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(54) **Visor for safety helmets**

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Visière pour casques de protection

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**EP 0 572 760 B1**

## Description

The invention relates to a visor for safety helmets, particularly for safety helmets for persons working in an environment rich in light, airborne, medium-size airborne particles, comprising a shield assembly including a substantially transparent shield mounted in a frame, and further comprising attaching means for attaching the visor to a safety helmet.

Visors of the above-mentioned kind are preferentially used in situations where light particles of medium size, that is, particles with a diameter of between about 0,3 to about 3,0 mm, constitute a major fraction of total airborne material. In the present context, the combination of "light" and "airborne" denotes particles that are being kept airborne for a while, especially when supported by moderate air movements or turbulence. Such particles will generally have a specific weight or, if of a porous or similar nature, an apparent specific weight of less than 1. Saw dust is a good example for a material rich in such particles.

Visors protecting the eyes against particles of the aforementioned kind comprise a substantially transparent shield made of a close-meshed net arranged within a frame. Under most working conditions, the meshes of the net do not substantially impede the view of the bearer. This, however, does not hold true for certain conditions, for example conditions with lighting by a light source placed above and slightly in front of the bearer. Under such conditions, light reflection by the net becomes a nuisance that may be aggravated by other factors, such as rainy weather or humid conditions in general, light reflection by a wet shield net being substantially larger than by a dry one. Humidity also promotes adherence of particles to the net and, thus, further reduces visibility.

WO-A-86/03656 discloses a hinge device for a retractable face guard on a safety helmet. In the hinge device is included an attachment associated with the guard, as well as a holder removably mounted on the helmet. In this case the holder is mounted on the helmet via an attachment member. The attachment has a substantially flat guide portion, accommodated in guide means in the holder. The attachment is pivotable in the holder around a pin, which has its axis at right angles to the guide portion. A latching means enables latching the attachment in different angular positions in relation to the holder. Included in the latching means are edge surfaces on the attachment and a latch member disposed in the holder for spring biased coaction with the edge surfaces. The latch member is here a spring plate fixed at one end in the holder, with its free end directed forwards. When the attachment is turned from the position depicted by full lines in fig. 3, the corner between edge surfaces will be nearer the fixed end of the latch member than when the attachment is turned from the inoperative position, denoted by chain dotted lines, back to the operative position.

The object of the present invention is to provide an improved visor for safety helmets of the aforementioned kind that substantially reduces light-reflection problems.

According to the invention, this object is met by a visor for safety helmets of the aforementioned kind, which visor comprises a shield assembly removably attached to the shield holder, a frontal bill portion projecting generally forwardly from the interconnecting portion and a rear bill portion projecting generally backwardly from the interconnecting portion, and wherein said supporting arms each is joined to and extending from either end of the interconnecting portion, wherein said anchoring elements are removably fixed to the respective supporting arm and the respective side wall of the helmet, wherein the hinge and locking means comprise a wedge-shaped bearing tap portion arranged at an essentially flat lateral surface of the respective supporting arm near the free end of the supporting arm and being fitted into a bearing ring portion having a triangular opening with rounded corners adapted to receive and hold said bearing tap portion, said bearing ring portion forming part of the anchoring element.

It is preferred for the supporting arms to be arranged in planes essentially perpendicular to the plane defined by the rims of the front bill portion and the rear bill portion, respectively, the planes of the essentially flat front bill portion and rear bill portion being tilted in relation to each other, and the shield having essentially the configuration of a portion of a cylinder mantle, the axis of the corresponding cylinder being arranged about perpendicular to the plane defined by the rims of the front bill portion and the rear bill portion.

It is further preferred for the interconnecting portion to comprise gripping means, particularly gripping means of the snap-in closure type, for gripping and holding the top portion of the shield frame.

According to an advantageous feature of the present invention, the rim of the rear bill portion of the holder fits the surface of the helmet both in the protecting and the non-protecting position.

It is also preferred for the means for attaching the visor to the helmet to comprise tongue means of the respective anchoring element for insertion into horizontal slots arranged at the respective lateral wall of the helmet, the tongue means preferably being provided with the male part of snap-in locking means cooperating with a corresponding female part arranged on the inside of the helmet.

According to another advantageous aspect of the invention, the bearing tap portion includes a circumferential groove for receiving and holding the bearing ring portion.

It is also preferred that the tap portion has about the form of two semicircles of different diameter arranged at a distance from each other and symmetrical in respect to a line connecting their centers and with their greatest distance at their intersections with this central line and

connected by side lines tangentially joining the respective semicircle.

According to a particularly advantageous aspect of the invention, the shield assembly consists of a mesh of metallic wire or polymer material in a frame.

It is furthermore preferred for the shield assembly to include a curved sheet of translucent plastic material.

According to another aspect of the invention, this object is met by a hinge and locking means for visors for safety helmets of the aforementioned kind, wherein the shield assembly is removably attached to the supporting arms and the anchoring elements are removably fixed to the respective supporting arm and the respective side wall of the helmet, wherein the hinge and locking means also comprises a wedge-shaped bearing tap portion arranged at an essentially flat lateral surface of the respective supporting arm near the free end of the supporting arm, and being fitted into a bearing ring portion having an opening, adapted to receive and hold said bearing tap portion, said bearing ring portion forming part of the anchoring element.

It is preferred for the hinge and locking means to also comprises tongue means of the respective anchoring element for insertion into horizontal slots, arranged at the respective lateral wall of the helmet, the tongue means being provided with the male part of snap-in locking means cooperating with a corresponding female part arranged on the helmet.

According to another advantageous aspect of the invention, the bearing tap portion includes a circumferential groove and a flange for receiving and holding the bearing ring portion.

It is also preferred that the tap portion has about the form of two semicircles of different diameter arranged at a distance from each other and symmetrical in respect to a line connecting their centers and with their greatest distance at their intersections with this central line and connected by side lines tangentially joining the respective semicircle.

According to another advantageous aspect of the invention the width of the groove is slightly larger than the thickness of the bearing ring portion.

It is furthermore preferred, that the opening of the bearing ring portion is defined by a longer sidewall and two shorter sidewalls of equal length, wherein the opening is triangular with corners and wherein the smaller semicircle is situated in the corner defined by the sidewalls and the greater semicircle is situated in the corner defined by the sidewalls when in one locking position and wherein the smaller semicircle is situated in the corner defined by the sidewalls and the greater semicircle is situated in the corner defined by the sidewalls when in the other locking position. Other objects, features, and advantages of the invention will be apparent from a preferred but not limiting embodiment, by reference to which the invention will be explained in more detail, said embodiment being illustrated by a drawing in which is shown by

Fig. 1 a schematic top view of the visor, with only a portion of the supporting arms shown,

Fig. 2 a schematic sectional view of the visor shown in Fig. 1, perpendicular to line A - A,

Fig. 3 a part of Fig. 2, enlarged, showing the interlocking mechanism between shield and shield holder,

Fig. 4 a schematic partial sectional view of the visor similar to that in Fig. 2, the visor being shown in a protecting position (H) and a non-protecting position (G), in relation to the safety helmet,

Fig. 5 the hinge and locking means of the right supporting arm, in side view and in a protecting position,

Fig. 6 the means shown in Fig. 5, in an intermediate position,

Fig. 7 the means shown in Fig. 5, in a non-protected position,

Fig. 8 the hinge and locking means in the position shown in Fig. 7, in a sectional view M - M.

A visor for a safety helmet 1 comprises a shield assembly 2 consisting of a shield 3 made of a net of metallic wire with a mesh width (diagonal) of about 1,5 mm embedded in a quadrilateral plastic frame 4 surrounding the net shield 3 and having rounded lower corners, the shield 3 together with the frame 4 having a spatial configuration approximating that of a portion of a cylinder mantle, and a shield holder 5 to which the shield is removably mounted.

Part of the circumference of the helmet 1 is indicated by point-dashed lines D (Fig. 1).

The shield holder 5 is made of a hard but resilient polymer material and is roughly half-moon shaped with an outer rim 51 and an inner rim 52 extending between tips 53 and 54, and, except for what is said below, has a predominantly planar extension which is best approximated by the plane P (Fig. 2) defined by rims 51 and 52. On the underside of the shield holder 5 two parallel flanges 56, 57, essentially perpendicular to the plane defined by the rear bill portion of the holder 5 and with a narrow groove between them, extend between the tips 53 and 54. The flanges 56, 57 divide the shield holder into a larger frontal bill portion 20 and the smaller rear bill portion 21 and, together with the portion of the holder extending in-between them, define an interconnecting portion 22 joined to the bill portions 20, 21. A mirror plane perpendicular to line A - A in Fig. 1 divides the visor into two symmetric halves.

By designing their respective profiles according to

the known snap-in closure principle, as shown in Fig. 3, the two parallel and resilient flanges 56, 57 are arranged for gripping contact with the upper frame rim portion 24 of the shield assembly 2. The upper rim 24 fits into the groove between the flanges 56 and 57. Upon insertion into the groove the rim 24 is locked in place by the locking cooperation of the flanges 56, 57 and the rim 24 profile, as evident from Fig. 3.

The respective upper surfaces of the inner bill portion 21, including that of the interconnecting portion 22, and the outer bill portion 20 are slightly tilted in respect of each other, the tilting angle  $\alpha$  being in the order of 5 to 15°; said surfaces meet at a ridge 28 at about center of the shield holder 5.

At its end regions 62, 63 extending for a distance of about 3 cm from the tips 53, 54 the holder 5 is provided with supporting arms 60, 61 extending backwards from the holder 5 and rigidly attached, preferably by moulding the holder 5 and the arms 60, 61 in one single piece, to it at said end regions 62, 63 where the holder 5 has fortified portions B and C, respectively (indicated by point-dashed lines in Fig. 1), the supporting arms 60, 61 with their respective exterior lateral surfaces tangentially joining the outer rim 51. The supporting arms 60, 61 are essentially straight and of moderate width (a few mm) (Fig. 1). For stability reasons their extension (Figs. 5 and 6) in a plane about perpendicular to the plane P defined by the rims 51 and 52 is considerably larger. At their free ends the supporting arms 60, 61 are provided with hinge and locking means (Figs. 5 - 8) arranged for pivoting movement of the visor between a protecting position (G, Fig. 4) and a non-protecting position (H, Fig. 4), and for temporarily locking the visor in the respective position.

Only the hinge and locking means of the right supporting arm 61 is shown in more detail in Figs. 5 to 8. It consists of a bearing tap portion 75 forming part of the free-end portion the supporting arm 61 and of a bearing ring portion 77, 80, 81 forming part of an anchoring element 71. The opening 76 of the bearing ring portion 77, 80, 81 is about triangular in form and defined by a longer sidewall 77 and two shorter sidewalls 80, 81 of equal length. The corners formed by the longer sidewall 77 and the shorter sidewalls 80, 81 are well rounded.

The wedge-formed bearing tap 75 portion is joined to the flat outer surface at the end region of supporting arm 60 from which it protrudes. It has a flat top surface parallel to the flat surface of supporting arm 60 from which it raises by a few mm. When seen in a direction perpendicular to said flat outer surface of the supporting arm 60, the tap portion 75 has about the form of two hemicircles of different diameter arranged at a distance from each other and symmetrical in respect to a line connecting their centers and with their greatest distance at their intersections with this central line and connected by side lines tangentially joining the respective hemicycle. The smaller hemicycle end of the tap portion 75 is arranged close to the free end of the supporting arm 60

and with said center line having an extension parallel to the edges of the supporting arm. As shown in Fig. 8, the lateral wall of the tap portion 75 is provided with a circumferential groove 79, the inner lateral wall of which coincides with the surface of the supporting arm portion 60 to which the tap portion 75 is joined.

The width of the groove 79 is slightly larger than the thickness of the bearing ring portion 77, 80, 81. The hinge and locking means is assembled by inserting the bearing tap portion 75 in the opening 76 of bearing ring portion 77, 80, 81 and turning the tap portion 75 until it snaps into one of the two stable positions illustrated in Figs. 5 and 7. The hemicurcular (center at point 85) end of the tap portion 75 with the smaller radius will then be fitted into the corner between the shorter sidewalls 80, 81 and the other end of the tap portion 75 will assume a position close to one of the rounded corners (rounded with a radius slightly larger than that of the larger one of the two hemicircles of the tap portion 75) between the shorter sidewalls 80, 81 and the longer sidewall 77, in which position it will be locked. By applying an upward lateral force to the supporting arm 60 either directly or indirectly, e.g. by lifting the visor, the tap portion 75 will turn around the center 85 of the smaller circle defining the wedge tip end of the tap portion 75. This will lead to lateral displacement of the longer sidewall 77 resisting that displacement by a resilient force. When this resilient force has been overcome, the tap portion 75 will be in the unstable position indicated in Fig. 6, that is, with its wedge top end at the center of the longer sidewall 77. Pushing a little further in the aforesaid direction will make it assume the other stable position illustrated in Fig. 7, in which it will be locked.

In a mounted state, the locking and hinge means 70 thus can occupy either of the two stable positions shown in Figs. 5.

The comparatively flat anchoring element 71 is provided with a rectangular tongue 72 for mounting it in a horizontal slot 73 of a vertical pocket (not shown) arranged in the lower part of the right lateral wall of the helmet 1. By adapting the width and the depth of the pocket to the shape of the tongue 72 and by providing the tongue 72 and the pocket 74 with a snap-in design, the visor can be removably fixed to the helmet. Preferably, the tongue 72 is adapted to function as the male part and the pocket 74 to function as the female part of the snap-in connection.

Supporting arm 62 is provided with corresponding hinge and fixation means not shown, mirroring the arrangement illustrated in Figs. 5 - 7.

In Fig. 4 the visor holder 5, (the supporting arms 60, 61 having been excluded for the sake of clarity) is shown in positional relation to the on safety helmet 1 on which it is mounted, the helmet 1 having a front bill portion 11 and being borne by a person with the head in a normal, upright position. In the protecting position G, the inner bill 21 of the visor overlaps the front bill portion 11 of the helmet, thereby preventing airborne particles

or light to enter from above between the shield and the face of the bearer. Entrance of water between the bills 11 and 21 can be avoided by arranging a sealing element (not shown) made of, for example, spongy polyurethane rubber, at the underside of bill 21 and parallel to rim 52, thus closing the gap between the bills 11 and 21. Figure 4 also shows that the outer bill 22 is tilting downwards in the protecting position G. As is explained in more detail in connection with the description of the hinge and locking means, a moderate upward pressure on the shield holder 5 or the shield 2 assembly suffices for moving the visor from the protecting position G to the non-protecting position H and to lock it in the latter, each part of the holder and the shield thereby being displaced along circular paths having their center at point 85.

To provide for a good but not abutting fit the negative curved shape of the inner rim 52 of the shield holder 5 is made to correspond about to the positive curved shape of the frontal profile of the helmet 1, the hinge means 70, as well as the corresponding hinge means for the left supporting arm 60, being positioned (center of rotation 85 in Fig. 4) for maintaining said fit in the protecting position G and in the non-protecting position H, thereby minimizing the dimensions of the supporting arms 60, 61 necessary to provide a reliable and safe connection of the visor to the helmet 1.

## Claims

1. Visor for safety helmets, particularly for safety helmets for persons working in an environment rich in light, airborne particles of a particle size between 0,3 to 3,0 mm and an apparent specific weight of less than 1, comprising a substantially transparent shield assembly (2) consisting of a shield (3) mounted in a frame (4), and further comprising attaching means for attaching the visor to a safety helmet, wherein the visor comprises an essentially non-transparent shield holder (5) to which the shield assembly (2) is attached, said holder (5) comprising an interconnecting portion (22) having essentially the extension of a portion of a circular band, and two supporting arms (60, 61), said supporting arms (60, 61) being arranged for hinged and removable attachment to a safety helmet (1) provided with a frontal bill portion (11) extending in an essentially horizontal plane, wherein the means for attaching the visor to the helmet (1) and the hinge means comprising anchoring elements (71) arranged between the respective supporting arm (61) and the respective side wall of the helmet (1), whereby the visor is arranged movably between a protecting position (G, fig. 4) and a non-protecting position (H, fig. 4) and temporarily can be held in either position with the aid of a locking means, characterized in that said shield assembly (2) is removably attached to said holder (5), said holder (5) also comprising a frontal bill portion (20) projecting generally forwardly from the interconnecting portion (22) and a rear bill portion (21) projecting generally backwardly from the interconnecting portion (22), and in that said supporting arms (60, 61) each is joined to and extending from either end of the interconnecting portion (22), wherein said anchoring elements (71) are removably fixed to the respective supporting arm (61) and respective side wall of the helmet (1), wherein the hinge and locking means comprise a wedge-shaped bearing tap portion (75) arranged at an essentially flat lateral surface of the respective supporting arm (61) near the free end of the supporting arm (61) and being fitted into a bearing ring portion (77, 80, 81) having a triangular opening with rounded corners adapted to receive and hold said bearing tap portion (75), said bearing ring portion (77, 80, 81) forming part of the anchoring element (71).
2. Visor according to claim 1, characterized in that the supporting arms (60, 61) are arranged in planes essentially perpendicular to the plane defined by the rims (51, 52) of the front bill portion (20) and the rear bill portion (21), respectively, the planes of the essentially flat front bill portion (20) and rear bill portion (21) being tilted in relation to each other, and the shield assembly (2) having essentially the configuration of a portion of a cylinder mantle, the axis of the corresponding cylinder being arranged about perpendicular to the plane defined by the rims (51, 52) of the front bill portion (20) and the rear bill portion (21).
3. Visor according to claim 1 or 2, characterized in that the interconnecting portion (22) comprises gripping means (24, 56, 57), particularly gripping means of the snap-in closure type, for gripping and holding the top portion of the shield frame (4).
4. Visor according to any of claims 1-3, characterized in that the rim (52) of the rear bill portion (21) of the holder (5) approaches the surface of the helmet (1) both in the protecting (G, fig. 4) and the non-protecting (H, fig. 5) position to retain a good fit.
5. Visor according to claim 4, characterized in that the means for attaching the visor to the helmet comprises tongue means (72) of the respective anchoring element (71) for insertion into horizontal slots (73) arranged at the respective lateral wall of the helmet (1), the tongue means (72) being provided with the male part of snap-in locking means cooperating with a corresponding female part arranged on the inside of the helmet (1).
6. Visor according to claim 5, characterized in that the bearing tap portion (75) includes a circumferential

groove (79) for receiving and holding the bearing ring portion (77, 80, 81).

7. Visor according to claim 6, characterized in that the tap portion (75) has about the form of two hemicircles of different diameter arranged at a distance from each other and symmetrical in respect to a line connecting their centers and with their greatest distance at their intersections with this central line and connected by side lines tangentially joining the respective hemicycle.
8. Visor according to any of the preceding claims, characterized in that it comprises a shield (3) consisting of a mesh of metallic wire or polymer material in a frame (4).
9. Visor according to any of the preceding claims, characterized in that it comprises a shield (3) including a curved sheet of translucent plastic material.
10. Hinge and locking means for visors for safety helmets, which visor comprises a substantially transparent shield assembly (2), consisting of a shield (3) mounted in a frame (4), and further comprises attaching means for attaching the visor to a safety helmet, wherein the hinge and locking means comprises two supporting arms (60, 61) to which the shield assembly (2) is attached, anchoring elements (71) arranged between the respective supporting arm (61) and the respective side wall of the helmet (1), whereby the visor with the aid of said hinge and locking means is movable between a protecting position (G, fig. 4) and a non-protecting position (H, fig. 4), and temporarily can be held in either position, characterized in that the shield assembly (2) is removably attached to the supporting arms (60, 61), and in that the anchoring elements (71) are removably fixed to the respective supporting arm (61) and the respective side wall of the helmet (1), wherein the hinge and locking means also comprises a wedge-shaped bearing tap portion (75) arranged at an essentially flat lateral surface of the respective supporting arm (61) near the free end of the supporting arm (61), and being fitted into a bearing ring portion (77, 80, 81), having an opening (76), adapted to receive and hold said bearing tap portion (75), said bearing ring portion (77, 80, 81) forming part of the anchoring element 71).
11. Hinge and locking means according to claim 10, characterized in that it also comprises tongue means (72) of the respective anchoring element (71) for insertion into horizontal slots (73), arranged at the respective lateral wall of the helmet (1), the tongue means (72) being provided with the male

part of snap-in locking means cooperating with a corresponding female part arranged on the helmet (1).

12. Hinge and locking means according to claim 11, characterized in that the bearing tap portion (75) includes a circumferential groove (79) and a flange (78) for receiving and holding the bearing ring portion (77, 80, 81).
13. Hinge and locking means according to claim 12, characterized in that the tap portion (75) has about the form of two hemicircles of different diameter arranged at a distance from each other and symmetrical in respect to a line connecting their centers and with their greatest distance at their intersections with this central line and connected by side lines tangentially joining the respective hemicycle.
14. Hinge and locking means according to claim 13, characterized in that the width of the groove (79) is slightly larger than the thickness of the bearing ring portion (77, 80, 81).
15. Hinge and locking means according to claim 13, characterized in that the opening (76) of the bearing ring portion (77, 80, 81) is defined by a longer side wall (77) and two shorter sidewalls (80, 81) of equal length, wherein the opening (76) is triangular with corners and wherein the smaller hemicycle is situated in the corner defined by the sidewalls (80, 81) and the greater hemicycle is situated in the corner defined by the sidewalls (77, 81) when in one locking position and wherein the smaller hemicycle is situated in the corner defined by the sidewalls (80, 81) and the greater hemicycle is situated in the corner defined by the sidewalls (77, 80) when in the other locking position.

#### 40 Patentansprüche

1. Schirm für Sicherheitshelme, insbesondere für Sicherheitshelme für Personen, die in Umgebungen mit leichten in der Luft enthaltene Partikeln mit einer Teilchengröße zwischen 0,3 und 3,0 mm und einem scheinbaren spezifischen Gewicht von unter 1 arbeiten, umfassend eine im wesentlichen transparente Schildbaugruppe (2), die aus einem in einem Rahmen (4) montierten Schild (3) besteht, und weiter umfassend Befestigungsmittel zur Befestigung des Schirms an einem Sicherheitshelm, wobei der Schirm einen im wesentlichen nicht transparenten Schildhalter (5) umfaßt, an dem die Schildbaugruppe (2) befestigt ist, der genannte Halter (5) einen Verbindungsteil (22) umfaßt, der im wesentlichen den Verlauf eines Teils eines Kreisbandes hat, und zwei Stützarme (60, 61), wobei die genannten Stützarme (60, 61) so angeordnet sind,

daß sie abnehmbar mittels eines Scharniers an einem Sicherheitshelm (1) befestigt werden können, der mit einem vorderen Ansatzstück (11) ausgestattet ist, das in einer im wesentlichen horizontalen Ebene verläuft, wobei das Mittel zum Anbringen des Schirms am Helm (1) und das Scharnier Verankerungselemente (71) umfassen, die zwischen dem betreffenden Stützarm (61) und der betreffenden Seitenwand des Helms (1) angeordnet sind, wodurch der Schirm beweglich zwischen einer Schutzposition (G, Fig. 4) und einer ungeschützten Position (H, Fig. 4) angeordnet ist und vorübergehend mit Hilfe eines Verriegelungsmittels in diesen beiden Positionen gehalten werden kann, **dadurch gekennzeichnet**, daß die genannte Schildbaugruppe (2) abnehmbar an dem genannten Halter (5) befestigt ist, der genannte Halter (5) außerdem ein vorderes Ansatzstück (20) umfaßt, das generell von dem Verbindungsabschnitt (22) nach vorne ragt, und ein hinteres Ansatzstück (21), das von dem Verbindungsteil (22) generell nach hinten ragt, und dadurch, daß die genannten Stützarme (60, 61) jeweils verbunden sind mit dem Verbindungsteil (22) und von beiden Enden des Verbindungsteils (22) abgehen, bei dem die genannten Verankerungselemente (71) abnehmbar an dem jeweiligen Stützarm (61) und der jeweiligen Seitenwand des Helms (1) befestigt sind, bei dem das Scharnier- und Verriegelungsmittel einen keilförmigen Lagerzapfenabschnitt (75) umfaßt, der an einer im wesentlichen flachen Seitenfläche des jeweiligen Stützarms (61) angeordnet ist, nahe dem freien Ende des Stützarms (61) und eingebaut in einen Lagerringabschnitt (77, 80, 81) mit einer dreieckigen Öffnung mit abgerundeten Ecken, die den genannten Lagerzapfenabschnitt (75) aufnehmen und halten können, wobei der genannte Lagerringabschnitt (77, 80, 81) einen Teil des Verankerungselements (71) bildet.

2. Schirm nach Anspruch 1, **dadurch gekennzeichnet**, daß die Stützarme (60, 61) in Ebenen angeordnet sind, die im wesentlichen senkrecht zu der durch die Ränder (51, 52) des vorderen Ansatzes (20) bzw. des hinteren Ansatzes (21) definierten Ebene angeordnet sind, wobei die Ebenen des im wesentlichen flachen vorderen Ansatzstückes (20) und des hinteren Ansatzstückes (21) gegeneinander geneigt sind, und die Schildbaugruppe (2) im wesentlichen die Konfiguration eines Teils eines Zylindermantels hat, wobei die Achse des entsprechenden Zylinders in etwa senkrecht zu der Ebene ausgerichtet ist, die von den Rändern (51, 52) des vorderen Ansatzstückes (20) und des hinteren Ansatzstückes (21) definiert wird.
3. Schirm nach Anspruch 1 oder 2, **dadurch gekennzeichnet**, daß der Verbindungsabschnitt (22) Greif-

mittel (24, 56, 57), speziell Greifmittel vom Typ eines Einschnappverschlusses, umfaßt, zum Greifen und Halten des oberen Abschnitts des Schildrahmens (4).

4. Schirm nach einem der Ansprüche 1-3, **dadurch gekennzeichnet**, daß der Rand (52) des hinteren Ansatzstückes (21) des Halters (5) sich der Oberfläche des Helms (1) sowohl in der Schutzstellung (G, Fig. 4) als auch in der Nicht-Schutzstellung (H, Fig. 5) nähert, um eine gute Passung zu erreichen.
5. Schirm nach Anspruch 4, **dadurch gekennzeichnet**, daß das Mittel zum Anbringen des Schirms am Helm Zungenmittel (72) des betreffenden Verankerungselements (71) umfaßt, zum Einführen in horizontale Schlitz (73), die an der betreffenden Seitenwand des Helms (1) angeordnet sind, wobei das Zungenmittel (72) mit dem Steckteil der Einschnapp-Verriegelung ausgestattet ist, der mit dem entsprechenden Aufnahmeteil zusammenwirkt, das auf der Innenseite des Helms (1) angeordnet ist.
6. Schirm nach Anspruch 5, **dadurch gekennzeichnet**, daß der Lagerzapfenteil (75) eine umlaufende Rille (79) umfaßt, zur Aufnahme und zum Halten des Lagerringabschnitts (77, 80, 81).
7. Schirm nach Anspruch 6, **dadurch gekennzeichnet**, daß der Zapfenteil (75) etwa die Form zweier Halbkreise unterschiedlichen Durchmessers hat, die mit einem Abstand zueinander angeordnet sind und, bezogen auf eine Linie, die ihre Mittelpunkte miteinander verbindet, symmetrisch sind, und ihre größte Distanz an ihren Schnittpunkten mit dieser Mittellinie haben, und durch Seitenlinien verbunden sind, die den jeweiligen Halbkreis tangential schneiden.
8. Schirm nach einem jeden vorangehenden Anspruch, **dadurch gekennzeichnet**, daß er einen Schild (3) umfaßt, der aus einem Geflecht aus Metalldraht oder Polymermaterial in einem Rahmen (4) besteht.
9. Schirm nach einem jeden vorangehenden Anspruch, **dadurch gekennzeichnet**, daß er einen Schild (3) umfaßt, der eine gebogene Platte aus transparentem Kunststoff umfaßt.
10. Scharnier- und Verriegelungsmittel für Schirme für Sicherheitshelme, wobei ein solcher Schirm eine im wesentlichen transparente Schildbaugruppe (2) umfaßt, bestehend aus einem Schild (3), der in einem Rahmen (4) montiert ist, und weiter umfaßt Befestigungsmittel zur Befestigung des Schirms an einem Sicherheitshelm, bei dem das Scharnier-

und Verriegelungsmittel zwei Stützarme (60, 61) umfaßt, an denen die Schildbaugruppe (2) befestigt ist, Verankerungselemente (71), die zwischen dem jeweiligen Stützarm (61) und der jeweiligen Seitenwand des Helms (1) angeordnet sind, wodurch der Schirm mit Hilfe des genannten Scharnier- und Verriegelungsmittels zwischen einer Schutzposition (G, Fig. 4) und einer ungeschützten Position (H, Fig. 4) beweglich ist, und vorübergehend in jeder der beiden Positionen gehalten werden kann, **dadurch gekennzeichnet**, daß die Schildbaugruppe (2) abnehmbar an den Stützarmen (60, 61) befestigt ist, und daß die Verankerungselemente (71) abnehmbar an dem jeweiligen Stützarm (61) und der jeweiligen Seitenwand des Helms (1) befestigt sind, wobei das Scharnier- und Verriegelungsmittel außerdem einen keilförmigen Lagerzapfenabschnitt (75) umfaßt, der an einer im wesentlichen flachen Seitenfläche des jeweiligen Stützarms (61) nahe dem freien Ende des Stützarms (61) angeordnet ist, und in einen Lagerringabschnitt (77, 80, 81) eingebaut ist, mit einer Öffnung (76), die den genannten Lagerzapfenabschnitt (75) aufnehmen und halten kann, wobei der genannte Lagerringabschnitt (77, 80, 81) Teil des Verankerungselements (71) ist.

11. Scharnier- und Verriegelungsmittel nach Anspruch 10, **dadurch gekennzeichnet**, daß es außerdem eine Zunge (72) des betreffenden Verankerungselements (71) umfaßt, die in horizontale Schlitz (73) eingeführt wird, welche an der betreffenden Seitenwand des Helms (1) angeordnet sind, wobei die Zunge (72) mit dem Steckteil eines Einschnapp-Verriegelungsmittels ausgestattet ist, der mit einem entsprechenden Aufnahmeteil am Helm (1) zusammenwirkt.
12. Scharnier- und Verriegelungsmittel nach Anspruch 11, **dadurch gekennzeichnet**, daß der Lagerzapfenteil (75) eine umlaufende Rille (79) umfaßt und einen Flansch (78) zur Aufnahme und zum Halten des Lagerringteils (77, 80, 81).
13. Scharnier- und Verriegelungsmittel nach Anspruch 12, **dadurch gekennzeichnet**, daß der Zapfenteil (75) etwa die Form zweier Halbkreise unterschiedlichen Durchmessers hat, die in einem Abstand zueinander angeordnet und, bezogen auf eine Linie, die ihre Mittelpunkte miteinander verbindet, symmetrisch sind, mit ihrem größten Abstand an ihren Schnittpunkten mit dieser Mittellinie und verbunden durch Seitenlinien, die tangential den jeweiligen Halbkreis schneiden.
14. Scharnier- und Verriegelungsmittel nach Anspruch 13, **dadurch gekennzeichnet**, daß die Breite der Rille (79) geringfügig über der Dicke des Lagerring-

abschnitts (77, 80, 81) liegt.

15. Scharnier- und Verriegelungsmittel nach Anspruch 13, **dadurch gekennzeichnet**, daß die Öffnung (76) des Lagerringabschnitts (77, 80, 81) definiert wird durch eine längere Seitenwand (77) und zwei kürzere Seitenwände (80, 81) von gleicher Länge, wobei die Öffnung (76) dreieckig mit abgerundeten Ecken ist und wobei der kleinere Halbkreis in der Ecke liegt, die durch die Seitenwände (80, 81) definiert wird, und der größere Halbkreis in der einen Verriegelungsstellung in der Ecke liegt, die durch die Seitenwände (77, 81) definiert wird, und der kleinere Halbkreis in der Ecke liegt, die definiert wird durch die Seitenwände (80, 81) und der größere Halbkreis in der Ecke liegt, die in der anderen Verriegelungsposition definiert wird durch die Seitenwände (77, 80).

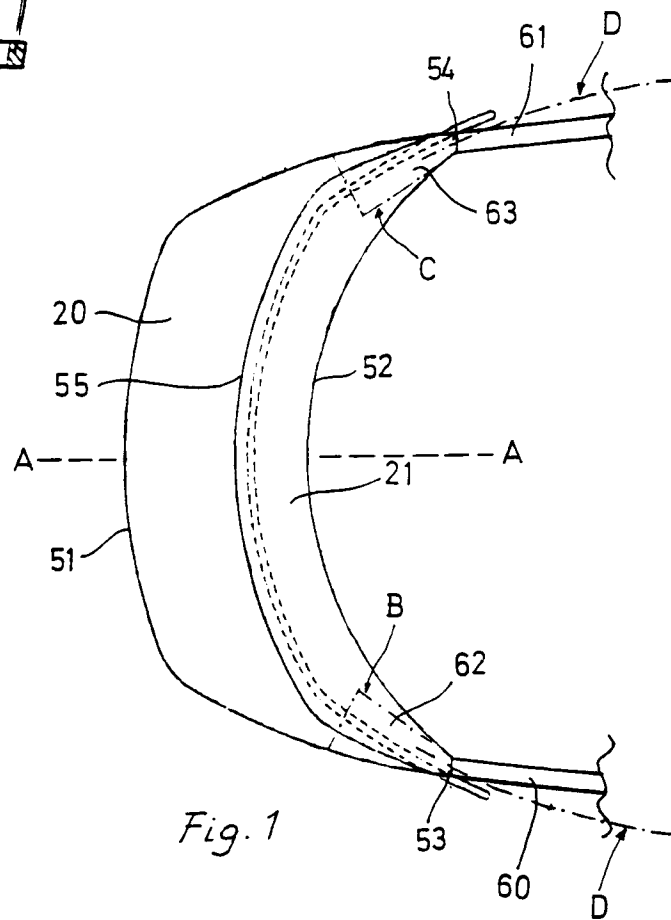
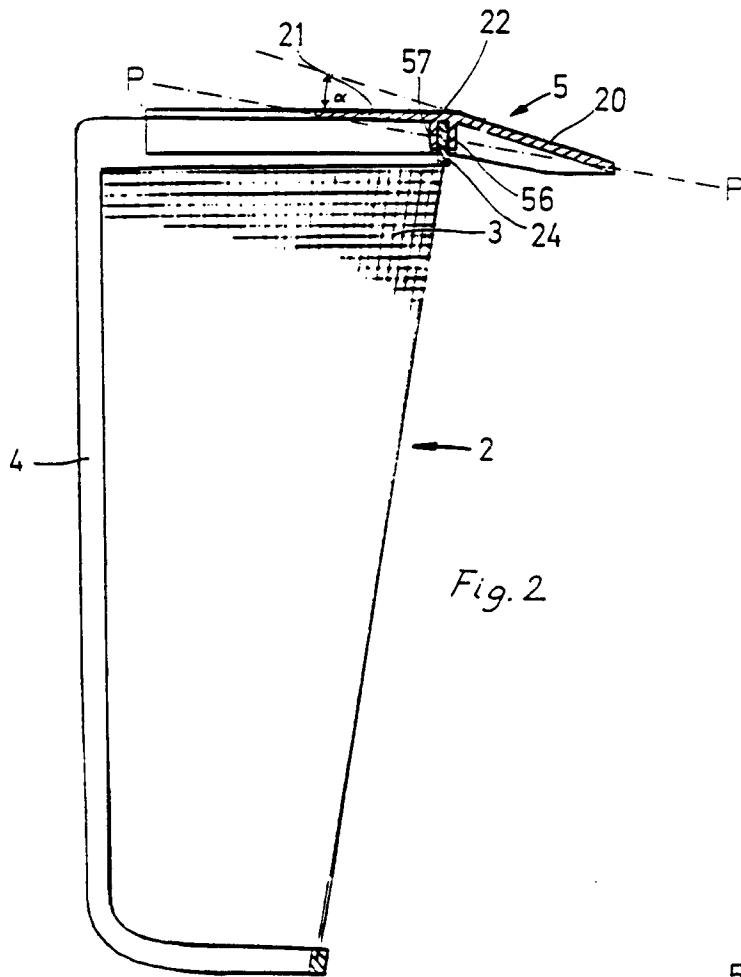
## Revendications

1. Visière pour casques de protection notamment pour des casques de protection pour des personnes travaillant dans un environnement riche en particules légères portées par l'air d'une dimension de particules comprise entre 0,3 et 3,0 mm et d'un poids spécifique apparent inférieur à 1, comprenant un ensemble d'écran sensiblement transparent (2) se composant d'un écran (3) monté dans un cadre (4), et comprenant, en outre, un moyen de fixation pour fixer la visière à un casque de protection, où la visière comprend un support d'écran essentiellement non transparent (5) auquel l'ensemble d'écran (2) est fixé, ledit support (5) comprenant une partie d'interconnexion (22) ayant essentiellement le prolongement d'une partie d'une bande circulaire et deux bras de support (60, 61), lesdits bras de support (60, 61) étant disposés pour être fixés de façon articulée et amovible à un casque de protection (1) prévu avec une partie de bec avant (11) s'étendant dans un plan essentiellement horizontal, où le moyen pour fixer la visière au casque (1) et le moyen d'articulation comprenant des éléments d'ancrage (71) sont disposés entre le bras de support respectif (61) et la paroi de côté respective du casque (1) de sorte que la visière est disposée de façon mobile entre une position de protection (G, figure 4) et une position de non-protection (H, figure 4) et peut être temporairement maintenue dans l'une ou l'autre position à l'aide d'un moyen de blocage, caractérisée en ce que ledit ensemble d'écran (2) est fixé de façon amovible audit support (5), ledit support (5) comprenant également une partie de bec avant (20) se prolongeant généralement vers l'avant à partir de la partie d'interconnexion (22) et une partie de bec arrière (21) se prolongeant généralement vers l'arrière à partir de la partie d'interconnexion (22) et en ce que lesdits

- bras de support (60, 61) sont chacun réunis et s'étendent à partir de l'une ou l'autre extrémité de la partie d'interconnexion (22) où lesdits éléments d'ancrage (71) sont fixés de façon amovible au bras de support respectif (61) et à la paroi latérale respective du casque (1), où les moyens d'articulation et de blocage comprennent une partie de prise de support en forme de coin (75) disposée dans une surface latérale essentiellement plate du bras de support respectif (61) près de l'extrémité libre du bras de support (61) et étant adaptée dans une partie annulaire de support (77, 80, 81) ayant une ouverture triangulaire avec des coins arrondis agencés pour recevoir et maintenir ladite partie de prise de support (75), ladite partie annulaire de support (77, 80, 81) formant une partie de l'élément d'ancrage (71).
2. Visière selon la revendication 1, caractérisée en ce que les bras de support (60, 61) sont agencés dans des plans essentiellement perpendiculaires au plan défini par les rebords (51, 52) de la partie de bec avant (20) et de la partie de bec arrière (21) respectivement, les plans de la partie de bec avant essentiellement plate et de la partie de bec arrière (21) étant inclinés l'un par rapport à l'autre et l'ensemble d'écran (2) ayant essentiellement la configuration d'une partie d'un revêtement de cylindre, l'axe du cylindre correspondant étant agencé sensiblement perpendiculairement au plan défini par les rebords (51, 52) de la partie de bec avant (20) et de la partie de bec arrière (21).
  3. Visière selon la revendication 1 ou 2, caractérisée en ce que la partie d'interconnexion (22) comprend des moyens de saisie (24, 50, 57), notamment des moyens de saisie du type à fermeture par encliquetage pour saisir et maintenir la partie de dessus du cadre d'écran (4).
  4. Visière selon l'une quelconque des revendications 1 à 3, caractérisée en ce que le rebord (52) de la partie de bec arrière (21) du support (5) s'approche de la surface du casque (1) à la fois dans la position de protection (G, figure 4) et la position de non-protection (H, figure 5) pour maintenir une bonne adaptation.
  5. Visière selon la revendication 4, caractérisée en ce que le moyen pour fixer la visière au casque comprend des moyens à languette (72) de l'élément d'ancrage respectif (71) pour l'insertion dans des fentes horizontales (73) ménagées dans la paroi latérale respective du casque (1), les moyens à languette (72) étant prévus avec la partie mâle du moyen de blocage à encliquetage coopérant avec une partie femelle correspondante ménagée sur l'intérieur du casque (1).
  6. Visière selon la revendication 5, caractérisée en ce que la partie de prise de support (75) comprend une rainure circonférentielle (79) pour recevoir et maintenir la partie annulaire de support (77, 80, 81).
  7. Visière selon la revendication 6, caractérisée en ce que la partie de prise (75) a sensiblement la forme de deux demi-cercles de diamètre différent agencés à une distance l'un de l'autre et symétriques par rapport à une ligne reliant leurs centres et avec leur distance la plus grande à leurs intersections avec cette ligne centrale et reliée par des lignes latérales reliant tangentiellement le demi-cercle respectif.
  8. Visière selon l'une quelconque des revendications précédentes, caractérisée en ce qu'elle comprend un écran (3) se composant d'un treillis de fil métallique ou d'un matériau polymère dans un cadre (4).
  9. Visière selon l'une quelconque des revendications précédentes, caractérisée en ce qu'elle comprend un écran (3) comprenant une feuille incurvée de matière plastique translucide.
  10. Moyen d'articulation et de verrouillage pour visières pour casques de protection, laquelle visière comprend un ensemble d'écran essentiellement transparent (2) se composant d'un écran (3) monté dans un cadre (4) et comprend, en outre un moyen de fixation pour fixer la visière à un casque de protection, où le moyen d'articulation et de verrouillage comprend deux bras de support (60, 61) auxquels l'ensemble d'écran (2) est fixé, des éléments d'ancrage (71) disposés entre le bras de support respectif (61) et la paroi latérale respective du casque (1), si bien que la visière avec l'aide dudit moyen d'articulation et de verrouillage est mobile entre une position de protection (G, figure 4) et une position de non-protection (H, figure 4) et peut être maintenue temporairement dans l'une ou l'autre position, caractérisée en ce que l'ensemble d'écran (2) est fixé de façon amovible aux bras de support (60, 61) et en ce que les éléments d'ancrage (71) sont fixés de façon amovible au bras de support respectif (61) et à la paroi latérale respective du casque (1), où le moyen d'articulation et de verrouillage comprend également une partie de prise de support en forme de coin (75) ménagée dans une surface latérale essentiellement plate du bras de support respectif (61) près de l'extrémité libre du bras de support (61) et étant adaptée dans une partie annulaire de support (77, 80, 81) ayant une ouverture (76) agencée pour recevoir et maintenir ladite partie de prise de support (75), ladite partie annulaire de support (77, 80, 81) formant une partie de l'élément d'ancrage (71).

11. Moyen d'articulation et de verrouillage selon la revendication 10, caractérisé en ce qu'il comprend aussi des moyens à languette (72) de l'élément d'ancrage respectif (71) pour l'insertion dans des fentes horizontales (73) ménagées dans la paroi latérale respective du casque (1), les moyens à languette (72) étant prévus avec la partie mâle du moyen de verrouillage à encliquetage coopérant avec une partie femelle correspondante ménagée sur le casque (1). 5 10
12. Moyen d'articulation et de verrouillage selon la revendication 11, caractérisé en ce que la partie de prise de support (75) comprend une rainure circonférentielle (79) et une bride (78) pour recevoir et maintenir la partie annulaire de support (77, 80, 81). 15
13. Moyen d'articulation et de verrouillage selon la revendication 12, caractérisé en ce que la partie de prise (75) présente environ la forme de deux demi-cercles de diamètre différent ménagés à une distance l'un de l'autre et symétriques par rapport à une ligne reliant leurs centres et avec leur distance la plus grande à leurs intersections avec cette ligne centrale et reliée par des lignes latérales reliant tangentiellement le demi-cercle respectif. 20 25
14. Moyen d'articulation et de verrouillage selon la revendication 13, caractérisé en ce que la largeur de la rainure (79) est légèrement supérieure à l'épaisseur de la partie annulaire de support (77, 80, 81). 30
15. Moyen d'articulation et de verrouillage selon la revendication 13, caractérisé en ce que l'ouverture (76) de la partie annulaire de support (77, 80, 81) est définie par une paroi latérale plus longue (77) et deux parois latérales plus courtes (80, 81) de longueur égale, où l'ouverture (76) est triangulaire avec des coins et où le demi-cercle plus petit est situé dans le coin défini par les parois latérales (80, 81) et le demi-cercle le plus grand est situé dans le coin défini par les parois latérales (77, 81) dans une position de verrouillage et où le demi-cercle plus petit est situé dans le coin défini par les parois latérales (80, 81) et le demi-cercle plus grand est situé dans le coin défini par les parois latérales (77, 80) dans l'autre position de verrouillage. 35 40 45 50

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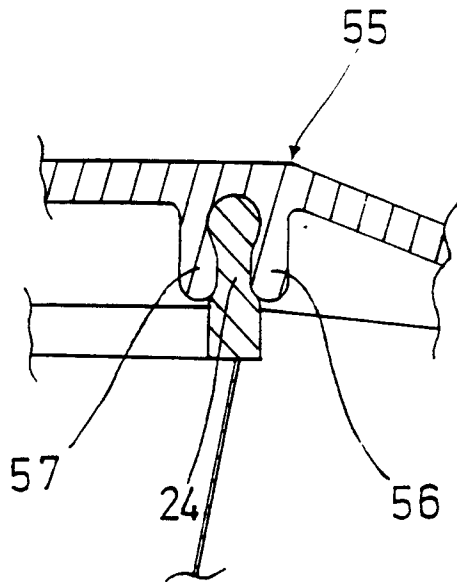


Fig. 3

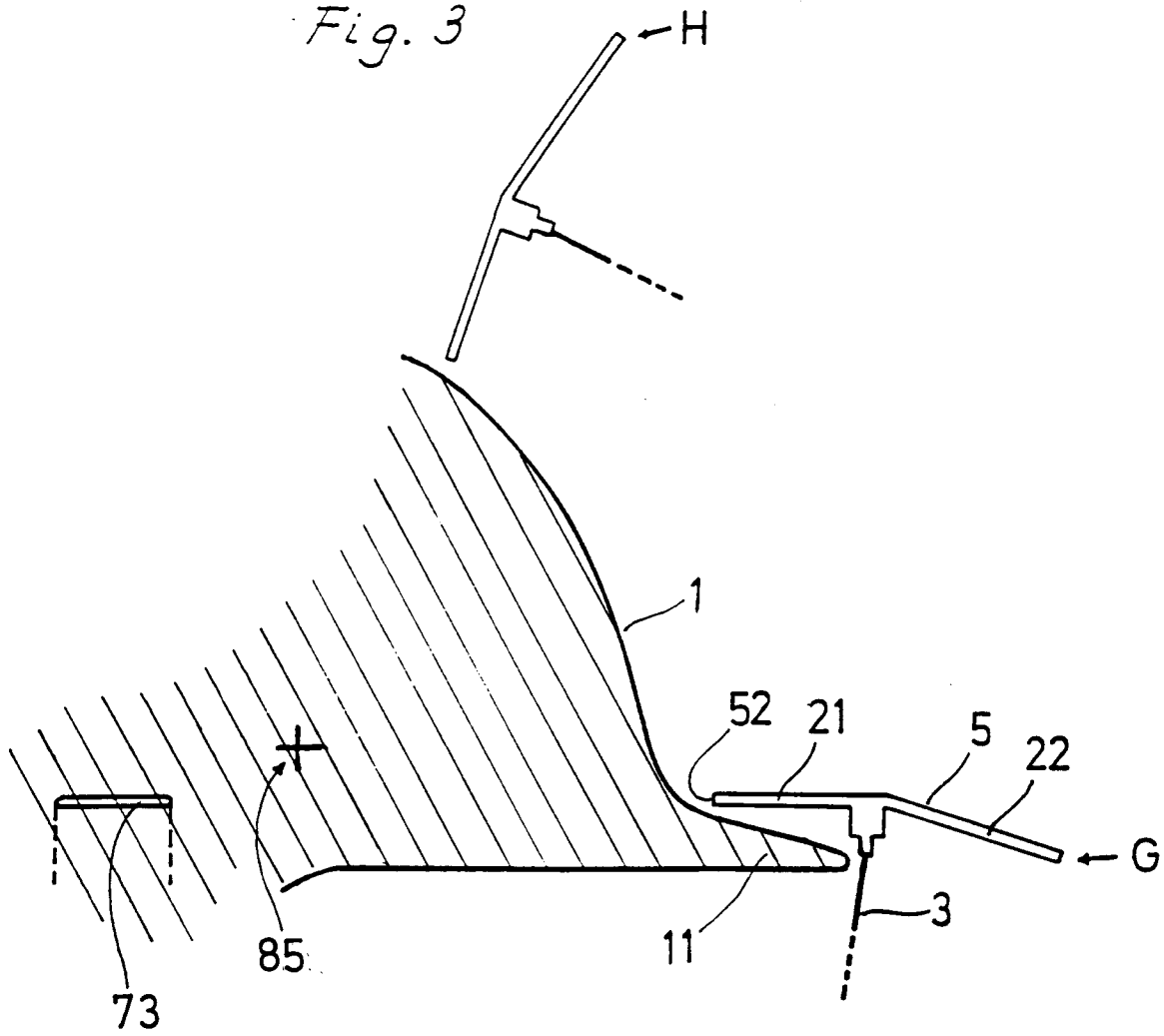


Fig. 4

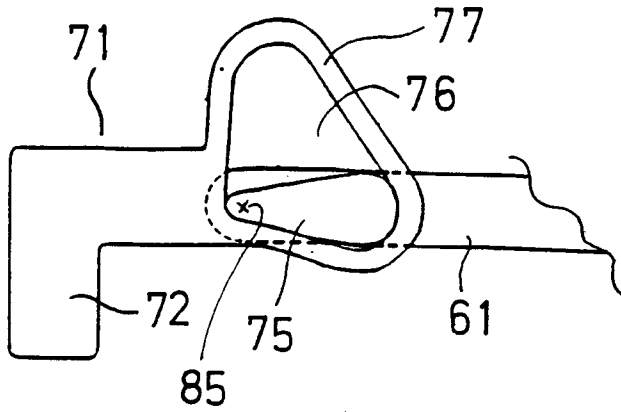


Fig. 5

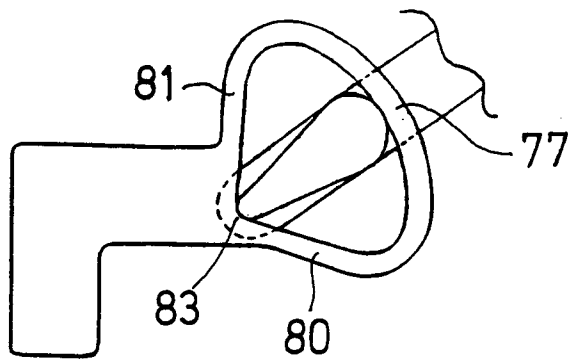


Fig. 6

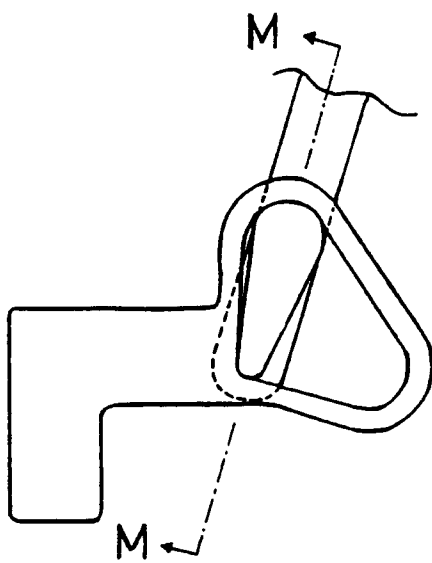


Fig. 7

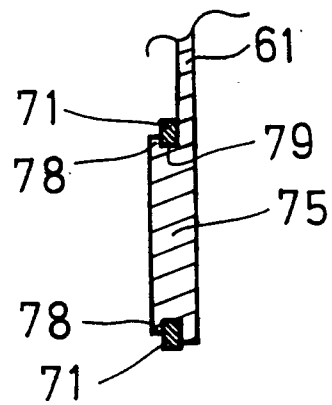


Fig. 8