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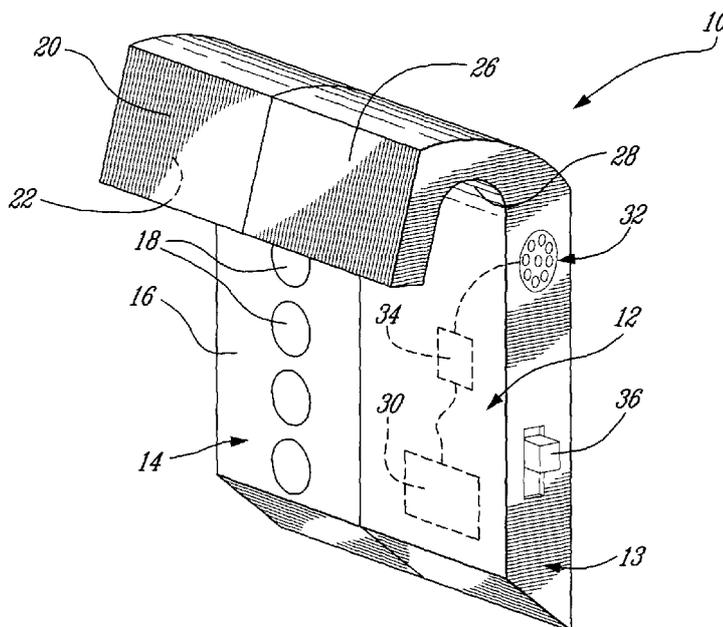
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(54) Title: VISOR ACCESSORY WITH WARNING DEVICE



(57) Abstract: A visor mounting element (10, 110, 121, 210), which is engageable with a hockey helmet (11) to mount a visor (9, 109) thereto, includes a warning device (12, 112, 212) having a sensor (30, 230) operable to detect a position of the device relative to a predetermined reference position and an indicator (32, 232) operable to provide a warning signal when the sensor detects that the device is displaced away from the predetermined reference position. The predetermined reference position may correspond to a substantially vertically-upright position of the helmet, and the sensor detects when the helmet is tilted downwards away from this position, such as when a wearer looks downwards.

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## VISOR ACCESSORY WITH WARNING DEVICE

### TECHNICAL FIELD

The present invention relates generally to a visor accessory for a helmet visor, and more particularly to a visor mounting element comprising a warning device.

### 5 BACKGROUND OF THE INVENTION

Risk of injuries is always of concern for athletes, both young and more mature alike. This is particularly true for more physical sports where contact between players is likely, particularly those stick based sports such as ice hockey, field hockey, lacrosse and the like. During the play of such contact sports, inexperienced athletes often tend to look  
10 down at the ground or ice surface as well as at their sticks, rather than keeping their heads more upright such that they can more easily spot obstacles and/or opposing players. For example, in ice hockey it is a common mistake, particularly when learning, to look down at one's stick when trying to control the puck, rather than keeping one's head upright. By keeping a more upright head position, players are more easily able to avoid potential  
15 contact, and therefore limit injuries which may result therefrom.

A warning device exists which is adapted to be incorporated into a hockey helmet and is capable of producing an audible sound when the device detects that the helmet, and therefore the user's head when the helmet is being worn, is no longer in a substantially horizontal position. Thus, if the user tilts his or her head downwards, such as to look at  
20 the stick and/or the puck, ball or ground for example, the device will sound a warning indicator thereby reminding the wearer to keep their head upright.

However, one problem with this device is that integrating such a device into a protective helmet is not necessarily an easily accomplished task, and one more complicated than that suggested by inventors of the aforementioned known indicating  
25 device. First, mounting any additional device into a protective helmet, especially on the interior thereof as suggested by the inventors of the aforementioned known device, creates possible safety hazards regardless of how small such a device is made. Particularly, even when covered by protective padding, such a device mounted to the inside of a helmet risks harming the user in the even of a severe blow to the helmet.

Further, the helmets worn for most of the aforementioned contact sports must be officially certified by governmental regulatory safety standards organizations, so as to ensure that the helmet is both safe and reliable for use by the general public. However, the addition of such a warning device, purchased as an after-market add-on item, into an already certified helmet would render the helmet no longer officially certified, as a major modification has been made thereto which risks negatively affecting the structural integrity of the helmet and potentially its ability to adequately protect the user. Conversely, while such a warning device could be designed into a new helmet such that when it is certified for the first time the device is incorporated therein, the helmet so certified could not be modified, such as to remove the warning device for example, without rendering the helmet un-certified. Thus, such a warning device, which is designed to be incorporated directly into the hockey helmet, cannot be removed from the helmet once incorporated therein and certified as a whole (i.e. the helmet with the device therein).

Therefore, although such a warning device exists, there remains a need to be able to more easily and cost effectively add such a warning device onto an existing protective sports helmet while nevertheless permitting the device to be removed therefrom without causing the helmet to lose its certification.

#### SUMMARY OF THE INVENTION

It is thus an object of the present invention to provide an improved warning device for mounting onto a sports helmet.

It is another object of the present invention to provide a visor accessory comprising a warning device therein.

Therefore, in accordance with one aspect of the present invention, there is provided an accessory for a visor of a protective sports helmet, the accessory comprising: a visor engaging element engageable with a portion of said visor; and a warning device having a sensor operable to detect a position of said device relative to a predetermined reference position, and an indicator operable to provide a warning signal when said sensor detects that said device is displaced away from said predetermined reference position.

In accordance with another aspect of the present invention, there is provided a sports helmet comprising: a visor engaged to the helmet by at least two visor mounting elements, the visor mounting elements being engaged to an exterior surface of the helmet and having a visor engaging portion which receives at least a portion of said visor when  
5 said visor is in an operable position on said helmet covering at least a portion of a user's face; and at least one of the visor mounting elements including a warning device including a sensor operable to detect a position of said helmet relative to a predetermined reference position and an indicator operable to provide a warning signal when said sensor detects that said helmet is displaced away from said predetermined reference position  
10 thereof.

There is further provided, in accordance with another aspect of the present invention, a visor assembly adapted to be mounted to a sports helmet, the visor assembly comprising: a visor having a curved protective portion through which a user can see and which is sized to cover at least a part of a user's face when wearing the sports helmet  
15 having said visor mounted thereto; at least one visor mounting element engageable to an exterior surface of the helmet for fixing said visor in place on said helmet, and having a slot formed therein within which a portion of said face visor is received; and wherein said visor mounting element includes a warning device, said warning device including a sensor operable to detect a position of said device relative to a predetermined reference  
20 position and an indicator operable to provide a warning signal when said sensor detects that said device is displaced away from said predetermined reference position thereof.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Further features and advantages of the present invention will become apparent from the following detailed description, taken in combination with the appended  
25 drawings, in which:

Fig. 1 is a perspective view of a visor mounting J-clip of the prior art;

Fig. 2 is a front elevation view of a helmet having a protective visor mounted thereto using at least one visor mounting element in accordance with the present invention;

Fig. 3a is a perspective view of a visor mounting element having a warning device in accordance with one aspect of the present invention;

Fig. 3b is a perspective view of a visor mounting element having a warning device in accordance with another aspect of the present invention;

5 Fig. 4 is a perspective view of a visor mounting element in accordance with another alternate aspect of the present invention, also having a warning device incorporated therein; and

Fig. 5 is a perspective view of a partial-face lens visor in accordance with an alternate aspect of the present invention, having a warning device incorporated into the  
10 mounting elements thereof.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Face visors are commonly fixed to sports helmets, such as ice hockey helmets, in order to provide improved protection to the wearer's eyes and face. Such visors are usually sold as an after-market item, which the end user installs themselves on their  
15 helmet. The visors themselves are tested and certified to ensure that their use with various helmets will be safe. As discussed above, protective helmets are themselves also tested and certified to strict standards. Modification of such helmets in most respects renders them un-certified for their intended use. The addition of approved visors to such a helmet, however, remains within the accepted and tested norms for helmet certification,  
20 and therefore does not cause the helmet to be un-certified.

Therefore, while warning devices that detect when the device, and therefore the helmet to which it is fixed, has been inclined away from a substantially vertical position and thus which warn against lowering one's head during play are known, such a device cannot be removed from a helmet which has been designed and certified with the device  
25 built therein without losing the helmet's certification, rendering the use of such a device to date fairly limited. The converse is also true, in that the addition of such a device into a helmet which has been designed and certified without the device incorporated therein would also cause the helmet's certification to be lost.

However, in accordance with an aspect of the present invention, such a warning device has been integrated into a mounting element used for mounting a visor onto the helmet, thereby obviating the need for re-certification of the helmet to which the device is engaged and/or causing the helmet to be un-certified if the warning device is removed  
5 from engagement therewith, therefore making the use of such a device more practical and feasible for use conjunction with a certified sports helmet. Therefore, by incorporating the warning device into a mounting element used to fasten a visor onto a helmet, or alternately into the visor itself as described below, the warning device can be readily removed from the helmet when required (e.g. for replacement, repair, to change the  
10 battery, etc.).

Visors are commonly mounted to hockey helmets using three mounting elements, namely a center element to which the visor is hinged such that it can be pivoted upwards relative to the helmet, and two opposed mounting elements located on either side of the helmet which receive an upper edge of the visor therein when the visor is located in an  
15 operative position (i.e. covering at least a portion of the face of a wearer). These two side mounting elements are typically called "J-clips" by those skilled in the art, due to their shape which resembles an inverted J. While other mounting elements and configurations exist, most visors use such a mounting assembly.

The term "visor" as used herein is to be understood to include any protective face  
20 shield which covers at least a portion of a wearer's face and which is mountable, either permanently or removably, to a helmet used for sports. This will include both the wire mask type of face shield, and the clear plastic face shields commonly worn today. Further, this will include full face shields as well as partial face visors, such as those which cover only the eye area of a user. Also, the term "accessory" for such a visor as  
25 used herein is intended to include any attachment, mounting element and/or fastening element, which is either attached to or incorporated within the visor or used to fasten the visor to the helmet. The term "helmet" as used herein is to be understood to include any protective helmet which is worn for and particularly intended for sports, such as, but not limited to, ice-hockey helmets, lacrosse helmets, cricket helmets, football helmets, and  
30 the like. Therefore, although the present invention is described in detail herein with

regards to its use for an ice-hockey (herein simply "hockey") helmet and visor, it is to be understood that this is exemplary only.

Referring to Fig. 1, a prior art J-clip 90 is depicted. Generally, the J-clip is made of a single plastic or metal body which includes a first planar portion 92 having several  
5 holes 94 therethrough, the first portion 92 being adapted to abut a surface of the helmet for mounting thereto, such as by using at least one fastener which extends through a hole 94 to fasten the J-clip 90 in place on the helmet. An upper curved portion 96 protrudes outward from the first portion 92 of the J-clip 90 and has a hook-shape, defining a slot 98  
10 therein within which a portion (such as an upper edge thereof) of the visor is received and retained to locate the visor in place.

As seen in Fig. 2, a protective sports helmet 11 (such as that used for hockey, for example) is provided with a visor 9 (in this case a full-face wire mask type visor) mounted thereto using a central visor mounting element 210 and a pair of side mounting  
15 elements 10, one on either side of the helmet 11. The central visor mounting element 210 of the present invention will be discussed in further detail below, with reference to Fig. 4. The side mounting elements 10 of the present invention are described below with reference to Figs. 3a and 3b.

Referring to Fig. 3a, the J-clip type visor mounting element 10 comprises two portions, namely a first mounting portion 14 and a second portion 13 having a warning  
20 device 12 therein. The mounting portion 14 is essentially configured as per the prior art J-clip 90, having a first substantially planar portion 16 through which mounting holes 18 extend for fastening the visor mounting element 10 to the helmet, using at least one suitable fastener such a screw or bolt for example. A second, upper curved portion 20  
25 protrudes outward from the first portion 16 and has a hook shape, thereby defining a slot 22 extending therethrough. The slot 22 is configured for receiving at least a portion, such as an upper edge for example, of the visor when it is located in an operable position on the helmet.

The second portion 13 comprising the warning device 12 of the visor mounting element 10 is disposed immediately adjacent the first mounting portion 14, lateral edge to

later edge, and is fastened thereto such as to create a continuous mounting element 10 made up of the two components. The warning device portion 12 may also, or instead, be fastened directly to the helmet against which the planar portion thereof is abutted when installed. The second portion 12 incorporating the warning device 12 is sized and shaped  
5 to correspond exactly to the mounting portion 14, such that it creates merely an extension thereof. Thus, the second portion 13 also includes an upper curved portion 26, which is aligned with the upper curved portion 20 such that a slot 28 defined by the hook-shaped upper curve portion 26 is aligned with the slot 22 in the mounting portion 14. In this embodiment, the second portion 13 having the warning device 12 is separately produced,  
10 and fastened to the mounting portion 14 to create the composite J-clip visor mounting element 10. The second portion 13 may also be permanently fastened to the mounting portion 14, such as by adhesive, rivet, or the like, or alternately may be removably engaged thereto, such as by threaded fastener for example. When removably engaged thereto, the second portion 13 having the warning device portion 12 may thus be removed  
15 when required following the initial installation of the visor mounting element 10 to the helmet, such as to permit repair thereof, or to change the battery therein for example. Thus, the portion 13 having the warning device portion 12 may also be simply fastened directly to an existing J-clip 90 already mounted to a helmet, in order to create the visor mounting element 10 of the present invention (in which case the mounting portion 14 is  
20 replaced by the existing J-clip 90).

The warning device 12 includes at least a sensor 30 therein which is operable to detect a position of the warning device 12, at least relative to a predetermined reference position. For example, in at least one embodiment the predetermined reference position is a substantially vertically-upright position of the helmet to which the visor mounting  
25 element 10 is engaged, the substantially vertically-upright position corresponding to a position of a wearer's head when they are looking substantially straight forward with their head up. The warning device 12 further includes at least one indicator 32 in electrical communication with the sensor 30, either directly or via a microcontroller 34. The indicator 32 is operable to provide a warning signal when the sensor 30 detects that the  
30 warning device 12 (and therefore the helmet to which it is engaged) is displaced away a sufficient distance away from the predetermined reference position. This sufficient

distance may be either pre-set, or alternately varied and calibrated by the user depending on their needs. Thus, when a wearer of a hockey helmet 11 (see Fig. 2) having such a visor mounting element 10 engaged thereto tilts their head downward such as to look at the puck and/or their stick for example (i.e. rotating their head and therefore the helmet  
5 11 forward about the horizontal axis 15 in Fig. 2), the sensor 30 detects that the helmet is tilted downwards away from the normal (substantially vertically-upright) position and sends an electrical signal to the indicator 32, which creates a warning signal to the user.

The indicator 32 may include a speaker as shown in Figs. 3a-3b, which is capable of producing an audible warning signal, and/or a visual indicator such as a small light.  
10 The audible warning signal is likely most useful to alert the wearer of the helmet, however a visible indicator such as a light may also be helpful to provide indication to a coach, other player or referee that the wearer's head is tilted downwards. The warning device 12 may also include at least one control switch, such as the on-off power switch 36. Other control switches may be provided, such as to control the volume of the audible  
15 warning signal, the type of sound produced, and the type of indication (visual, audible, both audible and visual, etc.) for example.

In the alternate embodiment of Fig. 3b, the visor mounting element 110 operates exactly as per the visor mounting element 10, however has the warning device portion 12 fully integrated into the mounting portion 14 thereof. Thus, a single casing 117 encloses  
20 the components of the warning device 12, and is directly mountable to the helmet, such as by using fasteners extending through the holes 18 in the mounting portion 14. Thus the visor mounting element 110 is a single unit, which could be either provided by itself for use with any type of helmet and visor, or provided in combination with an associated visor 13 for mounting onto a certified helmet.

Referring to Fig. 4, the central visor mounting element 210 (shown installed in Fig. 2) may also comprise a warning device 212 therein, which operates exactly as per the warning device 12 described above. Although several warning devices may be employed, generally either a visor mounting element 210 having a warning device 212 therein will be used with standard J-clips, or alternately the J-clip shaped visor mounting elements  
30 10/1 10 will be used with a standard (i.e. prior art) central visor mounting clip. Thus, in

stead of incorporating such a warning device into the side mounted J-clip visor mounting elements, it may be incorporated directly into the central mounting element 210. In this case, the mounting element may be a rectangular-shaped block, having at least two holes 54 therein to which a hinge portion of the visor is engaged, such as by threaded fasteners which may also be used to fasten the mounting element 210 itself to the helmet. The warning device 212 includes an indicator 232 and a sensor 230 in communication therewith, which operate as per those described above with respect to the warning device 12. The visor mounting element 210 is shown with two indicators 232, namely both a forward mounted speaker 244 for providing an audible warning signal and side-mounted light 246 for providing a visible warning signal.

Although many visors used today employ such a three-support mounting configuration as depicted in Fig. 2 (i.e. one central mounting bracket and at least two side mounting brackets), some visors, particularly the smaller clear lens visors which cover only partially the user's face, are mounted to the helmet only at opposed sides thereof. Further, these smaller visors (which typically cover only the eye region of the wearer) are fixed to the helmet and are not displaceable relative thereto once mounted in place. This is in comparison with the larger full-face visors, which must pivot relative to the helmet (typically at the front center mounting bracket thereof) to permit the helmet to be put on or taken off. Thus such smaller clear lens visors do not employ the aforementioned J-clip mounting elements or any central mounting element.

Accordingly, as shown in Fig. 5, a partial-face lens-type visor 113 is fixed to the helmet only at the side ends thereof 119 thereof. Thus, in accordance with an alternate aspect of the present invention, such a visor 109 includes visor mounting elements 121 which are fastenable to a protective sports helmet and which include a warning device 112 integrated therein. The warning device 112 is as per the warning device 12 described above, however is integrated directly into the side visor mounting elements 121 of the partial face lens visor 113.

The warning device as described above can also be incorporated into other parts and/or portions of a visor or a visor mounting accessory, such as for example in the chin cup, on an element engageable to an attachment strap of the visor, etc.

The embodiments of the invention described above are intended to be exemplary. Those skilled in the art will therefore appreciate that the foregoing description is illustrative only, and that various alternatives and modifications can be devised without departing from the spirit of the present invention. Accordingly, the present is intended to  
5 embrace all such alternatives, modifications and variances which fall within the scope of the appended claims.

## CLAIMS:

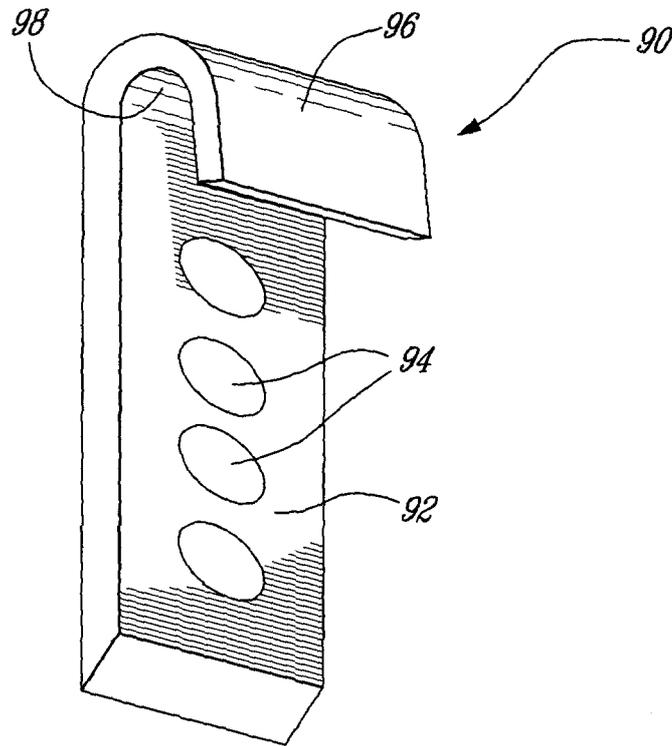
1. An accessory for a visor of a protective sports helmet, the accessory comprising:  
a visor engaging element engageable with a portion of said visor; and  
a warning device having a sensor operable to detect a position of said device relative to a predetermined reference position, and an indicator operable to provide a warning signal when said sensor detects that said device is displaced away from said predetermined reference position.
2. The accessory as defined in claim 1, wherein said visor mounting element comprises a visor J-clip.
3. The accessory as defined in claim 2, wherein said J-clip includes a first portion adapted to be abutted against the helmet and having at least one hole therethrough for mounting said J-clip to said helmet, and a second portion protecting outwards from said first portion and having a slot formed therein for receiving said portion of said visor.
4. The accessory as defined in claim 3, wherein said warning device is located adjacent said first portion of said J-clip.
5. The accessory as defined in claim 1, wherein said predetermined reference position corresponds to a substantially vertically-upright position of the device and therefore of the protective sports helmet to which it is adapted to be mounted, wherein said substantially vertically-upright position corresponds to a horizontal position of a user's head wearing the protective sports helmet .
6. The accessory as defined in claim 1, wherein said warning device is integrally incorporated into said visor mounting element.
7. The accessory as defined in claim 1, wherein said warning signal includes at least one of an audible noise and a visual indicator.

8. A sports helmet comprising:  
a visor engaged to the helmet by at least two visor mounting elements, the visor mounting elements being engaged to an exterior surface of the helmet and having a visor engaging portion which receives at least a portion of said visor when said visor is in an operable position on said helmet covering at least a portion of a user's face; and  
at least one of the visor mounting elements including a warning device including a sensor operable to detect a position of said helmet relative to a predetermined reference position and an indicator operable to provide a warning signal when said sensor detects that said helmet is displaced away from said predetermined reference position thereof.
9. The sports helmet as defined in claim 8, wherein said predetermined reference position corresponds to a substantially vertically-upright position of the helmet, and said sensor detects when said helmet is tilted downwards away from said substantially vertically-upright position, such as when a user looks downwards.
10. The sports helmet as defined in claim 8, wherein said visor mounting element comprises a visor J-clip.
11. The sports helmet as defined in claim 10, wherein said J-clip includes a first portion having at least one hole therethrough and a second portion protecting outwards from said first portion, said first portion being abutted against the helmet and fastened by a fastener extending through said at least one hole, and said second portion having a slot formed therein within which said portion of said visor is received.
12. The sports helmet as defined in claim 11, wherein said warning device is located at least within said first portion of said J-clip.
13. The sports helmet as defined in claim 8, wherein said sports helmet is an ice hockey helmet.

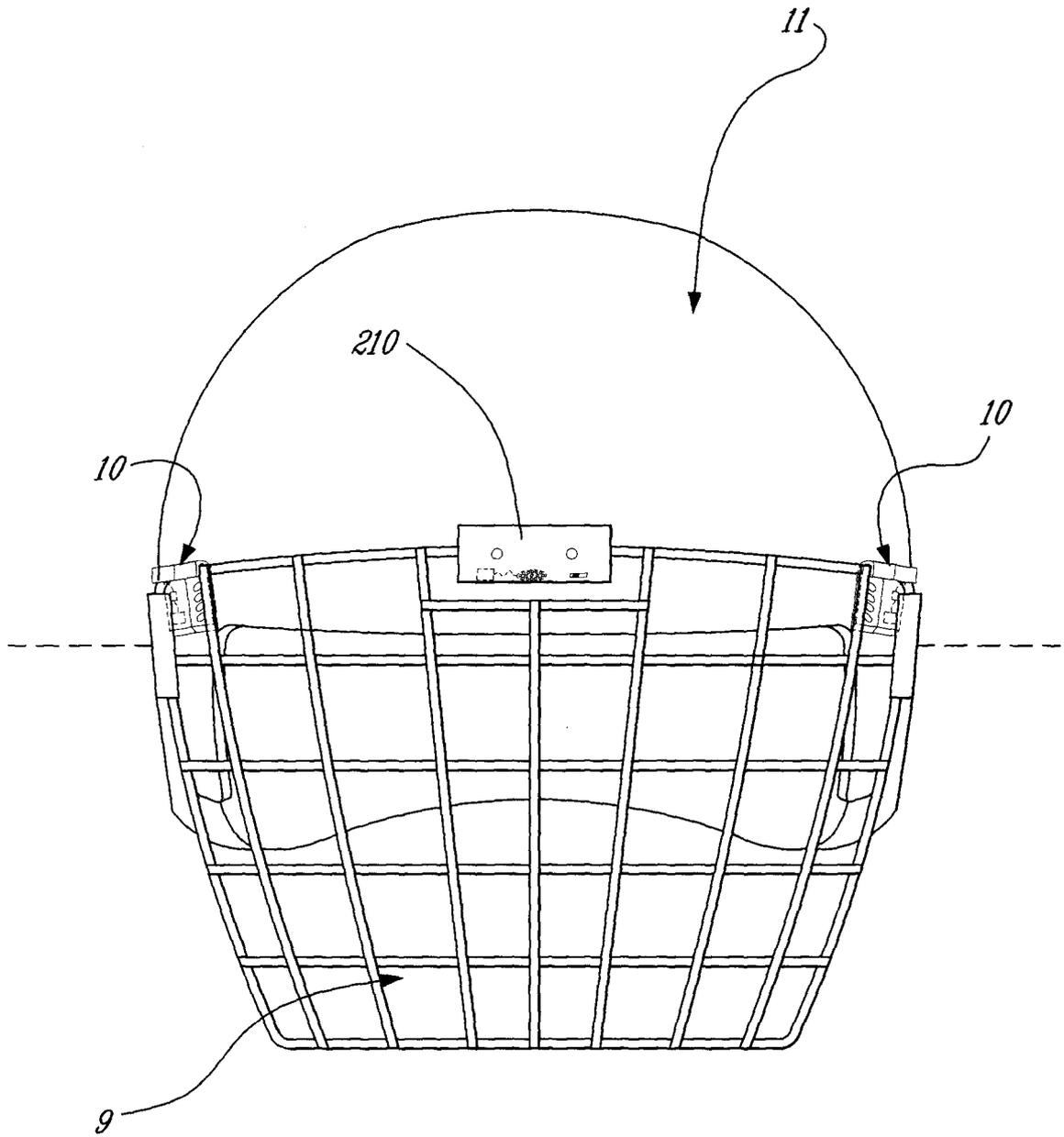
14. The sports helmet as defined in claim 8, wherein the warning device is incorporated within the visor mounting element.
15. The sports helmet as defined in claim 8, wherein the warning device is mounted to the visor mounting element.
16. A visor assembly adapted to be mounted to a sports helmet, the visor assembly comprising:
  - a visor having a curved protective portion through which a user can see and which is sized to cover at least a part of a user's face when wearing the sports helmet having said visor mounted thereto;
  - at least one visor mounting element engageable to an exterior surface of the helmet for fixing said visor in place on said helmet, and having a slot formed therein within which a portion of said face visor is received; and
  - wherein said visor mounting element includes a warning device, said warning device including a sensor operable to detect a position of said device relative to a predetermined reference position and an indicator operable to provide a warning signal when said sensor detects that said device is displaced away from said predetermined reference position thereof.
17. The visor assembly as defined in claim 16, wherein said predetermined reference position corresponds to a substantially vertically-upright position of the visor when mounted to the sports helmet, and said sensor detects when said visor is tilted downwards away from said substantially vertically-upright position, such as when a user looks downwards.
18. The visor assembly as defined in claim 16, wherein said visor mounting element comprises a visor J-clip.
19. The visor assembly as defined in claim 18, wherein said J-clip includes a first portion having at least one hole therethrough and a second portion protecting outwards from said first portion, said first portion being adapted to be abutted

against the helmet and fastened thereto by a fastener extending through said at least one hole, and said second portion having said slot formed therein within which said portion of said visor is received.

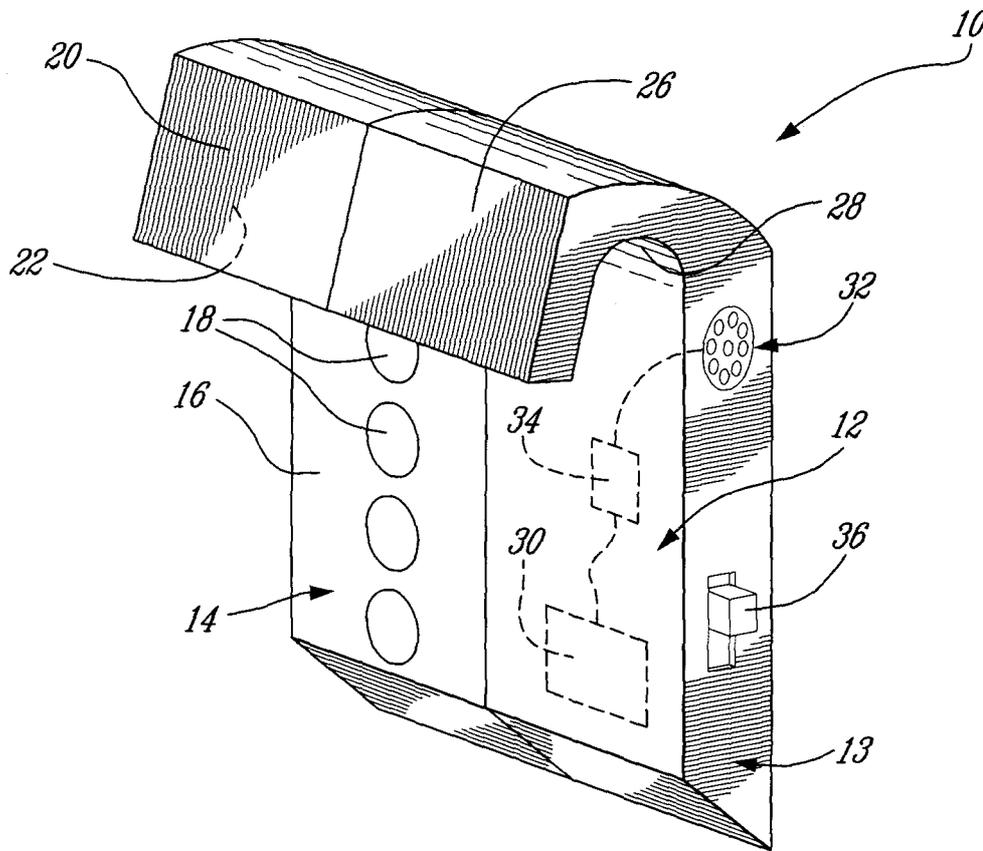
20. The visor assembly as defined in claim 16, wherein said warning device is integrally incorporated into said visor mounting element.
21. The visor assembly as defined in claim 16, wherein said warning signal includes at least one of an audible noise and a visual indicator.



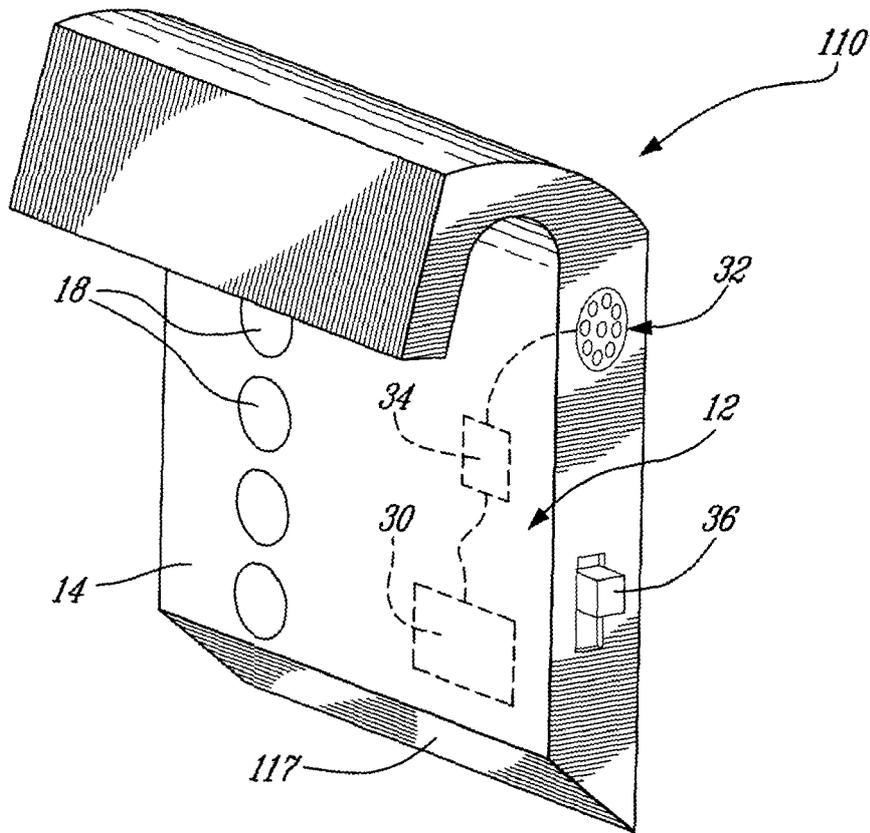
*Fig. 1* (PRIOR ART)



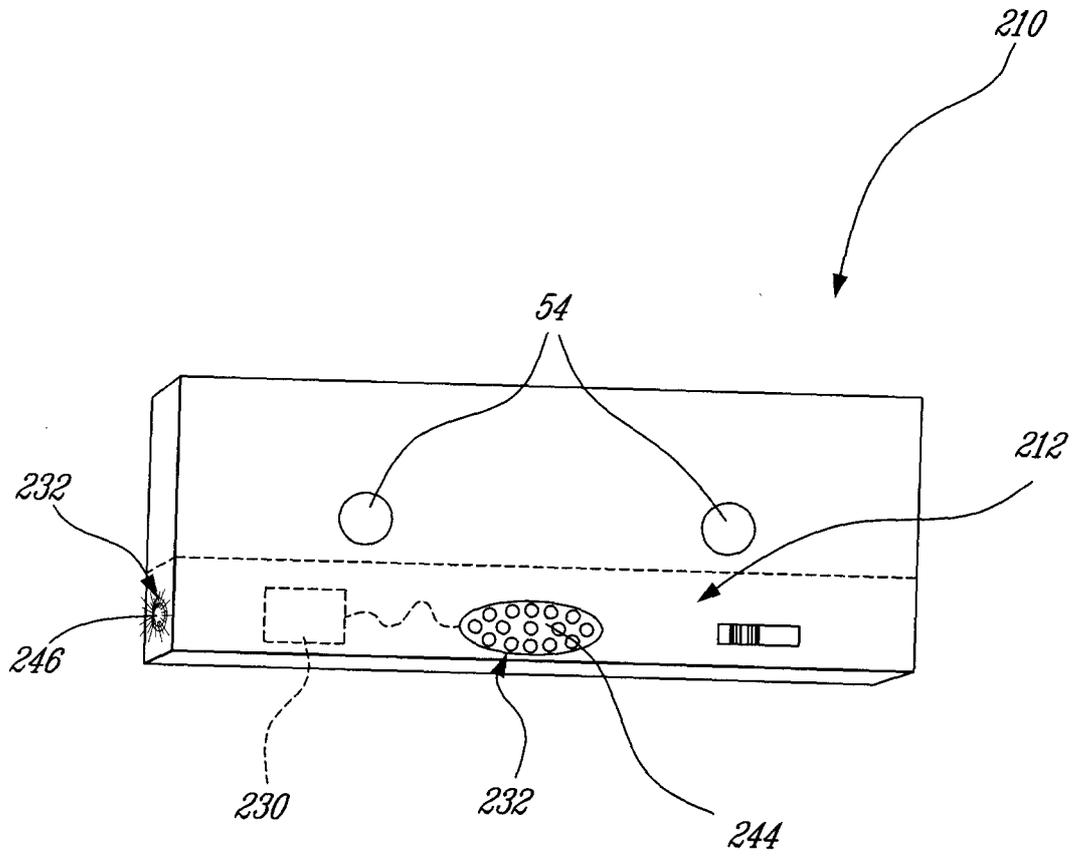
*Fig. 2*



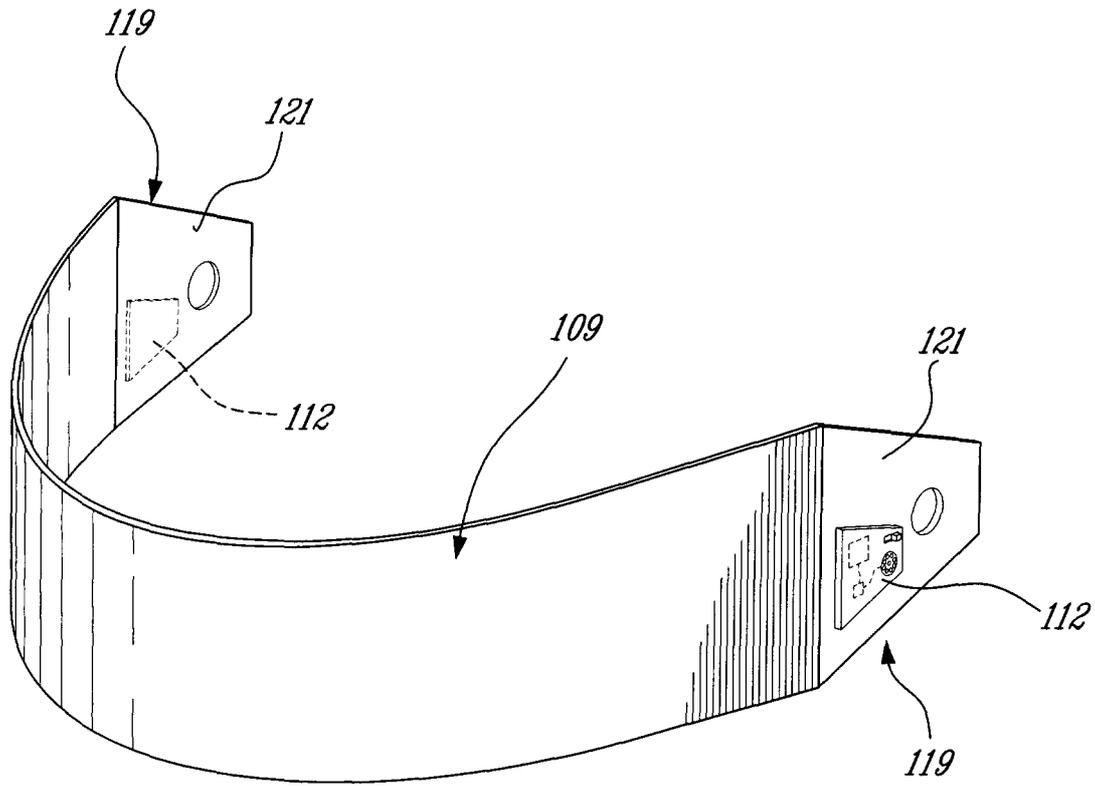
*Fig. 3a*



*Fig. 3b*



*Fig. 4*



*Fig. 5*

## INTERNATIONAL SEARCH REPORT

International application No.  
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<b>A CLASSIFICATION OF SUBJECT MATTER</b> <b>IPC: A42B 3/22 (2006.01) , A42B 3/04 (2006.01) , A42B 3/20 (2006.01) , A63B 71/06 (2006.01) , A63B 71/10 (2006.01) , G08B 21/02 (2006.01) A63B 69/00 (2006.01)</b> According to International Patent Classification (IPC) or to both national classification and P C		
<b>B FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC(2006 01) & ECLA: A42B 3/00,04,20,22,30 A63B 69/00; 71/00,02,06,10 G08B 21/02,24 CPC: 2/70.1, 2/71-73 2, 273/186, 324/59,67 340/106,135,135.4,135.7		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used) WEST, DELPHION, PAJ, DEPATIS and Canadian Patent Database keywords alarm, warning, audible, detect*, visor, position, (detach* or remov*)		
<b>C DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US6,730,047 B2 (SOCCI et al.) 04 May 2004 (04-05-2004) *Whole document*	1-21
A	US5,847,651 A (LU) 08 December 1998 (08-12-1998) *Whole document*	1-21
A	US5,697,099 A (SISKA, JR. et al.) 16 December 1997 (16-12-1997) *Whole document*	1-21
A	US5,428,846 A (SOCCI et al.) 04 July 1995 (04-07-1995) *Whole document*	1-21
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INTERNATIONAL SEARCH REPORT  
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