(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 207 446 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
14.12.2011 Bulletin 2011/50

(21) Application number: **08839938.1**

(22) Date of filing: **17.10.2008**

(51) Int Cl.:
A42B 3/14 *(2006.01)* ***A42B 3/32*** *(2006.01)*
A42C 2/00 *(2006.01)*

(86) International application number:
PCT/GB2008/003512

(87) International publication number:
WO 2009/050471 (23.04.2009 Gazette 2009/17)

(54) **A method of manufacturing a safety helmet**

Verfahren zum Herstellen eines Schutzhelms

Procédé de fabrication d'un casque de protection

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR

(30) Priority: **19.10.2007 GB 0720441**
16.07.2008 GB 0812963

(43) Date of publication of application:
21.07.2010 Bulletin 2010/29

(60) Divisional application:
11007299.8

(73) Proprietor: **Centurion Safety Products Limited**
Norfolk IP24 1HZ (GB)

(72) Inventors:
- **FORREST, Jacques, William**
  Norfolk IP24 1HZ (GB)
- **ROSE, Gary, Martin**
  Essex SS3 9QP (GB)
- **GARCIN, Christopher, Bryson**
  London N8 9LA (GB)
- **ANNS, Peter, Lawrence**
  Norfolk IP24 1HZ (GB)

(74) Representative: **Harrison, Paul Richard**
Novagraaf Norwich Limited
12 Meridian Way
Meridian Business Park
Norwich NR7 0TA (GB)

(56) References cited:
WO-A-2005/027671 **WO-A-2005/067752**
GB-A- 850 529 **US-A- 3 471 866**

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 2 207 446 B1

Printed by Jouve, 75001 PARIS (FR)

Description

Field of the Invention

[0001] The present invention relates to a method of manufacturing safety helmet. In particular, it pertains to a helmet which can be easily assembled.

Background to the Invention

[0002] Safety helmets, also referred to as hardhats are well known and widely used in a diverse range of industries. The helmets are for protection to the wearer's head to protect against falling objects and also against obstacles which are located at head height and which can easily cause accidental damage as persons move about a workplace. The helmets can in addition be employed as a support means for further safety elements. For example, provision is normally provided, often as part of the helmet's structure to attach ear defenders, reflective markers, identification labels etc. It is important when making such provision that the further safety elements can be easily replaced if required, for example for worn or damaged elements.

[0003] The material from which the helmets are formed must first and foremost therefore be impact resistant. However, they must allow the helmet to be worn over prolonged periods without causing undue discomfort to the wearer. This latter criterion not only applies to the physical aspects of the helmet rubbing against the person's scalp, but can also apply to less obvious considerations. For example, unless ventilation is included, the helmet can trap heat and moisture in the volume above the wearer's head.

[0004] A further problem with prior art helmets lies with their assembly. Typically, a helmet comprises a hard plastic shell which ultimately serves as the protecting element of the helmet. A number of tapes, of differing length need to be secured within the inside of the helmet. Said tapes are secured in place by means of an adhesive, ultrasonic welding, sewing or a support component which is secured to the shell through specially designed fitments, fixing the tapes between the support component and the shell. The tapes form thereby a flexible web which engages the wearer's head, keeping the helmet in position and also providing a cushioning effect if the helmet is struck.

[0005] GB 850,529 discloses a helmet where the straps are held in position by support components.

[0006] Assembly of the completed helmet from the components can therefore be time consuming. Moreover, the assembly is normally done by specialists on site at the place of manufacture. The assembled helmets are therefore not easily transported in a way which maximises space as the helmets do not stack well and include empty volume.

[0007] It is also of advantage for helmets to be available which enable secondary fixing mechanisms to be included, allowing additional features to be incorporated into a helmet. Such additional features include reflectors, pencil holders and the like. For prior art helmets the flexibility to include these secondary fixing mechanisms is limited due to the problems they would cause during the moulding step.

[0008] It is an object of the present invention to address the above problems, and provide a more easily and transportable safety helmet.

Summary of the Invention

[0009] According to the invention there is provided a method of manufacturing a safety helmet, the method including the steps of;

(i) providing an upper, substantially hemispherical protecting shell, formed of a plastics material to protect the skull of the wearer when in use;

(ii) providing a lower helmet section;

(iii) the lower helmet section including engaging means for support tape;

(iv) securing each end of the support tape with a tape engaging means such that the tape spans the lower helmet section, and securing sufficient tape to provide a web of material to rest on a wearer's head and support the helmet;

(v) engaging the lower helmet section with the upper helmet section, said engagement pushing the tape engaging means against the upper helmet shell, thereby sandwiching the tape ends and restricting movement of said tape ends.

[0010] A helmet can therefore be more rapidly produced than previously was the case.

[0011] Preferably the support tape comprises a plurality of tape sections secured together about the central region of each tape and particularly preferably, each tape used in a helmet is of the same length. As a common tape length is used, manufacturing and assembly times are reduced.

[0012] Conveniently, the pushing of the tape engaging means against the upper helmet shell traps a tape in position to prevent the tape's movement.

[0013] Optionally, the tape includes one or more apertures defined in the end regions enabling the tape to be fitted over corresponding locating means on the tape-engaging means. The fitment of a tape is thereby facilitated and the risk of the tape slipping during helmet assembly is reduced. The tape further optionally includes two apertures which number reduces twisting of the tape but does not weaken the tape. Conveniently the or each locating means is a peg. Yet further optionally, the free end of each peg has a portion of conical cross-section,

to give an arrow-like appearance, the basal portion of the conic portion being of greater diameter than that of the peg. The design enables a tape to easily pass over the conic portion onto the peg, but not easily be removed.

[0014] Conveniently, the interior of the shell includes downwardly depending, parallel walls defining an internal volume, into which the lower section, including the engagement means can be fitted, the lower section and the walls including securing means to resist separation.

[0015] The upper shell preferably comprises a ventilation means, the ventilation means including an internal channel defined by the roof of the helmet, the channel being wider at a forward end than the rearward end and being connected by a rearward aperture to the exterior of the helmet. Ventilation is thereby provided allowing movement of heat and moisture out of the volume of the shell and the wearer's head. The greater width of the forward end compared with the rearward end providing a pressure differential drawing air from within the shell and out of an aperture.

[0016] The rearward aperture is further preferably orientated in a downward direction, to minimise the ingress of material from the outside. The lowest point of the tunnel is optionally located above the highest point of the rearward aperture to prevent fluid flowing from outside the helmet onto the wearer's head.

[0017] Optionally, the lower helmet portion includes fitment means enabling accessories such as reflectors, neckshields, pencil holders and the like to be attached. Said fitment means are further optionally apertures engaging tabs on an accessory.

Brief Description of the Drawings

[0018] The invention will now be described with reference to the accompanying drawings which show by way of example only one embodiment of a safety helmet. In the drawings:

Figure 1 is a front view of a helmet;
Figure 2 is a sectional view along A-A of Figure 1;
Figure 3 is a top view of a helmet;
Figure 4 is a sectional view along B-B of the Figure 3;
Figure 5 is a rear perspective view of a helmet;
Figures 6,7 and 8 show an exploded view of the side, front and perspective of the assembly of a helmet;
Figure 9 is a perspective view of a completed helmet;
Figures 10 and 11 illustrate a second embodiment of a peg;
Figures 12-15 illustrate fitment means for accessories; and
Figures 16-24 illustrate accessories usable on the helmet.

Detailed Description of the Invention

[0019] Referring initially to Figure 1, the helmet 1 can be seen to include a number of features which are common to conventionally made helmets. The shell 10 of the helmet 1 is formed of a rigid impact resistant and non-electrically conducting plastics material. The frontpiece 11 or badging area is flat and can be used to identify the wearer or the company represented, by affixing a label thereto. A peak 12, below the frontpiece 11 acts to prevent injury to the wearer's face and eyes from material falling from above.

[0020] In order to alleviate the heat problem indicated above, the helmet 1 includes a ventilation means. Referring to Figures 2 to 4 a ventilation ridge 13 runs from a front portion of the top of the helmet 1 towards a rearward exterior opening into the inside of the helmet 1 at aperture 14. The ridge 13 defines an internal channel 14a running from the front towards the rear of the helmet 1. Said channel, opening to the outside at the aperture 14 is larger in width at the forward interior end than at the rearward end, and is also larger than the aperture 14. The channel 14a therefore connects the interior volume at the top of the helmet 1 with the outside.

[0021] The aperture 14 is orientated downwardly to minimise ingress of material through the aperture 14. Heat and moisture which would otherwise accumulate above the wearer's head are thereby removed. The aperture 14 together with the narrowing of the channel 14a towards that aperture 14 act to produce a slight lowering of pressure which draws air from the interior volume of the helmet and aids the cooling process. An additional optional exterior channel 16 is included to aid run off of moisture from the helmet 1. If required, a stopper or bung can be employed to close the hole for example, to minimise the risks where there is a danger of hot materials splashing in to the aperture. Alternatively, a stopper or bung can be used to prevent the user's head from becoming too cold.

[0022] Within prior art helmets a supporting structure - often referred to as a cradle - is fitted inside the shell 10 and acts as a support for a number of tapes which span the internal volume of the shell 10. The tapes combine together to form a web, which web of tapes acts to support the helmet when in use and also to absorb forces impacting the helmet.

[0023] Prior to insertion into the helmet shell the tapes, usually three in number, are sewn together at a common point, approximately central to each tape.

[0024] Special attachment means are then used to fix the free ends of the tapes to a cradle. The cradle and tape assembly is fixed into the helmet shell, rendering the helmet ready for use.

[0025] Due to the difficult nature of the above assembly method, these steps are typically done prior to dispatch of the helmets from a specialist manufacturing site. The result of this is firstly increased manufacturing times and secondly higher transport costs due to the poor stackability of completed helmets.

[0026] The method of assembly of a helmet according to the invention described herein facilitates the processes involved. The method also allows for all the tapes to be

used to be of the same length, reducing assembly time and lowering manufacturing costs.

[0027] In Figures 6-8, it can be seen that the helmet shell 60 is formed from two separate sections 61,62. The upper section 61 includes the ventilation tunnel 14a indicated above, although this feature is not essential to the working of the method of assembly. complementary features on the upper section 61 enable the invention to function. Firstly, at intervals around the lower section 62, tape securing elements 63 are located. Each securing element 63 has an outwardly facing planar surface 64. Two pegs 65 project upwardly from the securing element 63 which engage the end regions of a tape 66. To facilitate said engagement, holes (not illustrated) corresponding to the diameter and separation of the pegs 65 can be formed in the tape 66.

[0028] In the embodiment shown the lower section 61 has six securing elements 63, enabling three tapes 66 to be fitted combining together to form a supporting web inside the helmet 60. By suitable location of the securing elements 63, the distance between diametrically opposed elements 63 can be made the same, enabling therefore only one length of tape 66 to be used. Such standardisation reduces production and assembly costs.

[0029] In order to secure the upper and lower sections 61,62 to one another, a push-fit fixing mechanism is provided. Male fixing tabs are supplied on the lower portion 62. Said tabs are formed of a plastics material and are partially resilient. The corresponding female elements on the upper section 61 engage the male tabs, and vice versa, to provide a firm fitment. The resilient nature of the tabs enables the two sections 61,62 to be separated only with difficulty. The temptation for a wearer to carry out repairs if one section is damaged is therefore reduced: such repairs often being dangerous as, following an impact, weakening of the shell can occur which is not visible, but renders the helmet unsafe with regard to its being used further. The one-way fit also provides the helmet as a coherent unit comparable to conventional helmets.

[0030] To assist fitment together of the two sections, the upper section 61 has a double skin 67,68 which both guides the lower section 62 into position and also subsequently strengthens the completed unit.

[0031] In order to assemble the completed helmet therefore, an upper section 61 is selected and positioned such that the other elements can be added thereto. A lower section 62 is selected along with three tapes 66 of equal length. The pegs 65 are located within the holes at the end of each tape 66, with the tapes 66 thereby secured to the securing elements 63 on opposing sides of the lower section 61.

[0032] The upper and lower sections 61,62 are then brought together. In so doing the securing elements 63 pass between the walls of the double skins 67,68 carrying the tape 66. The free ends of a tape 66 are thereby sandwiched between the planar face 64 of a securing element 63 and the outer skin 68. Once the two sections 61,62 are clicked into their final position, the tapes 66 are held firmly in position to form a supporting web. The helmet 60 is then ready for use.

[0033] An additional embodiment, of peg is shown in Figures 10 and 11. The pegs 110 have, in cross-section, and arrow-head configuration. Once the peg 110 has passed through the tape 66 therefore the peg 110 is difficult to remove and almost impossible without irreparably damaging the tape 66.

[0034] A further feature displayed by the helmet 60 is the neck guard 70, which is included as an extension of the lower section 62.

[0035] In an alternative embodiment, not illustrated, a supporting web can be used in place of the tapes. The web includes tabs to enable the web to be secured in position. Alternatively, a plastic webbing or cradle can be used.

[0036] The helmet manufactured according to the present invention is defined to be used in conjunction with other safety apparatus. For example, fitments means to accommodate the use of ear defenders is included. The use of ear defenders is well known and different fitments means have been developed and in many regions become standard. For example standard fitments are in use in the United Kingdom with different standards in Continental Europe. The helmet manufactured according to the present invention is capable of use with both fitments. Additionally, visor carriers and visors, brow guards and weld shields.

[0037] The fitment means are exemplified in Figures 12-15. In Figure 12, a fitment clip 120 is shown typical for a standard UK fitment. The clip 120 has two downwardly depending arms 121. The arms 121 have limited resilience enabling the arms 121 to bend outwardly from the plane of the clip 120 if a force is applied. Once the force is removed however, the arms 121 revert to the configuration shown. The clip 120 further includes a tab 122, also depending downwardly to engage a fitment on the helmet 1.

[0038] Typically within the UK, the clip 120 engages a fitment 130, on the side of a helmet, shown in Figure 13. The tab 122 passes into the slot 131 in the fitment. Moreover, each arm 121 passes over the surfaces 132, bending due to the force exerted by the surface 132, until the clip portion 123 of the arm passes over the end of the surface 132. Once the clip portion 123 passes over the end, the arm 121 reverts to its normal position and the clip portion passes under the helmet 1 to hold the fitment clip 120 in position, with the support section 124 against the outer surface of the helmet 1. An accessory can then be fitted to the outer surface 125 of the fitment clip 120.

[0039] The fitment 130 is however unsuitable for use with the continents European clip 140 shown in Figure 14. A modified fitment 150, shown in Figure 15 can therefore be included on a helmet 1, which modified fitment can accommodate both types of clip 120 and 140. The fitment 150 is similar to that shown in Figure 13. The slot 151 is firstly broader to allow passage of the tab 141.

Moreover the outer surface 152 of this slot 151 includes a throughaperture 153 to receive the projecting tab 142.

[0040] As the tab 141 is therefore pushed into the slot 151, the resilient material from which the tab 141 is formed allowing the tab 141 to bend inwardly. Downward pressure is continued until the tab 141 engages this and enters the aperture 153. The tab 141 then springs back to its normal configuration pushing the tab 141 into the aperture 153 and fixing the fitment 150 in position.

[0041] In addition to the above cited advantages, the use of a two part construction enables fixing mechanisms to be readily incorporated enabling secondary accessories such as reflectors, pencil holders and the like to be included as part of the finished product. The fixing mechanisms are typically slots within the helmet, which slots do not affect the integrity of the helmet.

[0042] Examples of this are shown in Figures 16-24. In Figure 16 and 17, upper slots 160 can be seen on the rear portion 161, together with a lower slot 162 to receive the particular accessories, illustrated in Figures 16 and 17 by a reflector 163. The reflector 163 includes hooks 164 insertable into the slots 160, 162 to secure the reflector 163 in position.

[0043] In the following Figures, the same principle can be seen to serve to support other accessories. So in Figures 18-24 are shown a goggle strapholder 165, lamp cable holder 166, an Radio Frequency (RF) card holder 167, a centrally mounted card holder 168, a neck cover 169, an air supply feed 170 linked into the air vent slot and a pencil holder 171.

[0044] As the tab 141 is therefore pushed into the slot 151, the resilient materials from which the tab 141 is formed allowing the tab 141 to bend inwardly. Downward pressure is confirmed until the tab 141 engages this and enters the aperture 153. The tab 141 then springs back to its normal configuration pushing the tab 141 into the aperture 153 and fixing the fitment 150 in position.

[0045] It will of course be understood that the invention is not limited to the specific details described herein, which are given by way of example only, and that various modifications and alterations are possible within the scope of the invention, as defined by the claims.

Claims

1. A method of manufacturing a safety helmet (1), the method including the steps of;

   providing an upper, substantially hemispherical protecting shell (10), formed of a plastics material to protect the skull of the wearer when in use;
   providing a lower helmet section (61);
   the lower helmet section (61) including engaging means for support tape (66);
   securing each end of the support tape (66) with a tape engaging means (63) such that the tape spans the lower helmet section, and securing sufficient tape (66) to provide a web of material to rest on a wearer's head and support the helmet (1);
   engaging the lower helmet section (61) with the upper helmet section, **characterised by** said engagement pushing the tape engaging means against the upper helmet shell (10), thereby sandwiching the tape ends and restricting movement of said tape ends.

2. A method according to Claim 1 wherein the support tape comprises a plurality of tape sections secured to each other about a central region of each tape section.

3. A method according to Claim 2, wherein each tape used in a helmet is of the same length.

4. A method according to any preceding claim, wherein the pushing of the tape engaging means against the upper helmet shell traps a tape in position to prevent the tape's movement.

5. A method according to any preceding Claim, wherein the tape includes one or more apertures defined in the end regions enabling the tape to be fitted over corresponding locating means on the tape-engaging means.

6. A method according to Claim 5, wherein the tape includes two apertures.

7. A method according to any preceding claim, wherein the or each locating means is a peg (65).

8. A method according to Claim 7, wherein the free end of each peg (65) has a portion of conical cross-section, to give an arrow-like appearance, the basal portion of the conic portion being of greater diameter than that of the peg (65).

9. A method according to any preceding Claim, wherein the interior of the shell includes downwardly depending, parallel walls defining an internal volume, into which the lower section, including the engagement means, can be fitted, the lower section and the walls including securing means to resist separation.

10. A method according to any preceding Claim, wherein the upper shell comprises a ventilation means, the ventilation means including an internal channel (14a) defined by the roof of the helmet, the channel being wider at a forward end (14) than the rearward end and being connected by a rearward aperture to the exterior of the helmet.

11. A method according to Claim 12, wherein the rearward aperture is orientated in a downward direction,

to minimise the ingress of material from the outside.

12. A method according to Claim 11, wherein the lowest point of the tunnel is located above the highest point of the rearward aperture.

13. A method according to any preceding claim, wherein the lower helmet portion includes fitment means enabling accessories such as reflectors, neckshields, pencil holders and the like to be attached.

14. A method according to Claim 13 wherein said fitment means are apertures engaging tabs on an accessory.

Patentansprüche

1. Verfahren zur Herstellung eines Schutzhelm5 (1), wobei das Verfahren die folgenden Schritte beinhaltet:

Bereitstellen einer oberen, im Wesentlichen halbkugelförmigen Schutzschale (10), die aus einem Plastikmaterial gebildet ist, um den Schädel des Trägers beim Gebrauch zu schützen;
Bereitstellen eines unteren Helmabschnitts (61);
wobei der untere Helmabschnitt (61) Eingriffsmittel für Tragband (66) aufweist;
Befestigen jedes Endes des Tragbands (66) mit einem Bandeingriffsmittel (63), so dass das Band den unteren Helmabschnitt überspannt, und Refestigen von genügend Band (66), damit eine Materialbahn auf dem Kopf des Trägers ruht und den Helm (1) trägt;
Ineingriffbringen des unteren Helmabschnitts (61) mit dem oberen Helmabschnitt, **dadurch gekennzeichnet, dass** durch den genannten Eingriff das Bandeingriffsmitte7, gegen die obere Helmschale (10) gedrückt wird und so die Bandenden eingeschlossen werden und die Bewegung der genannten Bandenden eingeschränkt wird.

2. Verfahren nach Anspruch 1, wobei das Tragband mehrere Bandabschnitte umfasst, die aneinander um eine mittlere Region jedes Bandabschnitts befestigt sind.

3. Verfahren nach Anspruch 2, wobei jedes in einem Helm benutzte Band dieselbe Länge hat.

4. Verfahren nach einem der vorherigen Ansprüche, wobei durch das Schieben des Bandeingriffsmittels gegen die obere Helmschale ein Band festgeklemmt wird, um eine Bewegung des Bandes zu verhindern.

5. Verfahren nach einem der vorherigen Ansprüche, wobei das Band eine oder mehrere in den Endregionen definierte Öffnungen aufweist, so dass das Band über entsprechende Positionierungsmittel an dem Bandeingriffsmittel geführt werden kann.

6. Verfahren nach Anspruch 5, wobei das Band zwei Öffnungen aufweist.

7. Verfahren nach einem der vorherigen Ansprüche, wobei das oder jedes Positionierungsmittel ein Stift (65) ist.

8. Verfahren nach Anspruch 7, wobei das freie Ende jedes Stifts (65) einen Teil mit konischem Querschnitt hat, um ihm ein pfeilähnliches Aussehen zu verleihen, wobei der Basisabschnitt des konischen Teils einen größeren Durchmesser hat als der Stift (65).

9. Verfahren nach einem der vorherigen Ansprüche, wobei das Innere der Schale abwärts hängende, parallele Wände aufweist, die ein Innenvolumen definieren, in das der untere Abschnitt, einschließlich des Eingriffsmittels, gesetzt werden kann, wobei der untere Abschnitt und die Wände Befestigungsmittel als Sicherung gegen ein Lösen aufweisen.

10. Verfahren nach einem der vorherigen Ansprüche, wobei die obere Schale ein Ventilationsmittel aufweist, wobei das Ventilationsmittel einen durch das Dach des Helms definierten Innenkanal (14a) aufweist, wobei der Kanal an einem vorderen Ende (14) breiter ist als am hinteren Ende und über eine hintere Öffnung mit der Außenseite des Helms verbunden ist.

11. Verfahren nach Anspruch 10, wobei die hintere Öffnung in einer Abwärtsrichtung orientiert ist, um das Eindringen von Material von außen minimal zu halten.

12. Verfahren nach Anspruch 11, wobei sich der tiefste Punkt des Tunnels über dem höchsten Punkt der hinteren Öffnung befindet.

13. Verfahren nach einem der vorherigen Ansprüche, wobei der untere Helmteil Montagemittel aufweist, so dass Zubehörteile wie Reflektoren, Nackenwärmer, Bleistifthalter und dergleichen angebracht werden können.

14. Verfahren nach Anspruch 13, wobei das genannte Montagemittel Öffnungen sind, die in Zungen an einem Zubehörteil eingreifen.

Revendications

1. Procédé de fabrication d'un casque de sécurité (1), le procédé comprenant les étapes qui consistent à :

   fournir une coque de protection supérieure, fondamentalement hémisphérique (10), formée d'une matière plastique, pour protéger le crâne de la personne portant le casque en cours d'utilisation ;
   fournir une section de casque inférieure (61) ;
   la section de casque inférieure (61) intégrant des moyens d'engagement pour une courroie de support (66) ;
   fixer chaque extrémité de la courroie de support (66) avec un moyen d'engagement de courroie (63) de telle sorte que la courroie s'étende à travers la section de casque inférieure, et fixer une longueur de courroie (66) suffisante pour former une bande de matériau reposant sur la tête d'une personne portant le casque et supportant le casque (1) ;
   engager la section de casque inférieure (61) avec la section de casque supérieure, **caractérisé en ce que** ledit engagement pousse les moyens d'engagement de courroie contre la coque de casque supérieure (10), en positionnant ainsi en sandwich les extrémités de la courroie et en limitant le déplacement desdites extrémités de la courroie.

2. Procédé selon la revendication 1, dans lequel la courroie de support comprend une pluralité de sections de courroie fixées les unes aux autres autour d'une région centrale de chaque section de courroie.

3. Procédé selon la revendication 2, dans lequel chaque courroie utilisée dans un casque a la même longueur.

4. Procédé selon l'une quelconque des revendications précédentes, dans lequel le fait de pousser les moyens d'engagement de courroie contre la coque de casque supérieure bloque une courroie en place pour empêcher le déplacement de la courroie.

5. Procédé selon l'une quelconque des revendications précédentes, dans lequel la courroie comprend une ou plusieurs ouvertures définies dans les régions d'extrémité permettant la mise en place de la courroie par-dessus des moyens de positionnement correspondants sur les moyens d'engagement de courroie.

6. Procédé selon la revendication 5, dans lequel la courroie comprend deux ouvertures.

7. Procédé selon l'une quelconque des revendications précédentes, dans lequel le ou chaque moyen de positionnement est une cheville (65).

8. Procédé selon la revendication 7, dans lequel l'extrémité libre de chaque cheville (65) comporte une portion ayant une section transversale conique, pour produire une apparence semblable à une flèche, la portion de base de la portion clonique ayant un diamètre supérieur à celui de la cheville (65).

9. Procédé selon l'une quelconque des revendications précédentes, dans lequel l'intérieur de la coque comprend des parois orientées vers le bas, parallèles, définissant un volume interne, dans lequel la section inférieure, y compris les moyens d'engagement, peut être montée, la section inférieure et les parois intégrant des moyens de fixation pour résister la séparation.

10. Procédé selon l'une quelconque des revendications précédentes, dans lequel la coque supérieure comprend un moyen de ventilation, le moyen de ventilation comprenant un canal interne (14a) défini par le sommet du casque, le canal étant plus large à une extrémité antérieure (14) qu'à l'extrémité postérieure et étant connecté par une ouverture postérieure l'extérieur du casque.

11. Procédé selon la revendication 10, dans lequel l'ouverture postérieure est orientée vers le bas, pour minimiser la pénétration de matières à partir de l'extérieur.

12. Procédé selon la revendication 11, dans lequel le point le plus bas du tunnel est situé au-dessus du point le plus haut de l'ouverture postérieure.

13. Procédé selon l'une quelconque des revendications précédentes, dans lequel la partie inférieure du casque intègre des moyens de montage permettant de monter des accessoires tels que des réflecteurs, des protège-nuque, des porte-crayons et des accessoires similaires.

14. Procédé selon la revendication 13, dans lequel lesdits moyens de montage sont des ouvertures qui s'engagent avec des languettes sur un accessoire.

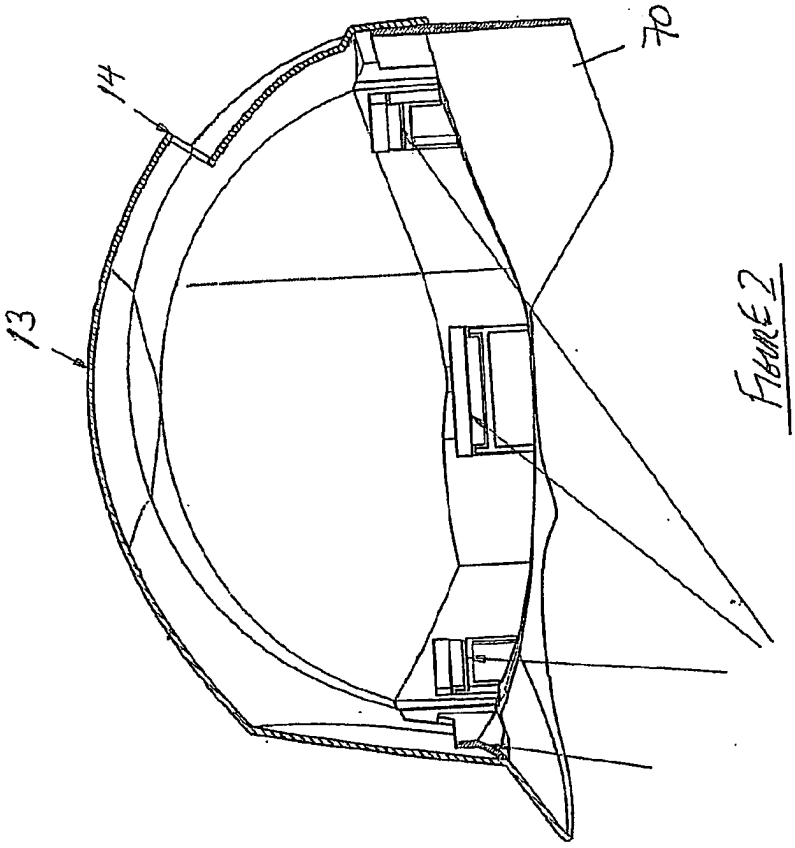


FIGURE 2

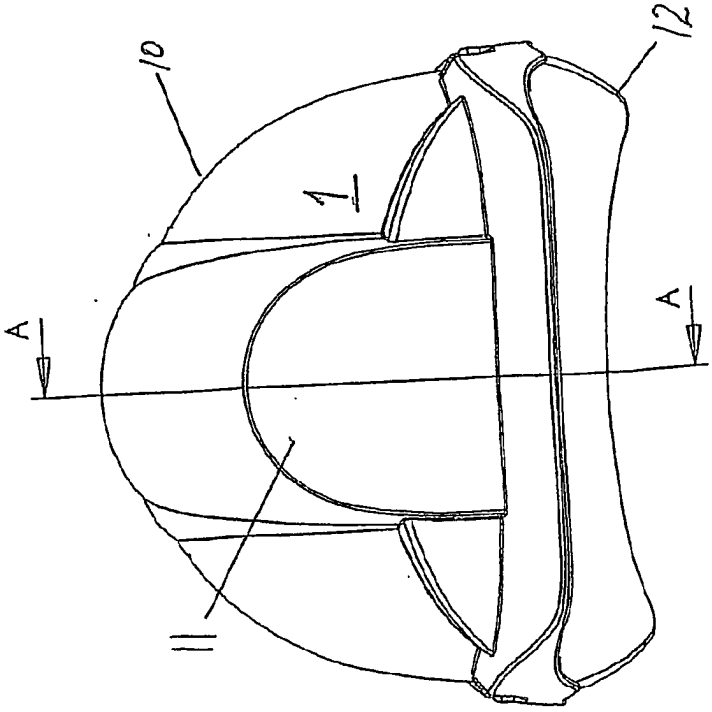


FIGURE 1

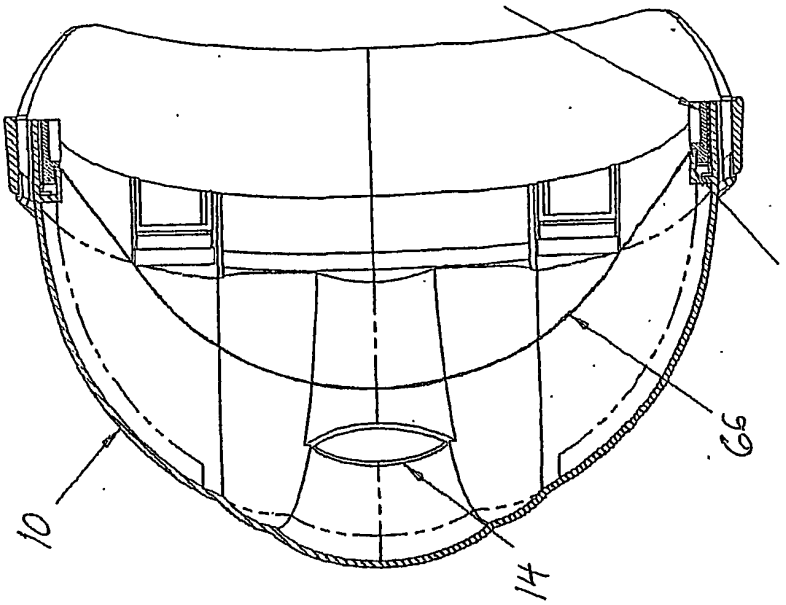


FIGURE 4

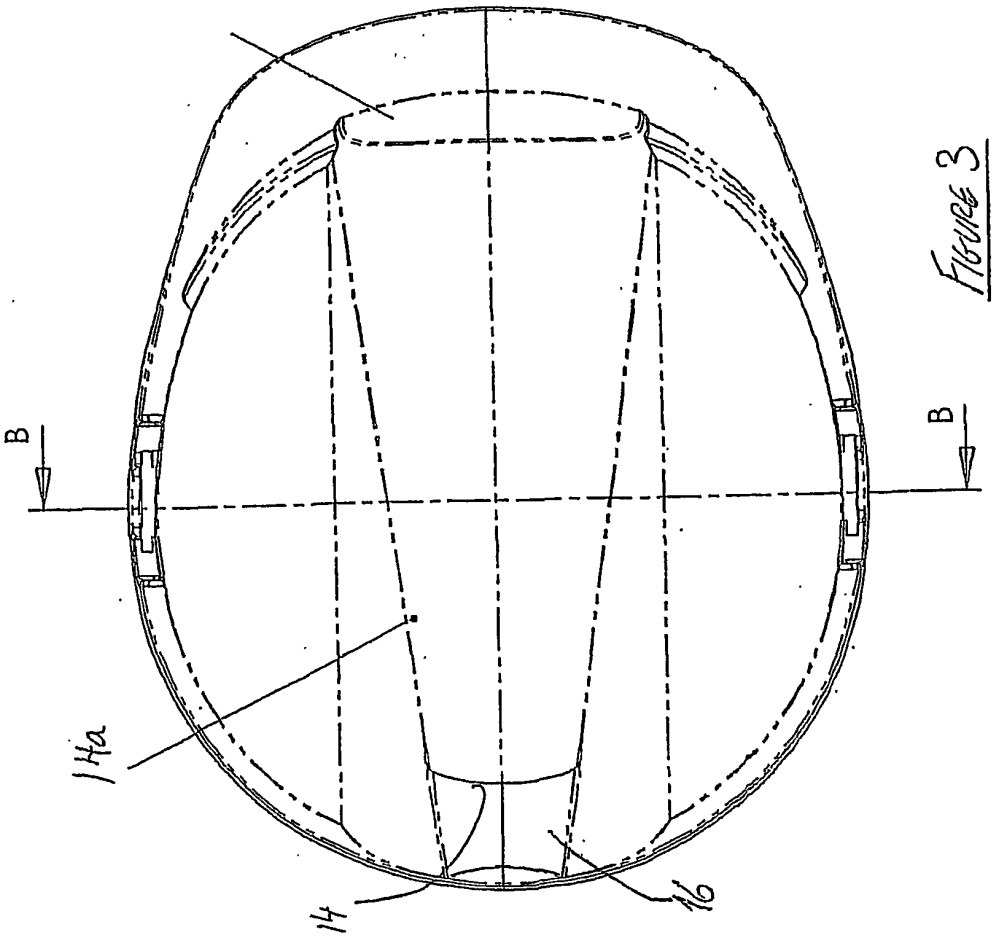


FIGURE 3

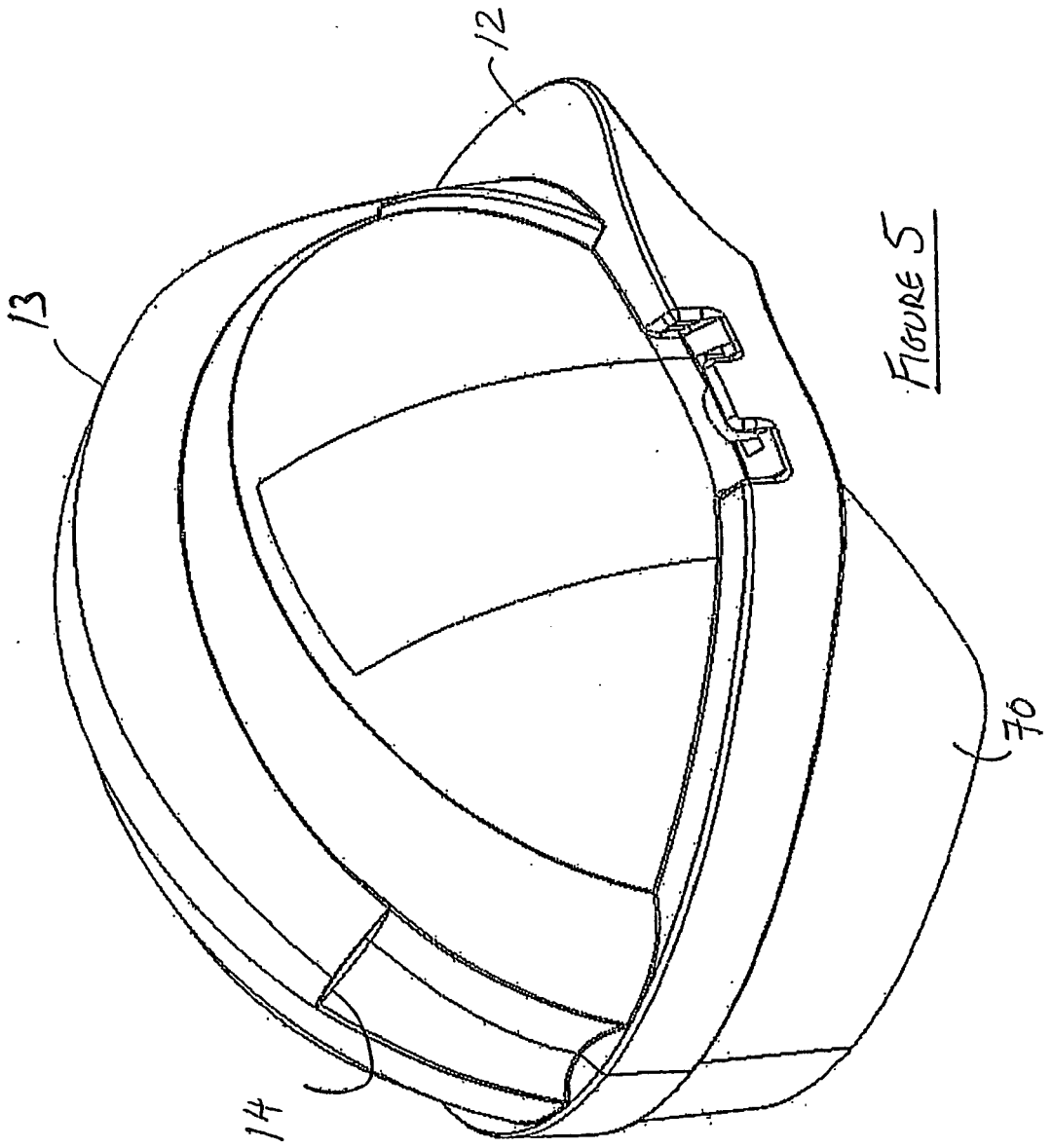


FIGURE 5

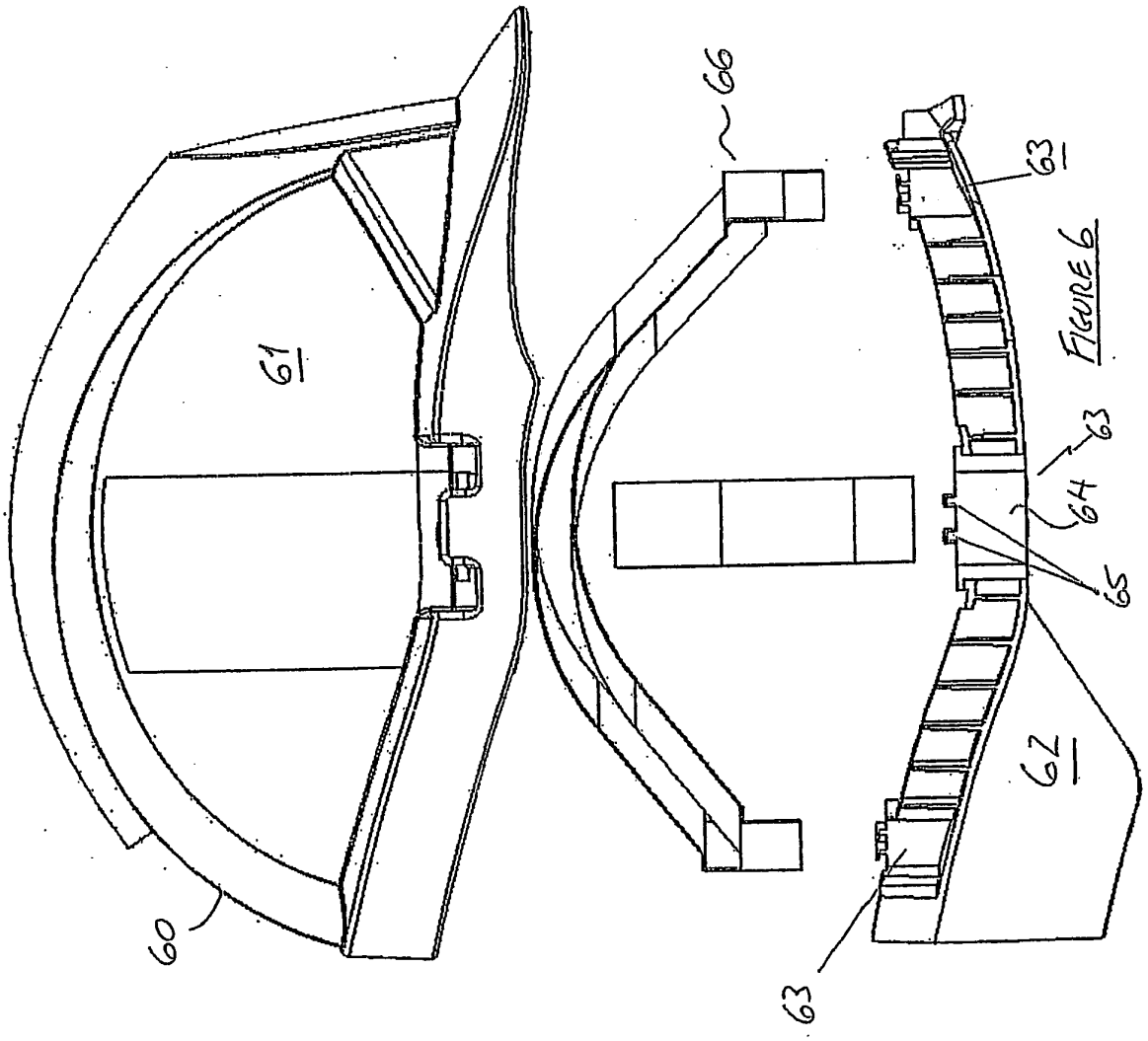


FIGURE 6

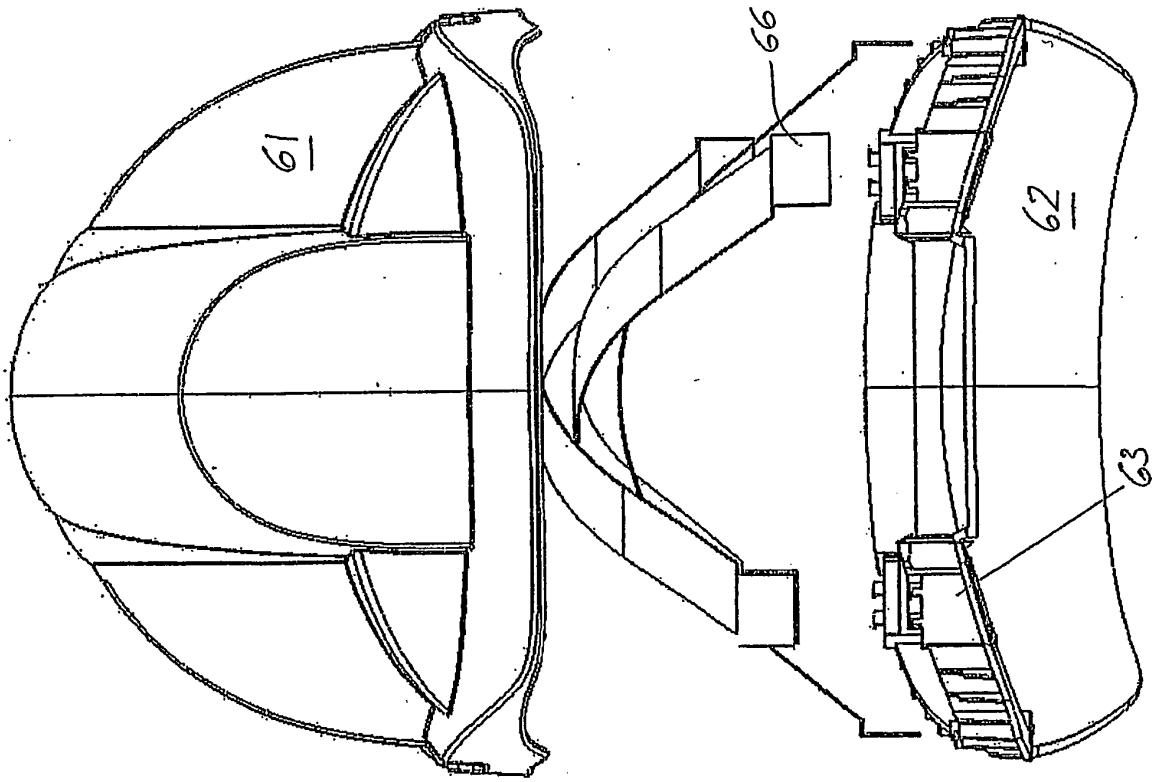


FIGURE 7

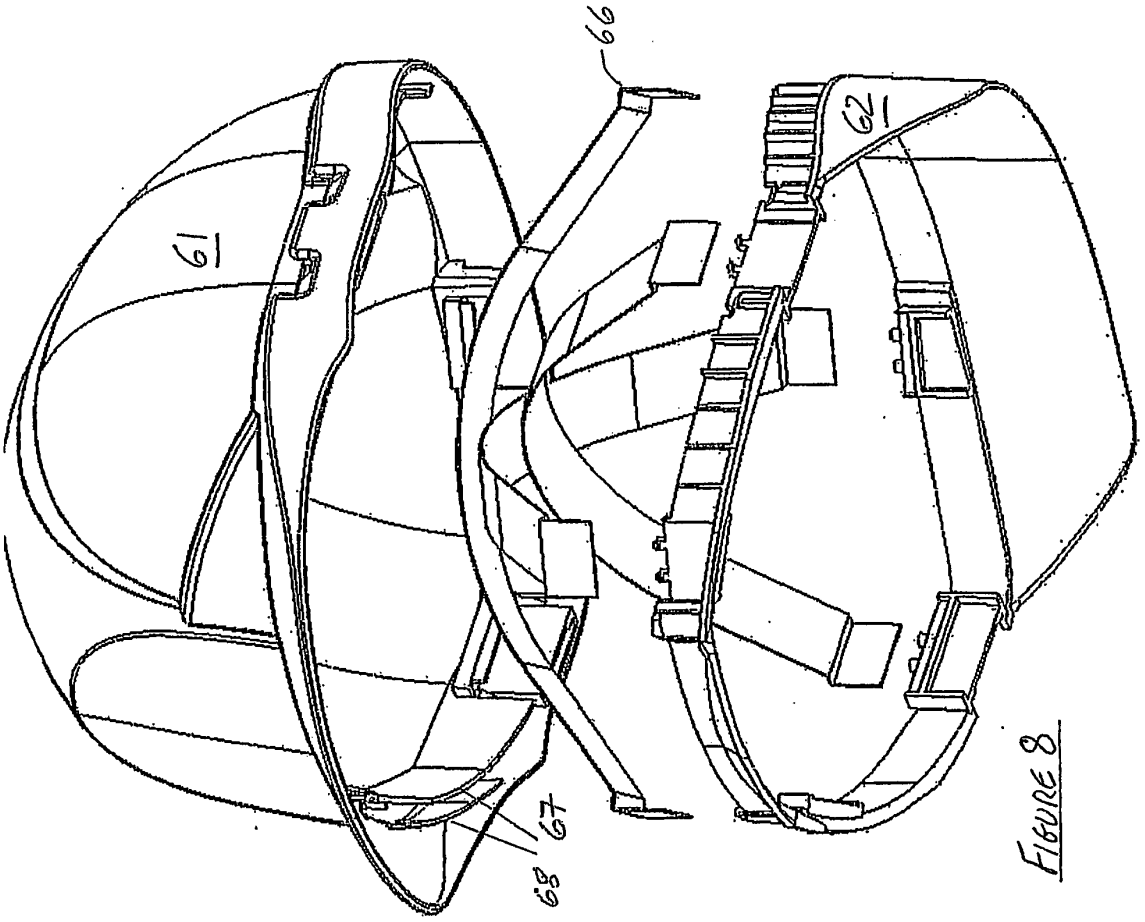


FIGURE 8

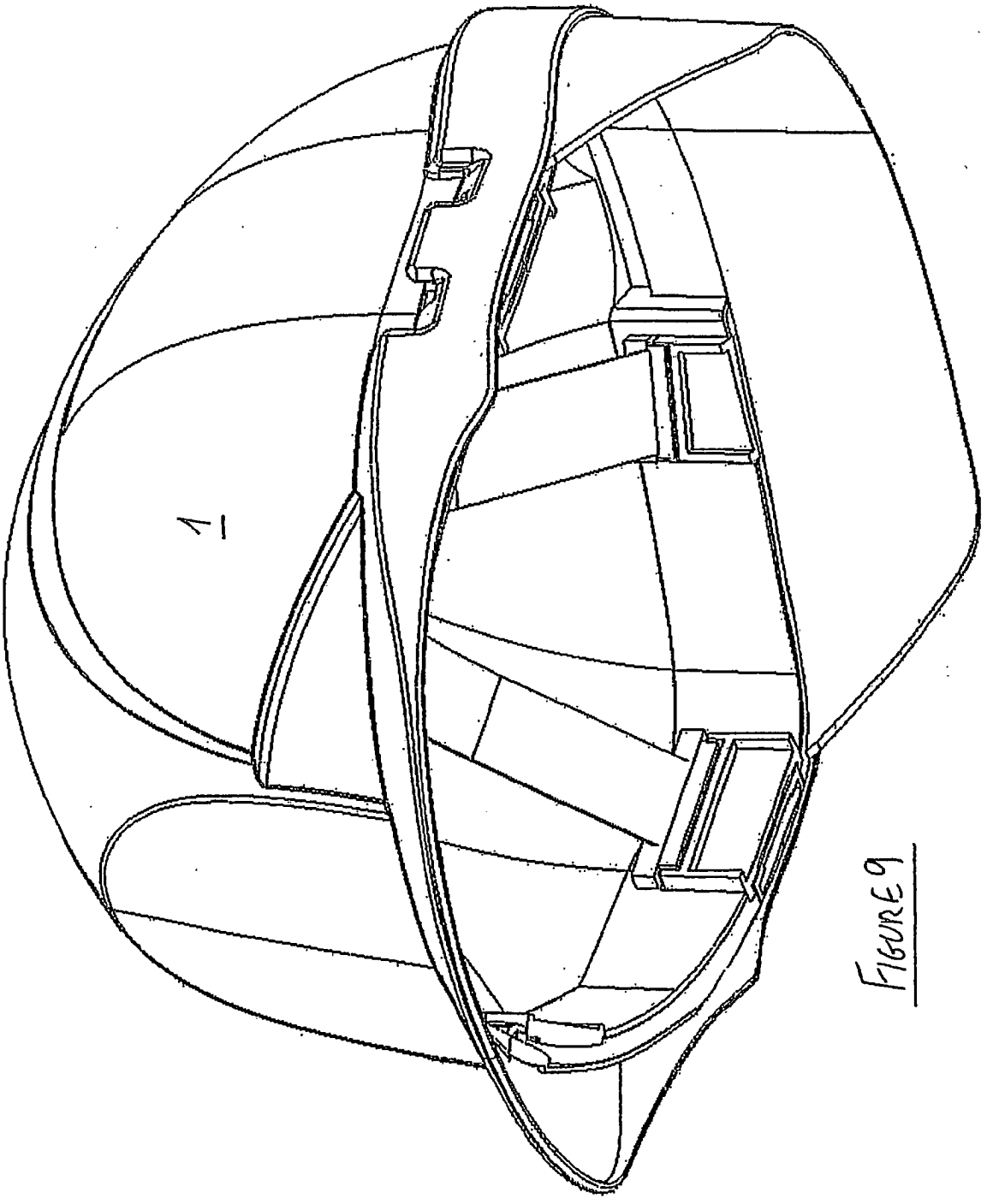


FIGURE 9

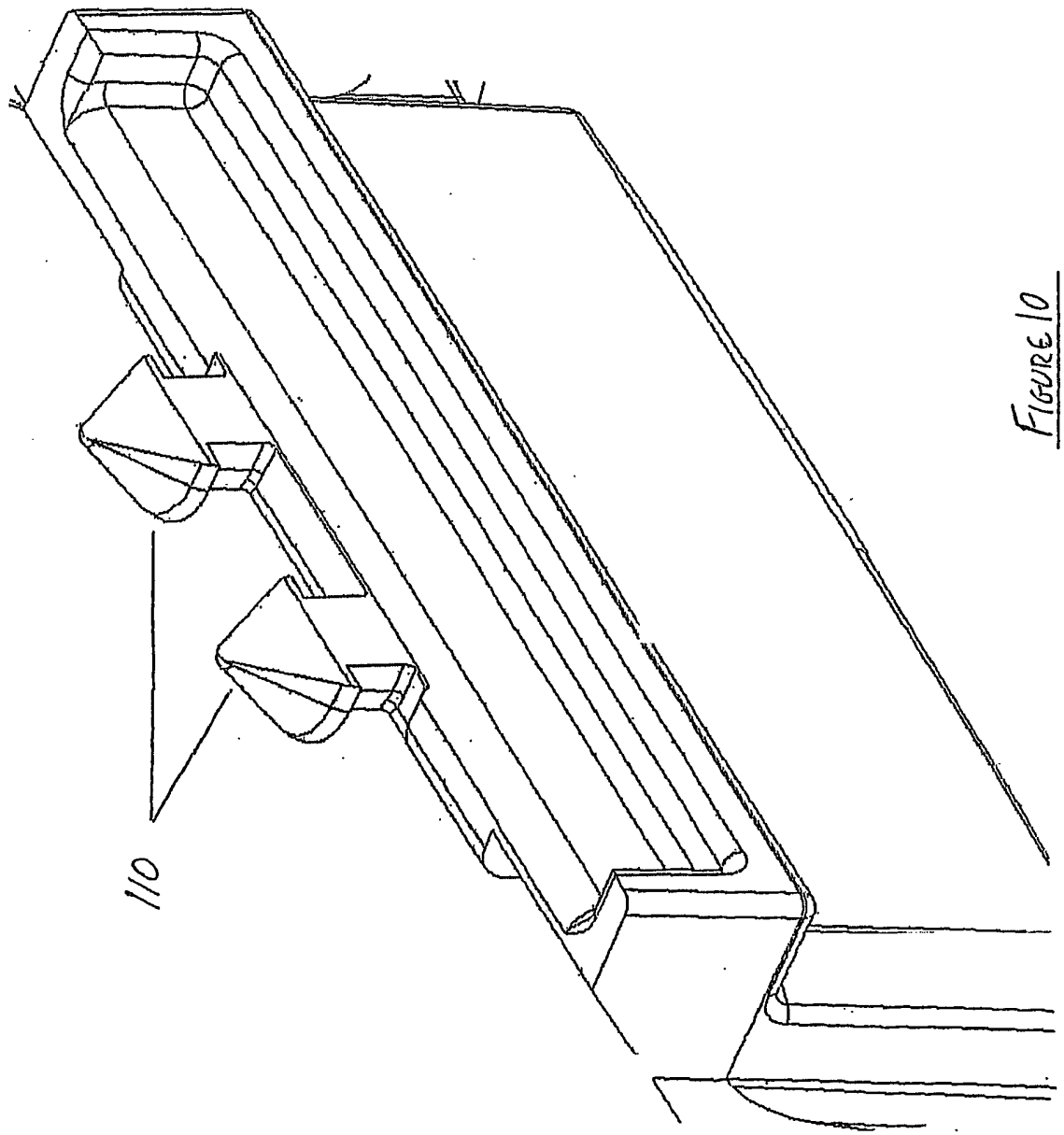


FIGURE 10

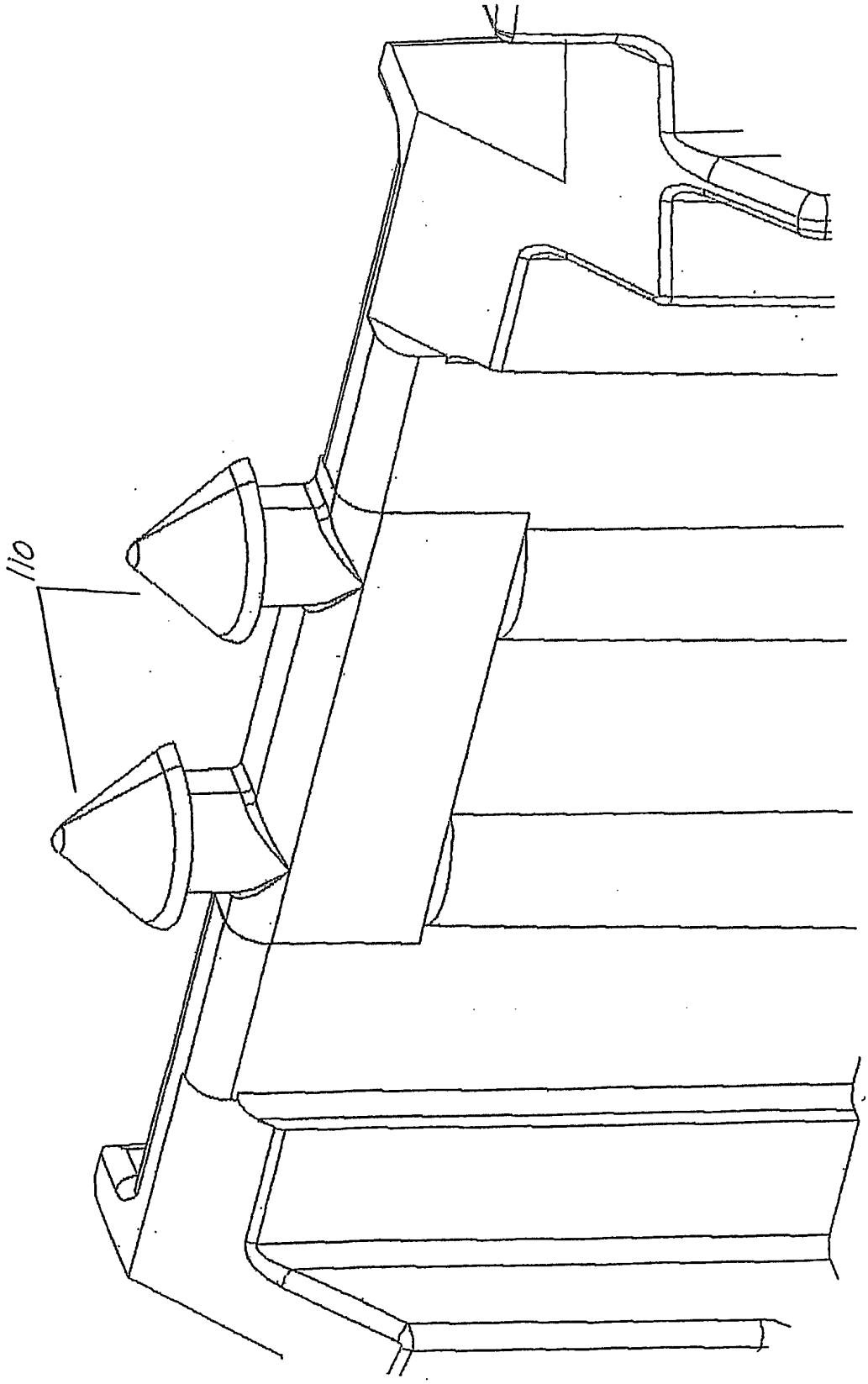


FIGURE 11

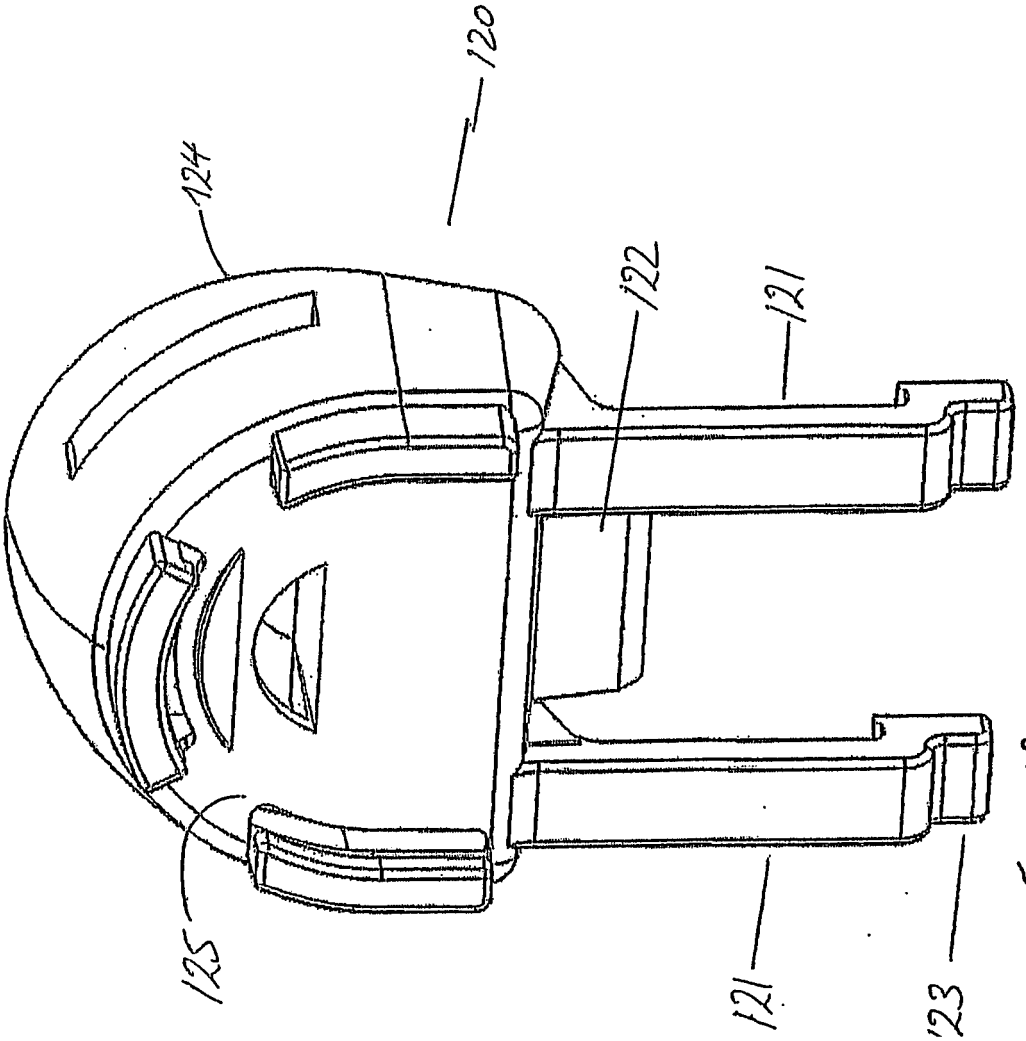


FIGURE 12

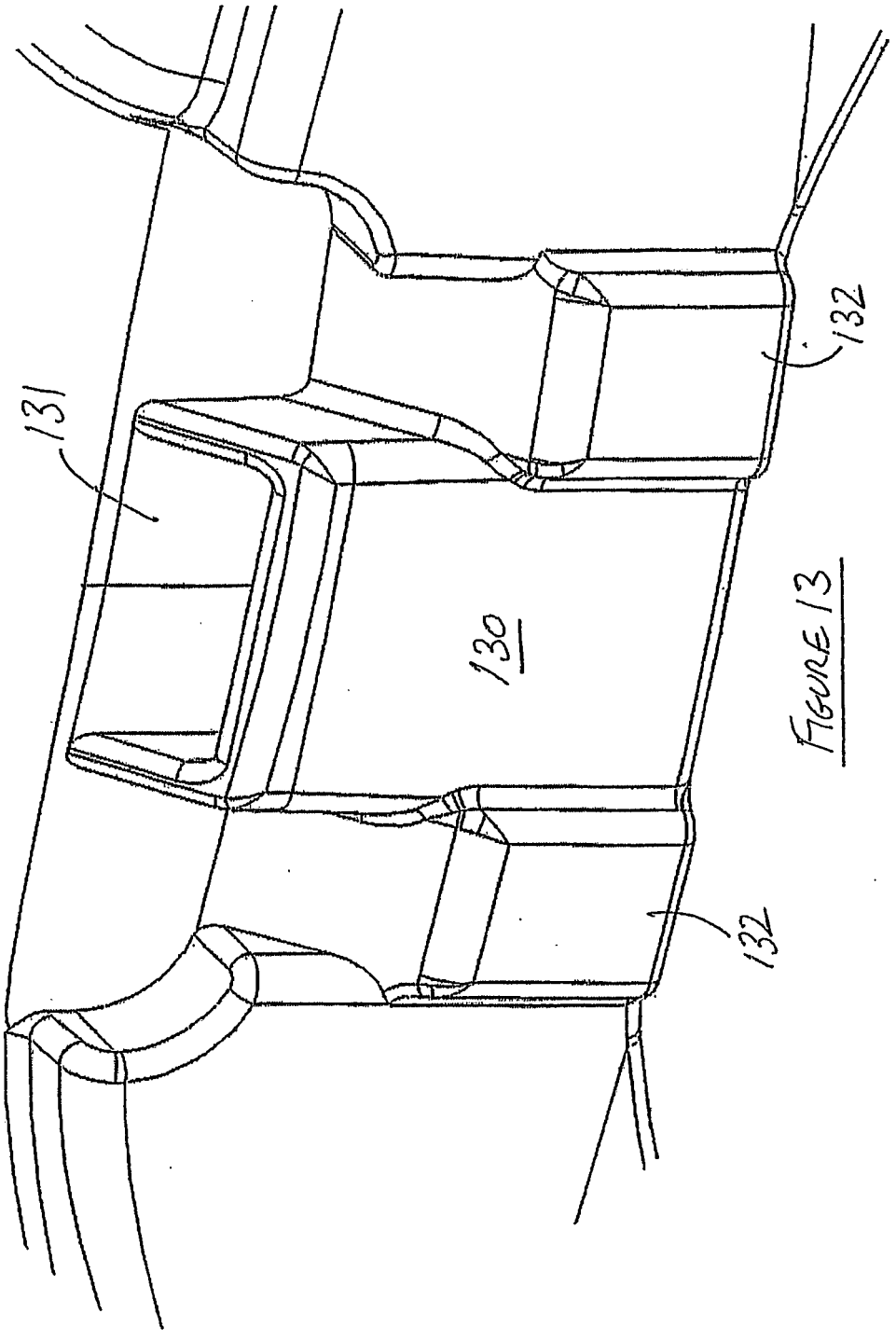


FIGURE 13

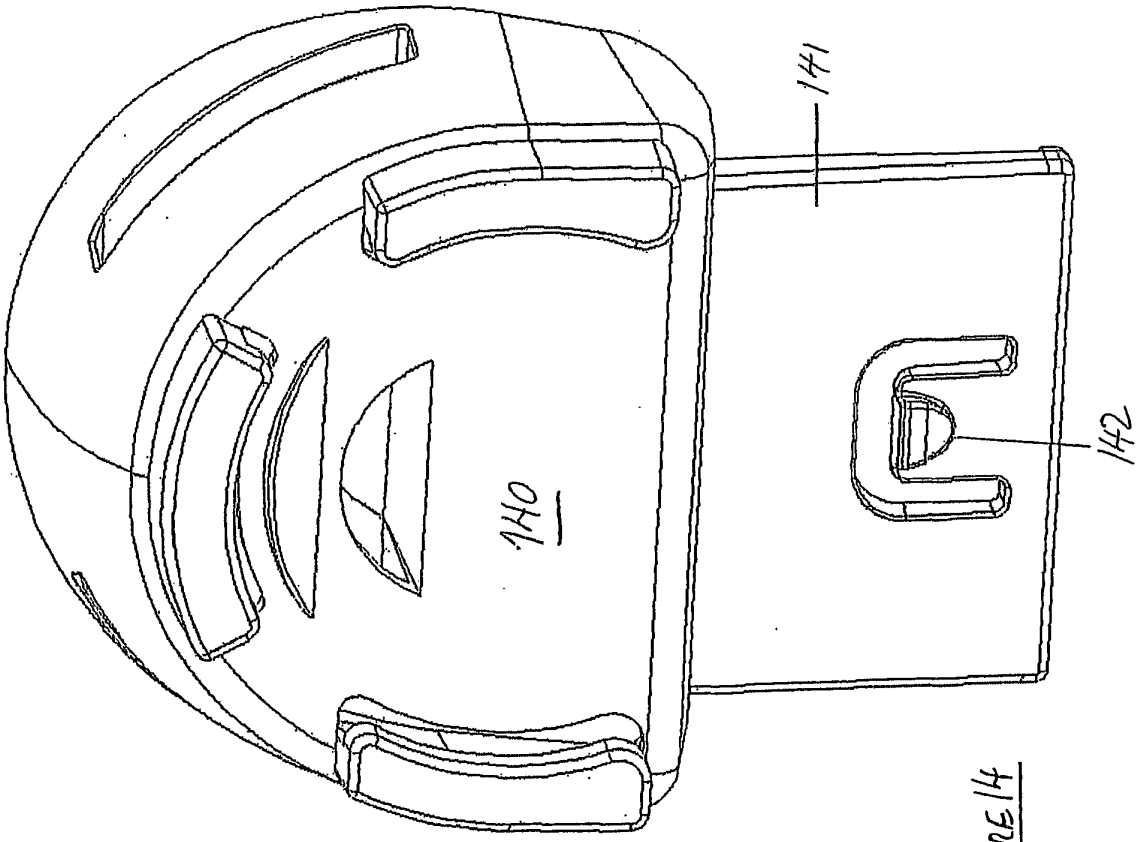


FIGURE 14

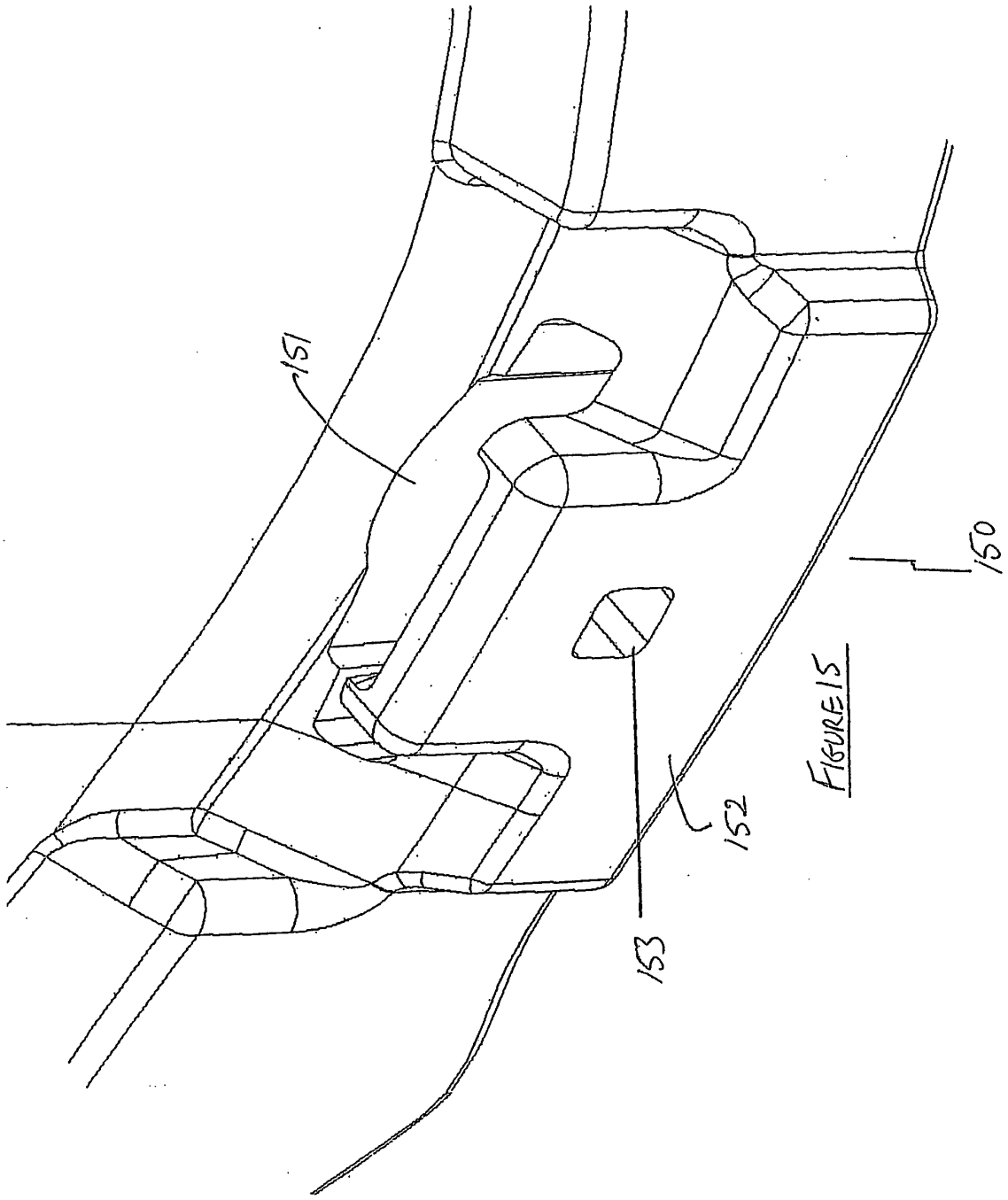


FIGURE 15

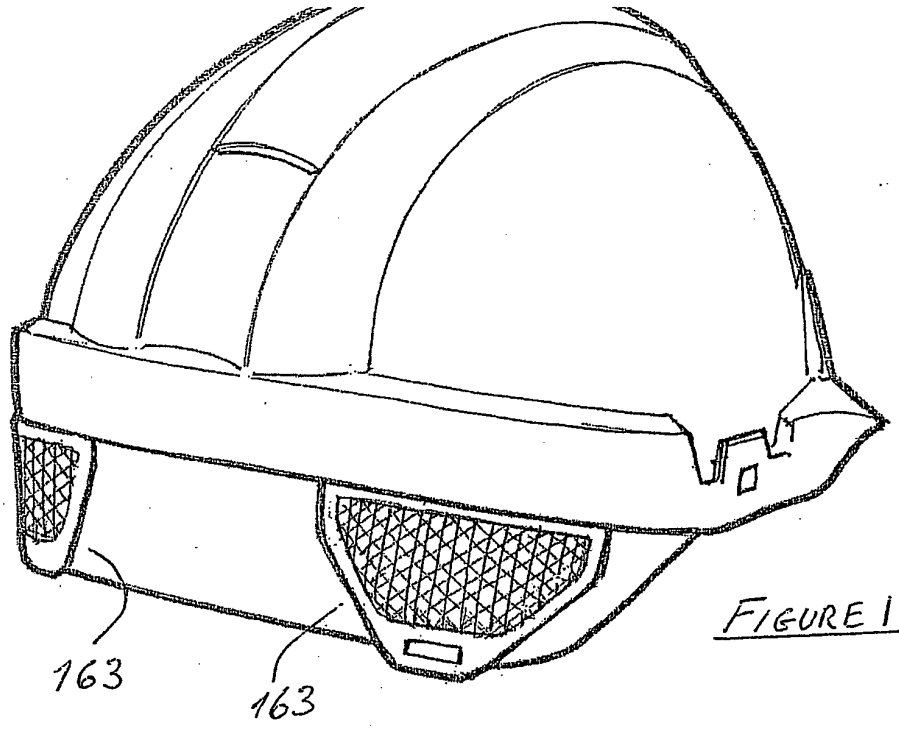


FIGURE 17

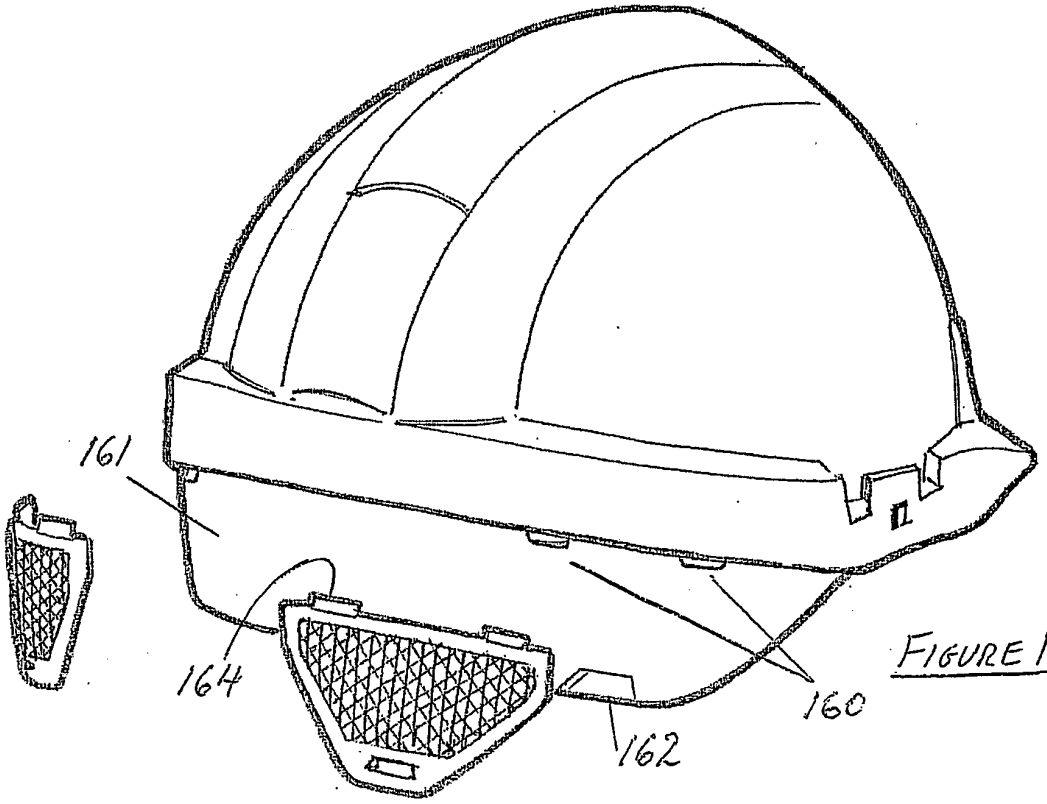


FIGURE 16

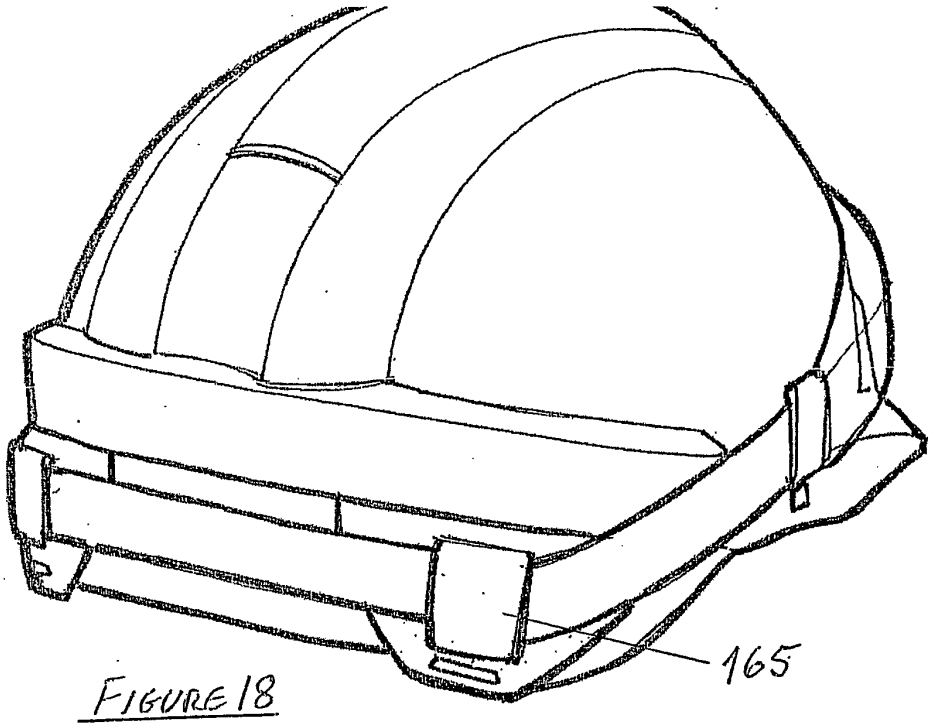


FIGURE 18

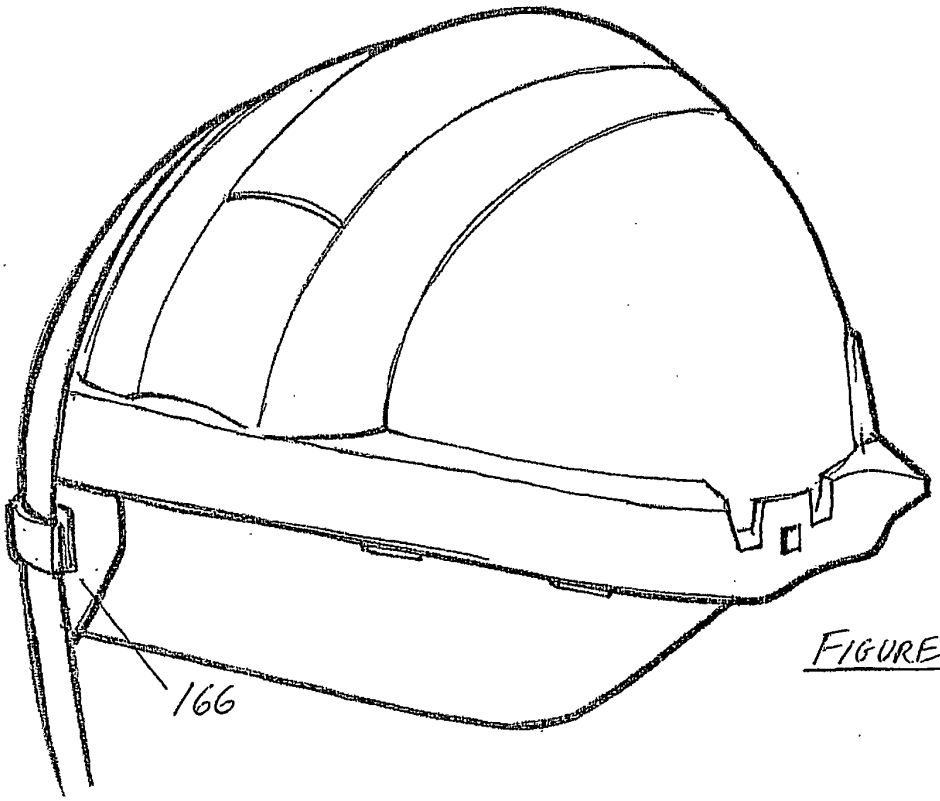


FIGURE 19

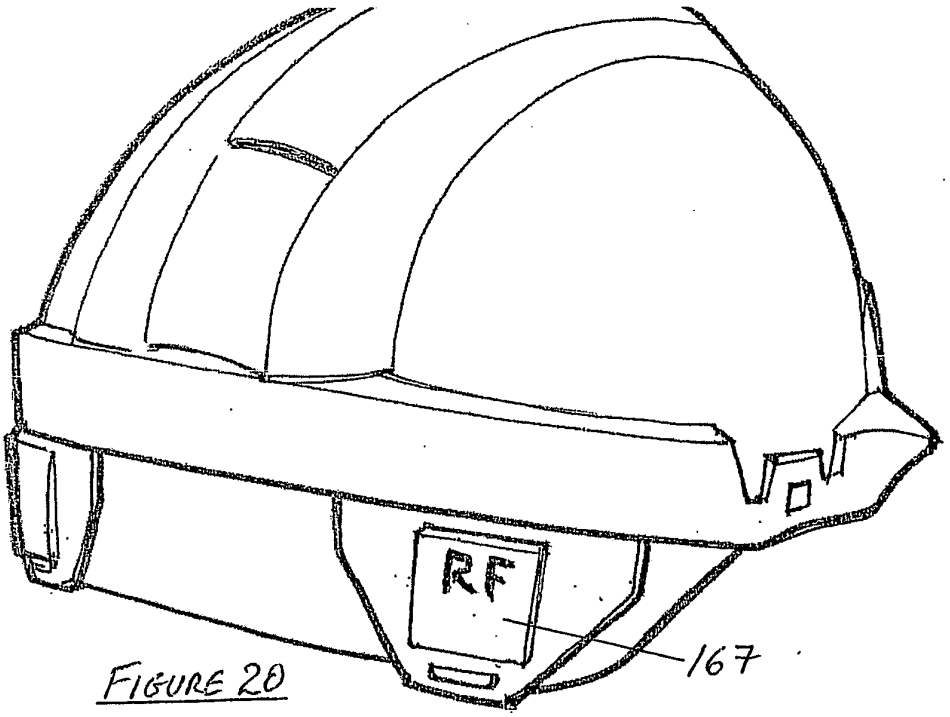


FIGURE 20

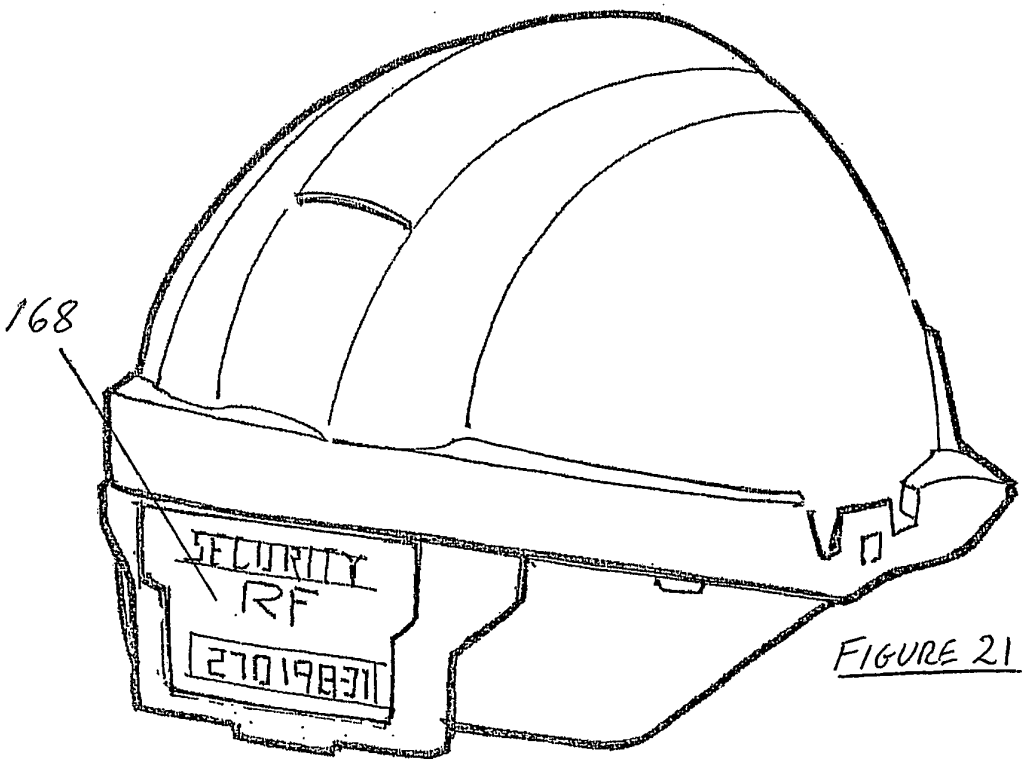


FIGURE 21

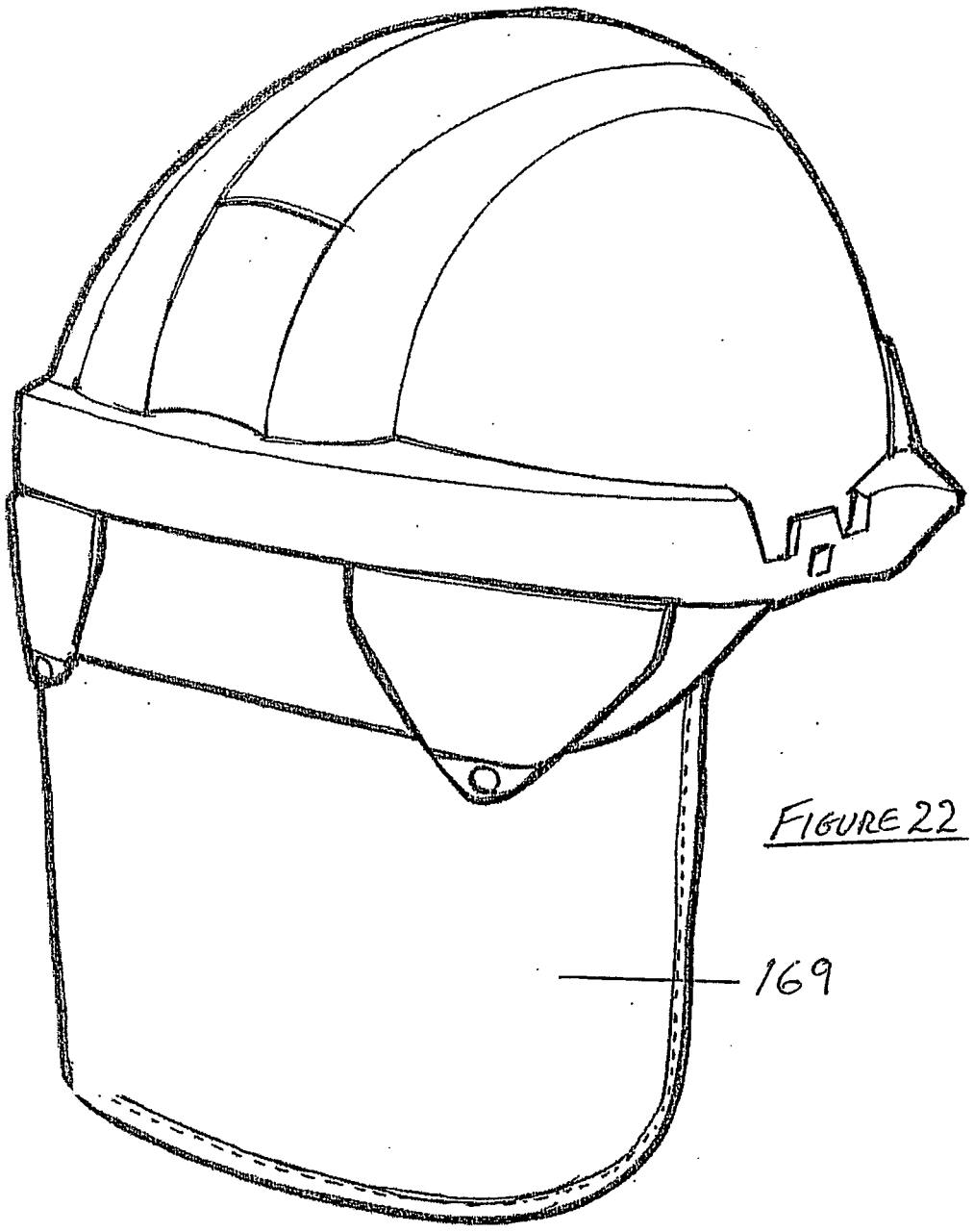


FIGURE 22

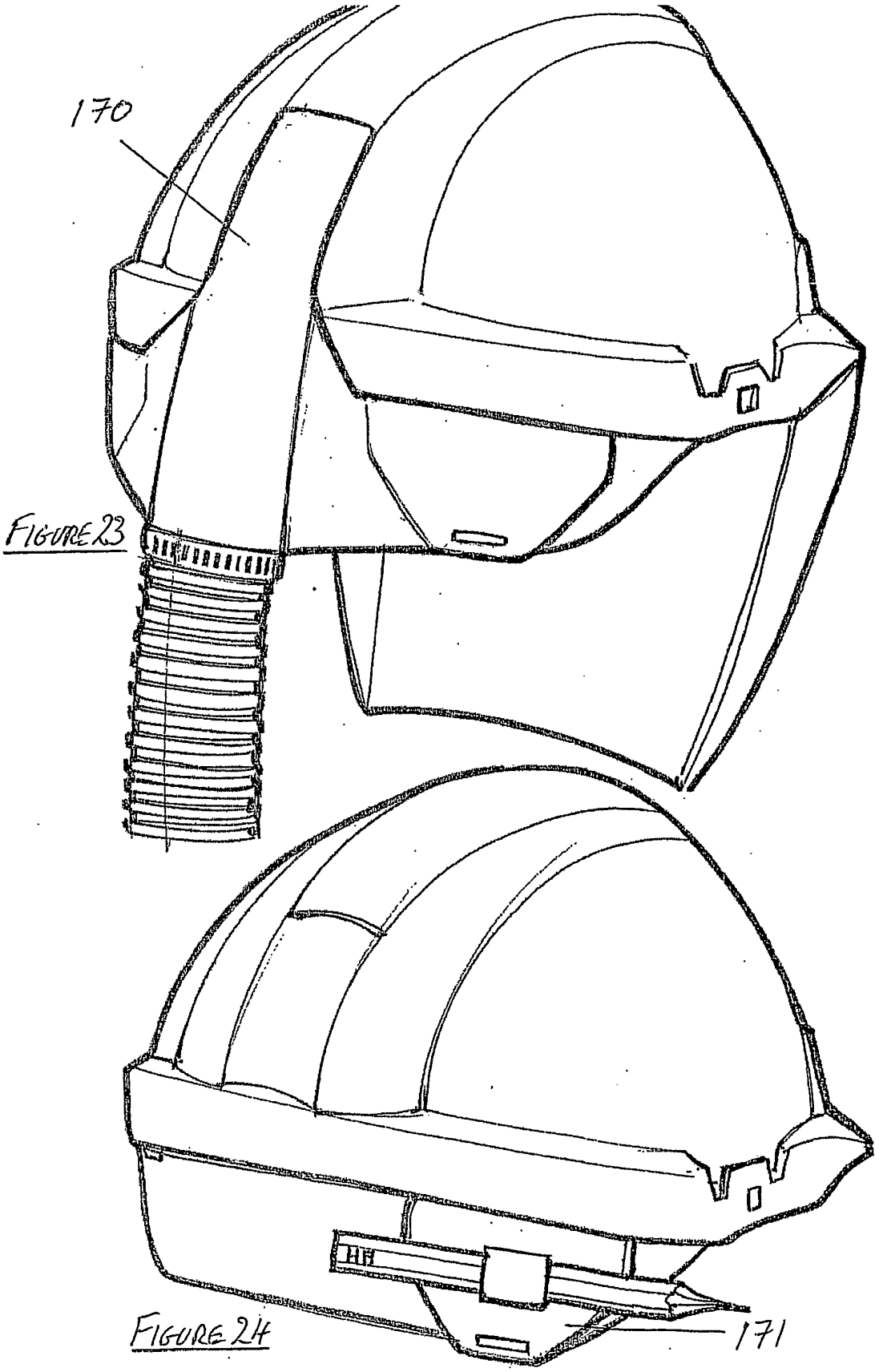


FIGURE 23

FIGURE 24

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- GB 850529 A **[0005]**