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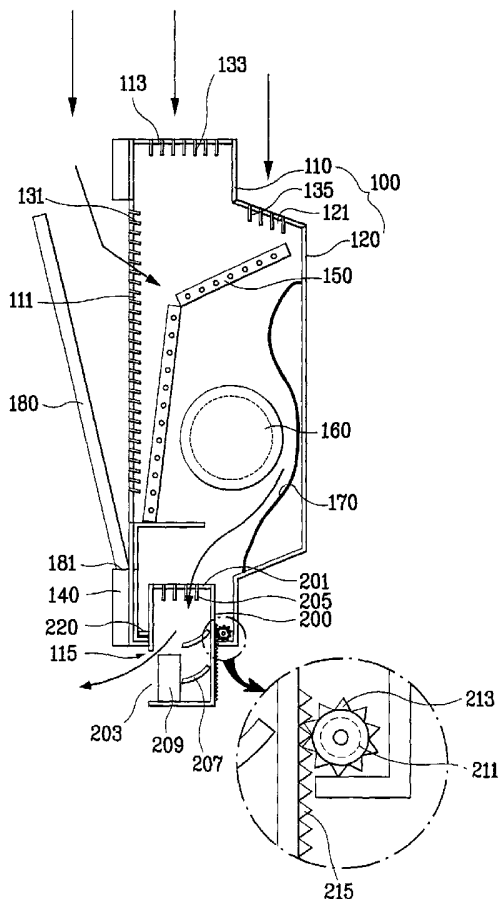
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(54) Title: AIR CONDITIONER



(57) Abstract: Indoor unit of air conditioner including a main chassis which forms an outer shape, a heat exchanger in the main chassis, for heat exchange of room air with a working fluid, a blower in the main chassis for forced circulation of room air toward the heat exchanger, and a control box in the main chassis to be drawable out of the main chassis having various electric fittings therein.



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## AIR CONDITIONER

### Technical Field

The present invention relates to an air conditioner,  
5 and more particularly, to an indoor unit of an air conditioner.

### Background Art

In general, the air conditioner circulates cooled, or  
10 heated air in a room for comfortable conditioning of a room air. In the air conditioners, there are an integrated type in which components of a cooling cycle are integrated in one unit, and a separated type in which components of a cooling cycle are separated into two units. In the  
15 separated type air conditioner, there are a wall mounting type in which the indoor unit is mounted on a wall, a floor mounting type in which the indoor unit is set on a floor, and a ceiling type in which the indoor unit is hung from a ceiling, or install on the ceiling.

20 Of the separated type air conditioner, the present invention relates to the indoor unit of the wall mounting type air conditioner. FIG. 1 illustrates a perspective view of the indoor unit of wall mounting type air conditioner.

25 Referring to FIG. 1, the related art indoor unit of a wall mounting type air conditioner is provided with a main chassis 1 forming an outer shape mounted on a wall of a room, a front panel 3 fitted to a front face of the main chassis 1, a suction grill 5 in the front panel 3, a  
30 discharge unit 7 fitted to a bottom of the main chassis 1, and a control box 9 in the main chassis 1 having electric fittings for controlling various operation. There is a heat exchanger 11 between the front panel 3 and the main

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chassis 1 for heat exchange of room air, and there is blower 13 in rear of the heat exchanger 11 for forced circulation of the room air. Also, there is a filter 4 between the suction grill 5 and a suction part of the front panel 3 for cleaning the room air drawn into the indoor unit.

The discharge unit 7 is provided with a diffuser 7a, a vane 7b for regulating a discharge direction of the heat exchanged air in up and down directions, and a louver 7c for regulating a discharge direction of the heat exchanged air in left and right directions.

In the meantime, there is a control box seat 2 in one side part of the main chassis 1, fastened thereto with screws 8.

The operation of the indoor unit will be explained, briefly.

The room air is drawn into the main chassis 1 through the suction grill 5 as the blower 13 is driven. Then, the room air is involved in heat exchange as the room air passes through the heat exchanger 11, and discharged into the room through the discharge unit 7. The room air is discharged to a user's desired direction by operating the vane 7b and the louver 7c.

However, the related art indoor unit of the wall mounting type air conditioner has the following problems.

First, since the control box 9 is enclosed by the main chassis 1 and the front panel 3, access to the control box 9 is difficult. In general, as the control box 9 has various electric fittings provided therein, it is required that repair of the system is carried out at the control box 9. However, in order to access to the control box 9, it is required that, after the front panel 3 is removed from the main chassis 1, the control box 9 is

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removed from the main chassis 1. Moreover, for taking out, or putting in the control box 1, there has been inconvenience of unscrewing/screwing the screws 8 one by one.

5       Second, the forward round bulge of the main chassis 1 and the front panel 3 have substantially great depth of the related art indoor unit, to occupy much room space and fail to provide a good look on the whole.

10       Third, positions of the suction grill 5 and the discharge unit 7 cause the air drawn into the indoor unit and the air discharged from the indoor unit to interfere each other. That is, the positions both of the suction grill 5 and the discharge unit 7 in front part of the main chassis 1 cause frequent cases in which the air drawn for  
15       heat exchange and the heat exchanged air are mixed together. In this case, the heat exchanged air is drawn into the heat exchanger 11 through the suction grill 5 directly without being circulated through the room, leading the heat exchange efficiency poor.

20       Fourth, since the suction grill 5 is opened always, foreign matters, such as dusts, enter into inside of the indoor unit through the suction grill.

25       Fifth, there has been a blind area right under the main chassis 1 caused by a structure of the discharge grill 7, to which no heat exchanged air is supplied properly. Of course, though the discharge direction of the heat exchanged air can be regulated by using the vane 7b or the louver 7c, the direct supply of the heat exchanged air right under the main chassis 1 has been impossible.

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#### **Disclosure of Invention**

An object of the present invention, designed for solving the foregoing problems, lies on improving

accessibility to a control box.

Another object of the present invention is to provide an air conditioner having a more slim outer shape.

Further object of the present invention is to provide  
5 an air conditioner, in which air before and after heat exchange does not interfere.

Still further object of the present invention is to provide an indoor unit of an air conditioner, which minimize entrance of foreign matters.

10 Still another object of the present invention is to provide an air conditioner, which can distribute heat exchanged air to a room uniformly.

To achieve the objects of the present invention, there is provided an indoor unit of an air conditioner  
15 including a main chassis which forms an outer shape, a heat exchanger in the main chassis, for heat exchange of room air with a working fluid, a blower in the main chassis for forced circulation of room air toward the heat exchanger, and a control box in the main chassis to be  
20 drawable out of the main chassis having various electric fittings therein.

Alternatively, the control box is detachably fitted to the main chassis. For this, the air conditioner further includes a coupling case in one side surface of the main  
25 chassis, having a coupling slot for inserting the control box therein, and fastening means for coupling the control box to the coupling case.

The fastening means includes a fastening projection on the control box, and a fastening unit fitted to the  
30 coupling case for coupling with the fastening projection by an elastic force. The fastening unit includes a fastening housing having an inserting hole formed therein, a linear motion member linearly movable along the

inserting hole having an elastic hook part at an end thereof for coupling with the fastening projection, and position regulating means for regulating a position of the hook part for coupling /decoupling of the hook part and the fastening projection.

The position regulating means includes a guide groove in the fastening housing having depths from an opening of the fastening housing different from one another, a connecting rod having one end hinge coupled to the linear motion member, and the other end moving along the guide groove, and a spring between the fastening housing and the linear motion member for pushing the hook part toward the opening of the fastening housing.

Alternatively, the control box is drawable out of the main chassis automatically during operation of the air conditioner. For this, the air conditioner further includes discharge means movable in/out of the main chassis for discharging air into the room, and the control box is fitted to a part of the discharge means drawable out of the main chassis.

The discharge means includes a discharge housing movable in up and down directions along the discharge part of the main chassis having a part drawable out of the main chassis through the discharge part, an inlet in the discharge housing, and an outlet drawable out of the main chassis as the discharge housing moves down.

The air conditioner further includes a vane in the discharge housing for regulating a discharge direction of the room air in up and down directions, and a louver for regulating a discharge direction of the room air in left and right directions.

The present invention provides driving means for moving the discharge housing up and down automatically.

The driving means includes a motor for receiving power and generating a rotating force, a pinion coupled to a driving shaft of the motor, a rack fitted to a side wall of the discharge housing in up and down direction and engaged  
5 with the pinion.

The main chassis includes a front part having a suction part in a front surface and a discharge part in a bottom surface, and a rear part in communication with the front part to be fitted to a wall of the room. The front  
10 part is rectangular having a width greater than the same of the rear part.

The air conditioner further includes a cover panel fitted to a front surface of the main chassis for selective opening of the suction part. The cover panel  
15 rotates a rotation center positioned between the suction part and the discharge part.

According to the present invention, as the control box is detachably coupled to the main chassis, or fitted to a discharge means drawable to outside of the main  
20 chassis, the control box is made accessible without disassembly of the main chassis. Moreover, the one touch type coupling of the control box to the main chassis without screws permits easy coupling/decoupling of the control box.

25 According to the present invention, since the main chassis is divided into a front part and the rear part, and the discharge housing is inserted in the main chassis, a depth of the indoor unit can be reduced, substantially. Particularly, in a case the rear part can be placed in a  
30 recess of a wall, a space occupied by the indoor unit can be reduced, substantially. Along with this, the rectangular front part provides an elegant look.

According to the present invention, the cover panel

provided between the suction part and the discharge part prevents interference between air before and after the heat exchange. Along with this, the selective opening of the suction part by the cover panel permits to minimize  
5 entrance of foreign matter.

According to the present invention, the discharge housing made drawable from the main chassis permits more unrestricted regulation of a discharge direction of the heat exchanged air, thereby minimizing the blind zone  
10 occurred right under the related art indoor unit.

#### **Brief Description of Drawings**

The accompanying drawings, which are included to provide a further understanding of the invention,  
15 illustrate embodiments of the invention and together with the description serve to explain the principles of the invention:

In the drawings:

FIG. 1 illustrates a disassembled perspective view of  
20 a related art indoor unit of an air conditioner;

FIG. 2 illustrates a perspective view of an indoor unit of an air conditioner in accordance with a preferred embodiment of the present invention;

FIG. 3 illustrates a section of an indoor unit in  
25 accordance with a preferred embodiment of the present invention;

FIG. 4 illustrates a perspective view of the indoor unit of the present invention, with opened discharge part and suction part;

30 FIG. 5 illustrates a perspective view of a control box and a coupling case in accordance with a first preferred embodiment of the present invention;

FIGS. 6A - 6B illustrate sections of key parts

showing the steps of a process for fastening the control box in FIG. 5 to the main chassis; and

FIG. 7 illustrates a perspective view of a drawing out structure of a control box in accordance with a second preferred embodiment of the present invention.

### **Best Mode for Carrying Out the Invention**

Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings. An indoor unit of an air conditioner in accordance with a preferred embodiment of the present invention will be explained, with reference to FIGS. 2 and 3. FIG. 2 illustrates a perspective view of an indoor unit of an air conditioner in accordance with a preferred embodiment of the present invention, and FIG. 3 illustrates a section of an indoor unit in accordance with a preferred embodiment of the present invention.

Referring to FIGS. 2 and 3, the indoor unit in accordance with a preferred embodiment of the present invention includes a main chassis 100 forming an outer shape having a suction part 111 and discharge part 115, a heat exchanger 150 in the main chassis 100, for heat exchange of the room air drawn through the suction part 111 with a working fluid, a blower 160 in the main chassis 100 for forced circulation of the room air through the suction part 111 and the discharge part 115, and discharge means movable into/out of the main chassis 100 for making selective opening of the discharge part 115.

The main chassis 100 has a front part 110 and a rear part 120 to be fitted to a wall of a room. The front part 110 and the rear part 120 are in communication, and the heat exchanger 150 and the blower 160 are provided through

a space between the two. There is a control box 300 fitted in one side part of the front part 110 drawable to outside of the front part 110. A fastening structure of the control box 300 will be explained in detail, later.

5       The front part 110, a rectangular shape with a height greater than a depth, has the suction part 111 in a front part, and the discharge part 115 in a bottom part. There is a front panel 140 in an upper part and a lower part of front part of the front part 110 excluding the suction  
10   part 111 for closing the inside space. The front panel 140 may be formed to close the front surface of the front part 110, while the suction part 110 is formed in the front panel 140.

      The rear part 120 projected from a rear surface of  
15   the front part 110 has a height and a width smaller than the same of the front part 110. Therefore, when the rear part 120 is mounted on a wall of a room, the front part 110 will be seen to the users mostly, such that the user sees the slim outer shape of the indoor unit. Particularly,  
20   if the wall has a recess in conformity with the rear part 120, a space occupied by the indoor unit can be reduced substantially because only the front part 110 is projected from the wall.

      The front part 110 and the rear part 120 may be  
25   members separable from each other, or a unit member.

      In the meantime, there may be additional suction parts 113, and 121 in top surfaces of the front part 110 and the rear part 120. In this instance, the heat exchanger 150 may be bent appropriately for the room air  
30   drawn through the front suction part 111, the top suction part 113, and the rear suction part 121. For smooth guidance of suction air flow, there may be suction grills 131, 133, and 135 fitted to the suction parts 111, 113,

and 121.

There is a cover panel 180 in the front surface of the front part 110 for selective opening/closing of the front suction part 111. The cover panel 180, not only  
5 provides an elegant look, but also prevents entrance of foreign matter through the front suction part 111, and serves for preventing interference between the suction and discharge air. For this, the cover panel 180, formed of a flat member which can cover entire front suction part 111,  
10 has a lower end rotatably fitted to the main chassis 110, such that the cover panel 180 rotates around the lower end 181, to open and close the front suction part 111. In this instance, the cover panel 180 separates the front suction part 111 from the discharge part 115, and prevents the  
15 interference between the suction air and the discharge air.

Of course, the cover panel 180 opens the front suction part 111 only when the air conditioner is in operation. Though, the cover panel 180 may be operative manually, it is preferable that the cover panel 180 is  
20 operative automatically by means of a driving source, such as a motor.

There is a display part 190 on the cover panel 180 for displaying an operation state of the air conditioner. In general, considering that the indoor unit is mounted on  
25 the wall, the user looks the display part 190 more conveniently if the cover panel 180 is tilted to face down.

In the meantime, the discharge means moves up and down through the bottom surface of the front part 110 for opening/closing the discharge part 115, selectively. To do  
30 this, there is a discharge housing 200 in the front part 110 for moving up and down along the discharge part 115. The discharge housing 200 has a part drawn outside of the front part 110 through the discharge part 115 depending on

an extent of moving down of the discharge housing 200. The discharge housing 200 has an inlet 201 for entrance of the heat exchanged air, and outlet 203 in communication with the room.

5       The discharge housing 200, a rectangular shape with a width greater than a depth, has the inlet 201 in a top part, and the outlet 203 in a lower part of a front part. Therefore, if the discharge housing 200 moves up into the main chassis 100 completely, the outlet 115 is closed by  
10 the discharge housing 200, and if the discharge housing moves down to some extent, to draw the outlet 203 to an outside of the main chassis 100, the outlet 115 is opened.

It is preferable that a member for regulating an air discharge direction is provided in the discharge housing  
15 200. For this, there are a vane 207 for regulating the air discharge direction in up and down directions, and a louver 209 for regulating the air discharge direction in left and right directions in the discharge housing 200. It is preferable that there is a suction grill 205 in the  
20 inlet 201 for smooth guidance of the air flow.

In the meantime, though the discharge housing 200 may be designed to move up and down by the user, it is preferable that the discharge housing 200 moves up and down automatically according to operation of the air  
25 conditioner. For this, there is driving means for moving up and down the discharge housing, automatically.

The driving means includes a motor 211 for generating rotating force upon reception of power, a pinion 213 coupled to a driving shaft of the motor 211, and a rack  
30 215 fitted in up and down directions to a rear wall of the discharge housing 200. Though it is shown that the driving means is fitted to rear of the discharge housing 200, it is preferable that the driving means is fitted to a side

of the discharge housing 200.

In order to prevent the discharge housing 200 from being separated from the main chassis 100 completely, there is a stopper 220 on a front wall of the discharge housing 200. When the discharge housing 200 moves down to some extent, the stopper 220 is caught at a lower part of the main chassis 100, in which state the discharge housing 200 can move down, no more.

The unexplained reference symbol 170 denotes a flow guide for guiding smooth flow of air in the main chassis 100.

The operation of the indoor unit in accordance with a first preferred embodiment of the present invention will be explained.

Upon putting the air conditioner into operation, the cover panel 180 rotates around the lower end 181. On the same time with this, as power is provided to the motor 211, the discharge housing 200 moves down by interaction of the pinion 213 and the rack 215 as shown in FIG. 4. Eventually, the front suction part 111 is opened by the rotation of the cover panel 180, and the discharge part 115 is opened by the moving down of the discharge housing 200. That is, an inside space of the main chassis 100 is made to communicate with the room through the inlet 201 and the outlet 203.

Next, when power is provided to the fan assembly 160, the room air is drawn toward the heat exchanger 150 side through the front suction part 111, the top suction part 113, and the rear suction part 121 by the blowing force of the fan assembly 160. Then, the room air passes the heat exchanger 150 and makes heat exchange with a working fluid, and, in continuation, flows to the discharge housing 200 through the inlet 201.

Then, the heat exchanged air is discharged into the room through the outlet 203 guided by the vane 207 and the louver 209. Since the discharge housing 200 is drawn down from the main chassis 100, the heat exchanged air can be discharged more uniformly than in the related art. In this instance, the blind area right under the related art indoor unit can be minimized.

Meanwhile, fastening and drawing out structures of the control box will be explained in detail. FIG. 5 illustrates a perspective view of a control box and a coupling case in accordance with a first preferred embodiment of the present invention, and FIGS. 6A - 6B illustrate sections of key parts showing the steps of a process for fastening the control box in FIG. 5 to the main chassis.

Referring to FIG. 5, the control box 300 is rectangular, and has various electric fittings provided therein. The control box 300 has a cover 320 fitted to one face of the control box 300, for exposing the electric fittings to outside of the indoor unit if required. The control box 300 also has a connection terminal 310 in one face for electric connection of the electric fittings to driving components.

In the meantime, there is a coupling case 400 in one side surface of the main chassis 100 having a coupling slot 401 for inserting the control box 300 into the coupling case 400. There is a connection terminal 410 in an inside wall of the coupling case 400 for electric connection to a connection terminal 310 in the control box 300. The connection terminal 410 in the coupling case is connected to various driving parts through separate lead lines. Once, the control box 300 is inserted into the coupling case 400 fully, the connection terminal 310 in

the control box comes into contact with the connection terminal 410 in the coupling case.

As means for coupling the control box 300 to the coupling case 400, there are a fastening projection 330 on the control box 300, and a fastening unit 430 for selective coupling with the fastening projection 330 by an elastic force.

Referring to FIG. 6A, the fastening unit 430 is fixed to a rear end of the coupling slot 401, and includes a fastening housing 431 fixed to the coupling case having an inserting hole 432 formed therein, and a linear motion member 433 linearly movable along the inserting hole 432 for coupling with the fastening projection 330. The linear motion member 433 has a hook part 434 at an end thereof for coupling with the fastening projection 330, and the hook part 434 is an elastic member having a restoring force openable outwardly.

The fastening projection 330 has a catch 331 at an end thereof. The catch 331 is caught at the hook part 434 when the hook part 434 is closed.

Therefore, when the hook part 434 is inserted in the fastening housing 431, the hook part 434 is closed by the fastening housing 431, such that the catch 331 on the fastening projection is caught by the hook part 434. Opposite to this, when the hook part 434 is pulled out of the fastening housing 431, the hook part 434 is opened outwardly, removing the force catching the catch 331. In conclusion, the coupling between the fastening projection 330 and the fastening unit 430 is fixed depending on a position of the hook part 434. In this instance, means for controlling the position of the hook part 434 is required, which is preferably has a function for fixing the hook part 434 when the hook part 434 comes to a position.

For this, there is guide groove 437 of a predetermined form in an inside wall of the fastening housing 431, and there is a connecting rod 435 in the fastening housing 431 for moving the linear motion member 433 according to a form of the guide groove 437. The connecting rod 435 has one end hinged on the linear motion member 433, and the other end having a guide projection 436 fitted thereto for moving along the guide groove 437. There is a spring 438 between the fastening housing 431 and the linear motion member 433 for pushing the linear motion member 433 toward an opening of the fastening housing 431.

The guide groove 437, in a zigzag form substantially, has different depths from the opening of the fastening housing 431 depending on positions of the guide groove 437. That is, the guide groove 437 includes a releasing part 'A' having a smallest depth from the opening of the fastening housing 431, a locking part 'B' having a depth greater than the releasing part 'A', and a transition part 'C' between the releasing part 'A' and the locking part 'B' having a greatest depth. Accordingly, when the guide projection 436 is at the releasing part 'A', the hook part 434 is outside of the fastening housing 431, and when the guide projection 436 is at the locking part 'B', the hook part 434 is inside of the fastening housing 431. During the foregoing processes, the guide projection 436 moves between the releasing part 'A' and the locking part 'C' through the transition part 'C'.

Coupling/decoupling processes of the control box 300 will be explained.

FIG. 6A illustrates a section showing the control box 300 coupled to the coupling case 400 fully, and FIG. 6B illustrates a section showing the control box 300 being

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inserted /removed in/from the coupling case 400.

Before the control box 300 is inserted in the coupling case 400, the hook part 434 is positioned outside of the fastening housing 431, and the guide projection 436 is positioned at the releasing part 'A' as shown in FIG. 6B.

When the control box 300 is inserted in the coupling slot 401, the fastening projection 330 is inserted in the inserting hole 432 in the coupling housing. In this process, the catch 331 on the fastening projection is inserted between the hook part 434, and the fastening projection 330 and the linear motion part 433, overcoming the elastic force of the spring 438, are inserted into an inner part of the inserting hole 432, continuously. During this time, the guide projection 436 moves from the releasing part 'A' to the transition part 'C'.

Then, when a force pressing the control box 300 is removed in a state the guide projection 436 is positioned at the transition part 'C', the guide projection 436 moves from the transition part 'C' to the locking part 'B' by the restoring force of the spring 438. As a result, the hook part 434 is maintained a state the hook part 434 is inserted in the fastening housing 431, when the catch 331 on the fastening projection is caught at the hook part 434 as shown in FIG. 6A.

For removing the control box 300 from the coupling case 400, the control box 300 is pushed. As a result, the fastening projection 330 and the linear motion member 433, overcoming the elastic force of the spring 438, move to inner part of the inserting hole 432, and, on the same time with this, the guide projection 436 moves from the locking part 'B' to the transition part 'C'.

Then, when the force pressing the control box 300 is

removed, the guide projection 436 moves from the transition part 'C' to the releasing part 'A' by the restoring force of the spring 438. As a result, the hook part 434 moves out of the fastening housing 431, when the  
5 hook part 431 is opened outwardly by own restoring force, releasing the catch 331 on the fastening projection from the hook part 434 as shown in FIG. 6B.

When the hook part 434 moves out of the fastening housing 431, the fastening projection 330 is pushed away  
10 naturally, moving a part of the control box 300 out of the coupling case 400. According to this, a service man can take the control box 300 away from the indoor unit by using the part of the control box 300 moved out of the coupling case 400.

15 As has been explained, according to the first preferred embodiment of the present invention, the processes of coupling/decoupling of the control box 300 are done only by processes of pushing the control box 300 simply, that provides a substantial convenience to the  
20 service man.

Next, FIG. 7 illustrates a perspective view of a drawing out structure of a control box in accordance with a second preferred embodiment of the present invention.

Referring to FIG. 7, the control box 600 in  
25 accordance with a second preferred embodiment of the present invention can be inserted in/drawn out of the main chassis 100. The drawing the control box 600 out of the main chassis 100 facilitates an easy accessibility to the control box 600.

30 In detail, as explained, there is a discharge housing 500, movable in up and down directions, in the bottom surface of the main chassis 100 for selective opening/closing of the discharge part. If the control box

600 is fitted to a part the discharge housing 500 is drawn out of the main chassis 100, the control box 600 can always be exposed to outside of the main chassis 100 during operation of the air conditioner.

5       The discharge housing 500 has an outlet 503 in a front surface thereof, and control box cavities 505 at opposite sides of the outlet 503 for inserting the control box 600 therein. A number of the control box cavities 505 are proportional to a number of the control boxes 600.

10       The control box 600 may be fastened to the discharge housing 600, by separate fastening screws, or by the fastening means having the foregoing fastening projection and the fastening unit explained before. In this instance, the fastening projection is fitted to a rear surface of  
15 the control box 600, and the fastening unit is fitted to a rear wall of an inside of the discharge housing 500.

      In the meantime, it is preferable that a control panel 610 is fitted to a front surface of the control box 600. The control panel 610 includes operation buttons 610  
20 for operating various electric fittings in the control box 600, and a display part 613 for displaying an operation state. In this instance, in a state the control box 600 is drawn out, the user may control operation states on the operation buttons even if the user has no operation means,  
25 such as a remote controller.

      In the meantime, if it is taken into account that the discharge housing 500 is drawable only in operation of the air conditioner, for securing accessibility to the control box 600 always, it is preferable that an operation button  
30 (not shown) is fitted the bottom surface of the discharge housing 500 for direct operation by the user. The operation button has a function for starting operation of the air conditioner, or a function for drawing the

discharge housing 500 out of the main chassis, regardless of the operation of the air conditioner.

In summary, according to the present invention, as the control box 300, or 600 is detachably coupled to the main chassis 100, or fitted to a discharge means drawable  
5 to outside of the main chassis, the control box 300, or 600 is made accessible without disassembly of the main chassis 100. Moreover, the one touch type coupling of the control box 300, or 600 to the main chassis 100 without  
10 screws permits easy coupling/decoupling of the control box 300, or 600.

According to the present invention, since the main chassis 100 is divided into a front part 110 and the rear part 120, and the discharge housing 200 or 500 is inserted  
15 in the main chassis 100, a depth of the indoor unit can be reduced, substantially. Particularly, in a case the rear part 120 can be placed in a recess of a wall, a space occupied by the indoor unit can be reduced, substantially. Along with this, the rectangular front part 110 provides  
20 an elegant look.

According to the present invention, the cover panel 180 provided between the suction part 111 and the discharge part 115 prevents interference between air before and after the heat exchange. Along with this, the  
25 selective opening of the suction part 111 by the cover panel 180 permits to minimize entrance of foreign matter.

According to the present invention, the discharge housing 200, or 500 made drawable from the main chassis 100 permits more unrestricted regulation of a discharge  
30 direction of the heat exchanged air, thereby minimizing the blind zone occurred right under the related art indoor unit.

It will be apparent to those skilled in the art that

various modifications and variations can be made in the air conditioner of the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover the  
5 modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

### **Industrial Applicability**

10       The present invention provides an air conditioner having an easy accessibility to the control box.

          The present invention provides an air conditioner which has an elegant look, and does not occupy much room space.

15       The present invention provides an air conditioner which can prevent interference between air before and after the heat exchange, thereby improving a heat exchange efficiency.

          The present invention provides an air conditioner  
20 which can minimize entrance of various foreign matters in the room into the air conditioner.

          Finally, the present invention provides an air conditioner which permits more unrestricted regulation of a discharge direction of the heat exchanged air, thereby  
25 minimizing a blind area.

**CLAIMS**

1. An air conditioner comprising:
  - a main chassis which forms an outer shape;
  - a heat exchanger in the main chassis, for heat
  - 5 exchange of room air with a working fluid;
  - a blower in the main chassis for forced circulation of room air toward the heat exchanger; and
  - a control box in the main chassis to be drawable out of the main chassis having various electric fittings
  - 10 therein.
2. An air conditioner comprising:
  - a main chassis which forms an outer shape;
  - a heat exchanger in the main chassis, for heat
  - 15 exchange of room air with a working fluid;
  - a blower in the main chassis for forced circulation of the room air toward the heat exchanger; and
  - a control box detachably fitted at one side of the main chassis having various electric fittings therein.
  - 20
3. An air conditioner as claimed in claim 1 or 2, further comprising:
  - a coupling case in one side surface of the main chassis, having a coupling slot for inserting the control
  - 25 box therein; and
  - fastening means for coupling the control box to the coupling case.
4. An air conditioner as claimed in claim 3, wherein the
- 30 fastening means includes;
  - a fastening projection on the control box, and
  - a fastening unit fitted to the coupling case for coupling with the fastening projection by an elastic force.

5. An air conditioner as claimed in claim 4, wherein the fastening unit includes;

5 a fastening housing fixed to the coupling case having an inserting hole formed therein,

a linear motion member linearly movable along the inserting hole having a hook part at an end thereof for coupling with the fastening projection, the hook part having a restoring force openable outwardly, and

10 position regulating means for regulating a position of the hook part for coupling /decoupling of the hook part and the fastening projection.

6. An air conditioner as claimed in claim 4, wherein the position regulating means includes;

a guide groove in the fastening housing having depths from an opening of the fastening housing different from one another depending on positions thereof,

20 a connecting rod having one end hinge coupled to the linear motion member, and the other end moving along the guide groove, and

a spring between the fastening housing and the linear motion member for pushing the hook part toward the opening of the fastening housing.

25

7. An air conditioner as claimed in claim 6, wherein the guide groove includes;

a locking part for positioning the hook part inside of the fastening housing,

30 a releasing part for positioning the hook part outside of the fastening housing, and

a transition part for positioning the hook part between the releasing part and the transition part.

8. An air conditioner comprising:
- a main chassis which forms an outer shape;
  - a heat exchanger in the main chassis, for heat
  - 5 exchange of room air with a working fluid;
  - a blower in the main chassis for forced circulation of room air toward the heat exchanger;
  - discharge means in the main chassis movable in/out of the main chassis for discharging air into a room; and
  - 10 a control box in a part of the discharge means drawable out of the main chassis having various electric fittings therein.
9. An air conditioner as claimed in claim 8, wherein the
- 15 discharge means includes a discharge housing movable up and down along a discharge part in the main chassis having the control box fitted therein.
10. An air conditioner as claimed in claim 9, wherein the
- 20 discharge means further includes;
- an inlet in the discharge housing for entrance of the heat exchanged air into the discharge housing, and
  - an outlet in the discharge housing formed in a part to be drawn outside of the main chassis when the discharge
  - 25 housing moves down.
11. An air conditioner as claimed in claim 10, wherein the discharge housing is rectangular.
- 30 12. An air conditioner as claimed in claim 11, wherein the outlet is formed in a front surface of the discharge housing.

13. An air conditioner as claimed in claim 11, wherein the discharge means further includes a stopper fitted to a side wall of the discharge housing for being caught at the main chassis when the discharge housing moves down to  
5 prevention the discharge housing from being fallen off the main chassis.

14. An air conditioner as claimed in claim 10, wherein the discharge means further includes an inlet grill fitted to  
10 the inlet side.

15. An air conditioner as claimed in claim 9, wherein the discharge means further includes;

a vane fitted to an inside of the discharge housing  
15 for regulating a discharge direction of the room air in up and down directions, and

a louver fitted to an inside of the discharge housing for regulating the discharge direction of the room air in left and right directions.

20

16. An air conditioner as claimed in claim 9, wherein the discharge means further includes driving means for automatic moving up and down of the discharge housing.

25 17. An air conditioner as claimed in claim 16, wherein the driving means includes;

a motor for generating rotating force upon reception of power,

a pinion coupled to a driving shaft of the motor, and

30 a rack fitted in up and down directions to a rear wall of the discharge housing.

18. An air conditioner as claimed in claim 9, further

-25-

comprising a control panel fitted in a front surface of the discharge housing having operation buttons for controlling various parts of the control box, and a displaying part for displaying an operation state thereon.

5

19. An air conditioner as claimed in one of claims 1, 2, and 8, wherein the main chassis includes;

a front part, and

10 a rear part to be fitted to a wall of the room in communication with the front part.

20. An air conditioner as claimed in claim 19, wherein the front part is rectangular having a width greater than the same of the rear part.

15

21. An air conditioner as claimed in claim 19, wherein the front part and the rear part are formed as one unit.

22. An air conditioner as claimed in claim 19, wherein the  
20 front part includes;

a suction part formed in a front surface thereof, and  
a discharge part formed in a bottom surface thereof.

23. An air conditioner as claimed in claim 22, wherein the  
25 suction part is also formed in a top surface of the front part, and a top surface of the rear part.

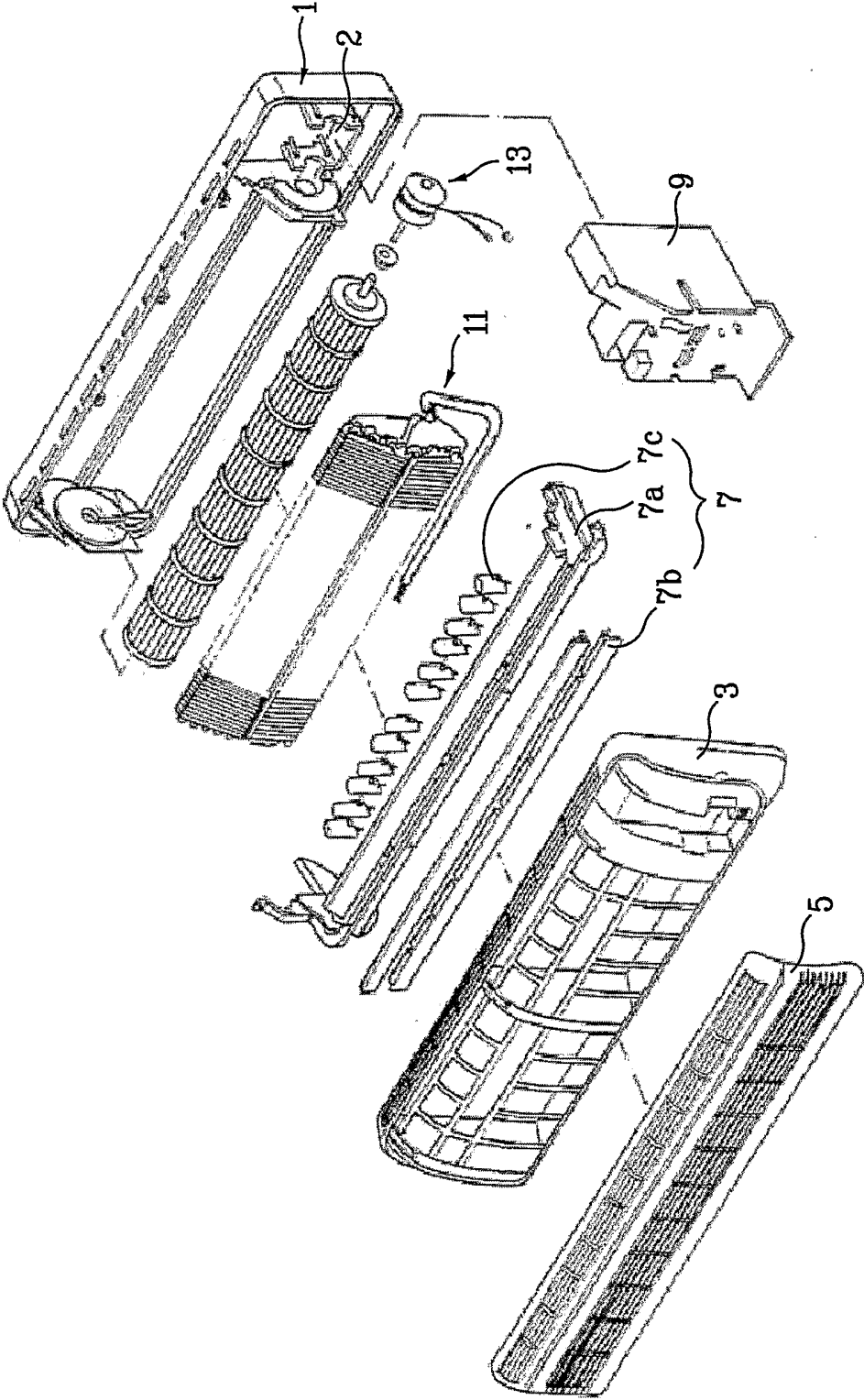
24. An air conditioner as claimed in claim 22, further  
comprising a cover panel fitted to a front surface of the  
30 main chassis for selective opening of the suction part.

25. An air conditioner as claimed in claim 24, wherein the cover panel rotates around one end.

26. An air conditioner as claimed in claim 25, wherein the cover panel rotates around a lower end for preventing interference of air flows between the suction part and the  
5 discharge part.

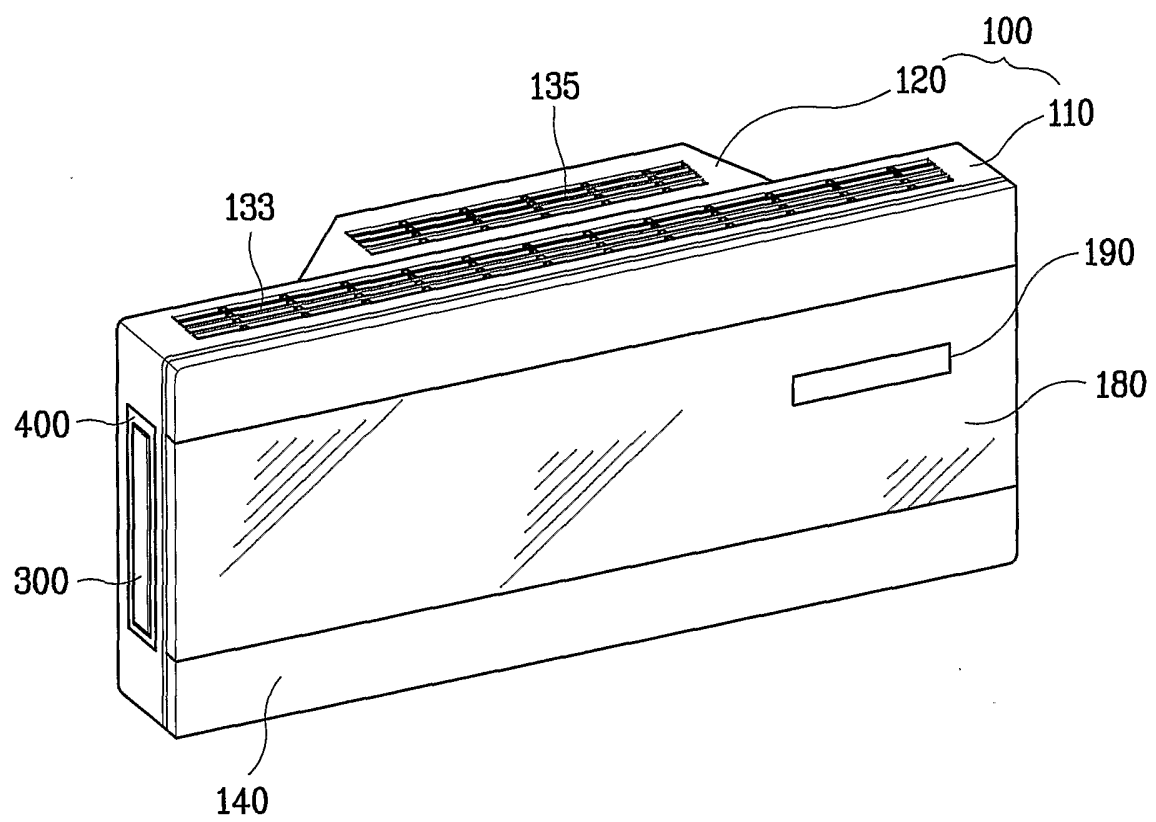
27. An air conditioner as claimed in claim 24, further comprising a display part fitted to the cover panel for displaying operation state of the air conditioner.

FIG.1



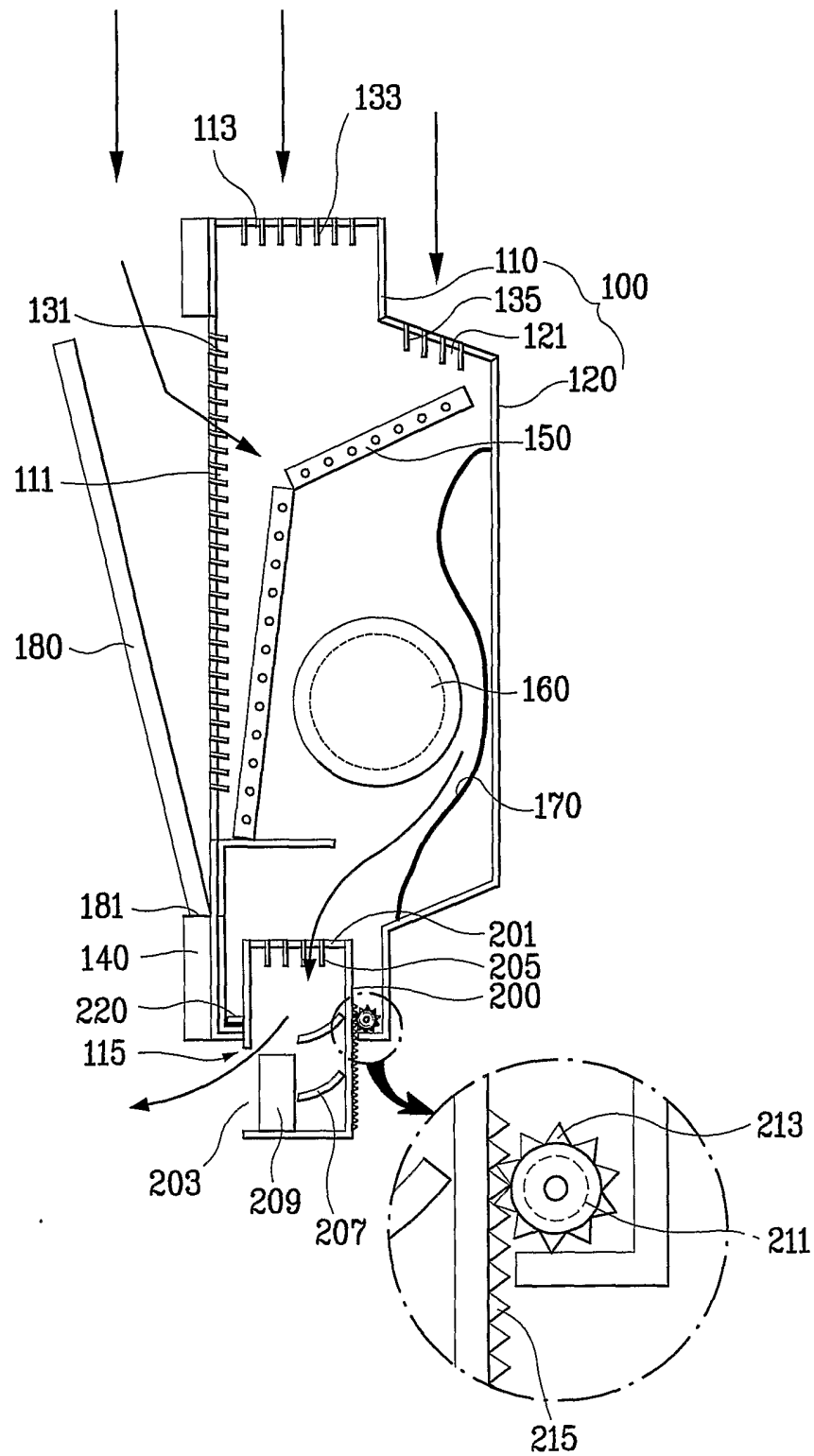
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FIG. 2



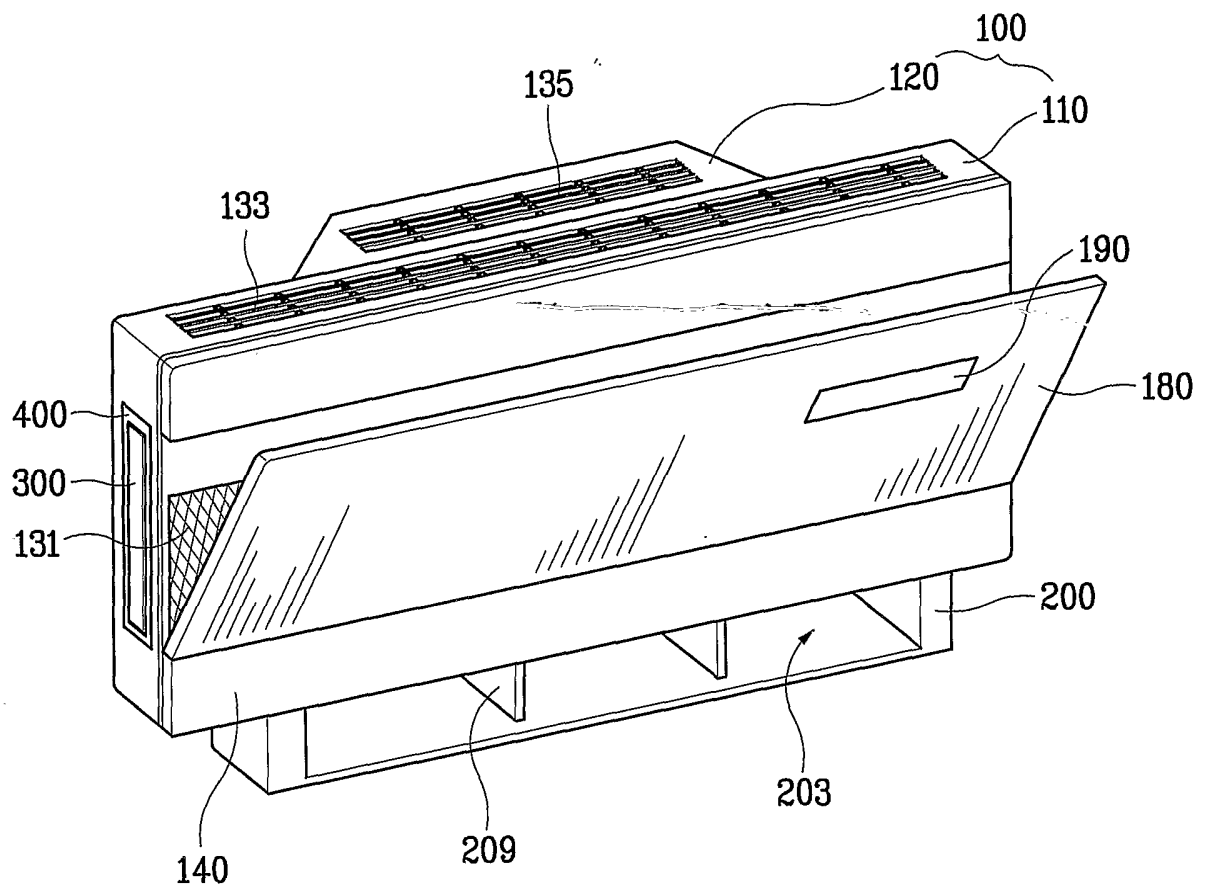
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FIG. 3



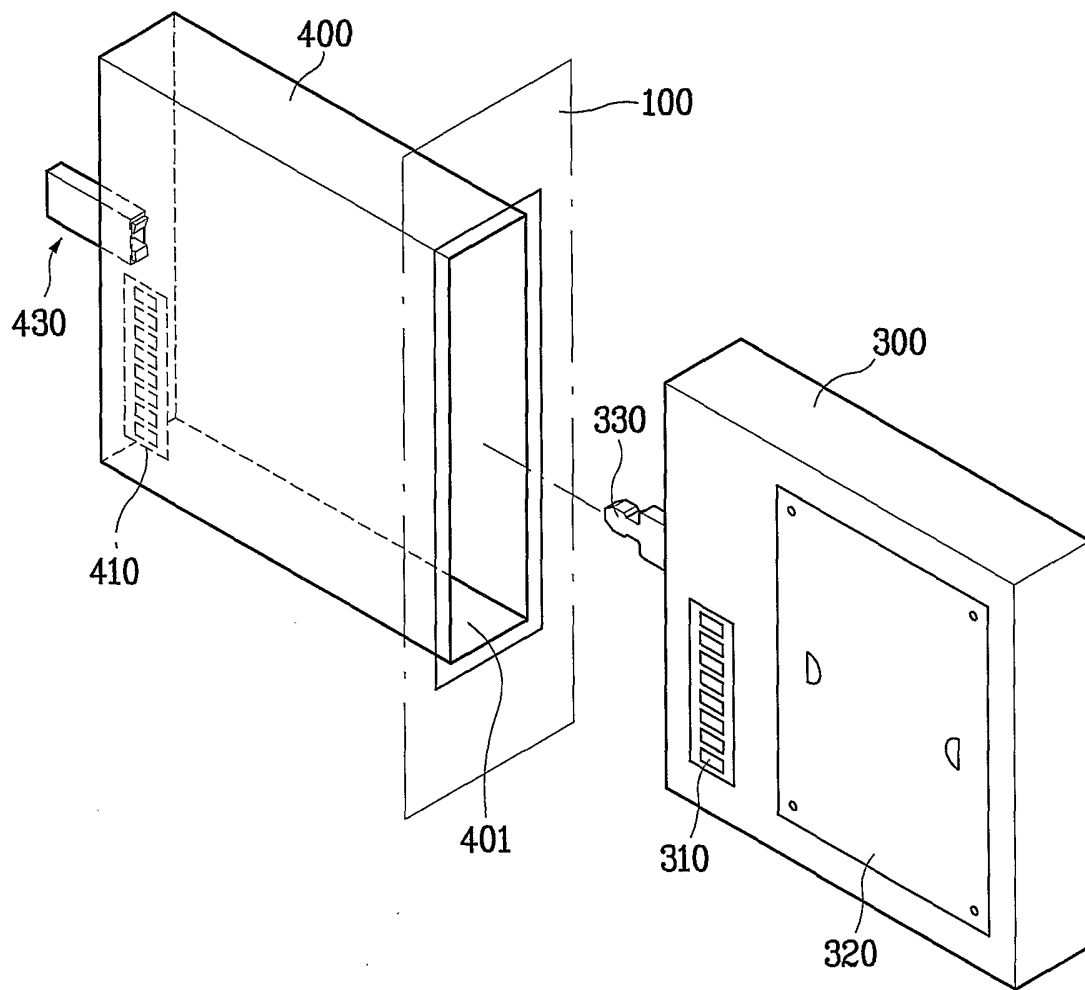
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FIG. 4



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FIG. 5



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FIG. 6A

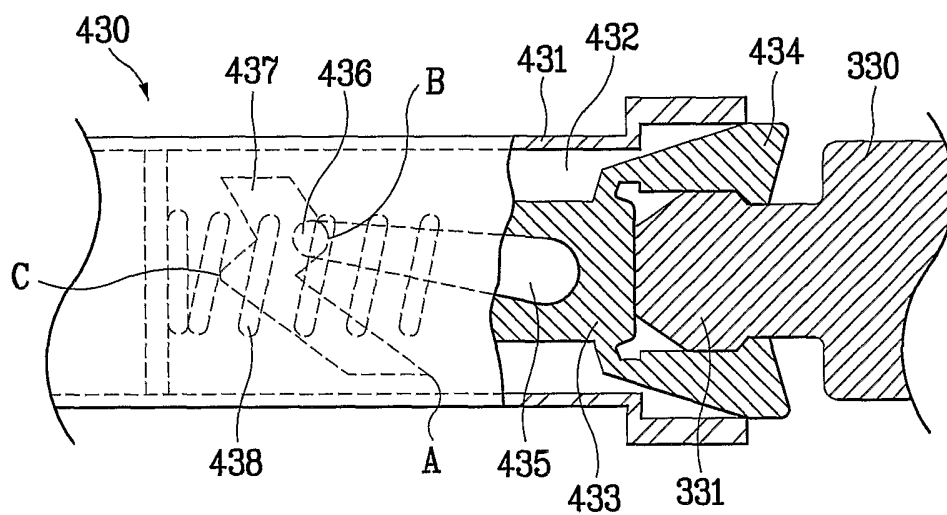
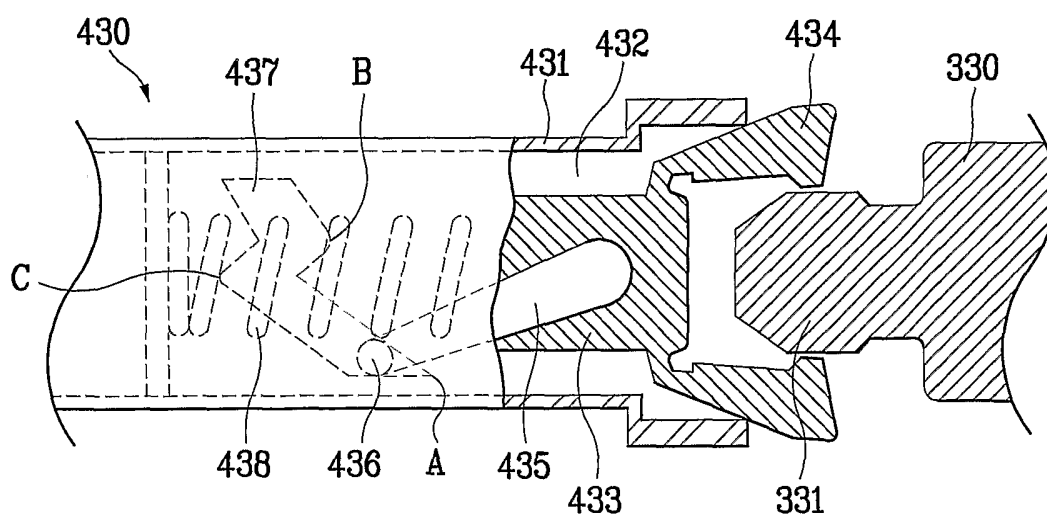


FIG. 6B



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FIG. 7

