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(54) **CLOTHES TREATMENT APPARATUS**

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D06F 73/02 (2006.01)

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(58) **Field of Classification Search**
CPC D06F 67/005; D06F 58/10; D06F 73/02; D06F 71/30; D06F 73/00
See application file for complete search history.

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

(57) **ABSTRACT**

A clothes treatment apparatus includes a cabinet that defines a treatment chamber. The clothes treatment apparatus further includes a door that is configured to open and close at least a portion of the cabinet. The clothes treatment apparatus further includes a wrinkle removal module that is located on an inside of the door, that is configured to remove wrinkles from clothes by applying pressure to the clothes. The wrinkle removal module includes a base plate that is located at the door and that is configured to support clothes. The wrinkle removal module further includes a press plate that is coupled to the base plate, that is configured to rotate relative to the base plate, and that is configured to remove wrinkles from clothes based on pressing against the base plate.

20 Claims, 8 Drawing Sheets

Amended

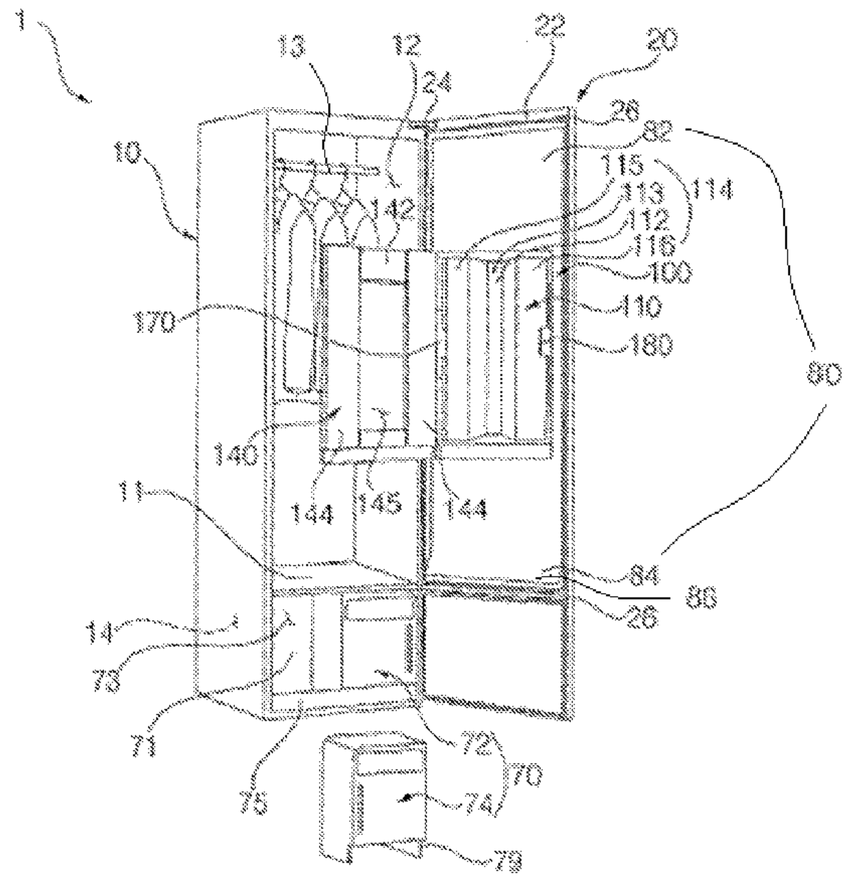

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FIG. 1 - Amended

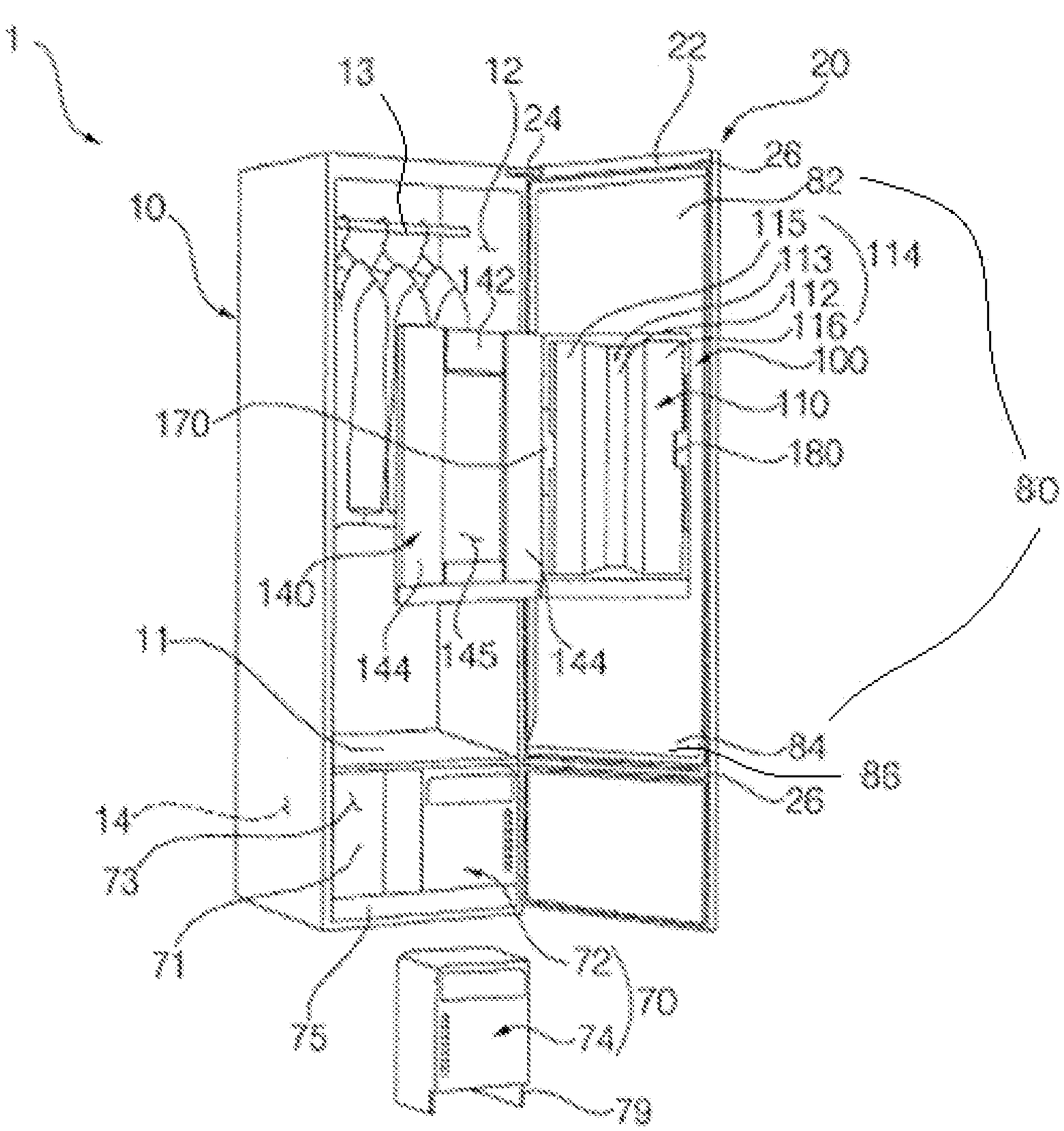

FIG.2

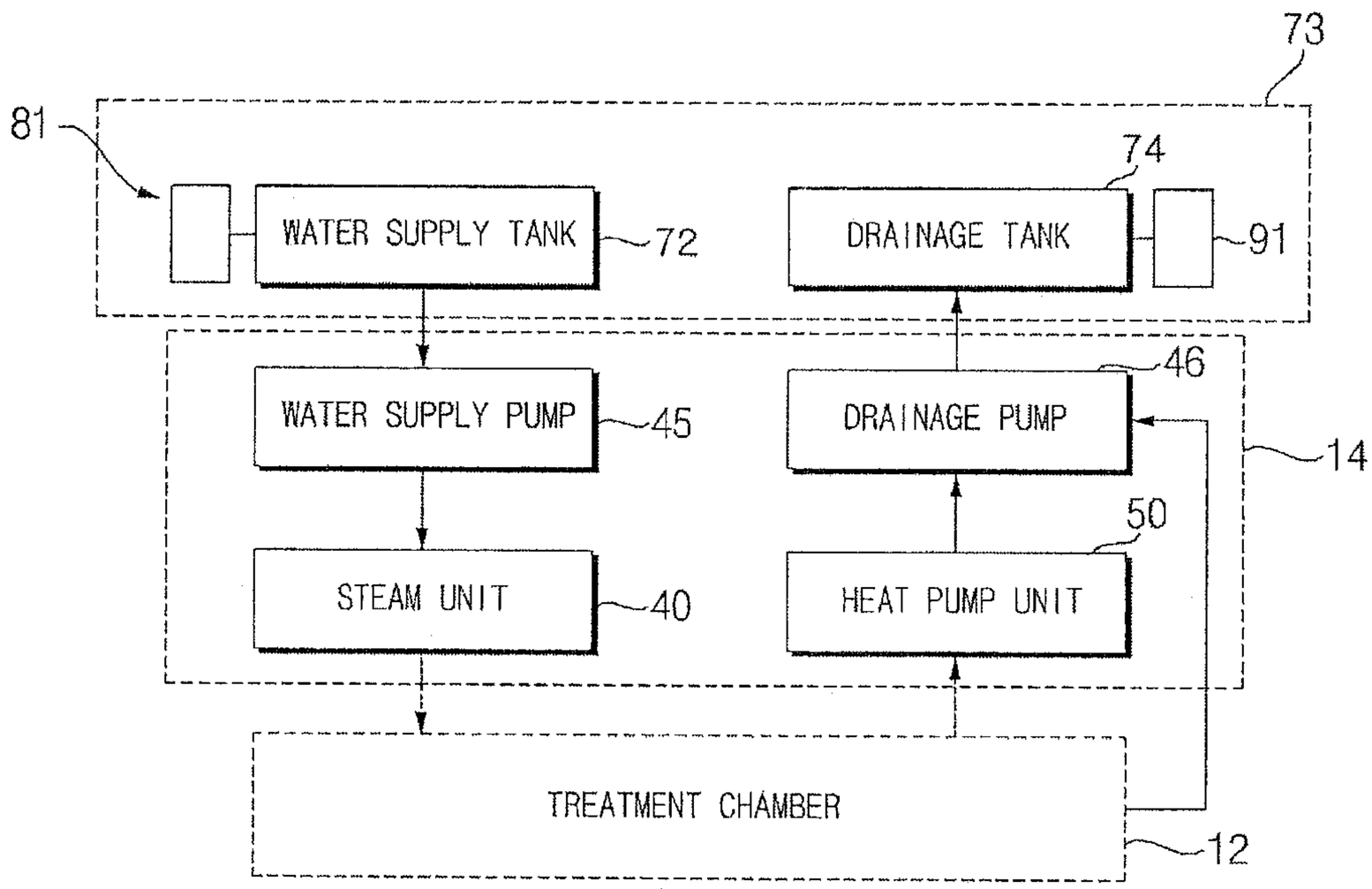
73
81
74
WATER SUPPLY TANK
72
DRAINAGE TANK
91
46
WATER SUPPLY PUMP
45
DRAINAGE PUMP
14
50
STEAM UNIT
40
HEAT PUMP UNIT
TREATMENT CHAMBER
12

FIG.3

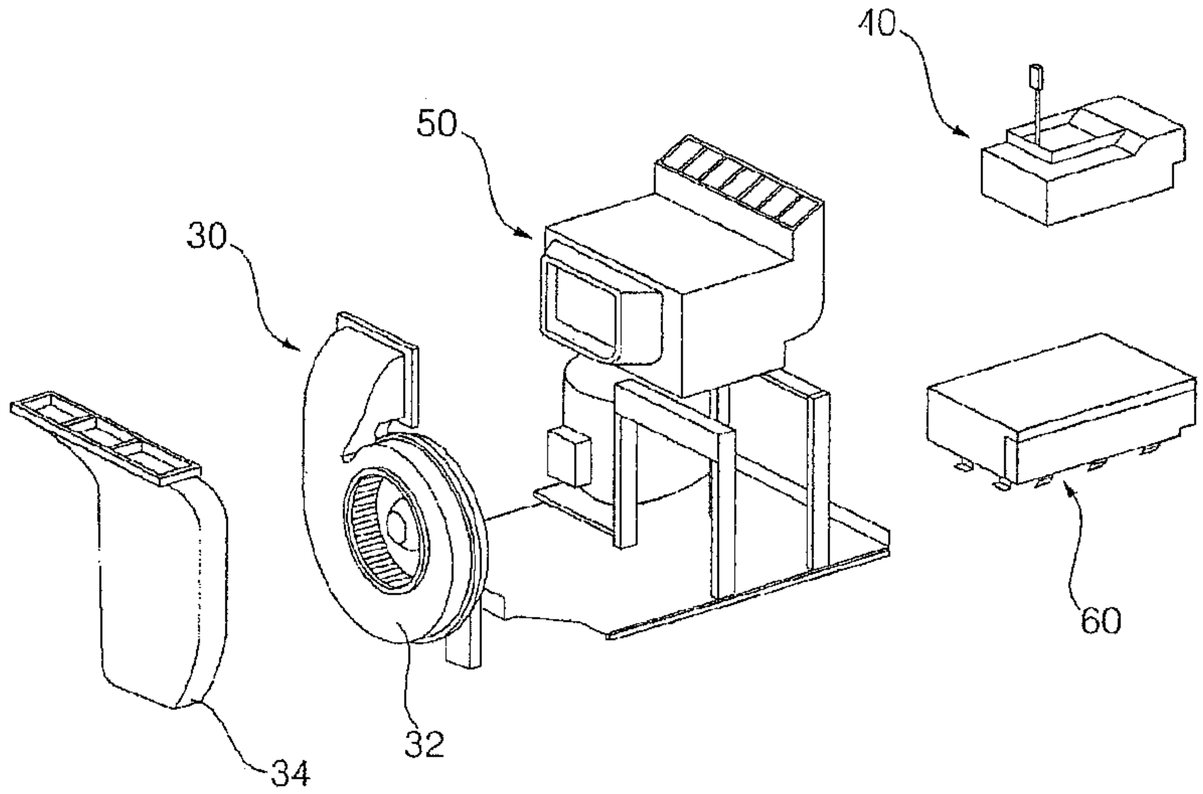

FIG.4

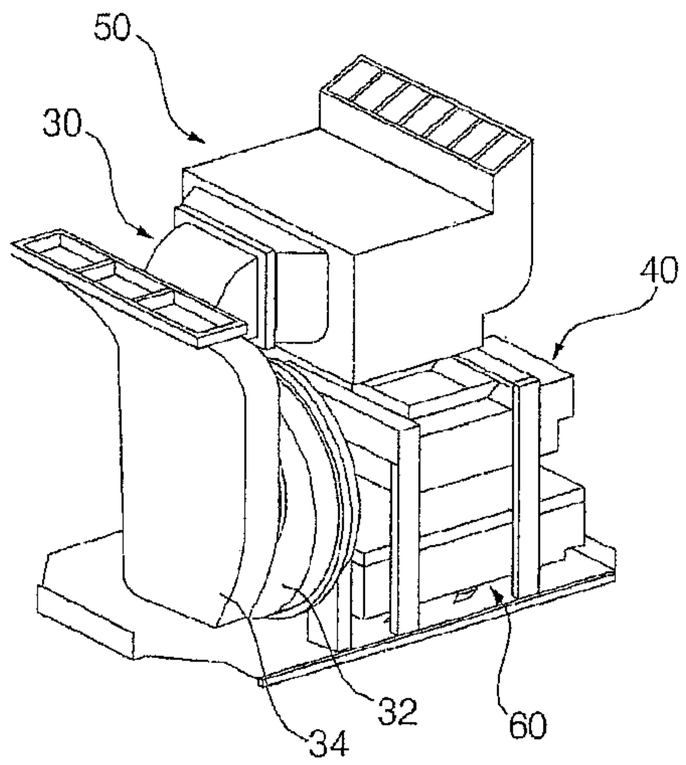

FIG.5

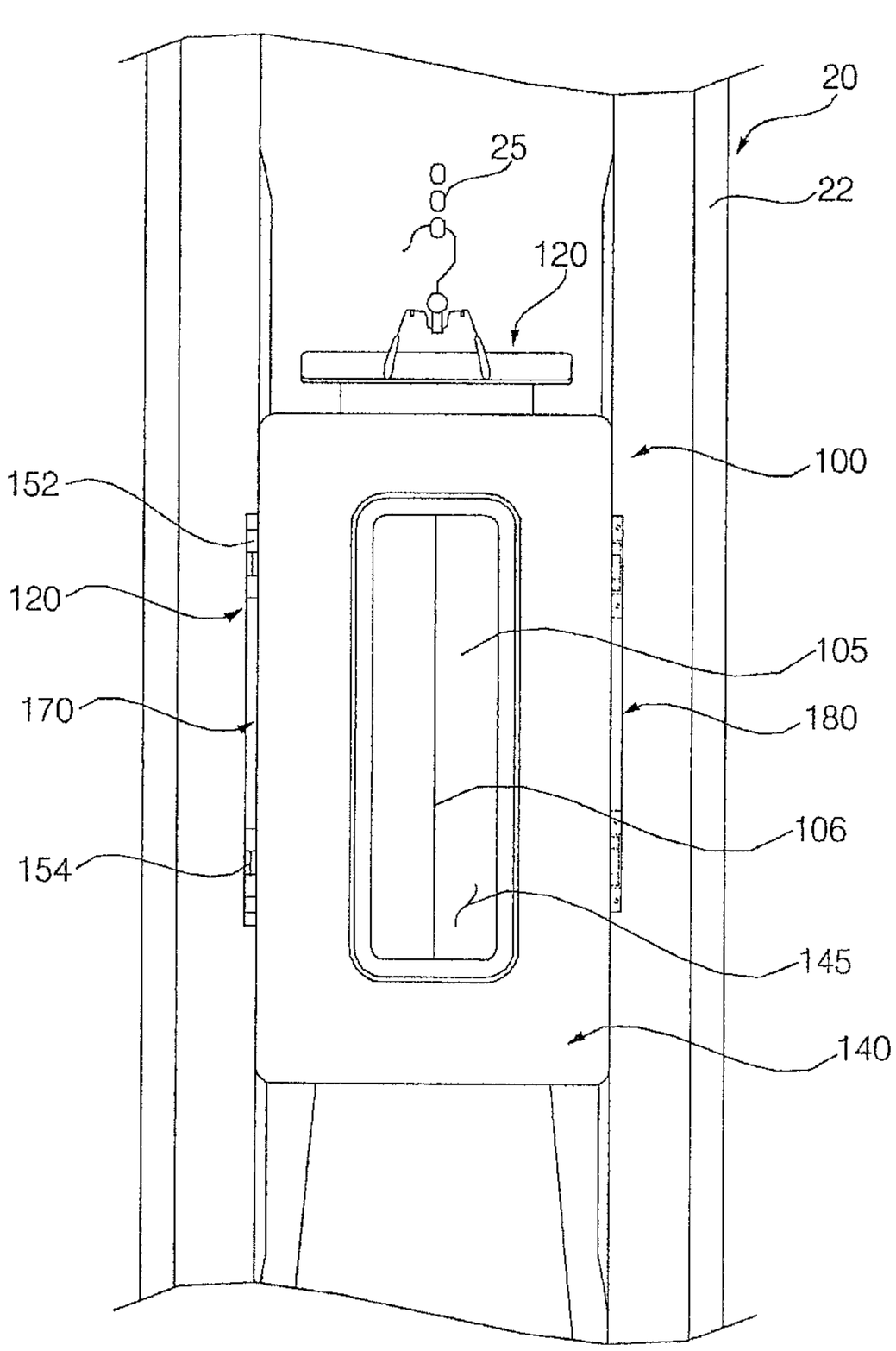

FIG.6

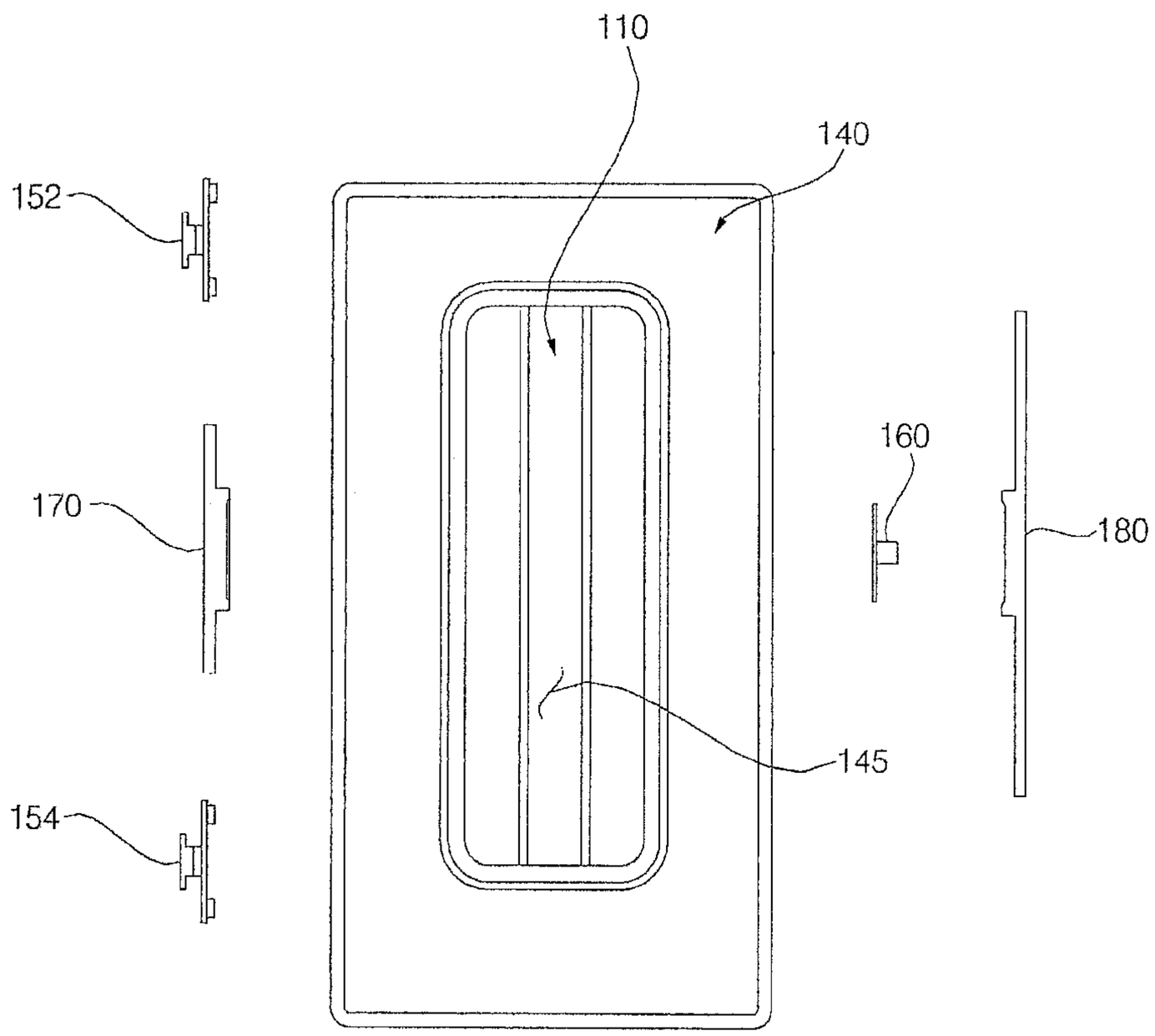

FIG.7

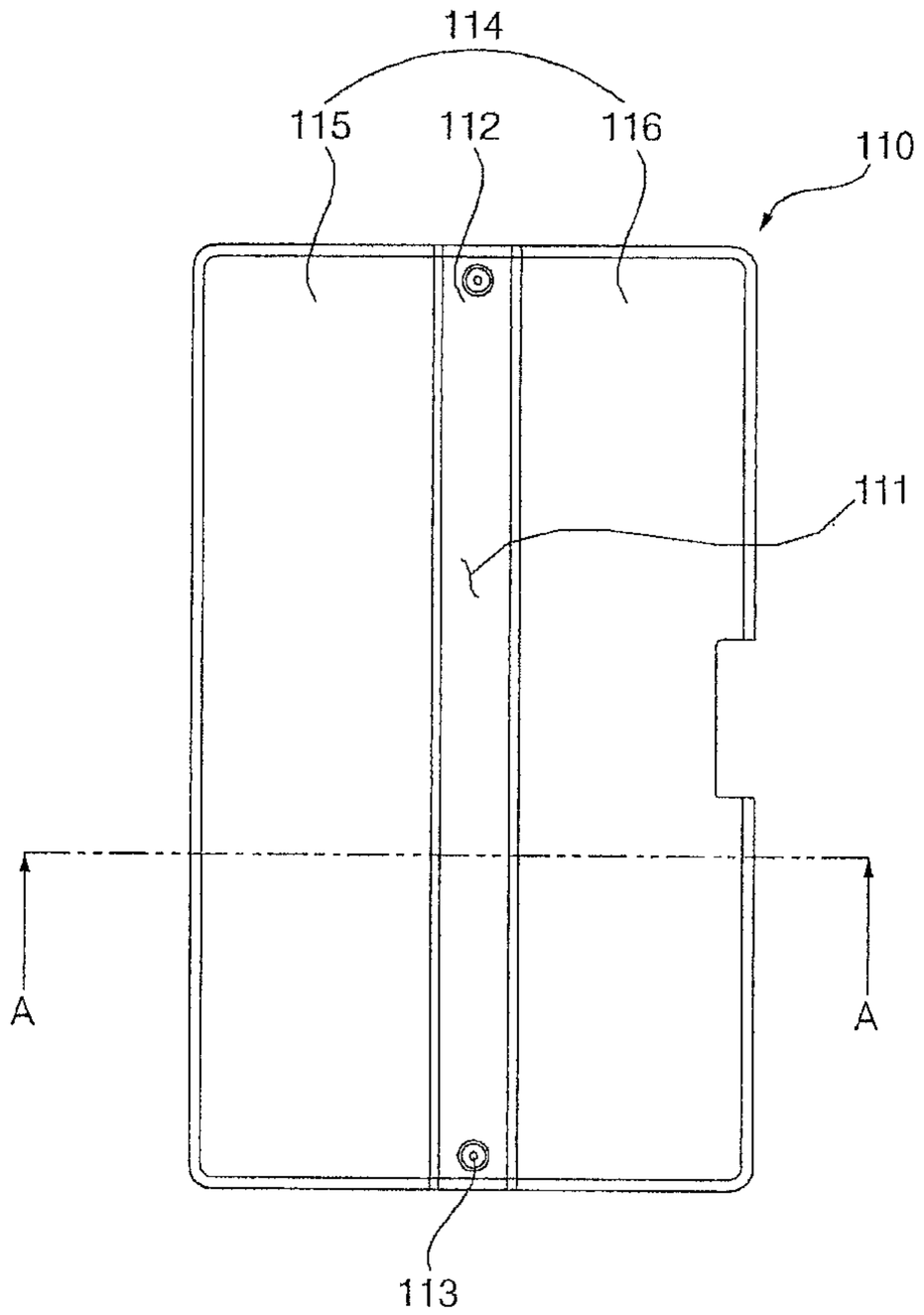

FIG.8

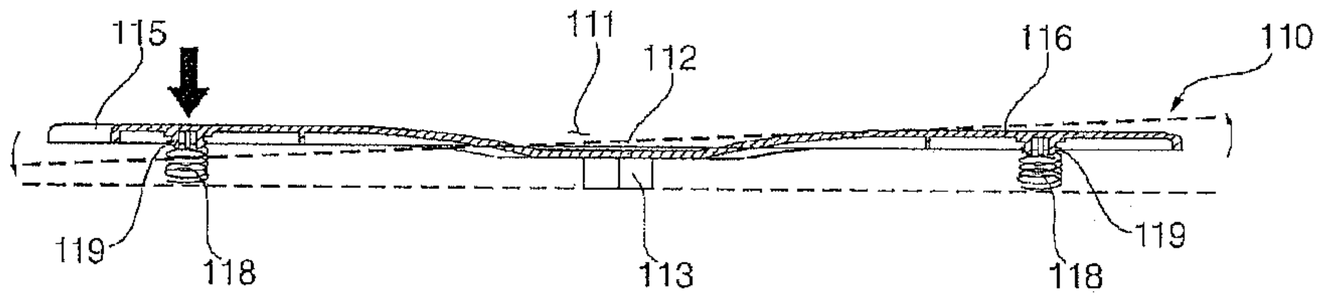
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FIG.9

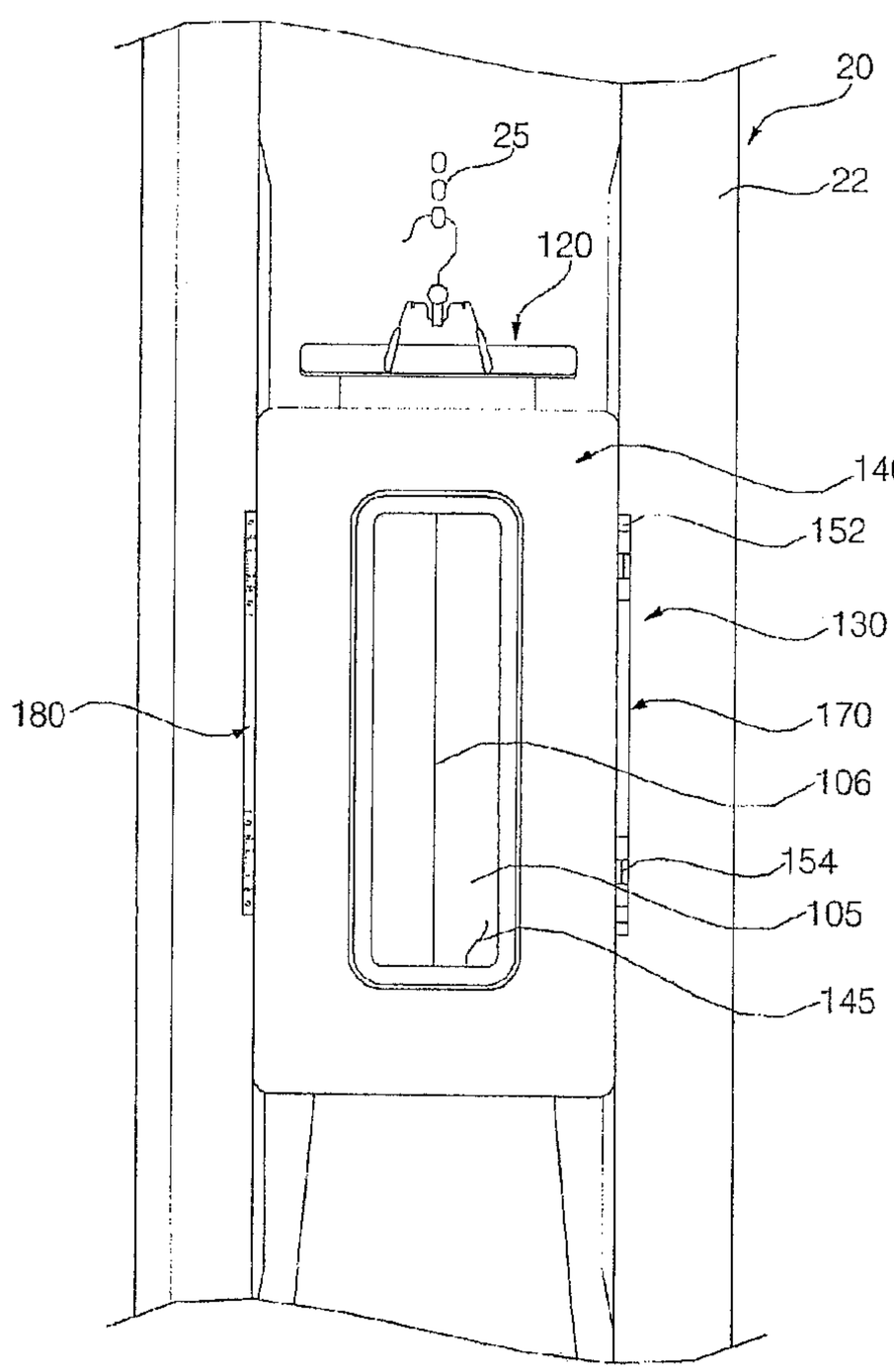
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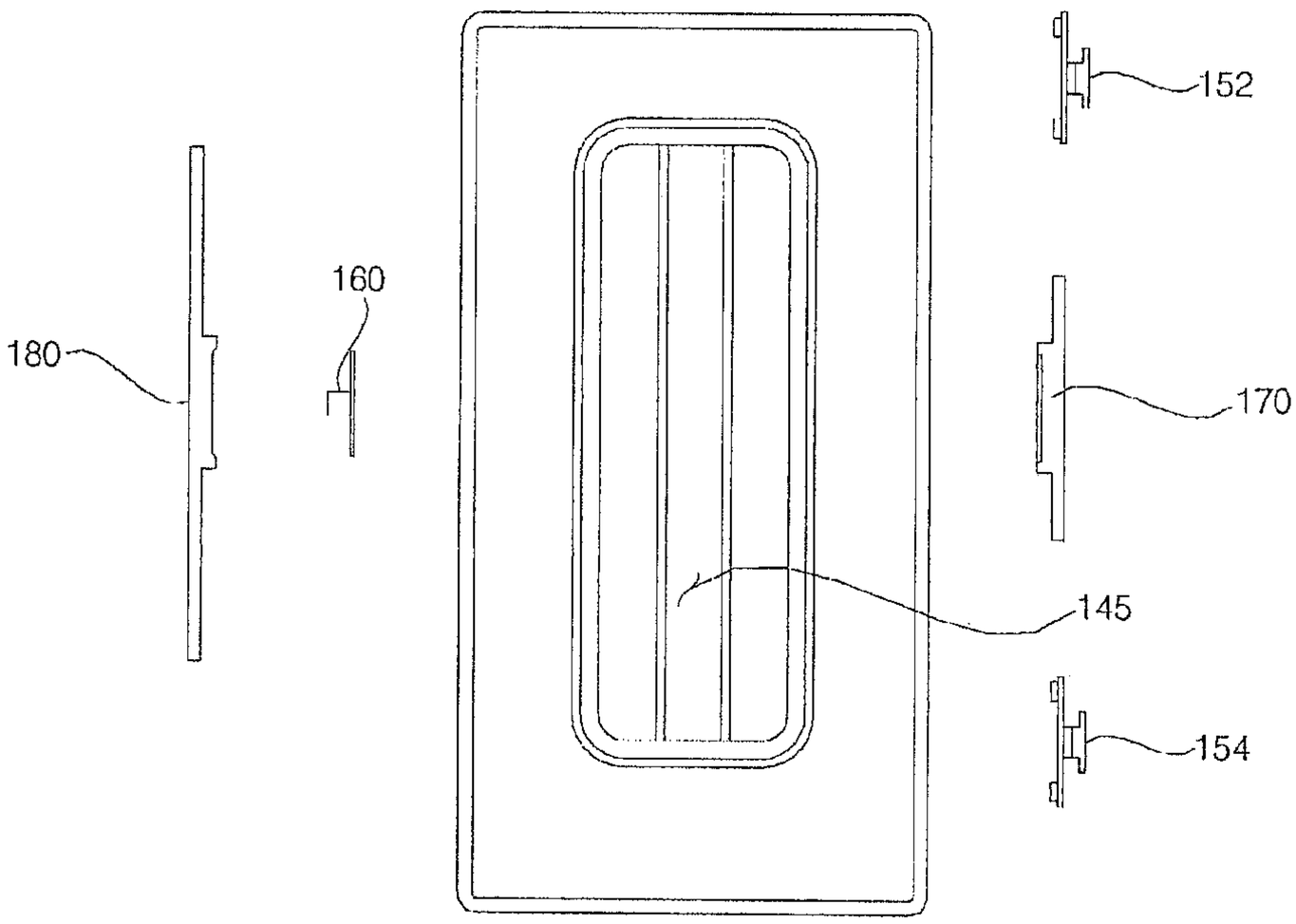
FIG. 10



CLOTHES 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 *is a Reissue of U.S. Pat. No. 9,809,924, which* claims the priority benefit of Korean Patent Application No. 10-2014-0184456, filed on Dec. 19, 2014 and Application No. 10-2014-0184457, filed on Dec. 19, 2014 in the Korean Intellectual Property Office, the disclosure of which is incorporated herein by reference.

FIELD

The present disclosure relates to a clothes treatment apparatus.

BACKGROUND

Clothes treatment apparatuses are apparatuses that treat clothes, e.g., wash and dry clothes and smooth wrinkles in clothes, at home or at laundromats.

Clothes treatment apparatuses may be classified into a washer for washing clothes, a dryer for drying clothes, a washer/dryer having both a washing function and a drying function, a refresher for refreshing clothes, and a steamer for removing unnecessary wrinkles in clothes.

The refresher is an apparatus that keep clothes comfortable and fresh. The refresher functions to dry clothes, to supply fragrance to clothes, to prevent the occurrence of static electricity in clothes, or to remove wrinkles from clothes.

The steamer is an apparatus that supplies steam to clothes in order to remove wrinkles from the clothes. Unlike a general iron, the steamer removes wrinkles from the clothes without directly applying heat to the clothes.

SUMMARY

According to an innovative aspect of the subject matter described in this application, a clothes treatment apparatus includes a cabinet that defines a treatment chamber; a door that is configured to open and close at least a portion of the cabinet; and a wrinkle removal module that is located on an inside of the door, that is configured to remove wrinkles from clothes by applying pressure to the clothes, and that includes a base plate that is located at the door and that is configured to support clothes; and a press plate that is coupled to the base plate, that is configured to rotate relative to the base plate, and that is configured to remove wrinkles from clothes based on pressing against the base plate.

The clothing treatment apparatus may include one or more of the following optional features. At least a portion of the base plate is separated from the door by a predetermined distance. The base plate includes a material that generates an elastic force that presses the base plate against the press plate. The press plate includes a material that generates an elastic force that presses the press plate against the base plate. The press plate is configured to rotate relative to the base plate in upward and downward directions or in leftward and rightward directions. At least one of the base plate or the press plate includes a press avoiding part that is configured to receive a sewn part of clothes and that defines a groove.

The base plate includes a fixed base part that is fixed to the door; and an elastic base part that extends from the fixed base part, that is separated from the door by a greater distance than the fixed base part, and that is configured to support clothes using elastic force. The fixed base part includes a press avoiding part that is configured to receive a sewn part of clothes and that defines a groove. The fixed base part is configured to be closer to the door than the elastic base part. The fixed base part includes a fastening part that protrudes toward the door, that is supported by the door, and that is configured to separate the fixed base part from the door. The base plate is configured to rotate about the fastening part through a predetermined angle based on being pressed by the press plate.

The elastic base part includes a left elastic base part that extends from the fixed base part in a leftward direction; and a right elastic base part that extends from the fixed base part in a rightward direction. The press plate defines an opening that is configured to expose clothes to the treatment chamber. The base plate further includes an elastic member that is located between the elastic base part and the door and that is configured to provide elastic force to the elastic base part. The base plate further includes an elastic member fixing part that is located at the elastic base part, that protrudes toward the door, that is configured to connect at least a portion of the elastic base part to the elastic member fixing part. The elastic member is a coil spring, and at least a portion of the coil spring is connected to the elastic member fixing part.

The wrinkle removal module further includes a first hinge that is coupled to a first side of the base plate, that is coupled to a first side of the press plate, and that is configured to allow rotation of the press plate; a second hinge that is coupled to the first side of the base plate, that is coupled to the first side of the press plate, and that is configured to allow rotation of the press plate; and a latch that is located at a second side of the base plate or a second side of the press plate, that is located opposite the first hinge and the second hinge, and that is configured to latch the press plate and the base plate. The wrinkle removal module further includes a cap cover that is located between the first hinge and the second hinge and that is located between the base plate and the press plate. The wrinkle removal module further includes a camouflage cover that is located at the second side of the base plate or the second side of the press plate and that is located at positions opposite the first hinge, the second hinge, and the cap cover.

According to another innovative aspect of the subject matter described in this application, a clothes treatment apparatus includes a cabinet that defines a treatment chamber; a door that is configured to open and close at least a portion of the cabinet; and a wrinkle removal module that is located on an inside of the door, that is configured to remove wrinkles from clothes by applying pressure to the clothes, and that includes a base plate that is located at the door and that is configured to support clothes; a press plate that is coupled to the base plate, that is configured to rotate relative to the base plate, that is configured to remove wrinkles from clothes based on pressing against the base plate, and that defines an opening that is configured to expose clothes to the treatment chamber; a first hinge that is coupled to a first side of the base plate, that is coupled to a first side of the press plate, and that is configured to allow rotation of the press plate; a second hinge that is coupled to the first side of the

base plate, that is coupled to the first side of the press plate, and that is configured to allow rotation of the press plate; and a latch that is located at a second side of the base plate or a second side of the press plate, that is located opposite the first hinge and the second hinge, and that is configured to latch the press plate and the base plate, where the base plate includes a fixed base part that is fixed to the door; and an elastic base part that extends from the fixed base part, that is separated from the door by a greater distance than the fixed base part, and that is configured to support clothes using elastic force.

It is an object of the subject matter described in this application to provide a clothes treatment apparatus that includes a wrinkle removal module that is capable of removing wrinkles from trousers and is configured such that the direction in which the wrinkle removal module is opened and closed can be reversed.

It is another object of the subject matter described in this application to provide a clothes treatment apparatus that is capable of uniformly pressing trousers when the trousers are hung in the clothes treatment apparatus.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of an example clothes treatment apparatus.

FIG. **2** is a block diagram of an example clothes treatment apparatus.

FIG. **3** is an exploded perspective view of an example cycle assembly.

FIG. **4** is a perspective view of an example cycle assembly.

FIG. **5** is a view of an example wrinkle removal module.

FIG. **6** is an exploded view of an example wrinkle removal module.

FIG. **7** is a front view of an example base plate.

FIG. **8** is a bottom view of an example base plate.

FIG. **9** is a view of an example wrinkle removal module when the opening and closing direction of the example wrinkle removal module is reversed as compared to FIG. **5**.

FIG. **10** is an exploded view of an example wrinkle removal module.

DETAILED DESCRIPTION

FIGS. **1** and **2** illustrate example clothes treatment apparatuses. FIGS. **3** and **4** illustrate example cycle assemblies.

The clothes treatment apparatus **1** includes a cabinet **10**, which defines a treatment chamber **12** that is open at the front thereof, and a door **20** configured to open and close the front of the cabinet **10**.

The interior of the cabinet **10** is partitioned into upper and lower interior parts by a partition plate **11**. A treatment chamber **12**, in which clothes are hung, is defined in the interior of the cabinet **10** above the partition plate **11**. A cycle chamber **14**, in which machinery is installed, is defined in the interior of the cabinet **10** below the partition plate **11**.

Clothes are hung in the treatment chamber **12**. In the treatment chamber **12**, wrinkles in the clothes are smoothed, or the clothes are deodorized, by the circulation of steam or air.

A hanger support bar **13** configured to support clothes hangers, on which clothes are hung, is provided in the upper part of the treatment chamber **12**. The hanger support bar **13** may be configured to be moved in the treatment chamber **12** in forward and rearward directions, in upward and downward directions, and/or in leftward and rightward directions

by a driving device, such as a motor. The hanger support bar **13** may be periodically reciprocated.

An air blowing port **[16]** and a steam discharge port **[17]** are formed in the treatment chamber **12**.

In some implementations, the air blowing port **[16]** and the steam discharge port **[17]** are formed in a discharge panel**[15]**.

In some implementations, the air blowing port **[16]** and the steam discharge port **[17]** may be formed in different panels.

In some implementations, the discharge panel **[15]** constitutes a portion of the cycle chamber **14**. The discharge panel **[15]** is located at the rear side of the partition plate **11**. The discharge panel **[15]** and the partition plate **11** form a continuous surface. The discharge panel **[15]** is inclined toward the partition plate **11**.

Air blown by a blowing unit **30** is discharged through the air blowing port**[16]**.

Steam generated by a steam unit **40** is discharged through the steam discharge port**[17]**.

A blowing unit **30** for circulating air in the treatment chamber **12**, a steam unit **40** for supplying steam into the treatment chamber **12**, a heat pump unit **50** for conditioning air in the treatment chamber **12**, and a control unit **60** for controlling the respective units **30**, **40**, and **50** are installed in the cycle chamber **14**.

In some implementations, an assembly of machinery, including the blowing unit **30**, the steam unit **40**, the heat pump unit **50**, and the control unit **60**, which are required to perform respective cycles of the clothes treatment apparatus, is defined as a cycle assembly.

The blowing unit **30** includes a blowing fan **32** and an inlet duct **34**.

The inlet duct **34** is installed at the suction side of the blowing fan **32** to guide air in the treatment chamber **12** to the blowing fan **32**.

The blowing fan **32** is rotated to blow air. The blowing fan **32** suctions air from the treatment chamber **12**, and discharges the suctioned air to the heat pump unit **50**.

When the steam unit **40** is powered on, heat is generated from the steam unit **40**. The steam unit **40** converts water supplied from a water supply tank **72**, which will be described hereinafter, into steam. The generated steam is discharged into the treatment chamber **12**.

In some implementations, a flow channel is defined such that the steam flows into the treatment chamber **12** via the heat pump unit **50**.

The heat pump unit **50** constitutes a heat pump cycle including a compressor, a condenser, an evaporator, and an expansion valve. Based on the operation mode of the heat pump unit **50**, cooled air or heated air may be discharged into the treatment chamber **12**.

In some implementations, the heat pump unit **50** may heat air around the condenser through heat exchange with a refrigerant, and may supply the heated air into the treatment chamber **12** through the blowing unit **30**. The high-temperature air, which is supplied into the treatment chamber **12**, is used to treat clothes that are hung on the clothes hangers, which are supported by the hanger support bar **13**. Of course, in a case which the heat pump unit **50** is not operated, but only the blowing unit is operated, room-temperature air is supplied into the treatment chamber **12**. In addition, air cooled by the evaporator may be supplied into the treatment chamber **12** through the blowing unit **30**.

The heat pump unit **50** may dehumidify the air in the treatment chamber **12**.

A tank module **70** for storing water is installed in front of the cycle chamber **14**. The tank module **70** includes a water supply tank **72** for supplying water to the steam unit **40** and a drainage tank **74** for collecting and storing condensed water that is generated in the treatment chamber **12**.

A water supply level sensor **81** for sensing the level of water stored in the water supply tank **72** is installed in the water supply tank **72**, and a drainage level sensor **91** for sensing the level of water stored in the drainage tank **74** is installed in the drainage tank **74**.

Water from the water supply tank **72** flows to the steam unit **40** via a water supply pump **45**.

Water that is condensed in the treatment chamber **12** flows to the lower side of the treatment chamber **12** due to gravity, and is then pumped to the drainage tank **74** by a drainage pump **46**. Water that is condensed in the heat pump unit **50** also flows to the drainage tank **74** via the drainage pump **46**.

The water supply pump **45** or the drainage pump **46** is controlled by the control unit **60**.

In some implementations, a tank module frame **71** is installed in front of the inlet duct **34**.

A tank installation space **73** is defined between the tank module frame **71** and the door **20**. The tank module frame **71** is coupled to the partition plate **11** to isolate the cycle chamber **14** from the outside.

A tank support bar **75**, which interferes with at least one selected from between the water supply tank **72** and the drainage tank **74**, is installed in front of the tank installation space **73**.

The tank support bar **75** prevents the water supply tank **72** or the drainage tank **74** from being unintentionally separated from the tank installation space **73**. The tank support bar **75** supports the front of the water supply tank **72** and the front of the drainage tank **74**.

When the door **20** is opened and closed, therefore, the water supply tank **72** and the drainage tank **74** are prevented from being separated from the tank installation space **73**.

In some implementations, the lower end of the water supply tank **72** is placed on the upper end of the tank support bar **75**, and the lower end of the drainage tank **74** is placed on the upper end of the tank support bar **75**.

A tank support end **79**, which interferes with the tank support bar **75**, is formed on at least one selected from between the water supply tank **72** and the drainage tank **74**.

The tank support end **79** is concavely recessed.

The front of the tank support bar **75** and the front of the water supply tank **72** may form a continuous surface due to the tank support end **79**. In addition, the front of the tank support bar **75** and the front of the drainage tank **74** may form a continuous surface due to the tank support end **79**.

The water supply tank **72** and the drainage tank **74** are disposed in the tank installation space **73** such that the water supply tank **72** and the drainage tank **74** are arranged parallel to each other in rightward and leftward directions.

When the door **20** is opened, the water supply tank **72** and the drainage tank **74** are exposed to a user.

The water supply tank **72** and the drainage tank **74** may be withdrawn by the user.

The water supply tank **72** and the drainage tank **74** may be separated from the tank module frame **71**. The water supply tank **72** and the drainage tank **74** may be separably mounted in the tank installation space **73**.

The water supply tank **72** is connected to the steam unit **40** to supply water to the steam unit **40**. The drainage tank **74** is connected to the treatment chamber **12** to store water discharged from the treatment chamber **12** or the heat pump unit **50**.

The drainage tank **74** is identical in function to the water supply tank **72**. The drainage tank **74** is disposed alongside the water supply tank **72**.

The door **20** includes a door panel **22** for opening and closing the front of the cabinet **10**, a hinge unit **24** for connecting the door panel **22** and the cabinet **10** in a hinged fashion, a door gasket **26** disposed at the door panel **22** such that the door gasket **26** is in tight contact with the edge of the cabinet **10** to achieve a seal between the door **20** and the cabinet **10**, and a door liner **80** disposed at the inside of the door panel **2** for guiding condensed water that is generated in the treatment chamber **12** to the partition plate **11**.

In some implementations, the door **20** is configured to have a structure that simultaneously opens and closes the treatment chamber **12** and the tank installation space **73**. In some implementations, a plurality of doors may be mounted to the cabinet **10** such that the respective doors can open and close the treatment chamber **12** and the tank installation space **73**.

The door liner **80** is disposed toward the treatment chamber **12**.

The door liner **80** guides condensed water that is generated on the surface thereof to a drainage grill **[13]** formed at the partition plate **11**.

The door liner **80** includes a liner part **82**, which is attached to the inside of the door panel **22** such that the liner part **82** is parallel to the door panel **22**, and a liner guide part **84**, which is formed at the lower end of the liner part **82** such that the liner guide part **84** is deviated toward the inside of the treatment chamber **12**.

The door liner **80** is located at the upper side of the partition plate **11**. The door liner **80** may have an area slightly less than the area of the front of the treatment chamber **12**.

The door gasket **26** may be mounted to the door panel **22** such that the door gasket **26** surrounds the door panel **22**. The seal between the door **20** and the cabinet **10** may be achieved by the door gasket **26**.

The door gasket **26** may individually seal the treatment chamber **12** and the tank installation space **73**.

The door gasket **26** may prevent condensed water that is generated in the treatment chamber **12** from flowing to the tank installation space **73**.

The liner part **82** is in tight contact with the door panel **22**.

In some implementations, the liner guide part **84** is integrally formed with the liner part **82**. In some implementations, the liner part **82** and the liner guide part **84** may be manufactured separately.

The liner guide part **84** is disposed such that the liner guide part **84** is deviated from the liner part **82** toward the treatment chamber **12**. The liner guide part **84** may be formed to have a round shape or an inclined surface.

The liner guide part **84** may protrude from the door **20** toward the inside of the treatment chamber **12**.

A drop part **86** is formed at the lower end of the liner guide part **84**. The drop part **86** may be formed to have an undercut shape. The drop part **86** functions to increase the size of droplets of condensed water and to drop the droplets downward.

A portion of the door gasket **26** may be disposed at the lower side of the liner guide part **84**. The door gasket **26** prevents condensed water that is generated in the treatment chamber **12** from falling to the tank installation space **73**.

In some implementations, the clothes treatment apparatus further includes a wrinkle removal module **100** for applying pressure to clothes to remove wrinkles from the clothes. The wrinkle removal module **100** is installed at the door **20**. In

some implementations, the wrinkle removal module **100** may be installed in the treatment chamber **12**.

The wrinkle removal module **100** is installed at the position to which steam is supplied.

The wrinkle removal module **100** includes a base plate **110** installed at the inside of the door **20** for supporting clothes (e.g., trousers) **105**, from which wrinkles are to be removed, and a press plate **140** configured to be brought into tight contact with the base plate **110** for pressing the trousers **105**.

The trousers **105** are hung on a hanger member **120**. The hanger member **120**, on which the trousers **105** are hung, is supported by a support part **25** disposed inside the door **20**.

In some implementations, a general trousers hanger is used as the hanger member **120**. Other kinds of hanger members for hanging scarves, mufflers, etc. may be used. The shape of the hanger member **120** may be variously modified.

A plurality of support parts **25** is disposed at the inside of the cabinet **10** such that the support parts **25** are arranged in a vertical direction. One of the support parts **25** is selected based on the length of trousers from which wrinkles are to be removed.

The base plate **110** is installed at the door **20**. The base plate **110** may be installed at the door panel **22** or the door liner **80**.

The base plate **110** is formed to have a plate shape that exhibits high elasticity. At least a portion of the base plate **110** is spaced apart from the door **20**.

Condensed water formed on the door **20** may move to the liner guide part **84** through a gap defined between the base plate **110** and the door **20**.

At least a portion of the base plate **110** is spaced apart from the door liner **80**. As a result, the condensed water formed on the door **20** is prevented from contacting clothes.

In some implementations, the press plate **140** may be formed of an elastic material. In some implementations, the base plate **110** may be formed of a hard material, and the press plate **140** may be formed of an elastic material. In some implementations, clothes may be brought into tight contact with the base plate **110** by the elastic force provided by the press plate **140**.

In some implementations, the base plate **110** is manufactured using a single plate. In some implementations, the base plate **110** may be manufactured by assembling a plurality of plates.

A groove is formed in the portion of the base plate **110** at which a sewn part **106** of the trousers is located. Interference between the base plate **110** and the sewn part **106** of the trousers is avoided, and the contact area between the base plate **110** and the trousers is maximized.

The base plate **110** is provided with a press avoiding part **111**, at which the sewn part **106** of the trousers is located.

The base plate **110** includes a fixed base part **112**, which is fixed to the door **20**, and an elastic base part **114** extending from the fixed base part **112**, the elastic base part **114** being configured to be spaced further apart from the door **20** than the fixed base part **112**.

In some implementations, the fixed base part **112** extends in upward and downward directions. The fixed base part **112** is provided at upper and lower sides thereof with fastening parts **113**, through which the fixed base part **112** is coupled to the door **20**.

The elastic base part **114** provides the elastic force necessary to support clothes. The elastic base part **114** elastically supports clothes such that the clothes are brought into tight contact with the elastic base part **114**.

The elastic base part **114** includes a left elastic base part **115** extending from the fixed base part **112** in a leftward direction and a right elastic base part **116** extending from the fixed base part **112** in a rightward direction.

When external force is applied to the left elastic base part **115** and the right elastic base part **116**, the left elastic base part **115** and the right elastic base part **116** may be elastically deformed toward the door **20**. When the external force applied to the left elastic base part **115** and the right elastic base part **116** is removed, the left elastic base part **115** and the right elastic base part **116** may return to their original states.

When the base plate **110** is pressed by the press plate **140**, the base plate **110** may be rotated or twisted about the fastening parts **113** by a predetermined angle. As a result, the press plate **140** is brought into uniform contact with the base plate **110**.

In some implementations, when the press plate **140** is rotated from left to right in a state in which the trousers **105** are located between the base plate **110** and the press plate **140**, the left elastic base part **115** is pressed first, and then the right elastic base part **116** is pressed.

In some implementations, the elastic base part **114** is elastically deformed to the left side about the fastening parts **113** by a predetermined angle. As a result, the pressure applied to the trousers is distributed, whereby the pressure is uniformly applied over the trousers.

The fixed base part **112** is disposed lower than the elastic base part **114**. The fixed base part **112** is disposed closer to the door **20** than the elastic base part **114**. As a result, a height difference is formed between the fixed base part **112** and the elastic base part **114**.

The press avoiding part **111** is formed at the upper side of the fixed base part **112**. In some implementations, the press avoiding part **111** is formed based on the height difference between the fixed base part **112** and the elastic base part **114**. In some implementations, a groove may be formed in the fixed base part **112**. In some implementations, the sewn part **106** of the trousers is located in the fixed base part **112**.

The sewn part **106** of the trousers is constituted by overlapping pieces of fabric. As a result, the sewn part **106** of the trousers is thick. Unless the press avoiding part **111** is formed as described above, the pressure from the press plate **140** is concentrated on the sewn part **106** of the trousers. In this case, the pressure is not uniformly applied over the trousers.

In some implementations, the pressure is applied to the remaining parts of the trousers excluding the sewn part **106**.

In addition, an elastic member **118** for elastically supporting the base plate **110** is disposed between the base plate **110** and the door **20**.

In some implementations, a coil spring is used as the elastic member **118**. In some implementations, a leaf spring may be used as the elastic member **118**. In addition, elasticity may be provided based on the elastic force that generated from a member (e.g., a rib) integrally formed at the base plate **110**.

In some implementations, elastic members **118** are disposed at the upper and lower sides of the left elastic base part **115** and the upper and lower sides of the right elastic base part **116**.

In some implementations, the base plate **110** is provided with elastic member fixing parts **119**, into which the elastic members **118** are fitted.

In some implementations, each of the elastic member fixing parts **119** is formed to have a hook shape.

A portion of the coil spring is caught and fixed by each of the elastic member fixing parts **119**.

The elastic member fixing parts **119** are formed between the door **20** and the base plate **110**. The elastic member fixing parts **119** are integrally formed at the base plate **110**. In some implementations, the elastic member fixing parts **119** may be manufactured separately, and may then be assembled to the base plate **110**.

The press plate **140** is opposite to the base plate **110**.

The press plate **140** may be rotated relative to the base plate **110**. In some implementations, the press plate **140** is rotated in a horizontal direction. In some implementations, the press plate **140** may be rotated in upward and downward directions.

The press plate **140** is formed so as to be flat.

The press plate **140** includes a press avoiding part **142** for avoiding interference between the press plate **140** and the sewn part **106** of the trousers and press parts **144** formed at the left and right sides of the press avoiding part **142** such that the press parts **144** are brought into tight contact with the elastic base part **114**.

The press plate **140** is provided with an opening **145**, through which steam is supplied to the trousers. In some implementations, the opening **145** is disposed so as to overlap the press avoiding part **142**. In some implementations, the press avoiding part **142** and the opening **145** may be disposed separately. In some implementations, the opening **145** may be formed in the press parts **144**.

In some implementations, a single opening **145** is formed. In some implementations, a plurality of openings **145** may be formed in the press plate **140**, and the openings **145** may have various shapes or patterns.

In some implementations, both the press avoiding part **111** and the press avoiding part **142** are provided. In some implementations, any one selected from between the press avoiding part **111** formed in the base plate **110** and the press avoiding part **142** formed in the press plate **140** may be provided.

In some implementations, the press plate **140** is installed to press the trousers **105** while rotating relative to the base plate **110**.

In some implementations, the wrinkle removal module **100** has an advantage in that the base plate is manufactured using a single plate material, whereby it is possible to effectively distribute pressure applied from the press plate to the base plate.

In some implementations, the wrinkle removal module **100** has an advantage in that the sewn part **106** of the trousers **105** is located in the base plate **110**, which extends in the upward and downward directions, whereby it is possible to prevent pressure from being concentrated on the sewn part **106** of the trousers **105** and thus to uniformly apply the pressure over the trousers **105** such that wrinkles can be effectively removed from the trousers **105**.

In some implementations, the door **20** may be installed so as to be opened from left to right or from right to left based on the position at which the hinge unit **24** is installed.

The press plate **140** of the wrinkle removal module **100** is configured to have a reversible structure **130** in which the press plate **140** can be opened from right to left or from left to right depending upon the direction in which the door **20** is opened.

The door **20** may be installed such that the door **20** can be opened from left to right or from right to left. The direction in which the door **20** is opened may be selected in order to efficiently use the space in which the clothes treatment apparatus is installed or based on user preference.

In some implementations, in which the door **20** is installed so as to be opened from left to right, as shown in FIG. **1**, the press plate **140** is installed so as to be rotated from right to left.

In some implementations, in which the door **20** is installed so as to be opened from right to left, on the other hand, the press plate **140** is installed so as to be rotated from left to right.

As described above, the reversible structure **130** is configured to change the direction in which the press plate **140** is opened.

FIGS. **5**, **6**, and **10** illustrate example wrinkle removal modules. FIGS. **7** and **8** illustrate example base plates. FIG. **9** is a view of an example wrinkle removal module when the opening and closing direction of the example wrinkle removal module is reversed as compared to FIG. **5**.

The reversible structure **130** includes a first hinge **152** and a second hinge **154** coupled to one side of the base plate **110** and one side of the press plate **140** for allowing the press plate **140** to be rotated thereabout, a latch **160** installed at the other side of the base plate **110** and the other side of the press plate **140** for fixing the press plate **140** to the base plate **110** when the press plate **140** is brought into tight contact with the base plate **110**, a cap cover **170** disposed between the first hinge **152** and the second hinge **154**, and a camouflage cover **180** installed at the other side of the base plate **110** and the other side of the press plate **140**.

In some implementations, the structure in which the press plate **140** is installed so as to be rotated from right to left will be described by way of example (see FIGS. **1**, **5**, and **6**).

The first hinge **152** is disposed at the upper end of the left side of the base plate **110**, and then the press plate **140** is connected to the base plate **110** via the first hinge **152**.

The second hinge **154** is disposed at the lower end of the left side of the base plate **110**, and then the press plate **140** is connected to the base plate **110** via the second hinge **154**.

The cap cover **170** is inserted into an empty space defined between the first hinge **152** and the second hinge **154**. The cap cover **170** may be located between the base plate **110** and the press plate **140**.

The latch **160** is installed at the other side of the press plate **140**, which is opposite to the first hinge **152** and the second hinge **154**.

When the press plate **140** is pushed toward the base plate **110** such that the press plate **140** is brought into tight contact with the base plate **110**, the press plate **140** and the base plate **110** catch on each other through the hook coupling of the latch **160**. When the press plate **140** is pushed again toward the base plate **110** in a state in which the press plate **140** and the base plate **110** catch on each other through the hook coupling of the latch **160**, the hook coupling of the latch **160** is released. The latch **160** is configured to achieve one-touch hook coupling.

The camouflage cover **180** is located opposite to the cap cover **170**.

The camouflage cover **180** is provided to prevent the first hinge **152**, the second hinge **154**, and the cap cover **170** from being exposed to a user. The camouflage cover **180** hides the first hinge **152**, the second hinge **154**, and the cap cover **170**.

The camouflage cover **180** is fixed to any one selected from between the base plate **110** and the press plate **140**. The camouflage cover **180** is installed at the entrance at which the press plate **140** opens.

In some implementations, the camouflage cover **180** is installed at the base plate **110**.

The shape of the camouflage cover **180** corresponds to the shapes of the first hinge **152**, the second hinge **154**, and the

cap cover **170**. As a result, the left and right shapes of the wrinkle removal module **100** are the same.

The state shown in FIG. **5** may be reversed to the state shown in FIG. **9**. As shown in FIGS. **9** and **10**, the first hinge **152**, the second hinge **154**, and the cap cover **170** may be installed at the right side of the press plate **140**, and the camouflage cover **180** may be installed at the left side of the press plate **140**, thereby achieving the reverse installation of the wrinkle removal module **100**.

The wrinkle removal module **100** may be installed in a state in which the direction in which the wrinkle removal module **100** is opened and closed is selected based on user preference.

In the wrinkle removal module **100**, the direction in which the press plate **140** is opened and closed may be set to interlock with the direction in which the door **20** is opened and closed.

In the clothes treatment apparatus, the direction in which the door **20** or the wrinkle removal module **100** is opened and closed may be selected based on the user's physical characteristics, for example, based on whether the user is a handicapped person or a left-handed person.

As is apparent from the above description, the clothes treatment apparatus has the following effects.

First, the base plate may be manufactured using a single plate material, whereby it is possible to effectively distribute pressure applied from the press plate to the base plate.

Second, when pressure is nonuniformly applied from the press plate to the base plate, the base plate may be deformed, whereby it is possible to uniformly distribute the pressure over the trousers.

Third, the plate may be deformed or rotated about the fastening parts formed at the base plate, whereby it is possible to balance the pressure.

Fourth, pressure may be prevented from being concentrated on the sewn part of the clothes by the provision of the press avoiding part, whereby it is possible to uniformly apply the pressure over the clothes.

Fifth, the wrinkle removal module may be configured such that the wrinkle removal module can be opened from left to right or from right to left based on the user's selection.

Sixth, the direction in which the press plate of the wrinkle removal module is opened and closed may be selected to interlock with the direction in which the door is opened and closed.

What is claimed is:

1. A clothes treatment apparatus comprising:

a cabinet that defines a treatment chamber;

a door that is configured to open and close at least a portion of the cabinet; and

a wrinkle removal module that is located on an inside of the door, that is configured to remove wrinkles from clothes by applying pressure to the clothes, and that comprises:

a base plate that is located at the door and that is configured to support clothes; and

a press plate **[**that is coupled to the base plate,**]** that is configured to rotate relative to the base plate, and that is configured to remove wrinkles from clothes based on pressing against the base plate,

wherein at least one of the base plate or the press plate includes a press avoiding part that is configured to receive a sewn part of clothes and that defines a groove.

2. The clothes treatment apparatus according to claim **1**, wherein at least a portion of the base plate is separated from the door by a predetermined distance.

3. The clothes treatment apparatus according to claim **1**, wherein the base plate comprises a material that generates an elastic force that presses the base plate against the press plate.

4. The clothes treatment apparatus according to claim **1**, wherein the press plate comprises a material that generates an elastic force that presses the press plate against the base plate.

5. The clothes treatment apparatus according to claim **1**, wherein the press plate is configured to rotate relative to the base plate in upward and downward directions or in leftward and rightward directions.

6. A clothes treatment apparatus comprising:

a cabinet that defines a treatment chamber;

a door that is configured to open and close at least a portion of the cabinet; and

a wrinkle removal module that is located on an inside of the door, that is configured to remove wrinkles from clothes by applying pressure to the clothes, and that comprises:

a base plate that is located at the door, that is configured to support clothes, and that comprises:

a fixed base part that is fixed to the door; and

an elastic base part that extends from the fixed base part, that is separated from the door by a greater distance than the fixed base part, and that is configured to support clothes using elastic force; and

a press plate **[**that is coupled to the base plate,**]** that is configured to rotate relative to the base plate, and that is configured to remove wrinkles from clothes based on pressing against the base plate.

7. The clothes treatment apparatus according to claim **6**, wherein the fixed base part includes a press avoiding part that is configured to receive a sewn part of clothes and that defines a groove.

8. The clothes treatment apparatus according to claim **6**, wherein the fixed base part is configured to be closer to the door than the elastic base part.

9. The clothes treatment apparatus according to claim **6**, wherein the fixed base part includes a fastening part that protrudes toward the door, that is supported by the door, and that is configured to separate the fixed base part from the door.

10. The clothes treatment apparatus according to claim **9**, wherein the base plate is configured to rotate about the fastening part through a predetermined angle based on being pressed by the press plate.

11. The clothes treatment apparatus according to claim **6**, wherein the elastic base part comprises:

a left elastic base part that extends from the fixed base part in a leftward direction; and

a right elastic base part that extends from the fixed base part in a rightward direction.

12. The clothes treatment apparatus according to claim **6**, wherein the press plate defines an opening that is configured to expose clothes to the treatment chamber.

13. The clothes treatment apparatus according to claim **6**, wherein the base plate further comprises an elastic member that is located between the elastic base part and the door and that is configured to provide elastic force to the elastic base part.

14. The clothes treatment apparatus according to claim **13**, wherein the base plate further comprises an elastic member fixing part that is located at the elastic base part, that

protrudes toward the door, that is configured to connect at least a portion of the elastic base part to the elastic member fixing part.

15. The clothes treatment apparatus according to claim **14**, wherein:

the elastic member is a coil spring, and

at least a portion of the coil spring is connected to the elastic member fixing part.

16. The clothes treatment apparatus according to claim **1**, wherein the wrinkle removal module further comprises:

a first hinge **[**that is coupled to a first side of the base plate,**]** that is coupled to a first side of the press plate, and that is configured to allow rotation of the press plate;

a second hinge **[**that is coupled to the first side of the base plate,**]** that is coupled to the first side of the press plate, and that is configured to allow rotation of the press plate; and

a latch that is located at a second side of the base plate or a second side of the press plate, that is located opposite the first hinge and the second hinge, and that is configured to latch the press plate and the base plate.

17. The clothes treatment apparatus according to claim **16**, wherein the wrinkle removal module further comprises a cap cover that is located between the first hinge and the second hinge and that is located between the base plate and the press plate.

18. The clothes treatment apparatus according to claim **17**, wherein the wrinkle removal module further comprises a camouflage cover that is located at the second side of the base plate or the second side of the press plate and that is located at positions opposite the first hinge, the second hinge, and the cap cover.

19. A clothes treatment apparatus comprising:

a cabinet that defines a treatment chamber;

a door that is configured to open and close at least a portion of the cabinet; and

a wrinkle removal module that is located on an inside of the door, that is configured to remove wrinkles from clothes by applying pressure to the clothes, and that comprises:

a base plate that is located at the door and that is configured to support clothes;

a press plate **[**that is coupled to the base plate,**]** that is configured to rotate relative to the base plate, and that is configured to remove wrinkles from clothes based on pressing against the base plate;

a first hinge **[**that is coupled to a first side of the base plate,**]** that is coupled to a first side of the press plate, and that is configured to allow rotation of the press plate;

a second hinge **[**that is coupled to the first side of the base plate,**]** that is coupled to the first side of the press plate, and that is configured to allow rotation of the press plate;

a latch that is located at a second side of the base plate or a second side of the press plate, that is located opposite the first hinge and the second hinge, and that is configured to latch the press plate and the base plate;

a cap cover that is located between the first hinge and the second hinge and that is located between the base plate and the press plate; and

a camouflage cover that is located at the second side of the base plate or the second side of the press plate and that is located at positions opposite the first hinge, the second hinge, and the cap cover.

20. The clothes treatment apparatus according to claim 1, further comprising a fastening part that is located between the base plate and the door to space apart the base plate from the door,

wherein the base plate is formed as a single plate and is configured to be rotatable about the fastening part when the base plate is pressed by the press plate.

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