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(54) **SLIDE DEVICE**

(57) One embodiment of the present invention provides a slide device comprising: a fixed rail fixed on a main body; a movable rail capable of sliding along the fixed rail; a body which is provided in one end portion region of the fixed rail and which has a guide path; a slider which is coupled to the body, and which selectively moves in the longitudinal direction of the body when the movable rail slides; a transfer pin which is rotatably coupled to the slider and which moves along the guide path; an elastic member which connects the body and the slider and which elastically compresses or expands when the slider moves; and a damper which is provided in the body and which has a rod having the end portion connected to the slider.

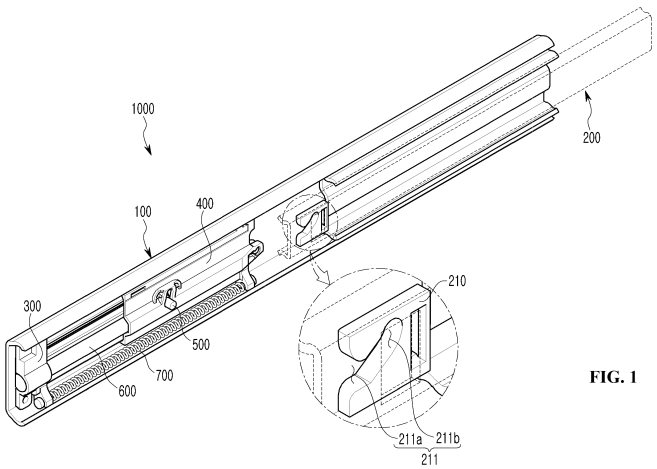

FIG. 1

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Description

Technical Field

[0001] The present disclosure relates to a slide device, and more particularly, to a slide device that allows a storing body to be inserted by a self-closing method and a soft-closing method and has a simplified structure and simplified components by separating a transfer pin and a damper member.

Background Art

[0002] Generally, a sliding-type storing body is provided to be openable from and closeable to a main body of a piece of furniture, a refrigerator, or various storage boxes by sliding and is used to accommodate and store necessary things.

[0003] The sliding-type storing body is opened and closed by slide devices having a storing body installation space provided in a main body and each installed between both side surfaces of the storing body and a wall surface at an inner side of the installation space and provided to be slidable by coming in rolling contact with each other.

[0004] The slide device includes a fixed rail installed to be fixed to the main body and a movable rail provided to be slidable relative to the fixed rail and configured to induce opening or closing of the storing body, and a separate damper member configured to reduce withdrawal and insertion speeds of the movable rail to a predetermined speed or less is provided at the fixed rail.

[0005] However, the conventional slide device employs a structure in which an end of a rod of a damper is connected to a sub-transfer pin, and in this case, the sub-transfer pin for coupling to the end of the rod of the damper and a transfer pin rotatably coupled to the sub-transfer pin and configured to be movable along a guide path should be provided at a slider.

[0006] That is, the conventional slide device has disadvantages that, not only the number of components is increased and the structure becomes complex to a certain extent or more due to the above-described content, but also, since the end of the rod of the damper, the transfer pin, and the slider are all coupled to the sub-transfer pin, the durability of the slide device is reduced after the slide device is opened and closed numerous times.

Related Art Document

[0007] (Patent Document 1) Korean Patent Registration No. 10-1742643 (May 26, 2017) Disclosure

Technical Problem

[0008] The present disclosure is directed to providing a slide device that allows a storing body to be inserted by a self-closing method and a soft-closing method and has a simplified structure and components by separating a transfer pin and a damper member.

Technical Solution

[0009] One aspect of the present disclosure provides a slide device including a fixed rail installed to be fixed to a main body, a movable rail provided to be slidable relative to the fixed rail, a body provided in one side end area of the fixed rail and having a guide path provided therein, a slider coupled to the body and configured to selectively move in a longitudinal direction of the body during sliding of the movable rail, a transfer pin rotatably coupled to the slider and configured to move along the guide path, an elastic member configured to connect the body and the slider and elastically compress or expand during movement of the slider, and a damper provided in the body and having a rod whose end is connected to the slider.

[0010] In one embodiment of the present disclosure, the damper may include a housing inserted into and coupled to the body, the rod provided to be movable in the longitudinal direction from the housing, and a mounting part formed at the end of the rod and mounted on the slider.

[0011] In one embodiment of the present disclosure, the mounting part may include a first coupling part inserted into and supported by an insertion part of the slider, a neck part inserted into a neck part insertion groove of the slider and formed to be concavely recessed so that a cross-sectional area is relatively reduced compared to the first coupling part, and a second coupling part seated on and supported by a support part of the slider, and since directions in which the first coupling part and the second coupling part are supported are opposite to each other, detachment from the slider in a width direction (W) may be prevented.

[0012] In one embodiment of the present disclosure, the slider may include a second through-part formed between the insertion part and the support part, and by being inserted into the slider through the second through-part and then rotating, the mounting part may be seated on each of the insertion part and the support part.

[0013] In one embodiment of the present disclosure, an inclined part may be formed at the support part to facilitate seating of the second coupling part.

[0014] In one embodiment of the present disclosure, the guide path may include a first guide path longitudinally formed in the longitudinal direction of the body and a second guide path connected to the first guide path at an end area of the first guide path and provided to be bent relative to the first guide path.

[0015] In one embodiment of the present disclosure, the transfer pin may include a pin body, a rotating shaft part formed at one end of the pin body and coupled to the slider, an upper protrusion configured to protrude from one surface of the pin body at the other end of the pin body and inserted into a first through-part formed in

the slider, and a lower protrusion configured to protrude from the other surface of the pin body at the other end of the pin body and configured to move along the guide path during the movement of the slider, and the transfer pin may be configured to be rotatable about the rotating shaft part relative to the slider.

Advantageous Effects

[0016] According to one aspect of the present disclosure, since an end of a rod of a damper and an elastic member are configured to be directly connected to a slider in the present disclosure, operation structures of self-closing and soft-closing can be simplified.

[0017] Also, since the present disclosure has a structure in which a transfer pin is rotatable relative to a slider in accordance with reciprocating movement of a movable rail, a coupling structure of the transfer pin can be simplified, and assembly can be facilitated.

[0018] In addition, in the present disclosure, an angle formed by an inner fixed surface of a second guide path to which a lower protrusion is fixed and a line connecting the lower protrusion and a rotating shaft part is formed within a certain range, and thus during operation, a binding force for a transfer pin can be improved, and loosening of the transfer pin due to vibration or the like can be prevented.

[0019] The advantageous effects of the present disclosure are not limited to the above-mentioned advantageous effects and should be understood as including all effects inferable from configurations of the present disclosure described in the detailed description or claims of the present disclosure.

Description of Drawings

[0020]

FIG. 1 shows a perspective view and a partially enlarged view of a slide device according to one embodiment of the present disclosure.

FIG. 2 is a perspective view showing a portion of the slide device according to one embodiment of the present disclosure.

FIG. 3 is an exploded view of the slide device according to one embodiment of the present disclosure.

FIGS. 4A and 4B are a front view of a body, a slider, and a damper according to one embodiment of the present disclosure and a front view of a damper according to another embodiment of the present disclosure, respectively.

FIG. 5 is a rear view of the body, slider, and damper according to one embodiment of the present disclosure.

FIG. 6 shows a coupling process of a mounting part of the damper and the slider according to one embodiment of the present disclosure.

FIG. 7 shows a perspective view and a lateral view of a transfer pin according to one embodiment of the present disclosure.

FIG. 8 shows a front view, a rear view, and a partially enlarged view of the slide device according to one embodiment of the present disclosure.

FIGS. 9 to 11 show an operation process according to an insertion operation of the slide device according to one embodiment of the present disclosure.

Modes of the Invention

[0021] Hereinafter, the present disclosure will be described with reference to the accompanying drawings. However, the present disclosure may be implemented in various different forms and thus is not limited to the embodiments described herein. Also, in the drawings, parts irrelevant to the description have been omitted to clearly describe the present disclosure, and like parts are denoted by like reference numerals throughout the specification.

[0022] Throughout the specification, when a certain part is described as being "connected" to another part, this includes not only the case in which the certain part is "directly connected" to the other part, but also the case in which the certain part is "indirectly connected" to the other part with another member disposed therebetween. Also, when a certain part is described as "including" a certain element, the certain part may further include another element instead of excluding other elements unless particularly described otherwise.

[0023] Hereinafter, embodiments of the present disclosure will be described in detail with reference to the accompanying drawings.

[0024] A slide device 1000 according to the present disclosure is provided to smoothly slide a drawer of a drawer-type refrigerator or various pieces of furniture in a front-rear direction. Specifically, the present disclosure employs a structure that allows self-closing of a storing body relative to a main body by a user pushing the storing body in a withdrawn state and additionally allows soft-closing of the storing body through an impact absorbing force of a damper 600.

[0025] Here, self-closing refers to automatic insertion of the storing body by a user simply pushing the storing body when attempting to insert the storing body in a withdrawn state, and soft-closing refers the storing body being inserted at a speed A at an initial stage of the insertion into the main body and then being finally inserted at a speed B after being inserted to a certain extent or more, wherein the speed B is relatively lower than the speed A.

[0026] FIG. 1 shows a perspective view and a partially enlarged view of a slide device according to one embodiment of the present disclosure, FIG. 2 is a perspective view showing a portion of the slide device according to one embodiment of the present disclosure, and FIG. 3 is an exploded view of the slide device according to one embodiment of the present disclosure.

[0027] Referring to FIGS. 1 to 3, the slide device 1000 includes a fixed rail 100, a movable rail 200, a body 300, a slider 400, a transfer pin 500, the damper 600, and an elastic member 700.

[0028] More specifically, the slide device 1000 is configured to include the fixed rail 100 installed to be fixed to a main body, the movable rail 200 provided to be slidable relative to the fixed rail 100, the body 300 provided in one side end area of the fixed rail 100 and having a guide path 310 provided therein, the slider 400 coupled to the body 300 and configured to selectively move in a longitudinal direction of the body 300 during sliding of the movable rail 200, the transfer pin 500 rotatably coupled to the slider 400 and configured to move along the guide path 310, the elastic member 700 configured to connect the body 300 and the slider 400 and elastically compress or expand during movement of the slider 400, and the damper 600 provided in the body 300 and having a rod whose end is connected to the slider 400.

[0029] The fixed rail 100 can be fixed using a screw or the like to an inner sidewall of various main bodies such as an inner wall surface of a refrigerator or an inner wall surface of a piece of furniture. The movable rail 200 is connected to a storing body to insert or withdraw the storing body relative to the main body and is provided to be slidable relative to the fixed rail 100. The movable rail 200 can be fixed to the storing body using a separate bracket (not illustrated) or the like.

[0030] FIGS. 4A and 4B are a front view of a body, a slider, and a damper according to one embodiment of the present disclosure and a front view of a damper according to another embodiment of the present disclosure, respectively, FIG. 5 is a rear view of the body, slider, and damper according to one embodiment of the present disclosure, FIG. 6 shows a coupling process of a mounting part of the damper and the slider according to one embodiment of the present disclosure, FIG. 7 shows a perspective view and a lateral view of a transfer pin according to one embodiment of the present disclosure, and FIG. 8 shows a front view, a rear view, and a partially enlarged view of the slide device according to one embodiment of the present disclosure.

[0031] Referring to FIGS. 1 to 8, the body 300 is provided to be fixed to the one side end area of the fixed rail 100, specifically, a rear end area thereof, and includes the guide path 310 and a damper accommodating part 320.

[0032] The guide path 310 has a first guide path 310a longitudinally formed in the longitudinal direction of the body 300 and a second guide path 310b connected to the first guide path 310a at an end area of the first guide path 310a and formed to be bent.

[0033] In a state in which the movable rail 200 is withdrawn, a lower protrusion 540 of the transfer pin 500 which will be described below is positioned on an inner fixed surface S of the second guide path 310b. Then, during an insertion operation of the movable rail 200, as a transfer pin fixing part 210 of the movable rail 200 and an upper protrusion 530 of the transfer pin 500 are engaged with each other, the position of the lower protrusion 540 is changed from the inner fixed surface S of the second guide path 310b to the first guide path 310a side.

[0034] A corner portion where the first guide path 311 and the second guide path 312 are connected may be formed to be rounded to facilitate the movement of the lower protrusion 540, that is, the movement thereof from the inner side of the second guide path 310b to the first guide path 310a side. Also, the first guide path 310a and the second guide path 310b may be configured to form an acute angle with each other to improve a binding force for the transfer pin 500.

[0035] The damper accommodating part 320 is longitudinally formed in the longitudinal direction of the body 300 and may be formed to be parallel to the guide path. Also, the damper accommodating part 320 is a space in which a housing 610 of the damper 600 which will be described below is accommodated, and the damper accommodating part 320 may be formed in a shape that corresponds to the shape of the housing 610. That is, the housing 610 is configured to be accommodated in the damper accommodating part 320 and fixed, and a rod 620 is configured to have one end positioned in the housing 610 and the other end fixed to the slider 400 which will be described below to be movable in the longitudinal direction along with the slider 400.

[0036] Referring to FIGS. 1 to 8, the slider 400 is coupled to the body 300 and provided to be selectively slidable in the longitudinal direction of the body 300 during sliding of the movable rail 200.

[0037] More specifically, in a state in which the movable rail 200 is completely withdrawn relative to the fixed rail 100, the slider 400 remains still relative to the body 300, and when the movable rail 200 is being inserted or when the movable rail 200 is being withdrawn from an inserted state, the slider 400 slides along the body 300. Meanwhile, since the transfer pin 500 is rotatably coupled to the slider 400, the transfer pin 500 also moves along with the slider 400 during the movement of the slider 400.

[0038] The elastic member 700 is provided to connect the body 300 and the slider 400, and the elastic member 700 is elastically compressed or stretched during the movement of the movable rail 200.

[0039] More specifically, during rearward movement of the slider 400 due to the insertion operation of the movable rail 200, the length of the elastic member 700 gradually decreases due to a restoring force. On the other hand, during forward movement of the slider 400 due to the withdrawal operation of the movable rail 200, the elastic member 700 is gradually stretched. In the process in which the movable rail 200 is withdrawn, the lower protrusion 540 of the transfer pin 500 moves along the first guide path 310a and then enters the second guide path 3 10b. Here, the upper protrusion 530 also moves toward a first eccentric movement groove 211a in a state in which the upper protrusion 530 is positioned at an inner side of a second eccentric movement groove 211b of the trans-

fer pin fixing part 210. Due to the movement of the upper protrusion 530, the movable rail 200 can be separated from the slider 400 and completely withdrawn forward.

[0040] Referring to FIGS. 1 to 8, the transfer pin 500 is rotatably coupled to the slider 400 and is provided to be movable along the guide path 310 together with the slider 400 during sliding of the movable rail 200.

[0041] More specifically, the transfer pin 500 includes a pin body 510, a rotating shaft part 520 formed at one end of the pin body 510 and coupled to a protruding part 450 of the slider 400, the upper protrusion 530 configured to protrude from one surface of the pin body 510 at the other end of the pin body 510 and inserted into a first through-part 410 formed in the slider 400, and the lower protrusion 540 configured to protrude from the other surface of the pin body 510 at the other end of the pin body 510 and configured to move along the guide path 310 during the movement of the slider 400.

[0042] Here, the transfer pin 500 is configured to be rotatable about the rotating shaft part 520 relative to the slider 400.

[0043] The upper protrusion 530 is provided to be insertable into the first through-part 410 formed in the slider 400. Here, the first through-part 410 is longitudinally formed in a direction intersecting a direction of movement of the slider 400 relative to the body 300, and the upper protrusion 530 is movable in the longitudinal direction of the slot-shaped through-part 410.

[0044] More specifically, during the insertion operation of the movable rail 200, the upper protrusion 530 enters the first eccentric movement groove 211a of the transfer pin fixing part 210, and as the insertion operation of the movable rail 200 is performed, the upper protrusion 530 moves to an inner side of and enters the second eccentric movement groove 211b. Here, the lower protrusion 540 is positioned at an inner side of the second guide path 310b and moves to an inner side of the first guide path 310a in accordance with the movement of the upper protrusion 530. Accordingly, the transfer pin fixing part 210, the transfer pin 500, and the slider 400 which are provided to be fixed to the movable rail 200 are movable in the direction of insertion.

[0045] The lower protrusion 540 is provided at a lower portion of the pin body 510 to correspond to the upper protrusion 530, and the position of the lower protrusion 540 is changed from the inner fixed surface S of the second guide path 310b to the first guide path 310a side in accordance with the movement of the upper protrusion 530 that is due to coupling with the transfer pin fixing part 210.

[0046] Meanwhile, an angle $\theta 1$ formed by the inner fixed surface S of the second guide path 310b to which the lower protrusion 540 is fixed and a line L connecting the lower protrusion 540 and the rotating shaft part 520 may be 70° or more and 120° or less.

[0047] In the case in which the angle $\theta 1$ formed by the fixed surface S and the line L connecting the lower protrusion 540 and the rotating shaft part 520 is within the above range, during operation, a binding force for the transfer pin 500 can be improved, and loosening of the transfer pin 500 due to vibration or the like can be prevented. Thus, the operation performance of the slide device 1000 can be improved. In the case in which the angle $\theta 1$ formed by the fixed surface S and the line L connecting the lower protrusion 540 and the rotating shaft part 520 deviates from the above range, the operation performance of the transfer pin 500 itself can be improved, but the transfer pin 500 becomes vulnerable to loosening or the like due to vibration or the like, and the overall operation performance of the slide device 1000 may be degraded.

[0048] Also, an angle $\theta 2$ at which the transfer pin 500 is rotatable about the rotating shaft part 520 in a state in which the lower protrusion 540 is positioned in the second guide path 310b may be 10° or more and 45° or less.

[0049] When the angle $\theta 2$ at which the transfer pin 500 is rotatable about the rotating shaft part 520 is less than 10°, a binding force of the second guide path 312 for the transfer pin 500 may be degraded, and the transfer pin 500 may become vulnerable to loosening or the like due to vibration or the like, and when the angle $\theta 2$ at which the transfer pin 500 is rotatable about the rotating shaft part 520 is more than 45°, a smooth position movement of the transfer pin in accordance with the insertion operation of the movable rail becomes impossible, and the operation performance of the slide device 1000 may be degraded.

[0050] Meanwhile, the transfer pin fixing part 210 engaged with the transfer pin 500 during sliding is provided at the movable rail 200.

[0051] The transfer pin fixing part 210 has an eccentric movement groove 211 configured to accommodate the upper protrusion 530 of the transfer pin 500 and cause the upper protrusion 530 to eccentrically move within a certain radius.

[0052] The eccentric movement groove 211 includes the first eccentric movement groove 211a longitudinally provided in the longitudinal direction of the transfer pin fixing part 210 so that the upper protrusion 530 of the transfer pin 500 can be accommodated during movement of the movable rail 200 and the second eccentric movement groove 211b provided to be bent at an end of the first eccentric movement groove 211b.

[0053] A direction in which the second guide path 310b is bent relative to the first guide path 310a and a direction in which the second eccentric movement groove 211b is bent relative to the first eccentric movement groove 211a are formed to be opposite to each other. At an initial state of movement of insertion of the movable rail 200, the upper protrusion 530 enters the first eccentric movement groove 21a2, and the lower protrusion 540 is positioned in the second guide path 310b. Then, when the movable rail 200 is further inserted, the upper protrusion 530 eccentrically moves to an inner side of the second eccentric movement groove 211b, and the lower protrusion 540 is positioned in the first guide path 310a.

[0054] Referring to FIGS. 3 to 6, the damper 600 includes the housing 610, the rod 620, and a mounting part 630.

[0055] More specifically, the damper 600 is configured to include the housing 610 inserted into and coupled to the body 300, the rod 620 provided to be movable in the longitudinal direction from the housing 610, and the mounting part 630 formed at an end of the rod 620 and mounted on the slider 400.

[0056] Also, referring to FIG. 4A, the mounting part 630 includes a first coupling part 631, a neck part 632, and a second coupling part 633.

[0057] More specifically, the mounting part 630 is configured to include the first coupling part 631 inserted into and supported by an insertion part 420 of the slider 400, the neck part 632 inserted into a neck part insertion groove 421 of the slider 400 and formed to be concavely recessed so that a cross-sectional area is relatively reduced compared to the first coupling part 631, and the second coupling part 633 seated on and supported by a support part 430 of the slider 400.

[0058] Here, since directions in which the first coupling part 631 and the second coupling part 633 are supported are opposite to each other, detachment from the slider 400 in a width direction W can be prevented. That is, since the mounting part 630 is supported from both sides in the width direction W by the insertion part 420 and the support part 430 of the slider 400, detachment due to vibration can be prevented during operation.

[0059] Meanwhile, referring to FIG. 6, the slider 400 includes a second through-part 440 formed between the insertion part 420 and the support part 430, and by being inserted into the slider 400 through the second through-part 440 and then rotating, the mounting part 630 may be seated on each of the insertion part 420 and the support part 430.

[0060] That is, the mounting part 630 can be more easily mounted on the insertion part 420 and the support part 430 through the second through-part 440, and a coupling structure between the mounting part 630 and the slider 400 can be simplified.

[0061] Meanwhile, the insertion part 420 may be formed in a shape that corresponds to the first coupling part 631 of the mounting part 630, and the neck part insertion groove 421 may be provided at one side of the insertion part 420. Here, when viewed from the front, the insertion part 420 may be formed in a substantially "C" shape. The first coupling part 631 and the neck part 632 are coupled to each other as the first coupling part 631 of the damper 600 is caught in the neck part insertion groove 421 with a relatively narrow width in a state in which the first coupling part 631 and the neck part 632 are respectively inserted into the insertion part 420 and the neck part insertion groove 421 of the slider 400. That is, the mounting part 630 is firmly fixed in the longitudinal direction by coupling between the first coupling part 631 and the insertion part 420.

[0062] Also, the support part 430 is provided to be spaced apart from the insertion part 420, and the second coupling part 633 is seated on and supported by the support part 430. Here, an inclined part 431 may be formed at the support part 430 to facilitate seating of the second coupling part 633.

[0063] That is, the mounting part 630 is seated on each of the insertion part 420 and the support part 430 by being inserted into the slider 400 through the second through-part 440 and then rotating, and here, by a portion where the second coupling part 633 first comes in contact with the support part 430 being formed to be inclined, the rotation is facilitated.

[0064] Meanwhile, referring to FIG. 4B, the mounting part 630 may be formed as one member formed at the end of the rod 620 instead of being formed as a separate member from the rod 620.

[0065] FIGS. 9 to 11 show an operation process according to an insertion operation of the slide device according to one embodiment of the present disclosure.

[0066] Referring to FIGS. 9 to 11, during the insertion operation of the movable rail 200, the lower protrusion 540 of the transfer pin 500 moves along the first guide path 310a, and here, the upper protrusion 530 remains coupled to the transfer pin fixing part 210, and a self-closing operation is performed due to an elastic restoring force of the elastic member 700. Here, a soft-closing operation simultaneously occurs due to an impact absorbing force of the damper 600.

[0067] Also, during the insertion operation of the movable rail 200, the upper protrusion 530 of the transfer pin 500 enters the eccentric movement groove 211 of the transfer pin fixing part 210, specifically, the first eccentric movement groove 211a thereof. Here, the lower protrusion 540 of the transfer pin 500 is positioned in the second guide path 310b.

[0068] Next, when the movable rail 200 is further inserted, that is, the position of the upper protrusion 530 is changed to the second eccentric movement groove 211b due to the self-closing operation by the elastic member 700, here, the lower protrusion 540 is detached from the second guide path 310b due to the eccentric movement of the upper protrusion 530. Accordingly, as the lower protrusion 540 is released and not caught, the transfer pin 500 rotatably coupled to the slider 400 reaches a state in which the transfer pin 500 can move backward along the first guide path 310a together with the slider 400.

[0069] Here, the slider 400, the transfer pin 500, and the movable rail 200 move rearward due to the elastic restoring force of the elastic member 700, and soft-closing is performed due to the impact absorbing force of the damper 600.

[0070] That is, the slide device 1000 is able to perform self-closing and soft-closing of the movable rail 200 through the elastic restoring force of the elastic member 700 and the impact absorbing force of the damper 600.

[0071] According to the present disclosure, since an end of the rod 620 of the damper 600 is configured to be

directly connected to the slider 400, the structure of the transfer pin 500 can be simplified, and by providing a structure in which the transfer pin 500 is rotatable relative to the slider 400 in accordance with reciprocating movement of the movable rail 200, a coupling structure between the transfer pin 500 and surrounding configurations can be further simplified, thus not only facilitating coupling and separation, but also increasing durability of the transfer pin 500. Also, in the present disclosure, for example, as compared to the case in which the end of the rod 620 of the damper 600 is directly coupled to the transfer pin 500, an impact caused by the operation of the damper 600 is not directly transmitted to the transfer pin 500, and thus the durability thereof is further improved.

[0072] That is, in the case in which the end of the rod 620 of the damper 600 is connected to the transfer pin 500, a coupling structure for coupling with the end of the rod 620 of the damper 600 and a coupling structure for coupling with the slider 400 should be provided in the transfer pin 500. Therefore, not only a disadvantage occurs in that the structure of the transfer pin 500 having a relatively small size becomes complex to a certain extent or more, but also, since both the end of the rod 620 of the damper 600 and the slider 400 are coupled to the transfer pin 500, the durability of the transfer pin 500 decreases after the transfer pin 500 is reciprocated numerous times. Further, since precision is required even in the process of manufacturing the transfer pin 500 which has a relatively small size, there is also a difficulty in terms of manufacture.

[0073] The above-given description of the present disclosure is only illustrative, and those of ordinary skill in the art to which the present disclosure pertains should understand that the present disclosure may be easily modified to other specific forms without changing the technical spirit or essential features of the present disclosure. Therefore, the embodiments described above should be understood as illustrative, instead of limiting, in all aspects. For example, each element described as a single type may be embodied in a distributed manner, and likewise, elements described as being distributed may be embodied in a combined form.

[0074] The scope of the present disclosure is shown by the claims below, and all changes or modifications derived from the meaning and scope of the claims and their equivalent concepts should be construed as falling within the scope of the present disclosure.

Description of reference numerals

[0075]

1000 slide device
100 fixed rail
200 movable rail
210 transfer pin fixing part
300 body
310 guide path
320 damper accommodating part
400 slider
410 first through-part
420 insertion part
430 support part
440 second through-part
500 transfer pin
510 pin body
520 rotating shaft part
530 upper protrusion
540 lower protrusion
600 damper
610 housing
620 rod
630 mounting part
700 elastic member

Claims

1. A slide device comprising:

a fixed rail installed to be fixed to a main body;
a movable rail provided to be slidable relative to the fixed rail;
a body provided in one side end area of the fixed rail and having a guide path provided therein;
a slider coupled to the body and configured to selectively move in a longitudinal direction of the body during sliding of the movable rail;
a transfer pin rotatably coupled to the slider and configured to move along the guide path;
an elastic member configured to connect the body and the slider and elastically compress or expand during movement of the slider; and
a damper provided in the body and having a rod whose end is connected to the slider.

2. The slide device of claim 1, wherein the damper includes:

a housing inserted into and coupled to the body;
the rod provided to be movable in the longitudinal direction from the housing; and
a mounting part formed at the end of the rod and mounted on the slider.

3. The slide device of claim 2, wherein the mounting part includes:

a first coupling part inserted into and supported by an insertion part of the slider;
a neck part inserted into a neck part insertion groove of the slider and formed to be concavely recessed so that a cross-sectional area is relatively reduced compared to the first coupling part; and

a second coupling part seated on and supported by a support part of the slider,
wherein, since directions in which the first coupling part and the second coupling part are supported are opposite to each other, detachment from the slider in a width direction (W) is prevented.

4. The slide device of claim 3, wherein:

the slider includes a second through-part formed between the insertion part and the support part; and
by being inserted into the slider through the second through-part and then rotating, the mounting part is seated on each of the insertion part and the support part.

5. The slide device of claim 4, wherein an inclined part is formed at the support part to facilitate seating of the second coupling part.

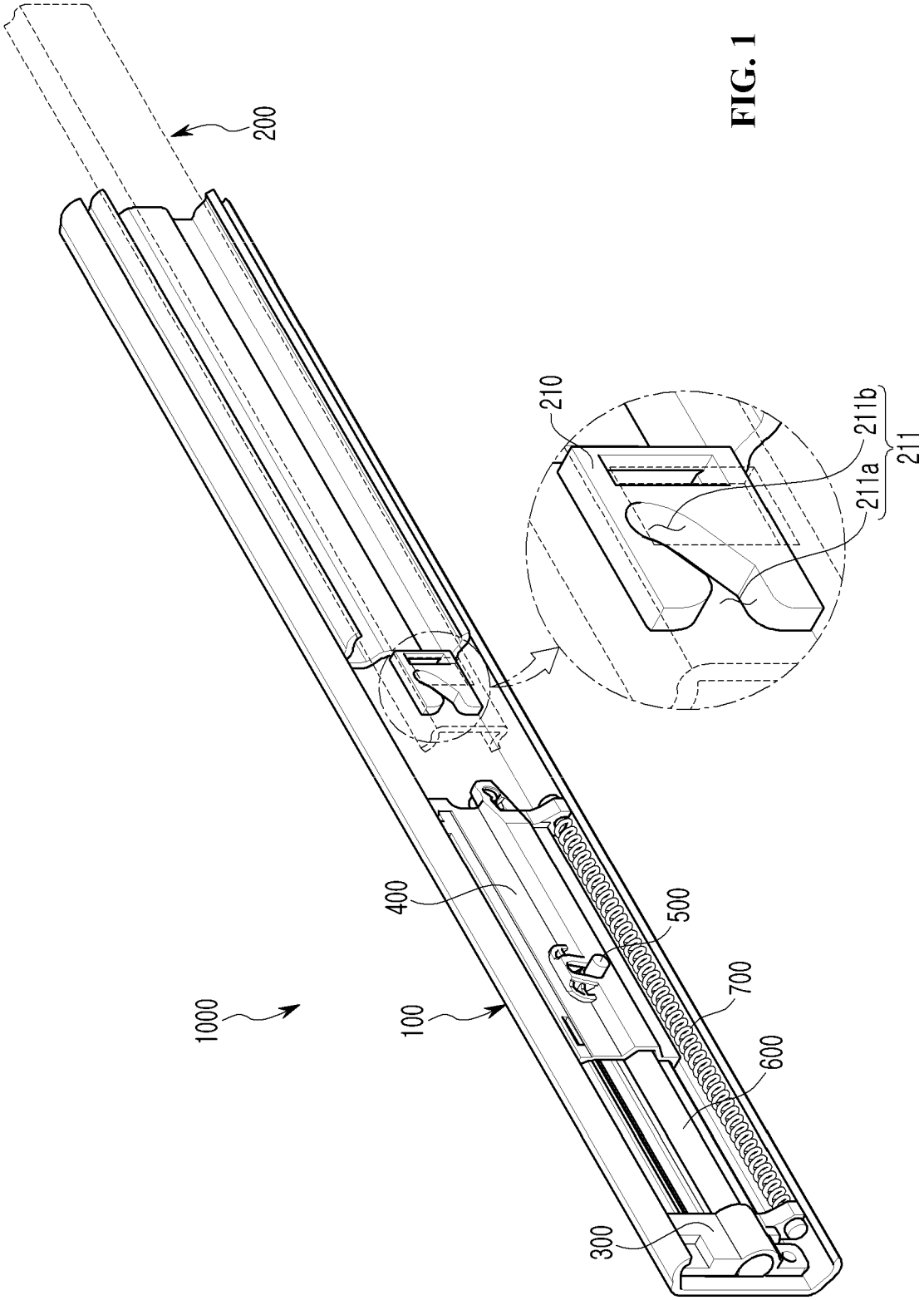
6. The slide device of claim 1, wherein the guide path includes:

a first guide path longitudinally formed in the longitudinal direction of the body; and
a second guide path connected to the first guide path at an end area of the first guide path and provided to be bent relative to the first guide path.

7. The slide device of claim 5, wherein the transfer pin includes:

a pin body;
a rotating shaft part formed at one end of the pin body and coupled to the slider;
an upper protrusion configured to protrude from one surface of the pin body at the other end of the pin body and inserted into a first through-part formed in the slider, and
a lower protrusion configured to protrude from the other surface of the pin body at the other end of the pin body and configured to move along the guide path during the movement of the slider,
wherein the transfer pin is configured to be rotatable about the rotating shaft part relative to the slider.

FIG. 1



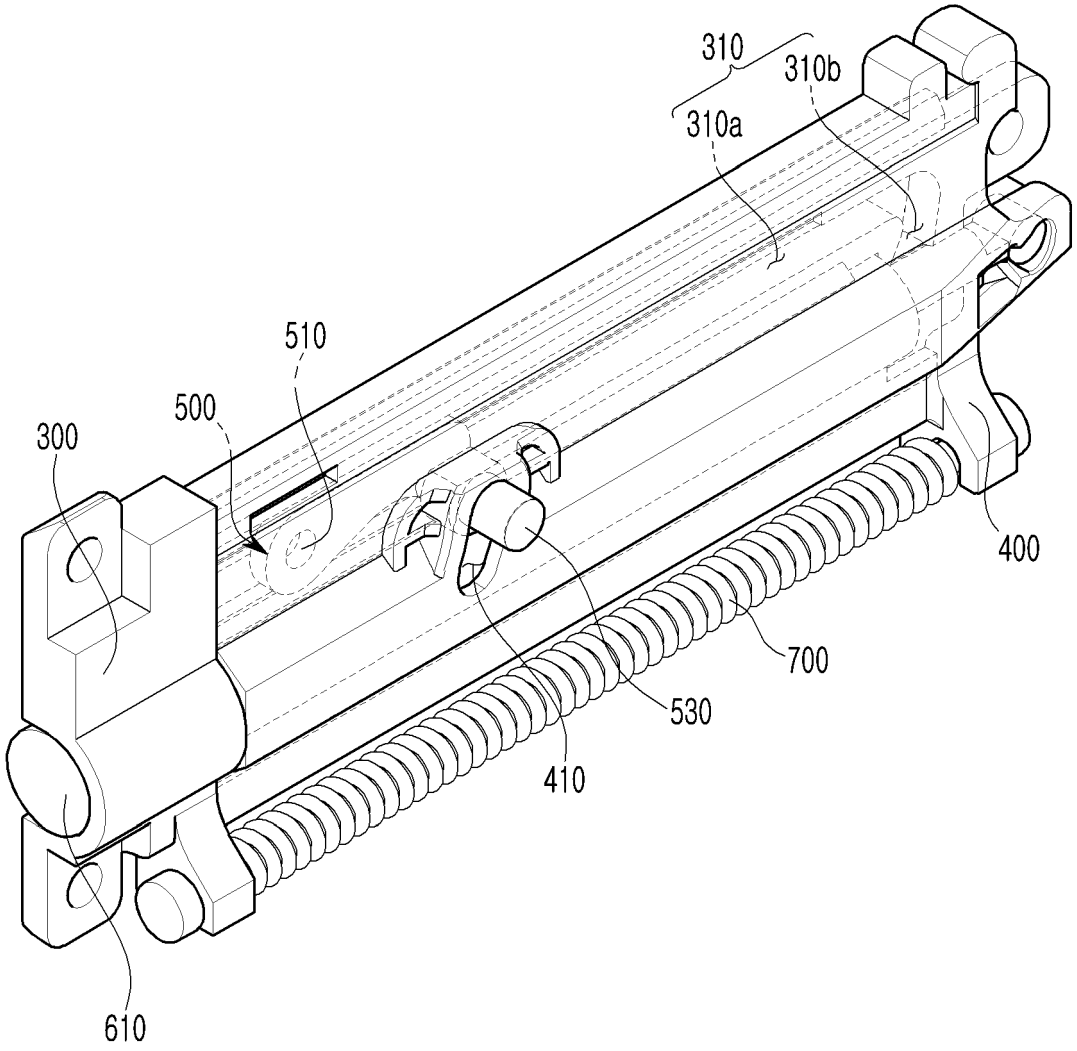


FIG. 2

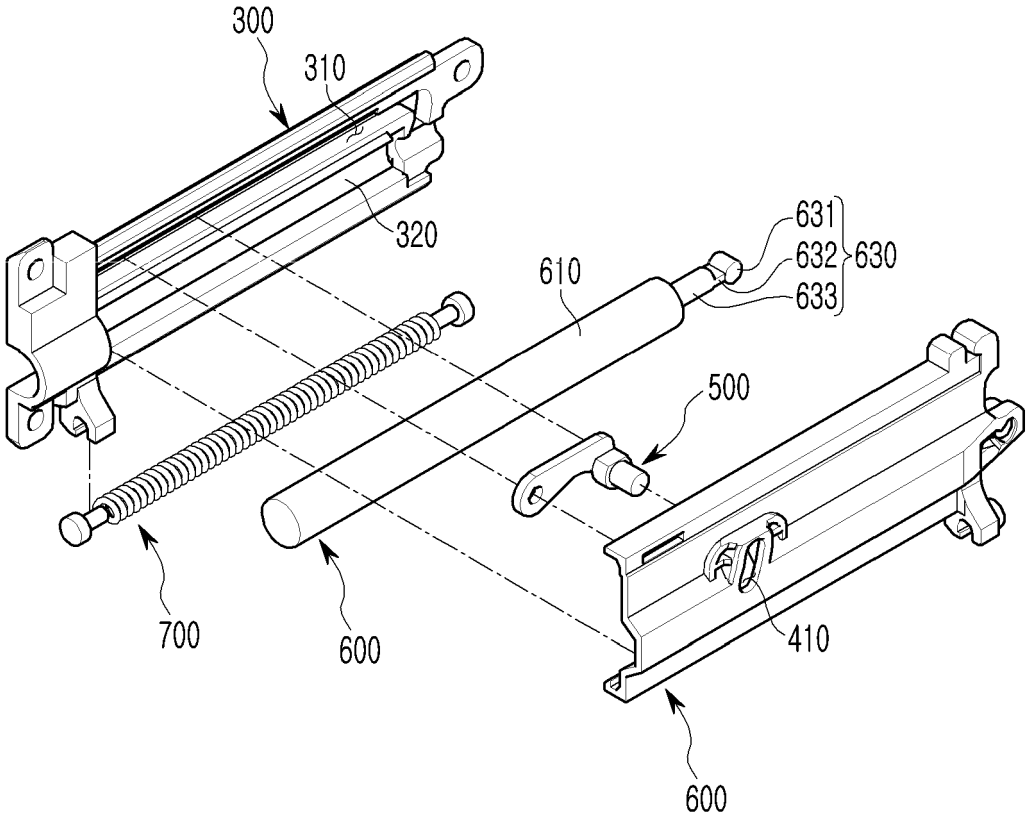
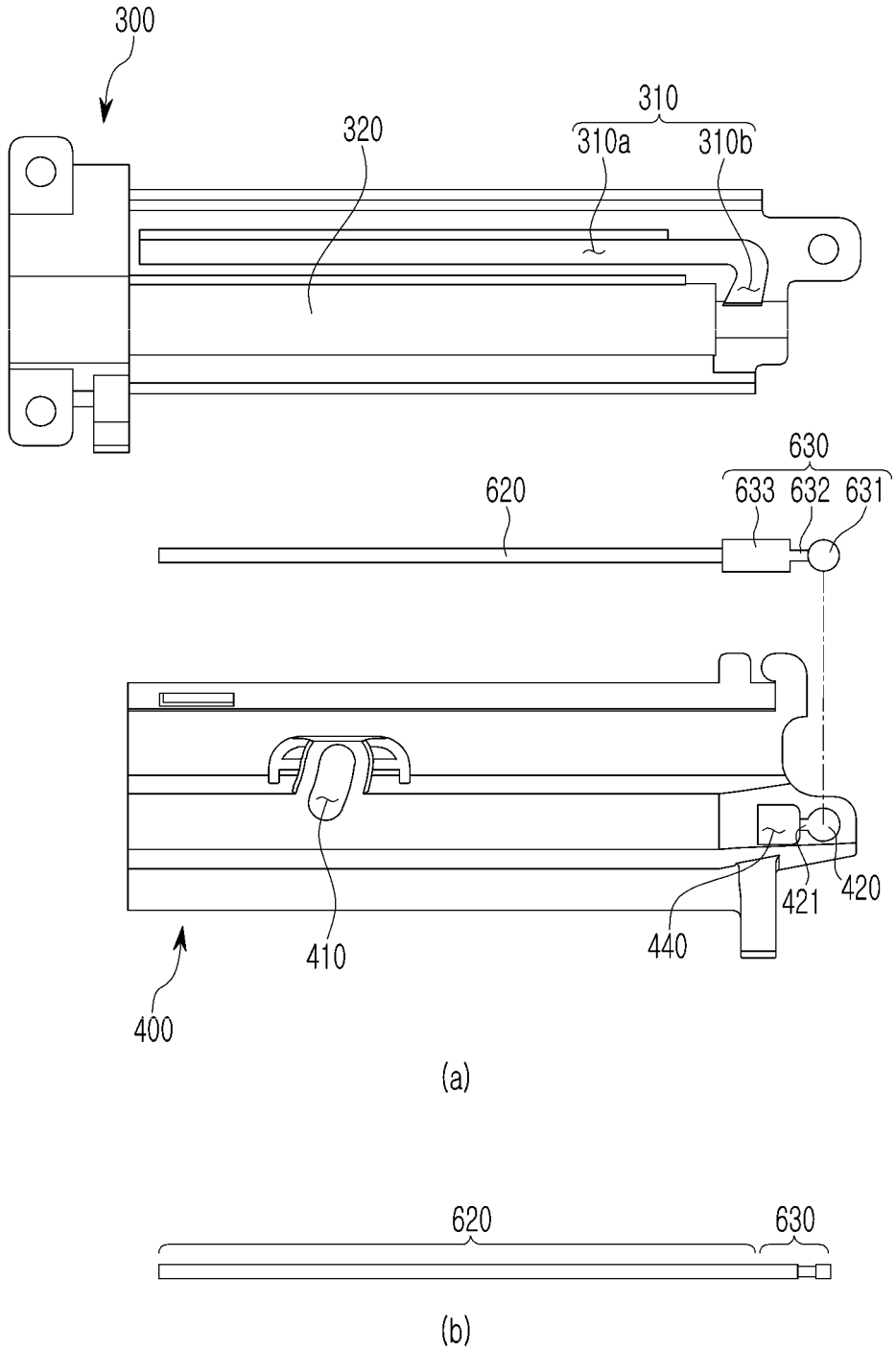


FIG. 3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320
310
310a
310b
630
620
633
632
631
420
421
440
410
400
(a)
620
630
(b)

FIG. 4

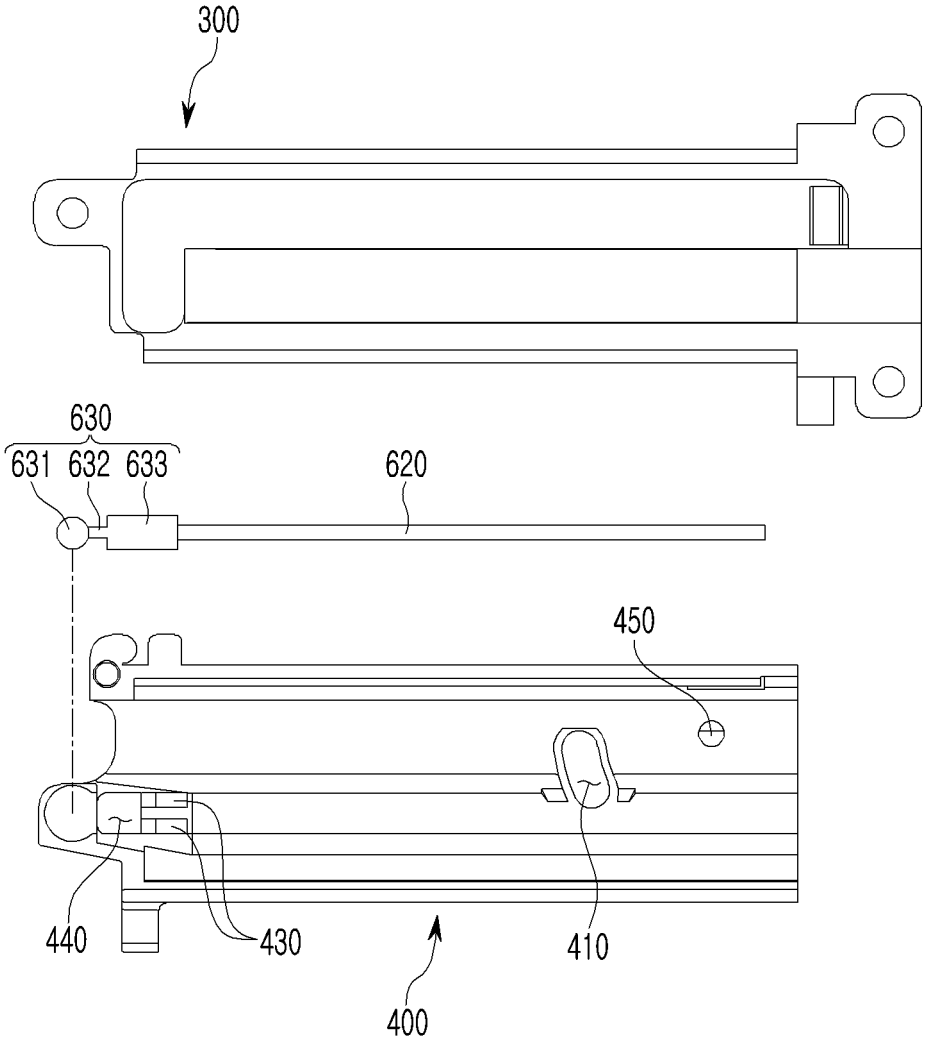
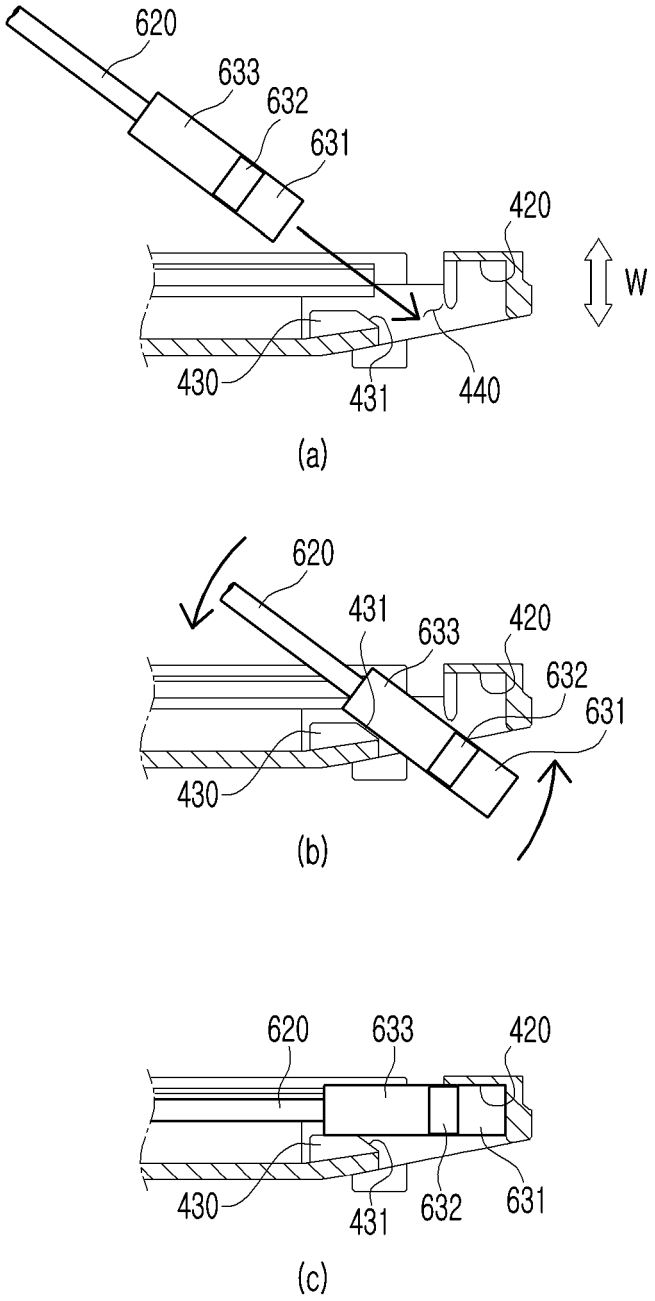


FIG. 5


620
633
632
631
420
W
430
431
440
(a)
620
431
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420
632
631
430
(b)
620
633
420
430
431
632
631
(c)

FIG. 6

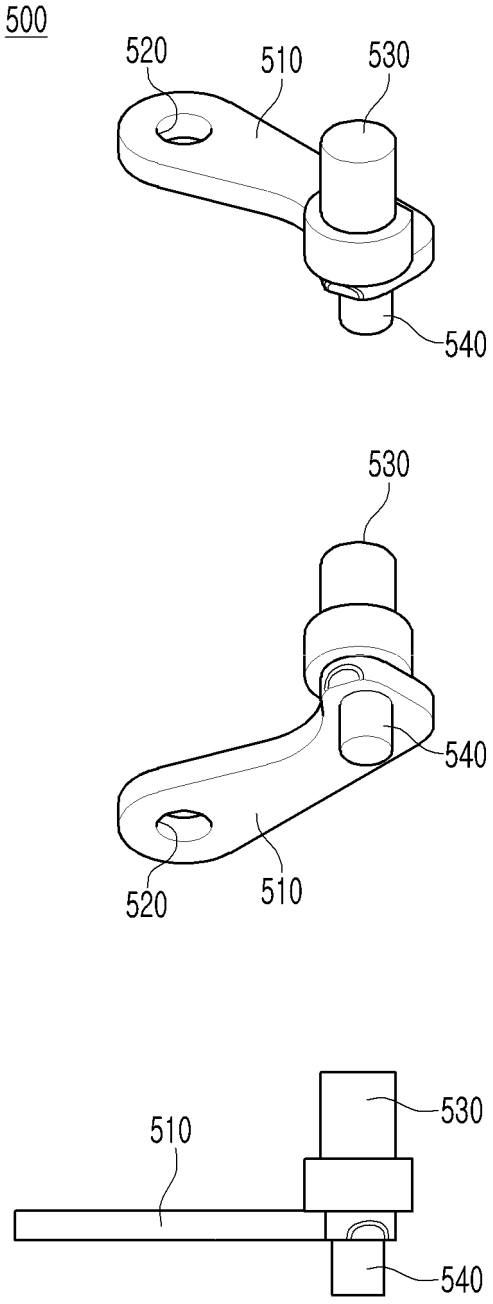
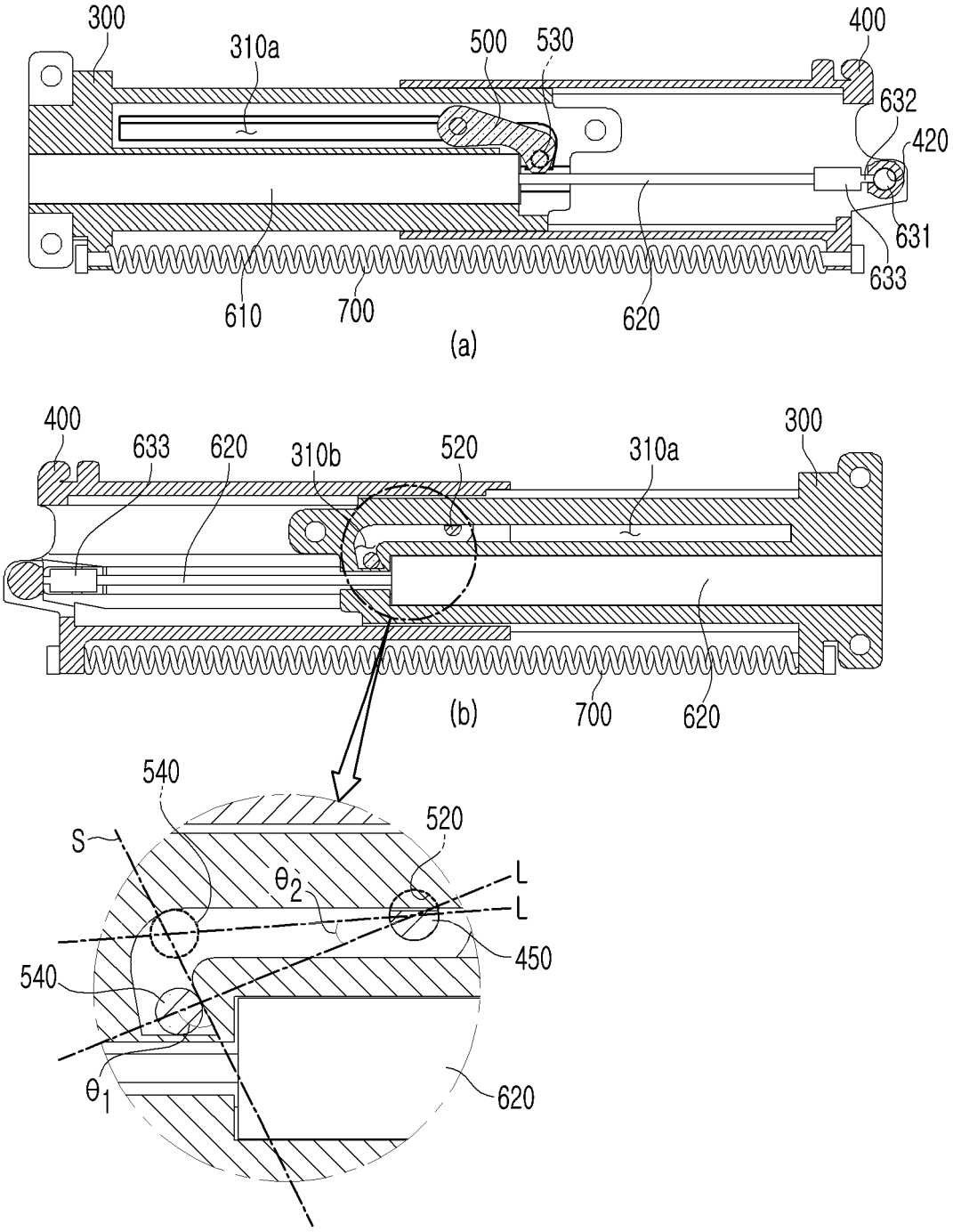


FIG. 7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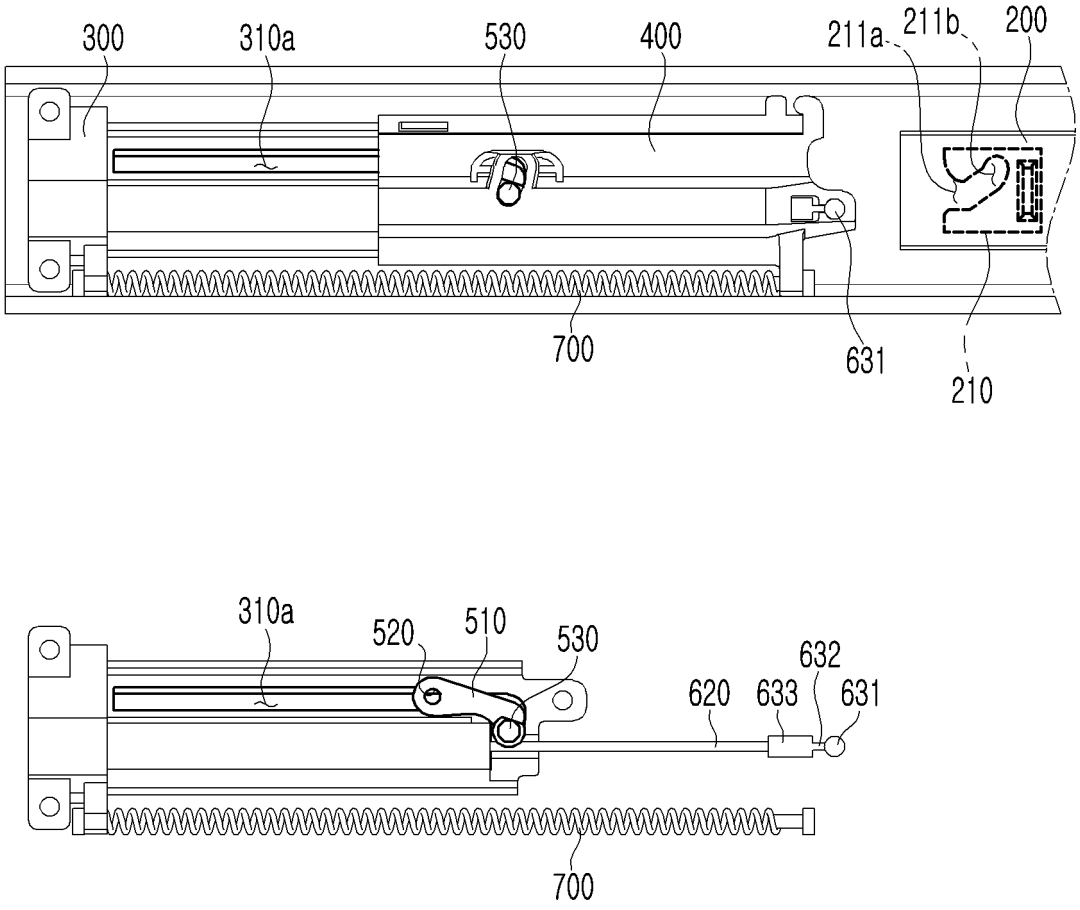
420
631
633
610
700
620
(a)
400
633
620
310b
520
310a
300
(b)
700
620
540
520
S
θ2
L
L
450
540
θ1
620

FIG. 8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211b
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700
631
210
310a
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510
530
632
620
633
631
700

FIG. 9

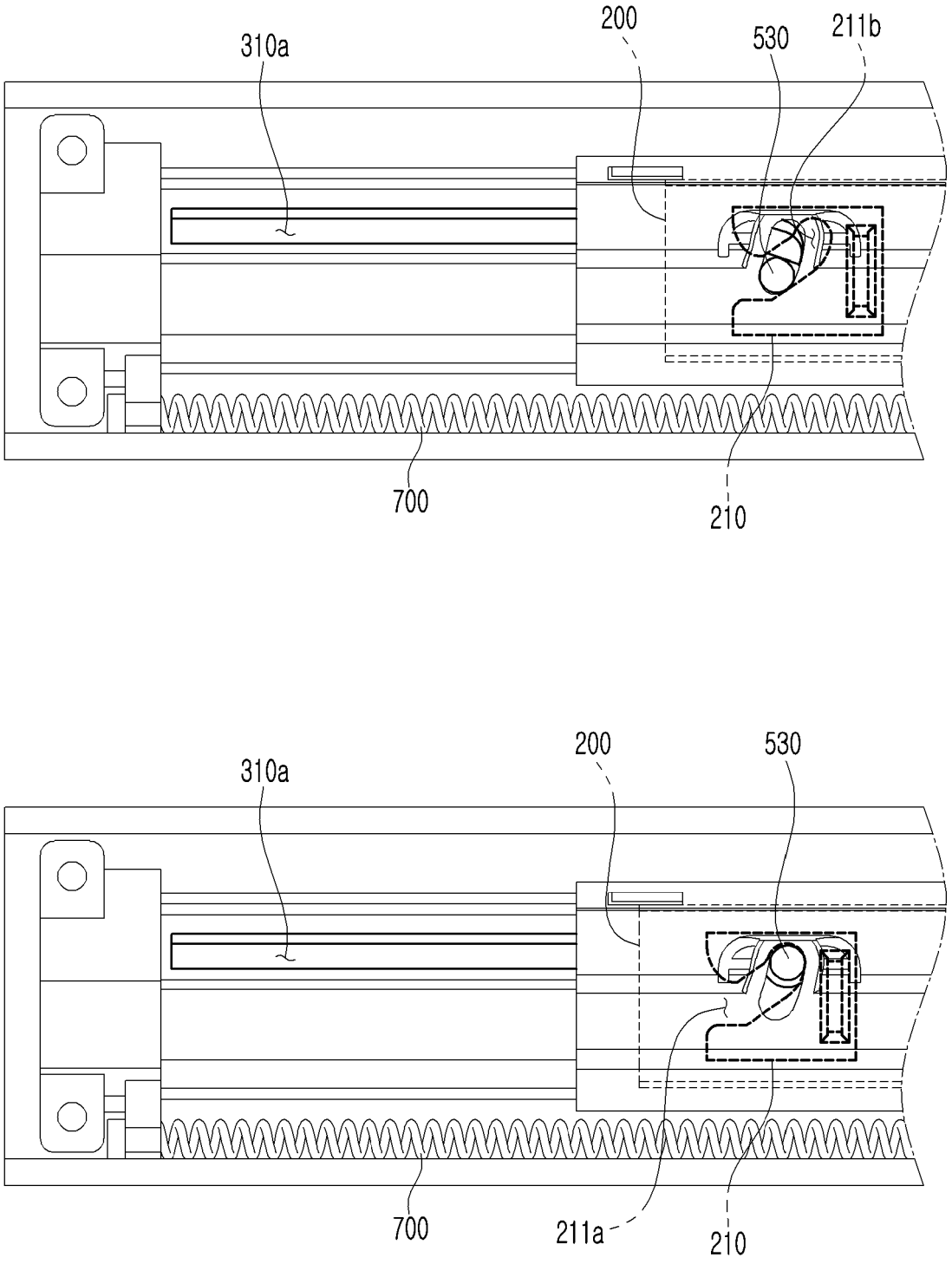
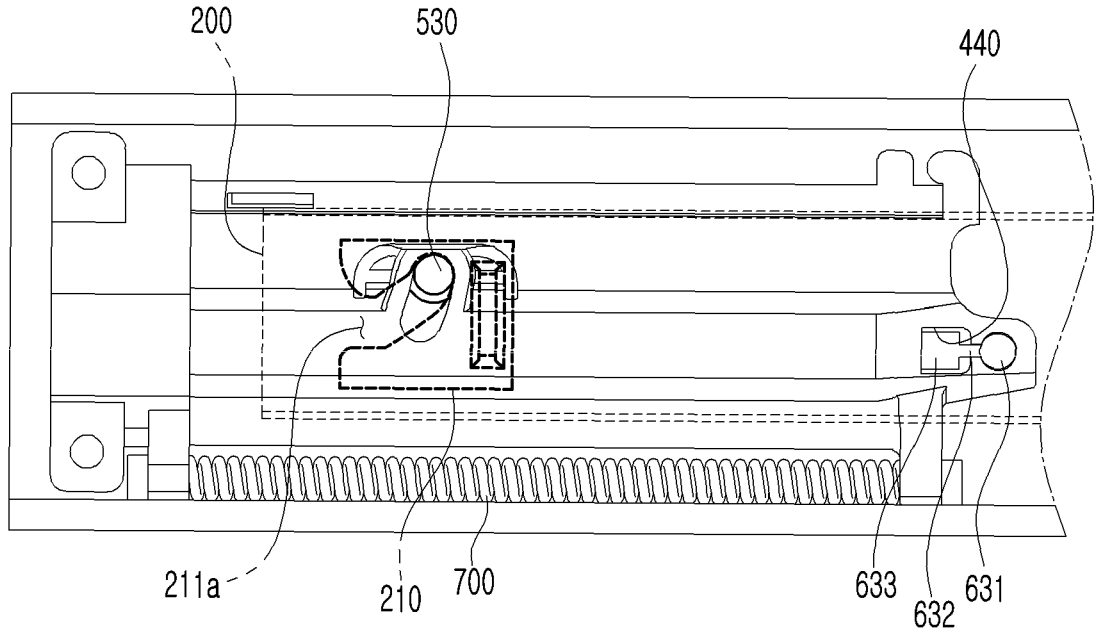


FIG. 10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440
211a
210
700
633
632
631

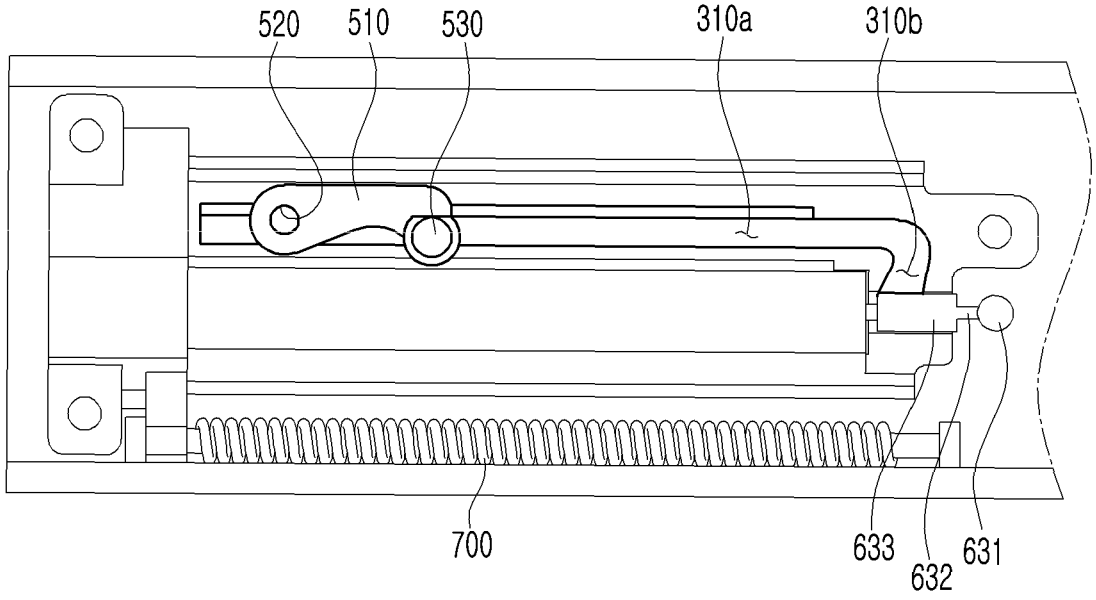
520
510
530
310a
310b
700
633
632
631

FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2022/005621

A. CLASSIFICATION OF SUBJECT MATTER

A47B 88/931(2017.01)i; **A47B 88/467**(2017.01)i; **A47B 88/473**(2017.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47B 88/931(2017.01); A47B 88/00(2006.01); A47B 88/04(2006.01); A47B 88/12(2006.01); A47B 88/14(2006.01); A47B 88/40(2017.01); A47B 88/453(2017.01); A47B 88/49(2017.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models: IPC as above
Japanese utility models and applications for utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) & keywords: 댐퍼(damper), 완충(buffer), 슬라이드(slide), 관통(penetrate) 및 삽입(insert)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-2021-0004644 A (SEGOS) 13 January 2021 (2021-01-13) See paragraphs [0027]-[0032] and [0057]-[0064]; claim 1; and figures 1-6.	1-3,6
A		4,5,7
X	KR 10-2007-0096813 A (PARK, Yoon Sig) 02 October 2007 (2007-10-02) See paragraphs [0020]-[0083] and figures 1-15.	1,6
A	KR 20-0478368 Y1 (TOPSCO CO., LTD.) 24 September 2015 (2015-09-24) See paragraphs [0020]-[0046] and figures 1-9.	1-7
A	US 2007-0132346 A1 (HUANG, Kuo-Sheng) 14 June 2007 (2007-06-14) See paragraphs [0024]-[0036] and figures 1-7.	1-7
A	JP 2019-510578 A (JULIUS BLUM GMBH) 18 April 2019 (2019-04-18) See paragraphs [0013]-[0021] and figures 1-5b.	1-7

☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 August 2022	**10 August 2022**
Name and mailing address of the ISA/KR **Korean Intellectual Property Office** **Government Complex-Daejeon Building 4, 189 Cheongsa-ro, Seo-gu, Daejeon 35208** Facsimile No. **+82-42-481-8578**	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2022/005621

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		WO 2017-173469 A2	12 October 2017
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Form PCT/ISA/210 (patent family annex) (July 2019)