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Hahne

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(54) **WINDSHIELD ASSEMBLY**

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(58) **Field of Classification Search** 296/78.1,
296/84.1, 90, 92, 96.21

See application file for complete search history.

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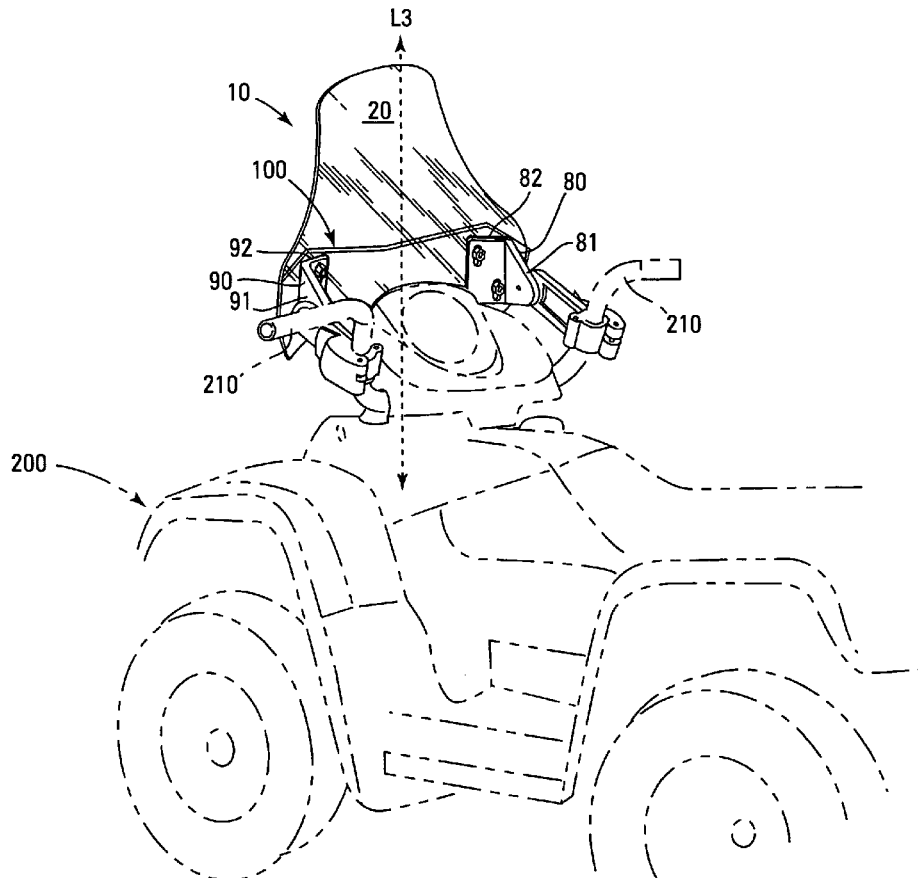
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(57) **ABSTRACT**

The invention is a windshield assembly comprising a windshield panel and a coupling assembly. The coupling assembly is for fixed attachment to the windshield panel and quick release attachment to a vehicle.

8 Claims, 6 Drawing Sheets



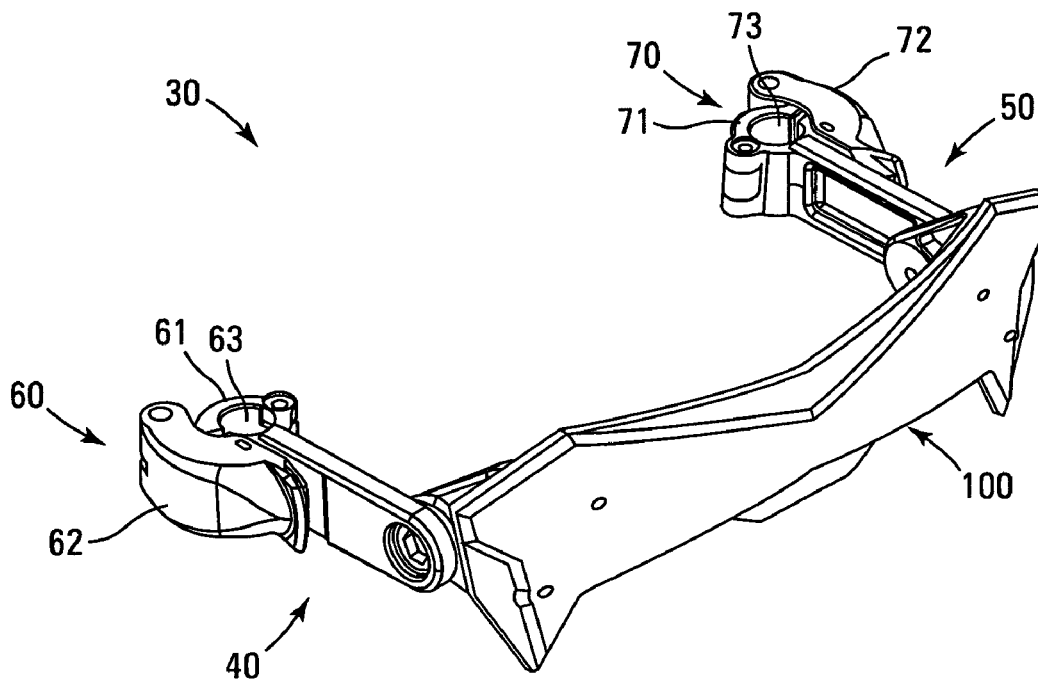


Fig. 1

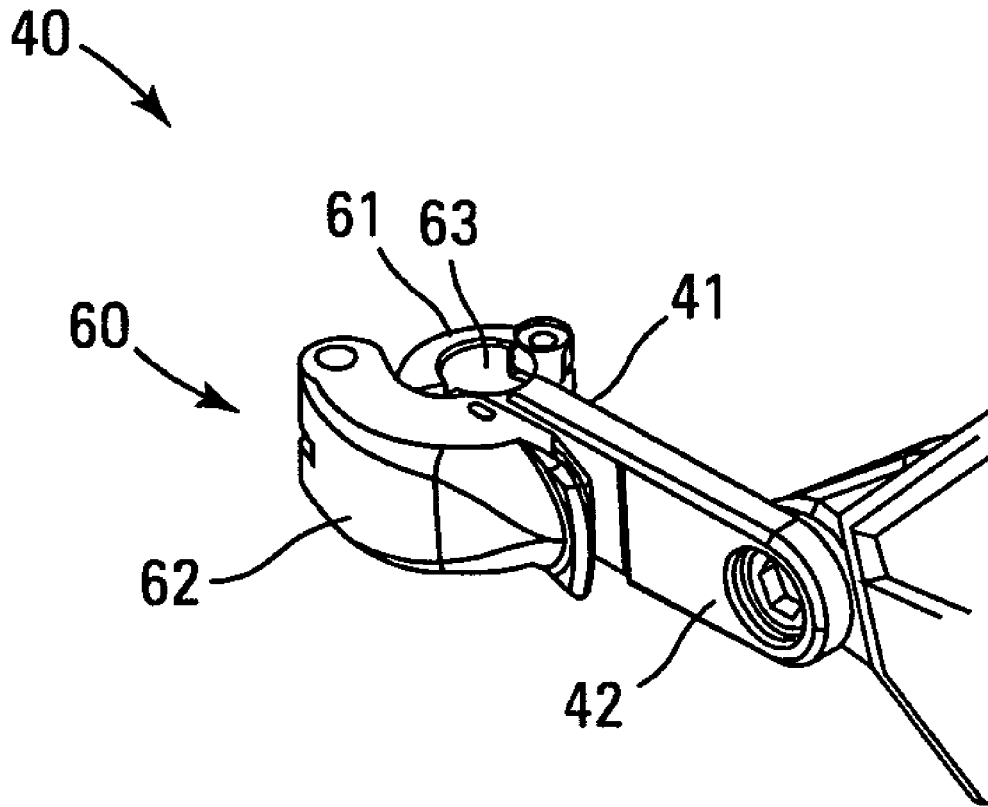


Fig. 2

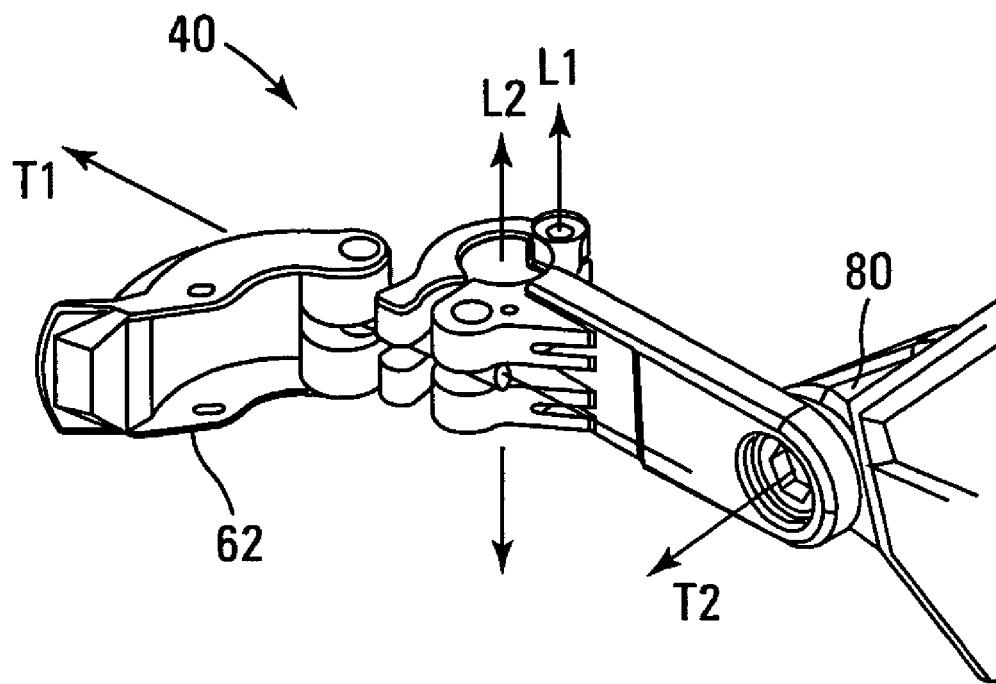


Fig. 3

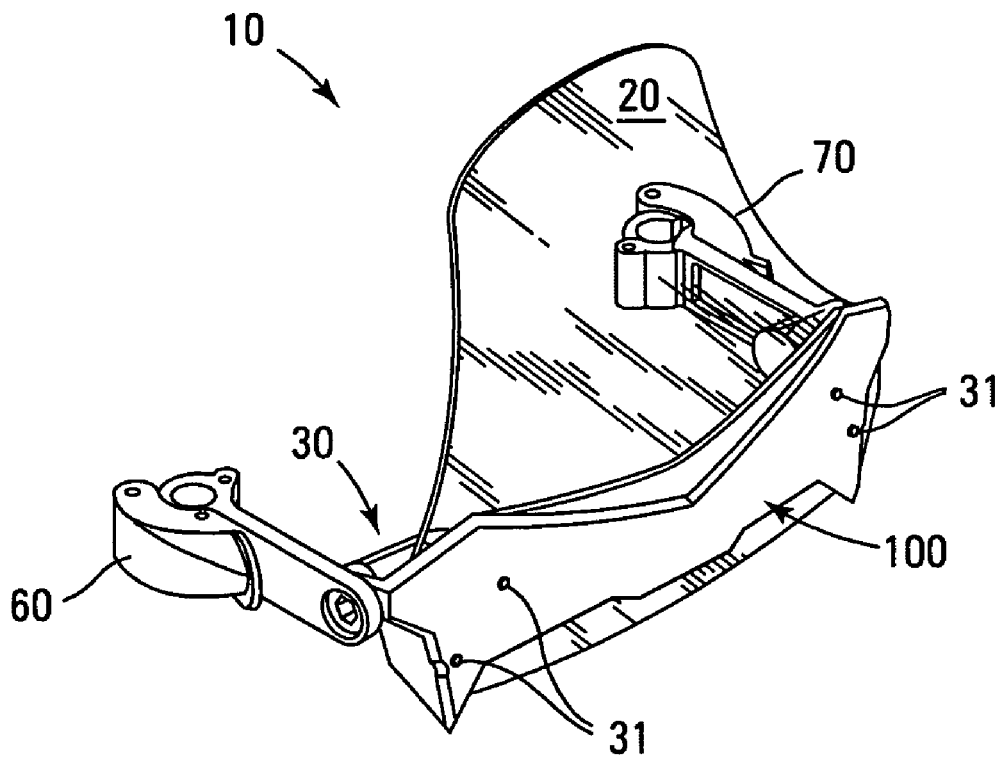
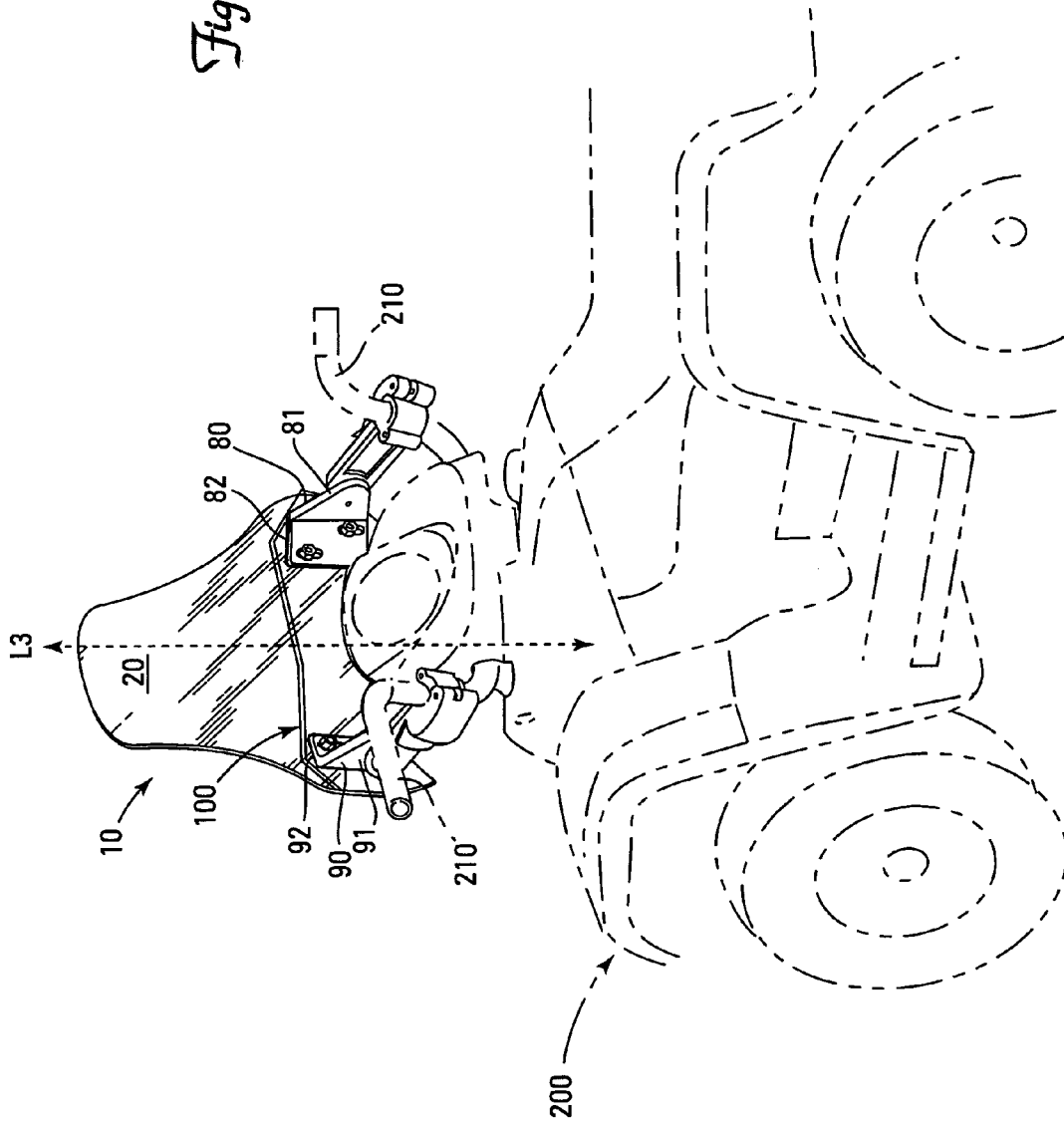


Fig. 4

Fig. 5



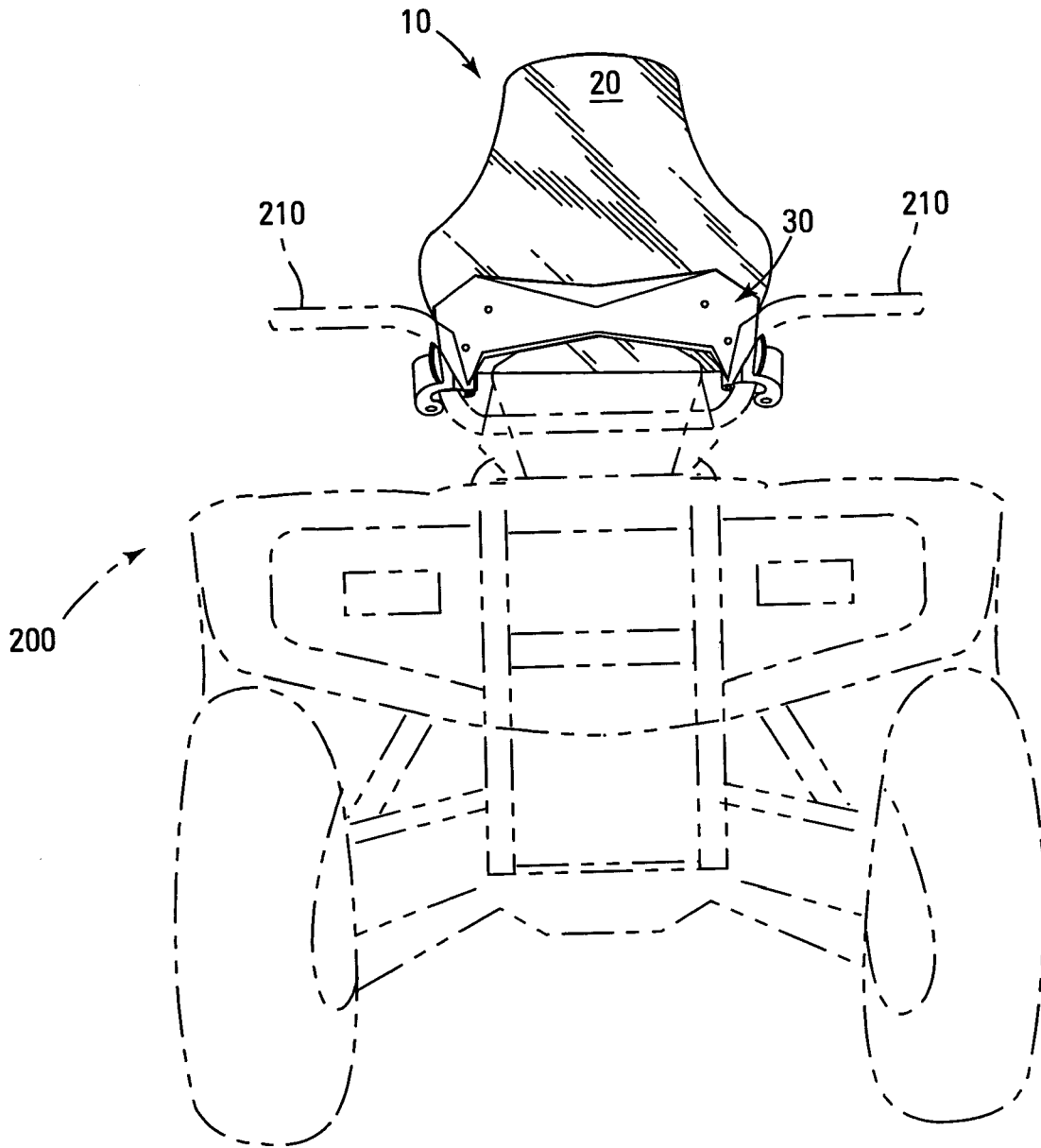


Fig. 6

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WINDSHIELD ASSEMBLY

FIELD OF INVENTION

This invention relates to windshield assemblies for open vehicles.

BACKGROUND

Open motorized vehicles such as all terrain vehicles (ATVs) are commonly used for recreational and utility purposes. Many ATVs are not equipped with windshield panels. The lack of a windshield panel allows wind and debris to blow in the face of the ATV operator, decreasing the visibility and comfort of the operator during use. After market windshield panels have been developed for use with most ATVs.

Often times the windshield panels become damaged during use or transportation in the bed of a truck or on a trailer. The industry has developed a windshield panel that is removably attached to the ATV to allow the windshield panel to be removed during transportation or replaced with a new windshield panel. The typical means of attaching a windshield panel to an ATV is disclosed in U.S. Pat. No. 6,752,447 ('447). The '477 coupling assembly attaches to the ATV handlebars by means of U-shaped brackets fixedly attached to the handlebars. By fixedly attaching the coupling assembly to the handlebars, considerable time is needed to remove the coupling assembly. Tools may also be needed to remove the coupling assembly. It would take considerable time and planning to remove the windshield and coupling assembly as disclosed in the '477 patent.

Therefore, what is needed is a hand operated windshield assembly that may be installed and removed quickly and easily.

SUMMARY OF THE INVENTION

A first embodiment of the invention is a windshield assembling comprising a windshield panel and a coupling assembly. The coupling assembly is for fixed attachment to the windshield panel and quick release attachment to a vehicle.

A second embodiment of the invention is a coupling assembly comprising a first mounting arm and a second mounting arm. The first mounting arm has at least a first end and a second end. The first end has a first quick release mechanism for releasable attachment to a vehicle. The second end is configured and arranged for fixed attachment to a windshield panel. The second mounting arm has at least a first end and a second end. The first end has a second quick release mechanism for releasable attachment to a vehicle. The second end is configured and arranged for fixed attachment to a windshield panel.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top perspective view of one embodiment of the coupling assembly.

FIG. 2 is a side perspective view of the first quick release mechanisms in FIG. 1 in the closed and locked position.

FIG. 3 is a side perspective view of the quick release mechanism in FIG. 2 in the open and unlocked position.

FIG. 4 is a front perspective view of one embodiment of a windshield assembly comprising the coupling assembly in FIG. 1 with a windshield panel attached.

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FIG. 5 is a back perspective view of the windshield assembly in FIG. 4 installed on a vehicle.

FIG. 6 is a front view of the windshield assembly in FIG. 5.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Definitions

As utilized herein, including the claims, the term "vehicle" refers to an open vehicle having handlebars for steering.

As utilized herein, including the claims, the phrase "quick release mechanism" includes any and all quick release mechanisms known in the industry.

Nomenclature

10	Windshield Assembly
20	Windshield Panel
30	Coupling Assembly
31	Fasteners
40	First Mounting Arm
41	First End of First Mounting Arm
42	Second End of First Mounting Arm
50	Second Mounting Arm
60	First Quick Release Mechanism
61	First Cam Bracket
62	First Lever
63	First Passageway
70	Second Quick Release Mechanism
71	Second Cam Bracket
72	Second Lever
73	Second Passageway
80	First Mounting Bracket
81	First End of First Mounting Bracket
82	Second End of First Mounting Bracket
90	Second Mounting Bracket
91	First End of Second Mounting Bracket
92	Second End of Second Mounting Bracket
100	Front Plate
200	Vehicle/ATV
210	Handlebar
L1	First Longitudinal Axis
L2	Second Longitudinal Axis
L3	Third Longitudinal Axis
T1	First Transverse Axis
T2	Second Transverse Axis

Construction

The coupling assembly 30 can be used to attach a windshield panel 20 to a vehicle 200. Vehicles 200 such as all terrain vehicles and snowmobiles either have no windshield panel or the windshield panels 20 are subject to replacement due to damage or customization. Windshield panels 20 are a popular after market accessory for all terrain vehicles. Therefore, the remainder of the discussion will be based upon an all terrain vehicle 200 ("ATV"). Limiting the remainder of the discussion to use of the invention on an ATV 200 is not intended to limit the invention. It should be recognized that the invention may be applied not only to ATVs 200 but also in other vehicles 200 such as motorcycles, snowmobiles, three-wheeled vehicles, etc.

As shown in FIG. 1, one embodiment of the coupling assembly 30 comprises a first mounting arm 40 and a second mounting arm. The first mounting arm 40 may have at least a first end 41 and a second end 42. The second mounting arm 50 may have at least a first end (not numbered) and a second end (not numbered).

The first end **41** of the first mounting arm **40** may be pivotably attached to a first quick release mechanism **60** for releasable attachment to an ATV **200**. The first end (not numbered) of the second mounting arm **50** may be pivotably attached to a second quick release mechanism **70** for releasable attachment to an ATV **200**. The first and second quick release mechanisms **60** and **70** enable the ATV **200** operator to install and remove the windshield panel **20** from the ATV **200**, after initial installation, quickly and without tools.

The first and second quick release mechanism **60** and **70** may comprise, respectively, at least a first cam bracket **61** and a second cam bracket **71** and a first lever **62** and a second lever **72**. The first and second cam brackets **61** and **71** are configured and arranged, respectively, to define a longitudinally extending first passageway **63** and second passageway **73** when the first and second quick release mechanisms **60** and **70** are in a closed position. The first cam bracket **61** may be configured and arranged for rotatable attachment to the first end **41** of the first mounting arm **40**. The second cam bracket **71** may be configured and arranged for rotatable attachment to the first end (not numbered) of the second mounting arm **50**. The first cam bracket **61** may rotate about a first longitudinal axis **L1** in relation to the first mounting arm **40** moving the first quick release mechanism **60** between a closed position and an open position. The second cam bracket **71** may rotate about a first longitudinal axis **L1** in relation to the second mounting arm **50** moving the second quick release mechanism **70** between a closed position and an open position. The first lever **62** may then be configured and arranged for rotatable attachment to the first mounting arm **40** about a second longitudinal axis **L2** in relation to the first mounting arm **40**. The second lever **72** may then be configured and arranged for rotatable attachment to the second mounting arm **50** about a second longitudinal axis **L2** in relation to the second mounting arm **50**. The first and second levers **62** and **72** are longitudinally rotatable from an unlocked position to a locked position. The first lever **62** may be attached to the first mounting arm **40** so as to be repositionable along a first transverse axis **T1** in relation to the second longitudinal axis **L2**. The second lever **72** may be attached to the second mounting arm **50** so as to be repositionable along a first transverse axis **T1** in relation to the second longitudinal axis **L2**. The first and second levers **62** and **72** may be repositioned along the first transverse axis **T1** to accommodate the first and second passageways **63** and **73** having a variable diameter (not numbered) and still allow the first and second levers **62** and **72** to achieve the locked position. As shown in FIGS. **2** and **3**, the preferred first and second quick release mechanisms **60** and **70** are off-center clamps.

The second end **42** of the first mounting arm **40** and the second end (not numbered) of the second mounting arm **50** may be configured and arranged for fixed attachment to a windshield panel **20**. The second end **42** of the first mounting arm **40** and the second end (not numbered) of the second mounting arm **50** may be configured and arranged for direct attachment to the windshield panel **20**. Preferably first and second mounting brackets **80** and **90** are utilized as an interface between the first and second mounting arms **40** and **50** and the windshield panel **20**.

The first end **81** of the first mounting bracket **80** may be configured and arranged for repositionable attachment to the second end **42** of the first mounting arm **40** about a second transverse axis **T2** in relation to the first mounting arm **40**. The first end **91** of the second mounting bracket **90** may be configured and arranged for repositionable attachment to the second end (not numbered) of the second mounting arm **50**

about a second transverse axis **T2** in relation to the second mounting arm **50**. Repositionable attachment of the first and second mounting brackets **80** and **90** allows the windshield panel **20** to be repositioned along a third longitudinal axis **L3** in relation to the ATV **200**.

The second ends **82** and **92** of the first and second mounting bracket **80** and **90** may be configured and arranged for attachment to the windshield panel **20**. As shown in FIGS. **4** and **5**, a front plate **100** may also be used in conjunction with the first and second mounting brackets **80** and **90** to secure the windshield panel **20** to the coupling assembly **30**.

The first mounting arm **40**, second mounting arm **50**, first quick release mechanism **60**, second quick release mechanism **70**, front plate **100**, first mounting bracket **80**, and second mounting bracket **90** may be made from any suitable material including metal, plastic, or wood. The preferred material is polycarbonate plastic.

The windshield panel **20** may be configured from any suitable material. Preferably the windshield panel **20** is configured from transparent and strong material such as polycarbonate plastic. The windshield panel **20** may also be configured entirely or partially from an opaque and strong material, as long as the vehicle **200** operator's vision is not impaired by the windshield panel **20**.

Use

Use of the windshield assembly **10** is generally initiated by attaching the windshield panel **20** to the coupling assembly **30**. The preferred coupling assembly **30** is shown in FIG. **1**. The fasteners **31** securing the front plate **100** to the second ends **82** and **92** of the first and second mounting brackets **80** and **90** are removed. The windshield panel **20** may have fastening holes (not numbered) configured and arranged to align with the fastening holes (not numbered) in the front plate **100** and the first and second mounting brackets **80** and **90**. After the fastening holes (not numbered) in the windshield panel **20** are properly aligned, the fasteners **31** are reinserted into the fastening holes (not numbered) in the front plate **100** and the first and second mounting brackets **80** and **90** and lightly tightened. FIG. **4** shows the coupling assembly **30** with a windshield panel **20** fixedly attached. The windshield panel **20** may be attached to the coupling assembly **30** after the coupling assembly **30** is attached to the ATV **200**.

As shown in FIGS. **5** and **6**, the coupling assembly **30** may then be attached to the ATV **200** handlebars **210**. As shown in FIG. **3**, the first and second quick release mechanisms **60** and **70** start in the open and unlocked position. The handlebars **210** of the ATV **200** are then inserted into the first and second passageways **63** and **73**. The first and second cam brackets **61** and **71** are then rotated into the locked position. The first and second levers **62** and **72** are then rotated into the locked position. If the first and second levers **62** and **72** will not rotate into the closed position due to the diameter (not numbered) of the handlebars **210**, the first and second levers **62** and **72** may be repositioned along the second transverse axis **T2** until the first and second levers **62** and **72** will rotate into the locked position.

Once the coupling assembly **30** is attached to the handlebars **210**, the windshield panel **20** may be repositioned along the third longitudinal axis **L3** for optimal placement for the AVT **200** operator by loosening the fasteners **31** in the front plate **100** and adjusting the placement of the windshield panel **20**. Once the windshield panel **20** is in the optimal position, the fasteners **31** are retightened.

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The coupling assembly **30** may be quickly removed from the ATV **200** handlebars **210** by rotating the first and second levers **62** and **72** from the locked position and moving the first and second cam brackets **61** and **71** from the closed position. The windshield assembly **10** may then be attached and removed from the ATV **200** at any time in a matter of seconds.

I claim:

1. A windshield assembly, comprising:

- (a) a windshield panel; and
- (b) a coupling assembly for fixed attachment to the windshield panel and quick release attachment to a vehicle;
- (c) wherein (i) the coupling assembly has at least (1) a first mounting arm having at least (A) a first end having a first tool-less quick release mechanism for releasable attachment to a vehicle, and (B) a second end; and (2) a second mounting arm having at least (A) a first end having a second tool-less quick release mechanism for releasable attachment to a vehicle, and (B) a second end; and (3) wherein the second ends of the first and second arms are configured and arranged for fixed attachment to the windshield panel; and (ii) the first tool-less quick release mechanism and the second tool-less quick release mechanism are configured and arranged, when in a closed position, to circumscribe a portion of a vehicle.

2. The windshield assembly recited in claim **1**, wherein the first tool-less quick release mechanism has at least a first lever configured and arranged to be repositionable along a first transverse axis in relation to a second longitudinal axis, and the second tool-less quick release mechanism has at least a second lever configured and arranged to be repositionable along a first transverse axis in relation to a second longitudinal axis.

3. The windshield assembly recited in claim **1**, wherein the coupling assembly is for tool-less quick releasable attachment to a handlebar of the vehicle.

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4. A coupling assembly, comprising:

- (a) a first mounting arm having at least,
 - (i) a first end having a first tool-less quick release mechanism for releasable attachment to a vehicle, and
 - (ii) a second end; and
- (b) a second mounting arm having at least,
 - (i) a first end having a second tool-less quick release mechanism for releasable attachment to a vehicle, and
 - (ii) a second end; and
- (c) wherein (i) the second ends of the first and second arms are configured and arranged for fixed attachment to a windshield panel and (ii) the first tool-less quick release mechanism and the second tool-less quick release mechanism are configured and arranged when in a closed position to circumscribe a portion of a vehicle.

5. The coupling assembly as recited in claim **4**, wherein the first tool-less quick release mechanisms is an off-center clamp and the second tool-less quick release mechanism is an off-center clamp.

6. The coupling assembly as recited in claim **4**, wherein the first and second tool-less quick release mechanisms are for releasable attachment to a handlebar of the vehicle.

7. The coupling assembly recited in claim **4**, further comprising a windshield panel attached to the second ends of the first and second arms.

8. The coupling assembly recited in claim **4**, wherein the first tool-less quick release mechanism has at least a first lever configured and arranged to be repositionable along a first transverse axis in relation to a second longitudinal axis, and the second tool-less quick release mechanism has at least a second lever configured and arranged to be repositionable along a first transverse axis in relation to a second longitudinal axis.

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