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(56) Documents Cited

GB 2167907 A

GB 1307066 A

GB 1235099 A

GB 0911832 A

GB 0445918 A

US 4796612 A

US 4256010 A

(58) Field of Search

UK CL (Edition O) **E2A ACSJ ACSR**

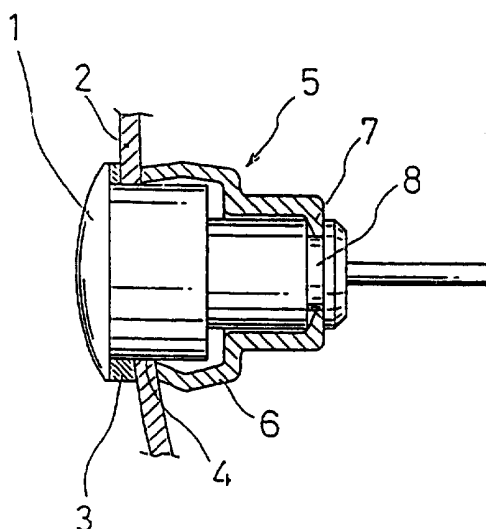
INT CL⁶ **B60R 19/48, F16B 19/00 21/16 21/18**

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(54) **Mounting electrical components**

(57) A component such as a sensor unit (1) engages with the fitting hole (4) of a mounting plate such as a bumper (2) together with a sensor washer (3). A clip (5) engages with the rear of the sensor unit (1). The clip (5) has elastic legs (6), which curve toward the outer periphery and deform to form a composite abutment surface in accordance with the back shape of the bumper (2). The clip (5) also has elastic claws (7), which engage with a stop groove (8) in the rear of the sensor unit (1) to fix the sensor unit (1) to the bumper (2). This reduces the number of parts and makes the operation easy, so that the sensor unit (1) can be securely fixed.

FIG. 1



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FIG. 1

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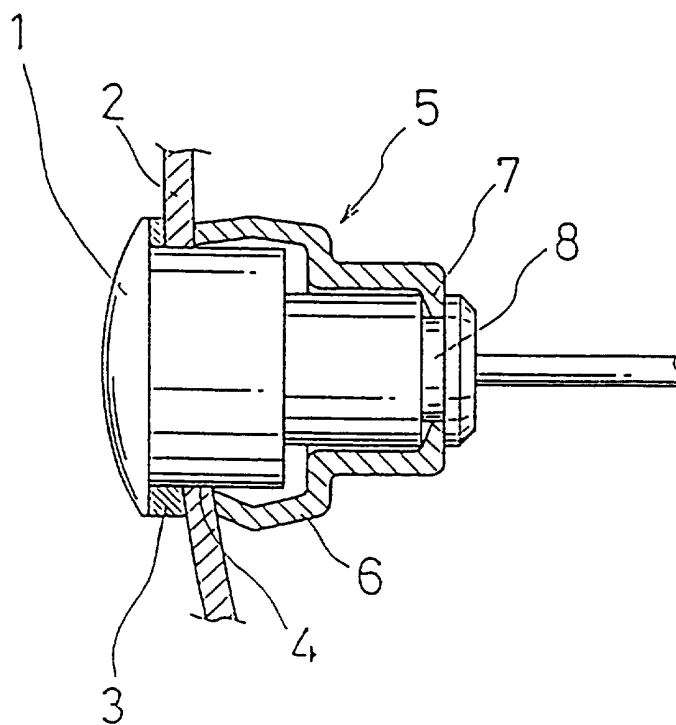
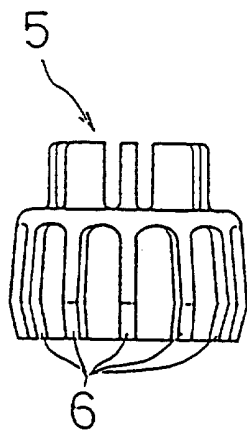
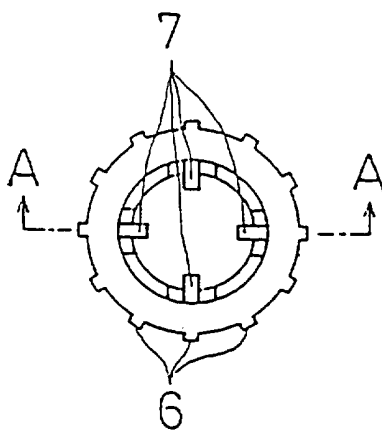


FIG. 2

(a)



(b)



(c)

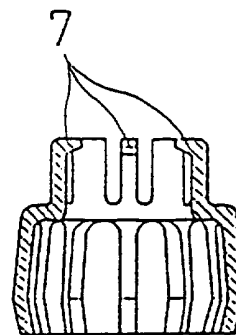


FIG. 3

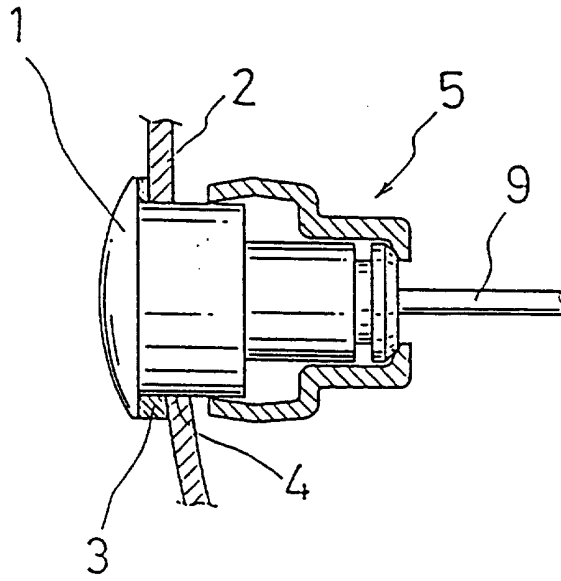


FIG. 4

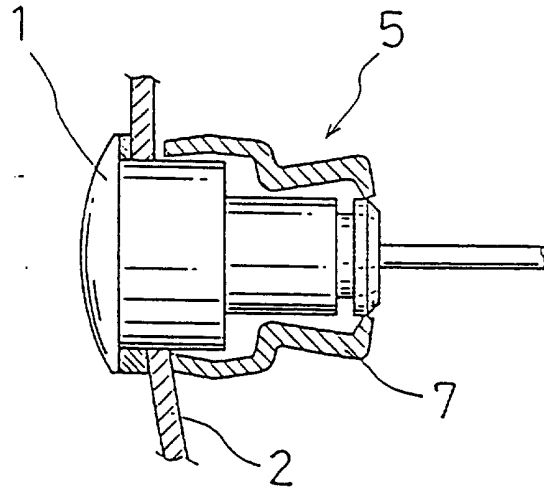


FIG. 5

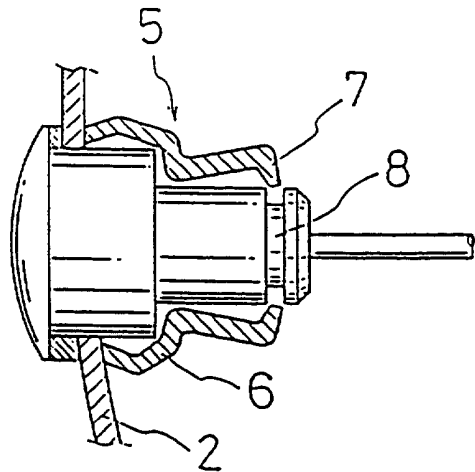


FIG. 6

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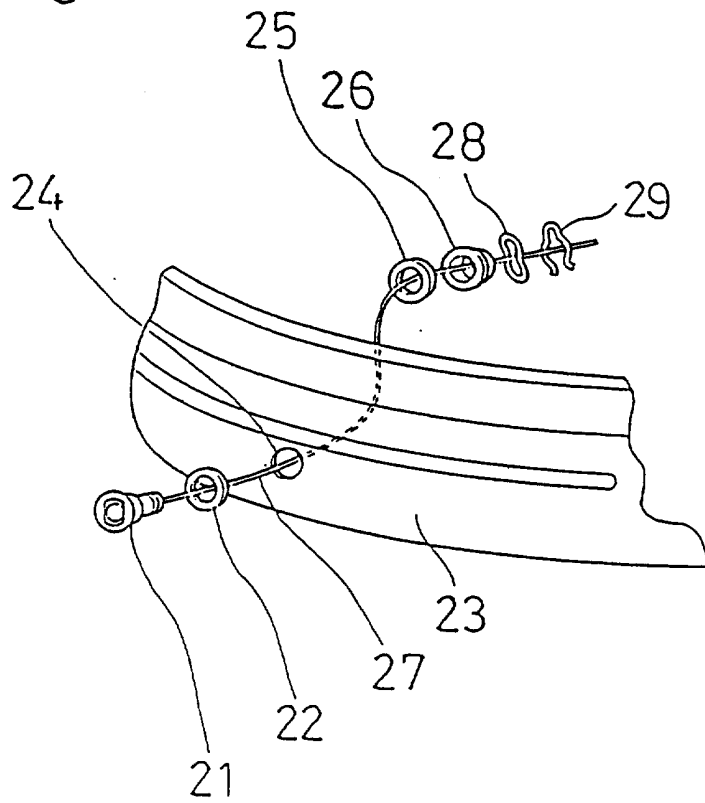
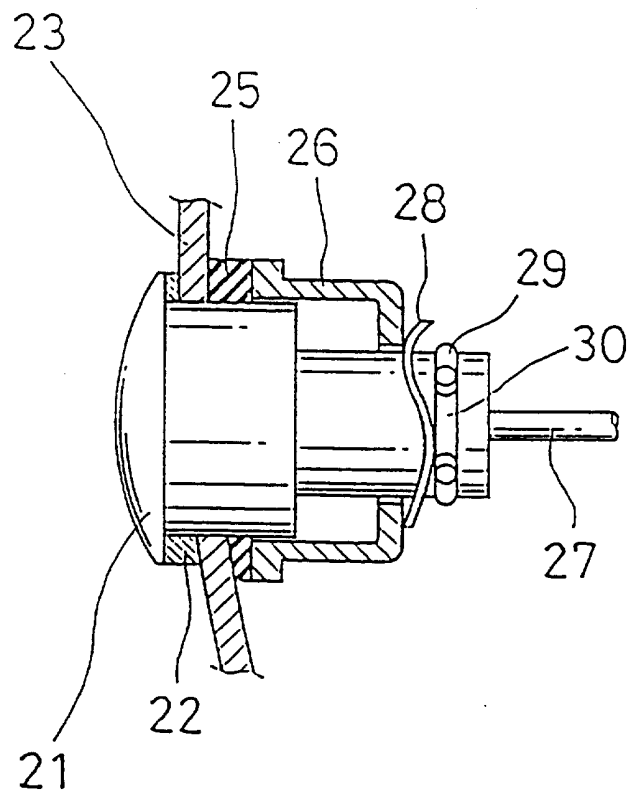


FIG. 7



MOUNTING ELECTRICAL COMPONENTS

The present invention relates to means for use in mounting components, particularly electrical components, e.g. mounting a sensor unit for detecting an obstacle on
5 a part of a vehicle, e.g. a bumper. In further aspects the invention relates to a mounting method and an assembly of a mounted component including mounting means according to the first aspect.

Conventionally, in mounting a sensor unit for
10 detecting obstacles on a bumper or the like of a vehicle, the sensor unit 21 as shown in Figs. 6 and 7 is inserted together with a sensor washer 22 into a fitting hole 24 of the bumper 23. The rear of the sensor unit 21 projects behind the bumper 23. A rubber washer 25, a
15 sensor cover 26, etc. are engaged with the rear of the sensor unit 21, with a sensor cable 27 extending through the rubber washer 25 and the sensor cover 26. Then, the parts are pressed by a wave washer 28, and a snap retainer 29 is engaged with and fixed to a stop groove 30
20 in the rear of the sensor unit 21. This involves rather awkward manipulation of parts, in a rather inaccessible location behind the bumper 23. Therefore, the mounting operation is very difficult and is not reliable.

A method of mounting a sensor unit for detecting an
25 obstacle to a vehicle of this type is disclosed in Japanese Unexamined Utility Model Publication SHO 57-46043, for example.

The present invention provides a means for mounting

a component having a rearwardly projecting portion with a mounting groove on a mounting plate having a mounting hole, by locating the component so that said projection portion projects rearwardly through said mounting hole, 5 engaging a clip with the projecting portion, and engaging a plurality of elastic claws with the mounting groove to fix the component in place.

The clip may have a plurality of elastic legs, which curve toward the outer periphery and engage along the 10 back shape of a mounting plate, and a plurality of elastic claws, which engage with the stop groove in the rear of the component.

An embodiment of the invention will now be described with reference to Figs. 1-5 of the accompanying drawings, 15 in which:

Fig. 1 is a cross section through an assembly which is one embodiment of the present invention, showing how a sensor unit is mounted;

Fig. 2 shows the clip of Fig. 1: Fig. 2(a) is a 20 side view, Fig. 2(b) is a plan view, and Fig. 2(c) is a cross section on line A-A of Fig. 2(b);

Figs. 3-5 are explanatory views showing how to fit the clip;

Fig. 6 is a perspective view showing a conventional 25 sensor unit mounting; and

Fig. 7 is a perspective view showing how the conventional sensor unit is mounted.

Fig. 1 is a cross section showing a sensor unit

mounted on a bumper.

The sensor unit is an electric component for use in detecting an obstacle to a vehicle. It engages with a fitting hole 4 of the bumper 2 together with a sensor washer 3, which is fitted to the surface shape of the mounting portion of a mounting plate such as the bumper 2.

The sensor unit 1 engages with the fitting hole 3 of the bumper 2 together with the sensor washer 3. The clip 5 is fitted to the rear of the sensor unit 1, which projects behind the bumper 2. The clip 5 has elastic legs 6, which curve toward the outer periphery at a lower portion (as viewed in Fig. 2a) of the cylindrical body of the clip 5, and elastically engage along the back shape of the bumper 2. The clip 5 also has elastic claws 7, which elastically engage with a mounting groove (or stop groove) 8 in the rear of the sensor unit 1 to fix the sensor unit 1 to the bumper 2.

Figs. 3-5 show how to fix the sensor unit 1 to the bumper 2 by using the clip 5. As shown in fig. 3, the projecting rear portion of the sensor unit 1 is passed through a sensor washer 3 and then through the fitting hole 4 of the bumper 2. Then, the clip 5 is engaged with the rear of the sensor unit 1, which projects behind the bumper 2, with a sensor lead 9 extending through the hollow portion of the clip 5.

As shown in Fig. 4, the clip 5 is further pushed toward the back of the bumper 2 so that the elastic claws

7 engage with the rear end of the sensor unit 1, curving toward the outer periphery.

As shown in Fig. 5, the clip is still further pushed toward the back of the bumper 2 so that the free ends of the elastic legs 6 of the clip 5 compressively contact with the back of the bumper 2. At the same time, the curves of the elastic legs 6 further curve toward the outer periphery along the back shape of the bumper 2. As a result, the elastic claws 7 become able to engage with the stop groove 8 in the rear of the sensor unit 1. The elastic legs 6 of the clip 5 curve in accordance with the distance between the back of the bumper 2 and the stop groove 8 of the sensor unit 1. Different legs deform elastically to different extents, if required, so that the legs can define a composite bumper-engaging surface. This need not be orthogonal to the clip's axis or even planar, but is adapted to the shape of the contacted region of the rear of the bumper (or any other member with which the clip may be used).

The present invention enables an electric apparatus such as a sensor unit, a switch or a lamp to be fixed without play to a mounting plate such as a bumper, since the elastic legs of the clip curve in accordance with the distance between the back of the mounting plate and the stop groove in the rear of the electric apparatus, and compressively contact to fix the electric apparatus. As a result, the invention does not need parts such as a rubber washer, a sensor cover, and even a wave washer.

The invention enables an electric apparatus to be fixed to a mounting plate by means of one clip, without needing mounting tools. The mounting operation is simple and secure. The invention can reduce the number of parts, 5 the number of operation steps, and the costs.

CLAIMS

1. A clip for mounting to a plate portion having a mounting aperture a component having a rearwardly projecting portion capable of projecting through said mounting aperture, said rearwardly projecting portion having a groove; said clip comprising a tubular body having a first axial end portion and a second axial end portion, said first axial end portion comprising a plurality of elastic claws; such that said clip can be passed over the projecting portion of a said component when it is projecting through a said mounting aperture, second axial end portion first, and said elastic claws can snap-engage in said groove.

2. A clip according to claim 1 wherein said second axial end portion comprises a plurality of elastic legs which are resiliently deformable by axial force, whereby if said clip is passed over said project portion until said legs contact the rear of said plate portion, continual urging of the clip in the same sense causes resilient deformation of said legs.

3. A clip substantially as herein described with reference to and as illustrated in Figs. 1-5 of the accompanying drawings.

4. An assembly of a clip according to any preceding claim with a said plate portion and a said component.

5. An assembly according to claim 4 wherein the clip is according to claim 2, and the dimensions are such

that when the clip is passed over the projecting portion, it abuts the plate portion and deformation of the legs commences, continued urging of the clip with continued formation of the legs enabling the claws to snap-engage
5 in the groove.

6. An assembly of clip, plate portion and component substantially as herein described with reference to and as illustrated in Figs. 1-5 of the accompanying drawings.

10 7. A method of mounting a component on a plate portion having a mounting aperture, said component having a rearwardly projecting portion having a groove, comprising locating said component with its projecting portion projecting through said aperture and engaging a
15 clip according to any of claims 1-3 therewith.

8. Structure for mounting an electric apparatus on a mounting plate, characterized by inserting said electric apparatus into a fitting hole of said mounting plate, engaging a clip with the rear of said electric
20 apparatus, which projects behind said mounting plate, and engaging a plurality of elastic claws with a stop groove in the rear of said electric apparatus to fix said electric apparatus.

9. Structure for mounting an electric apparatus
25 according to claim 8, and characterized in that said clip has a plurality of elastic legs, which curve toward the outer periphery and engage along the back shape of a mounting plate, and a plurality of elastic claws, which

engage with the stop groove in the rear of said electric apparatus.

Application No: GB 9607030.5
Claims searched: All

Examiner: Philip Silvie
Date of search: 25 June 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK Cl (Ed.O): E2A (AC SJ, ACS R)
Int Cl (Ed.6): B60R (19/48); F16B (19/00, 21/16, 21/18)
Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2 167 907 A (DIEHL) see figs 1,2	1,2,4,5,7-9
X	GB 1 307 066 A (F.T.) see fig 3	1,2,4,5,7-9
X	GB 1 235 099 A (D.B.A.) see fig 2	1,2,4,5,7-9
X	GB 0 911 832 A (F.T.) see fig 1	1,4,5,7,8
X	GB 0 445 918 A (FORD) see fig 2	1,2,4,5,7-9
X	US 4 796 612 A (REESE) see fig 1	1,4,5,8
X	US 4 256 010 A (PETRIE) see fig 2	1,2,4,5,8,9

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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