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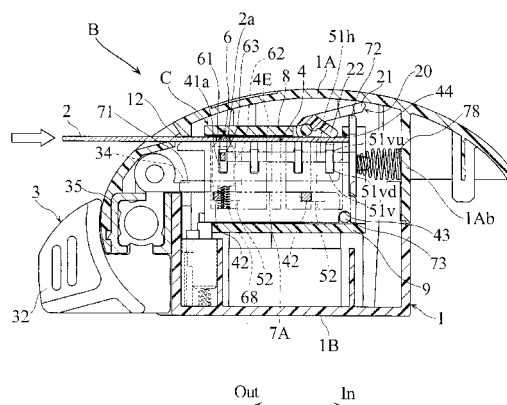
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(54) **UMBRELLA HOLDING DEVICE AND UMBRELLA STAND USING SAME**

(57) An umbrella holding device B includes a body 1, a receiver configured to have a vertically penetrating space which opens at the front of the body 1 and receives the handle of an umbrella, a shutter 3 configured to open and close the receiver, and a lock C configured to limit movement of the shutter 3 and have a locked state which is released by a card-key 2 inserted through a slot 12 in the body 1. The lock C includes a slide block 4 slidably supported by the body 1 in an insertion direction (In-Out direction) of the card-key 2. An abutment portion 44 which limits an insertion depth of the card-key 2 is provided on a main surface of the slide block 4 facing an insertion path 4E of the card-key 2. The slide block 4 enters a slidable state when the card-key 2 is inserted through the slot 12 and in a predetermined inserted state, and the slide block 4 moves backward in the In direction to release the locked state when the card-key 2 is inserted deeper in the In direction from the inserted state. The device further includes a rotating member 20 including a protruding piece 22 which displaces to advance into or retract from the insertion path 4E of the card-key 2. The rotating member prevents movement of the slide block 4 when the protruding piece 22 is in an advanced position in the insertion path 4E and allows movement of the slide block 4 when the protruding piece is in a retracted position from the insertion path 4E. When the card-key 2 is inserted through the slot 12 and an insertion-side tip of the card-key 2 abuts the abutment portion 44, the protruding piece 22 is brought into the retracted position to allow the slide block 4 to move backward in the In direction.

FIG.13



Description

TECHNICAL FIELD

[0001] The present invention relates to an umbrella holding device for holding umbrellas, parasols and the like individually, and an umbrella stand using the same.

BACKGROUND ART

[0002] Conventionally, for example, public facilities such as hotels and the like which are used by the general public have an umbrella stand for holding umbrellas, parasols and the like individually. Some umbrella stands are provided with a plurality of umbrella holding devices at an upper portion of the stand so that the handles of umbrellas or the like can be held in a locked state. Such an umbrella stand has a type of locking mechanism which is unlocked by inserting a card-key to release the locked state.

[0003] FIGS. 21-26 show an example conventional umbrella holding device which is unlocked utilizing a card-key and an example locking mechanism used in the device. As shown in FIG. 22, the locking mechanism Y includes a slide block 140 which is slidably supported in a body 110. As shown in FIG. 22, a plurality of holes 141 are formed in the slide block 140. As shown in FIG. 22, the holes 141 are arranged in two rows extending along both side edges of the slide block 140. The plurality of holes 141 forming each of the two rows are all arranged at the same pitch in an In-Out direction (insertion direction of card-key). Each hole 141 has a longitudinal groove 141a which is open outward at the side edge of the slide block 140. For example, two lock pins 160 are inserted in two holes 141 (one hole 141 is selected from each of the two rows). As shown in FIGS. 22 and 24, the lock pin 160 has a cone-shaped tip portion 161 and a cylindrical portion 162. A protrusion 163 is provided at an upper portion of the cylindrical portion 162. The lock pin 160 is inserted in the hole 141 so that the protrusion 163 passes through the vertical groove 141a and protrudes from the side surface in a Cs direction or an Op direction. A spring 168 is provided below the lock pin 160. Therefore, the lock pin 160 is limited by the hole 141 and the longitudinal groove 141a so as to be reciprocable in the up-down direction of the figure, as well as being biased upward in the figure by the spring 168. The portion of the protrusion 163 which protrudes from the longitudinal groove 141a advances into a guide groove 151 of a guide block 150A or 150B shown in FIG. 23. Note that, as shown in FIG. 22, the slide block 140 is biased in the Out direction by a spring 178.

[0004] The guide blocks 150A and 150B are spaced apart from each other with the slide block 140 being interposed therebetween. The guide groove 151 is formed in a surface facing the slide block 140 of each of the guide blocks 150A and 150B. As shown in FIGS. 23 and 24, the guide groove 151 includes a plurality of vertical

grooves 151v arranged corresponding to the longitudinal grooves 141a of the slide block 140, and a horizontal groove 151h intersecting the vertical grooves 151v at right angles. The lock pin 160 is positioned at an upper end by the biasing force of the spring 168. In this case, the protrusion 163 is positioned at an upper end portion 151vu of the vertical groove 151v, and the slide block 140 is locked so that movement of the slide block 140 relative to the guide blocks 150A and 150B is limited.

Also, in this case, the tip portion 161 of the lock pin 160 protrudes from the upper surface of the slide block 140.

[0005] The locked state of the locking mechanism Y is released by a card-key 120 shown in FIG. 21. The card-key 120 has two key holes 120a. The two key holes 120a are formed so that, when the card-key 120 is inserted through a slot 112 so as to be in a predetermined inserted state, their positions in the insertion direction and the width direction of the card-key 120 coincide with the positions of the two lock pins 160. When the card-key 120 is inserted through the slot 112, the card-key 120 moves along the upper surface of the slide block 140, and the lock pins 160 are pushed down below the lower surface of the card-key 120. Subsequently, as shown in FIG. 25, when the card-key 120 is inserted until the tip of the card-key 120 abuts an abutment portion 144, the positions of the lock pins 160 coincide with the positions of the key holes 120a. In this case, the lock pins 160 are each lifted by the biasing force of the spring 168 to a position which allows an upper portion of the tip portion 161 of each lock pin to advance into the corresponding key hole 120a. The dimensions of corresponding lock pin 160 and key hole 120a are determined so that the tip portion 161 of the lock pin 160 stops before completely passing through the key hole 120a. In this state, the protrusion 163 of each lock pin 160 is positioned at the height of the horizontal groove 151h. As a result, the locking action caused by the protrusion 163 fitting into the vertical groove 151v is released so that the slide block 140 can be slid in the In direction. When the card-key 120 is pushed further in the In direction from the state shown in FIG. 25, the tip of the card-key 120 pushes the abutment portion 144 and the key holes 120a push the respective lock pins 160, whereby the slide block 140, the lock pin 160, and a lock lever 170 supported by the slide block 140 are slidably moved together in the In direction against the spring 178, as shown in FIG. 26. As a result, a stopper 171 of the lock lever 170 which has advanced into the slide path of a bar 131 to hold a shutter 130 in a closed state retracts from the slide path. As a result, the locked state of the locking mechanism Y is released, and the shutter 130 is moved to an open position by the biasing force of a spring 138.

[0006] For example, in an umbrella stand using a plurality of umbrella holding devices X, locking mechanisms having the above configuration included in the umbrella holding devices each have a different arrangement of the lock pins 160 relative to the holes 141 of the slide block 140, and card-keys 120 each having key holes 120a po-

sitioned corresponding to the respective arrangement are used. As a result, the card-keys 120 can be distinguished for use as dedicated card-keys that only fit respective umbrella holding devices. In the structure of FIG. 22, with regard to the plurality of holes 141 of the slide block 140, when the lock pins 160 are inserted into holes 141 selected one from each of the two rows, for example, there are 16 combinations of positions of the lock pins 160. In this case, 16 locking mechanisms Y (16 umbrella holding devices X) can be unlocked by respective dedicated card-keys 120 having different arrangements of the key holes 120a. Therefore, the locking mechanism Y having such a structure is suitable for increasing the number of umbrella holding devices X which can be simultaneously used.

[0007] However, with the conventional umbrella holding device X, there is a risk that even if a card-key 120 other than a dedicated card-key 120 is used, the locking mechanism will be unlocked due to a malfunction. Specifically, for example, consider the case where the lock pins 160 are inserted in two holes 141 (see FIG. 27) which are adjacent in the Out direction, in comparison to the two holes 141 in which the lock pins 160 are inserted in FIG. 22. As described above, the holes 141 on each of the two rows are arranged at the same pitch. Therefore, the two lock pins 160 shown in FIG. 22 and the two lock pins 160 shown in FIG. 27 have the same positional relationship in the In-Out direction (insertion direction of the card-key). In this case, when the card-key 120 shown in FIG. 21 is inserted through the slot 112 into the umbrella holding device X of FIG. 27, the positions of the lock pins 160 coincide with the positions of the key holes 120a before the tip of the card-key 120 abuts the abutment portion 144 (see FIG. 28). When the positions of the lock pins 160 coincide with the positions of the key holes 120a, the slide block 140 is allowed to slide relative to the guide blocks 150A and 150B in the In direction as described above.

[0008] In the state of FIG. 28, if the card-key 120 is further pushed in the In direction, the key holes 120a push the respective lock pins 160, whereby the slide block 140 may be slid in the In direction against the spring 178. In other words, in the state shown in FIG. 28, although the tip of the card-key 120 does not abut the abutment portion 144 and the card-key 120 is not inserted to the predetermined inserted state, the locked state of the locking mechanism Y may be wrongly released if the card-key 120 is further pushed in this state. Therefore, the conventional umbrella holding device X may be unlocked using a card-key 120 other than a dedicated key, thus leaving room for improvement.

[0009]

Patent Document 1: JP 2006-152737A

SUMMARY OF INVENTION

[0010] The present invention has been made in view

of the above circumstances. It is an object of the present invention to provide an umbrella holding device in which an umbrella holding mechanism including a locking mechanism whose locked state is released by a card-key is suitable for preventing malfunction, and an umbrella stand using the same.

[0011] To achieve the object, the present invention has the following technical means.

[0012] An umbrella holding device according to a first aspect of the present invention includes a body, an umbrella receiver configured to have a vertically penetrating space which opens at a front of the body and receives a handle of an umbrella, a shutter configured to open and close the umbrella receiver, and a locking mechanism configured to limit movement of the shutter and have a locked state which is released by a card-key inserted through a slot provided in the body. The locking mechanism includes a slide block which is slidably supported by the body in an insertion direction of the card-key. An abutment portion which limits an insertion depth of the card-key is provided on a main surface of the slide block facing an insertion path of the card-key. The slide block enters a slidable state when the card-key is inserted through the slot and in a predetermined inserted state, and the slide block moves in the insertion direction to release the locked state when the card-key is inserted deeper in the insertion direction from the inserted state. The umbrella holding device further includes a restricting member a portion of which can displace to advance into or retract from the insertion path of the card-key so that movement of the slide block is prevented when the portion is in an advanced position and movement of the slide block is allowed when the portion is in a retracted position. When the card-key is inserted through the slot and an insertion-side tip of the card-key abuts the abutment portion, the portion is brought into the retracted position to allow the slide block to move backward in the insertion direction.

[0013] In a preferred embodiment, the locking mechanism includes a lock lever rotatably supported by the slide block and including a portion which advances into a slide path of the shutter to limit movement of the shutter. The lock lever includes a lock releasing portion arranged at a position in a width direction of the card-key when inserted which is different from the position of the abutment portion, and when the lock releasing portion is moved in the insertion direction, the lock lever rotates so that the portion of the lock lever which has advanced into the slide path of the shutter retracts from the slide path. The lock releasing portion is arranged at a position in the width direction of the card-key when inserted which is different from the position of a portion of the restricting member which advances into the insertion path of the card-key.

[0014] An umbrella stand according to a second aspect of the present invention includes a plurality of the umbrella holding devices of the first aspect of the present invention provided at an upper portion of a stand.

BRIEF DESCRIPTION OF DRAWINGS

[0015]

FIG. 1 is an overall perspective view showing an example umbrella stand according to the present invention.

FIG. 2 is an overall perspective view showing an example umbrella holding device according to the present invention.

FIG. 3 is an exploded perspective view showing the example umbrella holding device of the present invention.

FIG. 4 is an exploded perspective view of a locking mechanism.

FIG. 5 is a plan view showing a main portion of the example umbrella holding device of the present invention.

FIG. 6 is a cross-sectional view taken along line VI-VI of FIG. 5.

FIG. 7 is a cross-sectional view taken along line VII-VII of FIG. 5.

FIG. 8 is a cross-sectional view taken along line VIII-VIII of FIG. 5.

FIG. 9 is an enlarged view of a main portion taken along line IX-IX of FIG. 5.

FIG. 10 is a plan view of a main portion of the example umbrella holding device of the present invention.

FIG. 11 is a schematic cross-sectional view for describing a way in which the umbrella holding device of the present invention is used.

FIG. 12 is a schematic cross-sectional view for describing the way in which the umbrella holding device of the present invention is used.

FIG. 13 is a schematic cross-sectional view for describing the way in which the umbrella holding device of the present invention is used.

FIG. 14 is a schematic cross-sectional view for describing the way in which the umbrella holding device of the present invention is used.

FIG. 15 is a schematic cross-sectional view similar to FIG. 9 for describing the way in which the umbrella holding device of the present invention is used.

FIG. 16 is a plan view of a main portion for describing how the lock of the umbrella holding device of the present invention is released by a master card-key.

FIG. 17 is a schematic cross-sectional view for describing how the lock of the umbrella holding device of the present invention is released by the master card-key.

FIG. 18 is a schematic cross-sectional view for describing how the lock of the umbrella holding device of the present invention is released by the master card-key.

FIG. 19 is a diagram similar to FIG. 6 showing another example umbrella holding device according to the present invention.

FIG. 20 is a schematic cross-sectional view for de-

scribing a way in which the umbrella holding device shown in FIG. 19 is used.

FIG. 21 is an overall perspective view showing an example conventional umbrella holding device.

FIG. 22 is a plan view of a main portion of the example conventional umbrella holding device.

FIG. 23 is a cross-sectional view taken along line XXIII-XXIII of FIG. 22.

FIG. 24 is a schematic cross-sectional view for describing a way in which the conventional umbrella holding device is used.

FIG. 25 is a schematic cross-sectional view for describing the way in which the conventional umbrella holding device is used.

FIG. 26 is a schematic cross-sectional view for describing the way in which the conventional umbrella holding device is used.

FIG. 27 is a plan view of a main portion of the example conventional umbrella holding device.

FIG. 28 is a schematic cross-sectional view for describing a way in which the conventional umbrella holding device is used.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0016] Preferred embodiments of the present invention will be described below with reference to the accompanying drawings.

[0017] FIG. 1 shows an example umbrella stand according to the present invention. The illustrated umbrella stand A has a plurality of umbrella holding devices B attached to an upper portion of a stand Aa. Any of the umbrella holding devices B can hold a handle Da of an umbrella D so that the umbrella D can be stored in an upright state with the handle Da at the top.

[0018] As shown in FIGS. 2 and 3, the umbrella holding device B includes a body 1, an umbrella receiver 11 for receiving the umbrella handle Da, a shutter 3 which can open and close the umbrella receiver 11, and a locking mechanism C which releases the locked state of the shutter 3 using a card-key 2. The umbrella holding device B is attached to a support bar Ab of the umbrella stand A using a bolt (not shown).

[0019] The body 1 has a block construction consisting of an upper body 1A and a lower body 1B. The upper body 1A has an upper dome portion 1Aa which has a gentle arc shape so as to bulge upward. The upper dome portion 1Aa has a number display portion 17. The number display portion 17 indicates a unique number for each umbrella holding device B attached to the umbrella stand A, for example. The upper dome portion 1Aa has a slot 12 through which the card-key 2 is inserted into the umbrella holding device B in the In direction. The upper body 1A has, at a side surface of the umbrella receiver 11, a bar opening 14 for allowing a bar 31 of the shutter 3 to protrude. When the shutter 3 is moved in a Cs direction of the figure, the bar 31 protrudes from the bar opening 14, so that the umbrella receiver 11 is closed. When the

shutter 3 is moved in an Op direction, the bar 31 is housed in the bar opening 14, so that the umbrella receiver 11 is open.

[0020] The shutter 3 includes the cylindrical bar 31, a tab 32, and a cylinder 33. The shutter 3 is slidably supported by a case 35 and a slide shaft 36 such that the bar 31 moves from a housed state to a protruding state. When the bar 31 moves from the housed state to the protruding state, the tab 32 and the cylinder 33 are exposed outside the case 35 through openings formed in the case 35. Sandwiching pieces 35a and 35b are provided at opposite ends of the case 35. The slide shaft 36 is interposed between the sandwiching pieces 35a and 35b in a state of being inserted in the cylinder 33, so as to be fixed to the case 35. A spring 38 is provided in the bar 31. The spring 38 is, for example, an extension spring, one end of which is fixed to a tip of the bar 31 (the left end of the bar 31 in FIG. 3) and the other end of which is fixed to a base end of the case 35 (the right end of the case 35 in FIG. 3). The shutter 3 is arranged in a space toward the Out direction of the upper body 1A with opposite end portions of the case 35 being fitted in the bar opening 14 and a shutter attachment opening 15 of the upper body 1A. In this case, the tab 32 is exposed through an opening formed in a lower portion toward the Out direction of the upper dome portion 1Aa, and is movable in the Cs-Op direction. The shutter 3 is slidably supported in the Cs-Op direction, and the bar 31 is retractable through the bar opening 14. The shutter 3 is also supported by the upper body 1A via the case 35 and the slide shaft 36, and therefore can be smoothly slid without wobbling or the like. The spring 38 has substantially its natural length when the shutter 3 is in the open position, and is extended from the natural length to store an elastic force when the shutter 3 is in the closed position. The shutter 3 in the closed position is biased in the Op direction via the spring holder 33 by this stored force. Note that the shutter 3 is provided with a shutter engagement portion 34 as shown in FIGS. 3, 5, and 7. The shutter engagement portion 34 is used to maintain the shutter 3 in the closed state by engaging with a stopper 71 of a lock lever 7 described below. As shown in FIG. 9, the shutter engagement portion 34 has a sloped lower surface which serves as a cam 34a. The function of the cam 34a will be described below.

[0021] The card-key 2 has a rectangular shape and is made of, for example, resin. The card-key 2 has one or more key holes 2a in a region toward a tip thereof in the In direction. The card-key 2 shown in the drawings has two key holes 2a. A number display portion 2b is provided in a region toward a rear end of the card-key 2 in the Out direction. The number display portion 2b indicates a number corresponding to the number of the number display portion 17 provided in the body 1. As a result, each umbrella holding device B is provided with one dedicated card-key 2. The locking mechanism C described below releases the lock of the umbrella holding device B using the card-key 2 when the number indicated by the number

display portion 17 matches the number indicated by the number display portion 2b.

[0022] FIG. 4 is an exploded perspective view of the locking mechanism C. FIG. 5 is a plan view showing the umbrella holding device B from which the upper body 1A has been removed. The locking mechanism C can lock the shutter 3 in the closed position and can release the locked state using the card-key 2. The locking mechanism is located further back in the In direction than the shutter 3. As shown in FIGS. 4 and 5, the locking mechanism C includes a slide block 4, a pair of guide blocks 5A and 5B, a plurality of lock pins 6, the lock lever 7, an upper plate 8, a lower plate 9, and a rotating member 20. Note that, in FIG. 5, the upper plate 8 and the rotating member 20 are not shown for the sake of clarity in description.

[0023] The pair of guide blocks 5A and 5B are each a flat plate-like block, and are spaced apart with the slide block 4 being interposed therebetween. The guide blocks 5A and 5B have structures substantially symmetrical to each other. Although the guide block 5A will be described hereinafter, the guide block 5B has a similar structure, except for differences described below. As shown in FIGS. 4 and 6, the guide block 5A has two protrusions 53a protruding upward and two protrusions 53b protruding downward. The protrusions 53a and 53b are inserted through holes 81 and 91 of the upper and lower plates 8 and 9 (described below) into holes of the lower and upper bodies 1B and 1A, respectively, whereby the guide block 5A is fixed to the body 1.

[0024] The guide block 5A has a guide groove 51 and sliding grooves 52 in a surface thereof facing in the Op direction. The guide groove 51 includes a plurality of vertical grooves 51v arranged in the In-Out direction, and a horizontal groove 51h extending in the In-Out direction and intersecting the vertical grooves 51v. The horizontal groove 51h intersects the vertical grooves 51v at a portion slightly higher than the middle of each groove 51v. Each vertical groove 51v is partitioned into an upper end portion 51vu above the horizontal groove 51h and a lower end portion 51vd below the horizontal groove 51h. The two sliding grooves 52 are provided in the vicinity of the lower end of the guide block 5A, and are each a relatively short groove extending in the In-Out direction. Note that the guide block 5B has a guide groove 51, sliding grooves 52, and protrusions 53a and 53b which are similar to those of the guide block 5A. The guide grooves 51 of the guide blocks 5A and 5B face each other. The vertical grooves 51v of the guide grooves 51 of the guide blocks 5A and 5B are located at different positions in the In-Out direction corresponding to the positions of holes 41 (described below) in the slide block 4.

[0025] As shown in FIGS. 4 and 5, the slide block 4 is in the shape of a substantially rectangular parallelepiped, and is interposed between the pair of guide blocks 5A and 5B. The slide block 4 includes a pair of side portions 4A and 4B located at opposite side edges thereof, and a top plate 4C which links the side portions 4A and 4B

together. As shown in FIGS. 4, 7, and 8, each of the side portions 4A and 4B has, in the vicinity of the lower end thereof, two protrusions 42 protruding in the Cs or Op direction. The protrusions 42 are inserted in the sliding grooves 52 of the guide blocks 5A and 5B. As a result, the slide block 4 is supported so that the slide block 4 can be slid in the In-Out direction over the length of the sliding groove 52. As described below, the slide block 4 has a locked position in which the slide block 4 is slid toward the Out direction, and a lock release position in which the slide block 4 is slid toward the In direction. An abutment portion 44 protruding from the upper surface of the top plate 4C is provided in a location at a back end of the top plate 4C in the In direction excluding both edges thereof in the Cs-Op direction. The abutment portion 44 is used to limit the insertion depth of the card-key 2 from the slot 12.

[0026] As shown in FIG. 5, the holes 41 are provided and arranged in the In-Out direction in each of the side portions 4A and 4B of the slide block 4. The holes 41 provided in the side portion 4A and the holes 41 provided in the side portion 4B are arranged in rows 40A and 40B which are spaced apart from each other in the Cs-Op direction. The holes 41 in the row 40A are arranged at a predetermined pitch (e.g. 6.3 mm). On the other hand, the holes 41 in the row 40B are not arranged at a predetermined pitch. For example, while the pitches between the first and second holes 41 and between the third and fourth holes 41 as counted in the In direction are both 7 mm, the pitch between the second and third holes 41 as counted in the In direction is 10 mm. With this arrangement, sets of holes 41 selected one from each of the rows 40A and 40B have different positional relationships in the In-Out direction between the holes 41 forming each set. As shown in FIGS. 5 and 8, each hole 41 has a longitudinal groove 41a which is open outward in the slide block 4.

[0027] As shown in FIG. 5, a lock pin 6 is received in any of the holes 41. In this embodiment, for example, two lock pins 6 are received in two holes 41 as shown in the figure. The two holes 41 are selected one from each of the rows 40A and 40B. The number of lock pins 6 used in an umbrella holding device B and the positions of the holes 41 in which the lock pins 6 are received are unique to each umbrella holding device B. These correspond to the number of key holes 2a in the card-key 2 and the arrangement of the key holes 2 described above.

[0028] As shown in FIGS. 5 and 8, the lock pin 6 has a cone-shaped tip portion 61 and a cylindrical portion 62. A protrusion 63 is provided at an upper portion of the cylindrical portion 62. The top portion of the tip portion 61 has a diameter which is smaller than the inner diameter of the key hole 2a of the card-key 2. On the other hand, the cylindrical portion 62 has a diameter which is larger than the inner diameter of the key hole 2a. The lock pin 6 is inserted in the hole 41 so that the protrusion 63 passes through the longitudinal groove 41a to protrude in the Cs or Op direction. A spring 68 is provided

below the lock pin 6. As a result, the lock pin 6 is limited by the hole 41 and the longitudinal groove 41a so as to be reciprocable in the up-down direction of the figure, as well as being biased upward in the figure by the spring 68. A portion of the protrusion 63 which protrudes from the longitudinal groove 41a advances into the guide groove 51 of the guide block 5A or 5B shown in FIG. 6. As a result, depending on the up-down movement of the lock pin 6, it is determined whether or not the slide block 4 is allowed to slide as described below.

[0029] As shown in FIGS. 5 and 7, the lock lever 7 is provided in a space 4D interposed between the side portions 4A and 4B of the slide block 4. As shown in FIG. 7, the lock lever 7 has a substantially T-shaped cross-section, and has a horizontal portion 7A and a standing portion 7B.

[0030] As can be seen from FIGS. 4 and 8, a pair of support pins 73 protruding in the Cs-Op direction are provided at a lower end of the standing portion 7B. The pair of support pins 73 are inserted in a pair of pin grooves 43 formed toward the back in the In direction at lower ends of the pair of side portions 4A and 4B of the slide block 4. The lower plate 9 abuts the lower surfaces of the side portions 4A and 4B to prevent the support pins 73 from moving in the up-down direction. As a result, the lock lever 7 is supported relative to the slide block 4 so that the lock lever 7 can rotate about the support pins 73.

[0031] A tip of the horizontal portion 7A protrudes further in the Out direction than the side portions 4A and 4B of the slide block 4. As shown in FIG. 5, the tip portion has the stopper 71 which is wide in the Cs-Op direction. If the shutter 3 has been moved to the closed position by the user, then when the slide block 4 is slid in the Out direction, the stopper 71 advances into the slide path of the shutter engagement portion 34 to lock the shutter 3 so that the shutter 3 is maintained in the closed position.

[0032] As shown FIGS. 4 and 5, an upper portion of the standing portion 7B is bifurcated, and is exposed so as to extend along recessed portions 45 formed in surfaces facing in the In direction of the side portions 4A and 4B of the slide block 4. As shown in FIG. 7, a spring 78 is provided between the standing portion 7B and a back plate 1Ab of the upper block 1A. As a result, the lock lever 7 is biased so that the standing portion 7B is pressed against the side portions 4A and 4B of the slide block 4. Portions in the vicinity of the upper ends of the bifurcated portion of the standing portion 7B are lock releasing portions 72. The lock releasing portions 72 has a default position in which the standing portion 7B is pressed against the side portions 4A and 4B and a lock release position in which the entire lock lever 7 is rotated in the In direction against the biasing force of the spring 78. When the lock releasing portions 72 are in the lock release position, even if the slide block 4 is in the locked position, the stopper 71 which maintained the shutter 3 in the closed position is retracted to the upper right of FIG. 7, so that the locked state of the shutter 3 is released. As shown in FIG. 5, the bifurcated lock releasing portions

72 are located at both ends, in the Cs-Op direction, of the abutment portion 44 provided at the back end of the top plate 4C in the In direction. The lock releasing portions 72 in the lock release position are located further back in the In direction than the abutment portion 44.

[0033] The upper plate 8 and the lower plate 9 are used to put the parts of the locking mechanism C together so that the slide block 4 is maintained in an appropriate sandwiched position between the guide blocks 5A and 5B. As shown in FIG. 4, the upper plate 8 has, at the four corners thereof, holes 81 through which protrusions 53a protruding upward of the guide blocks 5A and 5B are inserted. The lower plate 9 has, at the four corners thereof, holes 91 through which protrusions 53b protruding downward of the guide blocks 5A and 5B are inserted. As shown in FIGS. 7 and 8, when the protrusions 53a of the guide blocks 5A and 5B are inserted through the holes 81 of the upper plate 8 so that the upper plate 8 abuts upper portions of the guide blocks 5A and 5B, an insertion path 4E for the card-key 2 which is a predetermined space is formed between the upper surface of the slide block 4 and the lower surface of the upper plate 8.

[0034] As shown in FIGS. 4 and 10, two slits 82 are formed at a back end of the upper plate 8 in the In direction, in portions toward both edges in the Cs-Op direction. The slits 82 prevent the lock releasing portions 72 of the lock lever 7 from interfering with the upper plate 8 while the lock releasing portions 72 are moved from the default position to the lock release position. A plurality of holes 83 for preventing interference with the tip portion 61 of the lock pin 6 are formed toward both edges of the upper plate 8 in the width direction. An opening 84 centrally positioned in the Cs-Op direction is formed toward the back of the upper plate 8 in the In direction. A round bar 85 extending across the opening 84 in the Cs-Op direction is provided in the middle of the upper plate 8 in the Cs-Op direction.

[0035] The rotating member 20 has a substantially T-shape as viewed from above, and includes a pair of lock release control protrusions 21 protruding in the Cs-Op direction, a protruding piece 22, and a recessed groove 23. As shown in FIG. 7, the round bar 85 of the upper plate 8 is fitted in the recessed groove 23. As a result, the rotating member 20 is supported relative to the upper plate 8 so that the rotating member 20 can be rotated about the round bar 85.

[0036] As shown in FIGS. 7 and 8, the rotating member 20 is normally put on the upper plate 8 under its own weight. In this case, the protruding piece 22 advances into the insertion path 4E for the card-key 2 through the opening 84 of the upper plate 8 (entry position). The protruding piece 22 in the entry position is located in the vicinity of the abutment portion 44. Here, as shown in FIGS. 8 and 10, the lock release control protrusions 21 are located further back in the In direction than the lock releasing portions 72 of the lock lever 7. As a result, the lock releasing portions 72 are prevented from moving back in the In direction. Therefore, the lock lever 7 does

not take the lock release position in which the lock lever 7 is rotated in the In direction, and the slide block 4 does not take the lock release position in which the slide block 4 is slid toward the In direction.

5 **[0037]** On the other hand, as shown in FIG. 13, when the card-key 2 is inserted through the slot 12 into the insertion path 4E, so that the tip portion of the card-key 2 abuts the abutment portion 44, the protruding piece 22 is pushed by the card-key 2 to retract from the insertion path 4E, so that the rotating member 20 rotates. When the protruding piece 22 is in the retracted position, the pair of lock release control protrusions 21 are displaced upward, so that the lock releasing portions 72 of the lock lever 7 are allowed to move back in the In direction. The rotating member 20 having this structure is an example of a restricting member according to the present invention.

[0038] As shown in FIGS. 3, 5, 7, and 9, the lower body 1B has a slide lock pin 16 in the vicinity of a front plate 1Bb which is located toward the Out direction. The slide lock pin 16 includes a tip protruding portion 16a, a cylindrical portion 16b, and a cam 16c. The cylindrical portion 16b is inserted in a hole formed in the lower body 1B. The cam 16c extends along the front plate 1Bb. A spring 18 is provided below the slide lock pin 16. As a result, the slide lock pin 16 is limited by the hole and the front plate 1Bb so as to be reciprocable in the up-down direction of the figure but not rotatable, as well as being biased upward in the figure by the spring 18.

30 **[0039]** When the slide block 4 is positioned toward the Out direction to be in the locked position, the protruding portion 16a of the slide lock pin 16 abuts the lower surface of the slide block 4, and therefore the slide lock pin 16 is lowered against the biasing force of the spring 18. On the other hand, as shown in FIG. 14, when the slide block 4 is positioned toward the In direction to be in the lock release position, the slide lock pin 16 is moved upward by the biasing force of the spring 18. In this case, the protruding portion 16a appears above the lower surface of the slide block 4, and therefore the slide block 4 is locked against movement in the Out direction.

[0040] Next, a way in which the umbrella stand A and the umbrella holding device B are used will be described hereinafter with reference to FIGS. 11-18.

45 **[0041]** FIGS. 11-14 show a way in which the locked state of the umbrella holding device B in which the umbrella receiver 11 is in the closed state as shown in FIG. 5 is released by the card-key 2 to open the umbrella receiver 11.

50 **[0042]** FIG. 11 shows the umbrella holding device B in which the locking mechanism C is in the locked state. The bar 31 is in the closed state in which the umbrella receiver 11 of FIG. 5 is in the closed state. The slide block 4 is biased in the Out direction by the spring 78 via the standing portion 7B of the lock lever 7, and therefore the protrusions 42 are located toward the Out direction in the sliding grooves 52 of the guide blocks 5A and 5B. This position corresponds to the locked position of the slide

block 4. The lock pin 6 is biased upward by the spring 68, and therefore the protrusion 63 is located in the upper end portion 51vu of the vertical groove 51v of the guide groove 51. As a result, the slide block 4 is not allowed to slide in the In-Out direction. In this state, the stopper 71 protrudes into the slide path of the shutter engagement portion 34. As a result, the shutter 3 is locked in the closed state.

[0043] Next, as shown in FIG. 12, the card-key 2 is inserted through the slot 12 into the insertion path 4E so as to release the locked state of the locking mechanism C. When the card-key 2 is inserted in the In direction, the card-key 2 moves along the upper surface of the slide block 4, so that each lock pin 6 is pushed down below the card-key 2 in the figure and therefore is lowered into the slide block 4. In this case, the protrusion 63 of each lock pin 6 is moved from the upper end portion 51vu of the vertical groove 51v through the horizontal groove 51h into the lower end portion 51vd of the vertical groove 51v. In this case, the tip portion of the card-key 2 does not abut the protruding piece 22 of the rotating member 20, and therefore the rotating member 20 does not rotate. Thereafter, as shown in FIG. 13, the tip of the card-key 2 is inserted to a position where the tip of the card-key 2 abuts the abutment portion 44. The key holes 2a are formed in the card-key 2 so that, in this state, the positions of the key holes 2a coincide with the respective positions of the lock pins 6 in the In-Out direction (a direction in which the card-key 2 is inserted) and in the width direction of the card-key 2 (the Cs-Op direction). Therefore, each lock pin 6 which is previously lowered is lifted by the biasing force of the spring 68 to a position in which an upper portion of the tip portion 61 of the lock pin 6 advances into the corresponding key hole 2a. As described above, the dimensions of the lock pin 6 and the key hole 2a corresponding to each other are determined so that the tip portion 61 of the lock pin 6 stops before completely passing through the key hole 2a. In this state, the protrusions 63 of the lock pins 6 are all positioned at the height of the horizontal groove 51h. As a result, the locking action achieved by the protrusions 63 being fitted in the vertical grooves 51v is released, so that the slide block 4 is allowed to slide in the In direction relative to the guide blocks 5A and 5B. As described above, in a state in which the tip of the card-key 2 abuts the abutment portion 44, the rotating member 20 supported by the upper plate 8 rotates, so that the lock release control protrusions 21 are displaced upward. Therefore, the slide block 4 is also allowed to slide relative to the rotating member 20.

[0044] As shown in FIG. 14, when the card-key 2 is inserted further in the In direction from the state of FIG. 13, the locked state of the locking mechanism C is released. In FIG. 13, the slide block 4 is allowed to slide. When the card-key 2 is further pushed in the In direction, the tip of the card-key 2 pushes the abutment portion 44 and the key holes 2a push the respective lock pins 6. As a result, as shown in FIG. 14, the slide block 4, the lock pin 6, and the lock lever 7 are slid together in the In di-

rection against the spring 78. As a result, the slide block 4 is slid in the In direction to the lock release position, so that the stopper 71 is retracted from the slide path of the shutter engagement portion 34. As a result, the locked state of the locking mechanism C is released, and the shutter 3 is moved to the open position of FIG. 3 by the biasing force of the spring 38. Thus, by inserting the card-key 2, the locked state of the locking mechanism C can be released, and therefore the umbrella receiver 11 can be opened.

[0045] In this embodiment, as described above with reference to FIG. 12, when the card-key 2 is inserted into the insertion path 4E and is moved in the In direction, the tip portion of the card-key 2 does not abut the protruding piece 22 of the rotating member 20 before the tip of the card-key 2 abuts the abutment portion 44. In other words, the protruding piece 22 is still present in the insertion path 4E of the card-key 2, and therefore the lock release control protrusions 21 of the rotating member 20 prevent the slide block 4 from moving back in the In direction. Therefore, because the rotating member 20 is provided, it is possible to prevent malfunction whereby the locked state of the locking mechanism C is released before the card-key 2 is inserted to reach a predetermined inserted state.

[0046] As described above, for the holes 41 formed in the slide block 4, sets of holes 41 selected one from each of the rows 40A and 40B have different positional relationships in the In-Out direction between the holes 41 forming each set. Also, in this embodiment, the lock pins 6 are inserted in holes 41 selected one from each of the rows 40A and 40B. Therefore, even if a card-key 2 other than a dedicated key is inserted in the In direction, the positions of the two lock pins 6 will not coincide with the positions of the two key holes 2a. Therefore, according to the umbrella holding device B, malfunction whereby the lock is unlocked by a card-key 2 other than a dedicated key can be prevented.

[0047] In FIG. 14, when the slide block 4 is slid in the In direction to reach the lock release position, the protruding portion 16a of the slide lock pin 16 appears above the lower surface of the slide block 4, and therefore the slide block 4 is not allowed to slide in the Out direction from the lock release position. On the other hand, a portion of the tip portion 61 of the lock pin 6 will have advanced into the key hole 2a of the card-key 2. As a result, when the shutter 3 is in the open position so that the umbrella receiver 11 is in the open state, and the slide block 4 is in the lock release position, the lock pins 6 do not allow the card-key 2 to be pulled out. Note that FIG. 15 is similar to FIG. 9 in which the shutter 3 is in the open position.

[0048] In the state of FIGS. 14 and 15, when the shutter 3 is slid to the closed position using the tab 32, the cam 34a of the shutter 3 and the cam 16c of the slide lock pin 16 slidably contact each other, and the slide lock pin 16 is lowered (see FIG. 9). In this case, the slide block 4 is slid in the Out direction by the biasing force of the spring

78, so that the stopper 71 of the lock lever 7 is engaged by the shutter engagement portion 34, and therefore the slide lock pin 16 is returned to the state of FIG. 7 against the biasing force of the spring 18. During this movement of the shutter 3, the bar 31 does not slidingly contact the slide block 4, and the cam 34a only slidingly contacts the cam 16c of the slide lock pin 16, and therefore an extra sliding contact resistance applied to the closing movement of the shutter 3 is reduced.

[0049] FIGS. 16-18 show a way in which the locked state of the umbrella holding device B in which the umbrella receiver 11 is locked in the closed state as shown in FIG. 5 is released using a master card-key 2M to open the umbrella receiver 11.

[0050] FIG. 16 is a plan view showing the umbrella holding device B in the locked state from which the upper body 1A has been removed. The master card-key 2M is different from the card-key 2 in that the master card-key 2M has protruding portions 2Ma at a tip thereof and does not have key holes. Similar to the card-key 2, the master card-key 2M is inserted through the slot 12 in the In direction. The protruding portions 2Ma are formed at opposite ends in the width direction of the master card-key 2M so that the protruding portions 2Ma abut the lock releasing portions 72 when the master card-key 2M is inserted in the In direction. The tip portion excluding the protruding portions 2Ma of the master card-key 2M is recessed in the Out direction so that the protruding portions 2Ma are not prevented from abutting the lock releasing portions 72. As shown in FIG. 17, when the master card-key 2M is inserted into the insertion path 4E, the tip portion (recessed portion) of the master card-key 2M pushes the protruding piece 22 of the rotating member 20, so that the rotating member 20 rotates. As a result, the pair of lock release control protrusions 21 are displaced upward, so that the lock releasing portions 72 are allowed to move back in the In direction. When the master card-key 2M is further pushed in the In direction, the protruding portions 2Ma push the lock releasing portions 72 in the In direction. In this case, the slide block 4 is not directly pushed in the In direction by the master card-key 2M.

[0051] As shown in FIG. 18, when the lock releasing portions 72 are pushed by the master card-key 2M, the lock lever 7 rotates about the support pin 73 in the clockwise direction of the figure against the spring 78. This rotation tilts the horizontal portion 7A of the lock lever 7 such that the left side is raised, whereby the stopper 71 is retracted diagonally to the upper right of the figure from the slide path of the shutter engagement portion 34. As a result, the locked state of the locking mechanism C is released, so that the shutter 3 is returned to the open position. Note that, as can be seen from FIGS. 17 and 18, the locked state of the locking mechanism C is released by the master card-key 2M only via the rotation of the lock lever 7. In this case, the slide block 4 is maintained in the locked position toward the Out direction. Thus, the card-key 2 and the master card-key 2M release

the lock using different mechanisms.

[0052] In this embodiment, the lock releasing portions 72 are located at the opposite ends in the width direction of the card-key 2. In contrast, the protruding piece 22 of the rotating member 20 is located at the middle in the width direction of the card-key 2, and therefore is arranged at a position in the width direction of the card-key 2 which is different from that of the lock releasing portions 72. Therefore, for example, even if a plate-like object which is narrow enough to prod the lock releasing portions 72 is inserted into the insertion path 4E to prod the lock releasing portions 72, the protruding piece 22 of the rotating member 20 is not caused to retract from the insertion path 4E. Therefore, the lock release control protrusions 21 of the rotating member 20 continue to prevent the lock releasing portions 72 from moving back in the In direction. As a result, the lock lever 7 is not rotated, and the locked state of the locking mechanism C is not wrongly released. As can be understood from the above description, the structure including the rotating member 20 can prevent an object other than the authentic master card-key 2M from unlocking the umbrella holding device B due to a malfunction.

[0053] Note that the shape of the master card-key 2M has nothing to do with the arrangement of the lock pins 6 in terms of the release of the locked state of the locking mechanism C by the master card-key 2M. Therefore, even when the number of umbrella holding devices B which can be simultaneously used is increased, a single master card-key 2M will suffice, which is convenient.

[0054] FIGS. 19 and 20 show another example structure of the umbrella holding device of the present invention. The umbrella holding device B of FIGS. 19 and 20 is different from the above embodiment in the structure of the guide blocks 5A and 5B. In FIGS. 19 and 20, the same or similar elements as those of the above embodiment are indicated by the same reference signs as those of the above embodiment, and will not be described unless necessary.

[0055] The horizontal groove 51h in the guide blocks 5A and 5B of this embodiment is located at a lower level than that (see FIG. 6) of the horizontal groove 51h in the guide blocks 5A and 5B of the locking mechanism C. The card-key 2 corresponding to the umbrella holding device B of this embodiment has a smaller diameter than that of FIG. 3 or 13. As shown in FIG. 20, when the card-key 2 is inserted into the insertion path 4E until the positions of the key holes 2a coincide with the positions of the lock pins 6, the tip portions 61 of the lock pins 6 are lifted to advance into the key holes 2a, and in this case, because the diameter of the key hole 2a is smaller, the lock pins 6 are stopped at a lower level than in FIG. 13. In this state, the protrusion 63 of the lock pin 6 is positioned at the height of the horizontal groove 51h, and therefore the slide block 4 is allowed to slide in the In direction relative to the guide blocks 5A and 5B. In other words, if a card-key 2 having key holes 2a with different diameters is prepared, the heights of the lock pins 6 when the card-key

2 is in a predetermined inserted state can be differentiated. Thus, if the position of the horizontal groove 51h formed in the guide blocks 5A and 5B is changed, and the diameter of the key hole 2a of the card-key 2 is changed to accommodate this change in position, two or more combinations can be provided by using the same lock pins 6 and the same arrangement of the lock pins 6. For example, in the slide block 4 of FIG. 5, when the lock pins 6 are inserted into holes 41 selected one from each of the rows 40A and 40B, there are 16 combinations of positions of the lock pins 6. Moreover, when two kinds of each of the guide blocks 5A and 5B are prepared, there are four combinations of the guide blocks 5A and 5B. In this case, 64 umbrella holding devices B can each be unlocked by a dedicated card-key 2. Such a structure is suitable to increase the number of umbrella holding devices B which can be simultaneously used.

[0056] Although specific embodiments of the present invention have been described, the umbrella holding device and the umbrella stand of the present invention are not limited to the above embodiments. Various changes and modification can be made in the design of the specific structure of each part of the umbrella holding device and the umbrella stand of the present invention.

[0057] The arrangement of the holes for insertion of lock pins provided in a slide block is not limited to the arrangement of the above embodiments. For example, all the holes may be arranged at the same pitch in the card insertion direction. In other words, the present invention is also applicable to the hole arrangement similar to that of the conventional structure described above with reference to Figs. 22-28. With the umbrella holding device according to the present invention, even when the holes 141 are arranged as shown in Figs. 22-28, the provision of the rotating member (restricting member) prevents malfunction whereby the locked state is released before the card-key is inserted to reach a predetermined inserted state.

[0058] In the above embodiments, the restricting member which is configured to rotate has been illustrated. The present invention is not limited to this. The restricting member may, for example, be configured to move in the up-down direction so that a portion thereof can be displaced to advance into or retract from the card-key insertion path.

[0059] The locking mechanism is not limited to a mechanism that uses a lock pin. For example, the locking mechanism may be structured such that, when a card-key having a characteristic configuration is inserted to provide a predetermined insertion state, each part corresponding to the characteristic configuration may move forward or backward in accordance with the insertion movement to release the locked state.

[0060] The card-key and the master card-key used for releasing the locked state of the umbrella holding device may additionally have a dummy key hole at a position which has nothing to do with the positions of the holes 41 of the slide block 4.

Claims

1. An umbrella holding device comprising:

5 a body;
an umbrella receiver configured to have a vertically penetrating space which opens at a front of the body and receives a handle of an umbrella;
10 a shutter configured to open and close the umbrella receiver; and
a locking mechanism configured to limit movement of the shutter and have a locked state which is released by a card-key inserted through a slot provided in the body,
15 wherein the locking mechanism includes a slide block which is slidably supported by the body in an insertion direction of the card-key,
an abutment portion which limits an insertion depth of the card-key is provided on a main surface of the slide block facing an insertion path of the card-key,
20 the umbrella holding device is configured such that, the slide block enters a slidable state when the card-key is inserted through the slot and in a predetermined inserted state, and the slide block moves in the insertion direction to release the locked state when the card-key is inserted deeper in the insertion direction from said inserted state,
25 the umbrella holding device further includes a restricting member a portion of which displaces to advance into or retract from the insertion path of the card-key so that movement of the slide block is prevented when said portion is in an advanced position and movement of the slide block is allowed when said portion is in a retracted position, and
30 when the card-key is inserted through the slot and an insertion-side tip of the card-key abuts the abutment portion, said portion is brought into the retracted position to allow the slide block to move backward in the insertion direction.

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2. The umbrella holding device according to claim 1, wherein the locking mechanism includes a lock lever rotatably supported by the slide block and including a portion which advances into a slide path of the shutter to limit movement of the shutter, the lock lever includes a lock releasing portion arranged at a position in a width direction of the card-key when inserted which is different from a position of the abutment portion, and when the lock releasing portion is moved in the insertion direction, the lock lever rotates so that the portion of the lock lever which has advanced into the slide path of the shutter retracts from the slide path, and the lock releasing portion is arranged at a position in the width direction of the card-key when inserted

which is different from a position of a portion of the restricting member which advances into the insertion path of the card-key.

3. An umbrella stand comprising:

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a plurality of the umbrella holding devices according to claim 1 or 2 provided at an upper portion of a stand.

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FIG.1

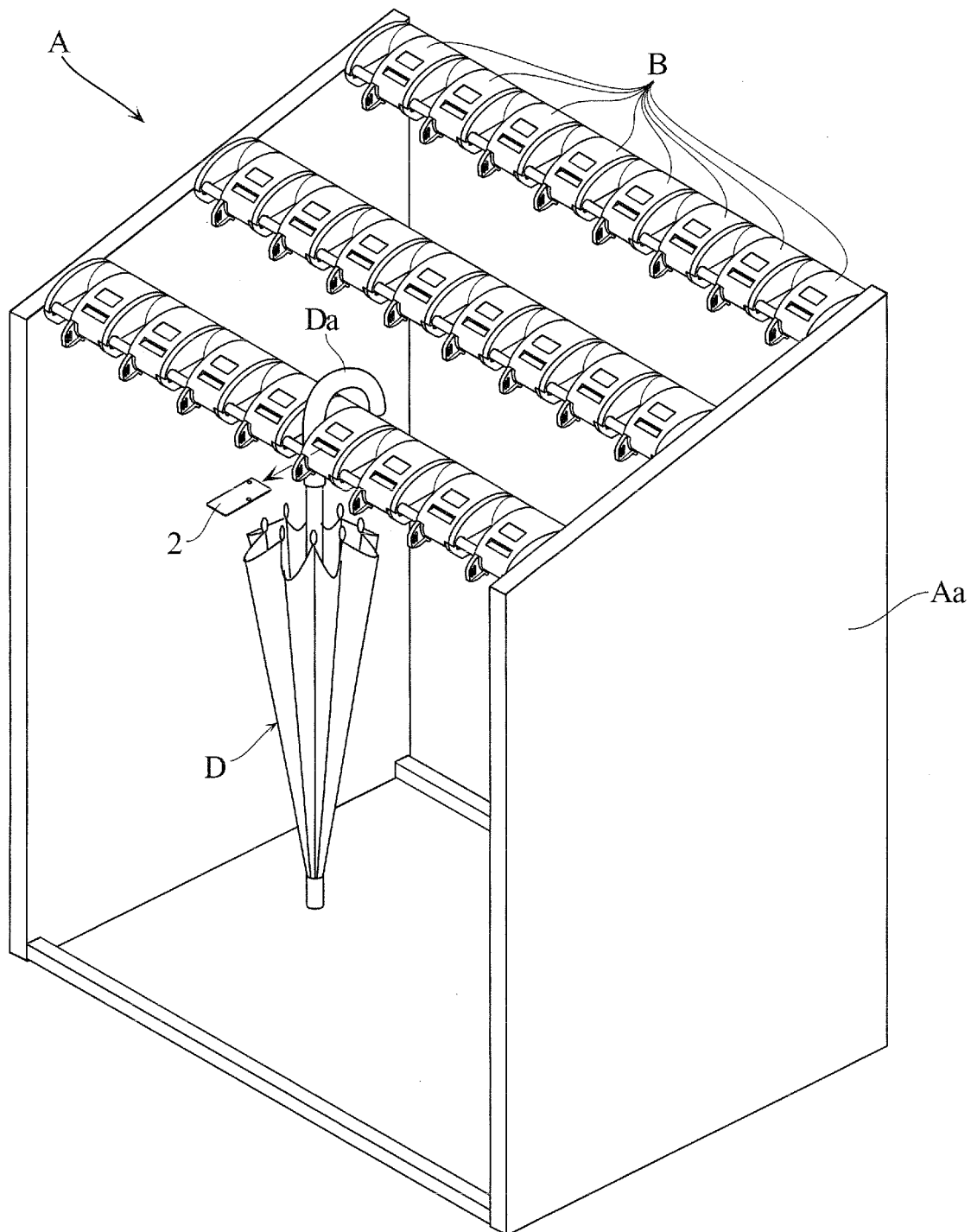


FIG.2

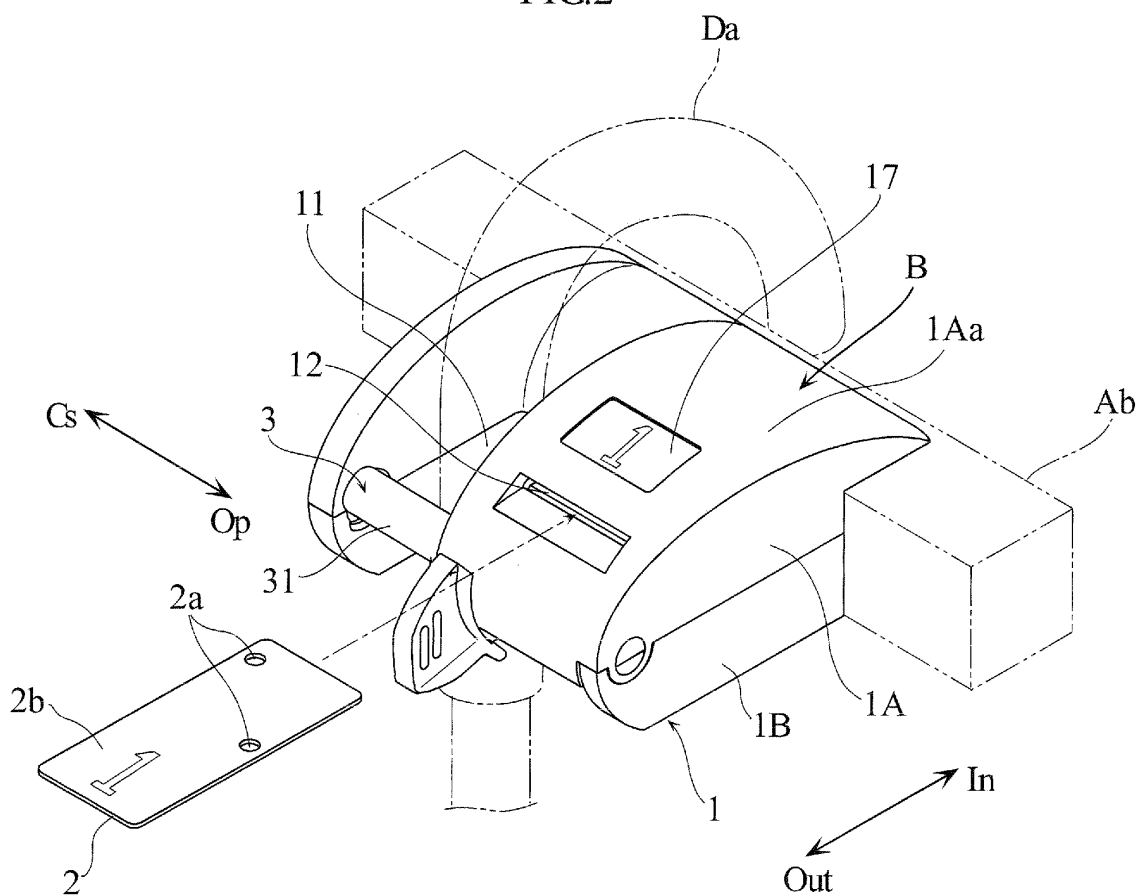


FIG.3

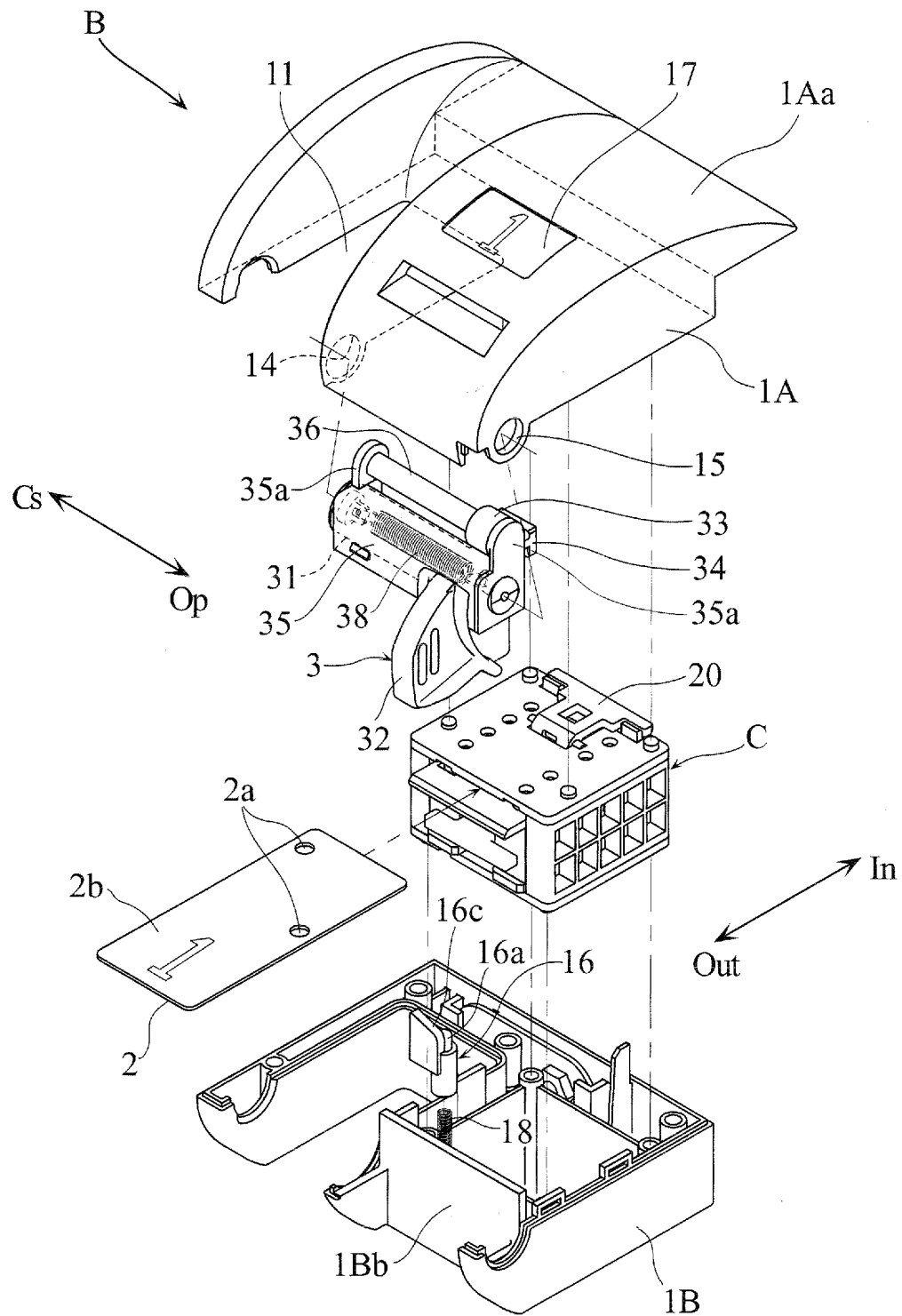


FIG.4

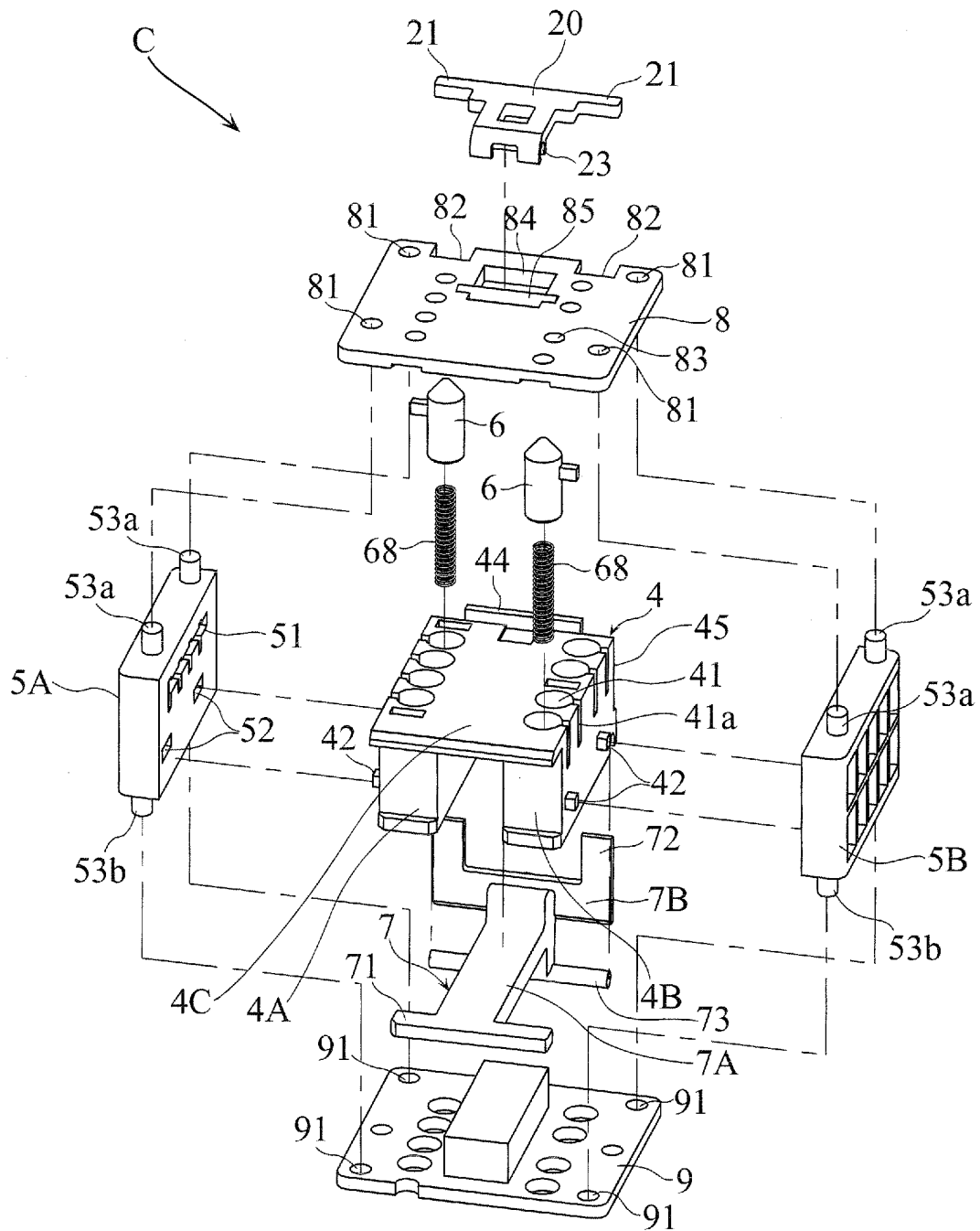


FIG.5

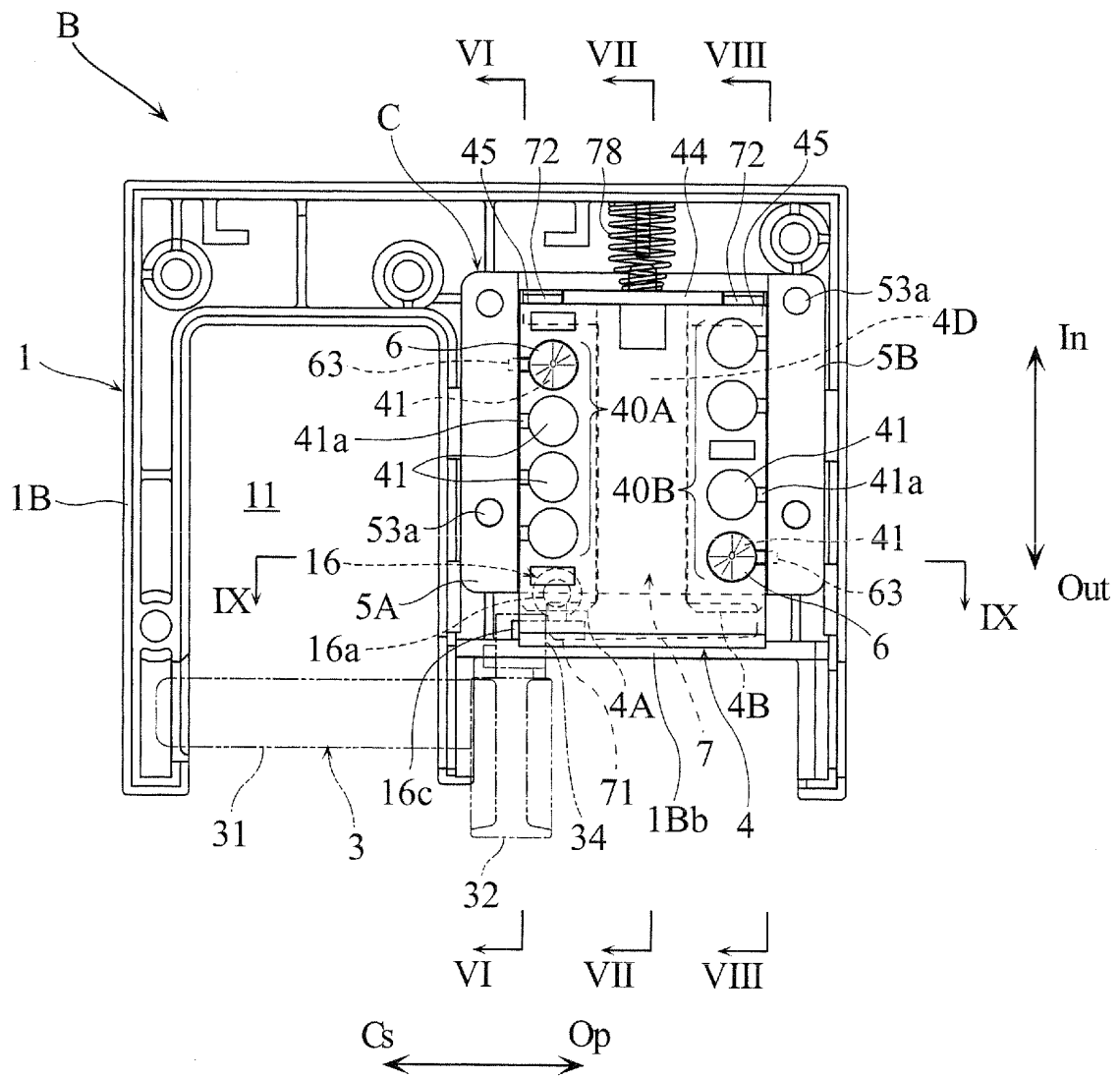


FIG.6

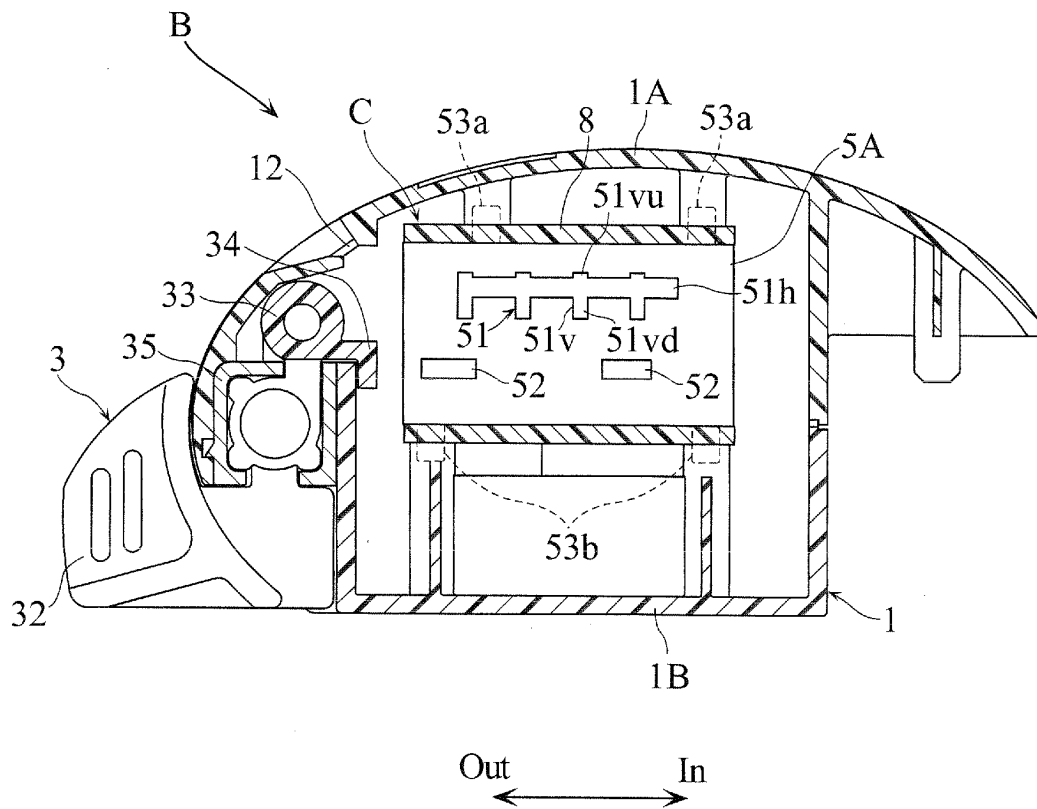


FIG.7

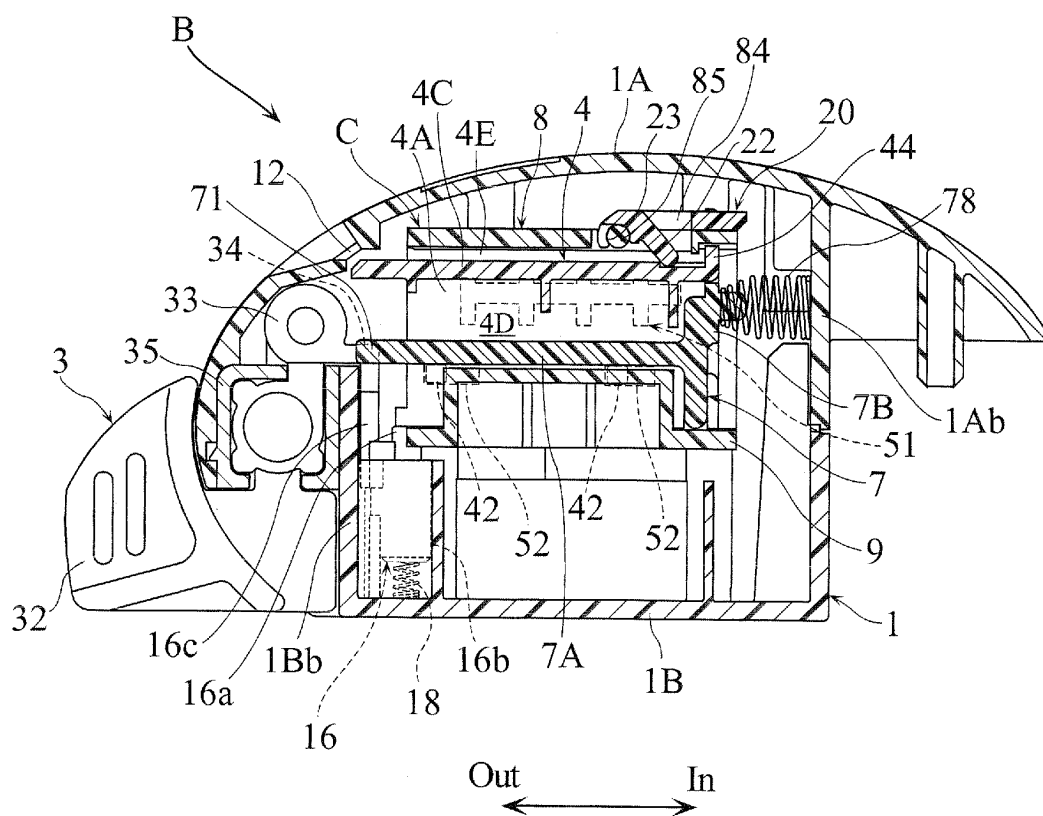


FIG.8

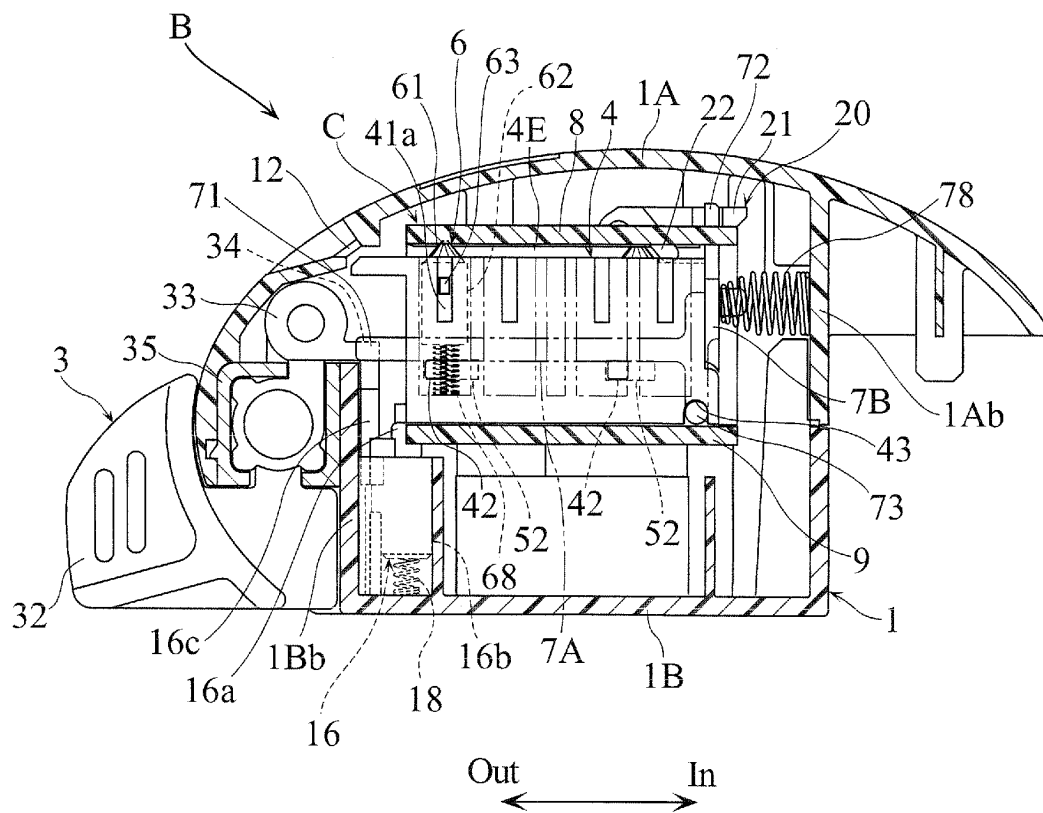


FIG.9

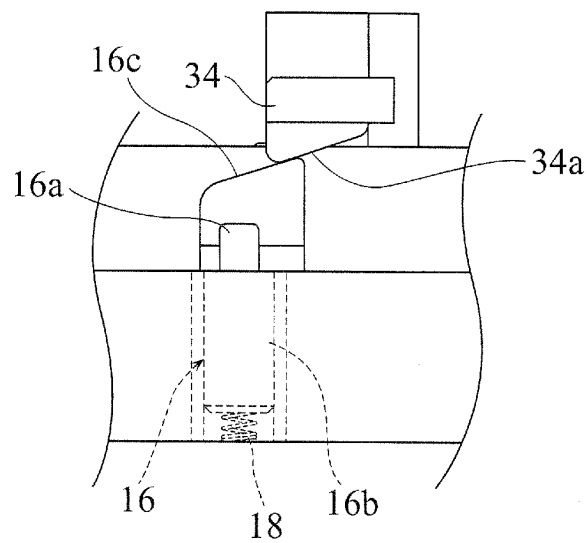


FIG.10

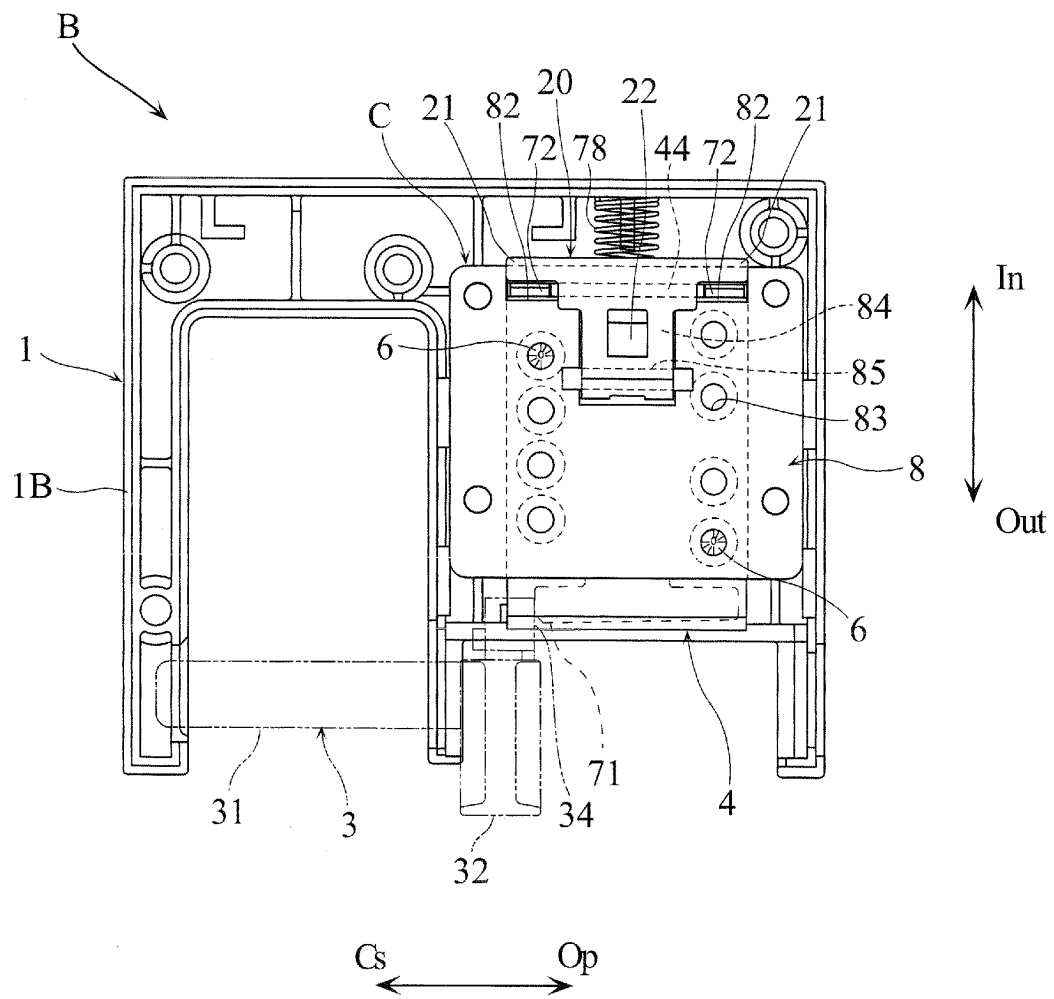


FIG.11

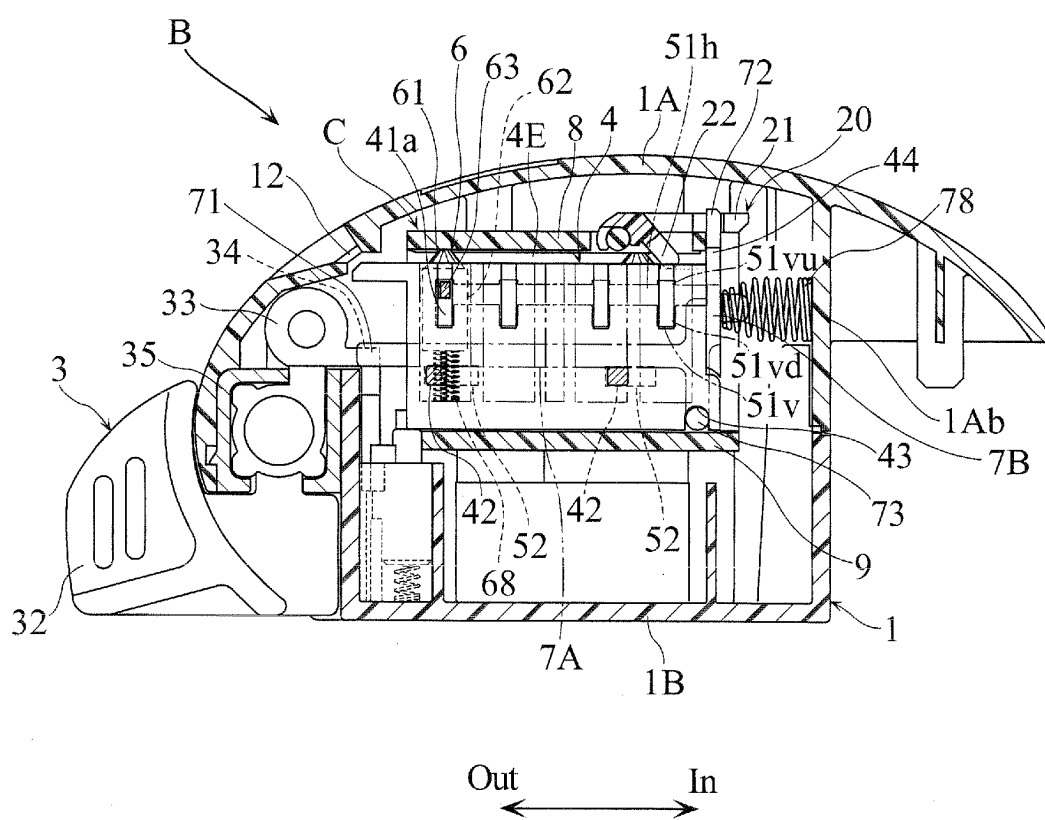


FIG.12

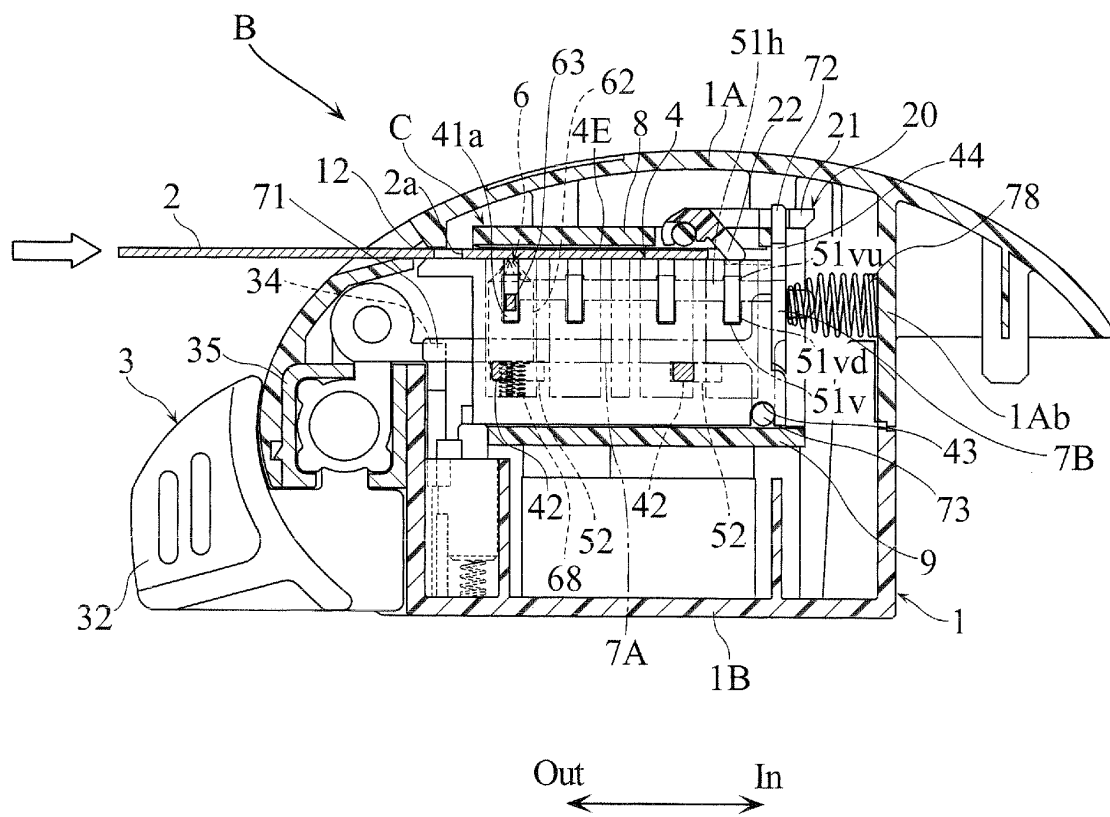


FIG.13

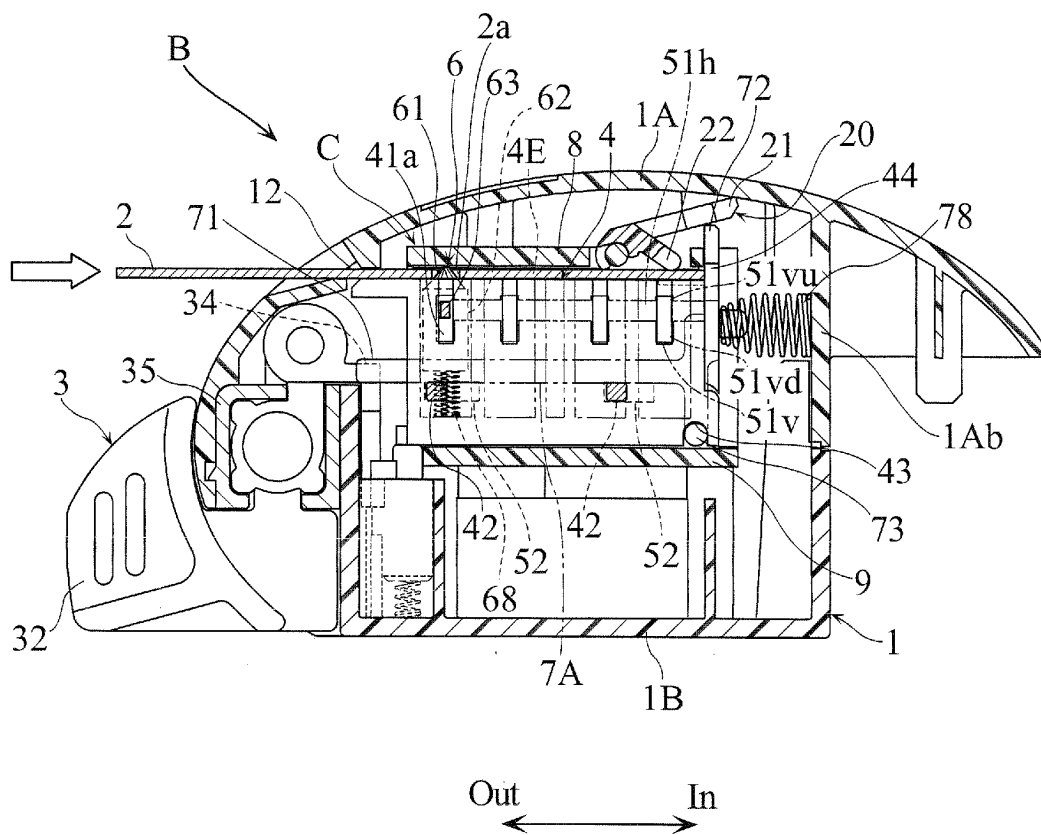


FIG.14

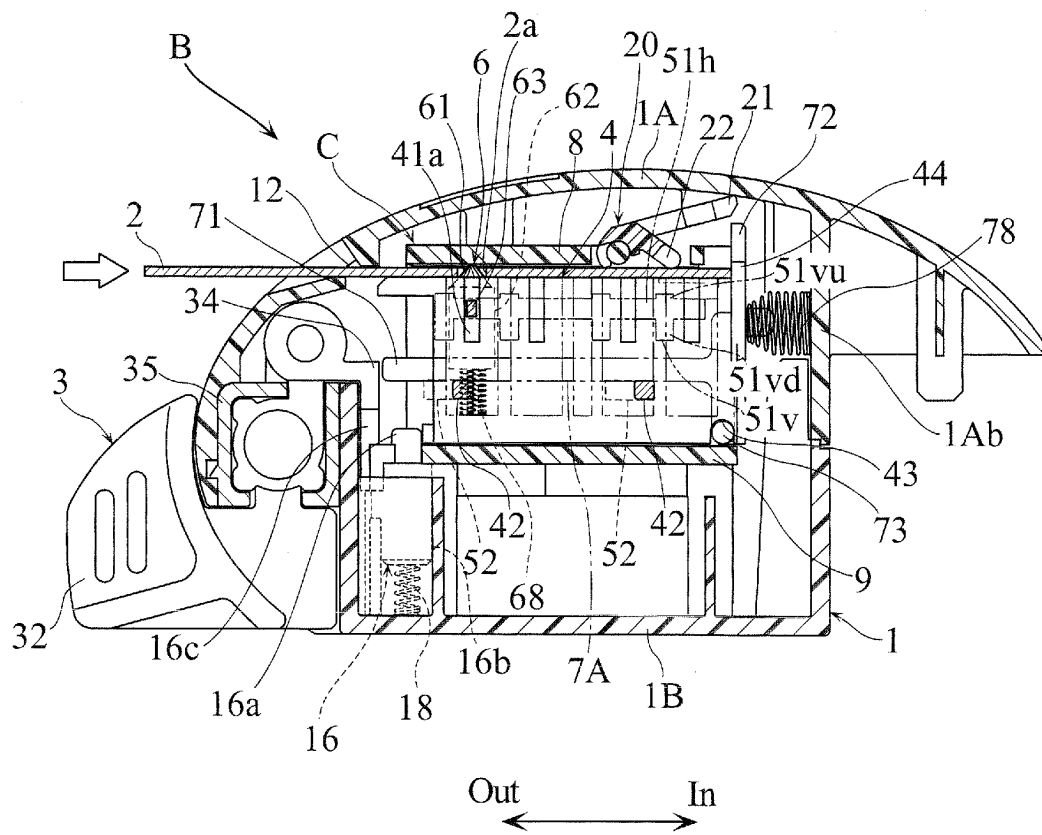


FIG.15

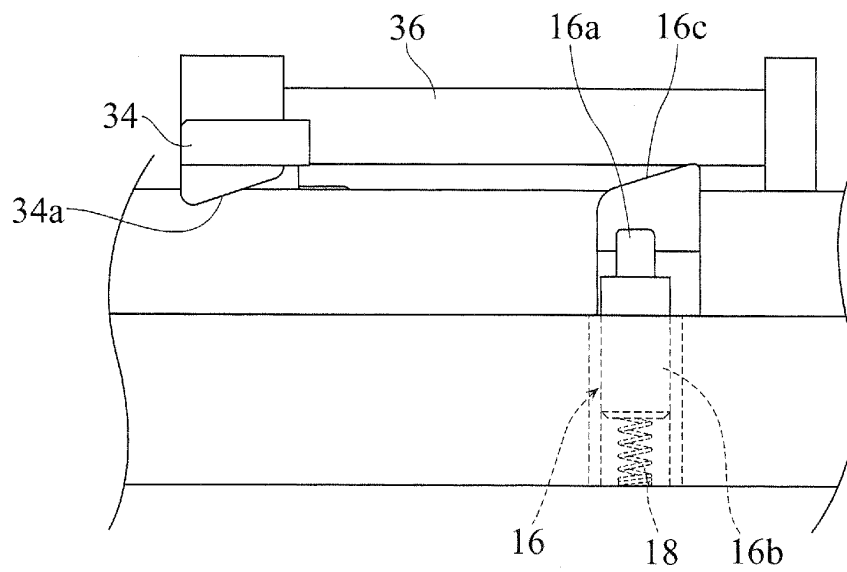


FIG.16

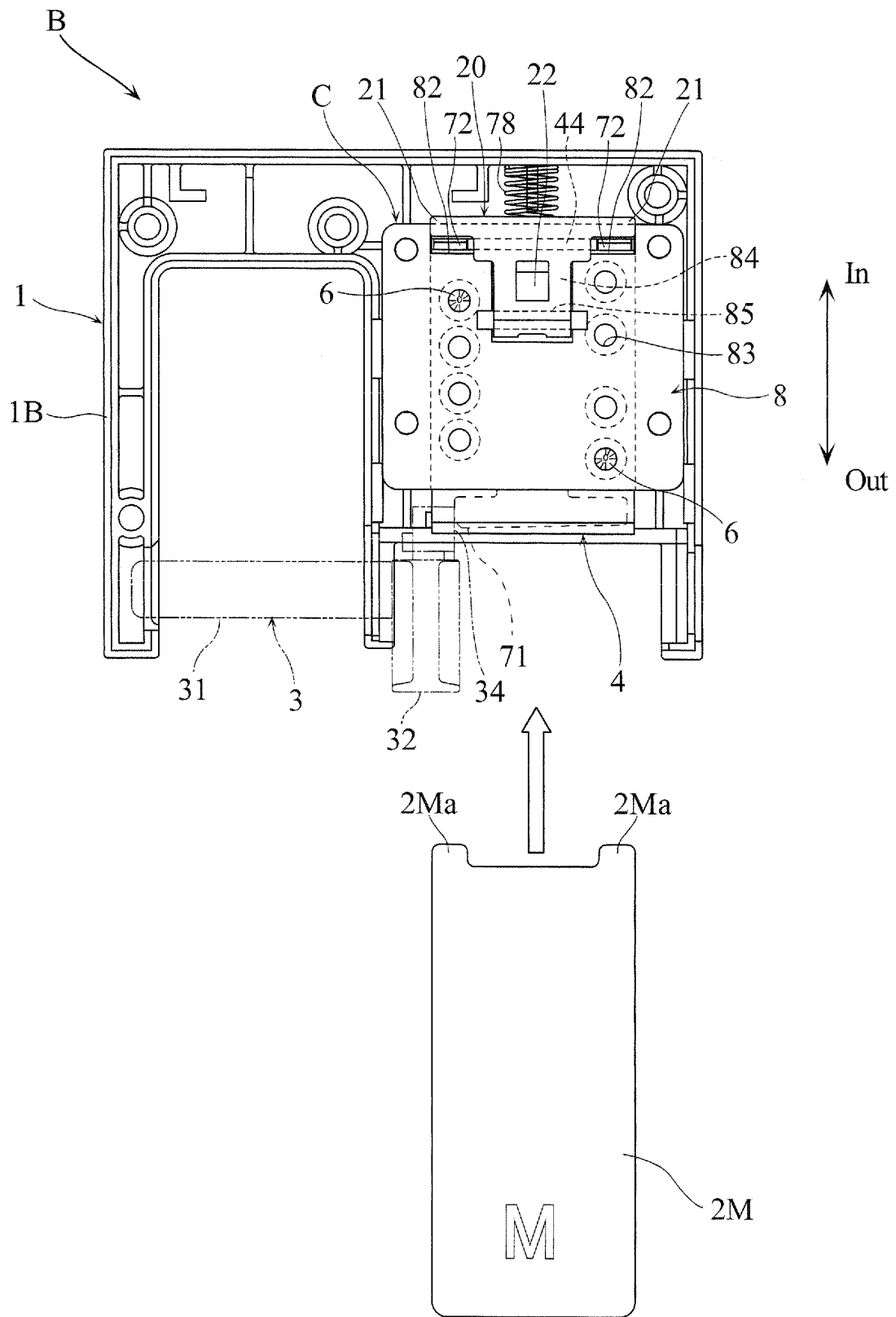


FIG.17

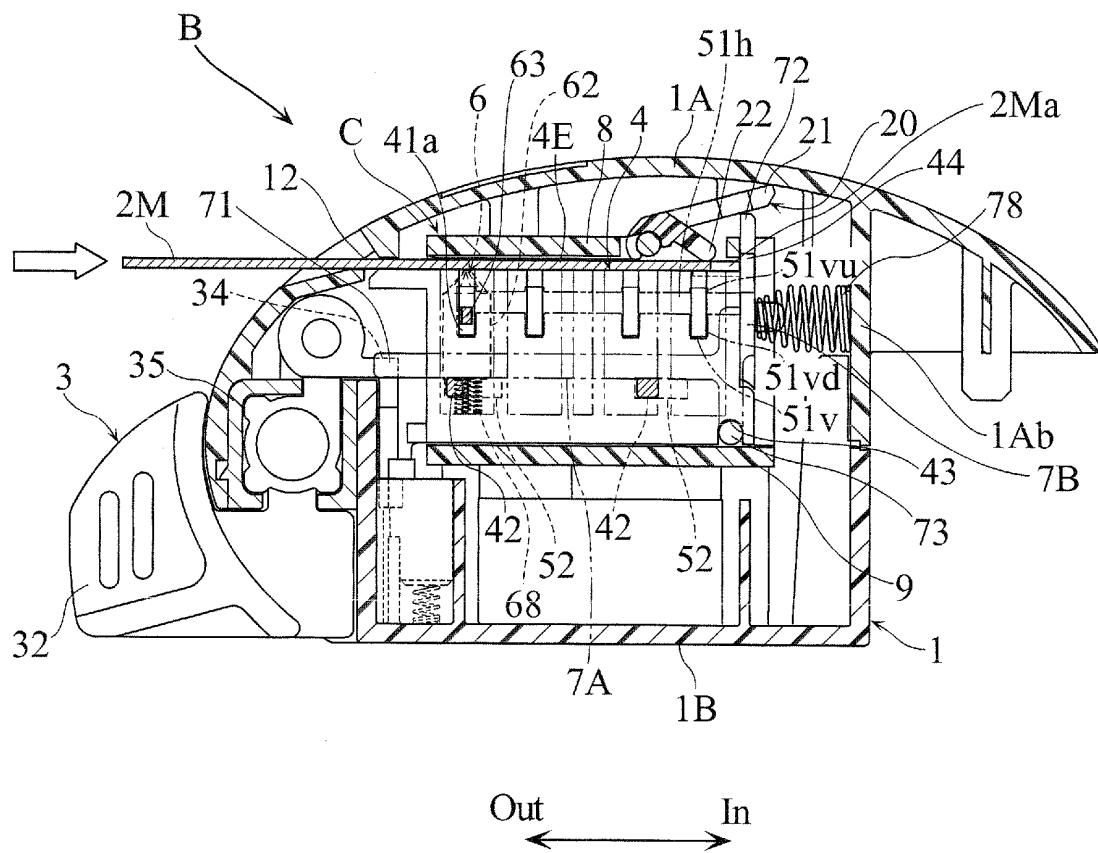


FIG.18

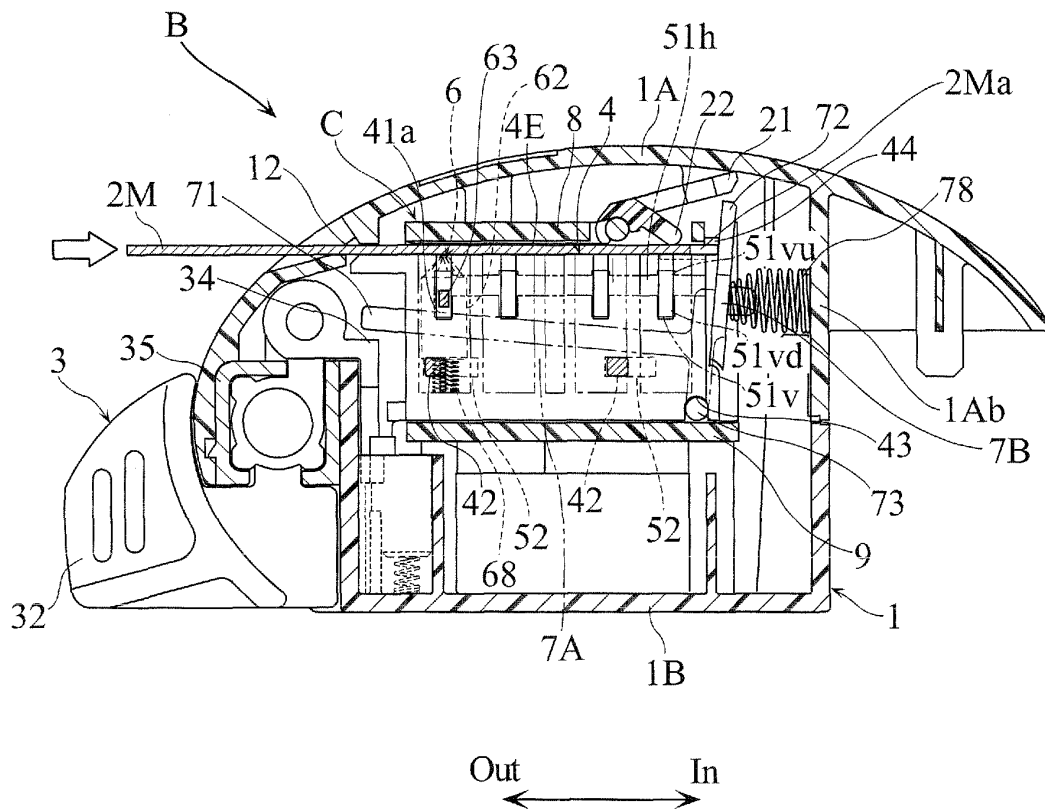


FIG.19

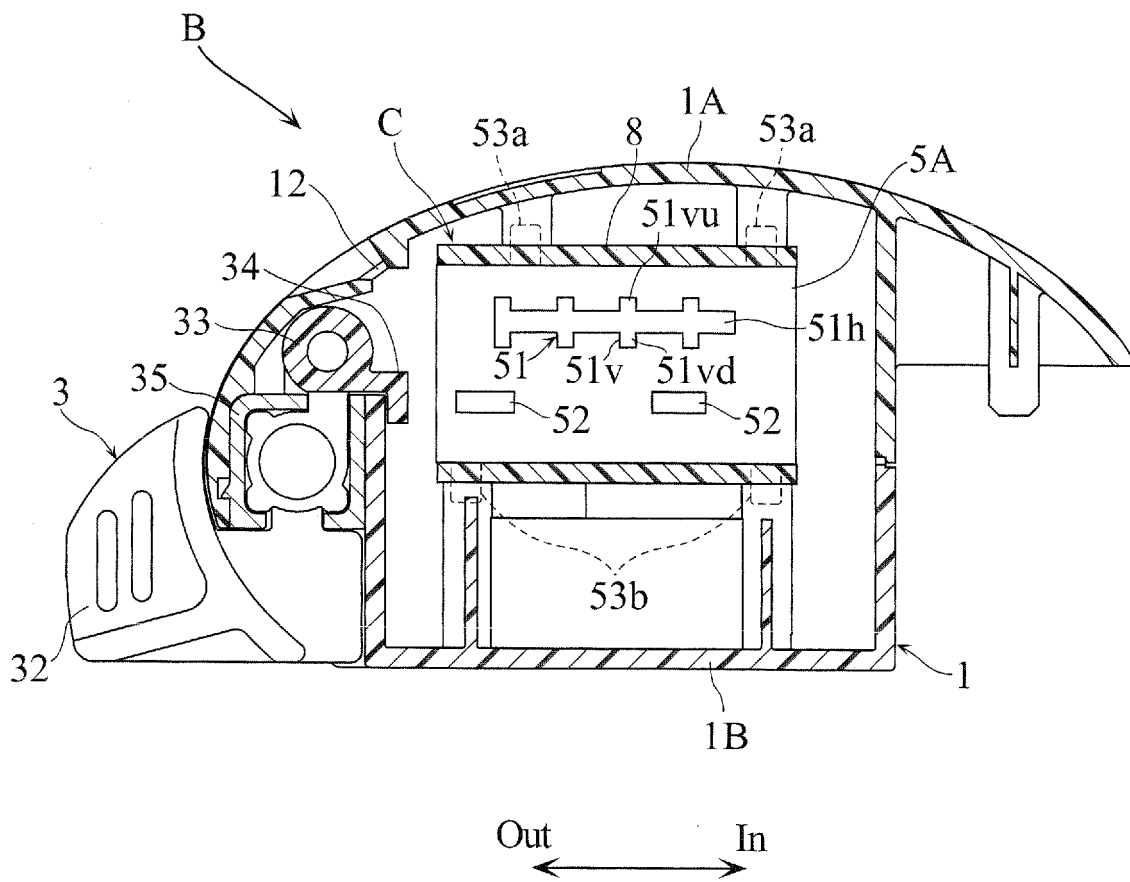


FIG.20

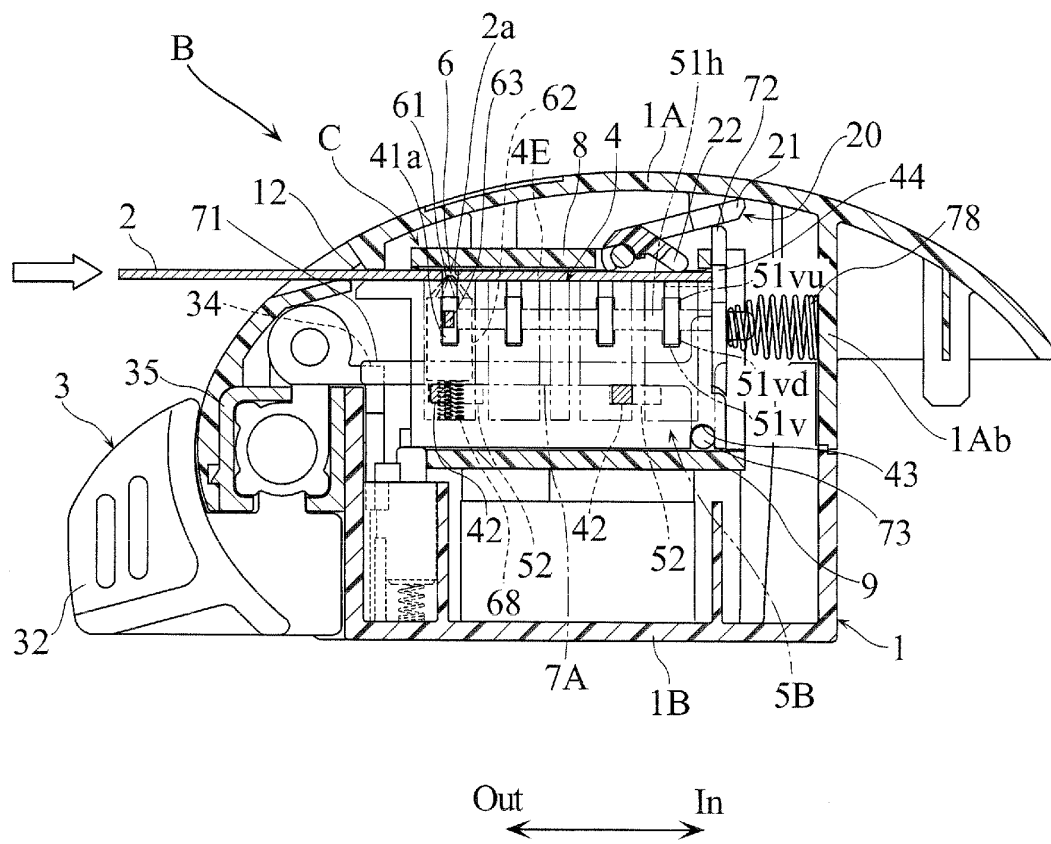


FIG.21
PRIOR ART

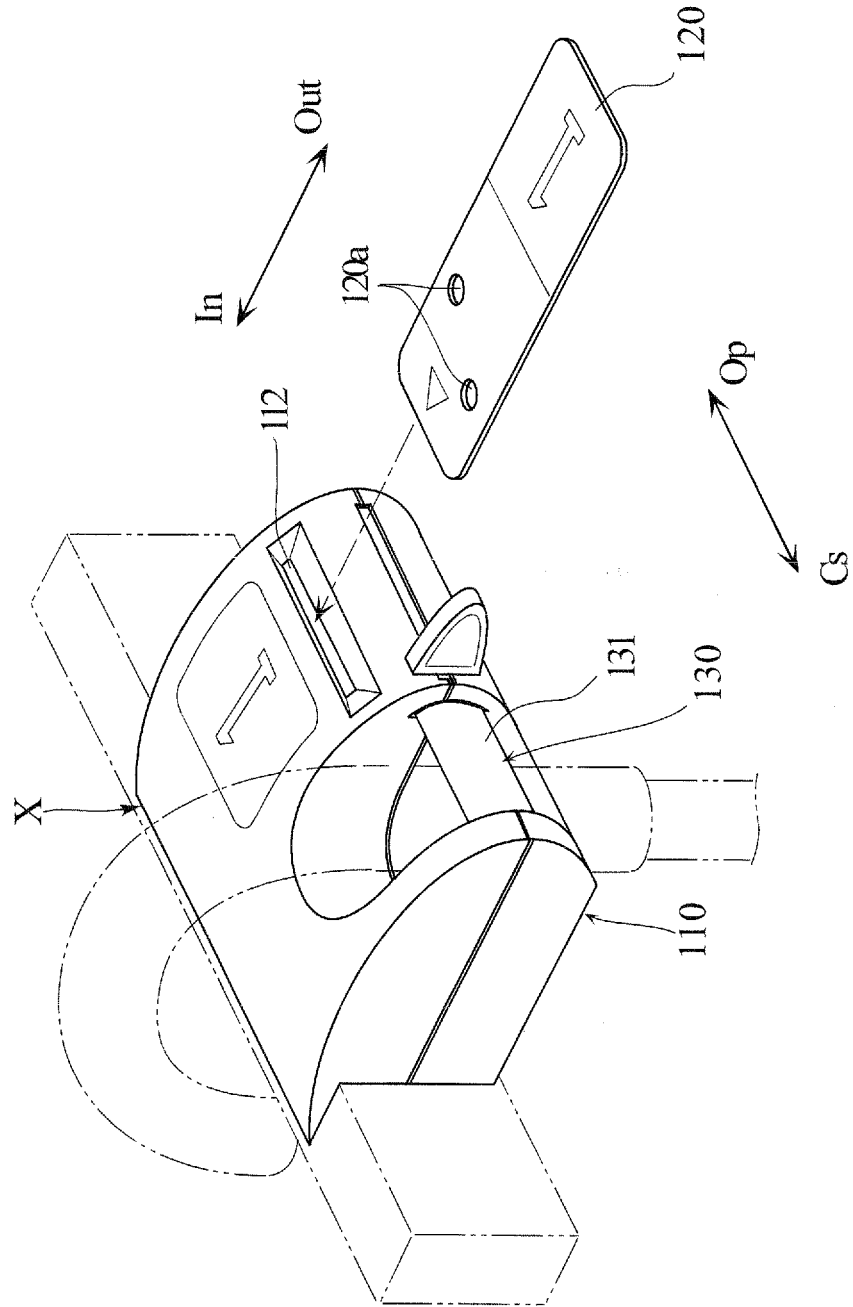


FIG.22
PRIOR ART

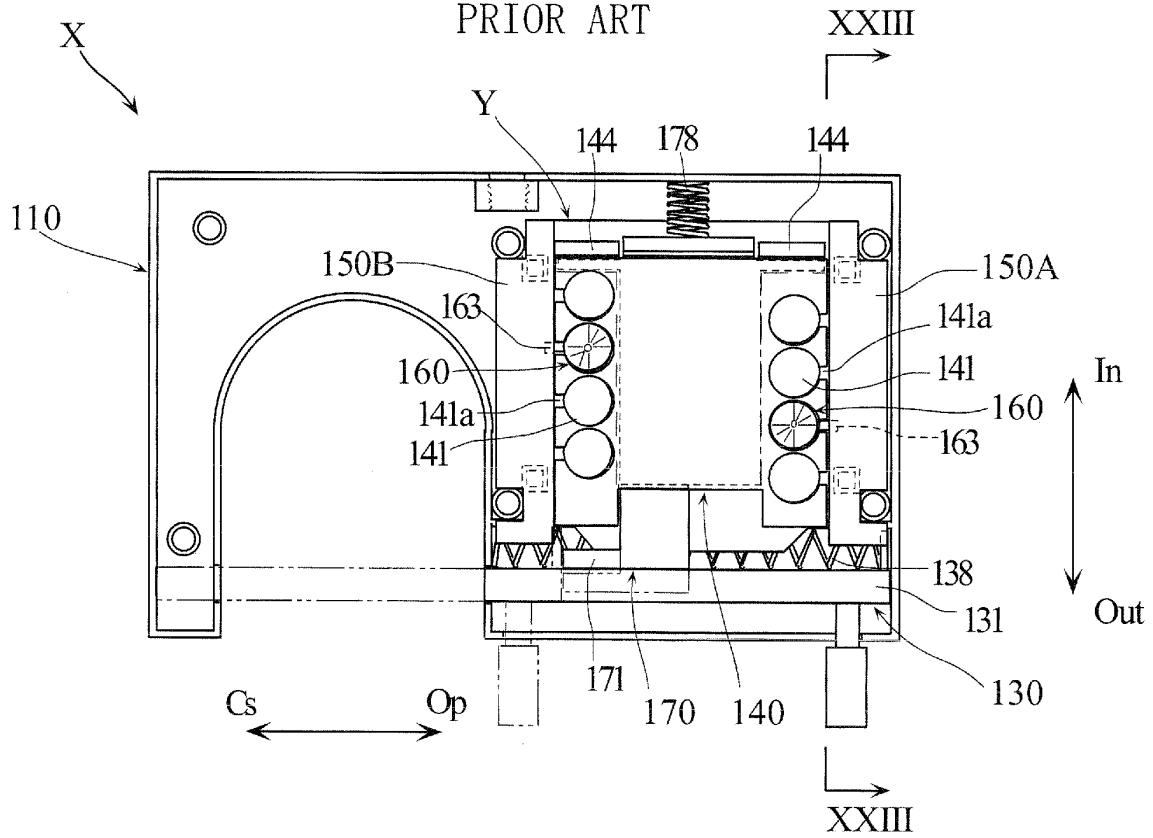


FIG.23
PRIOR ART

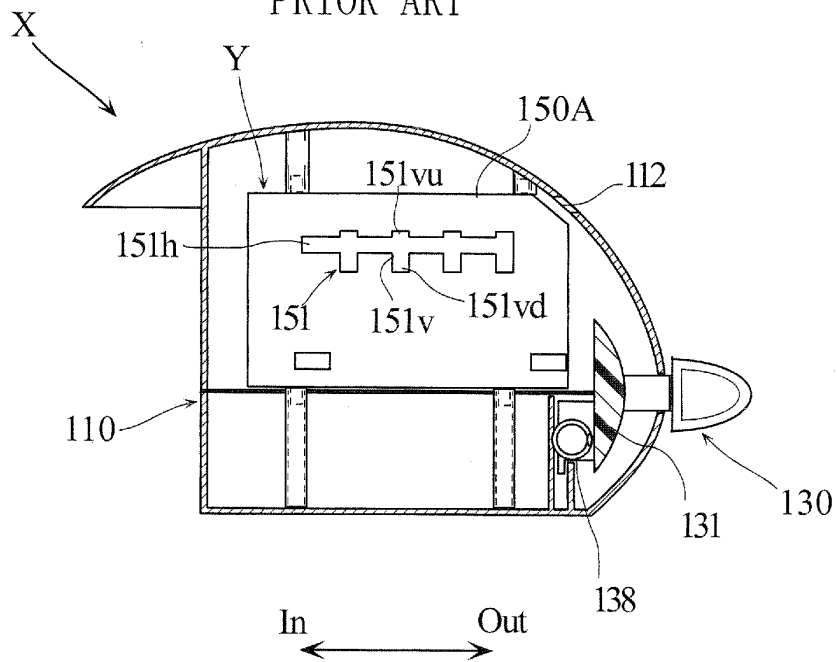


FIG.24
PRIOR ART

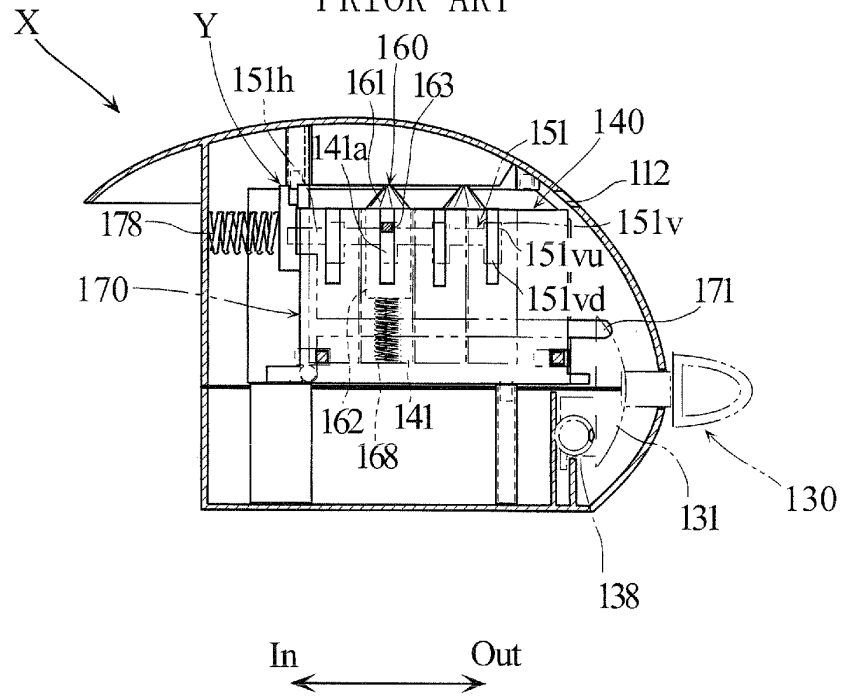


FIG.25
PRIOR ART

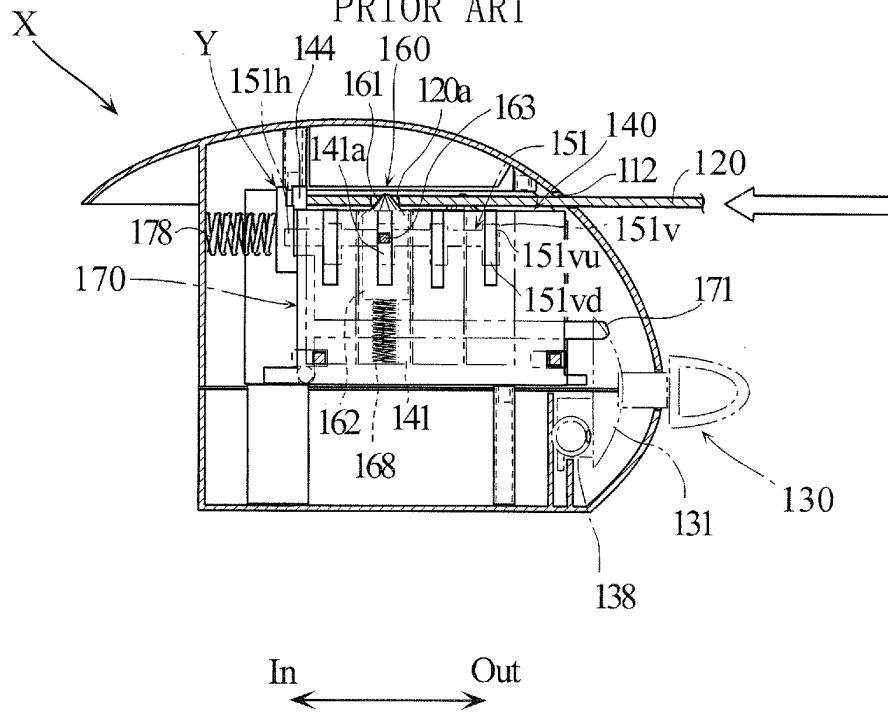


FIG.26
PRIOR ART

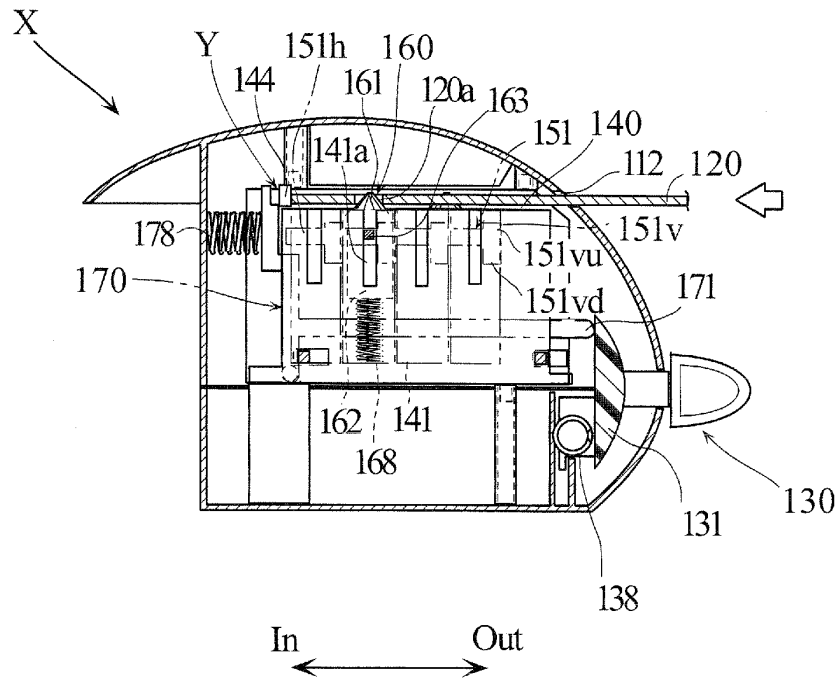


FIG.27
PRIOR ART

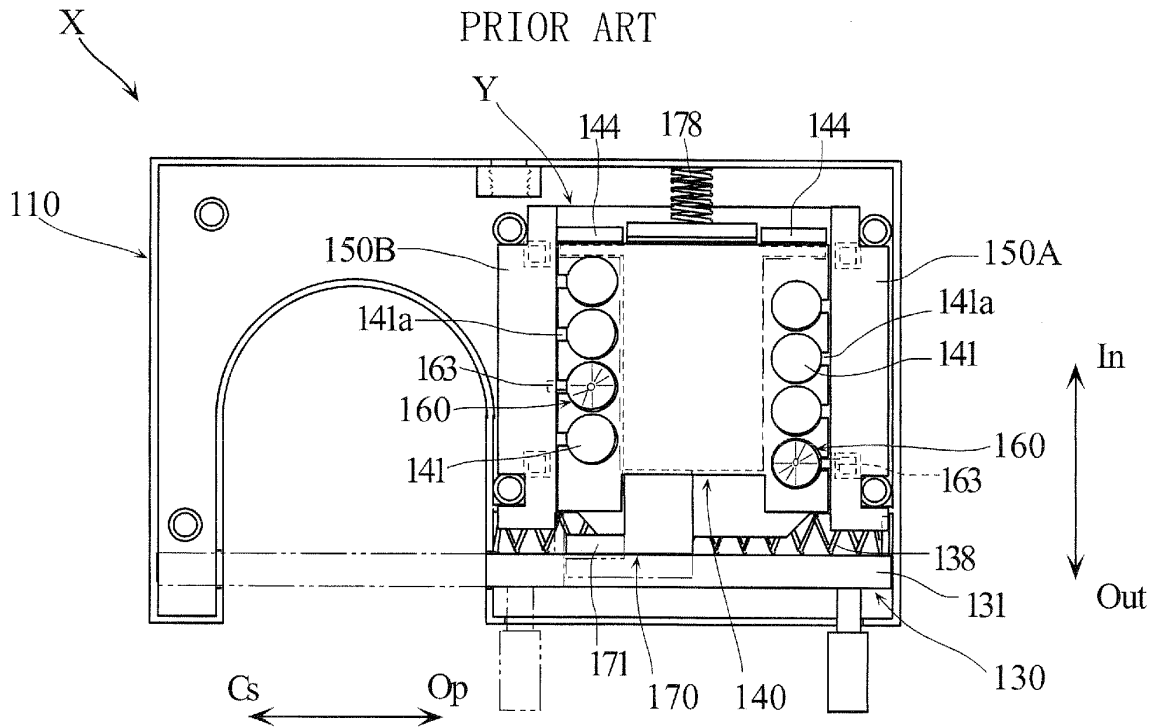
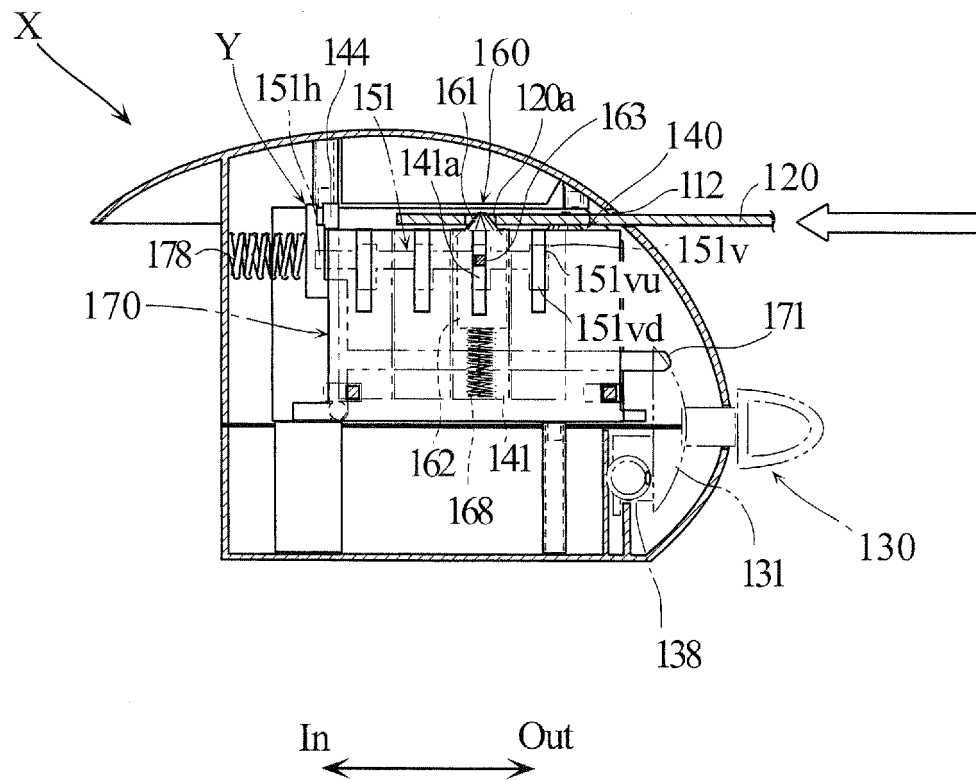


FIG.28
PRIOR ART



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2009/061692

A. CLASSIFICATION OF SUBJECT MATTER

A47G25/12 (2006.01) i, E05B73/02 (2006.01) 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)

A47G25/12, E05B73/02

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

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2009
Kokai Jitsuyo Shinan Koho	1971-2009	Toroku Jitsuyo Shinan Koho	1994-2009

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2006-152737 A (Teramoto Corp. Ltd.), 15 June, 2006 (15.06.06), Full text; all drawings (Family: none)	1-3
A	JP 2007-285002 A (Teramoto Corp. Ltd.), 01 November, 2007 (01.11.07), Full text; all drawings (Family: none)	1-3
A	JP 2009-91745 A (Tokai Rika Co., Ltd.), 30 April, 2009 (30.04.09), Full text; all drawings & US 2009/0090150 A & CN 101403262 A	1-3

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

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Date of the actual completion of the international search
07 September, 2009 (07.09.09)Date of mailing of the international search report
29 September, 2009 (29.09.09)Name and mailing address of the ISA/
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INTERNATIONAL SEARCH REPORT

International application No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2002-89098 A (Kabushiki Kaisha Enu Ke Patsu Kogyo), 27 March, 2002 (27.03.02), Full text; all drawings (Family: none)	1-3
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 73386/1988 (Laid-open No. 177369/1989) (Kabushiki Kaisha Fujiko Kogyo), 19 December, 1989 (19.12.89), Full text; all drawings (Family: none)	1-3

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2006152737 A [0009]