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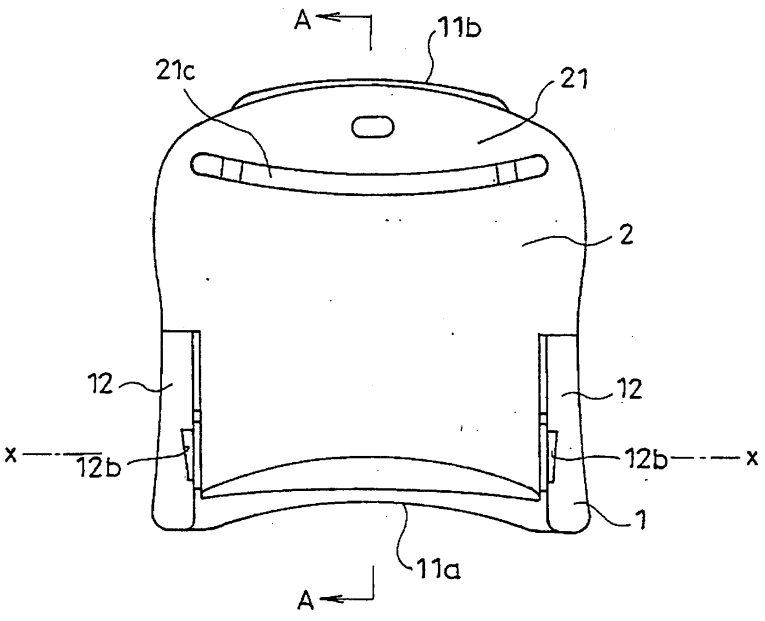
(54) Buckle

(57) A buckle has a base (1) including a mounting portion (10) for an object to couple (J), and a lever (2) swingably assembled to the base (1). The lever (2) includes an assembling portion (20) for assembling the lever to the base (1), an operating portion (21) extending from the assembling portion (20), and a clamping portion (22) extending from the assembling portion (20) in a direction different from the operating portion (21). A main part (11) of the base (1) and the assembling portion (20) of the lever (2) are configured to clamp a band-like member (W) therebetween by swinging and setting the lever (2) in a lying position, the band-like member (W) passing between the main part (11) of the base (1) and the assembling portion (20) of the lever (2) with the lever (2) being set in a raised position. The operating portion (21) of the lever (2) has a slit (21c) formed therein in order to pass the band-like member (W) therethrough.

Fig. 1



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Description

[0001] The present invention relates to an improved buckle, which is adapted to couple a band-like member with an object to couple, such as another band-like member, in such a state that the clamping position is adjustable.

[0002] JP-U-63-140207 has disclosed a buckle, which is formed of a main body and a stopper swingably assembled to the main body. The main body includes a pair of side plates and a bottom plate extending between the paired side plates. The stopper is bent at a bearing portion by a certain angle so that one of the two ends serves as an operating portion while the other end serves as an engaging cam portion. The stopper includes shafts disposed on both sides of the bearing portion. The stopper is swingably assembled to the main body by putting the shafts in holes formed in the paired side plates of the main body. The buckle is configured so that a belt can pass from outside into between the bottom plate of the main body and the bearing portion of the stopper with the stopper being raised. When the stopper is laid down from a state wherein the belt has passed as described above, the belt is sandwiched between the bottom of the main body and the engaging cam portion of the stopper, being clamped.

[0003] In order to adjust the clamping position of the belt in the buckle, it is necessary to move the belt in its longitudinal direction to set it at a desired position with the stopper being raised, followed by laying down the stopper. For this reason, it is necessary to perform the adjustment by both hands of a user in the buckle. If a tension is applied to the belt when the stopper is raised, the belt could unexpectedly fall out from between the main body and the stopper.

[0004] It is a main object of the present invention to provide a buckle, which is configured to include such a type of base and a lever swingably assembled to the base so that the base and the lever sandwich and clamp a band-like member passing through between the base and the lever with the lever being raised, and which is capable not only of preventing the band-like member from unexpectedly falling out from between the base and the lever when the lever is raised but also of at least laying down the lever by a single hand.

[0005] In order to attain the above-mentioned object, the present invention provides a buckle, which is defines as described below:

(1) A buckle for coupling a band-like member to an object to couple, comprising:
(2) a base including a mounting portion for the object to couple; and
(3) a lever swingably assembled to the base;
(4) wherein the base includes a main part and a support projecting from the main part to support the lever;
(5) wherein the lever includes an assembling portion for assembling the lever to the base, an operating portion extending from the assembling portion, and a clamping portion extending from the assembling portion in a direction different from the operating portion;
(6) wherein the main part of the base and the assembling portion of the lever are configured to clamp the band-like member therebetween by swinging and setting the lever in a lying position, the band-like member passing between the main part of the base and the assembling portion of the lever with the lever being set in a raised position; and
(7) wherein the operating portion of the lever has a slit formed therein so as to extend in a direction of a swing axis of the lever in order to pass the band-like member therethrough.

[0006] The band-like member, which has passed between the lever and the base with the lever set in such a raised position, is taken out from an inner side of the operating portion to an outer side of the operating portion through the slit formed in the operating portion. When the lever is set in a lying position from such a state with the band-like member taken out as described above, the band-like member can be clamped between the clamping portion and the main part of the base, completing the clamping of the band-like member.
Although the band-like member is released from the clamped position when the lever is set in a raised position, the band-like member may extend outside from the outer side of the operating portion through the slit even at that time. At that time, if a force is applied to the band-like member or to the buckle in a direction to cause the band-like member to fall out of the slit, or to both the band-like member and the buckle in such a direction, the band-like member W is brought into contact with a projecting end of the clamping portion, an edge of the slit close to the inner side of the operating portion, and an edge of the slit close to the outer side of the operating portion. As a result, if such a force is applied to, e.g. the band-like member when the lever is raised, the lever is urged toward the lying position, being swung by at least a certain angle in a direction to lie down. When the lever is swung as described above, the band-like member is clamped between the projecting end of the clamping portion and the main part of the base. Thus, the band-like member is prohibited from falling out from between the lever and the base, with the result that it is possible to prevent the band-like member and the buckle from being disassembled unexpectedly. By catching a portion of the band-like member, which extends out of the slit, and taking the extending portion toward the main part of the base, the band-like member can be clamped by a simple operation since the lever can be swung to the lying position by a single hand.

[0007] The slit may be formed in an arc shape in a longitudinal direction thereof. In this mode, an edge of the slit on one of the inner side and the outer side of the

operating portion can be brought into forceful contact with a central portion of the band-like member, which is strained by the above-mentioned force. Further, the edge of the slit on the other side can be brought into forceful contact with both side edges of the strained band-like member.

[0008] A portion of the operating portion of the lever with the slit formed therein may be formed so as to have both curved surfaces, each of which has a center of curvature coincident with the center of the slit. In this mode, an edge of the slit on one of the inner side and the outer side of the operating portion can be brought into forceful contact with a central portion of the band-like member, which is strained by the above-mentioned force. Further, the edge of the slit on the other side can be brought into forceful contact with both side edges of the strained band-like member.

[0009] The operating portion of the lever may have two slits formed therein so as to extend along a swing axis of the lever and to be spaced from each other in a projecting direction of the operating portion in order to pass the band-like member therethrough. In this mode, the band-like member, which has passed between the lever and the base, can be taken out from the inner side of the operating portion of the lever to the outer side of the operating portion through one of the two slits, followed by being taken out to the inner side of the operating portion through the other slit. In this mode as well, the lever, which has been raised when the above-mentioned force is applied, can be swung in a direction to lie down, preventing the band-like member from falling out from between the lever and the base.

[0010] The lever may have a swing center set at a position, which is located above the clamping portion and is closer to a side of the operating portion remote from a projecting side of the operating portion than a position just above the clamping portion when the lever is set in the lying position. In this mode, the main part of the base and the assembling portion of the lever can ensure as large a gap as possible therebetween in order to pass the band-like member through the gap when the lever is set in a raised position, while the main part of the base and the assembling portion of the lever can make the gap narrower therebetween to firmly clamp the band-like member in the gap when the lever is set in a lying position.

[0011] In accordance with the buckle of the present invention, when the lever is raised, a band-like member, which has passed between the base and the lever, can be brought into contact with the clamping portion of the lever and the edges of the slit at different positions because of passing through the slit of the operating portion of the lever as well. If a tension is applied to the band-like member so as to urge the band-like member to be raised, the band-like member is swung in a direction to lie down, preventing the band-like member from falling out from between the base and the lever unexpectedly. Further, by catching and holding a portion of the band-like member extending from the slit, it is possible to at least set the lever in the lying position by a single hand.

[0012] In the drawings:

Fig. 1 is a plan view of the buckle according to an embodiment of the present invention;
Fig. 2 is a bottom view of the buckle;
Fig. 3 is a right side view of the buckle;
Fig. 4 is a cross-sectional view taken along line A-A of Fig. 1;
Fig. 5 is a front view of the buckle;
Fig. 6 is a rear view of the buckle;
Fig. 7 is a plan view of the buckle when the lever according to the embodiment is raised;
Fig. 8 is a bottom view of the buckle when the lever according to the embodiment is raised;
Fig. 9 is a front view of the buckle when the lever according to the embodiment is raised;
Fig. 10 is a rear view of the buckle when the lever according to the embodiment is raised;
Fig. 11 is a right side view of the buckle when the lever according to the embodiment is raised;
Fig. 12 is a cross-sectional view taken along line B-B of Fig. 7;
Fig. 13 is a cross-sectional view of the buckle, explaining how to use the buckle;
Fig. 14 is another cross-sectional view of the buckle, explaining how to use the buckle;
Fig. 15 is a disassembled side view of the buckle according to another embodiment, where essential parts of the buckle are shown in section; and
Fig. 16 is a schematic view of the buckle shown in Fig. 15, explaining the function of the buckle.

[0013] Now, embodiments of the present invention will be described based on Fig. 1 to Fig. 16.

[0014] Fig. 1 to Fig. 6 show a buckle having a lever 2 set in a lying position, and Fig. 7 to Fig. 12 show the buckle having the lever 2 set in a raised position. The left side views of the buckle are shown so as to be symmetrical to Fig. 3 and Fig. 11 showing right side views of the buckle. Fig. 13 shows a state wherein band-like members W and W' are clamped by the buckle. Fig. 14 shows a state wherein the lever 2 has been raised from the position shown in Fig. 13.

[0015] Fig. 15 shows the base 1 and the lever 2 according to a modified embodiment in a disassembled way, wherein the structure of the buckle shown in Fig. 1 to Fig. 14 is partly modified. Fig. 16 shows the buckle shown in the modified embodiment in such a way that essential parts of the buckle are shown in a simplified manner as a side view in order to readily understand the functions of the buckle. (It should be noted that the profile of the lever 2 in a raised position is shown by imaginary lines.)

[0016] The buckle according to each of the embodiments according to the present invention may be typically used to couple an end portion of a band-like member W with an object to couple J, such as the other end portion

of the band-like member W, a different band-like member W' or a product itself, through the buckle in such a state that the clamping position is adjustable.

[0017] The buckle according to the first embodiment is formed of the base 1 and the lever 2.

[0018] The base 1 has a mounting portion 10 formed therein for the object to couple J. For example, when the base 1 is mounted to one of two band-like members W' by making use of the mounting portion 10 of the base 1, the two band-like members W and W' can be coupled together through the buckle. When the base 1 is mounted to an end portion of a band-like member W by making use of the mounting portion 10 of the base 1, both end portions of the band-like member W can be coupled together through the buckle. When the base 1 is mounted to, e.g. the main body of a bag by making use of the mounting portion 10 of the base 1, a band-like member W can be coupled with, e.g. the main body of the bag through the buckle.

[0019] The base 1 is formed of a main part 11 and a support 12 projecting the main part 11 to support the lever 2. In the shown embodiment, the main part 11 is formed of a plate, which has supports 12 formed on opposed sides. One 11a of sides of the main part 11 without the supports 12 is configured to be curved inside the main part 11 as being closer to a substantially middle position in the longitudinal direction of the side 11a. Each of the support 12 is formed as a side plate, which projects in a direction orthogonal to a surface of the main part 11. Each of the supports 12 starts at a corner where the curved side 11a and one of the sides with the supports 12 mounted thereto meet together, and terminates, decreasing the projection length from a middle portion of each of the supports. The main part 11 has a tongue 11b projecting from portions thereof, at which the supports terminate. Each of the supports 12 has a hole 12a formed therein so as to pass therethrough from outside to inside at a position close to each of the corners. The tongue 11b of the main part 11 has a slit 11c formed to extend in a spacing thereof between the paired supports 12 so as to pass therethrough at a position close to a portion of the main part, from which the tongue projects. In the shown embodiment, the base 1 may be mounted to the band-like member W' by passing the band-like member W' through the slit 11c and winding the band-like member W' around the tongue 11b of the base 1. In other words, the slit 11c serves as the mounting portion 10 in the shown embodiment.

[0020] The lever 2 is swingably assembled to the base 1. The lever 2 has an operating portion 21 projecting from an assembling portion 20 thereof with the lever assembled to the base 1, and a clamping portion 22 projecting from the assembling portion 20 in a direction different from the operating portion 21. In the shown embodiment, the operating portion 21 is formed of a plate having a size covering almost the entire surface of the base 1. The clamping portion 22 is formed so as to project from one side of the operating portion 21 throughout the entire side. In the shown embodiment, the clamping portion 22 projects in a direction substantially orthogonal to an inner side of the operating portion 21. The lever 2 has respective projections 20a formed on a pair of surfaces extending in a thickness direction thereof, at portions thereof with the operating portion 21 and the clamping portion 22 meeting each other. The lever 2 is swingably assembled to the base so as to be swingable about the projections 20a by putting one of the projections 20a in the hole 12a of one of the paired supports 12 and 12 and putting the other projection 20a in the hole 12a of the other of the supports 12 and 12. In other words, the meeting portion between the operating portion 21 and the clamping portion 22 serves as the assembling portion 20 in the shown embodiment. In the shown embodiment, each of the supports 12 of the base 1 has a guide groove 12b formed between a projecting end thereof and the hole 12a. On the other hand, each of the projections 20a of the lever 2 has an inclined surface 20b formed on an end facing the projecting direction of the clamping portion 22. The lever 2 and base 1 are assembled by making use of the guide grooves 12b and the inclined surfaces 20b to elastically expand the distance between the paired supports 12 and 12 as well as pressing the lever 2 into between the paired supports 12 and 12 until the projections 20a are fitted into the holes 12a. The distance between a projection 20a of the lever 2 and the projecting end 22a of the clamping portion 22 is determined so as to be slightly shorter than the distance between the surface of the main part 11 and the hole 12a formed in a support 12 of the base 1, just under the hole 12a. In the shown embodiment, the main part 11 of the base 1 has two ribs 11d and 11d formed thereon so as to extend between the paired supports 12 and 12 and to be spaced from each other just at positions under the holes 12a. The clamping portion 22 of the lever 2 is disposed so as to have the projecting end 22a set in between the ribs 11d and 11d when the lever 2 is set in the lying position. The projecting end 22a of the clamping portion 22 and the two ribs 11d and 11d are configured to form a clamping gap S at this time, which is narrower than the thickness of a band-like member to clamp (see Fig. 4). One of the two ribs 11d and 11d, which is closer to the tongue 11b of the base 1, has an inner side formed as an inclined surface 11e, which is inclined so as to gradually increase the rib width from the rib top toward the rib bottom.

[0021] In this embodiment, an outer side 20c of the assembled portion 20 of the lever 2 and an outer side 22b of the clamping portion 22 continuous with the outer side 20c of the assembled portion are curved along the curved side 11a of the base 1. The operating portion 21 of the lever 2 has a wide portion on its distal side and a narrow portion on its side close to the clamping portion. When the lever 2 is set in the lying position, both edges of the wide portion of the lever 2 are brought in contact with the top sides of lowered portions 12c of the clamping portion 12 of the base 1.

[0022] In the buckle according to this embodiment, a

band-like member W is passed between the main part 11 of the base 1 and the clamping portion 20 of the lever 2 in such a state wherein the lever 2 is set in a raised position, i.e. wherein an inner side 21b of the operating portion 21 of the lever 2 is drawn away from the main part 11 of the base 1. The band-like member is clamped between the clamping portion 22 of the lever 2 and the main part 11 of the base by swinging the lever 2 to set the lever in the lying position, i.e. swinging the inner side 21b of the operating portion 21 of the lever 2 to a position to closely confront with the main part 11 of the base 1.

[0023] In the shown embodiment, when the lever 2 is set in a raised position, the outer side 22b of the clamping portion 22 and an inner side of the main part 11 define a gap therebetween, which is wider than the thickness of the band-like member W to clamp. By making use of this wide gap, it is possible to pass the band-like member W between the base 1 and the lever 2 when the lever 2 is set in such a raised position.

[0024] In the buckle according to this embodiment, the operating portion 21 of the lever 2 has a slit 21c formed therein so as to extend in the swing axis x of the lever 2 in order to pass the band-like member W therethrough.

[0025] Specifically, in the shown embodiment, the operating portion 21 of the lever 2 has the single slit 21c formed therein on a distal side thereof, i.e. on a side remote from the clamping portion 22 so as to pass therethrough from outside to inside. The slit 21c is configured to have a width substantially equal to or slightly larger than the thickness of the band-like member W, which passes through the slit.

[0026] The slit 21c is formed in an arc shape in the longitudinal direction thereof.

[0027] Specifically, in the shown embodiment, the slit 21c is formed so as to be curved toward a side of the lever remote from the distal side, i.e. a side of the lever 2 close to the clamping portion 2.

[0028] In this embodiment, a portion of the operating portion 21 of the lever 2 with the slit 21c formed therein is formed so as to have both curved surfaces, each of which has the center of curvature coincident with the center of the slit 21c.

[0029] Specifically, in the shown embodiment, the operating portion 21 of the lever 2 is formed so as to have a curved surface on both the inner side 21b and an outer side 21a thereof on the distal side so that the inner side 21b is gradually closer to the outer side toward the center of the lever 2 while the outer side 21a gradually overhangs outside toward the center of the lever 2 (see Fig. 14).

[0030] The band-like member W, which has passed between the lever 2 and the base 1 with the lever 2 set in such a raised position, is taken out from the inner side 21b of the operating portion 21 to the outer side 21a of the operating portion 21 through the slit 21c formed in the operating portion. When the lever 2 is set in the lying position from the state with the band-like member W taken out as described above, the band-like member W can be clamped between the clamping portion 22 and the main part 11 of the base 1, completing the clamping of the band-like member W. Although the band-like member W is released from the clamped position when the lever 2 is set in a raised position, the band-like member may extend outside from the outer side 21a of the operating portion 21 through the slit 21c even at that time. At that time, if a force is applied to the band-like member W or to the buckle in a direction to cause the band-like member W to fall out of the slit 21c, or to both the band-like member W and the buckle in such a direction, the band-like member W is brought into contact with the projecting end 22a of the clamping portion 22, an edge 21d of the slit 21c close to the inner side 21b of the operating portion 21, and an edge of the slit 21c close to the outer side 21e of the operating portion 21 (see Fig. 14). As a result, if such a force is applied to, e.g. the band-like member W when the lever 2 is raised as shown in Fig. 14, the lever 2 is urged toward the lying position, being swung by at least a certain angle in a direction to lie down. When the lever 2 is swung as described above, the band-like member W is clamped between the projecting end 22a of the clamping portion 22 and the main part 11 of the base 1. Thus, the band-like member W is prohibited from falling out from between the lever 2 and the base 1, with the result that it is possible to prevent the band-like member W and the buckle from being disassembled unexpectedly. By catching a portion Wa of the band-like member W, which extends out of the slit 21c, and taking the extending portion Wa toward the main part 11 of the base 1, the band-like member W can be clamped by a simple operation since the lever 2 can swung to the lying position by a single hand.

[0031] In particular, in this embodiment, the slit 21c is formed in such an arc shape in the longitudinal direction thereof, and the portion of the operating portion 21 of the lever 2 with the slit 21c formed therein is formed so as to have both curved surfaces, each of which has the center of curvature coincident with the center of the slit 21c. By this arrangement, the edge of the slit 21c on one of the inner side 21b and the outer side 21a of the operating portion 21 can be brought into forceful contact with a central portion of the band-like member W, which is strained by the above-mentioned force. Further, the lever 2, which has been raised when the above-mentioned force is applied, can be reliably swung in a direction to lie down since the edge of the slit on the other side can be brought into forceful contact with both side edges of the strained band-like member W.

[0032] In the shown embodiment, an edge of the slit 21c, which is closer to the distal side of the operating portion 21 on the outer side 21a of the operating portion 21 of the lever 2, is brought into contact with the central portion of the band-like member W, which is urged to be linear in the width direction thereof, being strained by the above-mentioned force. Further, an edge of the slit 21c, which is closer to the side remote from the distal side on the inner side 21b of the operating portion 21 of the lever,

is brought into contact with both side edges of the strained band-like member W.

[0033] The buckle may be configured so that the operating portion 21 of the lever 2 has two slits formed therein so as to extend in the swing axis x of the lever 2 and to be spaced from each other in the projecting direction of the operating portion 21 in order to pass a band-like member W therethrough, which is different from the shown embodiment.

[0034] In this case, the band-like member W, which has passed between the lever 2 and the base 1, can be taken out from the inner side 21b of the operating portion 21 of the lever 2 to the outer side of the operating portion 21 through one of the two slits, followed by being taken out to the inner side 21b of the operating portion 21 through the other slit. In this case as well, the lever 2, which has been raised when the above-mentioned force is applied, can be swung in a direction to lie down, preventing the band-like member W from falling out from between the lever 2 and the base 1.

[0035] Fig. 15 shows the modified embodiment wherein the swing center of the lever 2 is set at a position, which is located above the clamping portion 22 and is closer to a side of the operating portion 21 remote from the projecting side of the operating portion than a position just above the clamping portion 22 when the lever 2 is set in the lying position.

[0036] In this modified embodiment, the base 1 has two ribs 11d and 11d disposed thereon just under the holes 12a formed in the supports 12. The base also has a slit 11c' formed to extend in a spacing thereof between the supports 12 at a position adjacent to one of the two ribs 11d and 11d. The base also has two slits 11c" formed therein between the other rib 11d and a side thereof without the supports 12 so as to be spaced from each other in order to serve as the mounting portion 10.

[0037] In this modified embodiment, the clamping portion 22 has a projection 22a formed thereon so as to have an inclined surface, which gradually increases the projection length toward the projecting side of the operating portion. In this modified embodiment, each of the projections 20a of the lever 2, which are formed as short circular members on the lever, has the center located at a position closer to the side of the operating portion remote from the projecting side of the operating portion than a position just above a lower end 22c of the inclined surface.

[0038] When the lever 2 is configured as described just above, the main part of the base 1 and the assembling portion 20 of the lever 20 can ensure as large a gap S as possible therebetween in order to pass a band-like member W through the gap when the lever 2 is set in a raised position, while the main part 11 of the base 1 and the assembling portion 20 of the lever 20 can make the gap narrower therebetween to firmly clamp the band-like member W in the gap when the lever 2 is set in a lying position (see Fig. 16). In other words, it is easy to pass the band-like member W between the main part 11 of the base 1 and the assembling portion 20 of the lever 2 when the lever 2 is set in such a raised position, and it is possible to pass the band-like member W between the main part of the base and the assembling portion of the lever to clamp therein even if the thickness of the band-like member W increases to some extent. When the lever 2 is raised from the lying position to release the band-like member W from the clamped position, it is possible to raise the lever 2 with a comparatively small force since the clamping portion 22 is pressed against the band-like member W at a position closer to the distal end of the lever 2 than a position just under the swing center of the lever 2.

Claims

1. A buckle for coupling a band-like member to an object to couple, comprising:

   a base including a mounting portion for the object to couple; and
   a lever swingably assembled to the base;

   wherein the base includes a main part and a support projecting from the main part to support the lever;
   wherein the lever includes an assembling portion for assembling the lever to the base, an operating portion extending from the assembling portion, and a clamping portion extending from the assembling portion in a direction different from the operating portion;
   wherein the main part of the base and the assembling portion of the lever are configured to clamp the band-like member therebetween by swinging and setting the lever in a lying position, the band-like member passing between the main part of the base and the assembling portion of the lever with the lever being set in a raised position; and
   wherein the operating portion of the lever has a slit formed therein so as to extend in a direction of a swing axis of the lever in order to pass the band-like member therethrough.

2. The buckle according to Claim 1, wherein the slit is formed in an arc shape in a longitudinal direction thereof.

3. The buckle according to Claim 1, wherein a portion of the operating portion of the lever with the slit formed therein is formed so as to have both curved surfaces, each of which has a center of curvature coincident with the center of the slit.

4. The buckle according to Claim 1, wherein the slit is formed in an arc shape in a longitudinal direction thereof; and
   wherein a portion of the operating portion of the lever with the slit formed therein is formed so as to have both curved surfaces, each of which has a center of

curvature coincident with the center of the slit.

5. The buckle according to any one of Claims 1 to 4, wherein the operating portion of the lever has two slits formed therein so as to extend along a swing axis of the lever and to be spaced from each other in a projecting direction of the operating portion in order to pass the band-like member therethrough.

6. The buckle according to any one of Claims 1 to 5, wherein the lever has a swing center set at a position, which is located above the clamping portion and is closer to a side of the operating portion remote from a projecting side of the operating portion than a position just above the clamping portion when the lever is set in the lying position.

Fig. 1

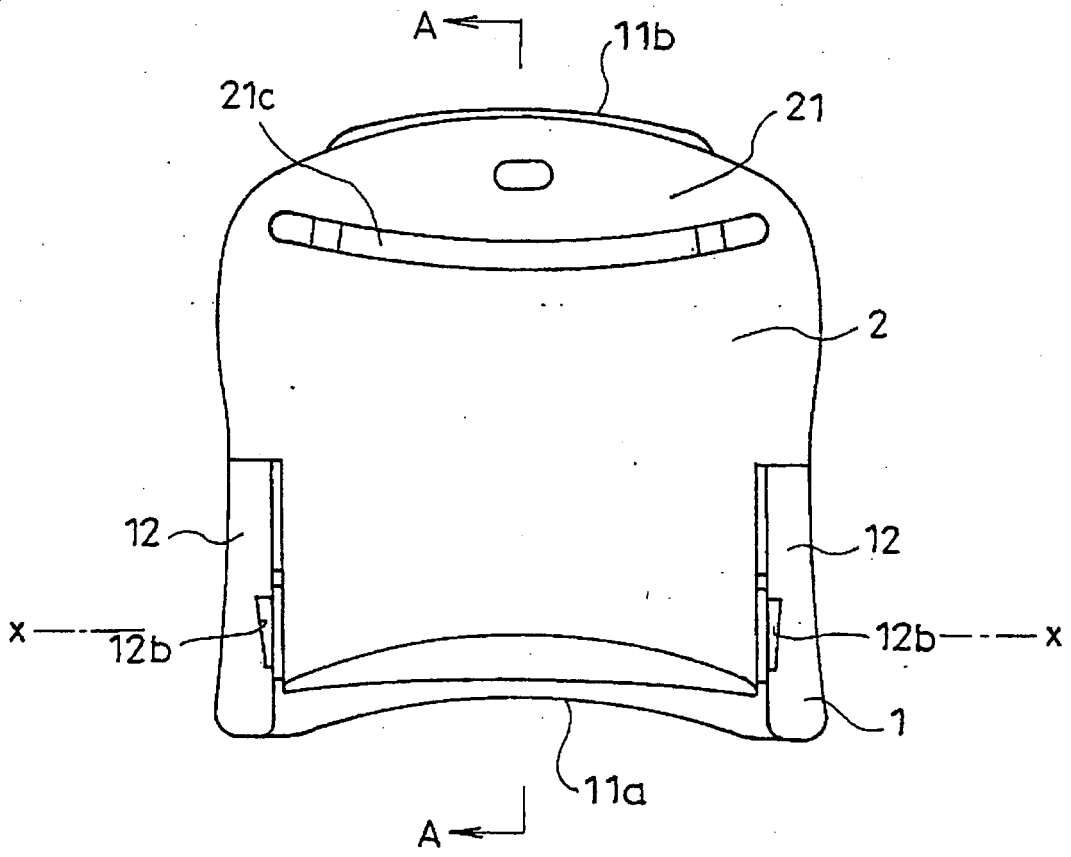


Fig. 2

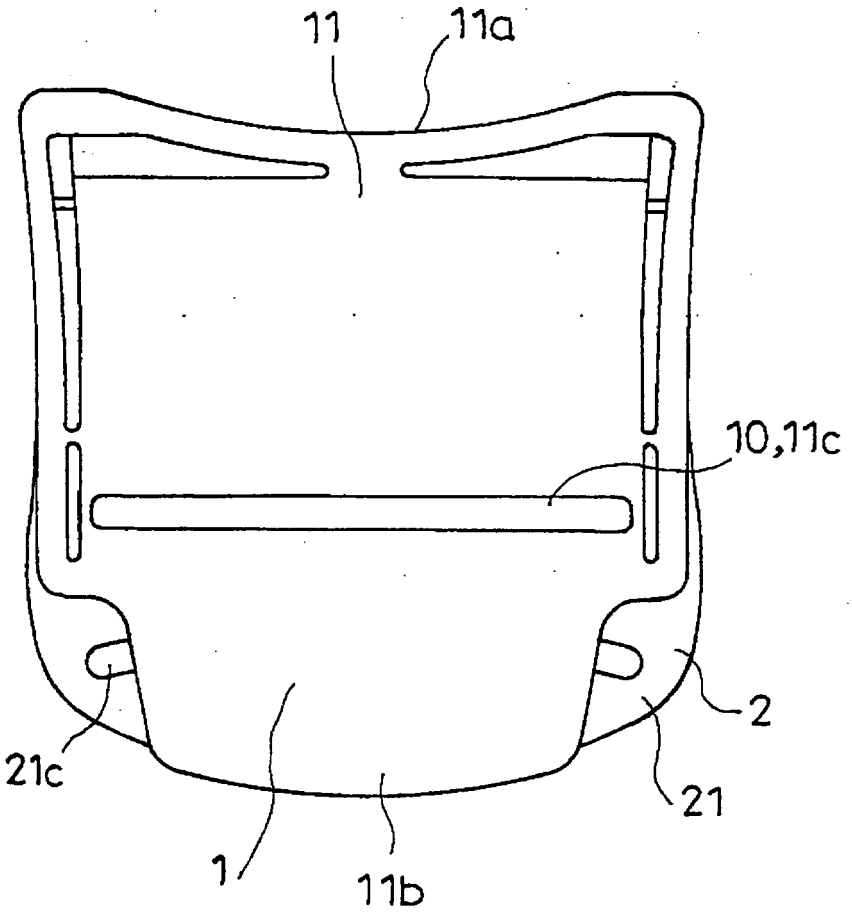


Fig.3

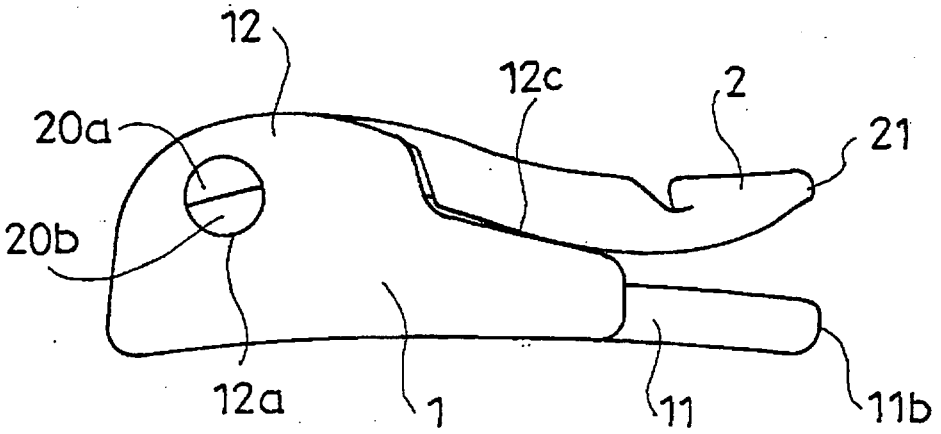

12
12c
2
20a
21
20b
12a
1
11
11b

Fig.4

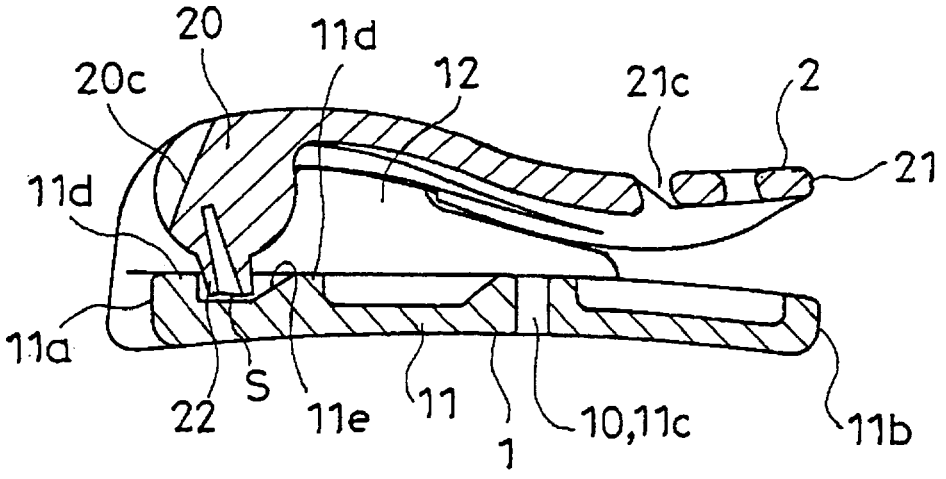

20
11d
20c
12
21c
2
21
11d
11a
22
S
11e
11
1
10,11c
11b

Fig.5

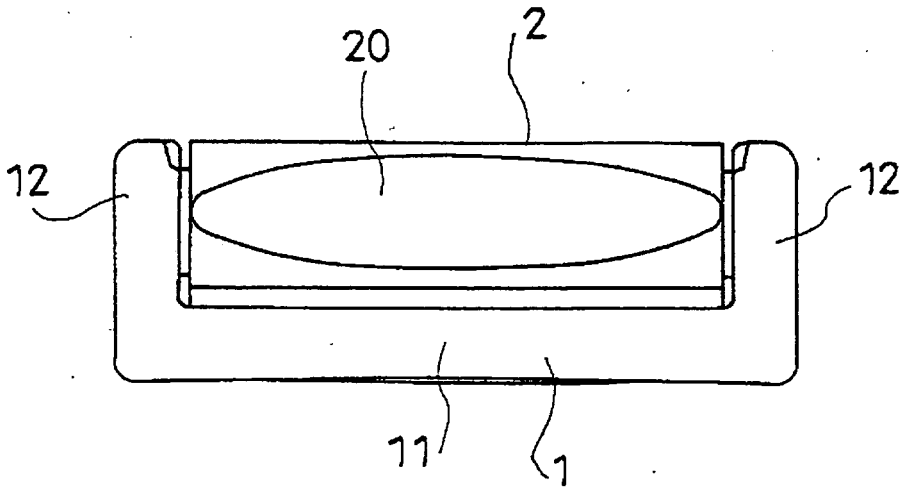


Fig.6

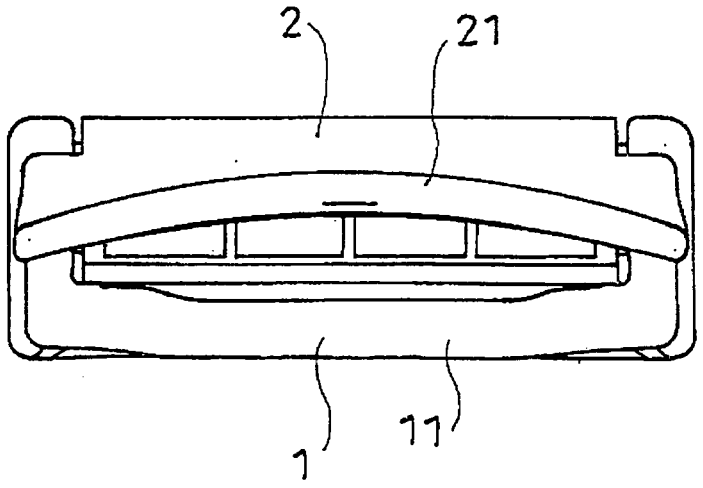


Fig. 7

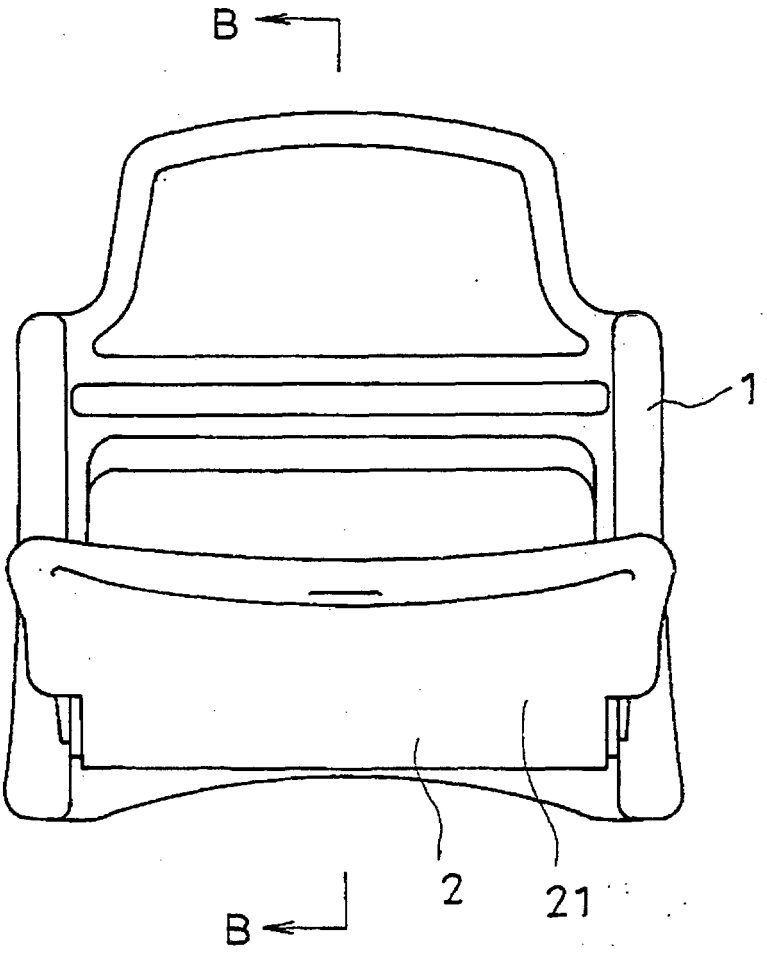


Fig. 8

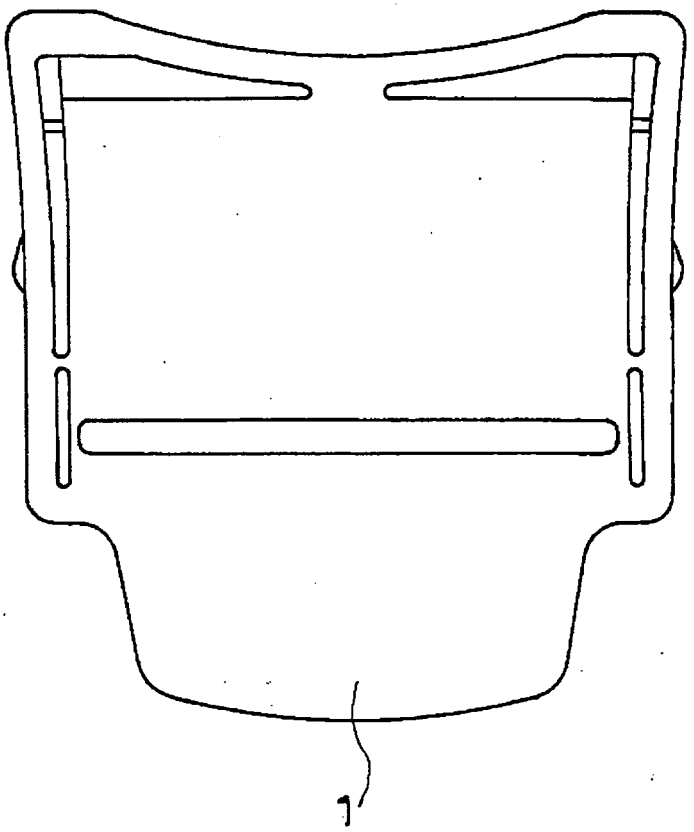


Fig.9

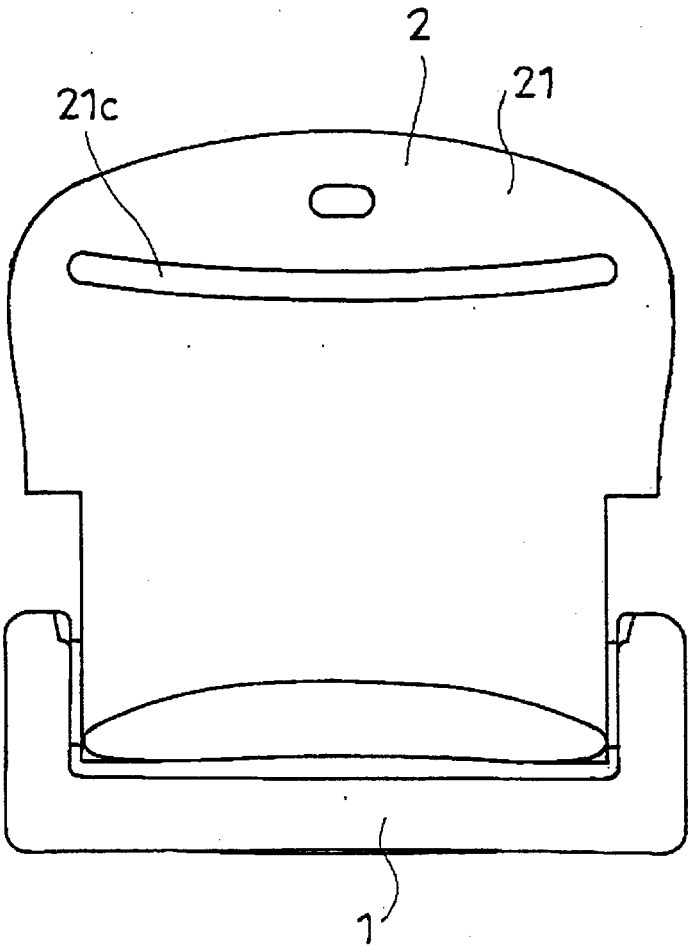


Fig.10

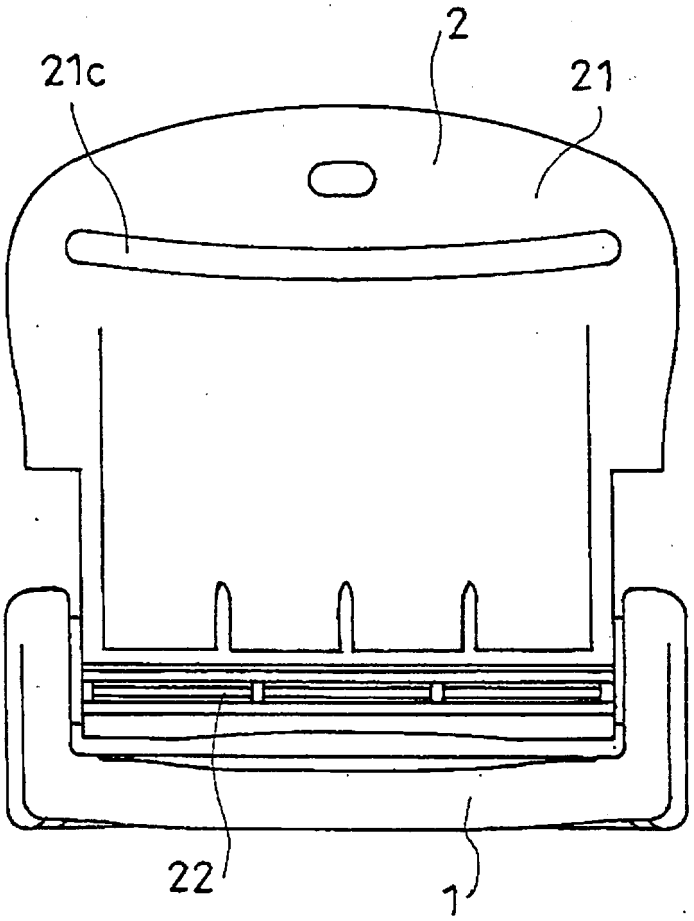


Fig.11

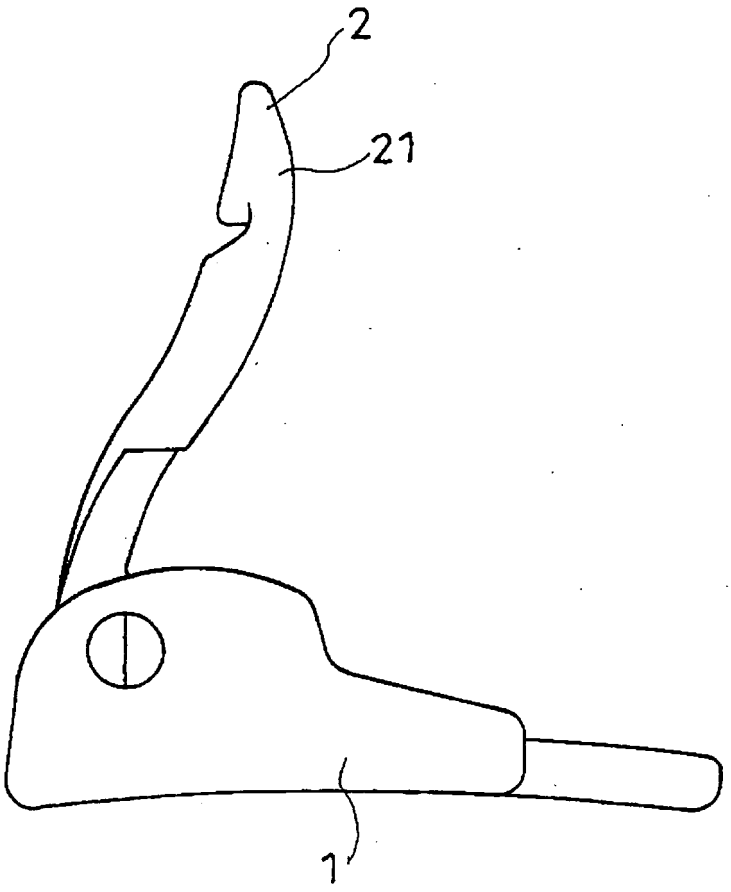


Fig.12

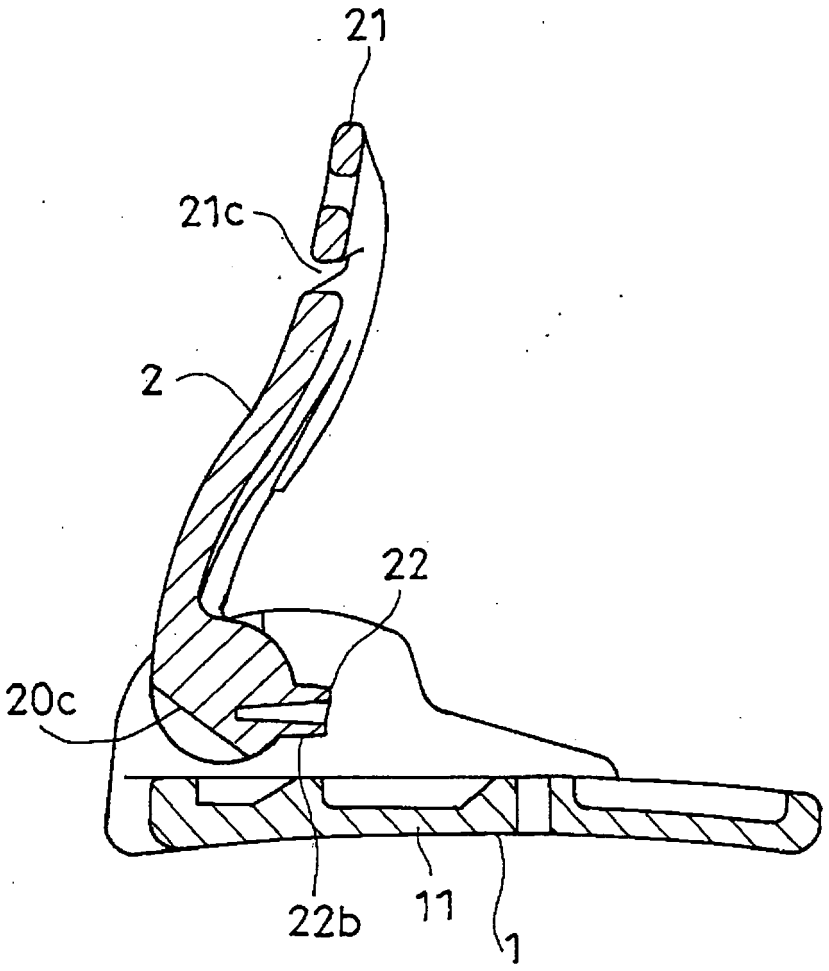


Fig.13

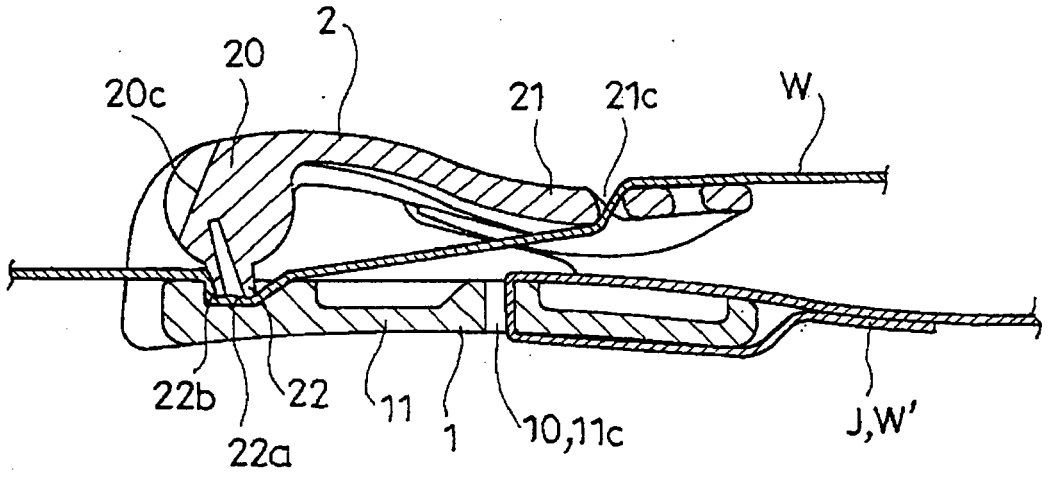


Fig.14

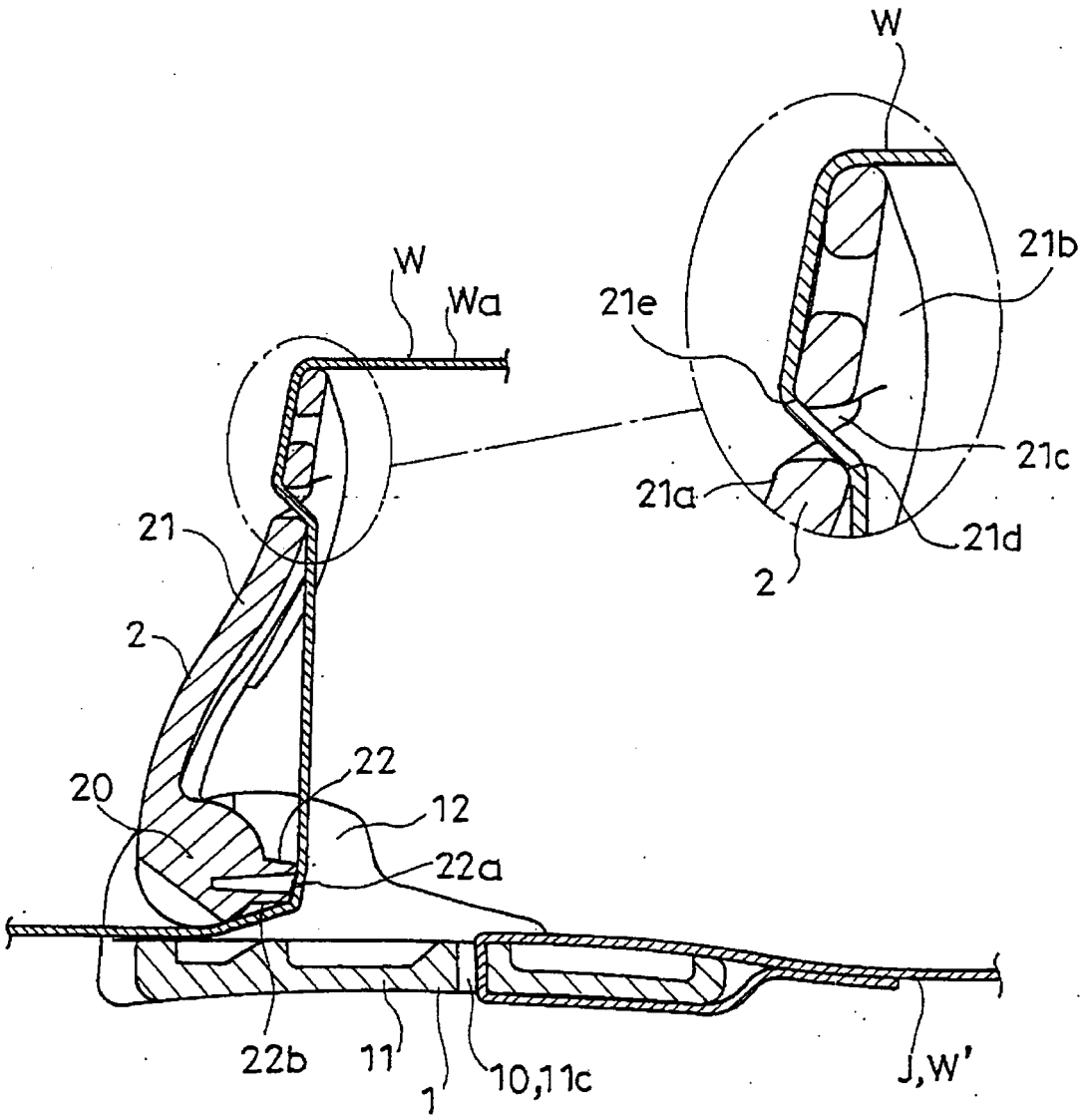


Fig.15

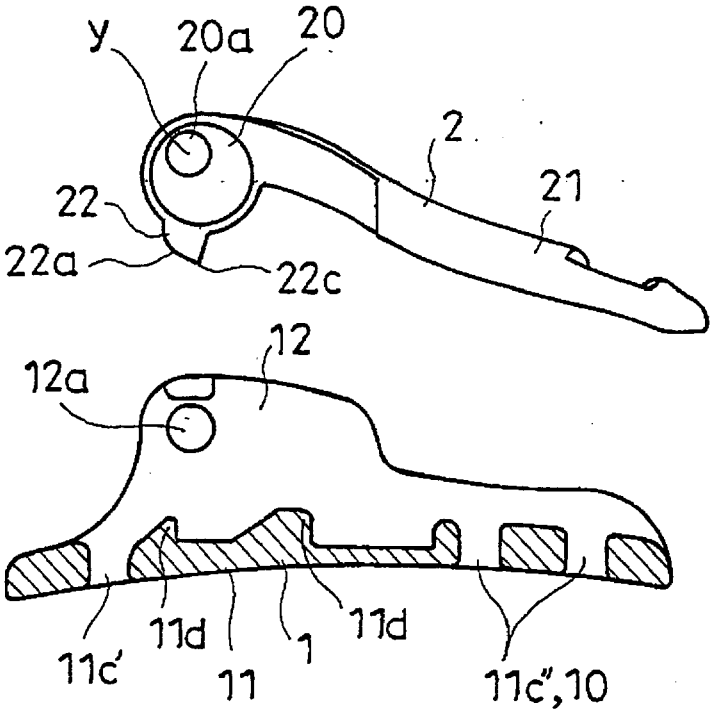
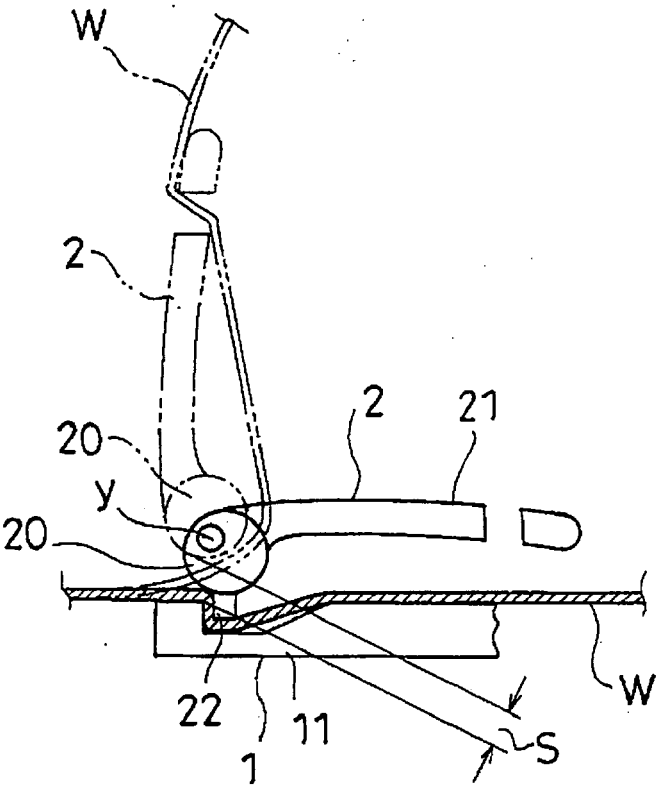


Fig.16



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EP 08 00 7099

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	8 October 2008	Monné, Eric

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