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(54) **AN ARTICLE OF HEADGEAR**

KOPFBEDECKUNG

ARTICLE DE PROTECTION POUR LA TETE

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(56) References cited:

EP-A- 0 007 432	WO-A-94/22336
BE-A- 864 521	BE-A- 888 108
DE-A- 2 730 635	FR-A- 1 291 711
FR-A- 2 631 789	US-A- 3 059 519

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Description

[0001] The invention relates to an article of headgear.

[0002] It is known from US 3,978,526 to provide an accessory for a motorcycle helmet in the form of a channel which is affixed to the top of the motorcycle helmet longitudinally in the position of a crest. The channel mounts three planar mirrors on its inner surface which are arranged so that the wearer of the helmet can look into the channel and via the mirrors see behind him. The mirrors are separately affixed to the interior surface of the channel. Other rear view helmets are known from FR 2,631,789 ; FR 1,291,711 and WO 94/22336.

[0003] According to the invention there is provided a helmet having a protective shell and padding inside the shell, the padding having a channel formed there-through, the channel having a base, side walls and an open top, and a separate one piece mounting inside the shell, the mounting carrying or comprising a plurality of mirrors, the mounting being arranged to be located across the open top of the channel so as to be carried by the padding on either side of the channel with the mirrors facing from the mounting into the channel, the mirrors and channel thus defining or forming part of a system enabling a person wearing the article to see rearwards through the channel.

[0004] The fact that the viewing system is provided within rather than outside the shell of the helmet greatly improves the safety of the helmet. The fact that the mirror or mirrors are carried by or formed on a one piece mounting, simplifies manufacture of the mounting and also enables the mounting together with the mirrors to be easily assembled within the helmet. The fact that the mounting is provided within the helmet also means that it can be made lightweight and the helmet of the invention can be very significantly lighter than the prior known helmet.

[0005] At least a portion of the mounting may extend from one side of the inner surface of the shell to the other, in a direction transverse to the fore and aft direction of the helmet. In this way, the mounting is readily located for fixing and can, if desired reinforce the strength of the shell. Sideways locating means may be provided between the shell and the mounting. The sideways locating means may comprise a rib on one of the shell and the mounting and means defining a groove to receive the rib on the other of the shell and the mounting.

[0006] There are a plurality of mirrors. The use of an odd number of mirrors results in an image which is the correct way around.

[0007] The mounting may include portions which engage in rebates at the top of the walls of the channel.

[0008] The upper surface of the mounting preferably follows the general contour of the shell. The mounting can thus be fitted closely and snugly against the inside of the shell. The lower surface of the mounting which faces into the channel preferably follows the general contour of the shell. The mounting will also in this way

follow the contour of a wearer's head to improve safety. The channel may be open at either or both ends but preferably the shell includes a transparent window element opposite the end of the channel. The transparent window element may be a separate part or alternatively may be integral with the shell. The mounting may be substantially constant thickness. This reduces the material required and hence the weight of the mounting while making moulding from plastics easier. The mounting may conveniently comprise a plurality of substantially planar sections. The channel is defined in a padding material such as foam within the helmet and the padding material may have increased resilience locally alongside the channel.

[0009] Each mirror may take any suitable form and may be electrodeposited onto a surface of the mounting. The mounting may suitably be made of plastics material such as ABS or an alloy of ABS and polycarbonate while the electrodeposited material may be metal and may for example be chromium.

[0010] The channel may be divided at least at the front of the article by further padding material. This provides greater energy absorption. An aperture may be provided in the padding material adjacent at least one mirror such as to allow pressurized air to be directed against the mirror to clean it.

[0011] The optical elements constituted by the mirrors may be of any desired shape but preferably at least one of the optical elements constituted by the mirrors is parabolically curved. The mirror into which a wearer will look is preferably parabolically concave.

[0012] Preferably the first optical element into which a wearer looks, in use, is parabolically concave and focused at the wearer's eye. This will reduce the spread of rays in the light path and hence enable the channel to be reduced in size. The final optical element may be a parabolically convex mirror. This will increase the spread of rays to compensate for a parabolically concave first mirror and/or to increase the field of view.

[0013] Embodiments of the invention will now be described by way of example and with reference to the accompanying drawings, in which:

Fig. 1 is a side elevation in cross-section of a helmet according to the first embodiment of the invention; Fig. 2 is a fragmentary detail rear elevation of the helmet of Fig. 1;

Fig. 3 is a side elevation in cross-section of a helmet according to the second embodiment of the invention: and

Fig. 4 is an exploded perspective view of the helmet of Fig. 3.

[0014] The helmet 10 of the embodiment comprises an outer shell 12 made of strong plastics material and a soft inner foam layer 14 within the shell 12. A liner 16 which may be made of cloth is shown over the inner surface of the foam 14. A one piece mounting 18 is provided

in the roof of the shell 12 and may be made of ABS or a plastics alloy of ABS and polycarbonate. The mounting 18 comprises four planar sections and one slightly convex section serially connected edge to edge. The first planar section 20 lies flat against a planar extension 21 of the outer shell 12 which extends into the upper field of view of the wearer. The inwardly facing surface of the first section 20 is electrodeposited with chromium to form a mirror surface 23. The second planar section 22 extends across the curved part of the shell 12 and is connected at its edge to a third planar section 24, the lower surface of which is metallised with electrodeposited chromium to form a mirror surface 26. A rib 28 extends upwardly to the shell 12 from the junction between the third planar section 24 and the fourth planar section 30 which is relatively short and a further rib 32 extends from the other edge of the fourth planar section 30 where it is connected to the convex section 34 which leads to the rear of the helmet. A single lateral rib 36 parallel to the ribs 28 and 32 extends centrally from the convex section 34. The convex section 34 is also metallised on its lower surface to provide a mirror surface 40. A flange 42 extends from the inner surface of the helmet 12 and the rear edge of the convex section 34 lies against the lower surface of the flange 42. The extension 21 and flange 42 assist in locating the mounting 18 longitudinally in the shell 12.

[0015] Behind the rib 36 are provided three further ribs 44,46 which lie in a longitudinal plane, as shown in Fig. 2. The central rib 44 extends to the inner surface of the shell 12 while the two outer ribs 46 extend from bosses 48 provided on the convex section 34 and are received in grooves 50 defined in bosses 52 depending from the inner surface of the shell 12. A rectangular cross-section channel 54 is defined between the mounting 18 and the foam 14 and leads to a transparent window section 56 of the shell 12.

[0016] As the window 56 may constitute a point of weakness, a further flange 58 is provided from the shell 12 extending over the floor of the channel 54 to a position on a radial plane of the helmet 10 intersecting the upper edge of the window 56.

[0017] In use, a wearer, by looking at the mirrored surfaces 23,26,40 can see outwardly to the rear of the helmet through the window 56 in the shell 12. The mounting 18 can be injection moulded and the electrodeposited areas can be connected by thin lines so that all three mirror surfaces 23,26,40 can be electrodeposited together for ease of manufacture. In assembly, the mounting 18 complete with mirrored surfaces is simply slid into the channel until the first section 20 lies against the extension 21 of the helmet shell 12 and the convex section 34 of the mounting 18 lies against the flange 42 with the ribs 44,46 in the boss grooves 50 for sideways location and can be glued into place.

[0018] The mounting 18 as shown is very lightweight. Alternatively the mounting 18 can be strengthened e.g. of greater thickness or stronger material to reinforce the

helmet. Clearly compromises between strength and weight can be struck as desired.

[0019] The flange 58 of the foam 14 adjacent the channel 56 may have additional resilience to compensate for the gap constituted by the channel.

[0020] In a further embodiment, the ribs 28,32,36 are not provided.

[0021] In a still further embodiment, the channel 54 is sealed and may be filled with dry gas or may be evacuated in order to protect the mirror surfaces 23,26,40. In this case, the foam 14 at the floor of the channel 54 would be covered and the front of the channel 54 would be sealed with a further transparent window 56.

[0022] In a further embodiment the one-piece mounting 18 provides a fourth mirror surface and a fifth mirror surface is provided at the base of the rear of the helmet 10 on the floor of the channel 54 which will extend over the entire longitudinal circumference of the helmet so that the final mirror surface faces outwardly under the lower edge of the shell 12.

[0023] In another embodiment a screen such as an LCD screen may be provided in the channel 54 to provide information to the wearer.

[0024] The second embodiment shown in Figs. 3 and 4 is similar to the first embodiment and the same reference numerals will be used for equivalent features. Only the differences from the first embodiment will be described.

[0025] The mounting 18 of the second embodiment comprises five sections 20,22,24,30,34 like the mounting 18 of the first embodiment, but the first section 20 is a separate part which includes outwardly extending hemispherical projections 60 which are snap-fitted into hemispherical recesses 62 in two arms 64 which depend from the front edge of the second section 22. In this way, the angle of the first section 20 can be adjusted by pivoting it, the friction between the parts 20,64 holding the first section 20 at the desired angle after adjustment. The mirror surface 23 of the first section 20 is in the shape of the surface of a paraboloid and is concave.

[0026] The mirror surface 26 on the third section 24 is planar. The mirror surface 40 on the fifth section 34 is in the shape of a surface of a paraboloid, this time being convex.

[0027] The mounting ribs 28,32,36,42,44,46 and bosses 48,52 are not provided so that the entire mounting 18 is substantially circumferential to a wearer's head. In the second embodiment, because of the shapes of the mirror surfaces 23,26,40, the channel 54 can be much smaller both in depth and width. The mounting 18 is wider than the channel 54 and is received in rebates 66 in the upper edges of the channel 54 and then taped onto the foam 14 with adhesive tape (not shown). An addition is the use of a black cloth lining 68 for the channel 54 to reduce extraneous reflections.

[0028] The window 56 is made of a very strong transparent material such as polycarbonate and includes a wide mounting flange 70 all around it which overlaps the

inner surface of the shell 12 enabling the window 56 to be glued to the shell 12. The window 56 may be made from about 3mm thick polycarbonate.

[0029] In use, as before, a person wearing the helmet 10 can look into the first mirror surface 23 and reflections from the first, second and third mirror surfaces 26, 40 enable the wearer to see what is behind him. The angle of the first section 20 which bears the first mirror surface 23 can be adjusted manually to suit the eye position of different wearers and also to suit different riding stances.

[0030] The fact that the first and last mirror surfaces 23, 40 are parabolically curved means that the size of the channel 54 and also the size of the window 56 can be reduced significantly in comparison with arrangements using planar mirrors. Indeed, it has been calculated that, for the same field of view, the width of the final mirror surface 40 and the window 56 can be reduced by 29% using the parabolic mirrors of the invention. This large improvement has a correspondingly large improvement in safety as a greater thickness of foam can be used inside a helmet of the same outer dimensions resulting in better energy absorption. There are also cosmetic advantages in that the size of the helmet can be made closer to that of a normal helmet i.e. one without a rear viewing system.

[0031] The method of mounting the mounting 18 is very simple and as the mounting 18 only comprises two pans, which comprise plate-like sections in series. They can be very readily manufactured for example by injection moulding from a suitable plastics material such as ABS, a combination of ABS and polycarbonate, or a composite material such as glass reinforced plastic, in particular, glass filled reinforced nylon.

[0032] In an alternative embodiment, the entire outer shell 12 may be made from transparent polycarbonate. This does away with the need for affixing the window 56 which would then merely be an integral part of the transparent shell 12. The shell 12 could be left transparent, or could be painted except for the area for the window 56.

[0033] The light paths to each eye of the wearer will overlap with one another part way through the channel 54. In order to provide additional strength, the channel 54 may not be a single open channel at the front of the helmet, but instead the foam 14 may extend up to the mounting 18 to form a dividing wall at the front of the channel 54. This will not affect the view for the wearer as it will not impinge upon the light paths. The dividing wall may be triangular being wider at the front to provide optimum strength by maximum size of the dividing wall. The central dividing wall may have a different density foam to increase strength and/or absorption of energy upon impact in that region.

[0034] Apertures may be provided through the foam 14 and the lining cloth into the channel 54 opposite each of the mirror surfaces 23, 26, 40. This enables the mirrors to be cleaned by using an aerosol can of com-

pressed air. The air is directed onto each mirror in turn through its respective aperture.

[0035] The adjustable mirror of the second embodiment could be replaced by a fixed mirror as in the first embodiment, if desired.

[0036] The position of the mirrors could be varied to provide dedicated helmets for different types of riding style. Thus, a helmet is envisaged with a mirror position specifically for riders of racing style motorcycles who lean forwards in prone position. Helmets could also be produced dedicated to the riders of custom motorcycles who lie recumbent.

[0037] In a further alternative embodiment, the mounting 18 may be movable within the helmet to allow for rider position changes.

[0038] Air vents may be provided in the foam leading to the channel 54 to provide cooling air to the head, or alternatively to provide de-misting for the mirror surfaces 23, 26, 40 to eliminate condensation.

[0039] While the helmets are described as intended for use by motorcyclists, the same helmet or helmets with the same viewing system could be used as cyclist's helmets, driving helmets, motor racing helmets, police helmets, fireman's helmets, military helmets, pilot's helmets, space helmets, safety helmets or security guard helmets, amongst others.

Claims

1. A helmet (10) having a protective shell (12) and padding (14) inside the shell (12), the padding (14) having a channel (54) formed therethrough, the channel (54) having a base, side walls and an open top, and a separate one piece mounting (18) inside the shell (12), the mounting (18) carrying or comprising a plurality of mirrors (23, 26, 40), the mounting (18) being arranged to be located across the open top of the channel (54) so as to be carried by the padding (14) on either side of the channel (54) with the mirrors (23, 26, 40) facing from the mounting (18) into the channel (54), the mirrors (23, 26, 40) and channel (54) thus defining or forming part of a system enabling a person wearing the article to see rearwards through the channel (54).
2. A helmet as claimed in claim 1 wherein the mounting (18) includes portions which engage in rebates (66) at the top of the walls of the channel.
3. A helmet according to claim 1 wherein the one piece mounting (18) is mounted to the shell (12).
4. A helmet as claimed in claim 3, wherein at least a portion of the mounting (18) extends from one side of the inner surface of the shell to the other, in a direction transverse to the fore and aft direction of the helmet.

5. A helmet as claimed in claim 3 or claim 4 wherein sideways locating means (44, 46) is provided between the shell (12) and the mounting (18).
6. A helmet as claimed in claim 5 wherein the sideways locating means (44, 46) comprises a rib (44, 46) on one of the shell (12) and the mounting (18) and means defining a groove (50) to receive the rib (44, 46) on the other of the shell (12) and the mounting (18).
7. A helmet as claimed in any preceding claim wherein the surface of the mounting which faces into the channel follows the general contour of the shell (12).
8. A helmet as claimed in any preceding claim wherein the shell (12) includes a transparent window element (56) opposite the end of the channel (54) adjacent the rear of the helmet.
9. A helmet as claimed in claim 8 wherein the transparent window element (56) is integral with the shell.
10. A helmet as claimed in any preceding claim, wherein the mounting (18) is of substantially constant thickness.
11. A helmet as claimed in any preceding claim wherein the mounting (18) comprises a plurality of substantially planar sections (20, 22, 24, 30).
12. A helmet as claimed in any preceding claim wherein the or each mirror (23, 26, 40) is electrodeposited onto a surface of the mounting.
13. A helmet as claimed in any preceding claim, wherein the mounting (18) is made of plastics material.
14. A helmet as claimed in any preceding claim wherein the padding material (14) has increased resilience locally alongside the channel.
15. A helmet as claimed in any preceding claim wherein the channel (54) is divided at least at the front of the helmet by further padding material.
16. A helmet as claimed in any preceding claim wherein an aperture is provided in the padding material adjacent at least one mirror such as to allow pressurised air to be directed against the mirror to clean it.
17. A helmet as claimed in any preceding claim wherein at least one of the optical elements constituted by the mirrors is parabolically curved.
18. A helmet as claimed in claim 17 wherein the mirror

(23) into which a wearer will look is parabolically concave.

5 Patentansprüche

1. Helm (10) mit einer Schutzschale (12) und einer Polsterung (14) innerhalb der Schale (12), wobei die Polsterung (14) einen dadurch hindurch verlaufend ausgebildeten Kanal (54) aufweist, wobei der Kanal eine Basis, Seitenwände und eine offene Oberseite aufweist, und einem getrennten einstückigen Befestigungselement (18) innerhalb der Schale (12), wobei das Befestigungselement (18) eine Vielzahl von Spiegeln (23, 26, 40) hält bzw. umfaßt, wobei das Befestigungselement (18) derart angeordnet ist, daß dieses über der offenen Oberseite des Kanals (54) geeignet angeordnet ist, um durch die Polsterung (14) auf jeder Seite des Kanals (54) gehalten zu werden, wobei die Spiegel (23, 26, 40) von der Befestigungsvorrichtung (18) in den Kanal (54) weisen, so daß die Spiegel (23, 26, 40) und der Kanal (54) somit einen Teil eines Systems definieren bzw. bilden, welches einen Träger des Gegenstands in die Lage versetzt, durch den Kanal (54) nach hinten zu sehen.
2. Helm nach Anspruch 1, wobei das Befestigungselement (18) Abschnitte umfaßt, welche sich in Eingriff mit Falzen (66) an der Oberseite der Wände des Kanals befinden.
3. Helm nach Anspruch 1, wobei das einstückige Befestigungselement (18) an der Schale (12) angebracht ist.
4. Helm nach Anspruch 3, wobei mindestens ein Abschnitt des Befestigungselements (18) in einer Querrichtung zu der nach vorne und hinten verlaufenden Richtung von einer Seite der Innenfläche des Helms zu der anderen verläuft.
5. Helm nach Anspruch 3 oder Anspruch 4, wobei eine quer verlaufende Anordnungsrichtung (44, 46) zwischen der Schale (12) und dem Befestigungselement (18) vorgesehen ist.
6. Helm nach Anspruch 5, wobei die quer verlaufende Anordnungsrichtung (44, 46) eine Rippe (44, 46) entweder an der Schale (12) oder dem Befestigungselement (18) sowie eine Einrichtung, welche eine Vertiefung (50) zum Aufnehmen der Rippe (44, 46) an dem jeweils anderen Element aus der Gruppe der Schale (12) und des Befestigungselements (18) definiert, umfaßt.
7. Helm nach einem beliebigen vorangehenden Anspruch, wobei die Fläche des Befestigungsele-

ments, welche in den Kanal weist, dem generellen Umriß der Schale (12) folgt.

8. Helm nach einem beliebigen vorangehenden Anspruch, wobei die Schale (12) ein transparentes Fensterelement (56) gegenüber dem Ende des Kanals (54) nahe bei der Hinterseite des Helms umfaßt. 5
9. Helm nach Anspruch 8, wobei das transparente Fensterelement (56) in der Schale eingebaut ist. 10
10. Helm nach einem beliebigen vorangehenden Anspruch, wobei das Befestigungselement (18) im wesentlichen eine konstante Dicke aufweist. 15
11. Helm nach einem beliebigen vorangehenden Anspruch, wobei das Befestigungselement (18) eine Vielzahl im wesentlichen ebener Abschnitte (20, 22, 24, 30) aufweist. 20
12. Helm nach einem beliebigen vorangehenden Anspruch, wobei der bzw. jeder Spiegel (23, 26, 40) durch Galvanisierung auf einer Fläche des Befestigungselements ausgebildet ist. 25
13. Helm nach einem beliebigen vorangehenden Anspruch, wobei das Befestigungselement (18) aus einem Kunststoffmaterial hergestellt ist. 30
14. Helm nach einem beliebigen vorangehenden Anspruch, wobei das Polsterungsmaterial (14) entlang des Kanals örtlich eine erhöhte Elastizität aufweist. 35
15. Helm nach einem beliebigen vorangehenden Anspruch, wobei der Kanal (54) mindestens an der Vorderseite des Helms durch weiteres Polsterungsmaterial geteilt ist. 40
16. Helm nach einem beliebigen vorangehenden Anspruch, wobei eine Öffnung in dem Polsterungsmaterial bei dem mindestens einen Spiegel vorgesehen ist, um es zu ermöglichen, daß Druckluft auf den Spiegel gerichtet wird, um diesen zu reinigen. 45
17. Helm nach einem beliebigen vorangehenden Anspruch, wobei mindestens eines der optischen Elemente, welche durch die Spiegel gebildet werden, parabolisch gekrümmt ist. 50
18. Helm nach Anspruch (17), wobei der Spiegel (23), in welchen ein Träger blickt, parabolisch konkav ist. 55

Revendications

1. Casque (10) comprenant une coque protectrice (12) et un rembourrage (14) à l'intérieur de la coque

(12), le rembourrage (14) présentant un canal (54) le traversant, le canal (54) comportant une base, des parois latérales et une partie supérieure ouverte, et un support (18) distinct situé à l'intérieur de la coque (12), le support (18) supportant ou comportant une pluralité de miroirs (23, 26, 40), le support (18) étant agencé pour être positionné à travers la partie supérieure ouverte du canal (54) de manière à être porté par le rembourrage (14) sur l'un ou l'autre côté du canal (54), les miroirs (23, 26, 40) regardant depuis le support (18) à l'intérieur du canal (54), les miroirs (23, 26, 40) et le canal (54) délimitant ou formant ainsi une partie d'un système permettant à une personne portant l'article de regarder en arrière par le canal (54).

2. Casque selon la revendication 1, dans lequel le support (18) comporte des parties qui s'engagent dans les contre-feuillures (66) en partie supérieure des parois du canal.
3. Casque selon la revendication 1, dans lequel le support (18) d'une seule pièce est monté sur la coque (12).
4. Casque selon la revendication 3, dans lequel au moins une partie du support (18) s'étend d'un côté de la surface interne de la coque jusqu'à l'autre, selon une direction transversale à la direction avant et arrière du casque.
5. Casque selon la revendication 3 ou 4, dans lequel des moyens de positionnement latéral (44, 46) sont prévus entre la coque (12) et le support (18).
6. Casque selon la revendication 5, dans lequel les moyens de positionnement latéral (44, 46) présentent une nervure (44, 46) sur un des moyens de positionnement de la coque (12) et du support (18) et dans lequel les moyens définissent une gorge (50) destinée à recevoir la nervure (44, 46) sur l'autre moyen de positionnement de la coque (12) et du support (18).
7. Casque selon l'une quelconque des revendications précédentes, dans lequel la surface du support (18) qui regarde à l'intérieur du canal suit le contour général de la coque (12).
8. Casque selon l'une quelconque des revendications précédentes, dans lequel la coque (12) comporte une ouverture transparente (56) opposé à l'extrémité du canal (54) adjacent à l'arrière du casque.
9. Casque selon la revendication 8, dans lequel l'ouverture transparente (56) est d'une seule pièce avec la coque.

10. Casque selon l'une quelconque des revendications précédentes, dans lequel le support (18) présente une épaisseur sensiblement constante.
11. Casque selon l'une quelconque des revendications précédentes, dans lequel le support (18) comporte une pluralité de zones (20, 22, 24, 30) sensiblement planes. 5
12. Casque selon l'une quelconque des revendications précédentes, dans lequel le ou chaque miroir (23, 26, 40) est formé par électrodéposition sur la surface de support. 10
13. Casque selon l'une quelconque des revendications précédentes, dans lequel le support (18) est réalisé en matière plastique. 15
14. Casque selon l'une quelconque des revendications précédentes, dans lequel la matière de rembourrage (14) présente une élasticité accrue localement le long du canal. 20
15. Casque selon l'une quelconque des revendications précédentes, dans lequel le canal (54) est divisé au moins à l'avant du casque par de la matière de rembourrage supplémentaire. 25
16. Casque selon l'une quelconque des revendications précédentes, dans lequel une ouverture est prévue dans la matière de rembourrage adjacente à au moins un miroir de manière à permettre à l'air sous pression d'être dirigée contre le miroir pour le nettoyer. 30
17. Casque selon l'une quelconque des revendications précédentes, dans lequel au moins un des éléments optiques constitués par les miroirs est incurvé de façon parabolique. 35
18. Casque selon la revendication 17, dans lequel le miroir (23) dans lequel regarde l'utilisateur est parabolique et concave. 40

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FIG. 1

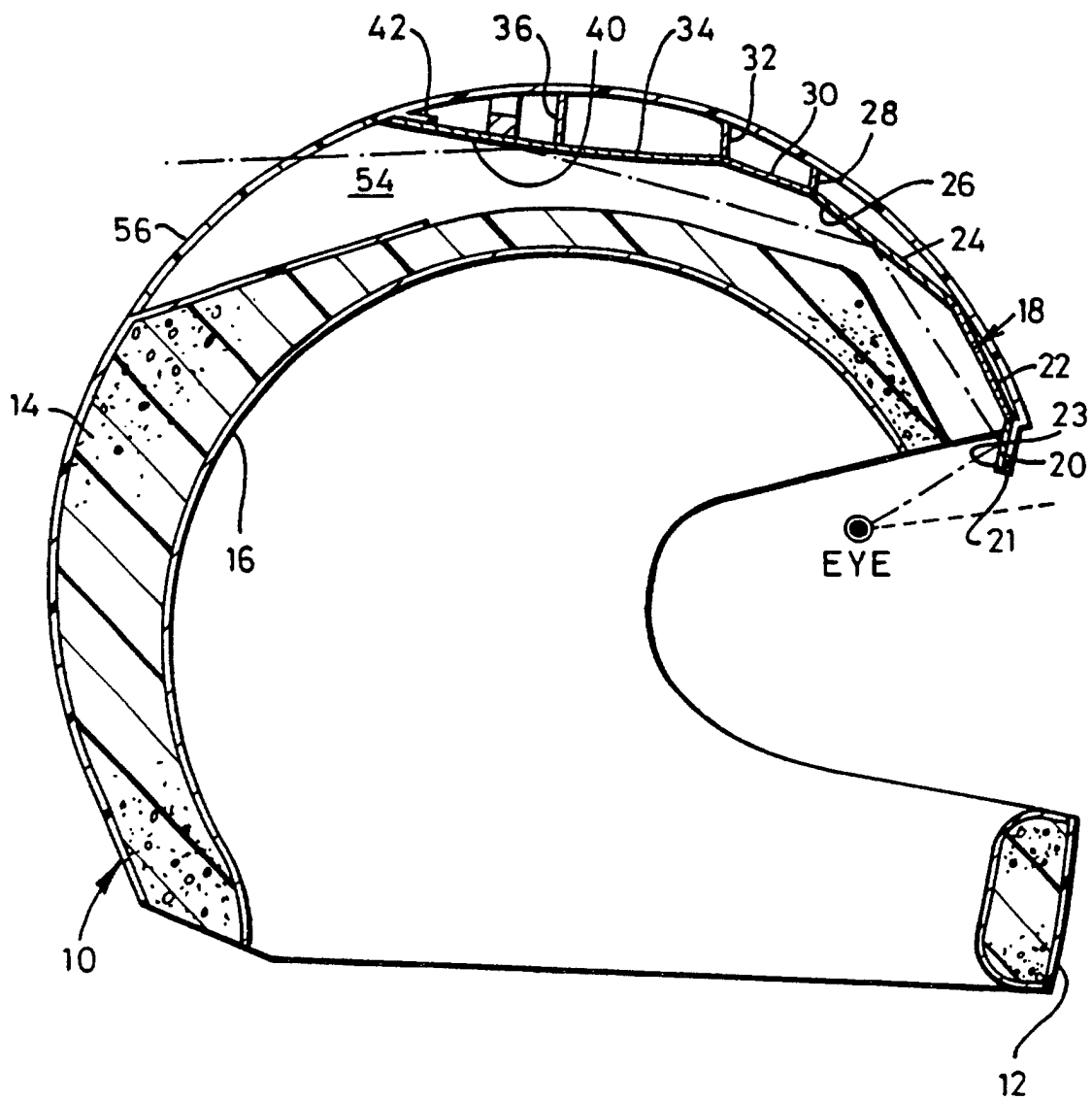


FIG. 2

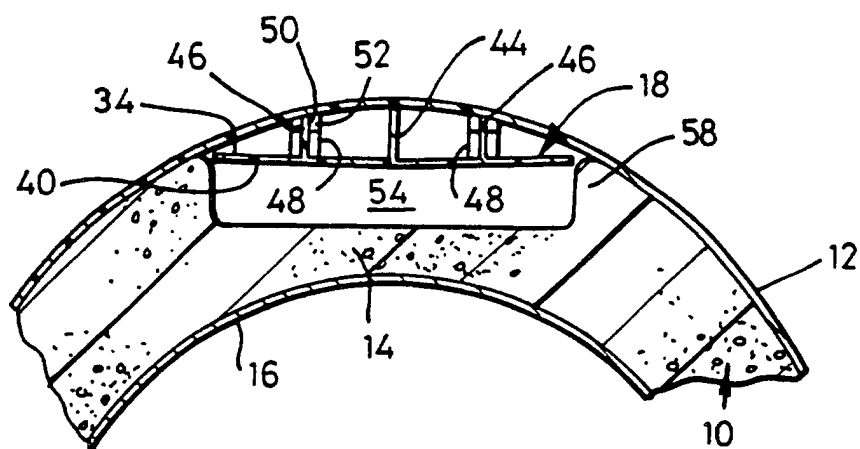


FIG. 3

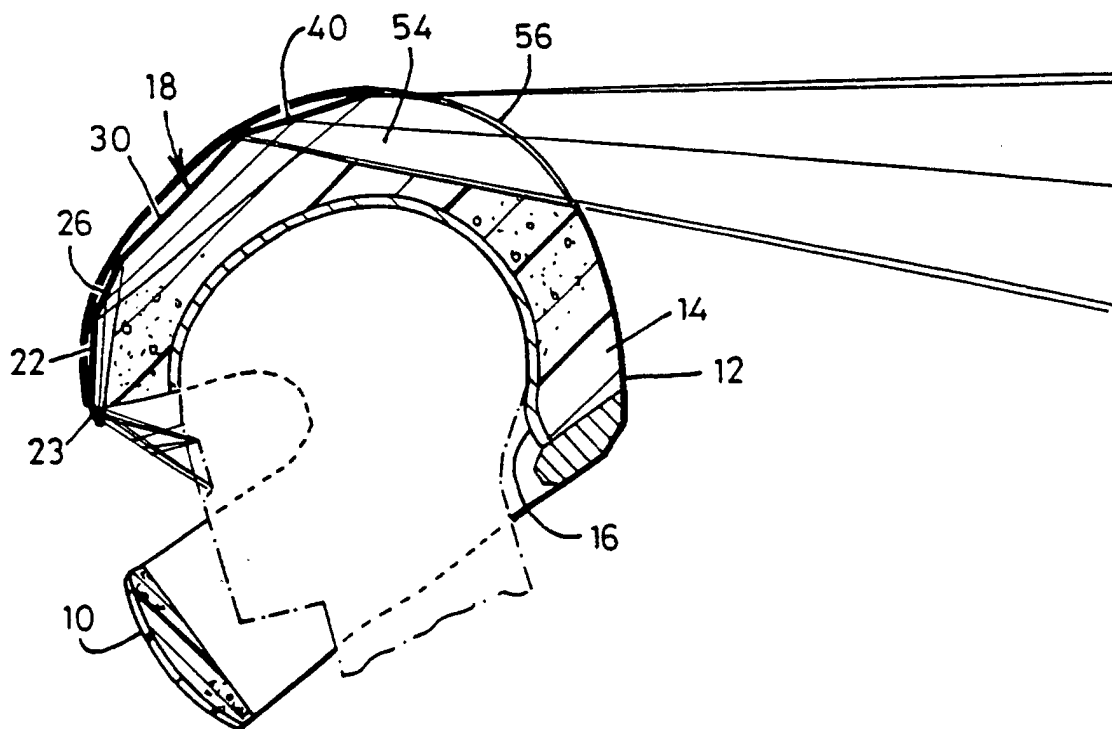


FIG. 4

