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(54) **MOUNTING BRACKET FOR VEHICLE VISOR AND METHOD OF MOUNTING BRACKET AND VISOR IN A VEHICLE**

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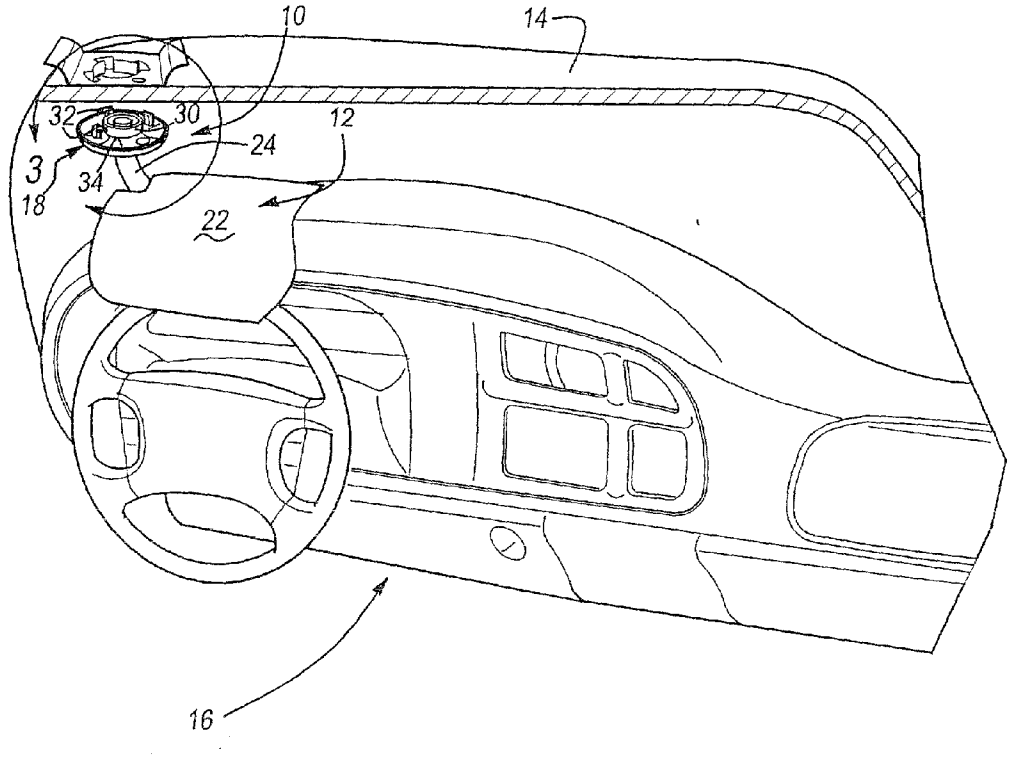
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(57) **ABSTRACT**

A mounting bracket assembly for supporting a sun shade visor to a vehicle includes a bracket having hooks and a center boss. A circular aperture and slots are formed in the headliner to receive the hooks and boss. The end of the rod supporting the visor has a finger extending radially outwardly to engage an abutment portion in the boss. The rod is inserted into the bracket and pivoted within the bracket to move the finger against the abutment surface. The bracket is inserted into the slots and the aperture of the headliner and the visor is twisted to move the hooks into engagement with the headliner.



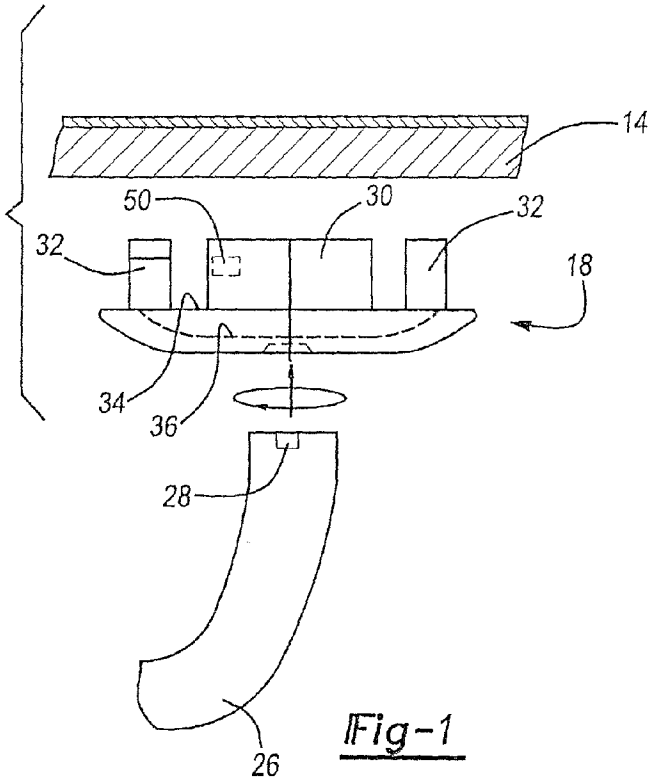


Fig-1

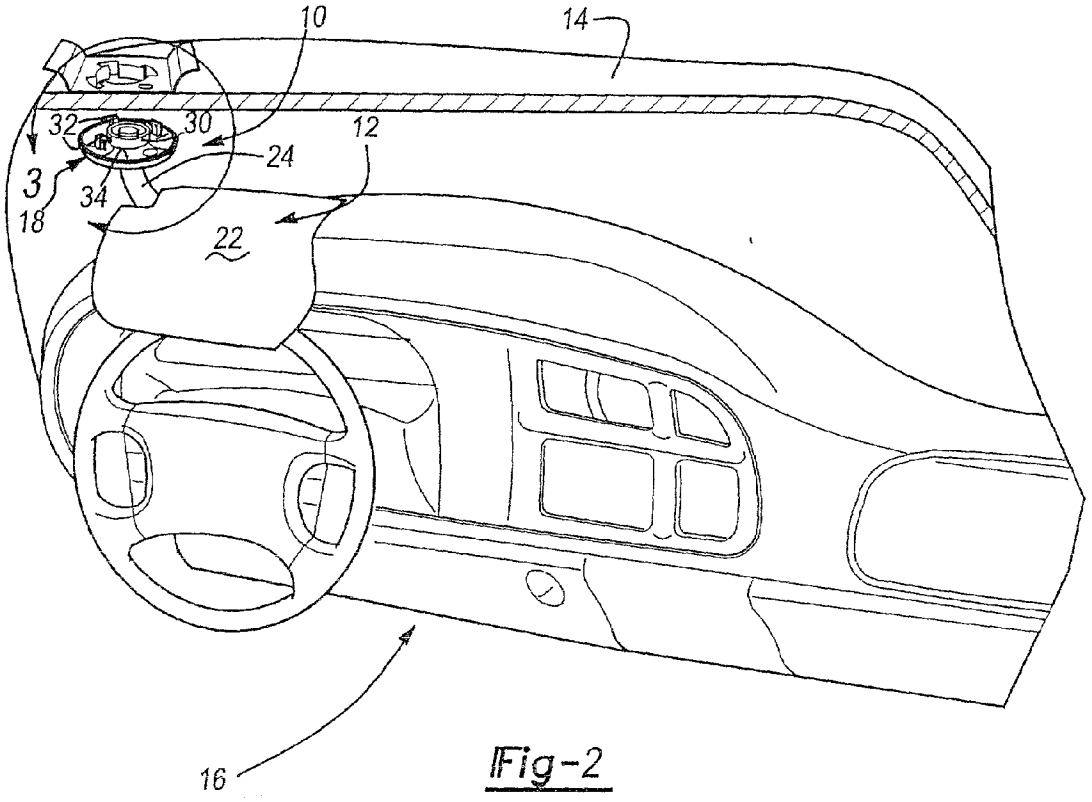


Fig-2

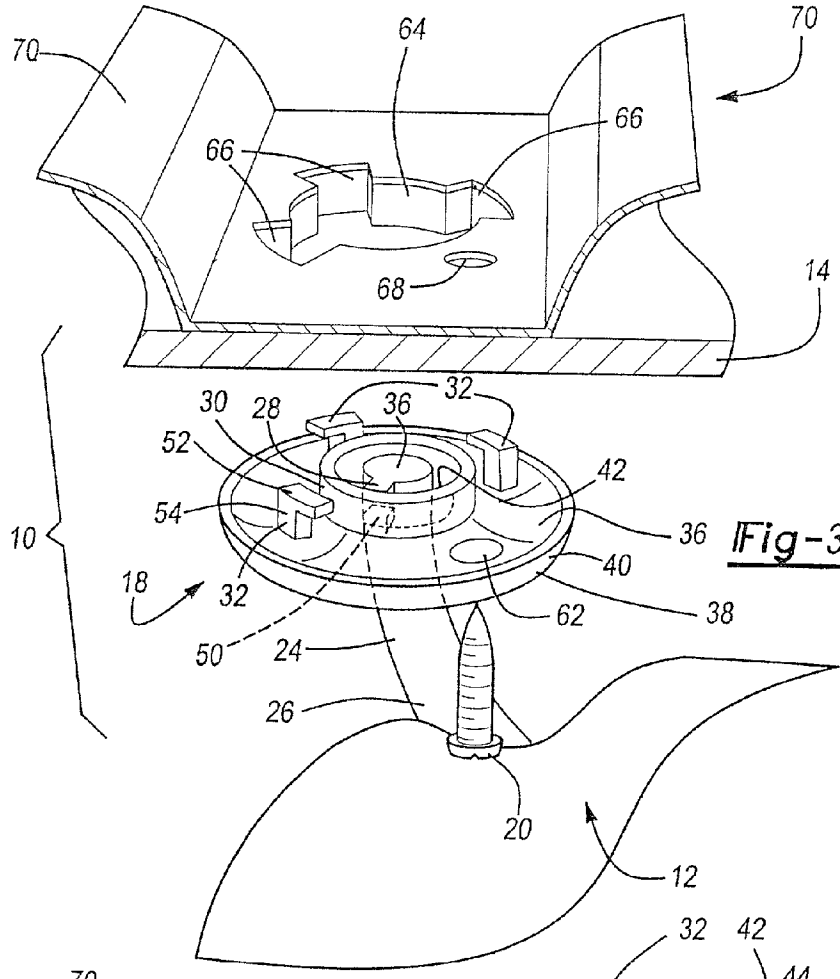


Fig-3

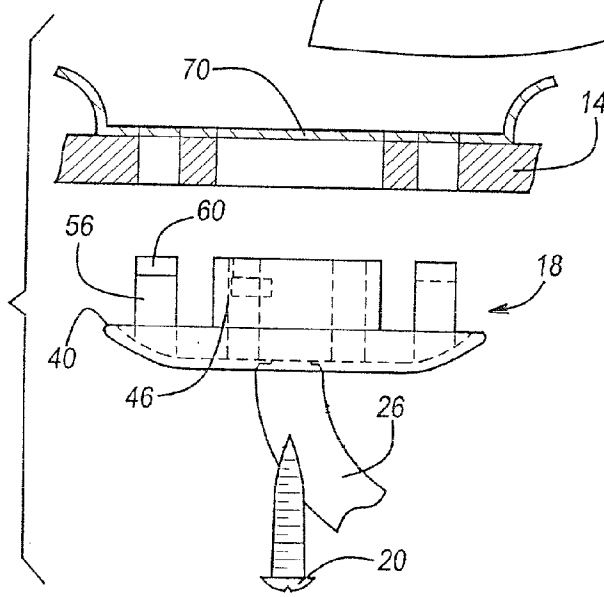


Fig-4A

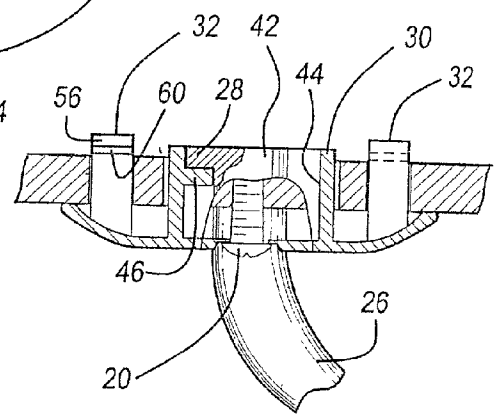


Fig-4B

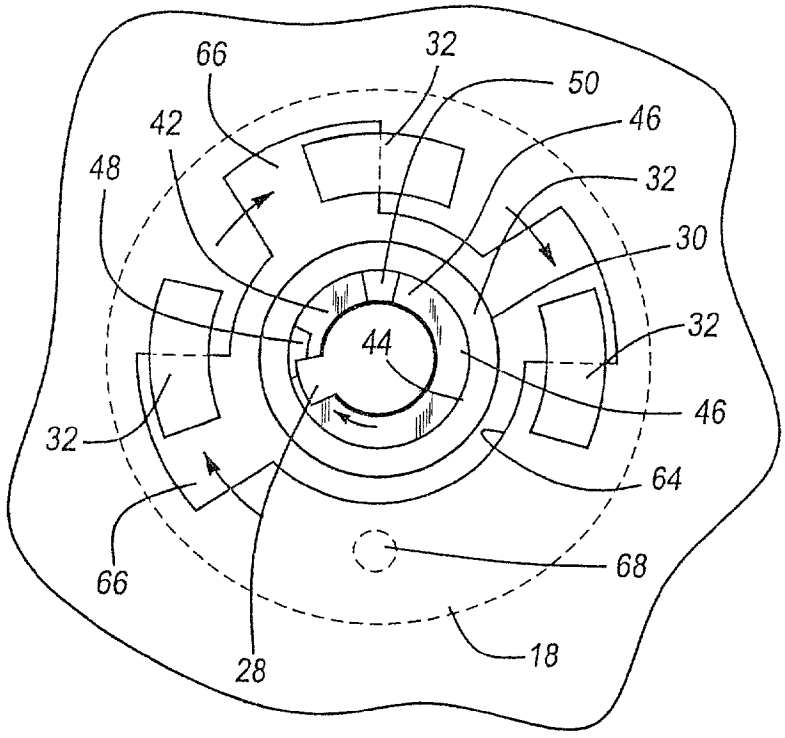


Fig-5

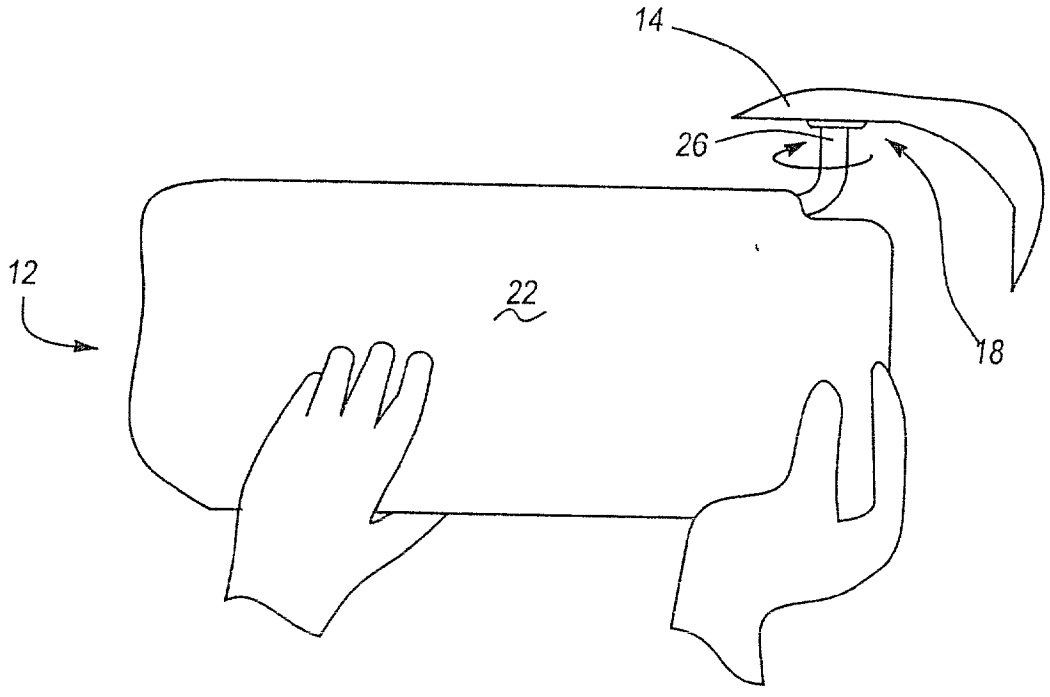


Fig-6

MOUNTING BRACKET FOR VEHICLE VISOR AND METHOD OF MOUNTING BRACKET AND VISOR IN A VEHICLE

BACKGROUND OF THE INVENTION

[0001] I. Field of the Invention

[0002] The present invention relates generally to brackets for mounting sun shade visors to vehicles and, more particularly, to a mounting bracket which is rotatably installed to a headliner of a vehicle.

[0003] II. Description of the Prior Art

[0004] Sun shade visors for vehicles typically have a visor blade which pivots on an arm mounted to the vehicle. The arm has an elbow which is received in a bracket mounted to the headliner of the vehicle. The visor blade pivots horizontally on the arm between a storage position against the headliner to a use position where the visor shades an upper portion of the windshield. The bracket supports the visor blade and elbow for pivotal movement in the use position between the windshield and a side window. Many brackets are known for use in mounting the elbow to the headliner. One type of bracket has a center bore for receiving the arm and has outer flanges which are mounted to the headliner by screws, such as disclosed in U.S. Pat. No. 4,756,570 to Cooper.

[0005] It is also known to mount a bracket to a headliner without screws using a three piece bracket assembly, such as disclosed in U.S. Pat. No. 5,031,954 to Peterson, et al. Peterson, et al. discloses forming a square aperture in the headliner and an inner bracket having a square shaped inner flange which is inserted through the square aperture. The elbow is inserted into the inner bracket and rotated to rotate the flange so that the corners of the flange overlay the inner surface of the headliner. An outer bracket is inserted through a separate aperture in the headliner to engage one corner of the inner bracket and lock it into position. Finally, a cover is snapped in place over the inner and outer brackets to cover the assembly. However, assembly of this bracket requires a number of steps, including inserting the outer cover over the elbow, inserting the elbow into the outer bracket, rotating the outer bracket, inserting the inner bracket into a hole, and finally, pushing the outer cover into position over the inner and outer brackets.

[0006] It would be desirable to provide a mounting bracket which is inexpensively produced and easily assembled. It is a further object of the invention to provide a bracket which does not require a separate cover and the associated assembly.

SUMMARY OF THE PRESENT INVENTION

[0007] Accordingly, a mounting apparatus for mounting the elbow of an arm supporting a visor assembly to a vehicle includes a bracket body and a fastener member. The elbow has a radially extending finger portion at its end. The bracket has a body with a circular dish portion having a central aperture. A cylindrical boss extends coaxially with the aperture for receiving the elbow. The boss has an inner wall having a radially inwardly extending abutment portion. A plurality of hooks extend from an underside of the skirt. A circular aperture is formed in the headliner to receive the boss. A plurality of arced slots are formed in the headliner to receive the hooks. The elbow is inserted through the aperture into the boss. The elbow is rotated within the throughbore until the finger contacts the abutment portion. The boss and the hooks are then inserted into the circular aperture and slots formed in the headliner. The elbow is then twisted to rotate the body and move the hooks to engage the headliner. A fastener, such as a screw, is inserted through a hole in the dished portion and into the headliner to prevent rotation and complete the assembly.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The foregoing and other objects and advantages of the present invention will become readily apparent to those skilled in the art upon studying the following detailed description, when considered in connection with the accompanying drawings, in which:

[0009] **FIG. 1** is an exploded side view of a portion of the headliner, mounting bracket, and visor elbow in accordance with the invention;

[0010] **FIG. 2** is a perspective view of the visor and bracket before assembly in accordance with the invention;

[0011] **FIG. 3** is an exploded perspective view of the bracket and headliner of the circle **3** of **FIG. 2** in accordance with the invention;

[0012] **FIG. 4*a*** is an exploded side view of the mounting bracket, headliner and fastener just before assembly into the headliner in accordance with the invention;

[0013] **FIG. 4*b*** is an exploded side view of the bracket and headliner after assembly in the headliner in accordance with the invention;

[0014] **FIG. 5** is a partial plan view of the headliner and mounting bracket taken from the rear side of the headliner as the bracket is being twisted into position in accordance with the invention; and

[0015] **FIG. 6** is a front view of the assembly of the visor as it is being twisted into the headliner in accordance with the invention;

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0016] An improved bracket assembly **10** for mounting a sun shade visor assembly **12** to a headliner **14** of a vehicle **16** is shown in FIGS. **2-3**. The sun shade visor assembly **12** includes a visor blade **22** which is rotatably mounted to an arm **24**. The arm **24** has an elbow portion **26** extending from the top of the blade **22**. A finger **28** extends radially outwardly from an end of the arm **24**. The blade **22** is mounted to pivot between a storage position against the headliner **14** and a use position covering an upper portion of a windshield, as shown in **FIG. 2**.

[0017] As shown in **FIGS. 1, 3** and **4**, the bracket assembly **10** includes a body **18** having a cylindrical center boss **30** and three hooks **32** extending from an underside **34** of a circular dish portion **36**. The dish portion **36** has a smooth outer surface **38** which curves from a generally planar center portion to a radially aligned circumferential edge **40**. An aperture **42** is formed to receive the elbow **26** therethrough into the boss **30**.

[0018] As shown in **FIGS. 4***b* and **5**, the boss **30** extends beyond the circumferential edge **40** of the dish portion **36**. the boss **30** extends coaxially with the aperture **42** and has an inner surface **44** with a radius slightly larger than the radius of the finger **28** of the elbow **26**. An annular flange **46** extends from the inner surface **44** of the boss **30** to provide a guide surface for the finger **28**. A slot **48** is formed in the flange **46** to accept the finger **28** when the elbow **26** is inserted into the body. An abutment portion **50** extends from the inner surface **44** above the flange **46** to engage the finger **28** to facilitate mounting of the body **18** as discussed below.

[0019] As shown in **FIGS. 4***a,* and **4***b,* the hooks **32** extend outwardly from the inner surface **44** in the same direction as the boss **30**. Each hook **32** has an arm portion **52** extending from a post portion **54**. Each hook **32** is spaced radially outwardly from the boss **30** an equal distance. Each arm portion has a flat inner surface **56** spaced apart a predetermined distance from the circumferential edge **40** of the dish portion **36**. This distance is equal or slightly less than the thickness of the headliner. At a free end **58** of the arm portion, the inner surface **56** may angle upwardly towards a top surface **60** of the arm to facilitate positioning and rotation of the hooks **32**. A hole **62** is formed in the dish portion for receiving the fastening member **20**. The hole **62** is spaced radially outwardly from the boss **30**. The body **18** is unitarily molded of a rigid material, such as plastic.

[0020] As shown in **FIGS. 3 and 4**, the fastener **20** is a screw, however other types of fasteners, such as mushroom inserts, may be used.

[0021] As best shown in **FIGS. 3 and 5**, a circular aperture **64** is formed in the headliner **14** to receive the boss **30** of the body **18**. Three arced slots **66** are spaced radially outwardly from the aperture **69** to receive the hooks **32** of the body. The slots **66** may be spaced apart from the circular aperture **64** or extend radially from the circular aperture **64**, as shown in **FIG. 5**. A throughbore **68** is positioned radially outwardly from the aperture **64** to receive the fastener **20**.

[0022] The headliner **14** is typically composed of a foam core sandwiched between a flexible outer skin and a rigid backboard. In some cases, the headliners do not have sufficient strength to support the sun shade assembly, making it necessary to mount a metal bracket **70** extending between the roof of the vehicle and the headliner to act as a backing plate. In such a case, the apertures **64**, **68** and slots **66** are formed through the headliner **14** and the metal bracket **70**.

Method of Assembly

[0023] As shown in **FIGS. 4***a,* **4***b,* **5** and **6**, the sun visor assembly **12** is assembled to the headliner **14** by first extending the elbow **26** through the aperture **42** and boss **30** with the finger **28** of the arm passing through the slot **48** of the flange **46**. The elbow **26** is then rotated within the boss **30** until the finger **28** contacts the abutment portion **50** of the boss as shown in **FIG. 3**.

[0024] The boss **30** and hooks **32** are then inserted through the headliner **14** with the boss positioned in the center aperture **62** and the hooks extending into the arced slots **48**. The elbow **26** is then rotated further in the same direction as before to push the arm portion **52** of the hooks over the inner surface of the headliner **14** or metal bracket **70**. As shown in **FIGS. 4***b,* **5** and **6**, the inner surface **56** of the arm portions **52** may be angled at the ends to facilitate the rotation. Since the foam core of the headliner **14** is normally resilient, the circumferential edge **40** of the dish portion **36** is compressed slightly into the headliner **14** as the body **18** is rotated. The body **18** is rotated until the post portions **54** of the hooks **32** contact the ends of the slots **48**. The hole **62** and aperture **68** are thus aligned and the fastener **20** is then inserted to prevent the body from being twisted and removed from the headliner **14**. The finger **28** of the elbow **26** rides on the flange **46** of the boss **30** to permit rotation of the visor from the windshield to the side. The visor is permitted to pivot through approximately 90° to 110° until it contacts either the windshield or side window. However, the elbow cannot be pivoted far enough to permit the finger **28** to pass back through the slot **48**.

[0025] To remove the body **18** from the headliner **14**, the fastener **20** is first removed and then the body **18** is twisted in a reverse direction from the assembly direction.

[0026] While specific embodiments of the invention have been shown, described to illustrate the present invention, it is to be understood that the invention may be embodied otherwise without departing from the principals. For example, one skilled in the art will recognize from such a discussion and the accompanying drawings and claims that various modifications and variations can be made without departing from the spirit and scope of the invention as defined in the following claims.

What is claimed is:

1. A mounting apparatus for mounting a visor assembly to a headliner of a vehicle, said visor assembly having an elbow extending from a blade, said mounting assembly comprising:

a body having a boss extending from an inner surface of a dish portion, said dish portion having an aperture extending into said boss adapted for receiving said elbow, said body further having at least two hooks extending outwardly from said inner surface for engaging said headliner; and

a fastener member adapted to be received in said hole to engage said headliner of said vehicle to prevent rotation of said body.

2. The mounting apparatus of claim 1, wherein said mounting assembly further comprises a cylindrical boss extending coaxially with said aperture from said inner surface of said dish portion.

3. The apparatus of claim 1, wherein said at least two hooks comprise three hooks.

4. The apparatus of claim 3, wherein said three hooks are equally spaced from said aperture.

5. The apparatus of claim 1, wherein said dish portion has a circular circumferential edge.

6. The apparatus of claim 1, wherein said fastener member is a threaded fastener.

7. The apparatus of claim 1, wherein each of said hooks further comprise an arm portion extending from a post portion, said arm portion having an inner surface spaced a predetermined distance from said circumferential edge of said dish portion, said distance being equal to or less than a thickness of said headliner.

8. The apparatus of claim 1, wherein said boss extends beyond a plane aligned with said circumferential edge.

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