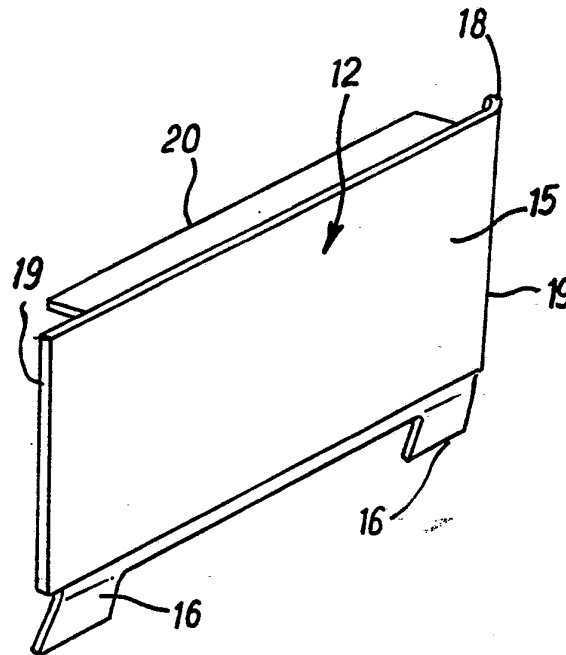


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: VEHICLE AIR-BAG COVER PLATE



## (57) Abstract

A cover (12) for a housing for an air-bag impact protection system for a vehicle comprises a plate (15) made of a deformable metal or synthetic plastic material. The plate (15) may be decorated directly or by an additional layer such as a veneer, the deformability of which is matched to the basic plate. On operation of the system the inflating air bag pushes the cover upwardly deforming it and a retention bracket (20). The deformed material is such that the cover is maintained in the deformed condition thus inhibiting interference with the inflated bag.

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VEHICLE AIR-BAG COVER PLATE

The present invention relates to a cover plate for a housing for an air bag impact protection system for a vehicle and to a system and vehicle incorporating such a plate.

Air-bag impact protection systems for vehicles are known. Examples of known systems are described in the specifications of U.S. Patent No. 4,770,439 and U.K. Patent Application Nos. 2,239,220 and 2,239,221. In the system described in the specification of the latter application, the air-bag is housed in a deflated condition in a cavity. The cavity is closed off by a cover comprising side walls and a canopy. The cover comprises a synthetic resin, a multi-piece reinforcing network member and plastic deformation members. The cover has a tear-line along which it cleaves into two halves when the air-bag is operated. The two halves deform out of the way of the bag so as not to inhibit inflation of the bag. The purpose of the plastic deformation members is to maintain the two halves of the cover in the deformed state so that they do not interfere with the bag after inflation. This is a complicated and expensive construction.

According to one aspect of the present invention,

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there is provided a cover plate for a housing for an air-bag impact protection system for a vehicle made of a material capable of deforming under the action of the inflating bag and remaining in a deformed position so as not to interfere with the operation of the bag.

According to another aspect of the present invention, there is provided a cover for a housing for an air-bag impact protection system for a vehicle capable of deforming under the action of an inflating bag and remaining in the deformed position so as not to interfere with the operation of the bag comprising a deformable substrate and a superposed decorative deformable layer.

In a preferred embodiment of the invention, the cover is pressed from a metal or moulded from synthetic plastics material. The metal may be aluminium. A suitable aluminium is 1200 Grade 0 to BS 1470 with a tensile strength in the range 70 to 105/Nmm<sup>2</sup> and a minimum percentage elongation of 25%. The cover may be retained at one edge to enable it to pivot away on deployment of the air-bag. Edge flanges may be provided to stiffen the cover. A retention bracket may be attached at the cover by any suitable means such as, for example, welding. The retention bracket may itself be made of a deformable material so that it deforms with the cover on deployment of the bag. Decoration may be

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provided on the cover either directly or by providing a superposed layer. The superposed layer may be a natural or real wood veneer.

In order that the invention may be more clearly understood, one embodiment thereof will now be described by way of example with reference to the accompanying drawings, in which:-

Figure 1a shows a diagrammatic cross sectional partial view of an air-bag impact protection system for vehicle occupants,

Figure 1b is a diagrammatic view of the system of Figure 1a showing the air-bag inflated,

Figure 2 is a perspective view of a cover plate forming part of the system of Figures 1a and 1b, and

Figure 3 is a more detailed sectional view of the cover plate showing the plate in position before actuation of the air-bag.

Referring to Figures 1a and 1b of the drawings, a typical instrument panel section for a vehicle is generally and diagrammatically shown. The front facia of the panel section is indicated generally by the reference

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numeral 8 and the top below the base of the windscreen 7 by the reference numeral 9. The air-bag module, which is of conventional construction and is indicated by the reference numeral 10, is housed in a cavity within the instrument panel section. The front of this cavity is closed off by a cover 12 in the form of a plate or flap. As this cover will be clearly visible to occupants of the passenger compartment, in the case of an automobile, this cover will usually be of pleasing appearance. It may, for example, be veneered.

The cover 12 is made of a deformable material. This may be a metal, for example aluminium, or a synthetic plastics material. The deformability characteristics of the material are such that the cover should be able to adopt and maintain a deformed shape and position as shown in Figure 1b so that it does not interfere with the inflation of the bag 10A or the inflated bag. Where the cover is provided with a decorative appearance, such as a veneer as mentioned above, the deformability of the decoration must be matched to that of the basic material of the cover. A veneer, for example, must possess sufficient rigidity to stick to the basic cover but sufficient flexibility to remain coherent with the cover in the event that the air-bag is deployed.

The cover 12, which may be made from a single

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pressing is shown in more detail in Figures 2 and 3 of the drawings. Referring particularly to Figure 2, the cover 12 comprises a plate 15 having downwardly dependent lugs 16. These lugs form part of a frictional restraint at the lower end 14 of the cover. The lateral edges 15 of the plate are bent over at right angles to the plane of the plate to form flanges 19 which provide stiffening for the plate. A right angled retention bracket 20 is attached to the upper edge of the plate 15. Attachment may be by welding or any other suitable means. The material of the retention bracket should be such as to allow deformation in addition to deformation of the plate on operation of the air-bag.

On operation of the air-bag, usually under collision conditions of the vehicle in which the air-bag is disposed, the bag inflates out of its module 10. On inflation, it pushes the cover 12 upwardly against the upper part 11 of the instrument panel section deforming the cover and perhaps also the retention bracket attached to the cover about this part of the panel section as shown in Figure 1b. The material of the cover, whether incorporating a decorative surface member such as a wooden veneer or not, maintains the deformed position shown in Figure 1b and therefore does not interfere with the inflated bag. The simplicity of the arrangement facilitates the prediction and provision of predetermined

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deformation characteristics than would be the case with a much more complex structure. This single plate arrangement also facilitates the provision of decorative surface effects thereon whether directly or by the addition of a further layer such as a wooden veneer as described above.

It will be appreciated that the above arrangement has been described by way of example only and that many variations are possible without departing from the scope of the invention. For example, it is within the scope of the invention to provide a real or synthetic wooden veneer or other decorative effect on a cover for an air-bag system irrespective of the constructional characteristics of the basic cover itself.

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CLAIMS

1. A cover for a housing for an air-bag impact protection system for a vehicle capable of deforming under the action of an inflating bag and remaining in the deformed position so as not to interfere with the operation of the bag comprising a deformable substrate (15) and a superposed decorative deformable layer.
2. A cover as claimed in claim 1 in which the substrate is made from a metal.
3. A cover as claimed in claim 1, in which the substrate is made from synthetic plastics material.
4. A cover as claimed in claim 1, 2 or 3, having edge flanges (19) for stiffening.
5. A cover as claimed in claim 1, 2, 3 or 4, which is retained at one edge to enable it to pivot away on operation of the bag.
6. A cover as claimed in claim 5, comprising a retention bracket (20) connected thereto.
7. A cover as claimed in claim 6, in which the retention bracket (20) is made of a deformable material.

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8. A cover plate for a housing for an air-bag impact protection system for a vehicle made of a material capable of deforming under the action of the inflating bag and remaining in a deformed position so as not to interfere with the operation of the bag.

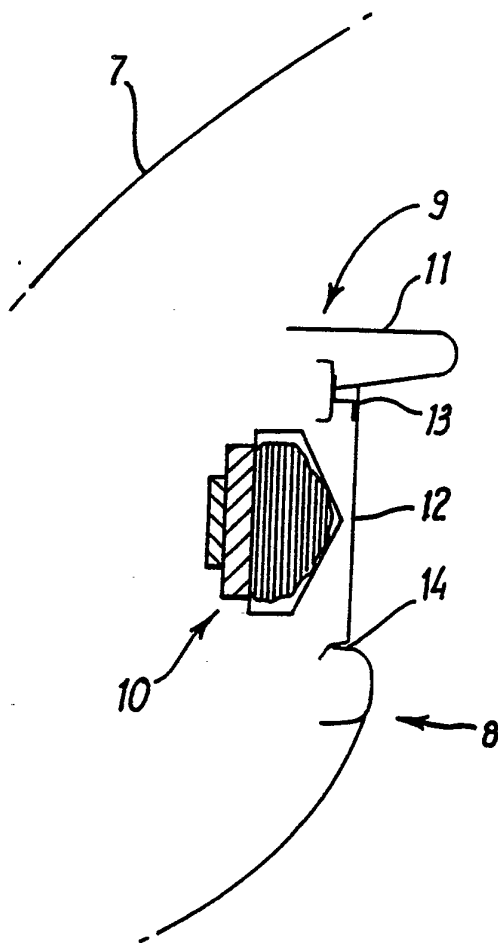
9. A cover plate as claimed in claim 8, in which decoration is provided on the cover (12).

10. A cover plate as claimed in claim 8, in which the decoration is applied directly.

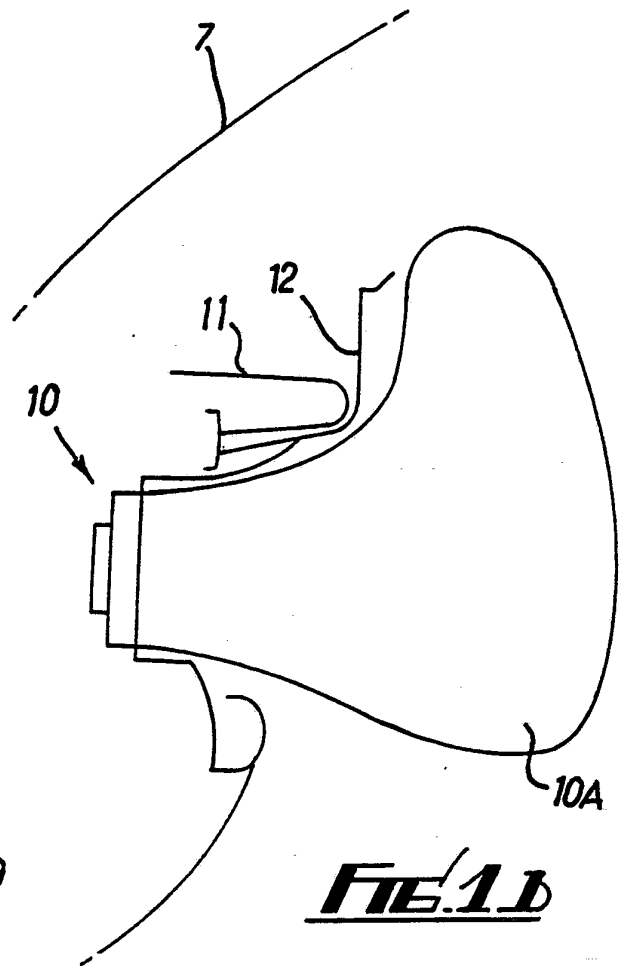
11. An air-bag protection system having a cover as claimed in any of claims 1 to 7.

12. An air-bag protection system having a cover plate as claimed in claim 8, 9 or 10.

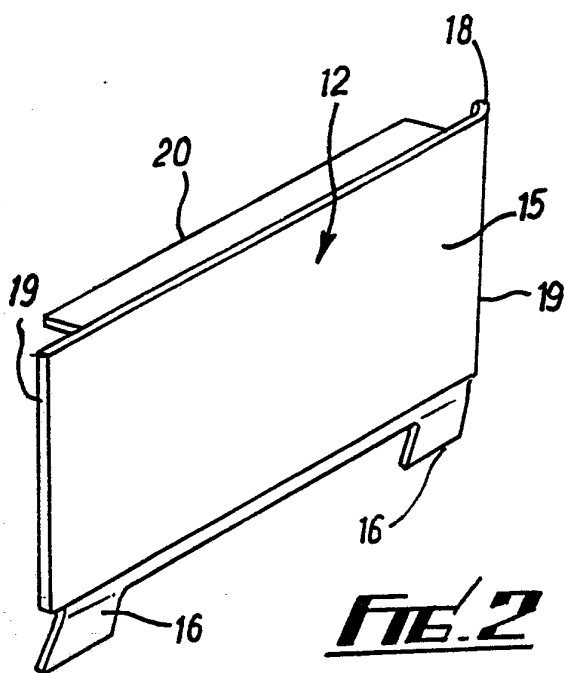
13. A vehicle having an air-bag protection system as claimed in claim 11 or 12.



**FIG. 1A**

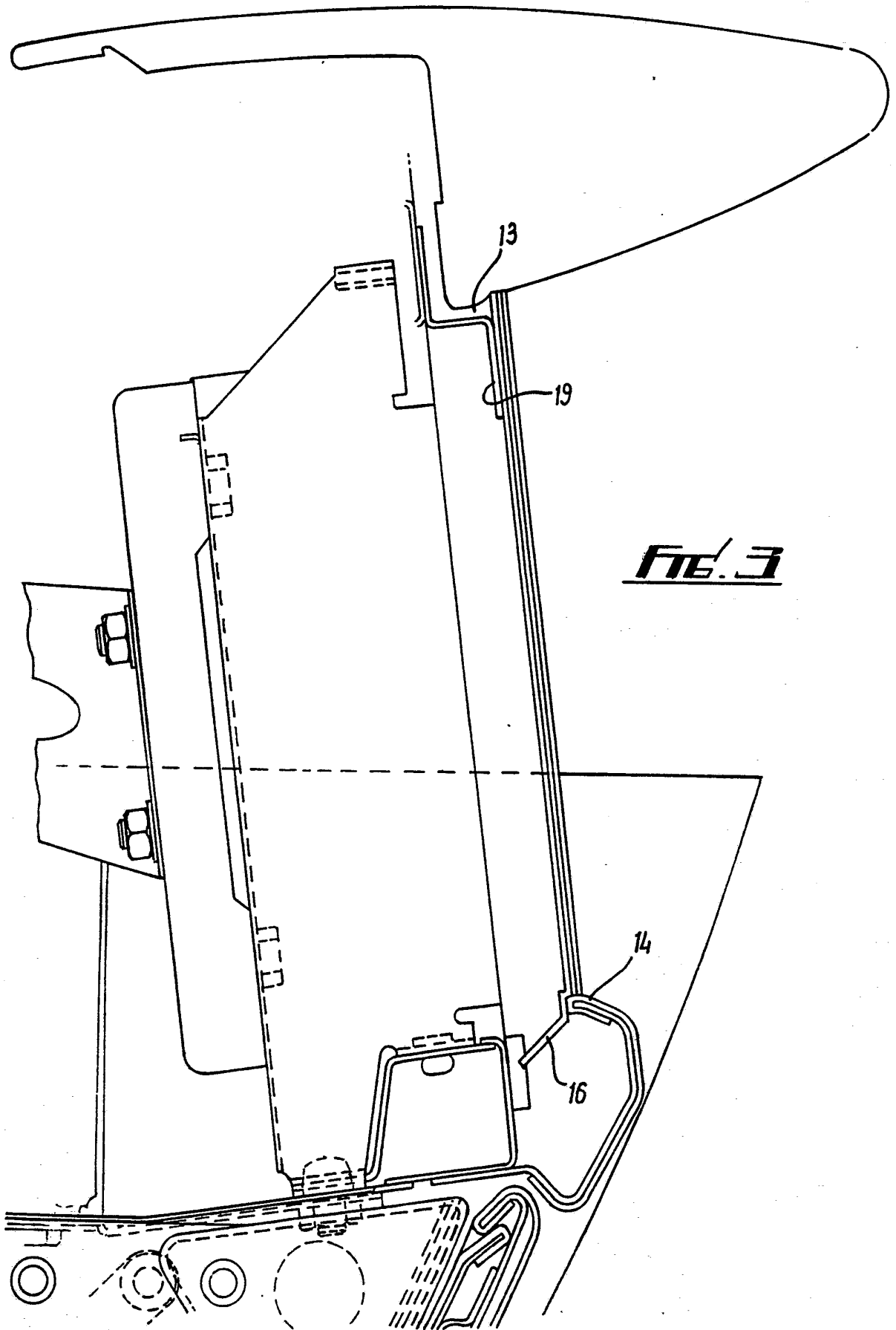


**FIG. 1B**



**FIG. 2**

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***FIG. 3***

## INTERNATIONAL SEARCH REPORT

international application No.

PCT/GB 92/01918

## A. CLASSIFICATION OF SUBJECT MATTER

IPC5: B60R 21/20

According to International Patent Classification (IPC) or to both national classification and IPC

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