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(54) **FACE SHIELD FOR SAFETY HELMET**

**VISIER FÜR SICHERHEITSHELM**

**ÉCRAN DE PROTECTION FACIALE POUR CASQUE DE SÉCURITÉ**

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## Description

[Technical Field]

**[0001]** The present invention relates to a face protector for a safety helmet, and more particularly, to a face protector for a safety helmet, which can be rotated upward and downward by a predetermined angle while being coupled to the safety helmet, and can be stably secured at an upwardly rotated position thereof with a low wind-resistance and negligible weight-deflection while eliminating the risk of unintentional lowering by a weight thereof.

[Background Art]

**[0002]** In general, safety helmets are widely used in a variety of industrial fields to protect workers from unexpected accidents. The safety helmets are provided with a face protector for protecting the wearer's face from light, wind, airborne materials, or physical hazards.

**[0003]** FIG. 1 illustrates a conventional face protector provided at a safety helmet. As shown in FIG. 1, the conventional face protector 20 is coupled, at opposite ends thereof, to coupling pieces 12 provided at opposite sides of the safety helmet 10 by use of rotating shafts 30, so as to be rotated upward and downward. In the conventional face protector 20 having the above described configuration, it is rotatable in a circle about the rotating shafts 30.

**[0004]** However, with the above described rotating structure, when being rotated upward by a certain angle, the face protector 20 is supported by only the rotating shafts 30. Therefore, there is a problem in that the face protector 20 may be easily lowered by a weight thereof, thus causing inconvenience in use.

**[0005]** Furthermore, the above described conventional face protector 20 suffers from a large size thereof because it has to be raised to protrude upward from the safety helmet 10 when not in use. Due to the large size, the conventional face protector 20 may receive an excessively large resistance from external environment during movement of the wearer and in particular, cause inconvenience for the wearer in narrow spaces. To solve the inconvenience in use, it is necessary to rotate the face protector beyond an angle of 90 degrees, so as to position the center of gravity of the face protector toward a rear side of the safety helmet. However, when the center of gravity of the face protector is deflected rearward, it may apply a burden to muscles of the wearer's neck. Also, in a state of being raised when not in use, there is a problem in that a lower end of the raised face protector is lifted from a front end of the safety helmet to thereby be located at a disadvantageous position receiving a considerably large resistance against wind. This may result in unintentional excessive rearward rotation of the face protector by wind.

**[0006]** US4224694 discloses a face protector for a

safety helmet.

**[0007]** Therefore, the present invention has been made in view of the above problems, and it is an object of the present invention to provide a face protector for a safety helmet, which can be rotated upward and downward by a predetermined angle while being coupled to the safety helmet, and can be stably secured at an upwardly rotated position thereof with a low wind-resistance and negligible weight-deflection while eliminating the risk of unintentional lowering by a weight thereof.

**[0008]** In accordance with an aspect of the present invention, the above and other objects can be accomplished by the provision of a face protector for a safety helmet, which is rotated upward and downward by a predetermined angle while being coupled to coupling pieces provided at opposite sides of the safety helmet, so as to protect the wearer's face, comprising: a body configured to protect the wearer's face; a pair of coupling units configured to be fixedly coupled to both the coupling pieces of the safety helmet, respectively; and a plurality of links used to connect the coupling units to opposite rear ends of the body, respectively, so as to restrict rotation of the body, wherein: the body has upper and lower operating shaft holes perforated, respectively, in both the rear ends thereof; each of the coupling units comprises: a fixing piece configured to be fitted to an associated one of the coupling pieces of the safety helmet and adapted to prevent unintentional movement of the coupling unit; and a supporting piece located at the outer side of the fixing piece and having upper and lower supporting shaft holes formed at a protruding portion thereof; and each of the links comprises upper and lower connecting shaft holes formed in opposite ends thereof, the links including upper links to connect the upper operating shaft hole with the upper supporting shaft hole through a shaft pin, and lower links to connect the lower operating shaft hole with the lower supporting shaft hole through a shaft pin, whereby, if the body is rotated downward, a recessed edge portion of the upper link comes into close contact with one end of the lower link to restrict rotation of the body after being located in front of the wearer's face, and if the body is rotated upward, the other end of the lower link comes into close contact with an end of the upper link to restrict rotation of the body while preventing a lower end of the body from being lifted from a front end portion of the safety helmet and allowing the body to come into close contact with a front portion of the safety helmet.

**[0009]** Preferably, elastic rings may be coupled to the shaft pins, which are used to couple the upper and lower links to the upper and lower supporting shaft holes and the upper and lower operating shaft holes, the elastic rings serving to restrict rotation of the shaft pins by an elastic force thereof.

**[0010]** Preferably, the fixing piece of each coupling unit may be formed at opposite sides thereof with elastic protrusions configured to be coupled to the coupling pieces of the safety helmet in a hook coupling manner.

**[0011]** Preferably, the body of the face protector may

have a lip formed at an upper end thereof to protrude inward, the lip being adapted to come into close contact with a rim of the safety helmet when the body is rotated downward.

#### [Advantageous Effects]

**[0012]** According to the present invention, a face protector for a safety helmet, which is coupled to the safety helmet via coupling units and links to come into close contact with a front portion of the helmet when being rotated upward while preventing a lower end thereof from being lifted from a front end portion of the helmet, has the effects of: preventing the wearer's head from colliding with any object above the head in a narrow space; maximizing wearing convenience of the face protector with a low wind-resistance and negligible weight-deflection; and guaranteeing easy and convenient use of the face protector by preventing the face protector from being unintentionally rotated downward by a weight thereof.

#### [Description of Drawings]

**[0013]** The above and other objects, features and other advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a side view illustrating a safety helmet having a face protector according to the prior art;  
 FIG. 2 is a perspective view illustrating a face protector for use with a safety helmet according to the present invention;  
 FIG. 3 is a side sectional view illustrating important parts of the face protector of FIG. 2;  
 FIG. 4 is a sectional view taken along the line A-A of FIG. 3;  
 FIG. 5 is a side view illustrating the face protector provided at a safety helmet, which is lowered; and  
 FIG. 6 is a side view illustrating the face protector provided at a safety helmet, which is raised.

#### [Best Mode]

**[0014]** Now, preferred embodiments of the present invention will be explained in detail with reference to the accompanying drawings.

**[0015]** FIG. 2 is a perspective view illustrating a face protector for use with a safety helmet according to the present invention. FIG. 3 is a side sectional view illustrating important parts of the face protector of FIG. 3. FIG. 4 is a sectional view taken along the line A-A of FIG. 3. FIGS. 5 and 6 are side views illustrating the face protector provided at a safety helmet, which is lowered and raised, respectively.

**[0016]** As shown in FIGS. 2 to 6, the face protector 100 for use with a safety helmet 10 according to the present invention comprises a body 120 configured to protect a

face of the wearer, a pair of coupling units 140 configured to be fixedly coupled to coupling pieces 12, respectively, which are provided at opposite sides of the safety helmet 10, and a plurality of upper links 160a and lower links 160b used to connect the coupling units 140 to opposite rear ends of the body 120, so as to restrict rotation of the body 120.

**[0017]** The body 120 is made of a transparent material, to allow the wearer to see in front through the body 120 in a state wherein the body 120 covers the wearer's face. The body 120 is formed, at both the rear ends thereof, with a plurality of upper and lower operating shaft holes 122a and 122b so that the upper and lower links 160a and 160b are aligned with the upper and lower operating shaft holes 122a and 122b, respectively, by use of shaft means.

**[0018]** To be aligned with the upper and lower links 160a and 160b, specifically, each upper operating shaft hole 122a is spaced apart from the associated lower operating shaft hole 122b by a predetermined distance in such a manner that they are arranged at opposite upper and lower diagonal positions.

**[0019]** Preferably, a lip 124 is formed along an inner periphery of an upper end of the body 120. The lip 124 protrudes inward to be caught by a rim of the safety helmet 10 when the body 120 is rotated downward.

**[0020]** Each of the coupling units 140 is configured such that it is coupled not only to an associated one of the coupling pieces 12 of the safety helmet 10, but also to the associated rear end of the body 120 by use of the upper and lower links 160a and 160b. Accordingly, the coupling units 140 serve to couple the respective rear ends of the body 120 of the face protector 100 to the coupling pieces 12 of the safety helmet 10. The two coupling units 140 provided at the face protector 100 has the same configuration and operation as each other and thus, only one of them will be described hereinafter.

**[0021]** Considering the configuration of the coupling unit 140 in detail, the coupling unit 140 includes a fixing piece 142 integrally formed, at opposite sides thereof, with elastic protrusions 144, the fixing piece 142 being configured to be fitted to the associated coupling piece 12 of the safety helmet 10 and adapted to prevent unintentional movement of the coupling unit 140. The coupling unit 140 further includes a supporting piece 146 located at the outer side of the fixing piece 142, the supporting piece 146 being formed with upper and lower supporting shaft holes 148a and 148b for allowing the coupling unit 140 to be coupled to the upper and lower links 160a and 160b by use of shaft means. Both the fixing piece 142 and supporting piece 146 are spaced apart from each other by a predetermined distance so that the associated coupling piece 12 of the safety helmet 10 is fitted into a gap between the fixing piece 142 and the supporting piece 146.

**[0022]** Similar to the above described upper and lower operating shaft holes 122a and 122b, the upper and lower supporting shaft holes 148a and 148b formed in the sup-

porting piece 146 are spaced apart from each other by a predetermined distance in such a manner that they are positioned at opposite upper and lower diagonal positions, to ensure the connection of the upper and lower links 160a and 160b as well as smooth rotation thereof.

**[0023]** The upper and lower supporting shaft holes 148a and 148b are formed in an outwardly protruding portion of the supporting piece 146, and the outwardly protruding portion has the same thickness as that of the body 120. Accordingly, both the rear ends of the body 120 of the face protector 100 can be guided while coming into close contact with the supporting pieces 146 of both the coupling units 140. Also, with the above described configuration, when the upper and lower supporting shaft holes 148a and 148b and the upper and lower operating shaft holes 122a and 122b are connected to each other, there is no deflection in the height of the upper and lower links 160a and 160b, and the stable connection and operation of the upper and lower links 160a and 160b can be accomplished.

**[0024]** As stated above, each fixing piece 142 is provided at opposite sides thereof with the elastic protrusions 144 to be fastened to the associated coupling piece 12 of the safety helmet 10 in a hook coupling manner. Preferably, the elastic protrusions 144 are designed to be easily unfastened from the coupling piece 12 if necessary.

**[0025]** The links 160a and 160b serve to connect both the rear ends of the body 120 of the face protector 100 to the corresponding coupling units 140, respectively, so as to restrict rotation of the body 120. The upper link 160a and the lower link 160b make a pair, and two pairs of the upper and lower links 160a and 160b are provided at both the rear ends of the body 120, respectively.

**[0026]** Specifically, each upper link 160a has a pair of connecting shaft holes 162a formed at opposite ends thereof, and each lower link 160b has a pair of connecting shaft holes 162b formed at opposite ends thereof. The upper link 160a is connected to the upper operating shaft hole 122a and the upper supporting shaft hole 148a such that a shaft pin 164 penetrates therethrough. Similarly, the lower link 160b is connected to the lower operating shaft hole 122b and the lower supporting shaft hole 148b such that another shaft pin 164 penetrates therethrough. In a state wherein the upper and lower links 160a and 160b are coupled to the body 120 through the coupling unit 140, if the body 120 is rotated downward, the upper link 160a pushes the lower link 160b to come into close contact with the lower link 160b, thereby acting to prevent the body 120 from being rotated unintentionally after being located in front of the wearer's face. Conversely, if the body 120 is rotated upward, the lower link 160b pushes the upper link 160a to come into close contact with the upper link 160a, thereby acting to cause the lower end of the body 120 to come into close contact with a front end portion of the safety helmet 10 without being lifted from the front end portion.

**[0027]** More specifically, when the body 120 is rotated

downward, as shown in FIG. 5, the upper and lower links 160a and 160b are rotated simultaneously, such that a recessed edge portion of the upper link 160a comes into close contact with one end of the lower link 160b, so as to prevent further rotation of the body 120. In a state wherein the end of the lower link 160b is closely engaged with the recessed edge portion of the upper link 160a, the body 120 is located to cover the wearer's face.

**[0028]** Also, when the body 120 is rotated upward, as shown in FIG. 6, the upper and lower links 160a and 160b are rotated simultaneously, such that the other end of the lower link 160b comes into close contact with an end of the upper link 160a, so as to prevent further rotation of the body 120. In a state wherein the other end of the lower link 160b comes into close contact with the facing end of the upper link 160a, the body 120 comes into close contact with a front portion of the safety helmet 10 while preventing the lower end of the body 120 from being lifted from the front end portion of the safety helmet 10.

**[0029]** As will be understood from the above description, the respective ends of the upper and lower links 160a and 160b coming into close contact with each other function as stoppers.

**[0030]** With interaction between the upper and lower links 160a and 160b, when the body 120 is rotated upward, the body 120 is horizontally moved rearward after being rotated by a predetermined angle, rather than being further rotated in a circle. This has the effect of preventing the lower end of the body 120 from being lifted from the front end portion of the body 120, thus allowing the body 120 to come into close contact with the front portion of the safety helmet 10.

**[0031]** In the present invention, additionally, elastic rings 166 are coupled to the shaft pins 164, which are used to connect the respective connecting shaft holes 162a and 162b formed at both the ends of the upper and lower links 160a and 160b to the upper and lower supporting shaft holes 148a and 148b and the upper and lower operating shaft holes 122a and 122b. The elastic rings 166 serve to restrict rotation of the shaft pins 164 by use of an elastic force thereof.

**[0032]** Specifically, each shaft pin 164 is penetrated from the upper or lower supporting shaft hole 148a or 148b and the upper or lower operating shaft hole 122a or 122b to the shaft hole 162a or 162b formed at a front or rear end of the upper or lower link 160a or 160b. The shaft pin 164 is formed at an end thereof with a hook protrusion or snap protrusion so as not to be easily separated from the above described holes. In the above described coupling manner, it is important to prevent the shaft pins 164 from being easily rotated in their fastened state for preventing the body 120 of the face protector 100 from being unintentionally rotated downward by a weight thereof. For this, the elastic rings 166 are coupled to the shaft pins 164 between the upper and lower operating shaft hole 122a and 122b and the shaft holes 162a and 162b of the upper and lower links 160a and 160b and between the upper and lower supporting shaft holes

148a and 148b and the shaft holes 162a and 162b of the upper and lower links 160a and 160b. Thereby, the elastic rings 166 come into close contact with the links 160a and 160b and the body 120, to restrict rotation of the body 120.

**[0033]** With the above described configuration of the face protector 100, the body 120 of the face protector 100 can be rotated upward and downward in a simplified manner via interaction between the coupling units 140 and the upper and lower links 160a and 160b, and the face protector 100 can guarantee easy and convenient wearing thereof in its upwardly rotated state.

[Industrial Applicability]

**[0034]** As apparent from the above description, a face protector for a safety helmet according to the present invention has the following advantageous effects.

**[0035]** Firstly, the face protector is coupled to the safety helmet via coupling units and links in such a manner that it comes into close contact with a front portion of the safety helmet when being rotated upward while preventing a lower end thereof from being lifted from a front end portion of the helmet. With this configuration, it is possible to prevent the wearer's head from colliding with any object above the head in a narrow space, to maximize wearing convenience of the face protector with a low wind-resistance and negligible weight-deflection, and to guarantee easy and convenient use of the face protector by preventing the face protector from being unintentionally rotated downward by a weight thereof.

**[0036]** Further, the face protector according to the present invention can not only be easily attached to the safety helmet, but also be easily rotated upward and downward. In use, the face protector has a minimized distance from the safety helmet, resulting in a compact structure. The face protector of the present invention also has a three-dimensional body designed to fit perfectly to the curvature of the human face. This has the effects of increasing a face protecting effect while decreasing the weight of the face protector.

**[0037]** Furthermore, when not in use, there is no considerable variation in the size of the helmet even in a state wherein the face protector is raised. This reduces inconvenience in motion of the wearer in a narrow space and prevents the wearer's head from colliding with any objects above the wearer's head in the narrow space, thereby achieving an ergonomic structure of the face protector. Accordingly, it can be said that the present invention is very useful in the field of safety equipment industry.

**[0038]** Finally, due to the fact that the face protector comes into close contact with a front portion of the safety helmet, the face protector can be affected by only a reduced wind-resistance and negligible weight-deflection. This has the effect of preventing unintentional lowering of the face protector by the weight thereof, and guaranteeing very convenient and easy use of the face protector.

**[0039]** Although the preferred embodiments of the present invention have been disclosed for illustrative pur-

poses, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope of the invention as disclosed in the accompanying claims.

## Claims

1. A face protector (100) for a safety helmet (10), which is rotated upward and downward by a predetermined angle while being coupled to coupling pieces (12) provided at opposite sides of the safety helmet, so as to protect the wearer's face, comprising:

a body (120) configured to protect the wearer's face;  
a pair of coupling units (140) configured to be fixedly coupled to both the coupling pieces of the safety helmet, respectively; and  
a plurality of links (160a, 160b) used to connect the coupling units to opposite rear ends of the body, respectively, so as to restrict rotation of the body,

wherein:

the body has upper and lower operating shaft holes (122a, 122b) perforated, respectively, in both the rear ends thereof;  
each of the coupling units comprises:

a fixing piece (142) configured to be fitted to an associated one of the coupling pieces of the safety helmet and adapted to prevent unintentional movement of the coupling unit; and

a supporting piece (146) located at the outer side of the fixing piece and having upper and lower supporting shaft holes (148a, 148b) formed at a protruding portion thereof; and

each of the links comprises upper and lower connecting shaft holes (162a, 162b) formed in opposite ends thereof, the links including upper links to connect the upper operating shaft hole with the upper supporting shaft hole through a shaft pin (164), and lower links to connect the lower operating shaft hole with the lower supporting shaft hole through a shaft pin,

## characterised in that

if the body is rotated downward, a recessed edge portion of the upper link comes into close contact with one end of the lower link to restrict rotation of the body after being located in front of the wearer's face, and

if the body is rotated upward, the other end of the

lower link comes into close contact with an end of the upper link to restrict rotation of the body while preventing a lower end of the body from being lifted from a front end portion of the safety helmet and allowing the body to come into close contact with a front portion of the safety helmet.

2. The face protector (100) according to claim 1, wherein elastic rings (166) are coupled to the shaft pins (164), which are used to couple the upper and lower links (160a, 160b) to the upper and lower supporting shaft holes (148a, 148b) and the upper and lower operating shaft holes, the elastic rings serving to restrict rotation of the shaft pins by an elastic force thereof.
3. The face protector (100) according to claim 1 or 2, wherein the fixing piece (142) of each coupling unit (140) is formed at opposite sides thereof with elastic protrusions (144) configured to be coupled to the coupling pieces (12) of the safety helmet (10) in a hook coupling manner.
4. The face protector (100) according to claim 3, wherein the body (120) of the face protector has a lip (124) formed at an upper end thereof to protrude inward, the lip being adapted to come into close contact with a rim of the safety helmet (10) when the body is rotated downward.

#### Patentansprüche

1. Visier (100) für einen Sicherheitshelm (10), der durch einen vorbestimmten Winkel nach oben und unten gedreht wird, während er an Kupplungsstücke (12) gekoppelt ist, die auf entgegengesetzten Seiten des Sicherheitshelms bereitgestellt sind, um das Gesicht des Trägers zu schützen, umfassend:

Einen Körper (120), der konfiguriert ist, das Gesicht des Trägers zu schützen;  
ein Paar von Kupplungseinheiten (140), die konfiguriert sind, unbeweglich jeweils an beide der Kupplungsstücke des Sicherheitshelms gekoppelt zu werden; und  
eine Vielzahl von Verbindungen (160a, 160b), die zum Verbinden der Kupplungseinheiten mit jeweiligen entgegengesetzten hinteren Enden des Körpers verwendet werden, um Drehung des Körpers zu beschränken, wobei:

Der Körper obere und untere Betätigungswellenlöcher (122a, 122b) aufweist, die jeweils, in beiden hinteren Enden davon, perforiert sind;  
jede der Kupplungseinheiten umfasst:

Ein Befestigungsstück (142), das konfiguriert ist, in ein zugehöriges der Kupplungsstücke des Sicherheitshelms montiert zu werden, und angepasst ist, unbeabsichtigte Bewegung der Kupplungseinheit zu verhindern; und

ein Auflagestück (146), das an der Außenseite des Befestigungsstücks positioniert ist und obere und untere Stützwellenlöcher (148a, 148b) aufweist, die auf einem hervorstehenden Teil davon gebildet sind; und

jede der Verbindungen obere und untere Verbindungswellenlöcher (162a, 162b) umfasst, die in entgegengesetzten Enden davon gebildet sind, wobei die Verbindungen obere Verbindungen zum Verbinden der oberen Betriebswellenlöcher mit dem oberen Stützwellenloch durch einen Wellenstift (164) und untere Verbindungen zum Verbinden des unteren Betriebswellenlochs mit dem unteren Stützwellenloch durch einen Wellenstift einschließt, **dadurch gekennzeichnet, dass**

wenn der Körper nach unten gedreht wird, ein vertiefter Kantenteil der oberen Verbindung in engen Kontakt mit einem Ende der unteren Verbindung kommt, um Drehung des Körpers zu beschränken, nach dem er vor das Gesicht des Trägers positioniert ist, und

wenn der Körper nach oben gedreht wird, kommt das andere Ende der unteren Verbindung in engen Kontakt mit einem Ende der oberen Verbindung, um Drehung des Körpers zu beschränken, während verhindert wird, dass ein unteres Ende des Körpers ab einem Vorderende des Sicherheitshelms hoch gehoben wird und dem Körper erlaubt, mit einem Vorderteil des Sicherheitshelms in engen Kontakt zu kommen.

2. Visier (100) nach Anspruch 1, wobei elastische Ringe (166) an die Wellenstifte (164) gekoppelt sind, die verwendet werden die oberen und unteren Verbindungen (160a, 160b) an die oberen und unteren Stützwellenlöcher (148a, 148b) und die oberen und unteren Betätigungswellenlöcher zu koppeln, wobei die elastischen Ringe durch deren elastische Kraft dazu dienen, Drehung der Wellenstifte zu beschränken.
3. Visier (100) nach Anspruch 1 oder 2, wobei das Befestigungsstück (142) jeder Kupplungseinheit (140) an entgegengesetzten Seiten davon mit elastischen

Vorsprünge (144) gebildet ist, die konfiguriert sind, an die Kupplungsstücke (12) des Sicherheitshelms (10) auf die Art einer Hakenkupplung gekoppelt werden sollen.

4. Visier (100) nach Anspruch 3, wobei der Körper (120) des Visiers eine Lippe (124) aufweist, die an einem oberen Ende davon gebildet ist, um nach innen hervorzustehen, wobei die Lippe angepasst ist, in engen Kontakt mit einem Rand des Sicherheitshelms (10) zu kommen, wenn der Körper nach unten gedreht wird.

## Revendications

1. Ecran de protection faciale (100) pour casque de sécurité (10) qui est mis en rotation vers le haut et vers le bas d'un angle prédéterminé alors qu'il est raccordé à des éléments de raccordement (12) prévus sur des côtés opposés du casque de sécurité, de manière à protéger le visage de l'utilisateur, comportant:

un corps (120) configuré de manière à protéger le visage de l'utilisateur;

deux unités de raccordement (140) configurées de manière à être raccordées de façon fixe respectivement aux deux éléments de raccordement du casque de sécurité; et

une pluralité de coupleurs (160a, 160b) servant à raccorder les unités de raccordement à des extrémités arrière opposées du corps respectivement, de manière à limiter la rotation du corps, **caractérisé en ce que**:

le corps comprend des trous pour axes d'articulation au haut et au bas (122a, 122b) qui sont perforés respectivement dans les deux extrémités du corps du casque; chacune des unités de raccordement comprend:

un élément de fixation (142) configuré de manière à être monté sur l'un des éléments de raccordement correspondants du casque de sécurité et adapté de manière à empêcher le mouvement accidentel de l'unité de raccordement; et

un élément de support (146) placé de l'autre côté de l'élément de fixation et dont les trous (148a, 148b) supérieur et inférieur pour axes de support sont formés au niveau d'une partie en saillie de l'élément de support; et chacun des coupleurs comprend des trous (162a, 162b) supérieur et infé-

rieur pour axes de raccordement qui sont formés sur des côtés opposés du casque, les coupleurs étant constitués de coupleurs supérieurs qui servent à raccorder le trou supérieur pour axe d'articulation au trou supérieur pour axe de support au moyen d'une broche d'axe (164), et de coupleurs inférieurs qui servent à raccorder le trou inférieur pour axe d'articulation au trou inférieur pour axe de support au moyen d'une broche d'axe,

## caractérisé en ce que

si le corps est tourné vers le bas, une partie du bord encastré du coupleur supérieur entre en contact étroit avec l'une des extrémités du coupleur inférieur et limite ainsi la rotation du corps après avoir été placé devant le visage de l'utilisateur, et

si le corps est tourné vers le haut, l'autre extrémité du coupleur inférieur entre en contact étroit avec l'une des extrémités du coupleur supérieur et limite ainsi la rotation du corps, tout en empêchant une extrémité inférieure du corps d'être soulevée d'une partie de l'extrémité avant du casque de sécurité et en permettant au corps d'entrer en contact étroit avec une partie avant du casque de sécurité.

2. Ecran de protection faciale (100) selon la revendication 1, **caractérisé en ce que** les rondelles élastiques (166) sont raccordées aux broches d'axe (164) qui servent à raccorder les coupleurs du haut et du bas (160a, 160b) aux trous pour axes de support du haut et du bas (148a, 148b) et aux trous pour axes d'articulation du haut et du bas, les rondelles élastiques servant à limiter la rotation des axes d'articulation par leur force élastique.

3. Ecran de protection faciale (100) selon la revendication 1 ou 2, **caractérisé en ce que** l'élément de fixation (142) de chaque unité de raccordement (140) est formé sur des côtés opposés de ces unités de raccordement au moyen de saillies élastiques (144) qui sont configurées de manière à se raccorder aux éléments de raccordement (12) du casque de sécurité (10) par un effet de crochet.

4. Ecran de protection faciale (100) selon la revendication 3, **caractérisé en ce que** le corps (120) de l'écran de protection faciale comprend un rebord (124) formé à son extrémité supérieure et qui fait saillie vers l'intérieur, le rebord étant adapté de manière à se mettre en contact étroit avec un bord du casque de sécurité (10) lorsque le corps est tourné vers le bas.

Fig. 1

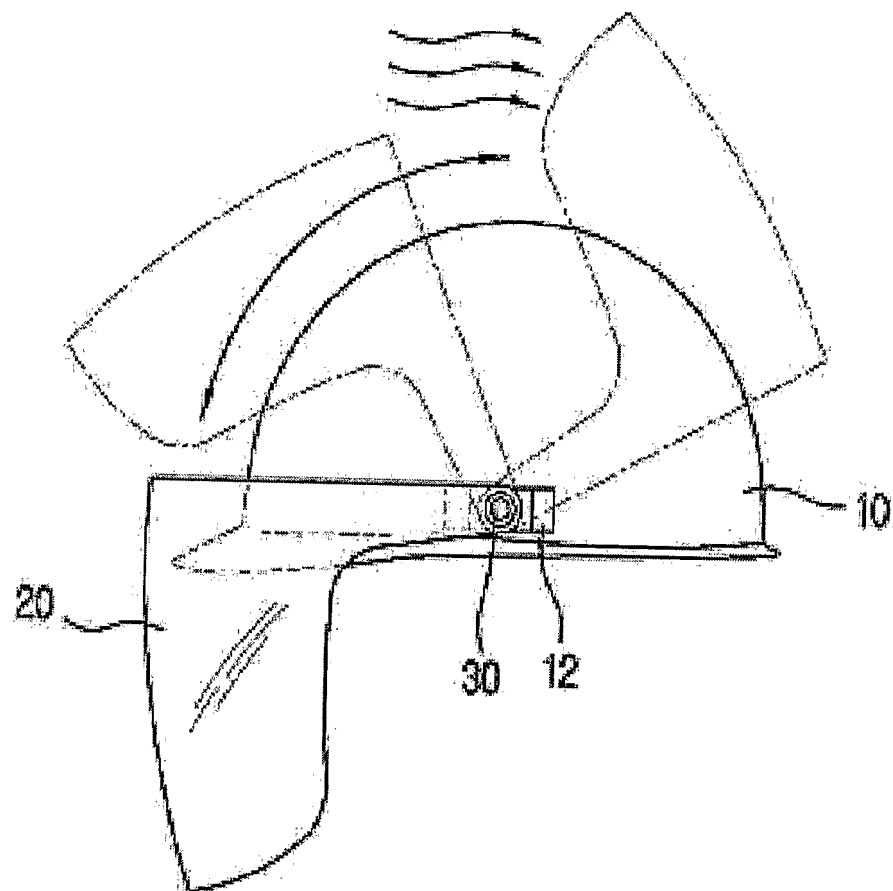




Fig. 2

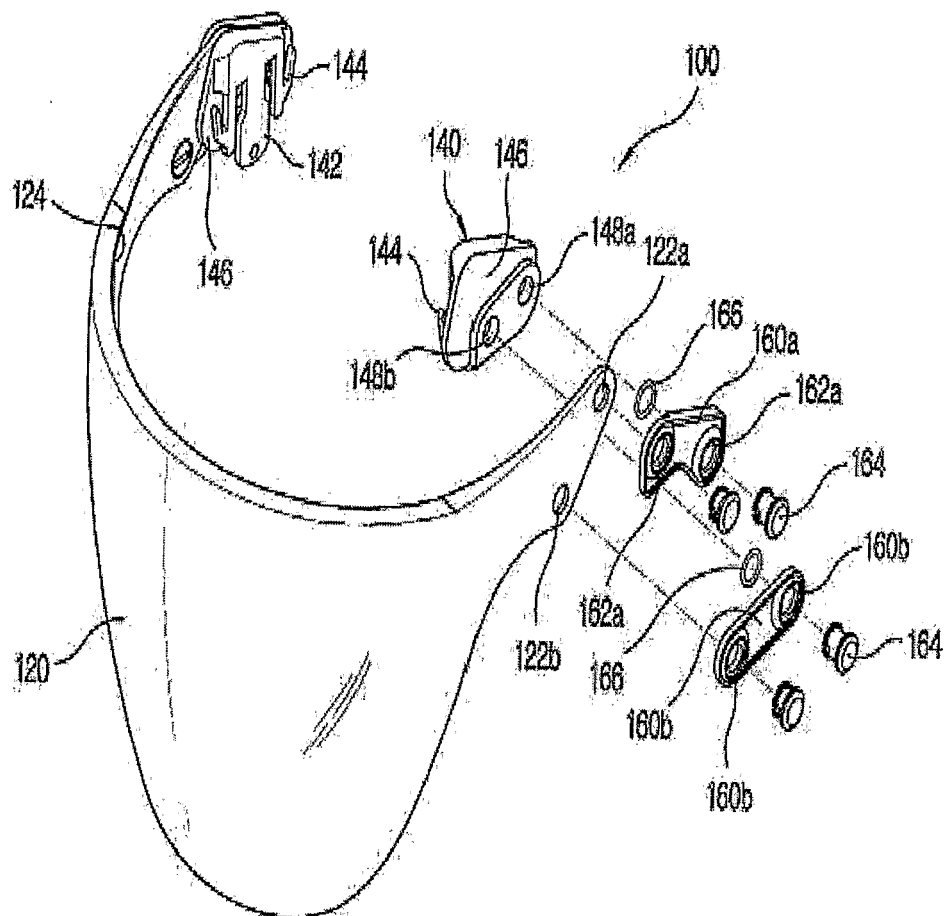


Fig. 3

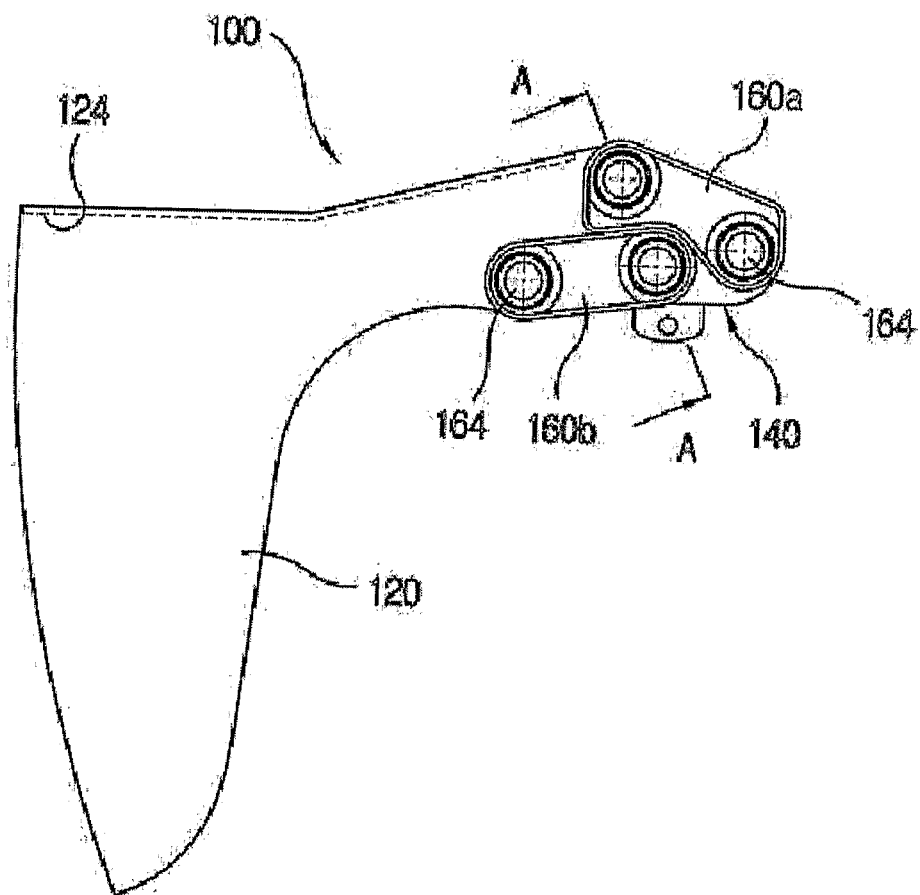


Fig. 4

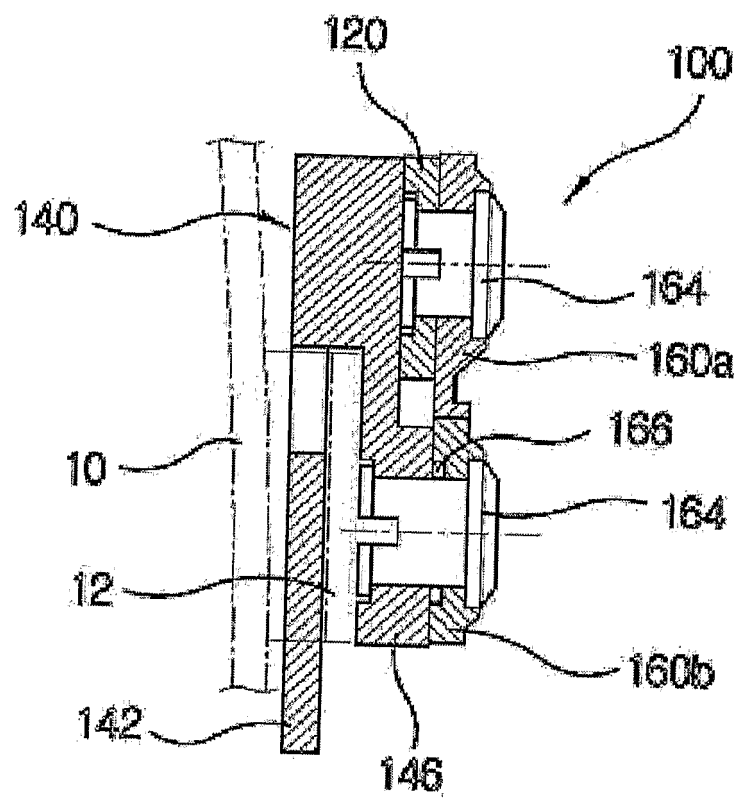


Fig. 5

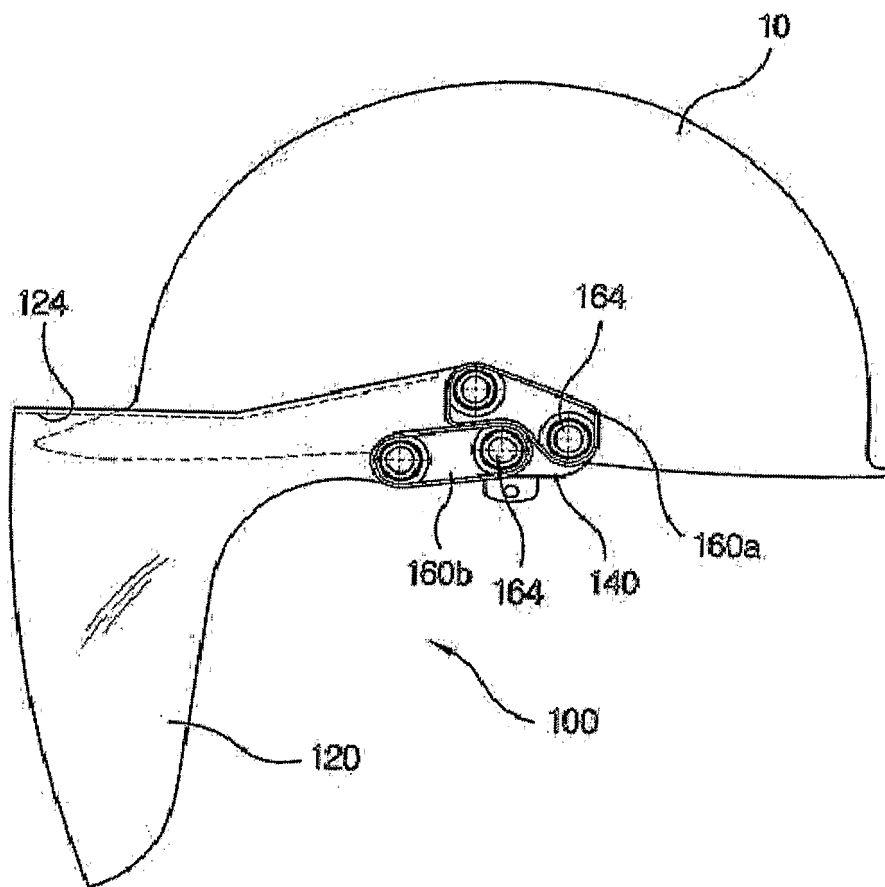
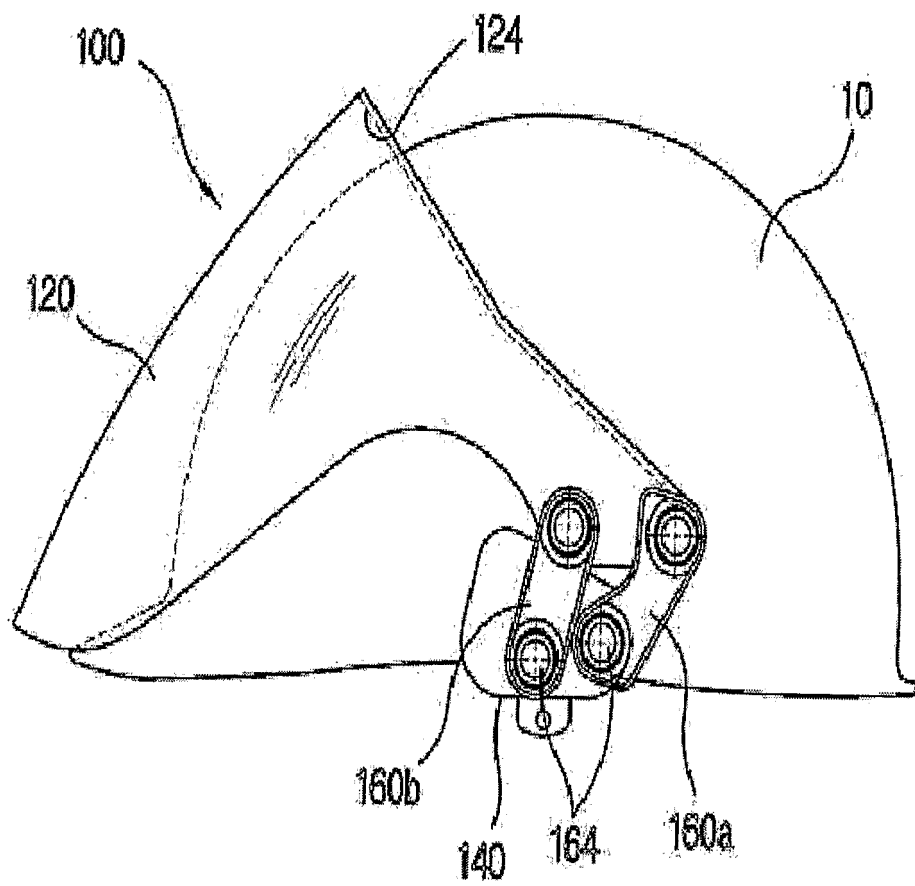


Fig. 6



**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

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