



US 20130007950A1

(19) **United States**

(12) **Patent Application Publication**  
ARAI

(10) **Pub. No.: US 2013/0007950 A1**

(43) **Pub. Date: Jan. 10, 2013**

(54) **HELMET**

(52) **U.S. Cl. .... 2/414**

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(57) **ABSTRACT**

(21) **Appl. No.: 13/296,485**

A helmet includes a helmet shell configuring the outermost layer of the helmet, an impact absorbing liner provided on the inner side surface of the helmet shell, and a detachable cushion body provided inside the impact absorbing liner, wherein the cushion body includes a basic cushion member configuring a wearer side part and an adjusting cushion members detachably provided so as to overlap the basic cushion member, and a covers for preventing the shift between the adjusting cushion members and the basic cushion member are provided outside the cushion body such that the covers are located outside the portion where the adjusting cushion members overlap the basic cushion member, and an opening section for inserting or removing the adjusting cushion members is provided between the covers and the basic cushion member.

(22) **Filed: Nov. 15, 2011**

(30) **Foreign Application Priority Data**

Jul. 8, 2011 (JP) ..... 2011-152228

**Publication Classification**

(51) **Int. Cl.**  
**A42B 3/12** (2006.01)

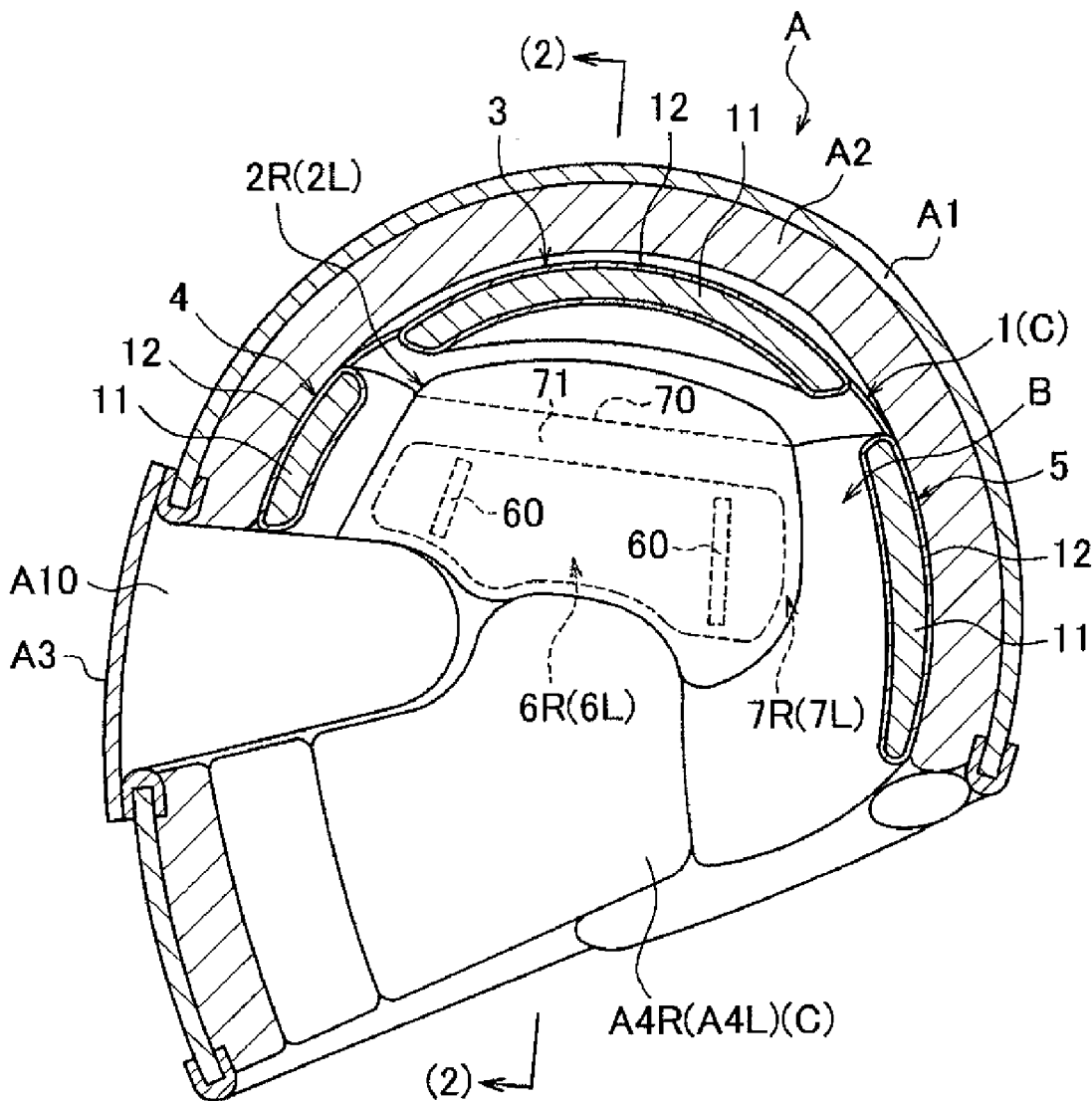


FIG. 1

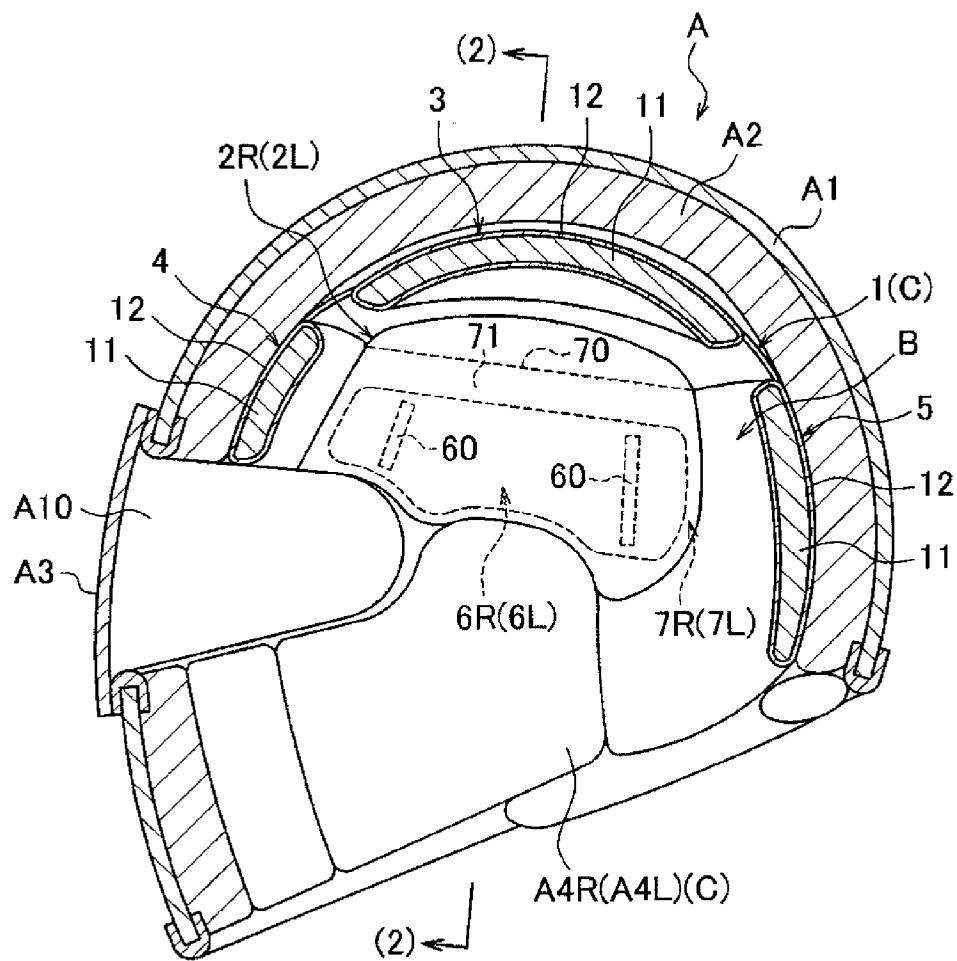


FIG. 2

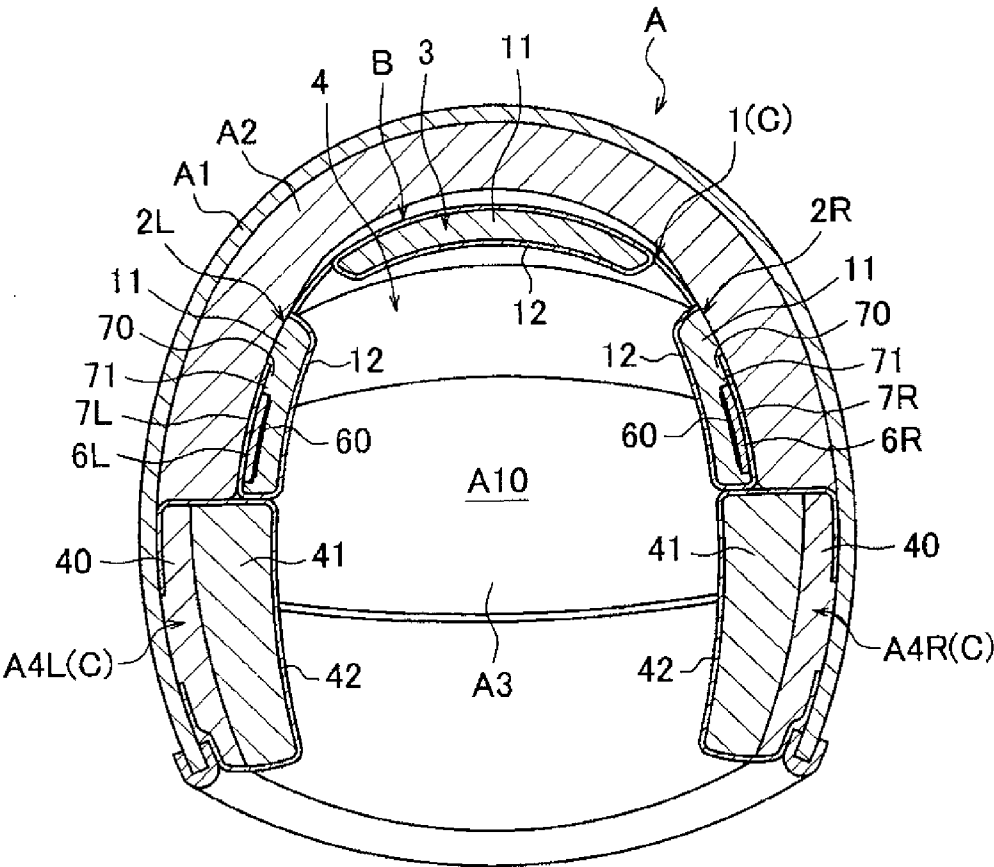


FIG. 3

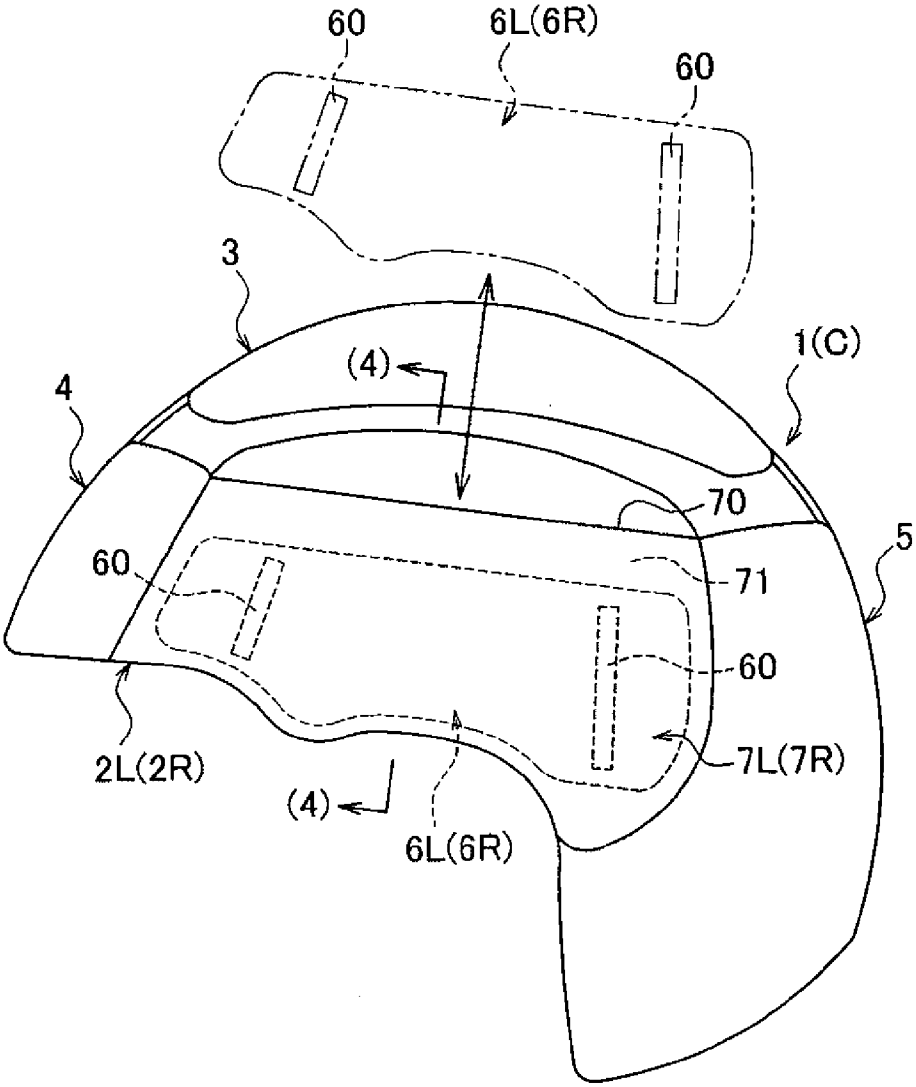


FIG. 4

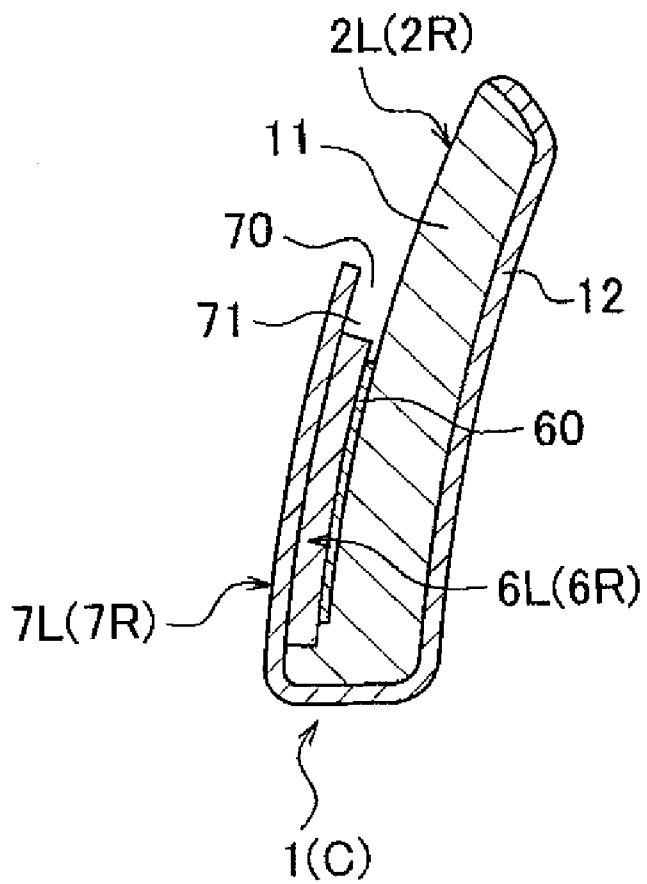


FIG. 5

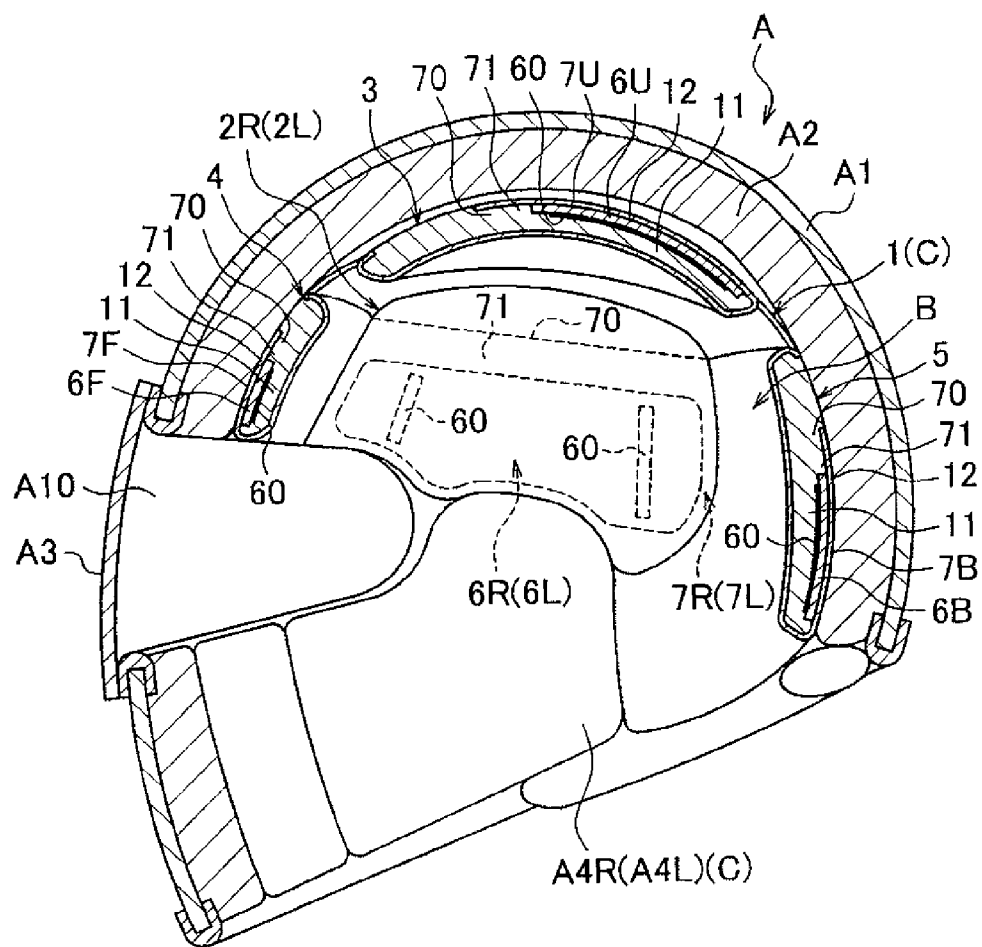


FIG. 6

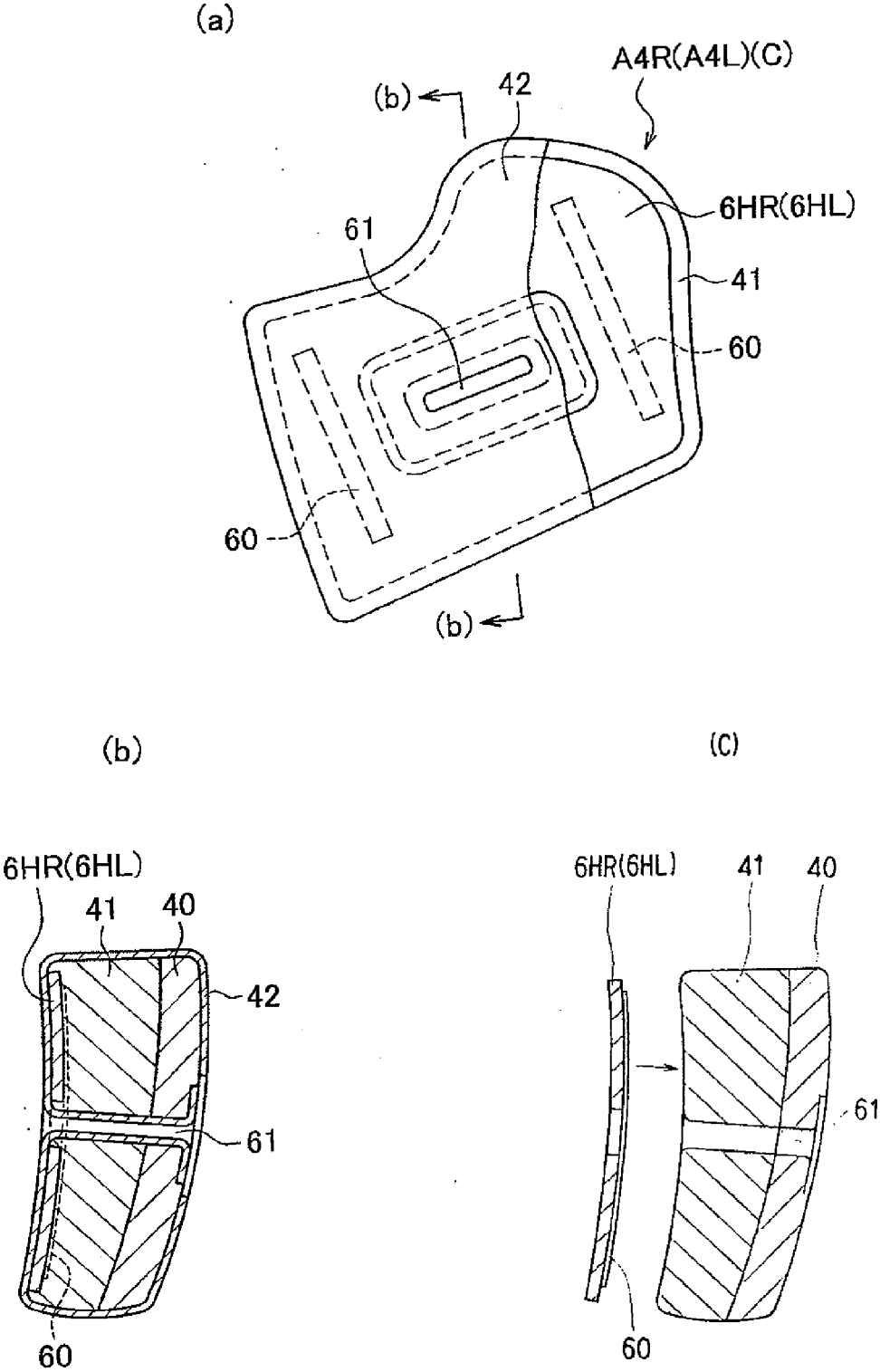


FIG. 7

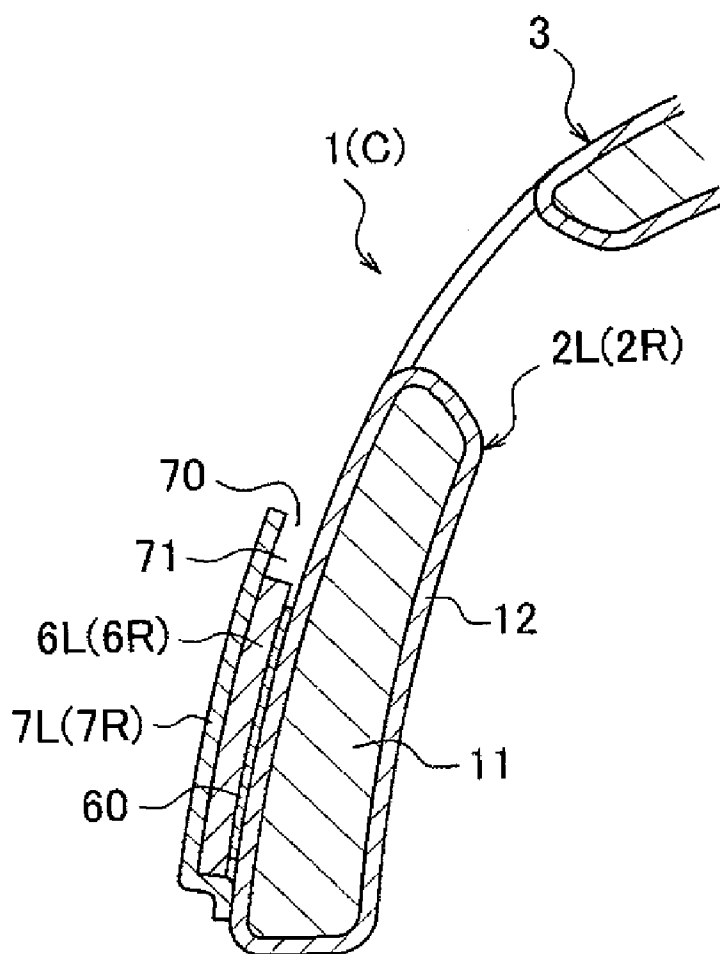




FIG. 8

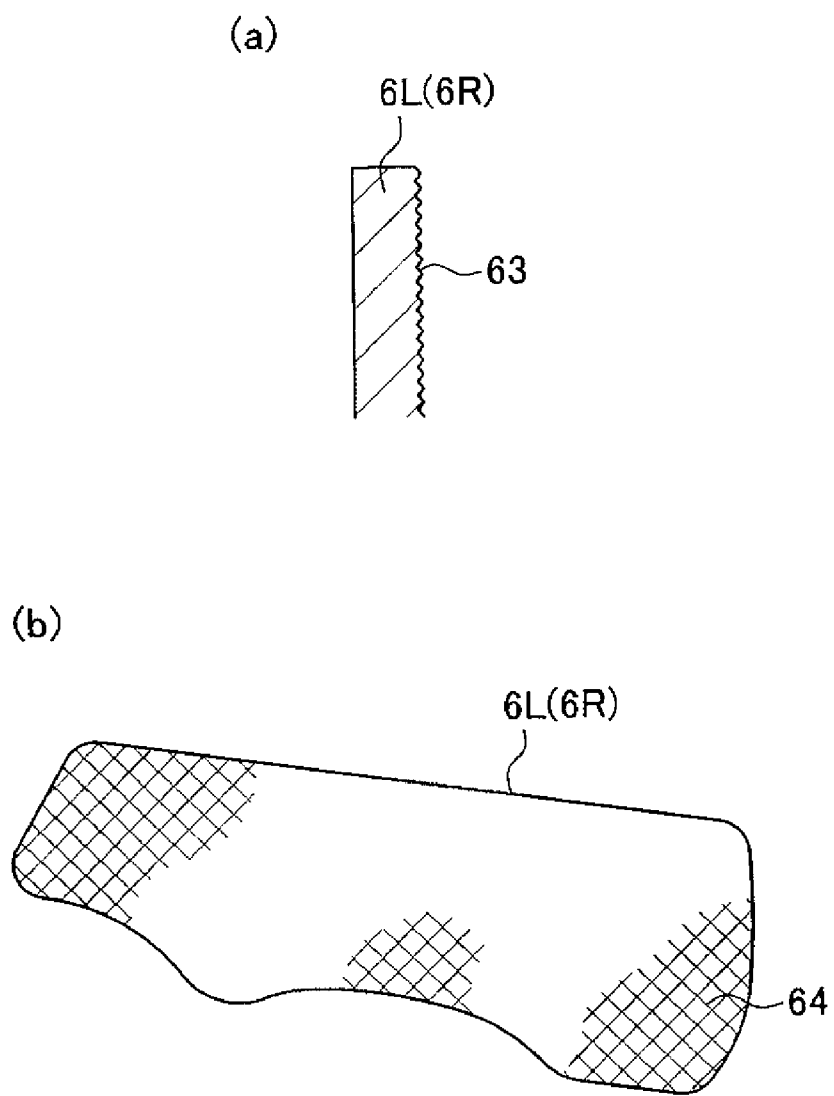
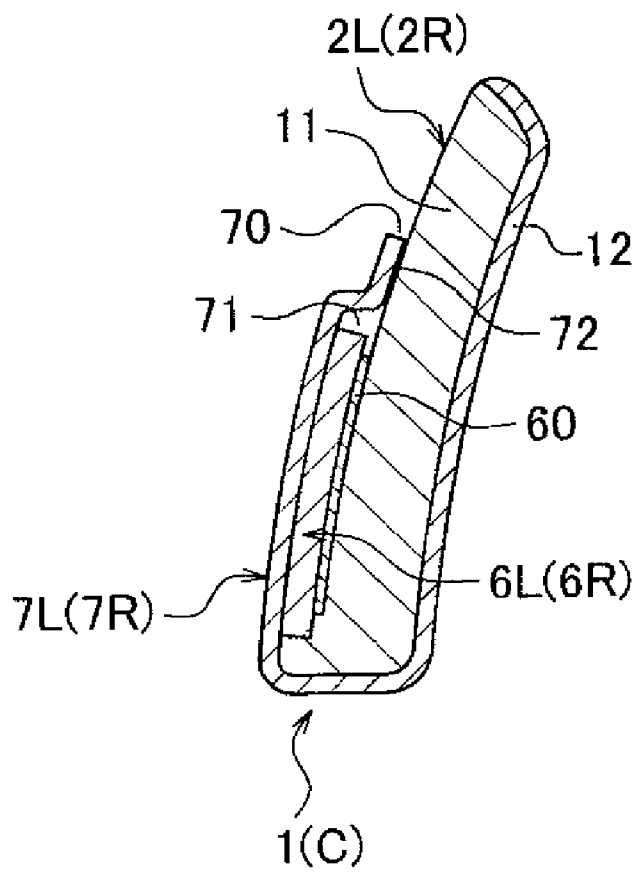


FIG. 9



## HELMET

### FIELD OF THE INVENTION

[0001] The present invention relates to a helmet for drives various types of vehicles such as automobiles and motor bikes, vessels such as motor boats, as well as moving tools such as bicycles and so forth.

### BACKGROUND OF THE INVENTION

[0002] There is known a helmet, which removably includes a head cushion member to give a comfortable wear feeling to the wearer when wearing the helmet. The head cushion member described in the patent literature 1 listed below is configured such that a side head part cushion member, a crown part cushion member, a front head part cushion member, and a rear head part cushion member, which are formed with a cushion member covered with fabric, are joined together along the inner surface of the helmet.

[0003] Further, the head cushion member is configured such that a pocket-shaped folding back part is formed by folding back the one end part of the neck part of a rear head part cushion member and an adjusting cushion member is provided insertably into or removably from this cover, and by inserting or removing this adjusting cushion member into or from the cover, the thickness in the neck part of rear head part cushion member can be adjusted.

### PATENT LITERATURE

[0004] [PATENT LITERATURE 1] Laid-open patent publication 2000-160424

### SUBJECTS TO BE SOLVED BY THE INVENTION

[0005] According to the related art shown in the patent literature 1, the insertion or removal of the adjusting cushion member into or from the cover makes it possible to easily adjust the thickness in the neck part of the rear head part cushion member, and thus a desired wear feeling can be obtained when wearing the helmet.

[0006] However, according to the related art shown in the patent literature 1, since the width of entrance of the cover is equal to the width of the adjusting cushion member, the adjusting cushion member easily gets out from the cover, thus shift easily occurs in the getting out direction when attaching the head part cushion member to the helmet.

[0007] The objects of the present invention are to make it possible to provide an adjusting cushion member so as to correspond to the individually different shape of the head part and cheek part of a wearer, to improve the holding capability of adjusting cushion member, and to reliably obtain a desired wear feeling by improving the holding capability of adjusting cushion member, and so forth.

[0008] In order to achieve such objects, the helmet according to the present invention is provided with at least the following configuration.

[0009] The present invention provides a helmet. The helmet includes a helmet shell configuring the outermost layer of a helmet, an impact absorbing liner provided on the inner side surface of the helmet shell and a detachable cushion body provided inside the impact absorbing liner, wherein the cushion body includes a basic cushion member configuring a wearer side part and an adjusting cushion member detachably provided so as to overlap the basic cushion member, and a

cover for preventing the shift between the adjusting cushion member and the basic cushion member is provided outside the cushion body such that the cover is located outside the portion where the adjusting cushion member overlaps the basic cushion member, and an opening section for inserting or removing the adjusting cushion member is provided between the cover and the basic cushion member.

[0010] It is preferable that the adjusting cushion member is provided on the impact absorbing liner side and/or the wearer side.

[0011] It is preferable that the adjusting cushion member and/or the basic cushion member is configured such that the shift of adjusting cushion member is prevented by friction resistance.

[0012] It is preferable that the adjusting cushion member and/or the basic cushion member has mutually peelable adherence the adjusting cushion member and/or the basic cushion member includes a mutually peelable adhesive member.

[0013] It is preferable that the opening width of the opening section is configured to be narrower than the total width of the adjusting cushion member.

[0014] It is preferable that the opening section is configured to be openable and closable.

### ADVANTAGES OF THE INVENTION

[0015] With such aspects, the present invention offers the following advantages. That is, the shift of an adjusting cushion member is prevented by a cover and the adjusting cushion member is configured to be insertable and removable into and from a cushion body, thereby making it possible to provide an adjusting cushion member so as to correspond to individually different shape of the head part or cheek part of the wearer, while making it possible to improve the holding capability of the adjusting cushion member. By improving the holding capability of the adjusting cushion member, a desired wear feeling can be reliably obtained.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0016] FIG. 1 is a cross-sectional view of a helmet according to an embodiment of the present invention;

[0017] FIG. 2 is a cross-sectional view taken along the line (2)-(2) of FIG. 1;

[0018] FIG. 3 is a side view of the head cushion member of FIG. 1;

[0019] FIG. 4 is a cross-sectional view taken along the line (4)-(4) of FIG. 3;

[0020] FIG. 5 is a cross-sectional view of a helmet illustrating another embodiment of the placement positions of the adjusting cushion member;

[0021] FIG. 6 is a view illustrating an embodiment wherein the adjusting cushion member is attached to the cheek part cushion member: FIG. 6(a) is a partially cut out side view of the cheek part cushion member, FIG. 6(b) is a cross-sectional view taken along the line (b)-(b) of FIG. 6(a), and FIG. 6(C) is a cross-sectional view illustrating a state where the adjusting cushion member is attached to the cushion component without the exterior members;

[0022] FIG. 7 is a cross-sectional view illustrating another embodiment of the cover;

[0023] FIG. 8 shows another embodiment of the adjusting cushion member, wherein FIG. 8(a) is an enlarged view of the essential part of the adjusting cushion member the surface of

which is configured to form fine concavity and convexity so as to generate friction resistance, FIG. 8(b) is an enlarged view of the essential part of the adjusting cushion member wherein a fabric with rough weave patterns or knitted stitches is bonded to the surface of the adjusting cushion member so as to generate friction resistance; and

[0024] FIG. 9 is a cross-sectional view illustrating an embodiment wherein the opening section of the cover is configured to be openable and closable.

#### DESCRIPTIONS OF THE INVENTION

[0025] The helmet described below includes an open face helmet.

[0026] Further, a helmet for both open-face and full-face use is included, wherein, as shown in the Japanese laid-open patent publication H07-126908, the front open part of the helmet body of an open face type is covered with a shield which is rotatably supported about an axis on both the right and left sides of a helmet shell, and a chin guard is rotatably and fixably attached to the supporting axis part of the shield, crossing over the front open part between both the right and left sides of the helmet shell.

[0027] The basic cushion member described hereinafter includes a head cushion member provided on the inner surface of the head part of helmet, and a cheek part cushion member provided on the inner surface of the side part of helmet.

[0028] The head part cushion member described hereinafter is provided on the inner surface of the head part of helmet including those which are configured to join the side head part cushion member, the crown part cushion member, the front head part cushion member, and the rear head part cushion member along the inner surface of the head part of the helmet.

[0029] Here, peelable adherence is defined as the adherence which does not cause damage to an adjusting cushion member and a basic cushion member when the adjusting cushion member is removed from the basic cushion member.

[0030] Hereinafter, a helmet according to an embodiment of the present invention is described with reference to the drawings. The helmet shown in this embodiment as an example is a full-face helmet and the basic cushion member to which the adjusting cushion member is detachably attached is a head part cushion member. FIG. 1 and FIG. 2 are configuration views of a helmet A, while FIG. 3 and FIG. 4 are configuration views of a head part cushion member 1.

[0031] The helmet A includes a helmet shell A1 configuring the outermost layer of the helmet A, an impact absorbing liner A2 provided on the inner surface of the helmet shell A1, a cushion body B provided on the inner surface of the impact absorbing liner A2 and the inner side of the helmet shell A1, and a shield A3 which is supported about an axis on both the right and left outer sides of the helmet shell A1 rotatably in the direction to open and close the front open part A10 of the helmet shell A1.

[0032] The cushion body B, which configures a wearer side part, includes a basic cushion member C having a head part cushion member 1 provided on the head part inner side of the impact absorbing liner A2 and cheek part cushion members A4L, A4R provided on the inner side of the right and left side part of the helmet shell A1; and adjusting cushion members 6L, 6R which are provided on the side of the impact absorbing liner A2 in the side head part cushion members 2L, 2R of the head part cushion member 1 in the basic cushion member C.

[0033] The helmet shell A1 is molded in the shape of a full face helmet by using a reinforced fiber resin material (GFRP, CFRP, and so forth) which is made by impregnating a reinforced fiber material (glass fiber, carbon fiber, and so forth) with a thermoset resin material (epoxy resin material, phenol resin material, and so forth), or a thermoplastic resin (polycarbonate, and so forth).

[0034] The impact absorbing liner A2 is molded in the shape corresponding to the protection region of head part (crown part, front head part, rear head part, side head part) on the inner surface side of the helmet shell A1, which is defined by various national standards, by using a material with shock-absorbing performance (for example, expanded polystyrene material) or an alternative material with the same shock-absorbing performance as this material.

[0035] The cheek part cushion members A4L, A4R are configured by enveloping a buffer material 40 molded by using the same or similar material as the impact absorbing liner A2 and a cushion component 41 molded by using urethane material and so forth with an exterior member 42 which is made of a flexible material such as fabric (see FIG. 2).

[0036] The cheek part cushion members A4L, A4R are detachably attached to the helmet shell A1 via a fixing member (not shown).

[0037] The head part cushion member 1 is configured by joining the aforementioned side head part cushion members 2L, 2R, crown part cushion member 3, front head part cushion member 4, and rear head part cushion member 5 along the head part inner surface of the impact absorbing liner A2.

[0038] The side head part cushion members 2L, 2R, the crown part cushion member 3, the front head part cushion member 4, and the rear head part cushion member 5 are configured by enveloping with an exterior member 12a a cushion component 11 which is made of the same material as the cushion component used for the cheek part cushion members A4L, A4R or has the similar cushion capability thereto.

[0039] The head part cushion member is detachably attached to the impact absorbing liner A2 via a fixing member (not shown) such that the cushion member can be replaced by a head part cushion member the size of which corresponds to the head part size of a wearer.

[0040] The side head part cushion members 2L, 2R are provided at the position corresponding to the side head part of a wearer, and adjusting cushion members 6L, 6R which adjust the thickness of the side head part cushion members 2L, 2R are detachably provided on the side of the impact absorbing liner A2 so as to overlap the side head part cushion members 2L, 2R. Further, the side head part cushion members 2L, 2R include covers 7L, 7R which hold the adjusting cushion members 6L, 6R from outside the adjusting cushion members 6L, 6R by sandwiching the adjusting cushion members 6L, 6R between the covers 7L, 7R and the cushion component 11.

[0041] The crown part cushion member 3 is provided at the position corresponding to the crown part of a wearer, the front head part cushion member 4 is provided at the position corresponding to the front head part of a wearer, and the rear head part cushion member 5 is provided at the position corresponding to the rear head part of a wearer, respectively.

[0042] The adjusting cushion members 6L, 6R are made of the same material as the cushion component 11 used for the side head part cushion members 2L, 2R or have the similar cushion capability thereto, and include an adhesive member 60 which detachably adheres to the side head part cushion members 2L, 2R.

[0043] The adhesive member 60 is an adhesive tape and so forth having an adhesive force which does not cause damage to the adjusting cushion members 6L, 6R and the side head part cushion members 2L, 2R when removing the adjusting cushion members 6L, 6R from the side head part cushion members 2L, 2R. The adhesive member 60 adheres to the exterior member 12 of the side head part cushion members 2L, 2R, whereby the adjusting cushion members 6L, 6R are detachably attached to the side head part cushion members 2L, 2R.

[0044] The covers 7L, 7R are provided so as to face the exterior member 12 and sandwich the cushion component 11 between the covers 7L, 7R and the exterior member 12, thus functioning as part of the exterior member 12 as well.

[0045] The three side parts except for the upper end part of the covers 7L, 7R are sewn to or adhered to the exterior member 12, thus being fixed thereto so as to form an opening section 70 which allows to insert or remove the adjusting cushion members 6L, 6R through between the non-fixed upper end part and the cushion component 11, and thus a bag part 71 is configured between the inner surface of the covers 7L, 7R and the outer surface of the cushion component 11 such that the adjusting cushion members 6L, 6R are inserted into the bag part 71 from the opening section 70.

[0046] The opening width of the opening section 70 is formed so as to be narrower than the total width of the adjusting cushion members 6L, 6R, and thus the adjusting cushion members 6L, 6R are deformed and contracted to allow insertion and removal of the adjusting cushion members 6L, 6R into and from the bag part 71 through the opening section 70.

[0047] While the adjusting cushion members 6L, 6R are inserted into the bag part 71, the adhesive member 60 is faced to the cushion component 11 and is bonded to the cushion component 11, whereby the adjusting cushion members 6L, 6R are held to the cushion component 11. The adhesive member 60 may be faced to the inner side of the covers 7L, 7R so as to be bonded to the covers 7L, 7R.

[0048] That is, the adjusting cushion members 6L, 6R are inserted into the bag part 71, thereby the adjusting cushion members 6L, 6R are held to the cushion component 11 while the adjusting cushion members 6L, 6R are prevented by the covers 7L, 7R from coming into contact with the impact absorbing liner A2, whereby when attaching the head part cushion member to the helmet A and wearing the helmet A, the shift of the adjusting cushion members 6L, 6R can be prevented.

[0049] Further, the opening width of the opening section 70 is formed to be narrower than the total width of the adjusting cushion members 6L, 6R, whereby when attaching the head part cushion member to the helmet A and wearing the helmet A, the adjusting cushion members 6L, 6R in the bag part 71 can be prevented from getting out from the opening section 70.

[0050] Moreover, the adjusting cushion members 6L, 6R are held by the adhesive member 60 which has an adhesive force without causing damage to the adjusting cushion members 6L, 6R and the side head part cushion members 2L, 2R, whereby the insertion and removal of the adjusting cushion members 6L, 6R are easy and when the adhesive member 60 is peeled off, the adjusting cushion members 6L, 6R and the side head part cushion members 2L, 2R can be prevented from being damaged.

[0051] As such, the adjusting cushion members 6L, 6R which are inserted into the bag part 71 are prevented from

shifting or getting out from the opening section 70, whereby the helmet A can be configured so as to have the high holding capability while reliably obtaining a desired wear feeling.

[0052] The present invention is not limited to the embodiments which are shown here as examples, and can be practiced based on the configuration without departing from the content described in each of claims. Hereinafter, the configurations on the basis of FIGS. 6 to 9 are described, and the same symbols are applied to the same parts in the configurations shown in FIGS. 1 to 5, whereby duplicated descriptions are eliminated.

[0053] In the aforementioned embodiments, the configuration was shown as the example wherein the covers 7L, 7R are provided only for the side head part cushion members 2L, 2R. In contrast, as shown in FIG. 5, in this embodiment, a cover 7U may be provided for the crown part cushion member 3, a cover 7F may be provided for the front head part cushion member 4, and a cover 7B may be provided for the rear head part cushion member 5 such that the bag parts 71 are provided for all the side head part cushion members 2L, 2R, the crown part cushion member 3, the front head part cushion member 4, and the rear head part cushion member 5.

[0054] These covers 7L, 7R, 7U, 7F, 7B may be provided on one or more of the side head part cushion members 2L, 2R, the crown part cushion member 3, the front head part cushion member 4, and the rear head part cushion member 5. Further, FIG. 5 shows as an example that the adjusting cushion members 6L, 6R, 6U, 6F, 6B are inserted in all the bag parts 71. However, the inserting part of the adjusting cushion members 6L, 6R, 6U, 6F, 6B may be determined according to the preference of a user.

[0055] Further, as shown in FIGS. 6(a) to 6(c), the adjusting cushion members 6L, 6R may be provided on the cheek part cushion members A4L, A4R. The cheek part cushion members A4L, A4R according to this embodiment is configured such that the exterior member 42 is detachable with respect to the cushion component 41. And, the adjusting cushion members 6L, 6R are applied to the cushion component 41 which is exposed when the exterior member 42 is removed therefrom, and then the cushion component 41 to which the adjusting cushion members 6L, 6R are applied, is covered with the exterior member 42, whereby the adjusting cushion members 6L, 6R can be inserted into the cheek part cushion members A4L, A4R.

[0056] The adjusting cushion members 6L, 6R are provided on the wearer side of the cushion component 41 such that the size and wear feeling can be adjusted on the wearer side.

[0057] The configuration wherein the adjusting cushion members 6L, 6R are provided on the wearer side of the cushion component 41 is applicable to the aforementioned side head part cushion members 2L, 2R, the crown part cushion member 3, the front head part cushion member 4, and the rear head part cushion member 5 as well.

[0058] The adjusting cushion members 6L, 6R are formed in an annular shape so as to surround the chin strap through-holes 61 provided on the cheek part cushion members A4L, A4R, thus preventing the adjusting cushion members 6L, 6R from interfering with the chin strap (not shown) which passes through the chin strap through-holes 61.

[0059] That is, in this embodiment, the exterior member 42 functions as the cover which holds the adjusting cushion members 6L, 6R provided on the interior member 41 such that the adjusting cushion members 6L, 6R do not shift, and

thus the adjusting cushion members 6L, 6R can be held so as not to shift in such a configuration as well.

[0060] Also, as shown in FIG. 7, the covers 7L, 7R which are made of the flexible fabric similar to that of the exterior member 12, may be sewn to the outer surface of the side head part cushion members 2L, 2R which are configured such that the exterior member 12 covers the entire cushion component 11.

[0061] Further, the friction resistance of the adjusting cushion members 6L, 6R may act to prevent the adjusting cushion members 6L, 6R from shifting. The friction resistance is generated by fine concavity and convexity 63 formed on the surface of the adjusting cushion members 6L, 6R as shown in FIG. 8(a), or by bonding a fabric 64 with rough weave patterns or knitted stitches onto the surface of the adjusting cushion members 6L, 6R as shown in FIG. 8(b). The friction resistance may be generated not only on the adjusting cushion members 6L, 6R, but also on all the side head part cushion members 2L, 2R, the cover 7L, 7R, the adjusting cushion members 6L, 6R, the side head part cushion members 2L, 2R, and the cover 7L, 7R.

[0062] Further, although the opening width of the opening section 70 shown as an example is configured to be narrower than the total width of the adjusting cushion members 6L, 6R, the opening width of the opening section 70 may be configured to be greater than or equal to the total width of the adjusting cushion members 6L, 6R and the opening section 70 may be configured to be openable and closable by using a surface tape 72 and so forth as shown in FIG. 9, whereby the adjusting cushion members 6L, 6R may be held in the covers 7L, 7R so as not to get out therefrom or shift therein. The configuration wherein the opening section 70 is configured to be openable and closable can be applied to the opening section 70 as shown in the example wherein the opening width is configured to be narrower than the total width of the adjusting cushion members 6L, 6R.

[0063] Further, although the adhesive member 60 shown in the example is provided on the adjusting cushion members 6L, 6R, the adhesive member 60 may be provided on the cushion component 11 and/or the inner surface of the covers 7L, 7R (not shown).

[0064] Moreover, the adhesive member 60 may be removed by configuring the adjusting cushion members 6L, 6R and/or the head part cushion member or the covers 7L, 7R with an adhesive material, or by generating the aforementioned friction resistance thereon (not shown). For example, as the adhesive material, polyurethane elastomer sheet and so forth are listed.

[0065] Having described specific preferred embodiments of the invention with reference to the accompanying drawings, it will be appreciated that the present invention is not limited to those precise embodiments, and that various changes and modifications can be effected therein by one of ordinary skill in the art without departing from the scope of the invention as defined by the appended claims.

What is claimed is:

- 1. A helmet comprising:
  - a helmet shell configuring the outermost layer of a helmet;
  - an impact absorbing liner provided on the inner side surface of said helmet shell; and
  - a detachable cushion body provided inside said impact absorbing liner,
 wherein said cushion body includes a basic cushion member configuring a wearer side part and an adjusting cushion member detachably provided so as to overlap said basic cushion member, and a cover for preventing the shift between said adjusting cushion member and said basic cushion member is provided outside said cushion body such that the cover is located outside the portion where said adjusting cushion member overlaps said basic cushion member, and an opening section for inserting or removing said adjusting cushion member is provided between said cover and said basic cushion member.
- 2. The helmet according to claim 1, wherein said adjusting cushion member is provided on said impact absorbing liner side and/or the wearer side.
- 3. The helmet according to claim 1, wherein said adjusting cushion member and/or said basic cushion member is configured such that the shift of adjusting cushion member is prevented by friction resistance.
- 4. The helmet according to claim 1, wherein said adjusting cushion member and/or said basic cushion member has mutually peelable adherence.
- 5. The helmet according to claim 1, wherein said adjusting cushion member and/or said basic cushion member includes a mutually peelable adhesive member.
- 6. The helmet according to claim 1, wherein the opening width of said opening section is configured to be narrower than the total width of said adjusting cushion member.
- 7. The helmet according to of claim 1, wherein said opening section is configured to be openable and closable.

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