

[54] TONGUE FOR INFLATABAND

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[22] Filed: **Feb. 13, 1974**

[21] Appl. No.: **442,022**

[52] U.S. Cl. **280/150 AB; 9/316; 9/319; 137/231; 280/150 SB**

[51] Int. Cl.² **B60R 21/08**

[58] Field of Search **280/150 AB, 150 SB; 9/316, 9/319, 321, 329, 340; 137/231, 223; 297/386**

[56] **References Cited**

UNITED STATES PATENTS

2,084,636	6/1937	Fromm	9/316
2,165,300	7/1939	Peterson	9/316
3,608,962	9/1971	Knecht	297/385
3,706,463	12/1972	Lipkin	280/150 AB
3,791,670	2/1974	Lucore	280/150 AB

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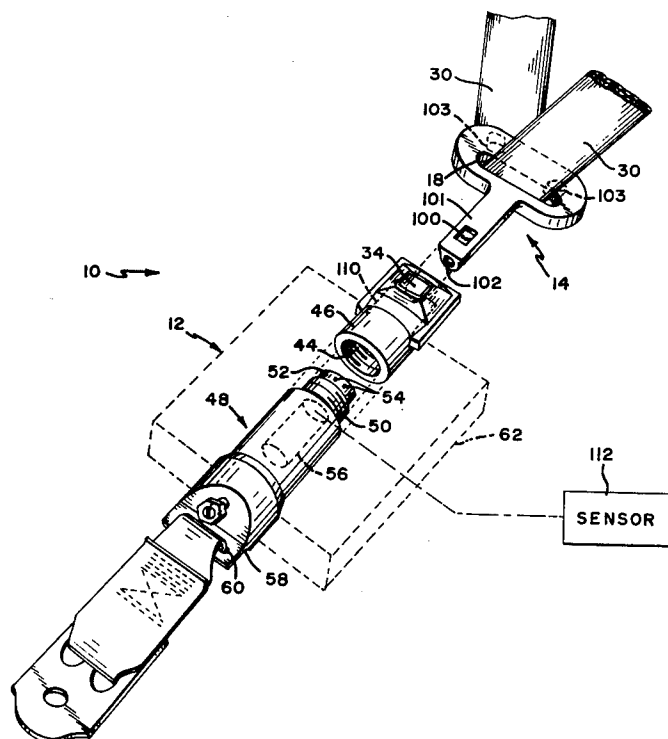
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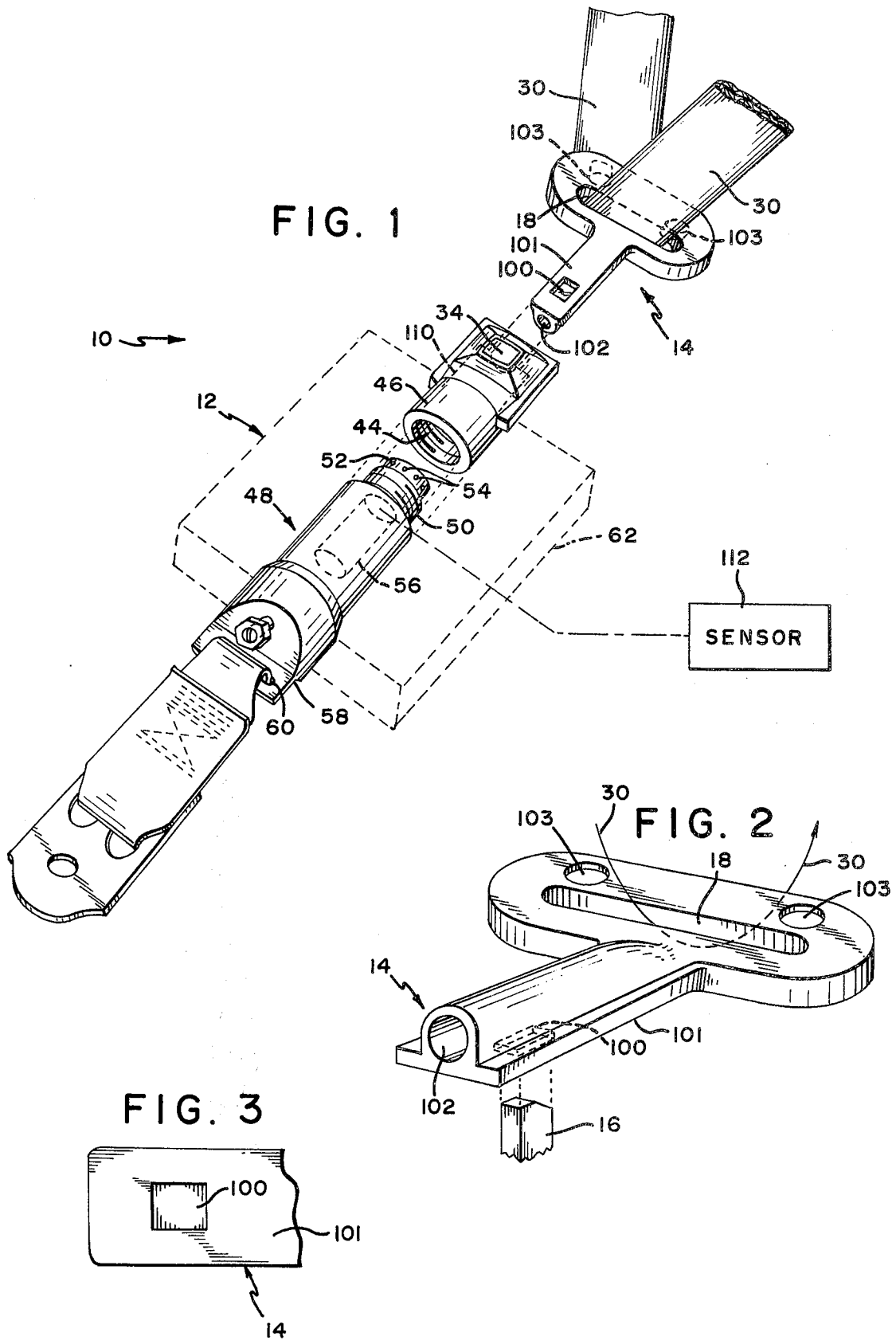
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[57] **ABSTRACT**

A seat belt buckle assembly is provided which comprises a hollow tongue portion; a buckle portion adapted to be lockably engaged with the tongue portion; the tongue portion being connected to an inflatable seat band; chamber means provided in the buckle portion; the hollow tongue portion communicating with the inflatable seat band; the hollow tongue portion communicating with the chamber means when the tongue and buckle portions are latched; and inflating means residing within or communicating with said chamber means; said inflating means including a gas source whereby the inflating means and the inflatable seat band are interconnected through the chamber means and the hollow tongue when the hollow tongue and buckle portions are latched so as to allow gas released from the gas source to pass through the chamber means and said hollow tongue and inflate the inflatable seat band.

1 Claim, 3 Drawing Figures





TONGUE FOR INFLATABAND

FIELD OF THE INVENTION

This invention relates to the hollow tongue of an inflatable seat band tongue and buckle combination adapted to be used to inflate the seat band restraint.

DESCRIPTION OF THE PRIOR ART

Inflatable restraints have been proposed to provide more protection for occupants of vehicles than conventional seat belts. U.S. Pat. applications Ser. No. 291,107 filed Sept. 21, 1972 (now U.S. Pat. No. 3,791,670) and Ser. No. 290,917, filed Sept. 21, 1972 (now U.S. Pat. No. 3,841,654) propose a buckle tongue combination and propose to include a source of gas within an inflatable section of a tubular restraint or attached to an inflatable section in order to inflate such section. As an example, it is proposed in said applications to include a gas cartridge within a section of the restraint adjacent to an attached tongue portion of a seat belt buckle assembly. To provide for automatic retraction of such a restraint requires a retractor having a powerful spring as well as having a large area for storing the seat belt. Where a hood is used with the retracted restraint, room must be provided for the complicated tongue mechanism.

A combination inflatable seat belt-air bag device has been proposed in U.S. Pat. No. 3,682,498 to Rutzki. Such a device also may include a gas cartridge provided within the tubular seat belt. Similar problems of retracting a seat belt including an interiorly located gas cartridge and the presence of electrical wiring within the seat belt are attendant with the design of that patent.

SUMMARY OF THE INVENTION

In accordance with this invention, inflating means for an inflatable seat band restraint in the form of a hollow tongue is provided to communicate with the buckle portion of an inflataband buckle assembly. The buckle portion is adapted to communicate inflating gas through the tongue to the inflatable band connected to the tongue, and the tongue is provided with recess means for receiving the latch of the buckle. The buckle is normally mounted to the floor and the tongue connected to the restraint, which may be retracted to a position on a reel on the vehicle floor when not in use. The tongue is made hollow so as to communicate the inflating gas through a central passageway thereof from the buckle from one end thereof to the other and to then disperse the inflating gas into the inflatable band from discharge ports at the end opposite to the end of the tongue latched to the buckle.

More particularly, in accordance with this invention, seat band buckle assembly is provided which comprises a hollow tongue portion, a buckle portion adapted to latchably engage with the tongue portion; the tongue portion being connected to an inflatable band; chamber means provided in the buckle portion; the hollow tongue in communication with the inflatable band through discharge ports on the end of the tongue opposite to the end latching the tongue to the buckle; the tongue itself communicating gas through its hollow central passageway; the gas being distributed from the passageway through the discharge ports directly into the inflatable band; inflating means communicating with the chamber means as a result of either being

stored or generated in the chamber or communicating therewith; inflating means including a gas source; whereby the inflating means and the inflatable band are interconnected through the chamber means and the hollow tongue when the tongue and buckle are lockably engaged.

In an embodiment of Ser. No. 291,107 communication from the buckle to the inflatable band is carried out through conduits employed in association with the tongue. Besides being more cumbersome and expensive, such an arrangement is disadvantageous as compared to the use of a hollow tongue since separate paths for the gas in addition to the tongue must be provided for and maintained, and problems of retraction of the band, and storage of the tongue when the band is retracted, result. According to applicant's invention, the tongue itself is not only employed to latch the inflatable band to the buckle, but to provide the passageway of gas from the buckle and source to the inflatable band.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 shows in an exploded view, the restraint assembly of this invention.

FIG. 2 shows a detail of the hollow tongue.

FIG. 3 shows a further detail of the hollow tongue.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the drawings, there is shown a seat band restraint assembly 10 which includes a buckle portion 12 and a tongue portion 14 which are adapted to latchably engage with each other. Latching structure of buckle 12 to tongue 14 may be of any suitable conventional design; for example, the buckle may have a locking dog (shown schematically at 16 in FIG. 2) which fits within a recess 100 in the underside 101 of the tongue (see FIGS. 2 and 3). The tongue is shown inverted in FIG. 2 from the position in FIG. 1 in order to better show the gas communicating structure. The locking dog 16 of the buckle 12 is adapted to extend into the recess 100 in the hollow tongue portion when the tongue and buckle portions are interfitted into latching engagement. Buckle portion 12 is provided with suitable releasing mechanism which releases tongue portion 14 therefrom when it is desired to unbuckle the assembly. The releasing mechanism may be controlled through a pushbutton 34 or other means as is well known in the art.

Hollow tongue portion 14 is adapted to be, and in use is, connected through suitable means (such as slot 18) to an inflatable seat band of the type described in the aforementioned U.S. patent applications, the disclosures of which are specifically incorporated herein. The slot 18 is located between the central passageway 102 and slots 103, as will be described hereinafter. Such an inflatable seat band generally includes an inflatable section which is in the form of a tube and normally maintained in an uninflated, folded condition by means of frangible fastening means which are adapted to break upon inflation of the inflatable section. As disclosed in said applications, preferably the inflatable section is formed from a tubular sleeve of seat belt webbing material.

Hollow tongue portion 14 is hollow in a central passageway 102 which is adapted to communicate, preferably by a mechanical seal, with chamber means provided in buckle 12. The passageway 102 runs through the tongue 14 from the point of communication with

the buckle near latch recess 100 to the opposite end where a plurality of discharge ports 103 communicate the passageway in the hollow tongue with the inflatable band 30. The forward end of the passageway 102 of the tongue near the recess 100 interfits with chamber means of the buckle, to be described hereinafter, which is in location or are in communication with an inflating gas source.

The chamber means 110 of the buckle is in the embodiment shown in communication with a gas discharge chamber 44 located in rearward portion 46 of buckle portion 12 which in this embodiment is adapted to receive inflating means 48. For this purpose, rearward portion 46 may be provided with internal threads or the equivalent.

Inflating means 48 is provided with a projecting portion 50 which is threaded or otherwise adapted to be connected to rearward portion 46. The connection between projecting portion 50 and rearward portion 46 is desirably of high strength since buckle portion 12 is mounted to the vehicle through inflating means 48 as is described below. Forward end 52 of projecting portion 50 may be provided with a series of apertures 54 which communicate with rear chamber 44 when projecting portion 50 and rearward portion 46 are connected.

Inflating means 48 includes a gas source, such as gas cartridge 56 which may be of the stored gas type, the generated gas type or a hybrid type (combination of stored and generated gas). Such gas sources are known in the art and have been suggested for use with proposed air bag restraint systems; accordingly, they are not specifically described herein.

Inflating means 48 is designed to release gas into rear chamber 44 upon the occurrence of a preselected condition of the vehicle, such as a collision or rapid deceleration. For this purpose, inflating means 48 may include a valve or the like which is opened in response to a signal from a sensing means 112 which senses such preselected condition. When the valve is opened, gas from cartridge 56 is introduced into rear chamber 44 through apertures 54. If a stored gas source is utilized, pressurized gas is thus released into rear chamber 44. If a generated gas source is utilized, generated gas is thus introduced into rear chamber 44 and similarly if a hybrid gas source is used, both generated and pressurized gas is so introduced. When the gas source is of the generated type (that is, is generated by a pyrotechnic device, etc.), suitable electrical connections are provided between the sensing means and a detonating device for the pyrotechnic.

The buckle assembly 10 may be mounted in a buckle housing 62 (shown in phantom) with the locking dog, pushbutton and chamber means protruding therefrom, if desired.

Rear portion 58 of inflating means 48 is provided with a coupling means, such as a slot 60, which is designed to connect with a section of seat belt webbing, cable or the like which in turn may be mounted to the vehicle, preferably the vehicle floor, in a manner well known in the art.

In operation of the preferred embodiment of this invention, a wearer places inflatable lap and shoulder bands about his body and inserts hollow tongue portion 14 into buckle portion 12 to lock the same together. Central passageway 102 in the hollow tongue 14 is received within chamber means 110 of the buckle as

the tongue is latched to the buckle by the locking dog 16 engaging in the recess 100. Without extraneous manifold structure the hollow tongue now serves through the passageway 102 therethrough and the ports 103 communicating to the inflatable band to allow the inflatable band restraint 30 to inflate upon the occurrence of the preselected condition of deceleration which the sensor 112 senses. When such condition occurs, the sensor 112 signals inflating means 48 which thereupon introduces a gas through apertures 54 into rear chamber 44 and into first chamber means 110. The gas then passes from the buckle portion 12 into the hollow tongue portion 14 through the central passageway 102 and then out the exit ports 103 at the opposite end of the tongue therefrom into the inflatable band 30, and as a result of which such band is inflated.

By so providing the entry of gas to the inflatable band through the hollow tongue itself, it is possible to provide an inflatable seat band restraint which is readily advantageously retractable and storable.

It is to be understood that variations and modifications of the present invention can be made without departing from the scope of the invention. It is also to be understood that the scope of the invention is not to be interpreted as limited to the specific embodiment disclosed herein, but only in accordance with the appended claims which read in light of the foregoing disclosure.

I claim:

1. A seat band restraint assembly comprising a hollow tongue, a buckle portion, with a push button mounted on one side thereof, adapted to be latched with said tongue and unlatched therefrom on actuation of the push button, an inflatable seat band restraint mounted on said tongue, said buckle portion being provided with chamber means, said tongue having a single central passageway having a longitudinal axis through a portion thereof, said buckle portion containing a latching bar mounted therein moving perpendicular to the longitudinal axis of the passageway, said tongue containing a recess therein for receipt of the bar and consequent latching of said tongue to said buckle at one end of said tongue as a result of reception of the bar in said recess, said recess located on the same side of the tongue as said push button mounting on the buckle, said central passageway being located at the end of said hollow tongue adjacent said recess, exit ports in said hollow tongue in communication with said central passageway and said inflatable band for communicating gas from said passageway to said band, said exit ports located at the end of said hollow tongue opposite to the end latched to the buckle, said central passageway being adapted to communicate with said chamber means when said tongue and buckle portions are latched, inflating means communicating with said chamber means, said inflating means including a gas source whereby said inflating means and said inflatable band are interconnected through said chamber means, said central passageway and said ports when said hollow tongue and said buckle portion are latched so as to allow gas released from said gas source to inflate said inflatable seat band restraint, said inflatable band restraint being mounted on said tongue between said exit ports and the end of the central passageway adjacent said recess.

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