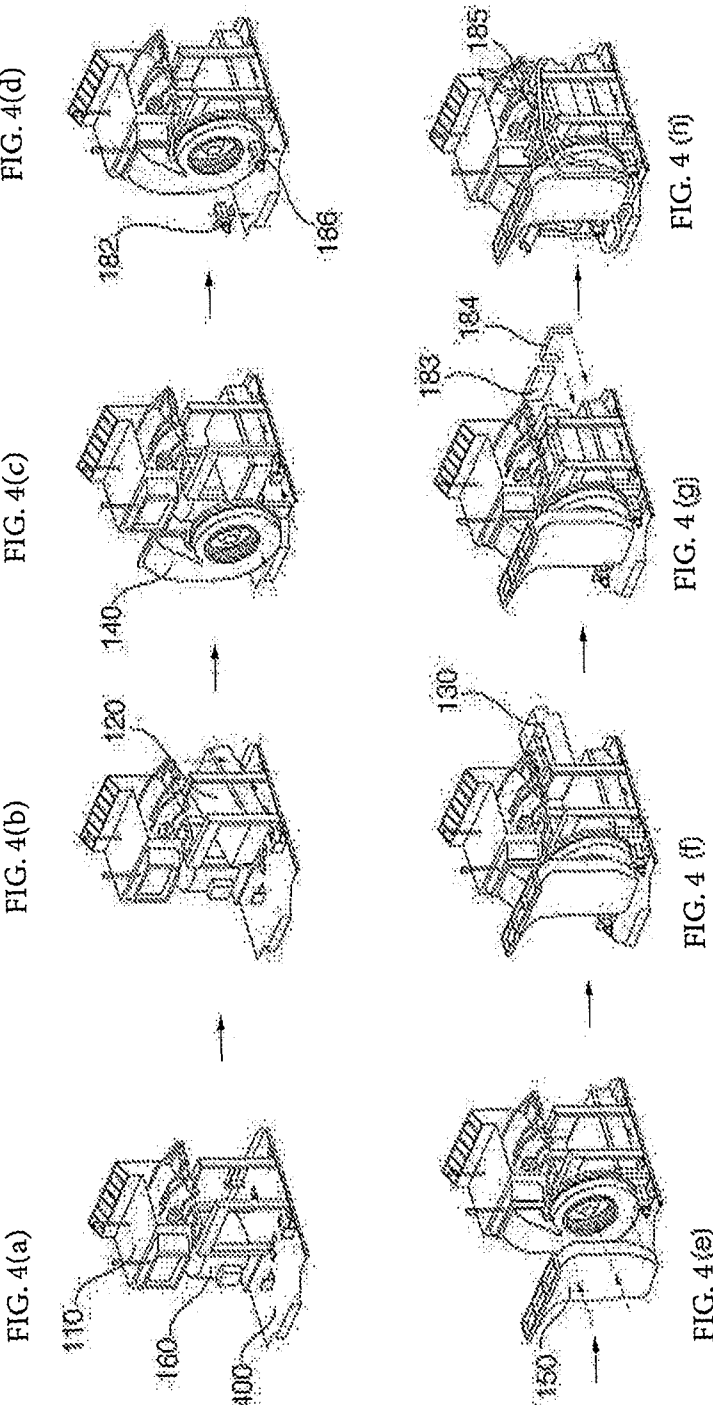


FIG. 5(a)

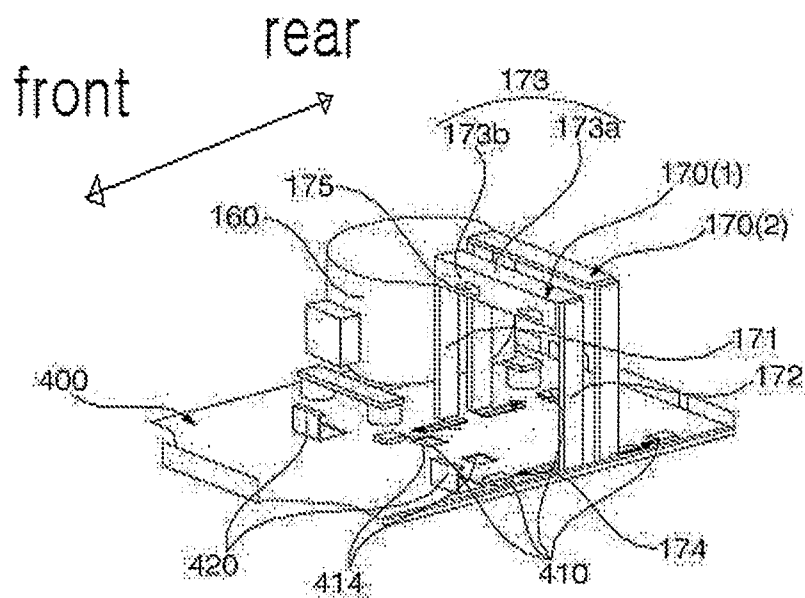


FIG. 5(b)

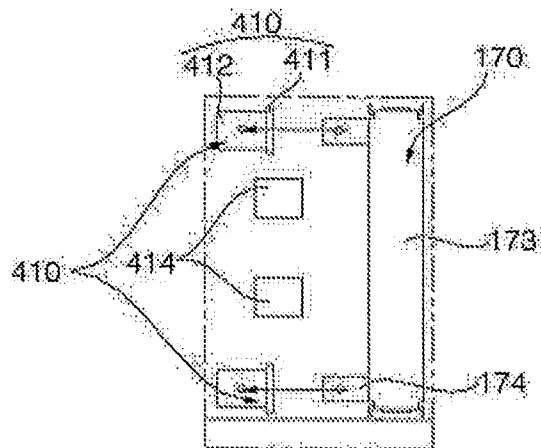


FIG. 6(a)

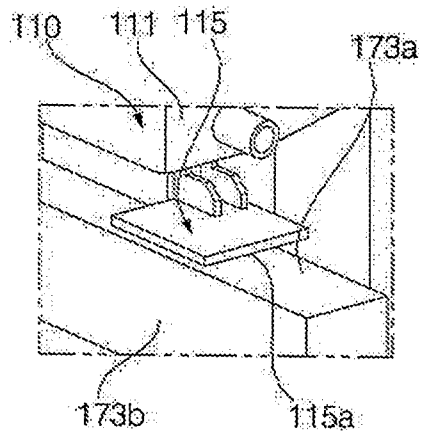
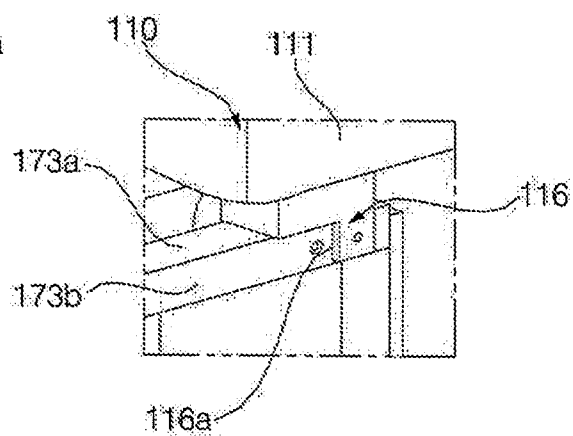
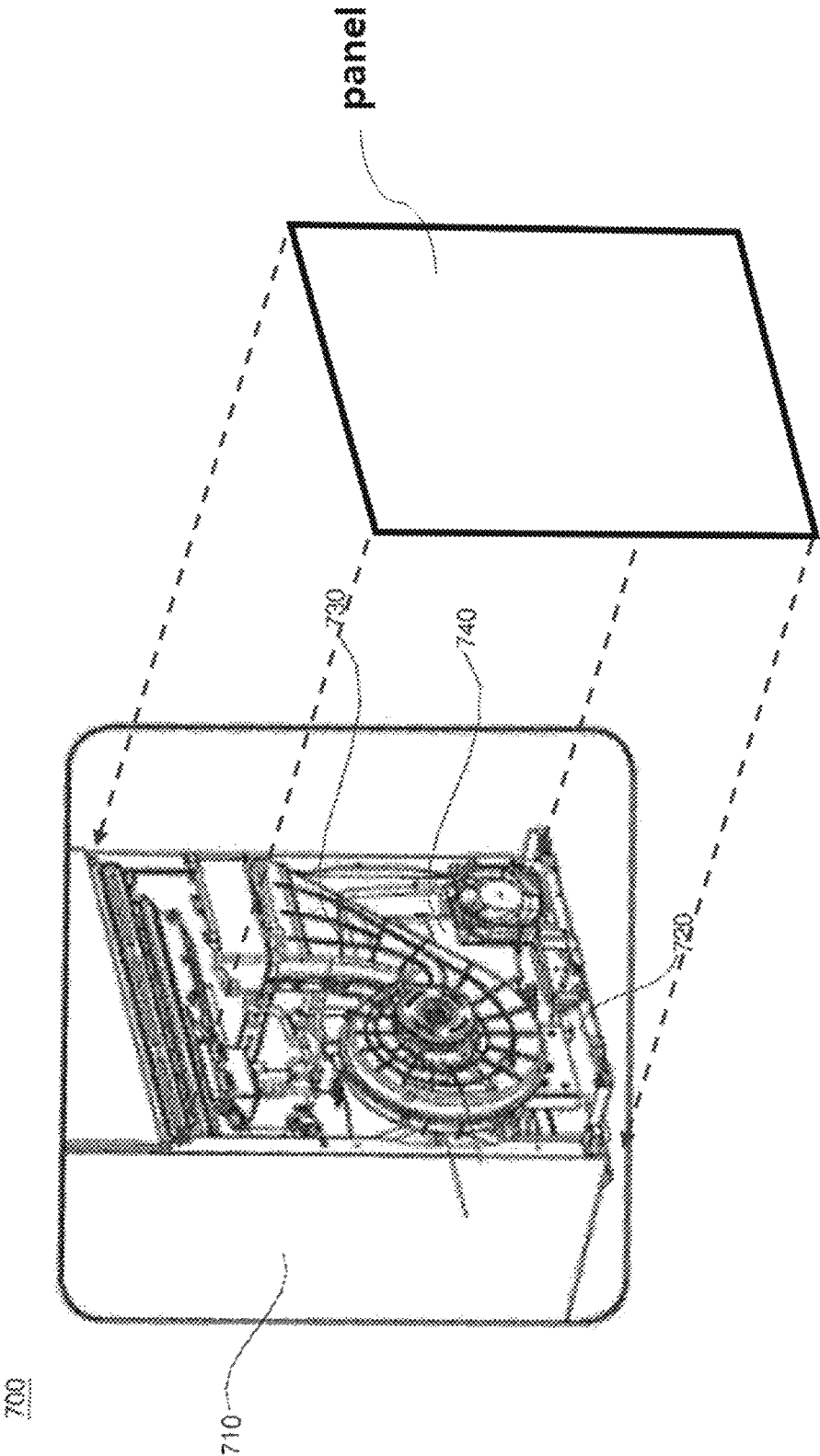


FIG. 6(b)



Prior Art

AMENDED FIG. 7



FABRIC TREATING APPARATUS

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue; a claim printed with strikethrough indicates that the claim was canceled, disclaimed, or held invalid by a prior post-patent action or proceeding.

CROSS-REFERENCE TO RELATED APPLICATION

This application is a *Continuation Reissue of Reissue application Ser. No. 16/797,187 filed Feb. 21, 2020, which is a Reissue of U.S. Pat. No. 10,138,586, filed on Dec. 17, 2015 and issued on Nov. 27, 2018 and which claims priority under 35 U.S.C. § 119 to Korean Patent Application No. 10-2014-0184787, filed on Dec. 19, 2014 in the Korean Intellectual Property Office, whose entire disclosure is incorporated herein by reference. More than one reissue application has been filed for the reissue of U.S. Pat. No. 10,138,586. The reissue application numbers are U.S. patent application Ser. No. 16/797,187 (filed on Feb. 21, 2020); U.S. patent application Ser. No. 16/797,725 (filed on Feb. 21, 2020); U.S. patent application Ser. No. 16/797,762 (filed on Feb. 21, 2020); U.S. patent application Ser. No. 16/797,836 (filed on Feb. 21, 2020 and now issued as U.S. Pat. No. RE48,900); U.S. patent application Ser. No. 16/797,864 (filed on Feb. 21, 2020 and now issued as U.S. Pat. No. RE49,131), and U.S. patent application Ser. No. 16/797,892 (filed on Feb. 21, 2020).*

FIELD

The present disclosure relates to a fabric treating apparatus.

BACKGROUND

A fabric treating apparatus refers to any device which is used at home or at a laundromat to manage clothes by washing, drying, and flattening the same.

For example, the fabric treating apparatus includes a washing machine, a drying machine, a washer-and-dryer, a refresher, a steamer for removing creases on fabric, and the like.

The refresher is designed to keep clothes in a clean and fresh condition, and, for this purpose, it sprays aroma to the fabric, prevents static electricity of the fabric, removes creases on the fabric, and the like.

A general iron removes creases on fabric by providing steam thereto. The steamer removes creases without heating the clothes.

A fabric treating apparatus having the functions of the refresher and the steamer is able to remove creases and unpleasant odors of fabric by using steam and heated air.

SUMMARY

According to an innovative aspect of the subject matter described in this application, a fabric treating apparatus includes a casing that includes a treating chamber that is configured to receive clothes; and a machinery room that is located below the treating chamber; a base that is located at a bottom of the machinery room; a heat pump module that is configured to condition air supplied to the treating cham-

ber; at least one supporter that is configured to support the heat pump module and that defines a space between the base and the heat pump module; a steam generating module that is located in the space and that is configured to generate steam and supply steam to the treating chamber; and a controller that is configured to control at least one of the heat pump module or the steam generating module, the controller being located in the space below the steam generating module.

The fabric treating apparatus may include one or more of the following optional features. The at least one supporter includes legs that are fixed to the base; and a shelf that is supported by the legs, where the heat pump module is supported by the shelf. The at least one supporter includes a supporter fixing tab that includes a surface that faces the base and that is located at a lower part of at least one of the legs, and the base includes a supporter fixing part that includes a supporter fastening hole that is configured to receive the supporter fixing tab. The supporter fixing tab is configured to slide into a pocket that is defined by the supporter fastening hole. A size of the pocket is about equal to a size of the supporter fixing tab. The fabric treating apparatus includes a first supporter that includes a first supporter fixing tab that is configured to slide into a first supporter fastening hole in a first direction; and a second supporter that includes a second supporter fixing tab that is configured to slide into a second supporter fastening hole in a second direction that is opposite the first direction.

The base includes a metal material, and the supporter fixing part includes a plastic material. The supporter fixing part is formed by cutting, about perpendicular to a direction in which the supporter fixing tab is configured to insert, a portion of the base having a predetermined length and then upwardly pressing a predetermined peripheral area of the cut portion. The supporter fastening hole is formed through plastic deformation of the cut portion. The fabric treating apparatus includes a fastening member that is configured to couple the base and the at least one supporter and that vertically penetrates the supporter fixing part and the supporter fixing tab.

The casing includes an opening that is located at a rear side of the casing and that is configured to receive the controller, the heat pump module is located above the controller, and the fabric treating apparatus further includes a blower that is configured to blow air into an interior of the heat pump module. The fabric treating apparatus includes a panel that is detachably coupled to the casing and that is configured to close the opening. The blower is located in front of the at least one supporter. The blower is coupled to the base. The base includes a blower installation tab that protrudes from the base and that is configured to couple to the blower. The fabric treating apparatus includes an air intake duct that is configured to guide air into the blower and that is located in front of the blower.

The air intake duct is fixed to at least one of the blower or the base. A ~~stream~~ steam generating module fixing tab is located at one of the steam generating module or the supporter, and an installation hole is configured to receive the steam generating module fixing tab and is located at another of the steam generating module or the supporter opposite the steam generating module fixing tab. The at least one supporter includes a pair of supporters that are spaced apart from each other and that are about perpendicular to a front and rear direction of the base, the installation hole is located on one of the pair of the supporters, and the steam generating module is coupled, by the fastening member, to another one of the pair of the supporters opposite the

installation hole, and the steam generating module fixing tab is inserted into the installation hole. The controller includes at least one controller fixing tab that is configured to slide into a controller fixing hole that is located at the base.

The subject matter described in this application aims to provide a fabric treating apparatus in which devices in a machinery room is configured to facilitate maintaining and repairing the devices.

In addition, the subject matter described in this application aims to provide a fabric treating apparatus that includes a machinery room that is arranged so that a user can remove a particular device without removing other devices.

Further, the subject matter described in this application aims to provide a fabric treating apparatus of which a controller, a steam generating module, and a heat pump module are capable of being independently removed from a machinery room

Moreover, the subject matter described in this application aims to provide a fabric treating device with improved space utilization of a machinery room.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view illustrating a fabric treating apparatus.

FIG. 2 is a diagram illustrating an example device assembly installed in an example machinery room.

FIG. 3 is an exploded perspective view illustrating an example device assembly.

FIGS. 4(a)-(h) show a procedure of how to assemble an example device assembly.

FIGS. 5(a) and (b) are diagrams illustrating an example structure in which a supporter is mounted on a base.

FIGS. 6(a) and (b) are diagrams illustrating an example installation structure of a heat pump module.

FIG. 7 is a diagram illustrating an example machinery room of an example fabric treating apparatus.

DETAILED DESCRIPTION

FIG. 1 illustrates an example fabric treating apparatus. FIG. 2 illustrates an example device assembly installed in an example machinery room. FIG. 3 illustrates an example device assembly. FIGS. 4(a)-(h) illustrate an example assembly of an example device assembly. FIGS. 5(a) and (b) illustrate an example structure in which a supporter is mounted on a base. FIGS. 6(a) and (b) illustrate an example installation structure of a heat pump module.

Referring to FIGS. 1 to 6, a fabric treating apparatus 1 includes a casing 10 forming an open front treating chamber 11, and a door 20 for closing the open front of the treating chamber 11.

A hanger rod 30 on which clothes hangers are to be hung is provided in an upper part of the treating chamber 11. The hanger rod 30 may be configured to move in a back and forth, up and down and/or right and left direction in the treating chamber 11 by a driving device, such as a motor. In some implementations, such movement is a reciprocating motion with a predetermined cycle.

A machinery room 12 may be provided outside the treating chamber 11 (e.g., below the treating chamber 11) within the casing 10, and various devices, such as a heat pump module 110, a controller 120, and a steam generating module 130, may be disposed in the machinery room 12. In some implementations, the casing 10 may include a base 400 which defines a bottom of the machinery room 12. The base 400 may be formed with a metal sheet.

An air outlet 51 discharging air blown by a blower 140 into the treating chamber 11, and a steam outlet 52 discharging steam generated by a [stream] steam generating module 130 may be formed in the lower part of the treating chamber 11. In some implementations, the air outlet 51 and the steam outlet 52 are formed as one body on a low panel 50 which defines a lower part of the treating chamber 11.

The steam generating module 130 is a device which generates steam. The steam generating module 130 may include a heater for applying heat to water. Steam generated according to an operation of the heater may be guided to the steam outlet 52 via a predetermined steam supply path.

A water supply tank 41 for storing water to be supplied to the steam generating module 130 may be disposed in the lower part of the treating chamber 11. The water supply tank 41 may be detachably coupled to the casing 10. A user may fill the water supply tank 41 with water after detaching the water supply tank 41 from the casing 10.

A sump may be disposed in the machinery room 12 to collect condensed water which is generated while steam generated by the steam generating module 130 moves along the steam supply path. The sump may be connected to the treating chamber 11 via a path. In some implementations, the condensed water on the bottom of the treating chamber 11 may be gathered in the sump.

A water drain pump 182 may be mounted on a base 400 to discharge the condensed water from the sump to a drain container 42. The drain container 42 may be detachably coupled to the casing 10. A user may detach the drain container 42 from the casing 10 and empty the drain container 42. The sump may be disposed in an inner low part of an air intake duct 150, and a nozzle module 181 may be further provided to discharge the condensed water stored in the sump to the drain container 42 via the water drain pump 182.

On the base 400, a water supply pump 186 may be mounted to supply water stored in the water supply tank 41 to the steam generating module 130. The water supply pump 186 may be connected to the steam generating module 130 via a water supply hose 185.

The heat pump module 110 is provided for air conditioning. The conditioned air is supplied to the treating chamber 11. The heat pump module 110 may be connected to the compressor 160 via a refrigerant line. The heat pump module 110 may include a condenser, an expansion valve, and an evaporator through which refrigerant passes in order when transferred via the refrigerant line.

Referring to FIG. 3, the heat pump module 110 may include a housing 111 forming an inner space where the condenser is housed. An air inlet 110a and an air outlet 110b may be formed in the housing 111. The air inlet 110a introduces air into the space where the condenser is housed, and the air outlet 110b discharges air being heat exchanged with the condenser. Not only the condenser, but also the evaporator may be housed in the housing 111.

The blower 140 is an air blowing device, and may include a fan which is rotated by a motor. A vent 142 discharging air blown by the fan is connected to the air inlet 110a of the housing 111. Accordingly, the air blown by the blower 140 is supplied to the housing 111 through the air inlet 110a, and the supplied air is heated by heat exchanging with the condenser. And the heated air is discharged through the air outlet 110b of the housing 111. In some implementations, the blower 140 is a centrifugal blower configured to guide the air, which is introduced through an opening 141 opened in

5

an axial direction of the fan (e.g., centrifugal fan), toward the vent **142** via a scroll-type path embracing the surroundings of the fan.

The air intake duct **150** guiding air toward the opening **141** of the blower **140** may be disposed in front of the blower **140**. The air intake duct **150** may be fixed by the blower **140**. In some implementations, the duct **150** may be fixed by the base **400**.

A blower installation tab **420** may be formed in the base **400**. The blower installation tab **420** may be formed by cutting a portion of the base **400** and bending the cut portion in a vertical direction. The blower **140** may be coupled to the blower installation tab **420** by a fastening member, such as a bolt and a screw.

The air intake duct **150** may include an air inflow path through which air passes. For efficient use of the inner space of the machinery room **12**, the air intake duct **150** may be extended upward from the opening **141** of the blower **140**. The air inflow path may have a width in a front-and-rear direction, which is smaller than a width in a left-and-right direction. The air intake duct **150** may have an opening **151** formed on a top surface thereof, and an outlet connected to the vent **142** of the blower **140**. Air inside the treating chamber **11** may be introduced through the opening **151**.

The supporter **170** supports the heat pump module **110**, and defines a predetermined space **S** below the heat pump module **110**. The space **S** may be formed between the support **170** and the base **400** below the heat pump module **110**. That is, as being supported by the supporter **170**, the heat pump module **110** is disposed in an upper side being spaced apart from the base **400**. The heat pump module **110** is spaced apart from the base **400**, thereby the space **S** is provided in the base **400**. Devices, for example, the steam generating module **130** and the controller **120**, are mounted in the space **S**.

A plurality of supporters **170** may be provided. In some implementations, a pair of supporters **170** are spaced apart from each other in a front-and-rear direction on the base **400**. The pair of supporters **170** may include supporter **170(1)**, **170(2)**. The supporter **170(1)** may locate further forward than the supporter **170(2)**.

Referring to FIG. 5, the supporter **170** may include at least two legs **171** and **172** which are fixed on the base **400**, and a shelf **173** which is extended in a lateral direction and supported by the legs **171** and **172**. A supporter fixing tab **174** having a surface facing the base **400** may be formed at a lower part of the legs **171** and **172**. As shown in (a) of FIG. 5, a supporter fixing part **410** may be formed in the base **400**. The supporter fixing part **410** has a fastening hole **411** into which the supporter fixing tab **174** is inserted in a front-and-rear direction of the fabric treating apparatus **1**.

The supporter fixing part **410** may be formed by cutting a portion having a predetermined length from the base **400** in a direction crossing a direction in which the supporter fixing tab **174** is inserted and then upwardly pressing a predetermined peripheral area **412** of the cut portion (e.g., the supporter fastening hole **411**).

With the supporter fixing tab **174** being inserted into the supporter fixing part **410** through the supporter fastening hole **411**, an upward movement of the supporter **170** is restrained as the supporter fixing tab **174** is retained by a bottom surface of the peripheral area **412** of the supporter fastening hole **411**.

At least two supporters **170** may be provided. In some implementations, as shown in FIG. 5, as the supporter **170(1)** disposed in front part of the base **400** moves forward, the supporter fixing tab **174** may be inserted into the

6

supporter fastening hole **411**. As the supporter **170(2)** disposed in rear part of the base **400** moves backward, the supporter fixing tab **174** may be inserted into the supporter fixing part **410** which is open toward the front direction. The base **400** and the supporter **170** may be coupled to each other by a fastening member, such as a screw or a bolt which penetrates the supporter fixing part **410** and the supporter fixing tab **174** in an up-and-down direction. The supporter **170** may be formed of a plastically deformable metal material. And the supporter fixing part may be formed by plastic working of the base.

By cutting and bending a metal plate according to a predetermined lay out, the supporter **170** may be formed to have the legs **171** and **172**, the supporter fixing tab **174**, and the shelf **173**, which are integrated in the supporter **170** as one body. In some implementations, the supporter **170** may be formed of a molded product of synthetic resin, or may be formed with two or more components coupled to one another.

The heat pump module **110** may be disposed on the shelf **173**. The shelf **173** may include a pair of side surfaces **173b** which faces front side and rear side, respectively, and a top surface **173a** connecting the pair of side faces **173b**. The shelf **173** may be formed by bending a metal plate at least twice.

Referring to FIG. 6, at least one connecting part **115** and **116** to be coupled to the shelf **173** may be formed in a lower part of the housing **111**. Referring to (a) of FIG. 6, the connecting part **115** may include a first contact surface **115a** which contacts the top surface **173a** of the shelf **173**. The first contact surface **115a** is substantially parallel with the top surface **173a**. After the first contact surface **115a** is put on the top surface **173a** of the shelf **173**, the first contact surface **115a** and the top surface **173a** of the shelf **173** may be coupled to each other by a fastening member.

Referring to (b) of FIG. 6, the connecting part **116** may have a second contact surface **116a** which contacts the side surface **173b** of the shelf **173**. In some implementations, the second contact surface **116a** is vertically disposed corresponding to the side surface **173b**, and may be coupled to the side surface **173b** of the shelf **173** by a fastening member. In some implementations, the first contact surface **115a** is secured to the top surface **173a** of the supporter **170(1)**, and the second contact surface **116a** is secured to the side surface **173b** of the supporter **170(2)**.

The controller **120** controls various devices composing the fabric treating apparatus **1**, and may include a circuit substrate and electric components mounted on the circuit substrate. The heat pump module **110**, the steam generating module **130**, the blower **140** and/or the compressor **160** may be controlled by the controller **120**.

The circuit substrate is accommodated in a body which defines an exterior of the controller **120**. The controller **120** may be disposed in the space **S** between the supporter **170** and the base **400**. In some implementations, the controller **120** is disposed on the base **400**.

Referring to FIGS. 3, 4, and 5, a controller fixing tab **121** may be formed in a body of the controller **120**, and a controller fixing hole **414** into which the controller fixing tab **121** is inserted may be formed on the base **400**. The controller fixing tab **121** may be a plate which is extended forward or backward. With the controller fixing tab **121** being inserted into the controller fixing hole **414**, upward movement of the controller **120** may be restrained because the controller fixing tab **121** is retained by a bottom surface of the base **400**.

In some implementations, the controller fixing tab **121** projects in a forward direction from the body of the controller **120**, and may be inserted into or separated from the controller fixing hole **414** according to forward or backward movement of the controller **120** on the base **400**.

An opening (see FIG. 7) may be formed on a rear side of the casing **10** allowing at least the controller **120** to pass through. In some implementations, the opening is formed to allow even the heat pump module **110** and the steam generating module **130** to pass through.

In some implementations, the casing **10** may include a panel closing the opening, and the panel may be detachably coupled to the casing **10**.

When the controller **120** is installed in the base **400** or detached from the base **400** for maintenance, the controller **120** may be transferred into or from the machinery room **120** through the opening. In some implementations, where the heat pump module **110** is disposed above the controller **120** and the blower **140** is disposed in front of the controller **120**, the blower **140** or the controller **120** may not cause a problem when an attempt is made to detach the controller **120**, so that the controller **120** may be drawn out from the machinery room **12** without detaching the blower **140** from the device assembly **2**, and thus, facilitating repairing or replacing the controller **120**.

The steam generating module **130** may be disposed inside the space **S**, and, in some implementations, above the controller **120**. The steam generating module **130** may be fixed by the supporter **170**. One of the steam generating module **130** and the supporter **170** may have a steam generating module fixing tab formed thereon, the other one may have an installation hole **175** (see FIG. 5) into which the steam generating module fixing tab is inserted. The steam generating module installation hole **175** may be formed on at least one of a pair of the supporters **170**. In some implementations, the installation hole **175** is formed on the supporter **170(1)**.

The steam generating module installation hole **175** may be formed on the side surface **173b** of the shelf **173**. With the steam generating module fixing tab being inserted into the steam generating module installation hole **175**, the steam generating module **130** is temporarily installed in the supporter **170**. Then, being temporarily installed in the supporter **170(1)**, the steam generating module **130** may be secured to the supporter **170(2)** by a fastening member.

Hereinafter, referring to FIG. 4, there is a procedure of how to assemble the device assembly **2**. In FIG. 4, a dotted line indicates a location and a direction in which a fastening member is secured. As shown in (a) of FIG. 4, when the compressor **160** is mounted on the base **400**, the heat pump module **110** may be mounted on the supporter **170**. The connection part **115** and **116** of the heat pump module **110** is fixed onto the shelf **173** by a fastening member. A refrigerant pipe which guides refrigerant may be connected between the compressor **160** and the heat pump module **110**.

Referring to (b) of FIG. 4, the controller **120** may be inserted into the space **S** below the supporter **170** and mounted on the base **400**. After the controller **120** is placed at a right position by inserting the controller fixing tab **121** into the controller fixing hole **414**, the controller **120** and the base **400** may be secured by a fastening member.

Referring to (c) of FIG. 4, the blower **140** may be mounted in front of the supporter **170**. The blower **140** may be secured to a blower installation tab **420** by a fastening member.

Referring to (d) of FIG. 4, a water drain pump **182** and a water supply pump **186** may be mounted on the base **400**.

One of the water drain pump **182** and the water supply pump **186** may be disposed on one side of the blower **140**, and the other one may be disposed on the opposite side thereof.

Referring to (e) of FIG. 4, the air intake duct **150** may be mounted in front of the blower **140**. A pin extended in a front-and-rear direction may be formed on any one of the blower **140** and the air intake duct **150**, and a pin hole into which the pin is inserted may be formed on the other one. After the air intake duct **150** is placed in a right position due to insertion of the pin into the pin hole, the air intake duct **150** and the blower **140** may be coupled to each other by a fastening member.

Referring to (f) of FIG. 4, after the steam generating module **130** is inserted into the space **S** below the supporter **170**, the steam generating module fixing tab formed on the steam generating module **130** is inserted into the installation hole **175**, so that the steam generating module **130** may be placed at a right position and then the steam generating module **130** and the supporter **170** may be coupled to each other by a fastening member. The fastening member may be coupled to the supporter **170(2)** so as to facilitate detaching the steam generating module **130** through an opening formed on the rear surface of the casing **10** for maintenance and repair.

Referring to (g) of FIG. 4, a noise filter **183** and a handle **184**, which user holds to move the device assembly **2**, may be mounted on the base **400**. The noise filter **183** lets only necessary components in a signal input to the controller **120** to pass, and reduces noise components.

Referring to (h) of FIG. 4, the water supply hose **185** connecting the water supply pump **186** and the steam generating module **130**, a nozzle module, a hose connecting the nozzle module **181** and a sump, a hose connecting the nozzle module **181** and the water drain pump **182**, and any other various hoses may be connected to devices.

FIG. 7 is a diagram illustrating a machinery room of a conventional fabric treating apparatus. Referring to FIG. 7, a conventional fabric treating apparatus **700** has a machinery room below a casing **710**, wherein various devices are installed in the machinery room. The devices to be installed in the machinery room includes not only a blower **730** and a compressor **740** which are shown in FIG. 7, but also a [stream] steam generating module, a heat pump module, and a controller which are shown in FIG. 3. Among them, the [stream] steam generating module, the heat pump module and/or the controller are not able to be drawn out from the machinery room for maintenance or repair without removing other devices, because the [stream] steam generating module, the heat pump module and/or the controller interfere with as the blower **730**, the compressor **740**, and the like, as shown in FIG. 7.

What is claimed is:

[1. A fabric treating apparatus comprising:

a casing that comprises:

- a treating chamber that is configured to receive clothes; and
- a machinery room that is located below the treating chamber;

a base that is located at a bottom of the machinery room; a heat pump module that is configured to condition air supplied to the treating chamber;

at least one supporter (a) that includes a shelf (i) that is supported by legs that are fixed to the base and (ii) that supports the heat pump module and that defines a space (i) between the base and the heat pump module and (ii) below the shelf and (b) that includes a first supporter

9

fixing tab that includes a surface that faces the base and that is located at a lower part of at least one of the legs; a steam generating module that is located in the space and that is configured to generate steam and supply steam to the treating chamber; and a controller that is configured to control at least one of the heat pump module or the steam generating module, the controller being located in the space and below the steam generating module, wherein the base includes a first supporter fixing part that includes a first supporter fastening hole that is configured to receive the first supporter fixing tab.]

[2. The fabric treating apparatus of claim 1, wherein the first supporter fixing tab is configured to slide into a pocket that is defined by the first supporter fastening hole.]

[3. The fabric treating apparatus of claim 2, wherein a size of the pocket is about equal to a size of the first supporter fixing tab.]

[4. The fabric treating apparatus of claim 1, wherein: the at least one supporter comprises:

a first supporter that includes a second supporter fixing tab; and

a second supporter that includes the first supporter fixing tab,

the base comprises:

a second supporter fixing part that defines a second supporter fastening hole that is configured to receive the second supporter fixing tab,

the second supporter fixing tab is configured to slide into the second supporter fastening hole in a first direction, and

the first supporter fixing tab is configured to slide into the first supporter fastening hole in a second direction that is opposite the first direction.]

[5. The fabric treating apparatus of claim 1, wherein: the base comprises a metal material, and the first supporter fixing part comprises a plastic material.]

[6. The fabric treating apparatus of claim 5, wherein the first supporter fixing part is formed by cutting, about perpendicular to a direction in which the first supporter fixing tab is configured to insert, a portion of the base having a predetermined length and then upwardly pressing a predetermined peripheral area of the cut portion.]

[7. The fabric treating apparatus of claim 6, wherein the first supporter fastening hole is formed through plastic deformation of the cut portion.]

[8. The fabric treating apparatus of claim 5, comprising a fastening member that is configured to couple the base and the at least one supporter and that vertically penetrates the first supporter fixing part and the first supporter fixing tab.]

[9. The fabric treating apparatus of claim 1, wherein: the casing includes an opening that is located at a rear side of the casing and that is configured to receive the controller, the heat pump module is located above the controller, and the fabric treating apparatus further comprises a blower that is configured to blow air into an interior of the heat pump module.]

[10. The fabric treating apparatus of claim 9, further comprising:

a panel that is detachably coupled to the casing and that is configured to close the opening.]

[11. The fabric treating apparatus of claim 10, wherein the blower is located in front of the at least one supporter.]

[12. The fabric treating apparatus of claim 10, wherein the blower is coupled to the base.]

10

[13. The fabric treating apparatus of claim of claim 10, wherein the base comprises a blower installation tab that protrudes from the base and that is configured to couple to the blower.]

[14. The fabric treating apparatus of claim 12, further comprising:

an air intake duct that is configured to guide air into the blower and that is located in front of the blower.]

[15. The fabric treating apparatus of claim 14, wherein the air intake duct is fixed to at least one of the blower or the base.]

[16. The fabric treating apparatus of claim 1, wherein the controller includes at least one controller fixing tab that is configured to slide into a controller fixing hole that is located at the base.]

[17. A fabric treating apparatus comprising:

a casing that comprises:

a treating chamber that is configured to receive clothes; and

a machinery room that is located below the treating chamber;

a base that is located at a bottom of the machinery room; a heat pump module that is configured to condition air supplied to the treating chamber;

at least one supporter that includes a shelf (i) that is supported by legs that are fixed to the base and (ii) that supports the heat pump module and that defines a space (i) between the base and the heat pump module and (ii) below the shelf;

a steam generating module that is located in the space and that is configured to generate steam and supply steam to the treating chamber; and

a controller that is configured to control at least one of the heat pump module or the steam generating module, the controller being located in the space and below the steam generating module,

wherein a steam generating module fixing tab is located at one of the steam generating module or the at least one supporter, and

wherein the fabric treating apparatus defines an installation hole that is configured to receive the steam generating module fixing tab and that is located at another of the steam generating module or the at least one supporter opposite the steam generating module fixing tab.]

[18. The fabric treating apparatus of claim 17, wherein: the at least one supporter comprises a pair of supporters that are spaced apart from each other and that are about perpendicular to a front and rear direction of the base, the installation hole is located on one of the pair of the supporters, and

the steam generating module is coupled, by a fastening member, to another one of the pair of the supporters opposite the installation hole, and

the steam generating module fixing tab is inserted into the installation hole.]

19. A fabric treating apparatus comprising:

a casing that comprises:

an open front;

a treating chamber that is configured to receive clothes; a machinery room that is located below the treating chamber; and

an opening located at a rear side of the casing;

a door rotatably coupled to the casing and configured to open or close the open front of the casing;

11

a panel that is detachably coupled to the casing and configured to cover at least a portion of the rear side of the casing when coupled to the casing to cover the opening;

a base that is located at a bottom of the machinery room;

a heat pump module that is configured to condition air supplied to the treating chamber;

at least one supporter that includes a shelf (i) that is supported by legs that are fixed to the base and (ii) that supports the heat pump module and that defines a space (i) between the base and the heat pump module and (ii) below the shelf;

a steam generating module that is located in the space and that is configured to generate steam and supply steam to the treating chamber;

a blower that is located in front of the at least one supporter and is configured to blow air to the heat pump module to circulate air in the treating chamber, and

a controller that is configured to control at least one of the heat pump module, the blower, or the steam generating module,

wherein a steam generating module fixing tab is located at one of the steam generating module or the at least one supporter, and

wherein the fabric treating apparatus further comprises an installation hole that is configured to receive the steam generating module fixing tab and wherein the installation hole is located (i) at the steam generating module when the steam generating module fixing tab is located at the at least one supporter, or (ii) at the at least one supporter when the steam generating module fixing tab is located at the steam generating module.

20. The fabric treating apparatus of claim 19, wherein the controller is exposed to an outside or accessible when the panel is detached.

21. The fabric treating apparatus of claim 19, wherein the heat pump module is mounted on the shelf.

22. The fabric treating apparatus of claim 21, wherein the heat pump module is positioned between the blower and the rear side of the casing.

23. The fabric treating apparatus of claim 19, wherein the at least one supporter further includes a mount provided at a lower end of one of the legs, and the mount is configured to be fixed to the base.

24. The fabric treating apparatus of claim 23, wherein the legs, the shelf, and the mount are formed of a single piece of metal.

25. The fabric treating apparatus of claim 23, wherein the base includes a hole that is configured to fix the mount of the at least one supporter.

26. The fabric treating apparatus of claim 25, wherein the base comprises a metal material, and wherein the hole includes a portion of the base that is plastically deformed by being cut a prescribed length in a first direction that is substantially perpendicular to a second direction in which the mount is inserted and then upwardly pressed.

12

27. The fabric treating apparatus of claim 23, further comprising a fastener that is configured to be inserted through the mount and the base to fix the at least one supporter to the base.

28. The fabric treating apparatus of claim 19, wherein the base includes a blower installation tab that protrudes from the base and is configured to be coupled to the blower.

29. The fabric treating apparatus of claim 19, wherein the heat pump module includes a housing configured to define an inner space to house a condenser and an evaporator, an air inlet configured to introduce air into the inner space, and an air outlet configured to discharge air heat-exchanged in the heat pump module to the treating chamber, and wherein the housing includes at a least one contact surface configured to be coupled to the at least one supporter.

30. The fabric treating apparatus of claim 29, wherein the at least one contact surface of the housing of the heat pump module is configured to be coupled to the shelf.

31. The fabric treating apparatus of claim 30, wherein the contact surface of the housing of the heat pump module extends horizontally to be coupled to a horizontal surface of the shelf or extends vertically to be coupled to a vertical surface of the shelf.

32. The fabric treating apparatus of claim 19, wherein the controller is positioned at a rear side of the machinery room.

33. The fabric treating apparatus of claim 19, further comprising:

a sump that is positioned in front of the at least one supporter and is configured to collect condensed water in a steam supply path carrying steam generated by the steam generating module toward the treating chamber.

34. The fabric treating apparatus of claim 33, wherein the sump is further connected to the treating chamber and collects condensed water from the treating chamber.

35. The fabric treating apparatus of claim 33, further comprising:

a water drain pump located in front of the at least one supporter and configured to discharge water from the sump.

36. The fabric treating apparatus of claim 19, further comprising:

an air intake duct located in front of the at least one supporter and configured to guide air from the treating chamber to the blower.

37. The fabric treating apparatus of claim 19, further comprising:

a water supply pump located in front of the at least one supporter and configured to supply water to the steam generation module.

38. The fabric treating apparatus of claim 19, wherein: the at least one supporter comprises a pair of supporters that are spaced apart from each other and that are about perpendicular to a front and rear direction of the base, the installation hole is located on one of the pair of the supporters, and the steam generating module is coupled, by a fastening member, to another one of the pair of the supporters opposite the installation hole, and the steam generating module fixing tab is inserted into the installation hole.

* * * * *