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(54) **KNEE PROTECTIVE DEVICE**

KNIESCHUTZVORRICHTUNG

DISPOSITIF DE PROTECTION DU GENOU

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(73) Proprietor: **Dainese S.p.A.**
36060 Molvena (IT)

(72) Inventor: **BATTAGLIN, Gianni**
I-36060 Molvena VI (IT)

(74) Representative: **Manfrin, Marta et al**
Società Italiana Brevetti S.p.A.
Stradone San Fermo 21 sc. B
37121 Verona (VR) (IT)

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Description

[0001] The present invention relates to a knee protection device, of the kind usually positioned proximate the knee and onto the outer side upper portion of the knee.

[0002] As it is known, onto the sporting motorcycle suits there are members, made of a material with low friction coefficient, usually plastic members, which have the function of avoiding the direct contact of the driver's knee with the asphalt upon running along a curve. In fact, in order to tackle curves, the driver shifts towards the outside of the vehicle so as to accompany the motorbike's tilting motion and to allow to curve at high speeds.

[0003] These protections, called "knee sliders" in slang, deteriorate upon use, thus wearing out and therefore they have to be replaced in case of need. To make their replacement easier, such members are usually fastened to the suit by means of a detachable attachment, generally implemented with a Velcro® coupling.

[0004] The attachment implemented by means of Velcro® requires a relatively complex processing in the motorcycle suit's manufacturing and in particular in the leather preparation. The presence of Velcro®, the need of gluing it to the protection and of providing a supporting cloth to be sewn to the suit represent additional costs for the motorcycle suits' manufacturer.

[0005] From the user's point of view, then, additional drawbacks due to Velcro® wear occurs, with consequent loss in the supporting properties thereof or problems due to a not perfect gluing of the Velcro® layer onto the plastic member's back. For example, sometimes the force exerted to remove the protection from the suit causes the detachment of Velcro® from the protection member's back. If the Velcro®'s layer onto the protection should remove when the latter, not yet wore out, is for example removed to adjust the position, the slider is damaged, thus becoming unusable.

[0006] The replacement of the sliders further results to be in all uncomfortable, exactly due to the need to detach the Velcro®.

[0007] Furthermore, the positioning of the known protections does not result to be always easy since, once fastened by means of Velcro®, the position thereof cannot be adjusted any more unless removing it and placing it in a better position.

[0008] Therefore, often it is necessary to be satisfied with an approximate position or to do many attempts before having the best placing of the protective member. WO 03/030667 discloses a protection device according to the preamble of claim 1.

[0009] Therefore, the technical problem underlying the present invention is to provide a protection device for the knees allowing to obviate the drawbacks mentioned above with reference to the known art.

[0010] Such problem is solved by a protection device for the knees according to claim 1 and by the garment according to claim 10.

[0011] The present invention provides some important

advantages. The main advantage is that it allows to fasten in a precise and stable way a protective member of the "slider" kind to the user's body.

[0012] Furthermore, the device according to the present invention requires quite low implementation costs and it is very resistant to wear.

[0013] At the same time, the device can be removed in a simple way without risking wear phenomena of any component.

[0014] Other advantages, features and application modes of the present invention will result clear from the following detailed description of some embodiments, illustrated by way of example and not for limitative purpose. The figures of the enclosed drawings will be referred to, wherein:

figure 1 is a front view of a motorcycle suit thereto a protection device for the knees according to the present invention is applied;

figure 2 is a front view, detail of figure 1, illustrating the protection device according to the present invention fastened to the motorcycle suit in a position underneath the knee;

figure 3 is an exploded perspective view, showing the device according to the present invention and related connection means;

figure 4 is a perspective view showing the assembled device of figure 3;

figure 5 is a perspective view, illustrating the working area of the device according to the present invention;

figure 6 is a rear view illustrating in detail the connection means of figure 3; and

figures 7 and 8 are two section views, respectively a side view and a top view, showing the device according to the present invention;

figures 9A, 9B and 9C, respectively, are a plan, rear and partially section view, a front section view and a side view of a protection member, detail of figure 3.

[0015] By firstly referring to figure 1, a protection device for the knee is fastened to a garment 6 so as to allow placing a protection member 1 in a position which, when the user is in an erect position, is proximate the knee, onto the upper outer side portion of the tibia.

[0016] The protection member 1 is substantially of the "slider" kind and, analogously to the commonly used sliders, the position thereof is so that, when the motorcyclist tilts the vehicle during a curve, with the bend leg, the protection member 1 comes in contact with the road by keeping substantially parallelly to the same or, generally, in the position wished by the driver.

[0017] It is clear that different driving styles, driver's ability and physical features of the same, require the adjustment of the slider's position so as to be in the correct placing with respect to the ground during curves.

[0018] By then referring to figure 2, the device's connection to the suit takes place by means of a fastening base 2, placed at a lower portion of the leg substantially beneath the knee.

[0019] The fastening base 2 can be obtained directly onto the suit or inserted onto the same by means of specific seams or any other means providing sufficient stability to the device. Alternatively to the seams, for example, the fastening base 2 can be implemented by means of thermoplastic material injected at the portion below the knee, glued onto the suit's leather or still injected in a specific pocket.

[0020] Then, generally the base 2, helped by the presence of adhesives, weldings, injection of plastic material or seams, easily allows to fasten the suit to the device, with reduced processing costs.

[0021] The fastening base 2 is conveniently used since the leather alone, thereof the suit is manufactured, would not be sufficient to implement a quite stable and resistant connection to the protection device.

[0022] The base 2 can further comprise paddings, not illustrated in figure, which can extend, apart from at the base itself, also proximate the knee or an upper portion of the tibia.

[0023] Furthermore, it is to be noted that the protection member 1 is fastened, as already mentioned previously, at the area beneath the knee, onto the outer side portion of the tibia.

[0024] Such feature is linked to the fact that during the curves, such limb portion is the one which approaches the road surface, whereas the knee instead, the rotula in particular, is substantially perpendicular thereto.

[0025] Among other things, the object of the protection device according to the present invention, always analogously to the traditional "sliders", is to allow the driver's maximum tilting upon running along a curve, without being afraid of scraping the leg against the asphalt.

[0026] Therefore, the main object is not to protect from impacts in general, but rather to resist to the stresses caused by scraping against the asphalt without causing any injury to the motorcyclist, even providing wear due to friction of the protection device.

[0027] By then referring to figures 3 and 4, the fastening base 2 is further connected to a mobile plate 3 whereon the protection member 1 is applied.

[0028] The mobile plate 3 is fastened to the fastening base 2 by means of connection means 4, illustrated in figure 4, allowing the plate 3 to slide onto the base 2.

[0029] In particular, and still referring to figures 3 and 4, such connection means comprises guides 41, 42 arranged substantially orthogonal therebetween, whereon the mobile plate 3 can slide.

[0030] Therefore, the plate 3, and consequently also the connected protection member 1, can be placed inside

a working area 5 defined by the composition of motions allowed by the two guides, as illustrated in figure 5.

[0031] The guides 41, 42 are obtained onto the surface of the fastening base 2, so as to allow motions along a surface which coincides with that of the base 2.

[0032] Such feature allows the adjustment of the position of the protection member 1 allowing it to come in contact with the asphalt, by approaching as much as parallelly possible to the road surface or however in the position wished by the driver.

[0033] This feature reveals particularly advantageous, since it allows to have a better contact with the asphalt, to slide better during curves, according to the drivers' different needs.

[0034] In any case, although in the present embodiment the guides 41 and 42 follow the development of the surface of the base 2 and also of the covered limb portion, they could have a different shape, so as to improve the impact modes with the road surface.

[0035] For example, the guides could allow shiftings according to a smaller curvature, until becoming rectilinear, or still a bigger curvature, which would allow the mobile plate to be positioned not in contact with the user's body, but spaced apart therefrom.

[0036] In the present embodiment, and by referring again to figure 3, the guides are formed by means of openings 43, 44 arranged horizontally and vertically and respectively made on fastening base 2 and mobile plate 3.

[0037] Furthermore, the guides comprise elongated members 47 which extend between the openings 43 and 44, by connecting in this way the fastening base and the mobile plate.

[0038] In order to implement a stable connection, in other words so as to not allow that the mobile plate moves away in normal direction with respect to the surface of the fastening base, the elongated members 47 are fastened to respective cursors 45 and 46 which have a greater extension with respect to the respective openings.

[0039] The cursors then allow to the elongated members to slide inside the openings, even though they keep the mobile plate in contact with the fastening base 2.

[0040] The same connection means further allows to lock the mobile plate 3 with respect to the fastening base 2 in the chosen position.

[0041] In fact, in the present embodiment the elongated members are implemented by means of screws, 47 which have a threaded portion, at least in the ending portion of the stem, which couples to a respective seat implemented in the cursor 45.

[0042] A through hole, allowing the screw to move freely, is implemented onto the other cursor 46.

[0043] Such cursor 45 is then in contact with the head 48 of the screws, the sizes thereof are greater than those of the through hole mentioned above.

[0044] In this way the screws allow joining the fastening base 2 to the mobile plate 3 by means of the two cursors 45 and 46 included therebetween.

[0045] Such connection is described in particular in figures 7 and 8, by means of section views.

[0046] It is then clear that the distance between the two cursors can be adjusted by screwing the screws onto the threaded cursor 45.

[0047] However, when the cursors approach therebetween, they produce a pressure between fastening base 2 and plate 3, included between the two cursors.

[0048] Such action allows to keep in contact the base 2 and the plate 3 in a stable position, since it will be sufficient that the contact force between the two components be so as to prevent the motion of the portions during the stresses determined by the contact with the asphalt.

[0049] Besides, by choosing materials with different friction coefficient, it will be sufficient to tighten the screws to obtain a perfect locking also under the conditions wherein the protection members have to work.

[0050] The operation of the device according to the present invention is then clear: first of all the screws 47 are not tightened so as to allow the sliding of the mobile plate 3 onto the guides 41 and 42 and the positioning of the same.

[0051] Once chosen the most correct position in order to obtain the maximum protection and efficiency upon driving, according to what described above, the screws are tightened and the mobile plate 3 locked in the chosen position.

[0052] Such operations take place without the protection member being fastened to the mobile plate, thereto it is connected only after having detected the most proper position.

[0053] Substantially, the connection means 4 between the mobile plate 3 and the fastening base 2 are so as to allow at the same time the positioning of the protection member, connected to the plate 3, and the locking in the chosen position.

[0054] Such solution reveals then to be particularly advantageous due to the fact that it allows an extremely precise positioning of the protection member to the sliders fastened by means of Velcro®.

[0055] With Velcro®, in fact, once the slider is placed proximate the knee, it is not possible implementing other shiftings along the leg surface in order to have a better positioning, but, if one is not satisfied with how it has been applied, it is necessary to remove it and re-apply it in a better position.

[0056] On the contrary, the mobile plate 3 of the device according to the present invention has an extension surface substantially equal to the one of the protective member, and therefore, without the need of applying and fastening it definitively, one could verify if the detected position is correct to obtain the maximum protection during curves and, in case, to modify it.

[0057] Only after being sure of the correct arrangement the connection means 4 will be locked and the protective member 1 will be fastened.

[0058] Alternatively to the guides 41, 42, the connection means 4 can comprise different systems apt to im-

plement the sliding of the mobile plate 3 onto a determined surface.

[0059] Furthermore, also the locking can take place according to different modes, for example by means of fixing or by means of using members creating interference between the mobile components of the device.

[0060] The guides can then have different configurations, for example they can exploit specific seats implemented onto base 2 and plate 3 instead of the openings mentioned above.

[0061] The mobile plate could also be integrated in the suit, even though allowing the motion described previously.

[0062] By referring to figure 8, the protection member 1 is connected to the mobile plate 3 by means of removable fastening means 7 illustrated in detail in figures 9A to 9C.

[0063] The fastening means allows alternatively to fasten the protection member 1 in a stable way to the mobile plate 3 and to replace the same when the wear is excessive.

[0064] More precisely, the means includes a fixed bracket 71 and a mobile bracket 72 which engage onto respective seats 31, illustrated in detail in figures 3, 4 and 8.

[0065] The position of the mobile bracket 72 can be fastened by means of a screw 77 which couples to a threaded hole, not illustrated in figure, made onto the bracket 72 itself.

[0066] By referring again to figure 9A, the screw 77 is further housed with clearance in a specific seat 78 implemented in the protection member 1, inside thereof the screw is idle or, in other words, it can rotate freely. The longitudinal shiftings of the screw 77 are further prevented on one side by a wall 75 and on the other side by a block 76, illustrated in figures 9A, 9B and 9C.

[0067] The block 76 is implemented so that, even though it prevents the longitudinal shiftings of the screw 77, it does not prevent a tool from accessing the screw's head. For example, in the present embodiment example, the block 76 has a semi-circular opening, therethrough it is possible inserting a hexagonal wrench and acting onto the screw.

[0068] The rotation of the screw 77 in this way allows implementing the shifting of the mobile bracket 72 along the longitudinal direction of the screw. More precisely, the mobile bracket can approach the fixed one as far as finding a second wall 74 which prevents the translation thereof beyond a certain position.

[0069] Therefore, by means of the reversed rotation of the screw 77 the bracket 72 can be brought as far as a second wall 74 and locked. Such feature is particularly advantageous since, as it will be seen hereinafter, it allows inserting the brackets inside the seats 31, since both result to be locked. If the mobile bracket moved freely, also slightly, the insertion in the seats would result to be more difficult, as less precise.

[0070] In this position the brackets 71 and 72 can be

inserted inside the seats 31 without any difficulty, thanks to the placing and size of the seats 31 themselves.

[0071] After having inserted the brackets inside the seats, the mobile bracket 72 can be moved away from the fixed one, by using the screw 77, and in this way the protection member 1 is fastened in stable position onto the mobile plate 3, as illustrated in figure 8. The shape of the brackets, in fact, is so as to include a tilted portion 79, illustrated in figure 9B, which prevents the brackets from outgoing from the seats 31, when they are sufficiently spaced apart therebetween.

[0072] This kind of fastening reveals to be particularly advantageous since it alternatively allows to fasten and remove the protection member 1 in a simple and quick way, without using any component subjected to wear. In fact, it is to be noted that the replacement of the protection member is right when, after scraping onto the asphalt, it begins wearing excessively and such fastening means allows then to remove the used member and place a new one.

[0073] Apart from these features, the use of such fastening means also allows an optimum protection of all the used mobile components, such as screw and bracket, as they are wholly protected.

[0074] Furthermore, the tilted portions allow an optimum adhesion of the protection member 1 to the base 2 and to the suit 6, since, during the fastening, they push the protection member towards the latter.

[0075] At last, the use of the mobile plate 3 thereto the protection member is connected allows to keep protected the connection means 4 and in particular the heads of the screws, which thus can be reached only when the protection member 1 is removed.

[0076] Besides, placing the screws in the present embodiment is so that they would be at the surface scraping against the asphalt if they were not covered by the protection member.

[0077] Therefore, the use of the mobile plate and of the protection member as covering of the same reveals to be particularly advantageous also for this reason.

[0078] However, the protection member could be fastened not removably from the fastening base, by leaving free access to the screws, for example by means of a specific seat and by providing to replace also the mobile plate in case of excessive wear of the protection member.

[0079] Therefore, in this case also the protection member could slide, together with the mobile plate, onto the fastening base.

[0080] It is clear that mobile plate 3 and protection member 1 in this case could be formed by a single component.

[0081] Alternatively, the plate and the protection member can be fastened by means of a fixing system or other removable connections.

[0082] In this case several solutions are possible, all however within the comprehension of any person skilled in the art.

[0083] For example, alternatively, the seats 31 can

have an enlarged portion wherein the connection members can be inserted and therefore, by means of a specific shifting of the protection member, the fixing is obtained inside a smaller portion of the seats mentioned above.

Claims

1. A protection device comprising a fastening base (2), a mobile plate (3), and a protection member (1) substantially of the "slider" type, said protection member (1) being connected to said mobile plate (3) by means of removable fastening means (7), connection means (4) for selectively slide said mobile plate (3) onto said fastening base (2) and locking the same, so as to place said protection member (1) with said mobile plate (3) in a chosen position, **characterised in that** said connection means (4) further comprises guides (41, 42) arranged substantially orthogonal therebetween.
2. Protection device according to the preceding claim, wherein said guides (41, 42) are implemented by means of openings (43, 44), and elongated members (47) fastened to cursors (45, 46) slidably arranged inside said openings (43, 44), said fastening base (2) and said mobile plate (3) being included between said cursors (45, 46).
3. Protection device according to the preceding claim, wherein said elongated members are screws (47) arranged to vary the distance between said cursors (45, 46) and the sliding thereof in said openings (43, 44) and the locking thereof by the tightening of said screws (47).
4. Protection device according to any of the preceding claims, wherein said fastening means (7) comprises a fixed bracket (71) and a mobile bracket (72) for the engaging thereof onto respective seats (31).
5. Protection device according to the preceding claim, wherein said mobile bracket (72) is coupled to a screw (77), said screw (77) being inserted into a respective seat (78) and constrained in longitudinal direction, the shifting of said bracket (72) being implemented by rotating said screw (77).
6. A protective garment (6), in particular for motorcycle activities, comprising a protection device according to claims 1 to 5, wherein said fastening base (2) is obtained by injected plastic material in a portion corresponding to the underneath of a knee of said protective garment (6).

Patentansprüche

1. Schutzvorrichtung, aufweisend eine Befestigungs-
basis (2), eine bewegliche Platte (3) und ein Schutz-
element (1), das im Wesentlichen ein Schutzzele-
ment mit Gleitmechanismus ist, wobei das Schutz-
element (1) mittels eines abnehmbaren Befesti-
gungsmittels (7) mit der beweglichen Platte (3) ver-
bunden ist, ein Verbindungsmittel (4) zum selektiven
Gleiten der beweglichen Platte (3) auf der Befesti-
gungsbasis (2) und zum Verriegeln derselben, um
das Schutzelement (1) zusammen mit der bewegli-
chen Platte (3) in einer gewählten Position anzuord-
nen,
dadurch gekennzeichnet, dass das Verbindungs-
mittel (4) ferner Führungen (41, 42) aufweist, die im
Wesentlichen orthogonal dazwischen angeordnet
sind. 5
2. Schutzvorrichtung nach dem vorhergehenden An-
spruch, wobei die Führungen (41, 42) mittels Öff-
nungen (43, 44) implementiert sind und längliche
Elemente (47) an Positionierungseinrichtungen (45,
46) befestigt sind, die innerhalb der Öffnungen (43,
44) gleitend angeordnet sind, wobei die Befesti-
gungsbasis (2) und die mobile Platte (3) zwischen
den Positionierungseinrichtungen (45, 46) beinhal-
tet sind. 10
3. Schutzvorrichtung nach dem vorhergehenden An-
spruch, wobei es sich bei den länglichen Elementen
um Schrauben (47) handelt, die so angeordnet sind,
dass sie den Abstand zwischen den Positionierungs-
einrichtungen (45, 46) und die Gleitbewegung der-
selben in die Öffnungen (43, 44) und die Verriegel-
ung derselben durch das Anziehen der Schrauben
(47) variieren. 15
4. Schutzvorrichtung nach einem der vorhergehenden
Ansprüche, wobei das Befestigungsmittel (7) einen
feststehenden Bügel (71) und einen beweglichen
Bügel (72) für die Eingriffnahme derselben auf ent-
sprechenden Aufnahmen (31) aufweist. 20
5. Schutzvorrichtung nach dem vorhergehenden An-
spruch, wobei der bewegliche Bügel (72) mit einer
Schraube (77) verbunden ist, wobei die Schraube
(77) in Bezug auf eine jeweilige Aufnahme (78) lose
eingefügt und in der Längsrichtung eingeschränkt
ist, wobei das Verschieben des Bügel (72) durch
Drehen der Schraube (77) implementiert wird. 25
6. Schutzbekleidung (6), insbesondere für Aktivitäten
in Verbindung mit einem Motorrad, aufweisend eine
Schutzvorrichtung nach den Ansprüchen 1 bis 5, wo-
bei die Befestigungsbasis (2) durch ein in einen Be-
reich injiziertes Kunststoffmaterial erhalten wird, der
dem unterhalb eines Knies der Schutzbekleidung (6) 30

entspricht.

Revendications

1. Dispositif de protection comprenant une base de
fixation (2), une plaque mobile (3), et un élément de
protection (1) sensiblement du type « glissière », le-
dit élément de protection (1) étant raccordé à ladite
plaque mobile (3) au moyen de moyens de fixation
amovibles (7), des moyens de raccordement (4) pour
faire coulisser sélectivement ladite plaque mobile (3)
sur ladite base de fixation (2) et bloquer cette der-
nière, afin de placer ledit élément de protection (1)
avec ladite plaque mobile (3) dans une position choi-
sie,
caractérisé en ce que lesdits moyens de raccorde-
ment (4) comprennent en outre des guides (41, 42)
agencés de manière sensiblement orthogonale en-
tre eux. 5
2. Dispositif de protection selon la revendication pré-
cédente, dans lequel lesdits guides (41, 42) sont mis
en oeuvre au moyen des ouvertures (43, 44), et des
éléments allongés (47) fixés à des curseurs (45, 46)
agencés de manière coulissante à l'intérieur desdi-
tes ouvertures (43, 44), ladite base de fixation (2) et
ladite plaque mobile (3) étant comprises entre lesdits
curseurs (45, 46). 10
3. Dispositif de protection selon la revendication pré-
cédente, dans lequel lesdits éléments allongés sont
des vis (47) agencées pour modifier la distance entre
lesdits curseurs (45, 46) et leur coulissement dans
lesdites ouvertures (43, 44) et leur blocage par le
serrage desdites vis (47). 15
4. Dispositif de protection selon l'une quelconque des
revendications précédentes, dans lequel lesdits
moyens de fixation (7) comprennent une console fixe
(71) et une console mobile (72) pour leur mise en
prise sur des sièges (31) respectifs. 20
5. Dispositif de protection selon les revendications pré-
cédentes, dans lequel ladite console mobile (72) est
couplée à une vis (77), ladite vis (77) étant insérée
à l'arrêt sur un siège (78) respectif et retenue dans
la direction longitudinale, le déplacement de ladite
console (72) étant mis en oeuvre en faisant tourner
ladite vis (77). 25
6. Vêtement de protection (6), en particulier pour des
activités en motocyclette, comprenant un dispositif
de protection selon les revendications 1 à 5, dans
lequel ladite base de fixation (2) est obtenue avec
une matière plastique injectée dans une partie cor-
respondant à la face inférieure d'un genou dudit vê-
tement de protection (6). 30

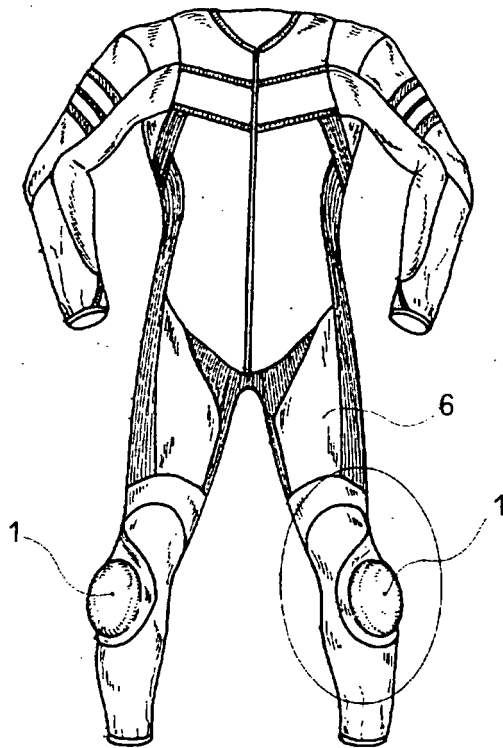


FIG.1

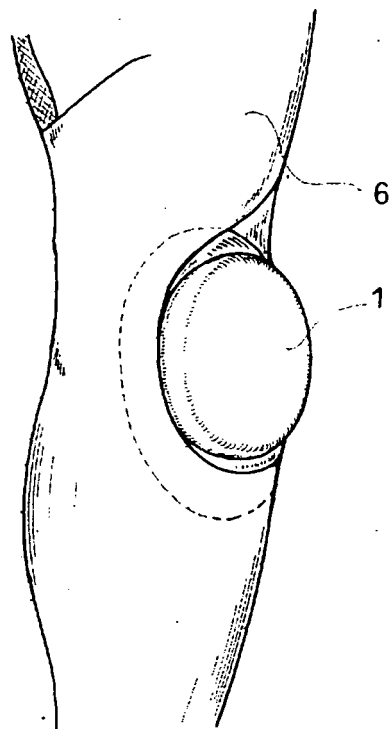
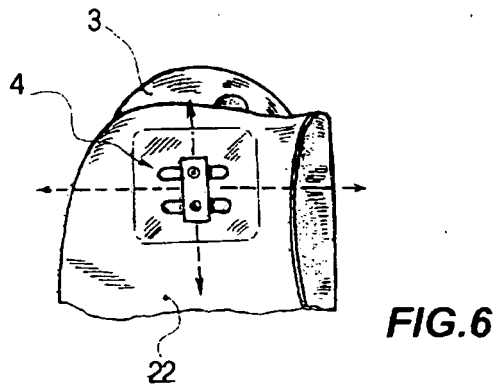
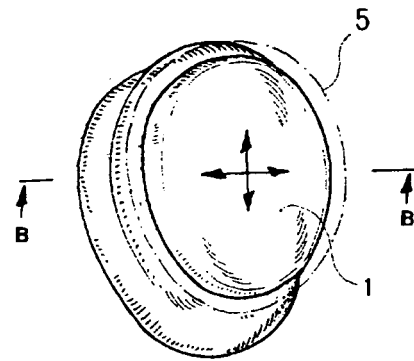
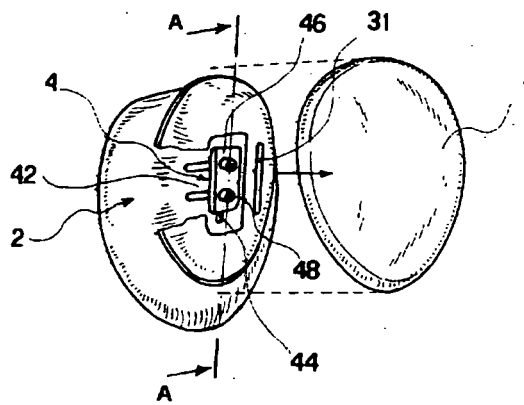
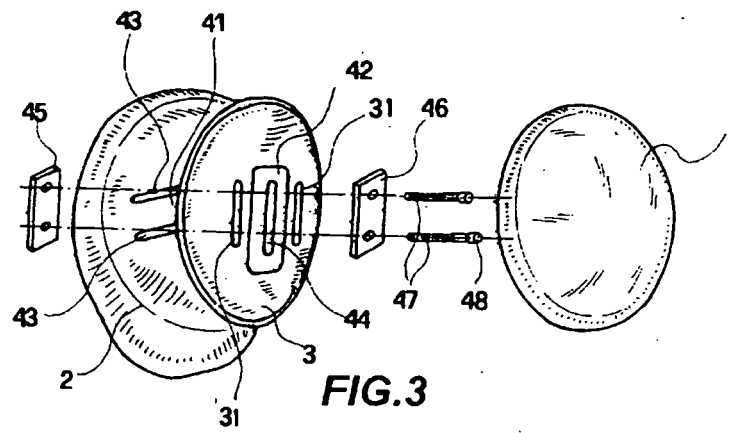


FIG.2



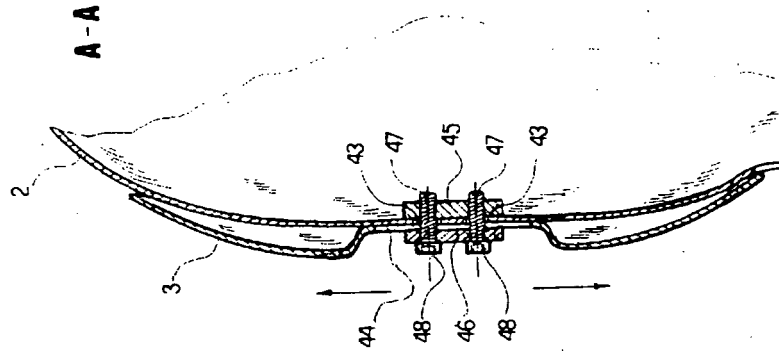


FIG.7

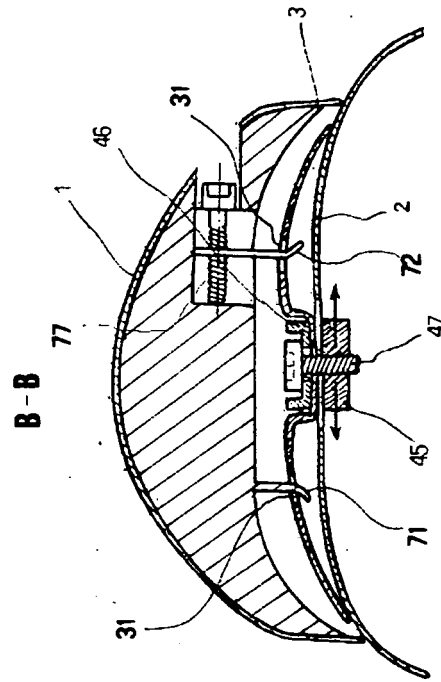


FIG.8

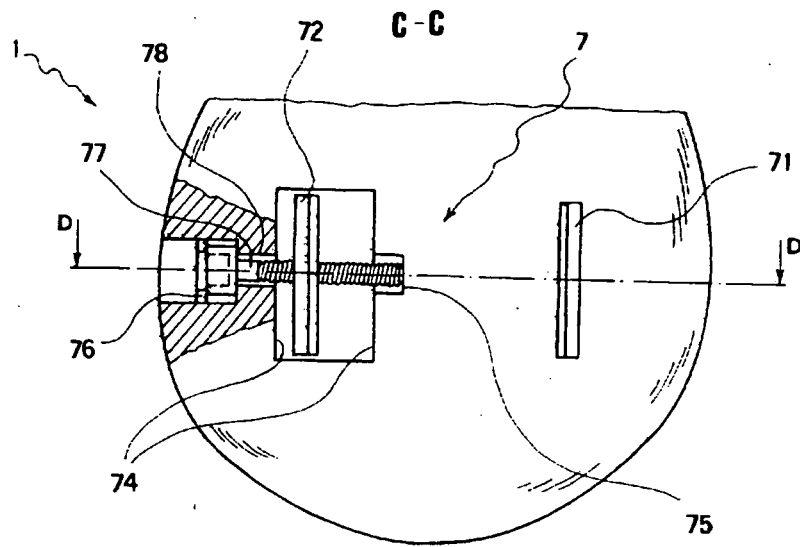


FIG. 9A

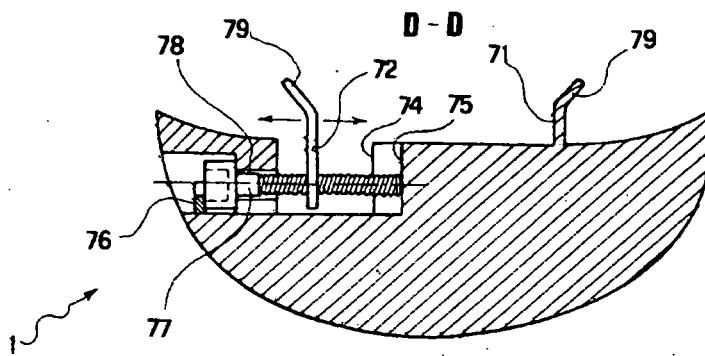


FIG. 9B

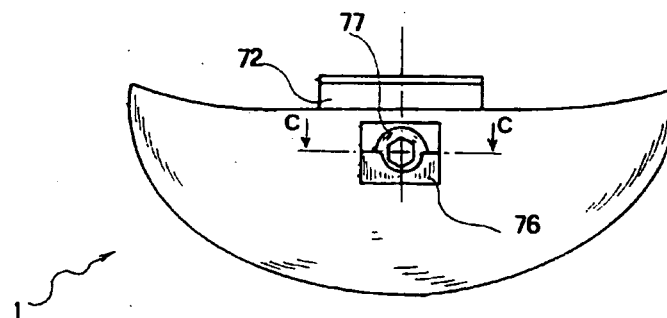


FIG. 9C

REFERENCES CITED IN THE DESCRIPTION

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