

US00RE49100E

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

(10) **Patent Number:** **US RE49,100 E**  
(45) **Date of Reissued Patent:** **Jun. 7, 2022**

(54) **LAUNDRY TREATMENT APPARATUS**

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

(72) Inventors: **Jaemyung Lim**, Seoul (KR); **Wookjun Chung**, Seoul (KR); **Junghoi Choi**, Seoul (KR); **Byeongkook Kim**, Seoul (KR)

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

(21) Appl. No.: **16/129,098**

(22) Filed: **Sep. 12, 2018**

**Related U.S. Patent Documents**

Reissue of:

(64) Patent No.: **9,359,717**  
Issued: **Jun. 7, 2016**  
Appl. No.: **14/559,753**  
Filed: **Dec. 3, 2014**

U.S. Applications:

(63) Continuation of application No. 16/002,610, filed on Jun. 7, 2018, now Pat. No. Re. 48,255, which is an application for the reissue of Pat. No. 9,359,717.

(30) **Foreign Application Priority Data**

Dec. 5, 2013 (KR) ..... 10-2013-0150441

(51) **Int. Cl.**  
**D06F 71/36** (2006.01)  
**D06F 58/10** (2006.01)  
(Continued)

(52) **U.S. Cl.**  
CPC ..... **D06F 71/36** (2013.01); **D06F 58/10** (2013.01); **D06F 71/29** (2013.01); **D06F 73/02** (2013.01)

(58) **Field of Classification Search**

CPC ..... D06F 73/00; D06F 73/02; D06F 58/10;  
D06F 58/12; D06F 58/14; D06F 81/06;  
(Continued)

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

1,882,214 A 10/1932 Etten  
3,117,704 A 1/1964 McMillan  
(Continued)

**FOREIGN PATENT DOCUMENTS**

CN 1037557 11/1989  
CN 2123546 12/1992  
(Continued)

**OTHER PUBLICATIONS**

Japanese Office Action dated Aug. 9, 2018 issued in JP Application No. 2017-532881.

(Continued)

*Primary Examiner* — Terrence R Till

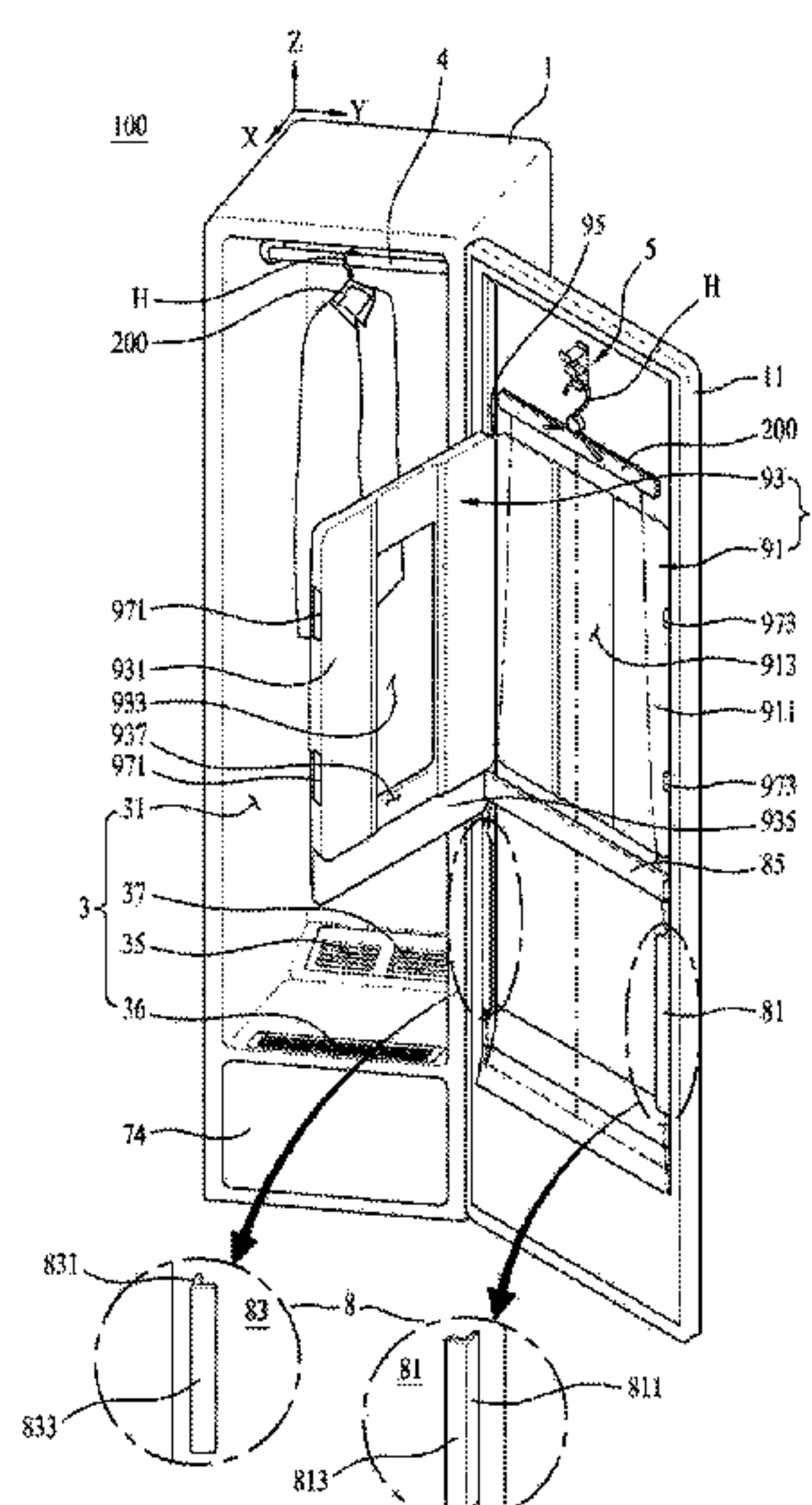
(74) *Attorney, Agent, or Firm* — Ked & Associates, LLP

(57) **ABSTRACT**

The laundry treatment apparatus includes a cabinet having a receiving space for reception of laundry, a feeder configured to feed at least one of air or moisture into the receiving space, a support structure placed in the receiving space, the support structure providing a support space to allow a surface of the laundry to be supported by the support space, a guide affixed in the receiving space, the guide being configured to set a movement range of the laundry to prevent the laundry from deviating from the support space, and a press structure separably coupled to the support structure, the press structure being configured to apply pressure to the laundry positioned in the support space.

**21 Claims, 4 Drawing Sheets**

Amended



(51) **Int. Cl.**  
*D06F 71/29* (2006.01)  
*D06F 73/02* (2006.01)  
(58) **Field of Classification Search**  
CPC ..... D06F 81/08; D06F 67/005; D06C 7/00;  
A47K 10/48  
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,203,122 A \* 8/1965 Sweatt ..... D06F 71/34  
108/35  
3,397,472 A 8/1968 Topliffe  
4,493,160 A \* 1/1985 Brembilla ..... D06F 73/02  
38/1 A  
5,305,484 A \* 4/1994 Fitzpatrick ..... D06F 73/02  
223/70  
5,474,216 A \* 12/1995 Harrod ..... D06F 71/08  
223/57  
5,815,961 A \* 10/1998 Estes ..... D06F 73/02  
223/67  
D597,272 S 7/2009 Auguste  
7,603,801 B2 10/2009 Jiang et al.  
9,309,618 B2 4/2016 Park et al.  
2002/0195914 A1 12/2002 Albaizar et al.  
2009/0064530 A1 3/2009 Moon et al.  
2009/0241269 A1 10/2009 Yoo et al.  
2012/0018461 A1 \* 1/2012 Azizian ..... D06F 73/02  
223/66  
2013/0097896 A1 4/2013 Moon et al.

FOREIGN PATENT DOCUMENTS

CN 2126854 2/1993  
CN 1170061 1/1998  
CN 1081702 3/2002  
CN 1346921 5/2002  
CN 1729332 2/2006  
CN 201738157 2/2011  
CN 104294529 1/2015  
CN 108193464 7/2020  
DE 2017394 10/1971  
EP 0 253 048 1/1988  
EP 0 324 589 7/1989  
EP 0 816 552 1/1998  
EP 0 816 552 A2 1/1998  
EP 1159 893 12/2001  
EP 2 322 707 5/2011  
EP 2 826 911 1/2015  
EP 2 826 911 A1 1/2015  
EP 2 889 426 7/2015  
JP 47-034352 5/1971  
JP S50-085866 7/1975  
JP 53-075638 11/1976  
JP 54-181183 6/1978  
JP S 63-82700 4/1988  
JP H 01-274799 11/1989  
JP H05-068795 3/1993  
JP 10-080331 3/1998

JP 11-128598 5/1999  
JP 2000-051585 2/2000  
JP 2002-177698 6/2002  
KR 10-2001-0113436 12/2001  
KR 10-0444005 11/2004  
KR 10-2008-0078367 8/2008  
KR 10-2011-0048344 11/2009  
KR 10-2010-0067780 6/2010  
KR 10-2011-0021167 3/2011  
KR 10-2012-0078278 7/2012  
KR 10-2012-0091799 8/2012  
KR 10-2013-0017029 2/2013  
KR 30-0704405 8/2013  
WO WO 02/052087 7/2002  
WO WO 2008/007200 1/2008  
WO WO 2008/007200 A1 1/2008  
WO WO2008007200 A1 \* 1/2008

OTHER PUBLICATIONS

Japanese Notice of Allowance dated Jul. 2, 2019 issued in JP Application No. 2017-532881.  
European Search Report dated Nov. 21, 2014 issued in Application No. 14176862.2.  
Chinese Office Action dated Dec. 3, 2015 issued in Application No. 201410340593.6.  
Chinese Office Action dated May 5, 2016 issued in Application No. 201410736887.0 (English translation attached).  
Extended European Search Report issued in European Application No. 15201190.4 dated Apr. 22, 2016, 11 pages.  
International Search Report and Written Opinion in International Application No. PCT/KR2015/014024, dated Apr. 20, 2016, 9 pages.  
United States Office Action dated Feb. 24, 2017 issued in U.S. Appl. No. 14/974,050.  
United States Office Action dated Aug. 10, 2015 issued in U.S. Appl. No. 14/332,161.  
Korean Office Action dated Mar. 26, 2019 issued in Application No. 10-2019-0014938.  
Korean Office Action dated Apr. 30, 2019 issued in Application No. 10-2013-0150441.  
United States Office Action dated May 27, 2020 issued in U.S. Appl. No. 16/150,515.  
United States Office Action dated Aug. 4, 2020 issued in co-pending related U.S. Appl. No. 16/150,401.  
Definition of “clip” from [://www.lexico.com/definition/clip](http://www.lexico.com/definition/clip) (Year: 2020).  
Korean Notice of Allowance dated Jun. 16, 2020 issued in KR Application No. 10-2020-0021152.  
United States Office Action dated Sep. 24, 2020 issued in U.S. Appl. No. 16/180,206.  
Japanese Office Action dated Sep. 15, 2020 issued in JP Application No. 2019-142078.  
Korean Office Action dated May 25, 2021 issued in Application No. 10-2020-0118935.  
European Search Report dated Jun. 2, 2015 issued in Application No. 14195999.9.

\* cited by examiner





## Figure 2

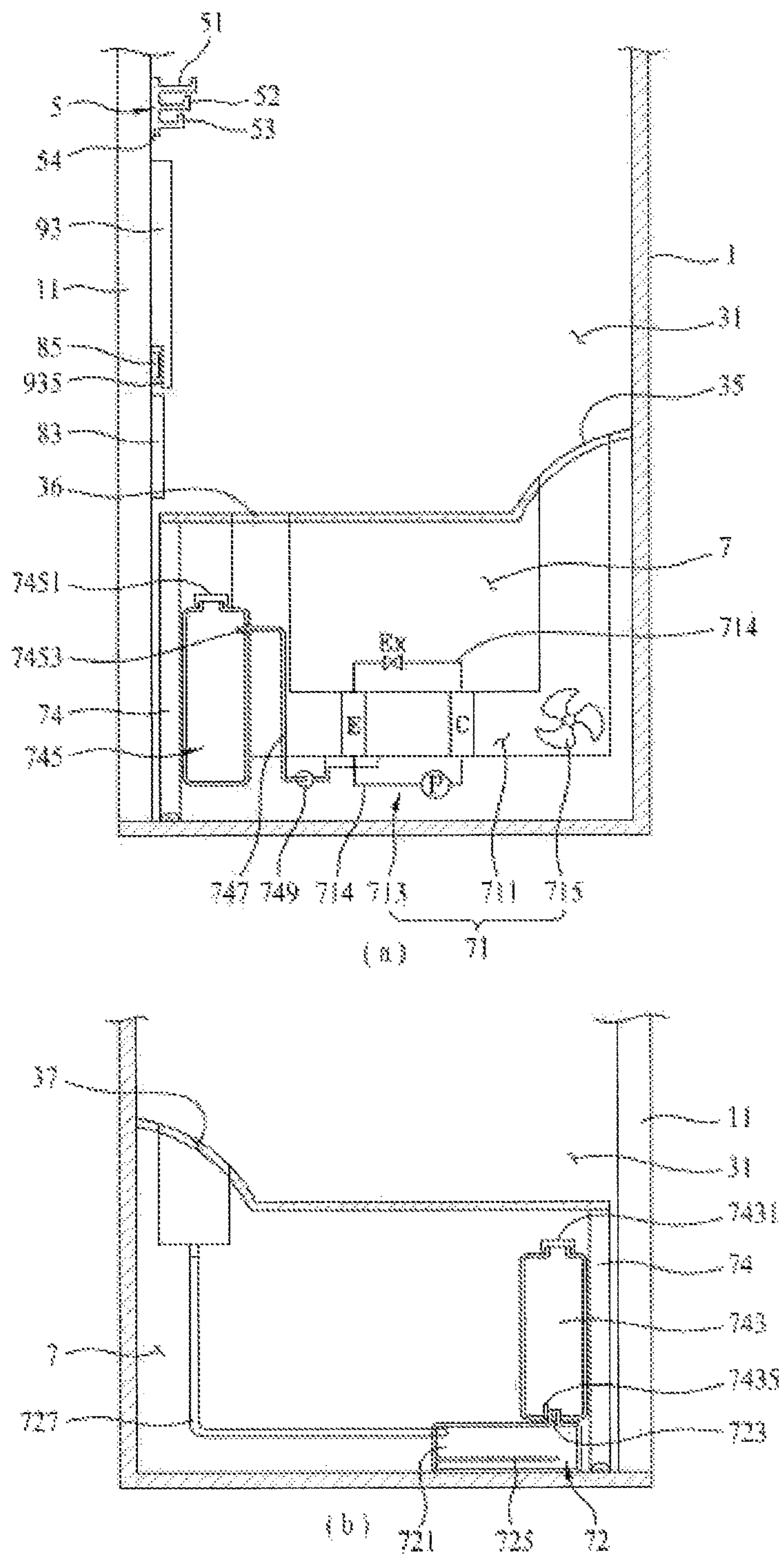


Figure 3

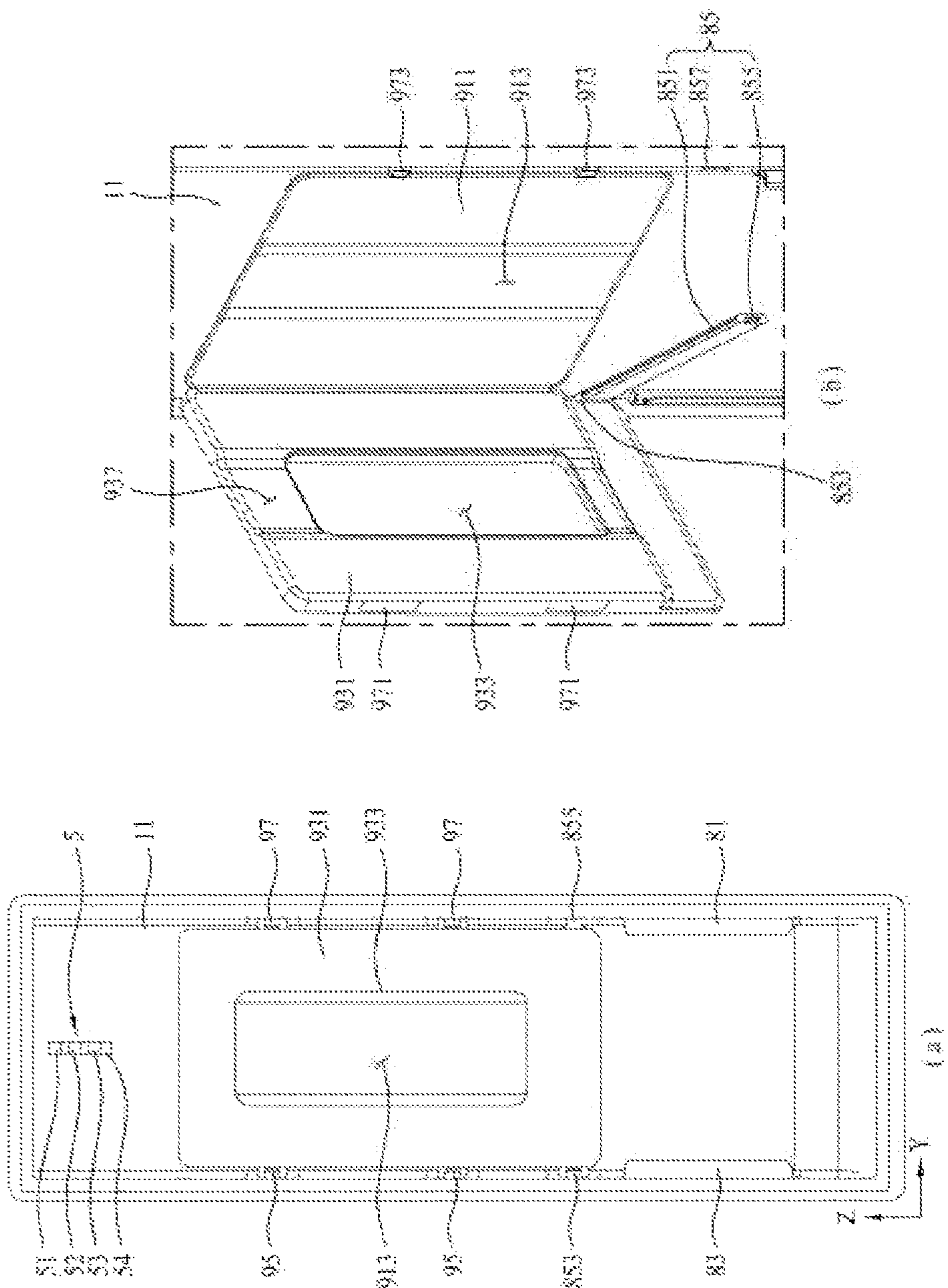
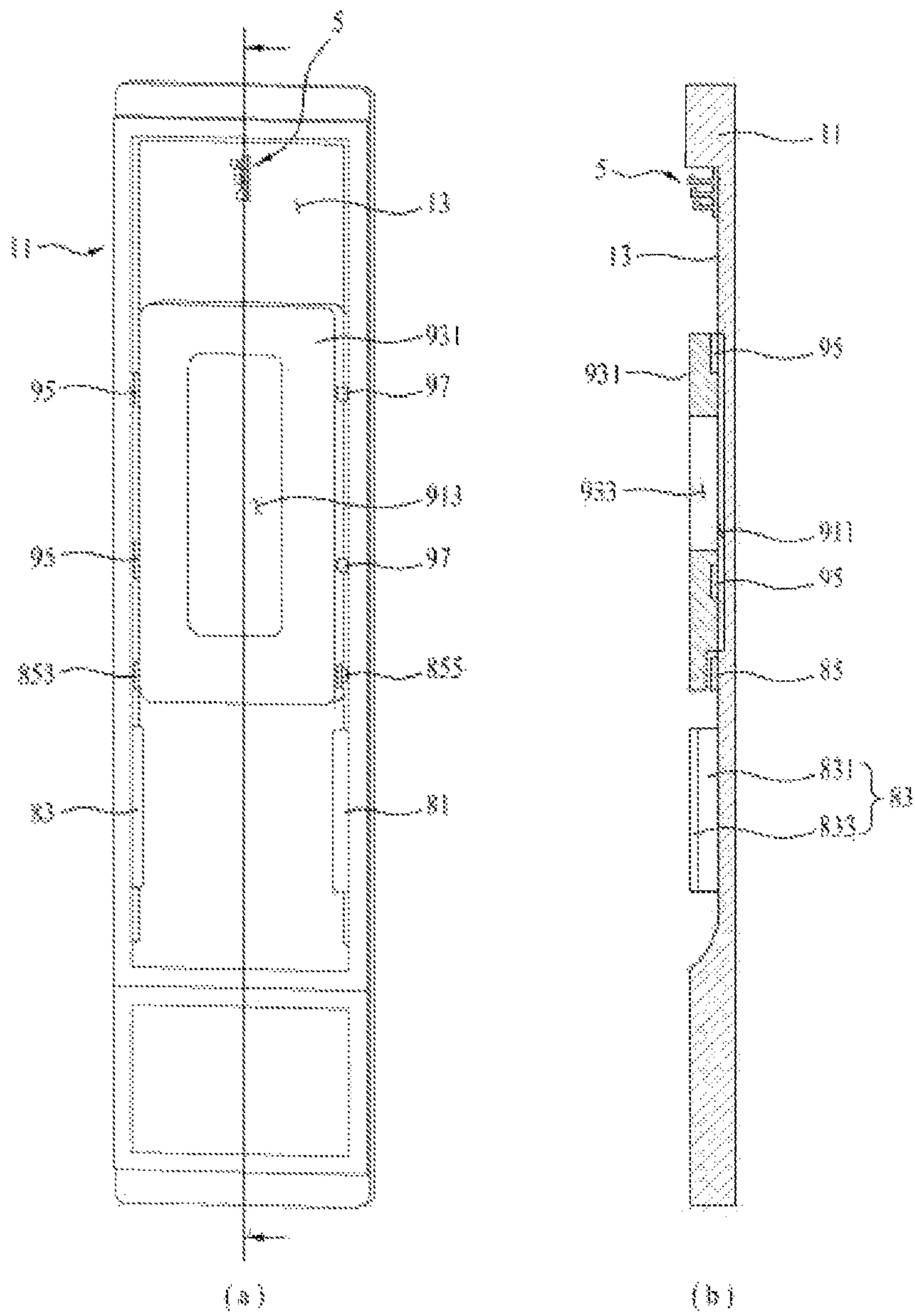


Figure 4





## LAUNDRY TREATMENT 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]** *Notice: More than one reissue application has been filed for the reissue of U.S. Pat. No. 9,359,717 B2. This reissue application is U.S. Reissue patent application Ser. No. 16/129,098, filed on Sep. 12, 2018, which is a continuation reissue application of U.S. Reissue patent application Ser. No. 16/002,610, filed on Jun. 7, 2018, now U.S. Pat. No. RE48,255, which is a reissue application of U.S. patent application Ser. No. 14/559,753, filed on Dec. 3, 2014, now U.S. Pat. No. 9,359,717 B2, issued Jun. 7, 2016 which claims priority under 35 U.S.C. §119 to Korean Patent Application No. 10-2013-0150441 filed on Dec. 5, 2013, whose entire disclosure is hereby incorporated by reference.*

## BACKGROUND

## 1. Field

The present disclosure relates to laundry treatment apparatuses.

## 2. Background

Generally, laundry treatment apparatuses refer to apparatuses that perform a variety of operations related to laundry (washing, drying, deodorization, wrinkle removal, and the like). Examples of laundry treatment apparatuses include washing machines that wash laundry, drying machines that dry wet laundry, and refreshers for deodorization and removal of wrinkles of laundry.

In recent years, laundry treatment apparatuses have been developed to allow a single apparatus to perform all of washing, drying, deodorization, and removal of wrinkles. However, these laundry treatment apparatuses, which include a drum in which laundry is received and a drive device to rotate the drum, do not provide satisfactory deodorization and removal of wrinkles.

Most laundry treatment apparatuses have limits on deodorization or removal of wrinkles because they generally perform deodorization or removal of wrinkles during rotation of a drum and laundry introduced into the drum is not spread, but wrinkled.

In addition, most laundry treatment apparatuses have no means to put a crease in laundry (e.g., the straight line in the front and back of trousers), which causes a user to inconveniently use a crease making means, such as an iron, after completion of washing or drying when desired to put a crease in laundry.

## BRIEF DESCRIPTION OF THE DRAWINGS

The embodiments will be described in detail with reference to the following drawings in which like reference numerals refer to like elements wherein:

FIG. 1 is a view showing one example of a laundry treatment apparatus according to the present disclosure;

FIG. 2 is a sectional view of the laundry treatment apparatus according to the present disclosure;

FIG. 3 is a view showing a presser included in the laundry treatment apparatus according to the present disclosure; and

FIG. 4 is a view showing another embodiment of the presser.

## DETAILED DESCRIPTION DISCLOSURE

As shown in FIG. 1, a laundry treatment apparatus according to the present disclosure, designated by reference numeral 100, includes a cabinet 1 defining an external appearance of the laundry treatment apparatus 100, a laundry receiver 3 defined within the cabinet 1 to provide a laundry receiving space, a feeder to feed at least one of air or moisture to the laundry receiver 3, and a presser 9 placed within the laundry receiver 3, the presser 9 serving to smooth out the wrinkles in laundry or to put a crease in laundry (e.g., the straight line in the front and back of trousers).

The laundry receiver 3 includes a receiving space 31 in which laundry is received, the receiving space 31 being defined within the cabinet 1. The receiving space 31 is opened or closed by a door 11 coupled to the cabinet 1.

The cabinet 1 may accommodate laundry support members configured to support laundry. The laundry support members may include a first laundry support member 4 installed in the receiving space 31 and a second laundry support member 5 affixed to the door 11.

The first laundry support member 4 may take the form of a bar that extends in the width direction of the receiving space 31 (i.e. in a width direction of the door 11 or along the Y-axis) or in the depth direction of the receiving space 31 (i.e. along the X-axis). FIG. 1 shows the case in which the first laundry support member 4 extends in the width direction of the receiving space 31 by way of example.

In this case, laundry may be supported by the first laundry support member 4 via a hook H of a hanger 200 or without the hanger 200. In either case, laundry may be kept spread within the receiving space 31.

The second laundry support member 5 is affixed to the door 11 to allow laundry to be placed within the receiving space 31 while being kept spread. More specifically, the second laundry support member 5, as exemplarily shown in FIG. 2, may include a base 54 affixed to the door 11, and two or more support pieces or hooks 51, 52 and 53 protruding from the base 54 and arranged in the height direction of the door 11 (i.e. along the Z-axis).

The support pieces of the second laundry support member 5 may include a first support piece 53, a second support piece 52 that is located above the first support piece 53 and has a greater length than a length of the first support piece 53, and a third support piece 51 that is located above the second support piece 52 and has a greater length than a length of the second support piece 52.

The reason why length of the support pieces increases from the first support piece 53 to the third support piece 51 is to allow the second laundry support member 5 to support a number of laundries. As laundry is hung on hangers 200 and hooks H of the hangers 200 are supported by the respective support pieces 51, 52 and 53, the laundry is kept spread within the receiving space 31.

Meanwhile, the cabinet 1 may further include a machine room 7 isolated from the receiving space 31. In this case, the feeder may be mounted in the machine room 7.



## 3

As exemplarily shown in FIG. 2, the machine room 7 may be located under the receiving space 31 and may be opened and closed by a machine room door 74.

When air fed into the receiving space 31 by the feeder is heated air and moisture fed into the receiving space 31 by the feeder is steam, positioning the machine room 7 under the receiving space 31 ensures that the heated air or steam is evenly fed into the receiving space 31 without a separate blowing device.

The feeder may include at least one of an air feeder 71 that feeds air (heated air or unheated air) into the receiving space 31 and a moisture feeder 72 that feeds moisture (steam or mist) into the receiving space 31.

Hereinafter, for convenience of description, it is assumed that the feeder includes both the air feeder 71 and the moisture feeder 72, the air feeder 71 feeds hot air into the receiving space 31, and the moisture feeder 72 feeds steam into the receiving space 31.

The air feeder 71 may include a circulation duct 711 for circulation of interior air of the receiving space 31, a heat exchanger 713 for heat exchange with air moving through the circulation duct 711, and a blower 715 for movement of interior air of the receiving space 31 through the circulation duct 711.

The circulation duct 711 communicates with the interior of the receiving space 31 through an air discharge port 35 and an air suction port 36 of the receiving space 31.

The air discharge port 35 and the air suction port 36 are perforated in the bottom of the receiving space 31 to enable communication between the receiving space 31 and the machine room 7. As such, when the circulation duct 711 mounted in the machine room 7 is connected at one end thereof to the air suction port 36 and at the other end thereof to the air discharge port 35, the circulation duct 711 may communicate with the interior of the receiving space 31.

The heat exchanger 713 serves to dehumidify and heat air introduced unto the circulation duct 711. FIG. 2 shows a heat pump as one example of the heat exchanger.

When the heat exchanger 713 takes the form of a heat pump, the heat exchanger 713 may include an evaporator E located within the circulation duct 711, a condenser C located within the circulation duct 711, a compressor P located at the outside of the circulation duct 711, and an expander Ex located at the outside of the circulation duct 711.

The evaporator E, the compressor P, the condenser C, and the expander Ex are connected to one another via refrigerant tubes 714.

The compressor P serves to compress refrigerant to high pressure to allow the refrigerant to be circulated through the refrigerant tubes 714. The evaporator E serves to evaporate the refrigerant by absorbing heat from air within the circulation duct 711. The condenser C serves to condense the refrigerant by discharging heat to the air within the circulation duct 711.

The blower 715 is located within the circulation duct 711 and serves to cause circulation of the interior air of the receiving space 31 through the circulation duct 711. The blower 715 is located between the condenser C and the air discharge port 35.

Accordingly, when the blower 715 is operated, the air within the circulation duct 711 moves into the receiving space 31 through the air discharge port 35, and the interior air of the receiving space 31 moves into the circulation duct 711 through the air suction port 36.

The air introduced into the circulation duct 711 through the air suction port 36 is cooled while passing through the

## 4

evaporator E and, in turn, the air having passed through the evaporator E is heated while passing through the condenser C.

When the air is cooled while passing through the evaporator E, moisture contained in the air is removed (dehumidification), and the moisture removed from the air (condensate water) remains on a surface of the evaporator E or within the circulation duct 711.

Since the resultant condensate water remaining in the circulation duct 711 causes deterioration in the heat exchange efficiency of the heat exchanger 713, according to the present disclosure, a drain unit may be further provided to remove the condensate water generated by the evaporator E.

The drain unit may include a drain tank 745 separably coupled to the machine room door 74, and a drainpipe 747 and a drain pump 749 which serve to direct the condensate water from the circulation duct 711 to the drain tank 745.

The drain tank 745 may have any shape so long as it can provide a space for storage of liquid. Preferably, the drain tank 745 may include a drain tank lid 7451 for discharge of liquid stored in the drain tank 745 and an inlet hole 7453 for separable connection of the drainpipe 747.

The inlet hole 7453 may be provided with a check valve (not shown). This serves to allow the drainpipe 747 to be separated from the inlet hole 7453 when the machine room door 74 opens the machine room 7 and to allow the drainpipe 747 to be inserted into the inlet hole 7453 when the machine room door 74 closes the machine room 7 (in addition to preventing leakage of water out of the drain tank 745 when the drain tank 745 is separated from the machine room door 74).

Meanwhile, as shown in FIG. 2(b), the moisture feeder 72 may include a reservoir 721 placed in the machine room 7, a heater 725 mounted in the reservoir 721, and a moisture feed pipe 727 to connect the reservoir 721 to a moisture discharge port 37.

The reservoir 721 serves to store water therein. The heater 725 serves to heat the water stored in the reservoir 721 to change the water into steam. The moisture feed pipe 721 serves to guide steam from the reservoir 721 to the receiving space 31.

Accordingly, the heater 725 is preferably located proximate to the bottom of the reservoir 721, and the moisture feed pipe 727 is preferably located at the top (or an upper end) of the reservoir 721.

The reservoir 721 receives water via a water supply unit. The water supply unit may include a water supply tank 743 separably coupled to the machine room door 74.

In this case, the reservoir 721 may be provided with a connection pipe 723 that is connected to the water supply tank 743 when the machine room door 7 closes the machine room 7 and is separated from the water supply tank 743 when the machine room door 7 opens the machine room 7.

While the water supply tank 743 may have any shape so long as it can store liquid therein, preferably, the water supply tank 743 may include a water supply tank lid 7431 for supply of liquid into the water supply tank 743, a discharge hole (not shown) for insertion of the connection pipe 723, and a check valve 7435 provided at the discharge hole.

The reason why the water supply tank 743 is separably coupled to the machine room door 74 is that the laundry treatment apparatus 100 according to the present disclosure is installed at a position distant from a water supply source (not shown).



## 5

That is, when the laundry treatment apparatus **100** is located proximate to a water supply source, the reservoir **721** may be controlled to receive water from the water supply source as needed. However, this control is impossible when the laundry treatment apparatus **100** is installed at a position distant from the water supply source. The water supply tank **743** serves to solve this problem.

Accordingly, differently from previous laundry treatment apparatuses that perform deodorization or removal of wrinkles by supplying hot air or steam into a drum during rotation of the drum, the laundry treatment apparatus **100** according to the present disclosure is configured to feed hot air or steam while keeping laundry spread within the receiving space **31**, thereby preventing the laundry from being wrinkled after steam or hot air is fed thereto.

Meanwhile, the presser (see reference numeral **9**) shown in FIG. **1** serves to remove wrinkles of laundry or to put a crease in laundry (e.g., the straight line in the front and back of trousers) using steam and hot air fed into the receiving space **31**.

The presser **9**, which is configured to direct at least one of steam and hot air fed into the receiving space **31** to laundry, may be located at any position within the receiving space **31**. FIG. **1** shows the case in which the presser **9** is affixed to an inner surface of the door **11** (i.e. a surface of the door **11** defining one side of the receiving space **31**) by way of example.

The presser **9** according to the present disclosure may include a support structure **91** formed in the inner surface of the door **11** to provide a laundry support space, and a press structure **93** rotatably coupled to the support structure **91** or the door **11**, the press structure **93** serving to apply pressure to laundry placed in the support structure **91**.

The support structure **91** may be a surface of the door **11** facing the receiving space **31**, or may be a separate member affixed to the surface of the door **11**. FIG. **1** shows the case in which the support structure **91** includes a support body **911** affixed to the surface of the door **11** by way of example.

In this case, the support body **911** may have a plane parallel to the surface of the door **11**.

The press structure **93** may include a press body **931** separably coupled to the inner surface of the door **11** or the support body **911**, and a body through-hole **933** perforated in the press body **931** to direct steam or hot air introduced into the receiving space **31** to laundry supported by the support body **911**.

That the press body **931** is separably coupled to the inner surface of the door **11** or the support body **911** means that one end of the press body **931** is rotatably coupled to the door **11** or the support body **911** and the other end (free end) of the press body **931** is separably coupled to the door **11** or the support body **911**.

In addition, that the press body **931** is separably coupled to the inner surface of the door **11** or the support body **911** means that the press body **931** is completely separable from the door **11** or the support body **911** without any connection therebetween.

FIG. **1** shows the case in which the press body **931** is secured to the door **11** via a hinge **95** mounted to the inner surface of the door **11** by way of example. The press body **931** is separably coupled to the inner surface of the door **11** via a coupling mechanism **971** and **973**.

The coupling mechanism may include a separable coupling recess **971** formed in one of the door **11** and the press body **931** and a coupling protrusion **973** formed at the other one of the door **11** and the press body **931** so as to be engaged with the separable coupling recess **971**.

## 6

Accordingly, as the user hangs the hook **H** of the hanger **200** on the second laundry support member **5**, laundry such as trousers may be supported by a surface of the support body **911** while being kept spread.

Once laundry is supported by the surface of the support body **911**, the user may pivotally rotate the press body **931** toward the support body **911** to couple the press body **931** and the support body **911** to each other via the coupling mechanism **971** and **973**.

When the air feeder **71** or the moisture feeder **72** feeds hot air or steam into the receiving space **31** while the laundry is kept pressed between the support body **911** and the press body **931**, the hot air or steam within the receiving space **31** is fed to the laundry through the body through-hole **933**.

Accordingly, the laundry treatment apparatus **100** of the present disclosure has the effects of removing wrinkles from laundry and of putting a crease in laundry (e.g., the straight line in the front and back of trousers).

Meanwhile, in the case of laundry such as trousers, there exists a sewing line that may cause the presser **9** having the above-described configuration to put an unnecessary crease in the laundry.

To solve this problem, the presser **9** may further include grooves **913** and **937** formed in any one of the support body **911** and the press body **931** to prevent a specific region of laundry such as a sewing line from being pressed.

FIG. **1** shows the case in which the support body **911** includes a support body groove **913** and the press body **931** includes a press body groove **937** by way of example.

The support body groove **913** may be recessed in a surface of the support body **911** to extend in the height direction of the door **11** (i.e. along the Z-axis). That is, the support body groove **913** may be recessed to cause the surface of the support body **911** to be far away from the receiving space **31**.

Likewise, the press body groove **937** may be recessed in a surface of the press body **931** to extend in the height direction of the door **11** (i.e. along the Z-axis), thus causing the surface of the press body **931** to be far away from the support body **911** (to be closer to the receiving space **31**).

Accordingly, in the present disclosure, when the press body **931** and the support body **911** are coupled to each other, the support body groove **913** and the press body groove **937** may be aligned with each other to define a space in a longitudinal direction of laundry (parallel to the height direction of the door **11**) in which no pressure is applied to a specific region of laundry such as a sewing line.

It should be noted, differently from the above description, that the present disclosure may employ only one of the support body groove **913** and the press body groove **937**.

In addition, the support body groove **913** may be located at the center of the support body **911** and the press body groove **937** may be located at the center of the press body **931**.

In use of the presser **9** having the above-described configuration, the user must position a sewing line of laundry in the support body groove **913** or in the press body groove **937** and thereafter must pivotally rotate the press body **931** toward the support body **911** so as to fix the laundry. Thus, there is a risk of the sewing line being deviated from the support body groove **913** or the press body groove **937** when the laundry is unintentionally displaced while the press body **931** is coupled to the support body **911**.

To solve the above-described problem, the laundry treatment apparatus **100** according to the present disclosure may further include a guide **8** to prevent laundry from deviating



from a support space (i.e. a space provided by the support body **911**) and a fixing member **85** (*or clip*) to fix laundry in the support space.

The fixing member **85** is separably coupled to the door **11** and has one end rotatably secured to the surface of the door **11**. The guides **8** protrude from the surface of the door **11** to provide a space for reception of laundry.

The fixing member **85** and the guide **8** may be located at any positions of the surface of the door **11** so long as they do not interfere with rotation of the press body **931**. FIG. **3** shows the case in which the fixing member **85** is located under the support body **911** and the guide **8** is located under the fixing member **85** by way of example.

As exemplarily shown in FIG. **1**, the guide **8** may include a first guide **81** and a second guide **83** respectively located at facing ends of the door **11**.

The first guide **81** may include a first fixing plate **811** protruding from the surface of the door **11** and a first extension plate **813** extending from the first fixing plate **811** toward the second guide **83**. The second guide **83** may include a second fixing plate **831** protruding from the surface of the door **11** and a second extension plate **833** extending from the second fixing plate **831** toward the first guide **81**.

A distance between the first fixing plate **811** and the second fixing plate **831** may be equal to a width of the support body **911** (i.e. a length of the support body **911** along the Y-axis). *A distance between a top end of the first extension plate 813 and the bottom end of the support 91 is substantially equal to a distance between a top end of the second extension plate 833 and the bottom end of the support 91.*

Accordingly, a free end of laundry supported by the second laundry support member **5** via the hook **H** of the hanger **200** is restricted in terms of movement along the Y-axis by the first fixing plate **811** and the second fixing plate **831** and restricted in terms of movement along the X-axis by the first extension plate **813** and the second extension plate **833**.

The first extension plate **813** of the first guide **81** is extendable in length toward the second extension plate **833** and the second extension plate **833** of the second guide **83** is extendable in length toward the first extension plate **813**.

This serves to prevent movement of laundry along the X-axis by adjusting lengths of the respective extension plates **813** and **833** according to a width of the laundry.

As exemplarily shown in FIG. **3**, the fixing member **85** may include a fixing body **851** in the form of a bar or board and a fixing body hinge **853** to rotatably secure the fixing body **851** to the inner surface of the door **11**.

The fixing member **85** may be separably coupled to the door **11** via a fixing body coupling mechanism.

The fixing body coupling mechanism may include a hook **855** formed at any one of the fixing body **851** and the door **11**, and a hook coupling recess **857** formed in the other one of the fixing body **851** and the door **11** to allow the hook **855** to be separably inserted thereinto.

Accordingly, the present disclosure allows the user to fix a position of laundry via the fixing member **85** after positioning a sewing line of the laundry in the support body groove **913**. This may minimize deviation possibility of the sewing line of the laundry from the support body groove **913** while the press body **931** is coupled to the support body **911**.

Meanwhile, the fixing member **85** may be installed so as not to be exposed out of the press body **931**. To this end, the press body **931** may further include a fixing member receiving groove **935** in which the fixing member **85** is received.

Preventing the fixing member **85** from being exposed out of the press body **931** serves to prevent deterioration in the aesthetics of the interior of the receiving space **31** when the door **11** opens the receiving space **31**.

FIG. **4** shows another embodiment of the laundry treatment apparatus according to the present disclosure. The present embodiment has a feature that a presser receiving recess **13** is formed in the surface of the door **11**.

The presser receiving recess **13** is recessed to cause the surface of the door **11** to be far away from the receiving space **31**. As such, the support structure **91**, the press structure **93**, the fixing member **85**, and the guide **8**, which constitute the presser **9**, are received in the presser receiving recess **13**.

Accordingly, the present embodiment has the effects of reducing a weight of the door **11** by positioning the presser **9** in an inner space of the door **11** and minimizing a volume of the door **11**.

Moreover, the surface of the press body **931** included in the presser **9** may be parallel to the surface of the door **11** where the press receiving recess **13** is not formed.

As is apparent from the above description, the present disclosure has the effect of providing laundry treatment apparatuses having a crease making means.

In addition, the present disclosure has the effect of providing laundry treatment apparatuses which provide easy drying, deodorization, removal of wrinkles, and sterilization of laundry.

Accordingly, the present disclosure is directed to laundry treatment apparatuses that substantially obviate one or more problems due to limitations and disadvantages of the related art.

One object of the present disclosure is to provide laundry treatment apparatuses having a crease making means.

Another object of the present disclosure is to provide laundry treatment apparatuses which provide easy drying, deodorization, removal of wrinkles, and sterilization of laundry.

Additional advantages, objects, and features will be set forth in part in the description which follows and in part will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice. The objectives and other advantages may be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

To achieve these objects and other advantages and in accordance with the purpose of the disclosure, as embodied and broadly described herein, in accordance with one aspect of the present disclosure, a laundry treatment apparatus includes a cabinet having a receiving space for reception of laundry, a feeder configured to feed at least one of air or moisture into the receiving space, a support structure placed in the receiving space, the support structure providing a support space to allow a surface of the laundry to be supported by the support space, a guide affixed in the receiving space, the guide being configured to set a movement range of the laundry to prevent the laundry from deviating from the support space, and a press structure separably coupled to the support structure, the press structure being configured to apply pressure to the laundry positioned in the support space.

The laundry treatment apparatus according to the present disclosure may further include a fixing member separably coupled in the receiving space, the fixing member being configured to fix a position of the laundry supported in the support space.



The support structure and the guide may be affixed to an inner circumferential surface of the receiving space, and the press structure and the fixing member may be rotatably coupled to the inner circumferential surface of the receiving space.

The laundry treatment apparatus according to the present disclosure may further include a door rotatably coupled to the cabinet to open or close the receiving space, the support structure and the guide may be affixed to an inner surface of the door facing the receiving space, and the press structure and the fixing member may be rotatably coupled to the inner surface of the door.

The inner surface of the door may be provided with a presser receiving recess, the presser receiving recess being recessed to cause the inner surface of the door to be far away from the receiving space, and the support structure, the press structure, the fixing member and the guide may be received in the presser receiving recess.

The support structure may include a support body providing the support space, and the press structure may include a press body separably coupled to the support body to apply pressure to the laundry, the press body being rotatably coupled to the inner surface of the door, and a body through-hole perforated in the press body for communication between the receiving space and the support structure.

The support body may be configured to form a plane parallel to the inner surface of the door.

At least one of the press body and the support body may have a groove configured to define a space for non-application of pressure to the laundry.

The support structure may further include a support body groove formed in a height direction of the door, the support body groove being recessed to cause a surface of the support body to be far away from the receiving space.

The press structure may further include a press body groove recessed in a surface of the press body, the press body groove being aligned with the support body groove to define a space for non-application of pressure to the laundry.

The fixing member may be located under the support body, and the press structure may further include a fixing member receiving groove formed in the press body for reception of the fixing member.

The guide may be located under the fixing member so as not to interfere with rotation of the press body.

The guide may include a first guide configured to receive one end of the laundry parallel to a height direction of the door and a second guide configured to receive the other end of the laundry parallel to the height direction of the door.

The first guide may include a first fixing plate protruding from the inner surface of the door, and a first extension plate extending from the first fixing plate toward the second guide to define a space for reception of one end of the laundry, and the second guide may include a second fixing plate protruding from the inner surface of the door, and a second extension plate extending from the second fixing plate toward the first guide to define a space for reception of the other end of the laundry.

The laundry treatment apparatus according to the present disclosure may further include a laundry support member affixed to the inner surface of the door at a position above the support structure, one end of the laundry being secured to the laundry support member.

It is to be understood that both the foregoing general description and the following detailed description of the present disclosure are exemplary and explanatory and are intended to provide further explanation of the present disclosure as claimed.

A laundry treatment apparatus comprises: a cabinet having a space configured to receive laundry; a feeder configured to feed at least one of air or moisture into the space; and a press to flatten the laundry, wherein the press includes: a support having an area to support a surface of the laundry; a guide configured to limit a movement range of the laundry from deviating from the support area; and a plate structure separably coupled to the support, the plate structure being configured to apply pressure to the surface of the laundry positioned in the support area.

Any reference in this specification to "one embodiment," "an embodiment," "example embodiment," etc., means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the disclosure. The appearances of such phrases in various places in the specification are not necessarily all referring to the same embodiment. Further, when a particular feature, structure, or characteristic is described in connection with any embodiment, it is submitted that it is within the purview of one skilled in the art to effect such feature, structure, or characteristic in connection with other ones of the embodiments.

Although embodiments have been described with reference to a number of illustrative embodiments thereof, it should be understood that numerous other modifications and embodiments can be devised by those skilled in the art that will fall within the spirit and scope of the principles of this disclosure. More particularly, various variations and modifications are possible in the component parts and/or arrangements of the subject combination arrangement within the scope of the disclosure, the drawings and the appended claims. In addition to variations and modifications in the component parts and/or arrangements, alternative uses will also be apparent to those skilled in the art.

What is claimed is:

[1. A laundry treatment apparatus comprising:  
a cabinet having a space configured to receive laundry;  
a door rotatably coupled to the cabinet to open or close the space;  
a feeder configured to feed at least one of air or moisture into the space; and  
a press to flatten the laundry, wherein the press includes:  
a support having an area to support a surface of the laundry;  
a guide configured to limit a movement range of the laundry from deviating from the support area; and  
a plate structure separably coupled to the support, the plate structure being configured to apply pressure to the surface of the laundry positioned in the support area, wherein the guide restricts the laundry's movement in a direction parallel to a bottom of the cabinet.]

[2. The apparatus according to claim 1, further including a clamp to fix a position of the laundry supported in the support area.]

[3. The apparatus according to claim 2, wherein the support and the guide are affixed to an inner circumferential surface of the receiving space, and the plate structure and the clamp are rotatably coupled to the inner circumferential surface of the receiving space.]

[4. The apparatus according to claim 2, wherein the support and the guide are affixed to an inner surface of the door facing the receiving space, and the plate structure and the clamp are rotatably coupled to the inner surface of the door.]



## 11

[5. The apparatus according to claim 4, wherein the inner surface of the door is provided with a recess, and wherein the support, the plate structure, the clamp and the guide are positioned in the recess.]

[6. The apparatus according to claim 4, wherein the support structure includes a support body providing the support area, and the plate structure includes a press body separably coupled to the support body to apply pressure to the laundry, the press body being rotatably coupled to the inner surface of the door, and a body through-hole perforated in the press body.]

[7. The apparatus according to claim 6, wherein the support body is configured to form a plane parallel to the inner surface of the door.]

[8. The apparatus according to claim 6, wherein at least one of the press body or the support body has a groove configured to define a space for non-application of pressure to the laundry.]

[9. The apparatus according to claim 6, wherein the support further includes a support body groove formed in a height direction of the door, the support body groove being recessed to cause a surface of the support body to be further away from the receiving space.]

[10. The apparatus according to claim 9, wherein the plate structure further includes a press body groove recessed in a surface of the press body, the, press body groove being aligned with the support body groove to define a space for non-application of pressure to the laundry.]

[11. The apparatus according to claim 6, wherein the clamp is located under the support body, and the plate structure further includes a fixing member receiving groove formed in the press body for covering the clamp.]

[12. The apparatus according to claim 11, wherein the guide is located under the clamp for non-interfere with rotation of the press body.]

[13. The apparatus according to claim 12, wherein the guide includes:

- a first guide configured to receive one end of the laundry parallel to a height direction of the door, and
- a second guide configured to receive the other end of the laundry parallel to the height direction of the door.]

[14. The apparatus according to claim 13, wherein the first guide includes a first fixing plate protruding from the inner surface of the door, and a first extension plate extending from the first fixing plate toward the second guide to define a space for reception of one end of the laundry, and

the second guide includes a second fixing plate protruding from the inner surface of the door, and a second extension plate extending from the second fixing plate toward the first guide to define a space for reception of the other end of the laundry.]

[15. The apparatus according to claim 4, further comprising a laundry support member or hook affixed to the inner surface of the door at a position above the press, one end of the laundry being secured to the laundry support member or the hook.]

16. A laundry treatment apparatus comprising:

- a cabinet having a space to receive laundry;
- a door rotatably coupled to the cabinet to open or close the space;
- a feeder configured to feed at least one of air or moisture into the space; and
- a laundry press provided on an inner side of the door to press the laundry, wherein the laundry press includes: a support that supports a surface of the laundry;

## 12

a guide configured to receive the laundry supported by the support and to restrict a movement of the laundry supported by the support in a direction parallel to a bottom of the cabinet, the guide includes a fixing plate protruding from the inner side of the door and an extension plate extending in a width direction of the door from a free end of the fixing plate; and a plate provided to be movable relative to the support, the plate being configured to apply pressure to the surface of the laundry positioned on the support.

17. The laundry treatment apparatus of claim 16, wherein the extension plate extends in the width direction of the door so as to face the laundry.

18. The laundry treatment apparatus of claim 17, wherein the guide includes a plurality of guides, and the plurality of guides include a first guide and a second guide, the first guide and the second guide being provided a prescribed distance from each other.

19. The laundry treatment apparatus of claim 18, wherein the first guide is positioned at a first side of the inner side of the door, and the second guide is positioned at a second side of the inner side of the door, the first side and the second side being opposite lateral sides.

20. The laundry treatment apparatus of claim 19, wherein the first guide has a first extension plate that extends laterally from the first side towards the second side and the second guide has a second extension plate that extends laterally from the second side towards the first side.

21. The laundry treatment apparatus of claim 20, wherein the first extension plate and the second extension plate have a prescribed length that extends partially across the inner side of the door.

22. The laundry treatment apparatus of claim 21, wherein the first extension plate and the second extension plate are spaced from each other in a width direction of the support to accommodate the laundry to be inserted between the first extension plate and the second extension plate.

23. The laundry treatment apparatus of claim 20, wherein the first extension plate and the second extension plate are provided below a bottom end of the support, and wherein a distance between a top end of the first extension plate and the bottom end of the support is substantially equal to a distance between a top end of the second extension plate and the bottom end of the support.

24. The laundry treatment apparatus of claim 20, wherein the first extension plate and the second extension plate are provided at a prescribed distance relative to the support in a direction perpendicular to the door.

25. The laundry treatment apparatus of claim 20, wherein inner surfaces of the first extension plate and the second extension plate are configured to contact the laundry to restrict the movement of the laundry relative to the support.

26. The laundry treatment apparatus of claim 16, further comprising a fixing member movable in a direction perpendicular to the door to hold a portion of the laundry.

27. The laundry treatment apparatus of claim 26, wherein the fixing member is provided a prescribed distance below a bottom end of the support, and

wherein a length of the plate is greater than a length of the support such that when the plate is in a closed position on the support, the plate covers the fixing member so that the fixing member is not visible.

28. The laundry treatment apparatus of claim 16, wherein the laundry is pants, and the guide is configured to hold lateral ends of the pants to form a crease, the crease being held on the support to be pressed by the plate.



13

29. The laundry treatment apparatus of claim 16, wherein the plate extends below the support.

30. A laundry treatment apparatus comprising:

a cabinet having a space to receive laundry;

a door rotatably coupled to the cabinet to open or close the space;

a feeder configured to feed at least one of air or moisture into the space; and

a laundry press provided on an inner side of the door to press the laundry, wherein the laundry press includes: 10 a support that supports a surface of the laundry;

a guide that is provided on the inner side of the door and below the support, the guide being configured to receive the laundry supported by the support and to restrict the laundry's movement in a direction parallel to a bottom of the cabinet; and 15

a plate provided to be movable relative to the support, the plate being configured to apply pressure to the surface of the laundry positioned on the support,

wherein the guide is configured to receive lateral ends of the laundry. 20

31. The laundry treatment apparatus of claim 30, wherein the guide includes a first guide and a second guide, wherein the first guide and the second guide are separated a prescribed distance from each other, and 25

wherein the first guide is configured to receive one of lateral ends of the laundry and the second guide is configured to receive another of the lateral ends of the laundry.

32. The laundry treatment apparatus of claim 31, wherein the first guide is positioned at a first side of the inner side of 30

14

the door and the second guide is positioned at a second side of the inner side of the door, the first side and the second side being opposite lateral sides.

33. The laundry treatment apparatus of claim 32, wherein the first guide has a first plate that extends laterally from the first side towards the second side, and the second guide has a second plate that extends laterally from the second side towards the first side.

34. The laundry treatment apparatus of claim 33, wherein the first plate and the second plate have a prescribed length that extends partially across the inner side of the door to accommodate the laundry to be inserted between the first plate and the second plate,

wherein the first plate and the second plate are provided below a bottom end of the support,

wherein a distance between a top end of the first plate and the bottom end of the support is substantially equal to a distance between a top end of the second plate and the bottom end of the support, and

wherein the first plate and the second plate are provided at a prescribed distance relative to the support in a direction perpendicular to the door.

35. The laundry treatment apparatus of claim 33, wherein inner surfaces of the first plate and the second plate are configured to contact the laundry to restrict the movement of the laundry relative to the support.

36. The laundry treatment apparatus of claim 30, wherein the plate extends below the support.

\* \* \* \* \*