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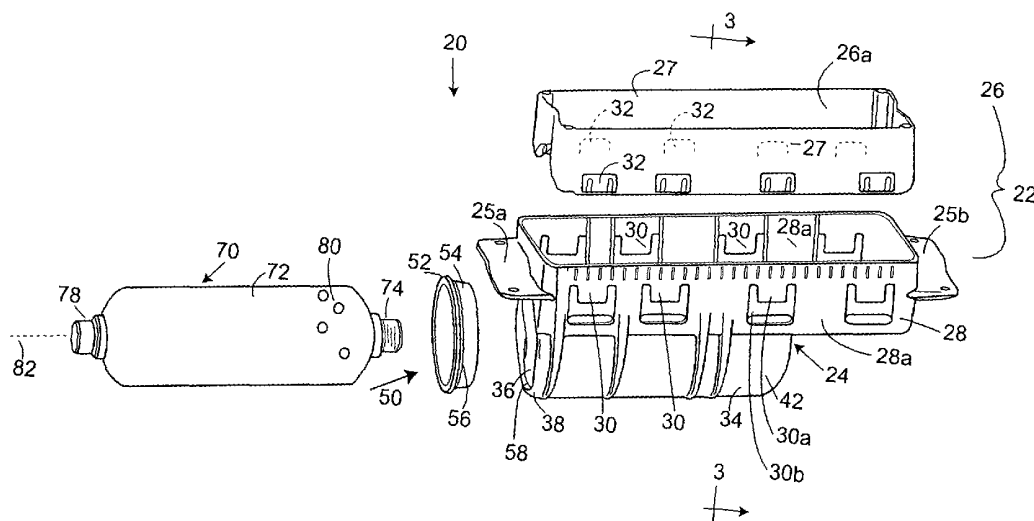
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(54) Title: AIRBAG MODULE



(57) Abstract: An airbag module (20) including: an airbag (90); a housing (22) formed of loosely interlocking upper (26) and lower (24) housing members, the airbag linked to at least one of the latching features (32) of the upper housing member to provide an insulating barrier between the members.



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

AIRBAG MODULE

The present invention relates to an airbag module and in particular to a passenger side airbag module having a multi-part housing, airbag
5 and inflator.

The present invention comprises an airbag module comprising: an airbag; a housing formed of loosely interlocking upper and lower housing members, the airbag linked to at least one of interlocking portions of the upper housing member to provide an insulating barrier between the
10 members. The lower housing member includes flexible tabs and the upper housing member including complementary flexible ear or plate-like portions to interlock with each tab.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is an assembly view of an airbag module incorporating the invention.

5 FIGURE 2 is a cross-sectional view of the airbag module.

FIGURE 3 is a cross-sectional view showing first and second housing members snap fit together clamping an airbag therebetween.

FIGURE 4 is another cross-sectional view showing an integral spring-like bridge formed in the upper housing member.

10 FIGURE 5 is a fragmentary isometric view of an airbag.

DETAILED DESCRIPTION OF THE INVENTION

FIGURES 1 - 3 show an airbag module 20 comprising a multi-piece housing 22, including a lower housing member 24 and an upper housing member 26. Preferably, the housing members 24, 26 are made of cast magnesium. The housing includes mounting flanges 25a, 25b so that the module can be mounted to a vehicle, typically near the instrument panel. The lower housing member 24 includes a hollow, upper rectangular portion 28 with a plurality of integrally formed first latching features 30 such as resilient tabs, which snap fit with complementary mating latching features 32 of the upper housing member 26. The illustrated embodiment utilizes four such latching features 30, 32 on each side of the lower and upper housing members. The upper housing member is also hollow and the ear-shaped latching features extend from sidewalls 27 thereof. In FIGURES 1 - 3, the lower housing member includes a hollow cylindrical inflator compartment 34 having an opening 36 in a first end 38 and an opening 40 in opposing end 42. The first end 38 defines a shoulder 44. In FIGURE 1, the latching features 30 also include an opening 30b below each tab 30a. When the upper housing member 26 has been snapped in place in the lower housing member, the latching features 32 will be positioned loosely in a respective opening 30b. The airbag 90 and lining 98, which is received about each of the latching features 32, is of sufficient thickness to prevent the upper housing member from rattling in the lower housing member 24. Once snapped into place the tabs prevent the upper housing member from being moved out from the lower housing member.

FIGURE 4 is another cross-sectional view of the mated housing 22. A bridge 120 is integrally formed in the upper housing member 26. The bridge is resilient and generates a reaction force to maintain the sides of the housing 22 in place and avoid bell-mouthing of the housing as the airbag inflates.

A plastic, such as PPA, sleeve 50 is received within an opening 36. The sleeve is a hollow structure comprising an outer lip 52 and an extending tapered ring 54. Located at the underside of the lip 52 on the outer wall of the ring, is an annular groove 56, which snaps upon the annular wall 58, formed about the opening 36. The module 20 also includes an inflator 70 having a cylindrical body 72 with a threaded fastener or stud 74 at one end. While not shown, the body is hollow and includes means for producing or releasing inflation gas using one of the many available technologies. FIGURE 2 shows a stud 74 received through an opening 40 and secured thereto by a nut 76. The other end of the inflator includes an electrical connector 78 for connection to a control unit. In FIGURE 1 the inflator includes a plurality of exit ports 80 to communicate gas from the inflator 70 through the housing 22 to an airbag 90, as also shown in FIGURE 3.

FIGURE 3 is a cross-sectional view taken perpendicular to an axis 82 of the module 20. The latching features 30, 32 are clearly shown snapped together. As can also be seen, an airbag 90 is clamped between the peripheral outer edge of housing member 26 and the inner peripheral edge of upper housing portion 28. The airbag 90 includes a neck 92, which is clamped between the housing members 24, actually the upper housing portion 28, 26. Situated about the neck is a plurality of openings 96, each of which is received about a corresponding latching feature 32 of the upper housing member 26. The ears 32a,b of each latching feature assist in holding the airbag to the housing. Each ear includes a root 31 and plate-like extension 31a. As illustrated, the airbag is shown folded and located within the open space 26a formed in the upper housing member 26. The airbag is maintained in this folded condition by a thin lining 98 of Tyvek[®] or other material, which has a preferred tear region such as defined by a line of perforations (not shown). The lining also includes openings 100 enabling the lining to be secured about the latching features 32. It is envisioned that the airbag is

first secured to the upper housing member and then the upper housing member is snapped into the lower housing member.

In FIGURES 1 and 2, the sleeve 50 is snapped into the lower housing member 24 and then the inflator is slid into the sleeve 50 and into
5 the housing and the fastener 74 secured in the housing. The body of the inflator is loosely received into the cylindrical interior wall of the sleeve. It has been shown that it is not necessary to effect a fluid tight seal between the sleeve 50 and the inflator 70, as most if not all of the inflation gas produced by the inflator 70 will exit the inflator and flow through the hollow
10 mating portions 24, 26 of the housing 22 into the airbag 90. In the preferred embodiment, the inside diameter of the sleeve is about 60.6 mm and the outside diameter of the inflator is about 60 mm.

FIGURE 5 shows the neck portion 92 of the airbag. The openings 96 in each side of the neck are clearly visible. Additionally, if the bridge
15 120 is used each side of the neck includes a slot 122 to permit the neck to be placed in the upper member 26 of the housing and about the bridge 120. One of the slots 122 is shown in FIGURE 2.

Claims:

1. An airbag module (20) comprising:
an airbag (90);
5 a housing (22) formed of loosely interlocking upper (26) and lower (24) housing members, the airbag being linked to at least one of the interlocking portions to provide an insulating barrier between the members.
- 10 2. The airbag module (20) defined in Claim 1 wherein the lower housing member is adapted to receive an inflator for providing inflation gas to an airbag that is mounted remote from the inflator.
- 15 3. The airbag module (20) defined in Claim 1 wherein the upper housing member (26) includes an arcuate, resilient bridge (120) linking opposing sides of the upper housing member.
- 20 4. The airbag module (20) defined in Claim 1 wherein the lower housing member (24) has a plurality of first latching features (30) on opposing sides and the upper housing member (26) includes a plurality of complementary mating latching features (32).
- 25 5. The airbag module (20) defined in Claim 4 wherein each first latching feature (30) includes an integrally formed flexible tab (30a) attached only on one of its sides to adjacent parts of the lower housing member (24).
- 30 6. The airbag module (20) defined in Claim 4 wherein the latching features of the upper housing member (26) include a root portion (31) extending from an adjacent side of the upper housing member and a plate-like member (31a) extending from the root portion.

7. The airbag module (20) defined in Claim 6 wherein once fitted together each tab of the lower housing member (24) fits between a side of the upper housing member (26) and a corresponding plate-like member (31a).

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8. The airbag module (20) defined in Claim 7 wherein the airbag has a plurality of openings (96) in a neck portion thereof and each slot or opening is received about a corresponding plate-like member (31a).

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9. The airbag module (20) defined in Claim 1 wherein the lower housing member (26) includes a hollow cylindrically shaped inflator compartment (34) with an opening (36) at one end of the compartment.

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10. The airbag module (20) defined in Claim 3 wherein the airbag (90) has opposing slots (122) in a neck portion (92) thereof enabling the airbag to be placed in the upper housing member (26) and about the bridge (120).

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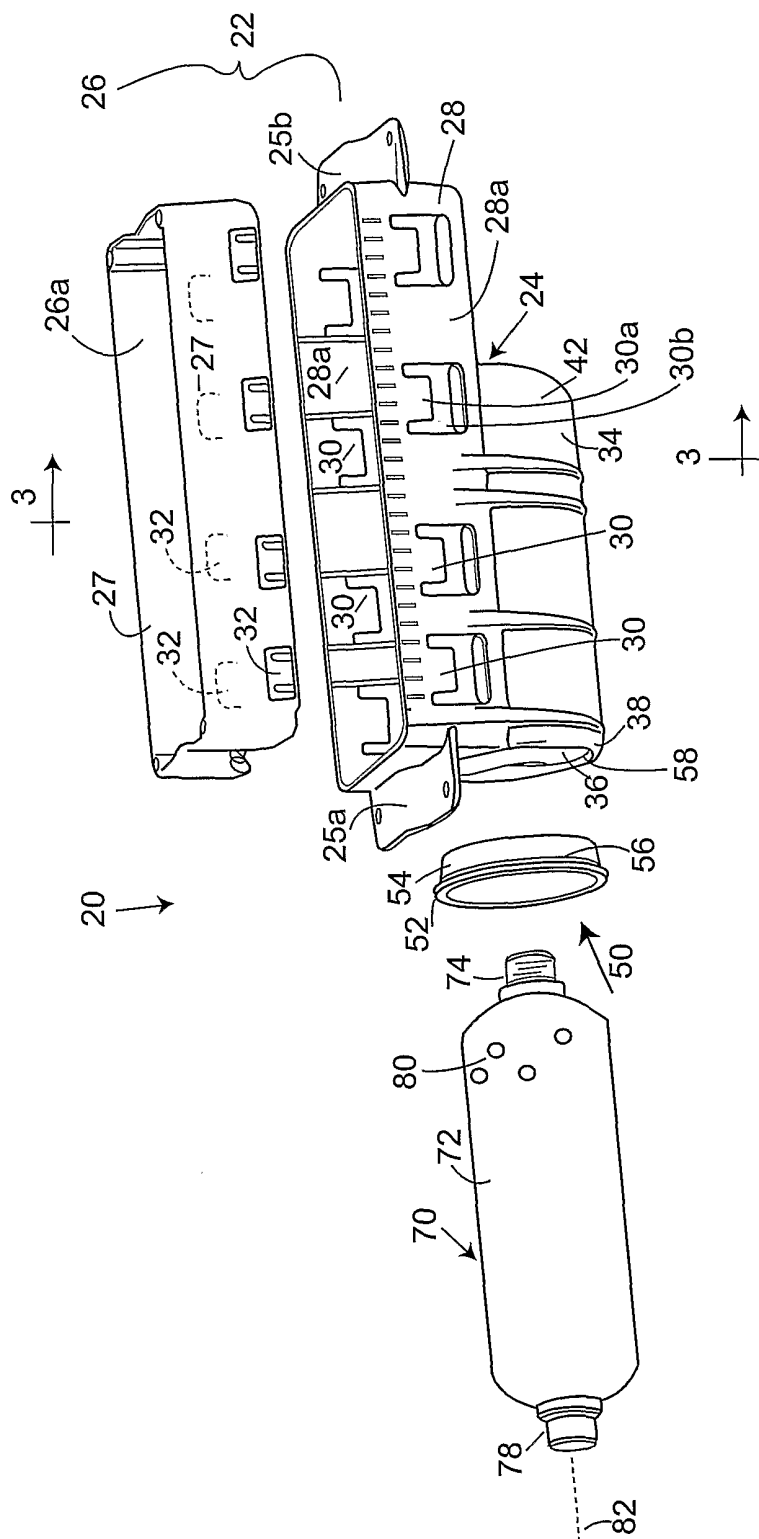


Fig. 1

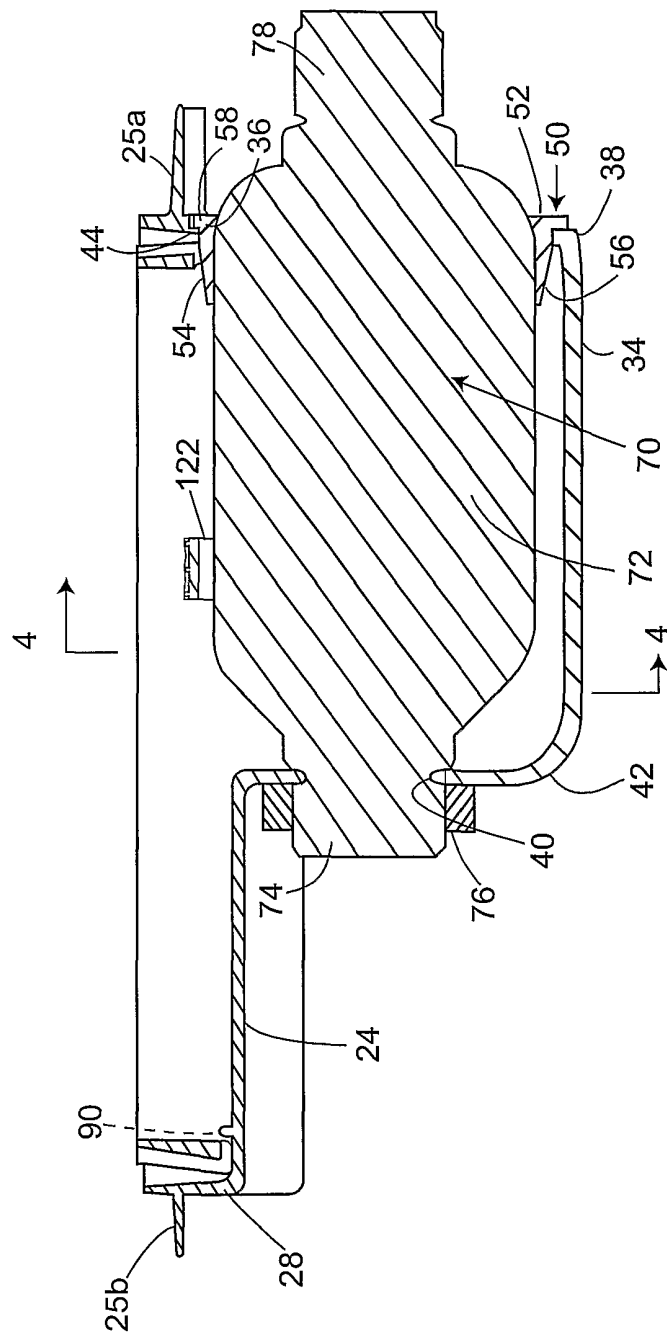


Fig. 2

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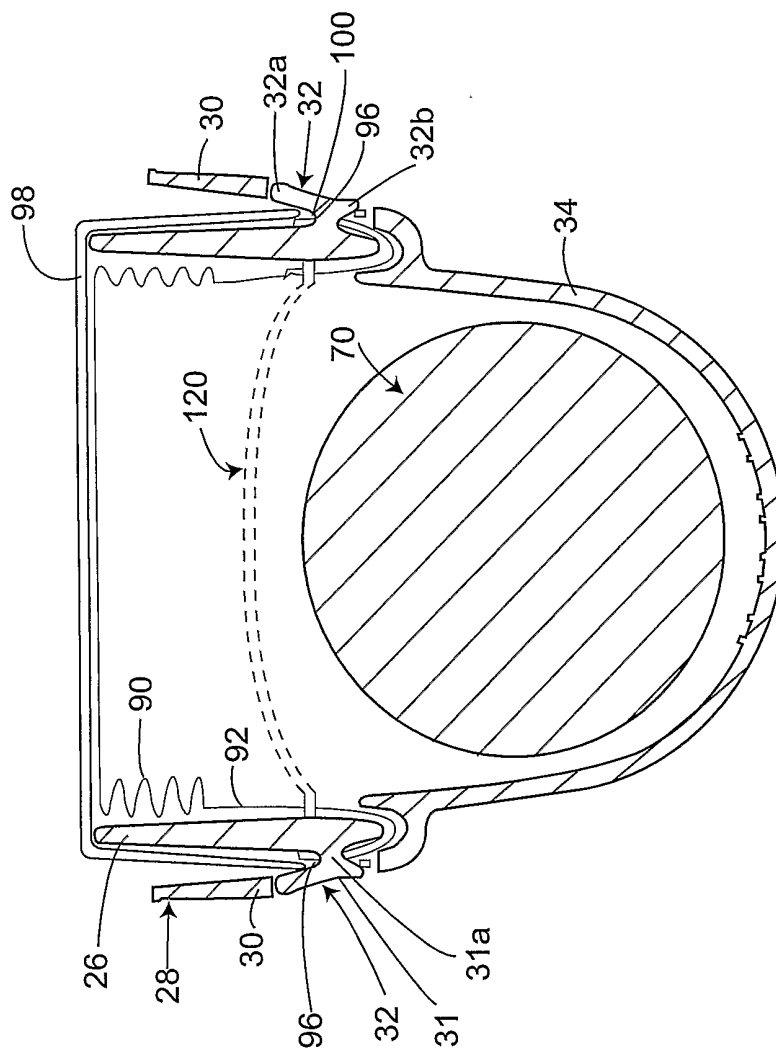


Fig. 3

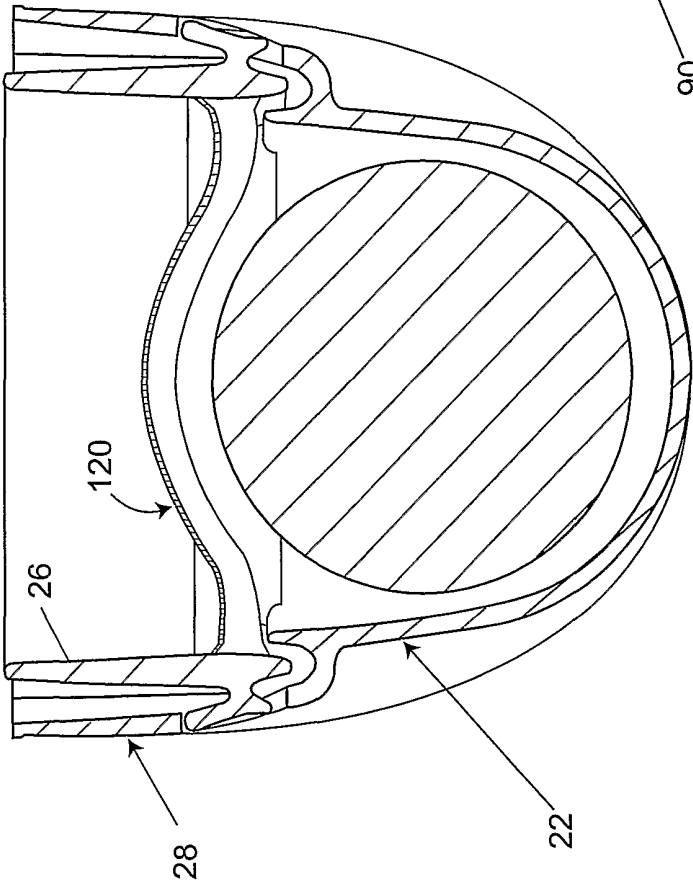


Fig. 4

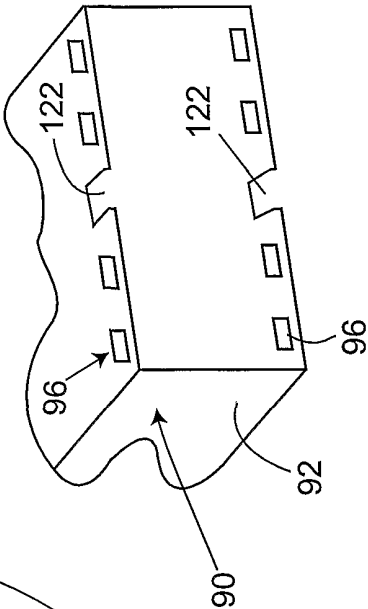


Fig. 5