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3,568,211

DOUBLE VISOR HELMET

Filed July 24, 1969

4 Sheets-Sheet 1

Fig. 1.

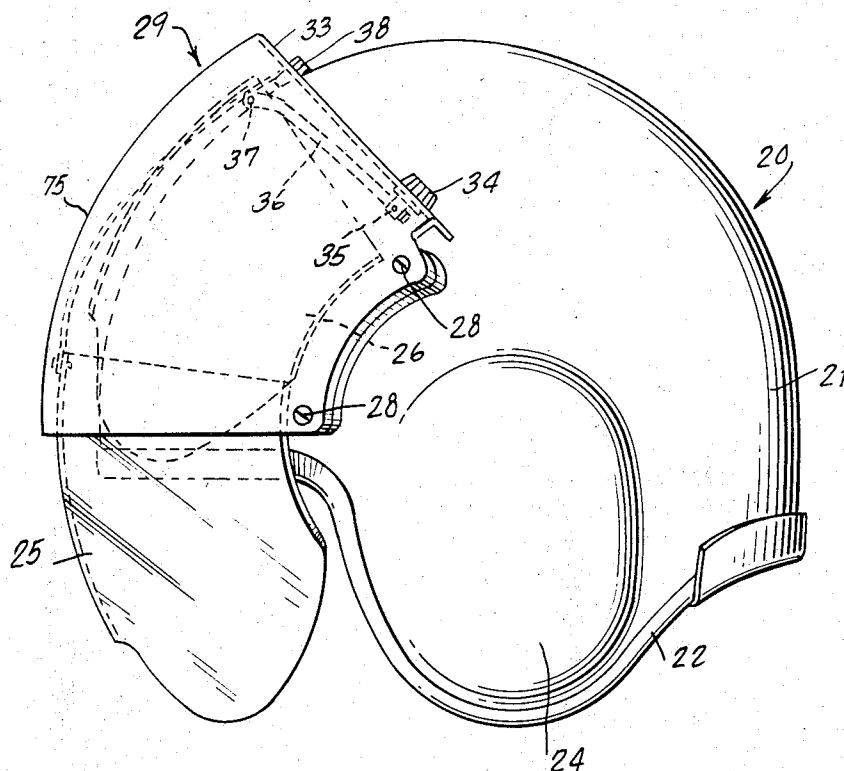
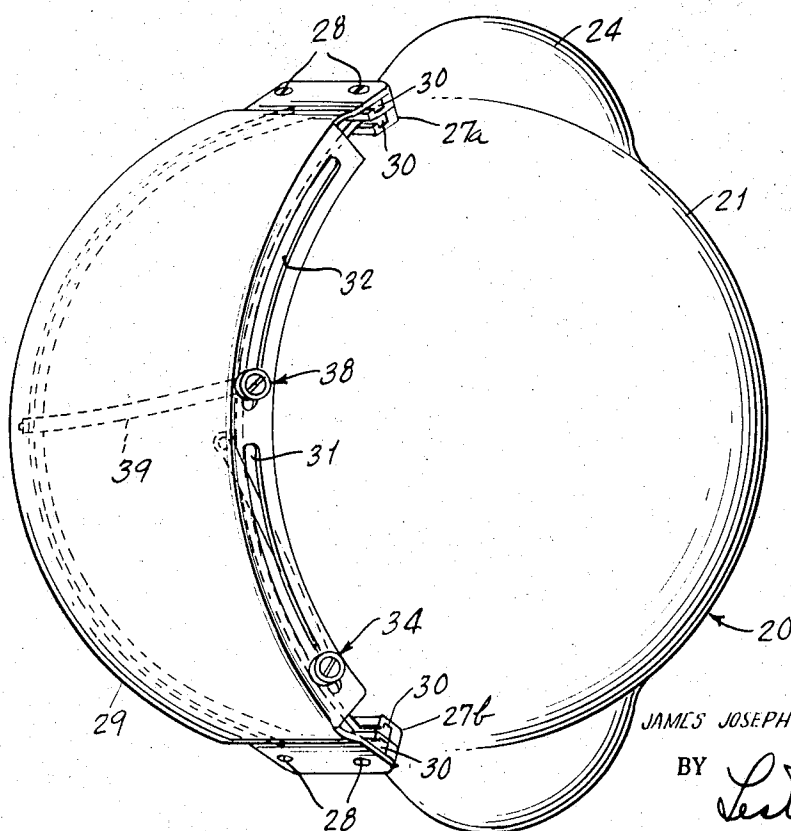


Fig. 2.



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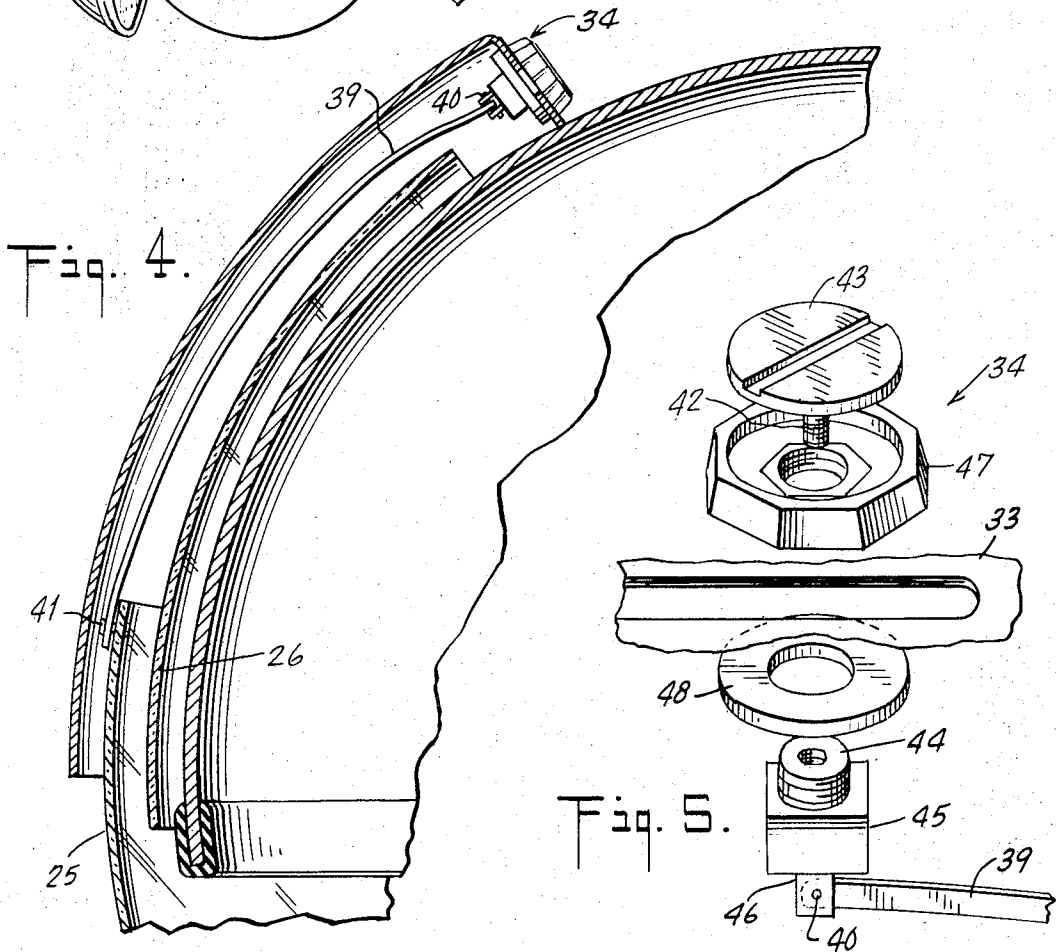
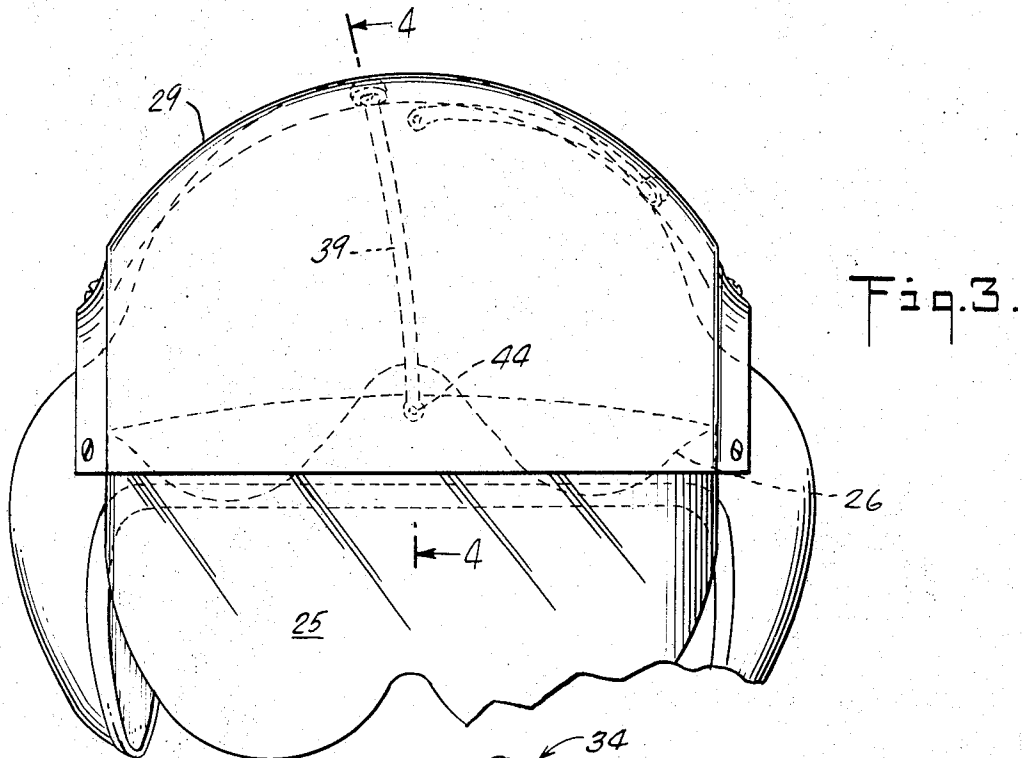
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Fig. 6.

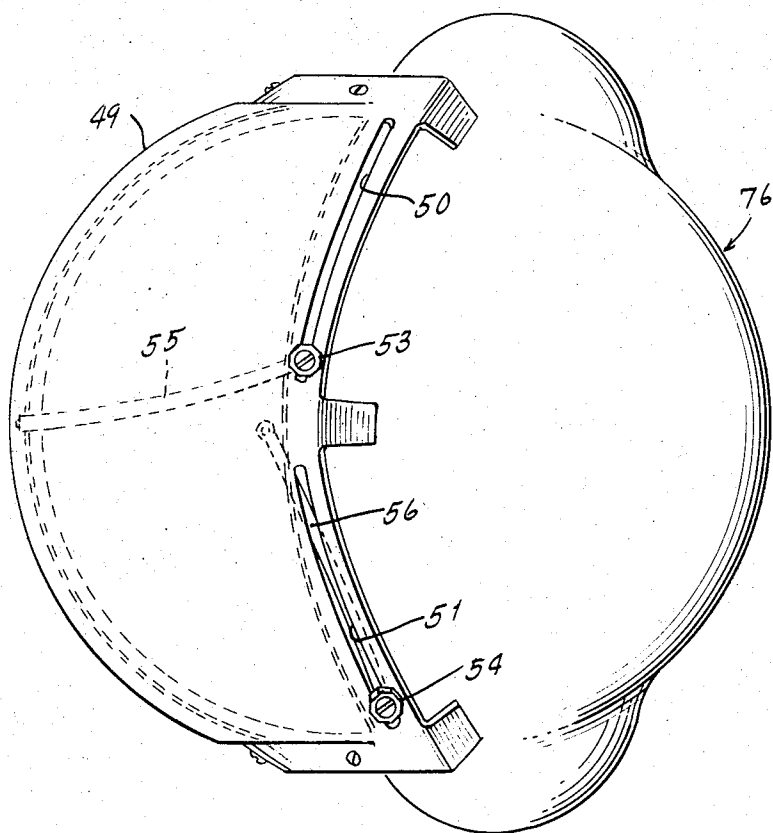
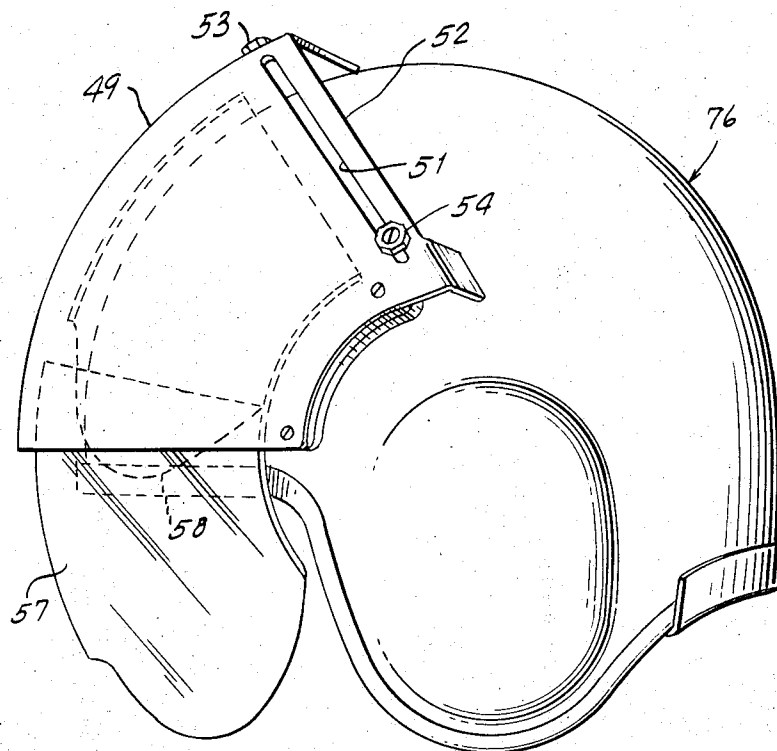


Fig. 7.

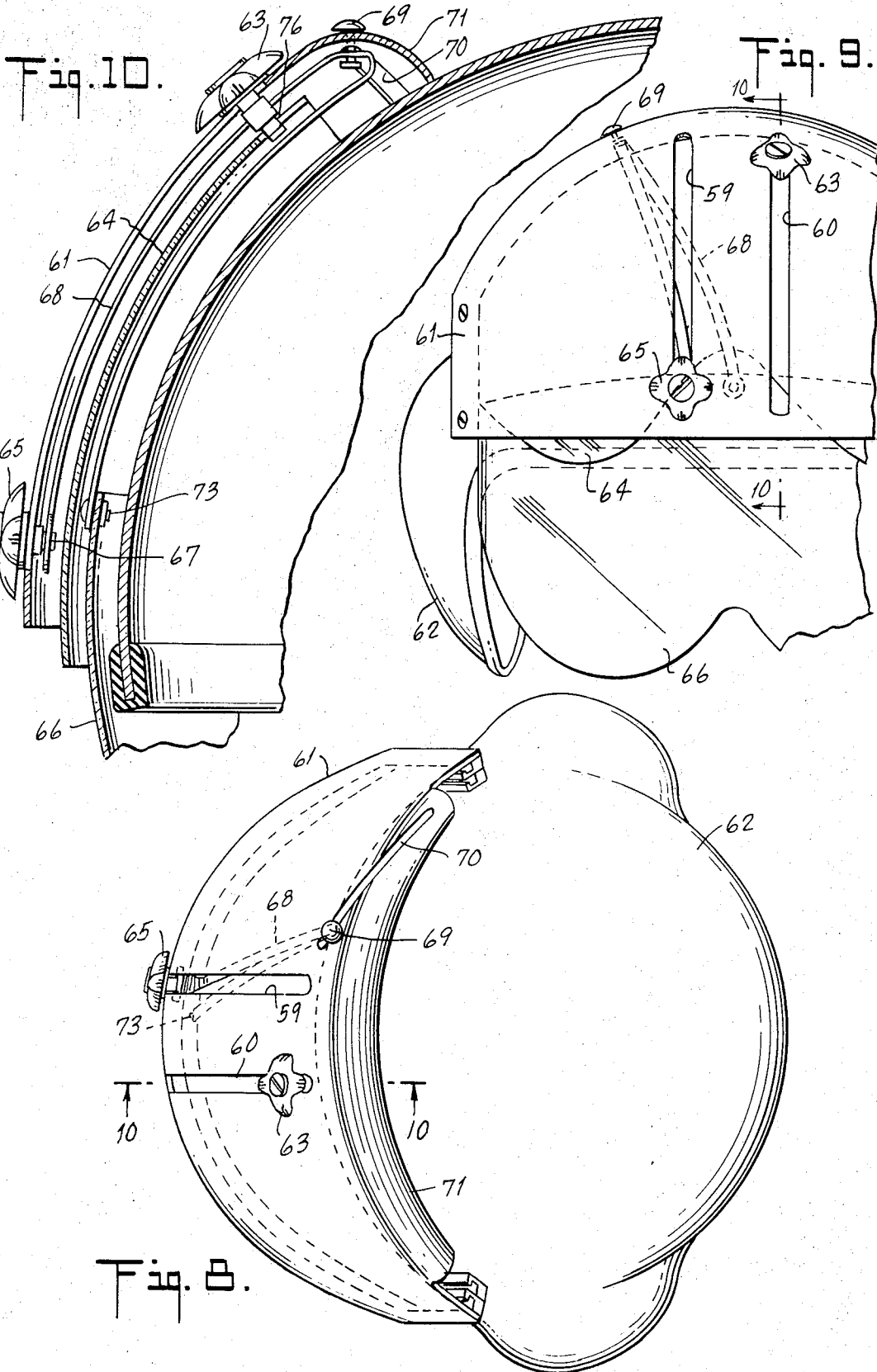
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3,568,211

DOUBLE VISOR HELMET

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U.S. Cl. 2—6

14 Claims

ABSTRACT OF THE DISCLOSURE

A rigid protective helmet having a cover secured to a shell to define a recess for receiving first and second adjustable visors each movable independently of the other along a path between an eye-shielding position and a retracted position, each visor being controlled by a manually operable visor slider element. Each slider element projects outwardly from the visor through a slot in the cover and terminates in a control knob movable along the slot. Linking means connects each slider element to the visor at an upper central locality thereof. As the slider element is moved along the slot in one direction the visor is caused to move downwardly from a retracted position to an eye-shielding position and when the slider element is moved along the slot in the other direction the visor is moved from an eye-shielding position to a retracted position.

BACKGROUND OF THE INVENTION

This invention relates to protective helmets having a rigid outer shell for warding off blows and impacts, and more particularly relates to a helmet of this type provided with a pair of eye-shielding visors each movable independently of the other between a retracted position and an eye-shielding position and to means for moving the visors to and holding them in any desired position.

In helmets of the subject type a rigging structure ordinarily is provided for supporting the weight of the helmet on the head of the wearer in such a manner that the shell of the helmet is disposed in spaced relation to and about the wearer's head to provide for absorbing the effects of a blow before it reaches the head. In such helmets it is desirable to provide an eyeshield for protecting the eyes and to this end a visor may be supported for movement from a retracted position located above the wearer's face and eyes which are exposed beneath the forward edge of the shell to an eye-shielding position where the visor covers a portion of the face or at least the eyes of the wearer. A problem also arises where it may be necessary some of the time not only to protect the eyes of the wearer but to cut off or reduce the glare due to the sun or other source of light. Thus, some of the time it may be desirable to use a clear eye shield and on other occasions a glare reducing shield. To achieve the desired flexibility, it is useful to have two visors, one clear and one glare proof.

Various devices have been proposed for effecting movement of dual visors and for retaining the visors in desired positions. The problem which arises in connection with the support of such visors is that in many cases, especially in aviation, the high velocity of the wind or movement through the atmosphere tends to lift the visor from the shell unless it is properly restrained. It has been proposed therefore to provide visor-guiding means which may be tracks with which the visor is engaged. In order to prevent or reduce the lifting or displacement of the visors, covers disposed outwardly of the visors have also been securely supported on the shell. This cover forms with the shell a space into which the visors may be re-

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tracted and out from which at the lower open side thereof the visors may be moved into eye-shielding position.

In order conveniently to achieve the desired movement of the visors, it is desirable that manually operable means may be actuated by one hand of the wearer to effect movement of either or both visors into either the retracted or eye-shielding position.

SUMMARY OF THE INVENTION

The invention relates to a helmet having a rigid shell and a pair of transparent visors movable between eye-shielding and retracted positions. The cover is secured to the shell and extends over the forward portion thereof to define a downward opening for receiving the visor in retracted position. The visors are supported for guided movement along a curved path between a shielding position in front of the wearer's eyes and a retracted position above the forward portion of the shell. In the upper portion of the cover two elongated slots are disposed each extending from one side of said cover toward the center line of the shell transversely of the path of visor movement. A manually operable slider element is mounted in each of said slots for guided movement along said slots. An elongated link pivotally connected at one end to one visor at an upper central locality thereof is pivotally connected one slider within the pocket at a point on said link spaced from said one end by a distance substantially equal to the path of visor movement. By such means, movement of the slider along the slot from the side of the shell toward the center line transmits movement to the visor and causes it to move downwardly from the retracted position to eye-shielding position. Clamping means are provided for clamping the visor in any selected position along the path of movement of the visor.

The second slider is connected to the second visor in substantially the same way that the first slider is connected to the first visor. However, the second visor is disposed inwardly of the first visor and the linking means therefor is disposed inwardly of the linking means of the first visor. Means such as a pair of tracks are provided at the edge of the cover for guiding the movement of each visor from retracted position to eye-shielding position.

In a second form of the invention the cover has a curved major surface conforming in contour to the forward portion of the shell and an upper portion projecting inwardly from said major surface toward said shell. The elongated slots are disposed in said inwardly projecting cover edge extending from the side toward the center line of the shell so that the slot edges lie in a surface transverse to said cover major surface. Each slider element is pivotally connected to the link to provide pivotal movement of the link relative to the slider element about an axis parallel to the surface in which the slot edges lie.

In a third form of the subject invention the cover has two centrally disposed slots extending generally parallel to the path of movement of the visors. A first manually operable knob is mounted for sliding movement along the first slot and is connected directly to the outer one of the visors.

The second manually operable knob is mounted for sliding movement along the second slot and is pivotally connected to a link which is connected to an idler member which is movable along a slot disposed transversely to the path of visor movement in the upper portion of the cover. The link is bent through an angle of about 180° at the point of pivotal connection with the idler member. A second portion of the linking means connects the idler with the inner visor. The first portion of the linking means is disposed between the inner surface of the cover and the outer visor and the second portion is

disposed inwardly of the outer visor. According to this construction, when the manually operable knob is moved downwardly in the second slot, the idler is caused to move transversely from a position near the edge of the cover along the slot toward the center line of the shell. As it so moves, the second portion of the link is caused to move with the idler and concomitantly downward movement of the visor is effected.

In each of the above summarized forms of the invention, the manually operable knob is positioned externally of said slot and may releasably engage edge portions of said slot to hold said visor against movement from a selected position.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of a helmet having mounted thereon an eye-shield structure embodying the present invention in a particular form with the one eye shield disposed in eye-shielding position and the other in retracted position;

FIG. 2 shows a top view of the helmet of FIG. 1;

FIG. 3 shows a front view of the helmet of FIGS. 1 and 2 with one visor in retracted position and one in eye-shielding position;

FIG. 4 is a section on line 4—4 of FIG. 3;

FIG. 5 is an exploded view of the manually operable knob and clamping means for the helmet shown in FIGS. 1-4;

FIG. 6 is a side elevation of an alternative embodiment of the invention;

FIG. 7 is a top view of the embodiment shown in FIG. 6;

FIG. 8 is a top view of a further modification of the invention in which one visor is disposed in eye-shielding position;

FIG. 9 shows a front elevation of a cut-away portion of the helmet of FIG. 8; and

FIG. 10 is a section on line 10—10 of FIG. 9.

DETAILED DESCRIPTION

In FIG. 1 is shown a helmet 20 having a rigid outer shell 21 of suitable material. Shell 21 has an opening at the lower side thereof for receiving the head of the wearer. The opening is defined by an edge 22 disposed at a level somewhat above the eyes and above the nape of the neck of the wearer. Shell 21 is supported on the head of the wearer by rigging and headband means not shown. The edge 22 of shell 21 extends about an ear cup 24 which is incorporated in shell 21. The shell carries an outer visor or eye shield 25 and an inner visor or eye shield 26. As shown in FIGS. 1 to 4, the visors are supported for movement between eye-shielding position and retracted position. Thus, various views are shown of visor 25 in eye-shielding position and visor 26 in retracted position. As seen in FIG. 2, track members 27a and 27b are disposed on opposite sides on the front face of the shell 21. The track members 27a and 27b may be attached to the shell by suitable means such as screws 28. Screws 28 may be threaded into nuts (not shown) on the inner surface of the shell. The heads of the screws 28 bear on the outer exterior surface of the edge portions of a cover 29 which is supported in outwardly spaced relation to the shell and outwardly to the visors 25, 26. Cover 29 has a curved major surface 75 conforming in contour to the forward portion of shell 20. Cover 29 has an upper edge portion 33 projecting inwardly from said major surface 75 transversely toward said shell. Cover 29 and shell 20 define a recess into which visors 25 and 26 may be retracted.

Visors 25 and 26 are formed with slide elements (not shown) which fit for sliding movement within the grooves 30 of tracks 27a and 27b.

In FIGS. 1 to 4 inclusive is shown a novel construction for support of a dual visor on the helmet and detent means for these visors which provide for movement of both

visors between eye-shielding and retracted positions thereof as well as for holding the visors in selected positions between these two extreme positions. Upper portion 33 of cover 29 has formed therein two slots 31 and 32. As seen in FIG. 2, slot 31 extends from one side of cover 29 toward the center line of the shell. Slot 32 extends from the other side of cover 29 toward the center line of cover 29.

As best seen in FIG. 1, upper edge portion 33 of cover 29 is disposed transversely to shell 21 so that slots 31 and 32 lie in a surface transverse to the cover major surface 75. A manually operable slider element, including a knob portion indicated generally at 34, is provided for disposition through slot 31. Slider element 34, which will be described in more detail below, is pivotally connected at pivot 35 to link 36. Link 36 is pivotally connected to visor 26 at 37 in an upper central locality thereof. When visor 26 is in retracted position as seen in FIG. 1, the link is disposed substantially parallel to upper edge portion 33. Slider element 38 is disposed in slot 32 and is pivotally attached to link 39 at pivot 40. Link 39 is pivotally connected to visor 25 in an upper central locality thereof at 41. When visor 25 is in eye-shielding position the slider element 38 is disposed in slot 32 near the center line of cover 29 and link 39 is disposed in a direction generally transverse to slot 32. When the slider element 38 is moved along slot 32 from the center line of cover 29 toward the side of cover 29, visor 25 is pulled upwardly. The pivotal connection of the link 39 to slider element 38 is such as to provide pivotal movement of link 39 relative to slider element 38 about an axis parallel to the surface 33 in which slot 32 lies. Slider element 38 is constructed in such a way that the visor may be clamped in position at any selected level determined by the position of the slider element 38 along slot 32.

The slider element 34 is shown in detail in FIG. 5. A screw 42 with a head 43 is adapted for threaded engagement with counter member 44 which is mounted on block 45. Affixed to block 45 is a downwardly protruding member 46 which is pivotally connected at 40 to link 39. Threaded upon the threaded portion of counter member 44 is a nut 47 which engages the outer surface of upper edge portion 33 of cover 29. Counter member 44 is provided with a threaded bore adapted to threadedly receive screw 42. A washer member 48 is mounted on counter member 44. Washer 48 is disposed between block 45 and the inner surface of edge portion 33 of cover 29. Nut 47 is shaped to form a hand-gripping means so that it may be moved upwardly or downwardly on counter member 44 by a simple turning action of the fingers.

Clamping action may be obtained by turning nut 47 so that it axially is drawn toward block 45 until nut 47 engages the outer surface of upper edge portion 33, and washer member 48 engages the inner surface of the upper edge portion 33. Unclamping may be effected by a slight rotational movement of the nut 47 in opposite direction, which will tend to separate nut 47 from block 45 and permit sliding movement of the detent means 34 on slot 31. Nut 47 is retained on counter member 44 by screw member 42 and screw member 42 threadedly engages with the internal bore of counter member 44 which may be set at a position which permits nut 47 to be tightened to effect clamping action and loosened sufficiently to permit free sliding movement of the slider element 34 along slot 31. At the same time, the screw 42 is set so as not to permit excessive loosening of nut 47. If it is desired to remove the entire assembly screw 42 may be rotated until it is axially moved out of engagement of the inner bore of counter member 44.

FIGS. 6 and 7 show an alternative embodiment of the invention heretofore described. In the alternative embodiment shown in FIGS. 6 and 7 cover 49 conforms in contour to the curved forward portion of shell 76. In the upper portion of cover 49 slots 50 and 51 extend transversely respectively from the sides of the shell toward

the center line of the shell. Slider elements 53 and 54 are disposed for movement within slots 50 and 51 and the axes of said slider elements are disposed transversely of the surface of cover 49. Slider elements 53 and 54 are respectively connected by links 55 and 56 to outer visor or eye shield 57 and inner visor or eye shield 58 in the same manner that slider elements 34 and 38 are connected by links 39 and 37 to visors 25 and 26. In operation the eye shields shown in FIGS. 6 and 7 can be moved from retracted to eye-shielding position and clamped in said positions in the same manner as that shown in FIGS. 1-4. The slider elements 53 and 54 may be constructed in the manner shown in FIG. 5. As in the case of the embodiment shown in FIGS. 1-4, the eye shields in the embodiment shown in FIGS. 6 and 7 are movable independently of one another.

FIGS. 8-10 show another alternative embodiment of the invention heretofore described. Cover 61 conforms in contour to the outer surface of the front portion of shell 62. Slots 59 and 60 are formed in cover 61 and each extends from the upper central portion of cover 61 to a lower central portion thereof in a direction generally parallel to the path of movement of the visors. Slider element 63 is disposed for sliding movement along slot 60. Slider element 63 is connected by suitable means directly to outer visor 64 at an upper central portion thereof at 76. Slider element 65 is disposed for sliding movement along slot 69, and controls the movement of inner visor 66 in the manner described below. Slider element 65 is pivotally connected at 67 to link 68. A slot 70 is formed in the upper portion of cover 61 and extends transversely from one edge of cover 61 toward the center line. Link 68 extends from a slider element 65 to an idler element 69 mounted for sliding movement along slot 70. At idler 69 link 68 is bent through an angle of approximately 180° and extends inwardly of the outer visor 64 to pivotally connect with the inner visor 66 at 73.

In operation, outer visor 64 may be moved from a retracted position to an eye-shielding position by moving slider element 63 along slot 60. The visor may be set at any desired position by clamping slider element 63 to cover 61 in a manner similar to the clamping action effected by the embodiment shown in FIGS. 1-4.

The inner visor 66 may be moved from retracted position to eye-shielding position by movement of manually operable slider element 65. Movement of the slider element 65 downwardly causes idler member 69 to move transversely toward the center line of cover 61 along slot 70. Movement of the idler in such direction causes link 68 to follow idler 69 and pull downwardly visor 66 until it reaches the eye-shielding position as shown in FIG. 9. When the visor is in the desired position, the detent means may be used to clamp the visor in the manner heretofore described.

While a particular form of slider element has been shown and described in FIG. 5, it should be kept in mind that there are many detent means which may be used to control the locking of a visor. It may be appreciated that there may be other alternative forms of a clamping device which can be substituted by one skilled in the art.

What is claimed is:

1. A helmet comprising:

- (a) a shell adapted to receive the head of a wearer;
- (b) a first visor supported on the shell for movement along a path extending between an eye-shielding position and a retracted position;
- (c) a second visor disposed inwardly of the first visor and supported on the shell for movement between an eye-shielding position and a retracted position;
- (d) a cover affixed to the shell and cooperating with the shell to define a recess sufficiently large to receive the first and second visors in their retracted positions, said cover having a first elongated slot and a second elongated slot, at least one of said

slots extending transversely of and on one side of the center line of the paths of movement of said visors;

- (e) a first manually operable visor position adjusting assembly extending outwardly from the first visor through the first slot in the cover comprising

- (1) a first control member;
- (2) a first means for linking the first control member to the first visor so that as the control member is moved in one direction along the first slot, the first visor is caused to move from a retracted position to an eye-shielding position and as the first control member is moved in the opposite direction along the first slot the first visor is caused to be moved from an eye-shielding position to a retracted position; and

- (f) a second manually operable visor position adjusting assembly extending outwardly from the second visor through the second slot in the cover, said second visor position adjusting assembly being operable independently of the operation of the first visor position adjusting assembly comprising

- (3) a second control member;
- (4) a second means for linking the second control member and the second visor so that as the second control member is moved in one direction along the second slot, the second visor is caused to move from a retracted position toward an eye-shielding position and as the second control member is moved in the opposite direction along the second slot, the second visor is caused to move from an eye-shielding position toward a retracted position.

2. A helmet as defined in claim 1 in which the first and second control members each include two cooperating threaded elements being relatively rotatable about an axis extending through the respective slot and two clamp members being spaced along said axis on opposite sides of the cover and operable into and out of gripping engagement with said cover by relative rotation of said threaded members while the visor remains fixed to one threaded member during said relative rotation whereby said visor may be moved to and held in any selected position along its path by translation and rotation of said threaded member.

3. A helmet as defined in claim 1 in which the first linking means comprises a first elongated member one end of which is pivotally connected to the first control member, the other end of which is pivotally connected to the first visor, said first elongated member having a length approximately equal to the length of the path of movement of the first visor from its retracted position to its eye-shielding position.

4. A helmet as defined in claim 3 in which the second linking means comprises a second elongated member one end of which is pivotally connected to the second control member, the second end of which is pivotally connected to the visor, said second elongated member having a length approximately equal to the length of the path of movement of the first visor from its retracted position to its eye-shielding position.

5. A helmet as defined in claim 3 in which the first linking means is pivotally connected to the first visor at a point near the midpoint of the first visor.

6. A helmet as defined in claim 1 in which both first and second elongated slots extend transversely of the path of movement of the first visor.

7. A helmet as defined in claim 3 in which the cover has a top portion disposed substantially transverse to the surface of the first visor and the first elongated slot is disposed in said top portion of the cover so that the first control member is movable along a path substantially transverse to the path of movement of the first visor.

8. A protective helmet including:

- (a) a rigid helmet shell adapted to receive the head of a wearer;

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- (b) a transparent visor; and
 (c) means secured to said shell for supporting said visor for guided movement along a curved path between a shielding position in front of the wearer's eyes and a retracted position above the forward portion of said shell; wherein the improvement comprises:
 (d) a cover secured to said shell and extending over the forward portion of said shell in spaced relation thereto to define a downwardly opening pocket for receiving said visor in said retracted position, said cover having an elongated slot in its upper portion extending from one side of said shell toward the center line of said shell transversely of the path of visor movement;
 (e) a slider element mounted in said slot for guided movement along said slot; and
 (f) an elongated link pivotally connected at one end to said visor at an upper central locality thereof, and pivotally connected to said slider element within said pocket at a point on said link spaced from said one end by a distance substantially equal to the path of visor movement, for transmitting movement of said slider element to said visor so that as said slider element moves along said slot from the side of the shell toward the center line of the shell, said visor moves downwardly from said retracted position toward said shielding position.

9. A helmet as defined in claim 8 wherein said cover has a curved major surface conforming in contour to said shell forward portion, wherein said cover further has an upper edge portion projecting inwardly from said major surface toward said shell, wherein said slot is disposed in said inwardly projecting cover edge portion so that the slot edges lie in a surface transverse to said cover major surface, and wherein the pivotal connection of said link to said slider element provides pivotal movement of said link relative to said slider element about an axis parallel to the surface in which said slot edges lie.

10. A helmet as defined in claim 9 wherein said slider element comprises manually operable means, including a knob positioned externally of said slot for releasably engaging edge portions of said slot to hold said visor against movement from a selected position, the distance between said shell and the surface of said knob most remote therefrom being not more than about equal to the width of said cover edge portion measured in a direction transverse to the surface of said shell.

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11. A helmet as defined in claim 8 wherein said cover has a curved major surface conforming in contour to the front portion of said helmet shell, and wherein said slot is so disposed that its edges lie in said cover major surfaces.

12. A helmet as defined in claim 8 wherein said visor supporting means comprises a pair of tracks respectively extending along opposite side edges of said visor and engaging said side edges to support said visor for sliding movement between said retracted and eye-shielding positions.

13. A helmet as defined in claim 12 further including a second visor disposed outwardly of said first-mentioned visor with respect to said helmet and engaged at its side edges in said tracks for guided sliding movement along a curved path between a shielding position in front of the wearer's eyes and a retracted position above said shell forward portion within said pocket; and manually operable means connected to said second visor for moving said second visor between its shielding and retracted positions, said cover having a second slot, said manually operable means extending through said second slot and being movable along said second slot to effect movement of said second visor between its shielding and retracted positions.

14. A helmet as defined in claim 8 wherein said cover has a centrally disposed second slot extending in a direction generally parallel to the path of movement of said visor; further including a manually operable knob mounted for sliding movement along said second slot; and wherein said link is bent through an angle of about 180° at its point of pivotal connection with said slider element and extends therefrom to a second end pivotally connected to said knob in such manner that downward movement of said knob in said second slot effects transverse movement of said slider element in said first slot toward said shell centerline and concomittant downward movement of said visor from said retracted position to said shielding position.

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