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Inventor(s)	Teetzel; James W. et al.

Reclining helmet mount apparatus

Abstract

A helmet mount apparatus includes a track assembly and a sliding carriage assembly slidable coupled to the track assembly. A combined vertical adjustment and pivot assembly pivotally is coupled to the sliding carriage assembly, wherein the combined vertical adjustment and pivot assembly includes a bracket for attaching a viewing device.

Inventors: **Teetzel; James W. (Portsmouth, NH), Lemire; Gary M. (Lee, NH), Graham; Patrick K. (Kittery, ME)**

Applicant: **WILCOX INDUSTRIES CORP.** (Newington, NH)

Family ID: **1000008765446**

Assignee: **Wilcox Industries Corp. (Newington, NH)**

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References Cited

U.S. PATENT DOCUMENTS

Patent No.	Issued Date	Patentee Name	U.S. Cl.	CPC
4449787	12/1983	Burbo et al.	N/A	N/A
5416922	12/1994	Horvat et al.	N/A	N/A
5506730	12/1995	Morley et al.	N/A	N/A
6125477	12/1999	Crippa et al.	N/A	N/A
7219370	12/2006	Teetzel et al.	N/A	N/A
11627774	12/2022	Meney	248/187.1	F16M 13/04
2008/0263752	12/2007	Solinsky	2/422	A42B 3/042
2014/0082810	12/2013	Bjorn et al.	N/A	N/A
2014/0373423	12/2013	Teetzel et al.	N/A	N/A
2018/0231404	12/2017	Kitain	N/A	A42B 3/042
2022/0071336	12/2021	Franzino	N/A	A42B 3/04
2024/0365913	12/2023	Teetzel et al.	N/A	N/A

OTHER PUBLICATIONS

International Search Report and Written Opinion in Application No. PCT/US2024/027894 dated Aug. 8, 2024. cited by applicant

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Primary Examiner: Trieu; Timothy K

Attorney, Agent or Firm: McLane Middleton, Professional Association

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Background/Summary

CROSS REFERENCE TO RELATED APPLICATION (1) This application claims the priority benefit of U.S. provisional application No. 63/464,256 filed May 5, 2023. The aforementioned application is incorporated herein by reference in its entirety.

INCORPORATION BY REFERENCE
(1) This application is related to commonly owned U.S. Pat. No. 7,219,370 entitled “Helmet Mounting Systems” and U.S. Pat. No. 9,775,395 entitled “Headgear Shroud Assembly”. Each of the aforementioned patents is incorporated herein by reference in its entirety.
BACKGROUND
(2) The present disclosure relates to a helmet mount assembly and, in particular, to a reclining mount for alternately positioning a helmet mounted display which is mounted to a helmet or similar headgear between a viewable position and a stowed position. The present disclosure contemplates a new and improved helmet mount apparatus and method. The helmet mount apparatus is suited for

mounting a display device such as a virtual reality (VR) display, augmented reality (AR) display, head up display (HUD), or other near eye display, although it is also amenable to mounting other viewing devices, including optical and electro-optical devices, including without limitation binoculars, night vision devices, electronic night vision devices, cameras such as thermal cameras, short wave infrared (SWIR) cameras, visors, face shields, optical filters and attenuators, and others.

SUMMARY

(3) A helmet mount apparatus includes a track assembly and a sliding carriage assembly slidably coupled to the track assembly. A combined vertical adjustment and pivot assembly is pivotally coupled to the sliding carriage assembly, wherein the combined vertical adjustment and pivot assembly includes a bracket for attaching a viewing device.

(4) In one aspect, a helmet mount apparatus for adjusting a position of a viewing device on a helmet includes a track subassembly removably attachable to the helmet and a carriage subassembly slidably attached to and movable along the track subassembly. A vertical adjustment subassembly is configured for detachably coupling the viewing device. A first pivot assembly is disposed between the carriage subassembly and the vertical adjustment subassembly such that the vertical adjustment subassembly and the viewing device removably attached thereto are pivotable with respect to the carriage subassembly and the helmet.

(5) In a more limited aspect, the carriage subassembly includes a locking tongue extending inward toward the helmet and first and second locking tabs extend laterally from opposing sides of the carriage subassembly. The track subassembly includes a groove that engages with the locking tongue to place the carriage subassembly in a deployed position wherein the viewing device is generally parallel to a user's line of sight and first and second locking shoulders that engage with the first and second locking tabs, respectively, to place the carriage subassembly in a stowed position wherein the viewing device is above the user's line of sight.

(6) In another more limited aspect, the carriage subassembly further includes a sliding plate member having one or more sliding tongues extending transversely from opposing sides thereof and the track subassembly includes a track with channels transversely spaced apart on opposing sides of the track, the channels spaced to accommodate the sliding plate member and configured to slidably receive the one or more sliding tongues.

(7) In another more limited aspect, the carriage subassembly further includes a sliding plate member having an outward-extending second inner hinge knuckle and a carriage pivot lock plate, wherein the sliding plate member is disposed between the track subassembly and the carriage pivot lock plate. The locking tongue is disposed on a lower end of the carriage pivot lock plate. The carriage pivot lock plate includes an opening and second outer hinge knuckles, wherein the second inner hinge knuckle of the sliding plate member passes through the opening and is complementary with the second outer hinge knuckles. The helmet mount apparatus further includes a second pivot hinge assembly having a second pivot rod passing through the second outer and inner knuckles. One or more springs are disposed intermediate the carriage pivot lock plate and the sliding plate member, the one or more spring configured to bias the locking tongue toward the track subassembly for secure engagement of the locking tongue and the groove.

(8) In another more limited aspect, the helmet mount apparatus of claim **1**, wherein the track subassembly further includes a track stop configured to limit a range of sliding movement of the carriage along the track subassembly.

(9) In another more limited aspect, the carriage subassembly includes opposing first and second outer hinge knuckles and the vertical adjustment subassembly includes one or more inner hinge knuckles intermediate the first and second outer hinge knuckles. The first pivot assembly includes a first pivot rod passing through the first and second outer hinge knuckles and the one or more inner hinge knuckles along a first pivot axis.

(10) In another more limited aspect, the first and second outer hinge knuckles engage the vertical adjustment subassembly, the first and second outer hinge knuckles having tilt-limiting stop flats

formed thereon for limiting a range of rotation of the vertical adjustment subassembly with respect to the carriage subassembly.
(11) In another more limited aspect, the first pivot assembly has an angle of rotation of about 15 degrees.
(12) In another more limited aspect, the vertical adjustment subassembly includes a mounting bracket for attaching the viewing device.
(13) In another more limited aspect, the vertical adjustment subassembly includes one or more alignment pins configured to engage one or more complementary receptacles in the viewing device for aligning the vertical adjustment subassembly with the viewing device.
(14) In another more limited aspect, the track subassembly includes at least one cable management trough.
(15) In another more limited aspect, the vertical adjustment subassembly is configured to allow vertical adjustment of the viewing device with respect to a user's line of sight.
(16) In a further aspect, a method for moving a helmet mount apparatus between a deployed position and a stowed position or vice versa includes, if the helmet mount apparatus is in the deployed position, rotating the viewing device upward by rotating along the first pivot assembly and pushing the viewing device outward, away from the track subassembly such that the locking tongue of the carriage subassembly disengages from the groove of the track subassembly. The viewing device is slid upward with respect to the track subassembly until the locking tabs of the carriage subassembly move past the shoulder of the track subassembly. If the helmet mount apparatus is in the deployed position, the viewing device is pushed outward, away from the track subassembly such that the locking tabs of the carriage subassembly disengage from the shoulders of the track subassembly. The viewing device is slid downward with respect to the track subassembly until the locking tongue of the carriage assembly engages with the groove of the track subassembly and the viewing device is rotated downward by rotating along the first pivot assembly.
(17) Various advantages and benefits of the present development will become apparent to persons skilled in the art upon reading and understanding the following detailed description of the preferred embodiments.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
(1) The invention may take form in various components and arrangements of components, and in various steps and arrangements of steps. The drawings are only for purposes of illustrating preferred embodiments and are not to be construed as limiting the invention.
(2) FIG. **1** is an isometric view of a helmet employing the reclining helmet mount apparatus in conjunction with a first shroud.
(3) FIG. **2** is an isometric view of a helmet employing the reclining helmet mount apparatus in conjunctions with a second shroud and attachment system.
(4) FIGS. **3**A-**3**D are sequential side views illustrating the transition of the viewing device from the deployed position to the stowed position.
(5) FIGS. **4**A-**4**D are sequential side views illustrating the transition of the vertical adjustment subassembly from the deployed position to the stowed position.
(6) FIG. **5** is an enlarged isometric view of the recliner apparatus.
(7) FIG. **6** is an exploded isometric view of the recliner apparatus.
(8) FIG. **7**A is an isometric view of an interface assembly for detachably coupling the helmet track assembly to the front shroud of a helmet.
(9) FIG. **7**B is an exploded isometric view of the interface assembly appearing in FIG. **7**A.
(10) FIG. **8**A is an isometric view of the track assembly, viewing device interface assembly and

viewing device.
(11) FIG. **8**B is an enlarged view of the region **8**B appearing in FIG. **8**A.
(12) FIG. **9** is a partially exploded isometric view of the sliding carriage and vertical adjustment subassemblies.
(13) FIG. **10**A is a generally rear isometric view of the sliding carriage subassembly.
(14) FIG. **10**B is a generally rear exploded isometric view of the sliding carriage subassembly.
(15) FIG. **11**A is an isometric view of the vertical adjustment subassembly.
(16) FIG. **11**B is an exploded isometric view of the vertical adjustment subassembly.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

(17) Reference will now be made in detail to presently preferred embodiments of the invention, one or more examples of which are illustrated in the accompanying drawings. Each example is provided by way of explanation of the invention, not limitation of the invention. In fact, it will be apparent to those skilled in the art that modifications and variations can be made in the present invention without departing from the scope or spirit thereof. For instance, features illustrated or described as part of one embodiment may be used on another embodiment to yield a still further embodiment. Thus, it is intended that the present invention covers such modifications and variations as come within the scope of the appended claims and their equivalents.
(18) Detailed embodiments of the present development are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention, which may be embodied in various forms. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the present inventive concept in virtually any appropriately detailed structure. Further, the terms and phrases used herein are not intended to be limiting but rather to provide an understandable description of the present development.
(19) The terms “a” or “an,” as used herein, are defined as one or more than one. The term “another,” as used herein, is defined as at least a second or more. The terms “including” and/or “having” as used herein, are defined as comprising (i.e., open transition). The term “coupled” or “operatively coupled,” as used herein, is defined as indirectly or directly connected.
(20) As used in this disclosure, the terms “front,” “rear,” “upper,” “lower,” “upwardly,” “downwardly,” “left,” “right,” and other orientation descriptors are intended to facilitate the description of the exemplary embodiment(s) of the present invention in relation to the provided figures, and are not intended to limit the structure thereof to any particular position or orientation.
(21) As used herein, the term “shroud” refers to a component attached to the frontal portion of a helmet which is designed to serve as a mounting fixture or interfacing platform for facilitating attachment of helmet-mounted devices.
(22) Referring now to FIG. **1** there is shown a reclining helmet mount assembly **100** attached to a helmet **104** for supporting a viewing device **110** in front of the eyes of a user. The viewing device **110** may be a near eye display, virtual reality display, augmented reality display, mixed reality display, holographic display, head up display, or the like.
(23) The helmet mount assembly **100** includes a shroud interface assembly **108** configured for detachably securing to a front shroud **116***a*, **116***b* of a helmet. In embodiments, the shroud is a legacy shroud **116***a* configured to receive a G**22** or G**24** series shroud available from Wilcox Industries Corp. of Newington, NH. Such shrouds include, for example, shrouds in the L**4** series from Wilcox Industries Corp., including without limitation the Wilcox L**4** one hole shroud for helmets having a single hole pattern and the Wilcox L**4** three hole shroud for helmets having a three hole pattern.
(24) Referring now to FIG. **2**, the front shroud may be a shroud **116***b* associated with the Wilcox Industries Corp. Universal Helmet Mount Assembly or CLAW helmet attachment system **120**.
(25) The helmet mount assembly **100** includes a helmet track subassembly **124** and a sliding carriage subassembly **128** slidably attached thereto. A vertical adjustment subassembly **130** is

pivotably coupled to the sliding carriage subassembly **128**. The vertical adjustment subassembly **130** in turn is secured to the viewing device **110**.

(26) Referring now to FIGS. **3**A-**3**D and **4**A-**4**D, there is illustrated the manner of moving the viewing device **110** from the deployed or operable position to a stowed position. In FIG. **3**A, the viewing device is in the deployed position wherein the viewing device **110** is parallel to the horizon or user's line of sight. To move the viewing device **110** to the stowed position, the user first rotates the viewing device **110** as indicated by the arrow **132** in FIG. **3**B. The tilt limiting stop flats **136** (see FIG. **8**B) in the sliding carriage subassembly **128** limit the range of rotation to an extent sufficient to allow the viewing device **110** to clear the brim **140** of the helmet **104**. In embodiments, the angle of rotation is about 15 degrees.

(27) Next, the viewing device **110** is pushed outward, away from the track subassembly **124** as indicated by the arrow **142** in FIG. **3**C. This causes a locking tongue **144** (see FIG. **10**B) on the sliding carriage subassembly **128** to disengage from a complementary locking groove **148** (see FIG. **6**) on the track subassembly **124**.

(28) Next, the sliding carriage subassembly **128** is slid upward with respect to the helmet track subassembly **124** as indicated by the arrow **152** in FIG. **3**D. The sliding carriage subassembly **128** is slid upward along a track **150** until locking tab **156** (see FIG. **5**) on opposing sides of the sliding carriage subassembly **128** move past shoulders **158** on opposing sides of the track **150** to secure the viewing device **110** in the stowed position. To return the viewing the viewing device **110** to the deployed position, the viewing device **110** is lifted away from the track **150** until the locking tabs **156** clear the shoulders **158** and the process as described above is reversed.

(29) Referring now to FIGS. **5** and **6**, the track subassembly **124** includes the track **150**. A track stop **160** is secured to the track **150** with threaded fasteners **162** and is disposed at the distal end of the track **150** to limit sliding movement of the sliding carriage subassembly **128** there past. In embodiments, cable management apertures or channels **164** are provided in the track subassembly **124**. Threaded fasteners **168** pass through clearance opening **170** at the proximal end of the track **150** and engage tapped openings **172** in the helmet shroud interface subassembly **108** to secure the shroud interface assembly **108** to the track **150**.

(30) The track **150** includes opposing channels or grooves **176** which run parallel to each other and are spaced apart by a distance configured to accommodate a sliding plate member **180** of the sliding carriage subassembly **128**. Sliding tongues **184** on the sliding plate member **180** are slidably received in the respective grooves **176**.

(31) Referring now to FIGS. **7**A and **7**B, the shroud interface subassembly **108** includes a base plate **190**. A fixed locking tongue **192** is disposed on a lower end of the base plate **190** and is configured to be received in a corresponding lower interface groove (not shown) on the shroud **116***a*, **116***b*. A movable locking tongue **196** is disposed at a distal end of a carrier **212**. The movable locking tongue is positioned at an upper end of the base plate **190** and is configured to be received in a corresponding upper interface groove (not shown) on the shroud **116***a*, **116***b*.

(32) The carrier **212** includes an elongate opening receiving a tensioning spring **220**. One end of the spring **220** bears against a spring boss **224** on the base plate **190** and urges or biases the carrier **212** and locking tongue **196** upward. The proximal end of the carrier **212** includes a slot **232**. The lower end of the base plate **190** includes slots **236** adjacent and aligned with the slot **232**.

(33) An actuator bar **200** is transversely slidably received within the slots **232**, **236**. The extent of sliding movement of the actuator bar **200** with respect to the base plate **190** is constrained by guide pins **228** passing through the channels **236** and riding in elongate slots **204** in the actuator bar **200**. Movement of the actuator bar **200** in relation to the carrier **212** is constrained by an actuator pin **240** passing through the channel **232** and an elongate opening **210** in the actuator bar **210**. The elongate opening **210** is angled relative to the horizontal or transverse direction such that transverse sliding movement of the actuator bar **200** causes up and down movement of the carrier **212**. The spring **220** biases the carrier so that it is retained in the upper position such that the upper tongue

196 is extended. In order to retract the tongue **196**, i.e., for the purpose of attaching or removing the interface assembly **108** to the shroud **116***a*, **116***b*, the actuator bar **200** is manually moved by the user against the bias of the spring **200**. In embodiments, dampening members such as grommets **250** are received in openings **252** in the base plate **190** to decrease noise or vibration between the shroud interface assembly **108** and the shroud **116***a*, **116***b*. In embodiments, the shroud interface subassembly **108** operates in a manner similar to the interface assembly as shown and described in commonly owned U.S. Pat. No. 8,739,313, albeit inverted, with respect to the shroud interface subassembly **108**. U.S. Pat. No. 8,739,313 is incorporated herein by reference in its entirety.

(34) Referring now to FIGS. **8**A and **8**B, the viewing device **110** is secured to the vertical adjustment subassembly **130** via a first set of threaded fasteners **260** engaging an upper housing portion of the viewing device **110** and a second set of threaded fasteners **264** engaging a rear housing portion of the viewing device **110**. Alignment pins **262** extend from the vertical adjustment subassembly and are configured to engage complementary receptacles on the viewing device **110** for ensuring proper alignment of the vertical adjustment subassembly **130** with the viewing device **110**. In embodiments, the forward facing side of the vertical adjustment subassembly **130** defines a mounting bracket for attaching the viewing device **110**.

(35) Referring now to FIGS. **8**A, **8**B, and **9**, the vertical adjustment subassembly **130** is pivotally attached to the sliding carriage subassembly **128** via a first pivot assembly **268** defining a pivot axis **266**. The pivot assembly **268** includes a first pivot rod **270** passing through outer hinge knuckles **272** on the sliding carriage subassembly **128** and an inner hinge knuckle **276** on the vertical adjustment subassembly **130**. A first tensioning washer **280** is disposed between one of the outer knuckles **272** and a head **284** of the rod **270**. A second tensioning washer **280** is disposed between the other one of the outer knuckles **272** and a threaded cap **282** engaging a threaded end **286** of the rod **270**. The cap **282** is tightened to provide a constantly tensioned pivot assembly that allows about, e.g., 30 degrees or more of rotational tilt, with the extent of pivoting rotation being limited by the tilt limiting stop flats **136**.

(36) Referring now to FIGS. **10**A and **10**B, a second pivot hinge assembly **288** defines a pivot axis **300** and includes a second pivot rod **290** passing through second outer hinge knuckles **292** on a carriage pivot lock plate **294** and a second inner hinge knuckle **296** on a slide carriage plate **298**. The inner hinge knuckle **296** passes through an opening **308** in the carriage pivot lock plate **294**. A threaded cap **302** engages a threaded end **306** of the rod **290**. Compression springs **310** are disposed between the upper end of the carriage pivot lock plate **294** and the upper end of the slide carriage plate **298**. The springs **310** bear against the upper end of the carriage pivot lock plate **294**, thereby biasing the carriage locking tongue **144** toward the track assembly **124** to secure the tongue **144** into engagement with the groove **148** when the main sliding carriage assembly **128** is in the deployed position and to secure the locking tabs **156** into engagement with the locking shoulders **158** when the main sliding carriage assembly **128** is in the stowed position.

(37) Referring now to FIGS. **11**A and **11**B, the vertical adjustment subassembly **130**, includes a base member **320** which is secured to the housing of the viewing device **110** as described above. A lock rail assembly comprises elongate vertical bosses **324** having elongate lock rails **328** attached thereto with threaded fasteners **332** and defining a channel **330** therebetween.

(38) Travel limiters **336** pass through and ride in elongate vertical slots **340** and threadably engage a vertical adjust pivot plate **344**. The slots **340** limit the extent of vertical travel of the vertical adjust pivot plate **344** locking tabs relative to the base member **320**. A lock lever **350** is secured to a rear facing side of the vertical adjust pivot plate **344** and a cam lock member **352** is secured to a front facing surface of the vertical adjust pivot plate **344** via a threaded fastener **354** passing through a clearance opening **358** in the vertical adjust pivot plate **344**. A conical washer or disc spring **360** is disposed between the lever **350** and the vertical adjust pivot plate **344** to develop a tension therebetween.

(39) The cam lock member has a narrow dimension **364** and a wide dimension **368**. When the cam

lock member **352** is rotated using the lever **350** so that the narrow dimension **364** is aligned with the channel **340**, the vertical adjust pivot plate **344** can slide freely along the lock rails **328**, allowing the vertical adjust pivot plate **344** be positioned at a desired height to vertically align the viewing device **110** with the to the user's eyes. When the lever **350** is rotated to rotate the wide dimension **368** toward a transverse orientation, the cam lock member **352** wedges tightly within the channel **340** to create a secure locked position.

(40) The invention has been described with reference to the preferred embodiment. Modifications and alterations will occur to others upon a reading and understanding of the preceding detailed description. It is intended that the invention be construed as including all such modifications and alterations insofar as they come within the scope of the appended claims or the equivalents thereof.

Claims

1. A helmet mount apparatus for adjusting a position of a viewing device on a helmet, said helmet mount apparatus comprising: a track subassembly removably attachable to the helmet; a carriage subassembly slidably attached to and movable along said track subassembly between a deployed position, wherein the viewing device is generally aligned with a user's line of sight when worn by the user, and a stowed position, wherein the viewing device is positioned above the user's line of sight when worn by the user; a vertical adjustment subassembly configured for detachably coupling the viewing device; and a first pivot assembly disposed between said carriage subassembly and said vertical adjustment subassembly such that said vertical adjustment subassembly and the viewing device removably attached thereto are pivotable with respect to said carriage subassembly and the helmet.

2. The helmet mount apparatus of claim 1, further comprising: said carriage subassembly comprising a locking tongue extending inward toward the helmet and first and second locking tabs extending laterally from opposing sides of said carriage subassembly; and said track subassembly comprising: a groove that engages with said locking tongue to place said carriage subassembly in the deployed position wherein the viewing device is generally parallel to the user's line of sight; and first and second locking shoulders that engage with said first and second locking tabs, respectively, to place said carriage subassembly in the stowed position wherein the viewing device is above the user's line of sight.

3. The helmet mount apparatus of claim 2, further comprising: said carriage subassembly further comprising a sliding plate member having an outward-extending second inner hinge knuckle and a carriage pivot lock plate, wherein said sliding plate member is disposed between said track subassembly and said carriage pivot lock plate; said locking tongue being disposed on a lower end of said carriage pivot lock plate; said carriage pivot lock plate comprising an opening and second outer hinge knuckles, wherein said second inner hinge knuckle of said sliding plate member passes through said opening and is complementary with said second outer hinge knuckles; said helmet mount apparatus further comprising a second pivot hinge assembly having a second pivot rod passing through said second outer and inner knuckles; and one or more springs disposed intermediate the carriage pivot lock plate and the sliding plate member, the one or more spring configured to bias the locking tongue toward said track subassembly for secure engagement of said locking tongue and said groove.

4. The helmet mount apparatus of claim 1, wherein: said carriage subassembly further comprises a sliding plate member having one or more sliding tongues extending transversely from opposing sides thereof; and said track subassembly comprises a track with channels transversely spaced apart on opposing sides of said track, said channels spaced to accommodate said sliding plate member and configured to slidably receive said one or more sliding tongues.

5. The helmet mount apparatus of claim 1, wherein said track subassembly further comprises a track stop configured to limit a range of sliding movement of the carriage along the track

subassembly.
6. The helmet mount apparatus of claim 1, further comprising: said carriage subassembly comprising opposing first and second outer hinge knuckles; said vertical adjustment subassembly comprises one or more inner hinge knuckles intermediate the first and second outer hinge knuckles; and said first pivot assembly comprises a first pivot rod passing through said first and second outer hinge knuckles and said one or more inner hinge knuckles along a first pivot axis.
7. The helmet mount apparatus of claim 6, wherein the first and second outer hinge knuckles engage the vertical adjustment subassembly, the first and second outer hinge knuckles having tilt-limiting stop flats formed thereon for limiting a range of rotation of said vertical adjustment subassembly with respect to said carriage subassembly.
8. The helmet mount apparatus of claim 7, wherein said first pivot assembly has an angle of rotation of about 15 degrees.
9. The helmet mount apparatus of claim 1, wherein said vertical adjustment subassembly comprises a mounting bracket for attaching the viewing device.
10. The helmet mount apparatus of claim 1, wherein said vertical adjustment subassembly comprises one or more alignment pins configured to engage one or more complementary receptacles in the viewing device for aligning said vertical adjustment subassembly with the viewing device.
11. The helmet mount apparatus of claim 1, wherein said track subassembly comprises at least one cable management trough.
12. The helmet mount apparatus of claim 1, wherein said vertical adjustment subassembly is configured to allow vertical adjustment of the viewing device with respect to a user's line of sight.
13. A method for operating a helmet mount apparatus comprising a track subassembly removably attachable to the helmet; a carriage subassembly slidably attached to and movable along said track subassembly between a deployed position, wherein the viewing device is generally aligned with a user's line of sight when worn by the user, and a stowed position, wherein the viewing device is positioned above the user's line of sight when worn by the user; a vertical adjustment subassembly configured for detachably coupling the viewing device; and a first pivot assembly disposed between said carriage subassembly and said vertical adjustment subassembly such that said vertical adjustment subassembly and the viewing device removably attached thereto are pivotable with respect to said carriage subassembly and the helmet, the method comprising the steps of: if the helmet mount apparatus is in the deployed position: rotating the viewing device upward by rotating along the first pivot assembly; pushing the viewing device outward, away from the track subassembly such that the locking tongue of the carriage subassembly disengages from the groove of the track subassembly; and sliding the viewing device upward with respect to the track subassembly until the locking tabs of the carriage subassembly move past the shoulder of the track subassembly; and if the helmet mount apparatus is in the deployed position: pushing the viewing device outward, away from the track subassembly such that the locking tabs of the carriage subassembly disengage from the shoulders of the track subassembly; sliding the viewing device downward with respect to the track subassembly until the locking tongue of the carriage assembly engages with the groove of the track subassembly; and rotating the viewing device downward by rotating along the first pivot assembly.