TWO POSITION MOUNTING BRACKET FOR COMPUTER DISPLAY

Inventor: Michael J. Manceor, Troy, MI (US)

Assignee: The United States of America as represented by the Secretary of the Army, Washington, DC (US)

Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

Appl. No.: 10/402,867
Filed: Mar. 24, 2003

Int. Cl. 7 .......................... E04G 3/00
U.S. Cl. ................. 248/284.1, 248/126; 248/456
Field of Search .................. 248/398, 371, 248/284.1, 447, 454, 455, 456, 457, 126, 286.1, 918

References Cited
U.S. PATENT DOCUMENTS
5,141,196 A * 8/1992 Arnold et al. ............. 248/397

FOREIGN PATENT DOCUMENTS

Primary Examiner—Gwendolyn Baxter
Attorney, Agent, or Firm—David L. Kuhn; Clifford C. Carter; Gail S. Soderling

ABSTRACT
A bracket for mounting a view screen fixes the screen in a retracted or deployed position. The bracket has a base plate fixed to an upright panel. A carrier plate both swings and vertically translates on the base plate. Hinged between the base plate and the carrier plate is a bridge plate. The carrier plate holds the screen, whereby swinging the carrier plate away from the base plate will tilt the screen. A latch subassembly disposed on the carrier plate has a finger that locks to either a tang of the bridge plate or a projection of the base plate to hold the bracket respectively in the deployed or the retracted position. The latch subassembly includes a grip-squeeze actuator to release the finger from the bridge plate or the base plate.

6 Claims, 3 Drawing Sheets
**Title:** Two Position Mounting Bracket for Computer Display

**Author:** Michael J. Manceor

**Performing Organization:** US Army RDECOM-TARDEC 6501 E 11 Mile Rd Warren, MI 48397-5000

**Sponsoring/Monitoring Agency:** TACOM/TARDEC

**Supplementary Notes:** United States Patent No.: US 6,796,540 B1

**Security Classification:**
- Report: Unclassified
- Abstract: Unclassified
- This Page: Unclassified
1

TWO POSITION MOUNTING BRACKET
FOR COMPUTER DISPLAY

GOVERNMENT USE

The invention described here may be made, used and
licensed by the or for the U.S. Government for governmental
purposes without paying me any royalty.

BACKGROUND

In recent years, the United States Army has embraced a
doctrinal concept known as the digitized battlefield. One
aspect of the digitized battlefield is a high rate of data
processing and electronic communication among a network
of users, some of which are often vehicles speeding across
unfamiliar terrain. Typical vehicles in the network are tanks,
reconnaissance vehicles or armored personnel carriers.
These vehicles use the network for tasks such as tracking all
friendly units simultaneously or immediately giving these
units tactical data acquired by one vehicle. Information from
the network is displayed on viewing screens or computer
monitors at the commander’s station of the individual vehicles.
Particularly during intense tactical events, vehicle
commanders need to watch the viewing screens constantly.

A problem exists in some vehicles if the vehicle’s com-
mander stands up to look outside the vehicle. The com-
mander then can not see information on the screen. This
happens because the screen is fixedly faced horizontally
whereby the commander’s head as he sits. When the com-
mander stands the viewing angle is too poor for him to read
the screen. One solution for this is to install new viewing
mounting brackets in vehicles that allow the screen to tilt up
when the commander stands. This solution allows the screen
to normally occupy minimum space as it lies flat against an
inner vehicle panel, and yet allows the screen to be tilted on
demand. A specific example of such a solution is shown by
U.S. Pat. No. 6,431,511 to Pilster. In Pilster, a mounting
plate is fixed to a panel inside the vehicle. A frame plate is
tilted to the mounting plate and has the screen mounted
thereon. Swinging of the frame plate out from the mounting
plate tilts the screen so that the vehicle commander can see it
while standing. A guide plate is hinged to the mounting plate
and to a slide plate that translates on the frame plate. The
attachment is such that all the plates together form a trian-
gular configuration when the screen is tilted but these plates
form a flat configuration when the screen is not tilted. The
slide plate accommodates part of the relative motion among
the plates as the screen is moved. A latch on the stationary
plate engages either the slide plate or the mounting plate to
lock the screen in either the tilted or non-tilted positions.

SUMMARY

The present invention is an improved bracket for mount-
ing a relatively flat screen or other relatively flat visual
device in a combat vehicle. The mounting is such that the
screen can be moved from a vertical orientation to a tilted
orientation in order to address the problem described
above. The present invention differs from Pilster by elimi-
nating the slide plate and thereby economizing the design.
The present invention also uses a different latch system, which
eliminates guiding a latch member into slots as Pilster
does, and is thus deemed easier to use.

The invention is a mounting bracket that includes a base
plate fixed to an upright panel inside a combat vehicle. A
carrier plate connects to the base plate so that it swings
and vertically translates on the base plate. The carrier plate has
a view screen mounted thereon, so that swinging the carrier
plate away from the base plate will tilt the screen. A bridge
plate is hinged to both the base plate and the carrier plate. A
latch subassembly is disposed on the carrier plate. The
subassembly has a finger that locks to either a tang on the
bridge plate or to a tab on the base plate. When the finger locks
to the bridge plate’s tang, the mounting bracket is in a
deployed position and tilts the screen. When the finger locks
to the base plate’s tab, the mounting bracket is retracted and
the screen lies flat against the upright panel in the vehicle.
The latch subassembly includes a grip-squeeze actuator.
Squeezing the actuator releases the carrier plate, which is
then swung to or from the base plate. Thereupon the latch
subassembly’s finger locks respectively with the base plate
or the bridge plate.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of the mounting bracket
in a deployed configuration.

FIG. 2 is a side elevational view of the mounting bracket
in a retracted configuration.

FIG. 3 is a front elevational view of the mounting bracket.

FIG. 4 is a top elevational view of the mounting bracket.

FIG. 5 is a rear elevational view of the base plate and
neighboring structure.

FIG. 6 is a rear elevational view of the bridge plate of
the mounting assembly.

DETAILED DESCRIPTION

FIG. 1 shows mounting bracket 10 whose bracket subas-
semble member 12 is affixed to an inner wall, post or other
structural component 8 inside a combat vehicle, such as a
tank or armored personnel carrier. Subassembly 12 has a
generally U-shaped base or base plate 14, whose overall
configuration is perhaps better shown in FIG. 5. Base plate
14 defines at its upper edge a pair of elongate ears 26 and 28
in registry with each other, the ears defining respective slots
30 and 32. Plate 14 also has a planar projection or tab 36
defining a rectangular hole 38.

Subassembly 12 has two elongate upright gussets 16 and
18 welded to the back of plate 14, one gusset being along
each lateral edge of the base plate. A lateral flange 17 is welded to the gussets and to the back of plate 14. Subas-
semble 12 has apertured tabs that facilitate mounting bracket
10 being fastened to surrounding structure, this structure
typically being a panel or post 8 the commander’s station of
the combat vehicle. In the particular embodiment shown,
subassembly 12 has apertured tab 20 affixed at the top of
plate 14, and has apertured tabs 22 and 24 affixed to gussets
16 and 18.

Swingably connected to ears 26 and 28 is a carrier or
carrier plate 40, this plate having a deployed position shown
in FIG. 1 in which it forms about a 30° angle with base plate
14. Carrier plate 40 has a retracted position in which it faces
against the base plate, as seen in FIG. 2. The swinging
connection between plate 40 and the ears is accomplished by
a rod 46 at the top of plate 40, the rod’s ends extending
through the ears’ slots 30 and 32. This connection allows the
top of plate 40 to translate along the slots as the plate swings.
Caps 48 and 50 on the ends of the rod prevent plate 40 from
escaping its connection to the ears.

Plate 40 carries a computer monitor or other display
screen 42, which faces somewhat upward during the
deployed position of mounting bracket 10. Plate 40 addi-
tionally carries a latch subassembly 44 disposed alongside
the screen. Preferably, the main body of the latch assembly extends no further from plate 40 than does screen 42, so that the latch subassembly’s space claim in the combat vehicle is minimized. The latch subassembly includes a retainer 52 bolted to plate 40 and a latch bar 54 passing through the end walls of the retainer. The bar preferably has a rectangular cross section that fits with complimentary orifices in the end walls, so that the bar can not rotate about its longitudinal axis 55. Biassing spring 56 encircles the bar inside the retainer and is disposed between pin 58 protruding from the bar and one of the retainer’s end walls. At one end of bar 54 is a catch mechanism such as finger 60 that extends through plate 40. Finger 60 defines detent 62, which catches tang 64 or tab 36, as explained later in further detail. Other catch mechanisms such as hooks or clips can be used.

Latch subassembly 44 is operated by manual grip-squeeze actuator 66, which is attached to the bottom of plate 40. The actuator includes a cross-sectionally L-shaped stationary member 68 fixed to plate 40, the stationary member having flange 70 extending down therefrom. Slidably connected to stationary member 68 is mobile member 72 having flange 74 integral therewith. These members define respective apertures 76 and 78 through which closely fits the tapered end 80 of latch bar 54. Between flanges 70 and 74 is a spring 82 that biasses member 72 towards its FIG. 1 position, where apertures 76 and 78 are in registry. Squeezing mobile member 72 towards flange 70 drives an edge of aperture 78 against tapered end 80, thereby translating latch bar 54 upward along axis 55.

Hinged to both base plate 14 and carrier plate 40 is a bridge or bridge plate 84, a rear elevational view of which is shown in FIG. 6. Hinge 86 connects plate 84 to plate 40 and hinge 88 connects plate 84 to plate 14. Along one edge of bridge plate 84 is tang 64, which is stiffened by gusset 90. The edge of tang 64 is held by detent 62 of latch subassembly 44 so that plates 14, 40 and 84 are locked in their FIG. 1, deployed position. The bias of spring 56 maintains the engagement between tang 64 and detent 62.

In operation of bracket 10, tang 64 is released when bar 54 translates upward along axis 55. Thereupon plate 84 can swing and rise as rod 46 pivots and translates in slots 30 and 32. Plate 84 arrives at a position adjacent to plate 14, as shown in FIG. 2. Here plate 14, plate 40 and plate 84 form a relatively flatter structure than in the FIG. 1, deployed position. It is contemplated that screen 42 will now be facing horizontally. As plate 84 swings and rises from its deployed position, tang 64 swings past tab 36 while finger 60 enters hole 38. Detent 62 catches the edge of hole 38 and maintains locking engagement therewith because of the bias of spring 56. Squeezing actuator 66 releases this locking engagement, so carrier plate 40 can move from its retracted position in FIG. 2 to its deployed position in FIG. 1.

Moving the mounting bracket between its retracted and deployed positions is a relatively simple action for a soldier. He squeezes actuator 66 while pushing or pulling carrier plate 40, the actuator serving as a handle by which the soldier holds the carrier plate. The soldier’s motion is much quicker and easier motion than that used in known mounting brackets for screens at a commander’s station. Since seconds or fractions thereof are critical in combat, the quicker motion for using mounting bracket 10 is significant.

Mobile member 72 is disposed generally between stationary member 68 and structural component 8. It is thus less likely that the mobile member will be struck so that it moves against tapered end 80. Should the mobile member be struck accidentally from below, it will be forced against stationary member 68, whereby contact friction between the two members increases. This in turn inhibits sliding of the mobile member against tapered end 80. By the foregoing design aspects, actuator 66 incorporates means to inhibit its accidental operation.

I do not desire to be limited to the exact details of construction or method shown herein since obvious modifications will occur to those skilled in the relevant arts without departing from the spirit and scope of the following claims.

What is claimed is:

1. A bracket for a display device which can be fixed in either of two orientations and moved quickly between the orientations, the bracket comprising:

   a first plate;
   a second plate;
   a sliding hinge connection between the first plate and the second plate, whereby the second plate can both slide and pivot relative to the first plate;
   a bridge hinged to both the first plate and the second plate;
   the bracket having a deployed configuration in which the second plate and the bridge form angles with the first plate;
   the bracket having a retracted configuration in which the first plate, the second plate and the bridge form a flatter profile than in the deployed configuration a catch mechanism translatably connected to the second plate, the catch mechanism piercing a general plane occupied by the second plate;
   means for translating the catch mechanism;
   a first catch engagement region on the first plate;
   a second catch engagement region on the bridge;
   wherein the catch mechanism engages the first region during the retracted configuration and engages the second region during the deployed configuration.

2. The bracket of claim 1 wherein the translatable means comprises:

   a first member fixed to the second plate;
   a second member slideable on the first member;
   a drive edge defined by the second member;
   a bar to which the catch mechanism is fixed, the bar translatably connected to the second plate; and
   a tapered end of the bar;
   wherein sliding the second member engages the drive edge with the tapered end.

3. A bracket for mounting a display screen to a structure, wherein the screen can be quickly reoriented from one securely fixed position to another securely fixed position, the bracket comprising:

   a base fixed to the structure;
   a carrier capable of carrying the screen;
   a sliding hinge connection between the base and the carrier, whereby the carrier can both pivot and slide relative to the base;
   a bridle hinged both to the base and to the carrier;
   the bracket having a deployed configuration in which the carrier and the bridge form angles with the base;
   the bracket having a retracted position in which the base, the carrier and the bridge form a flatter profile than in the deployed configuration;
   a finger translatably connected to the carrier, the finger piercing a general plane occupied by the carrier,
means for translating the finger;
a first finger engagement region on the base;
a second finger engagement region on the bridge;
wherein the finger engages the first region during the retracted configuration and engages the second region during the deployed configuration.

4. The bracket of claim 3 wherein the translating means comprises means for inhibiting accidental operation thereof.

5. The bracket of claim 3 wherein the translating means comprises a grip-squeeze actuator on a lower portion of the carrier wherein the actuator is also a handle for holding the carrier.

6. The bracket of claim 3 wherein the translating means comprises:
a first member fixed to the carrier;
a second member slidable on the first member;
a drive edge defined by the second member;
a translatable bar connected to the carrier, the finger fixed to the bar;
a tapered end of the bar; and
means to bias the bar such that the tapered end is biased toward a location adjacent the drive edge;
wherein sliding the second member engages the drive edge with the tapered end.