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3,605,210

SIDE LOCKING SEAT BELT BUCKLE

Filed April 21, 1969

2 Sheets-Sheet 1

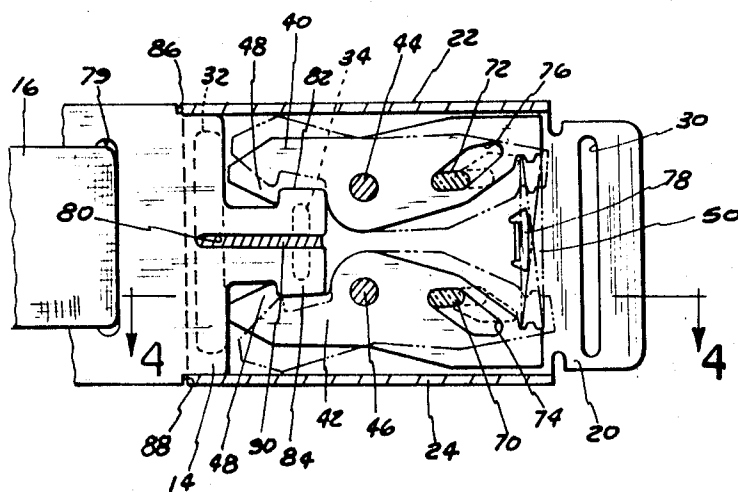
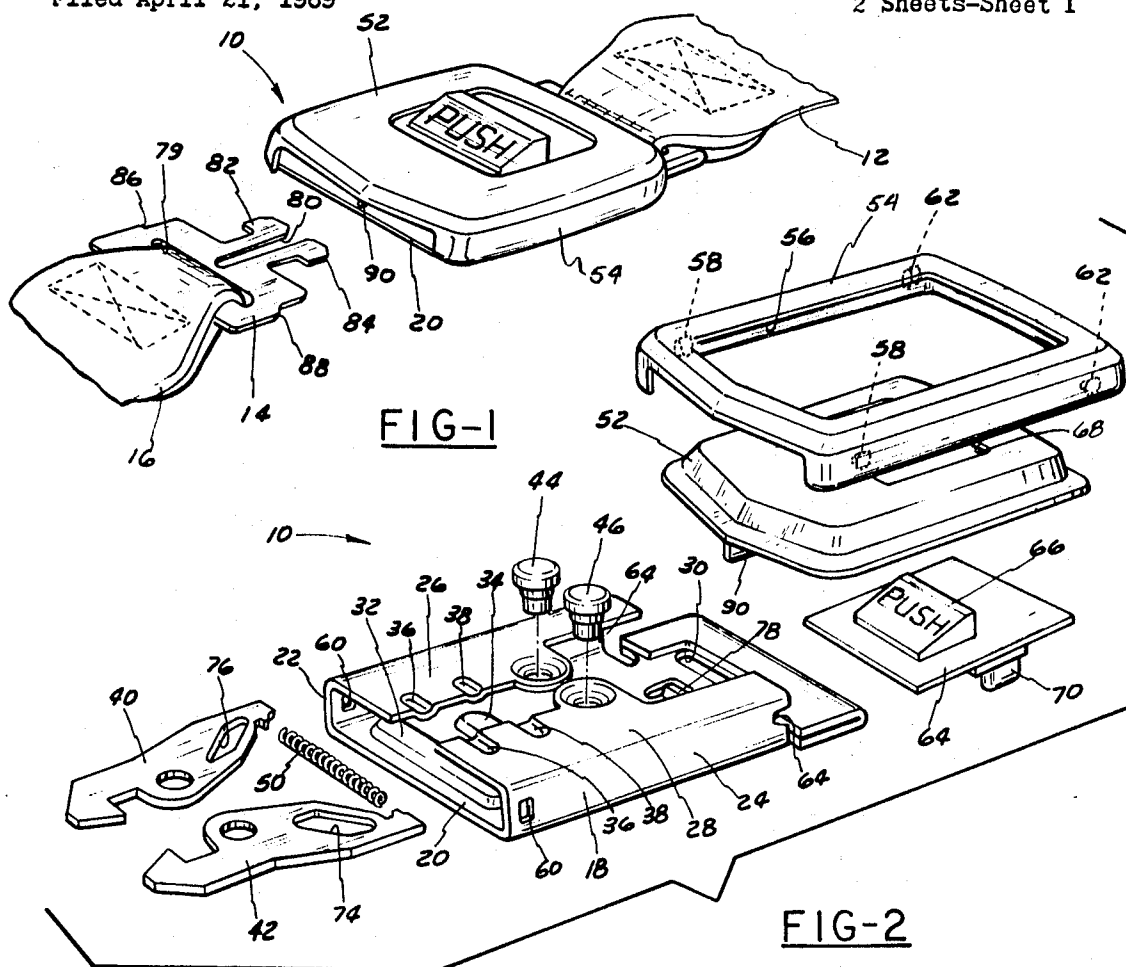


FIG-3

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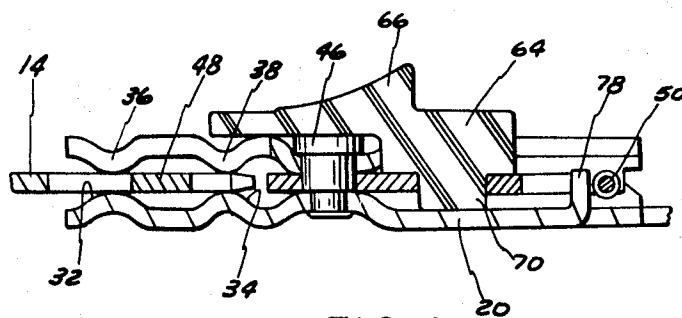


FIG-4

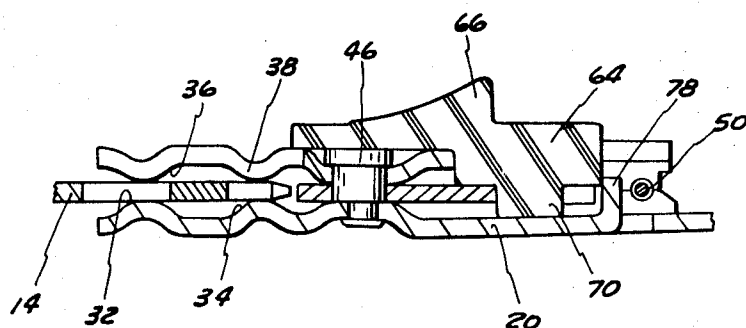


FIG-5

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3,605,210

SIDE LOCKING SEAT BELT BUCKLE

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U.S. Cl. 24—230

4 Claims

ABSTRACT OF THE DISCLOSURE

A safety seat belt buckle having a pair of locking members which engage opposite side edges of a plate-like tongue to prevent its removal from a latched position in the buckle. A release member on the buckle is connected to the locking members such that they can be moved toward release positions either by a motion of the release member, or by contact with the tongue as it is received toward its latched position.

BACKGROUND OF THE INVENTION

This invention relates to safety seat belt buckles, and more specifically to a buckle assembly having a plate-like tongue which is releasably locked in a buckle housing by a pair of cooperating locking members that engage the side edges of the tongue.

Considerable effort has been directed by seat belt buckle manufacturers toward providing a buckle configuration that is thinner and narrower than current commercially available buckles. A significant size reduction of commercial buckles is limited by the space within the buckle housing that is necessary to accommodate the motion of the locking mechanism. This is because conventional locking mechanisms generally employ one or more members having a component of motion that is perpendicular to the buckle base.

One method for reducing overall buckle thickness is to provide a locking member that is movable only in directions parallel to the buckle base thereby eliminating the necessity for space within the buckle housing to accommodate perpendicular motion of these members. Buckles having such a locking member although not necessarily for the purpose of compactness, have been disclosed in U.S. Pat. No. 3,262,169 to G. Jantzen and U.S. Pat. No. 3,311,188 to J. G. Tutshall. Another buckle component having a motion that must also be considered is that of the release member. In order to satisfy certain safety criteria, the release member must be in a protected position so that it cannot be easily accidentally actuated and this is usually connected to the locking member and is movable to release the locking member. The housing must not only accommodate this movement but for safety reasons, to reduce the possibility of the release member being accidentally actuated, it must be in a protected or recessed position adding to the required thickness of the housing.

SUMMARY OF THE INVENTION

The broad purpose of the present invention is to provide a seat belt buckle assembly having a locking member and a release member both of which are only movable parallel to the base of the buckle housing. In the preferred embodiment of the present invention, the preferred buckle has a flat base, a pair of cooperating locking members that are pivotal parallel to the base between release and locking positions, and a release member which is also movable parallel to the base. Because none of the movable buckle elements has a component of motion that is perpendicular to the base, the buckle housing can be formed with a relatively flat configuration. By mounting the release member such that it is movable parallel to the base, its connection to the locking members provides a mechan-

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ical advantage that allows the user to easily release the tongue from its latched position. The release member is connected to the locking member in a manner that allows the locking member to be moved toward its release position by the tongue as it is received by the buckle. The user, therefore, does not have to manipulate the release member in order to insert the tongue to its latched position.

The preferred buckle has an overall width that is less than three inches, a length that is less than two inches, and a thickness of only about $\frac{5}{8}$ of an inch. In addition to its compact, flat configuration still further advantages of the present invention will become readily apparent to those skilled in the art to which the invention pertains upon reference to the following detailed description.

DESCRIPTION OF THE DRAWINGS

The description refers to the accompanying drawings in which like reference characters refer to like parts throughout the several views, and in which:

FIG. 1 is a perspective view showing a buckle assembly illustrating the preferred embodiment of the invention;

FIG. 2 is a perspective view showing the components of the preferred buckle in exploded relationship;

FIG. 3 is a sectional view of the preferred buckle showing the manner in which the locking members engage the side edges of the tongue;

FIG. 4 is a sectional view taken along lines 4—4 of FIG. 3 with the cover removed and showing the release member in its position in which the locking members are in their locking positions; and

FIG. 5 is a view similar to FIG. 4, but showing the release member in its position in which the locking members are in their release positions.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Now referring to the drawings, a preferred seat belt buckle comprises a buckle housing 10 carried on the end of a vehicle safety seat belt 12, and a tongue 14 which is carried on the end of a vehicle safety seat belt 16. The tongue 14 and the buckle housing 10 cooperate to form a releasable connection between the belts 12 and 16.

As best illustrated in FIG. 2, the buckle housing 10 comprises a shell 18 of a metal stamping which is bent to form a planar base 20, a pair of sides 22 and 24 which extend normally with respect to the base 20, and a pair of opposed flanges 26 and 28 which are parallel to the base 20. The base 20 extends beyond one end of the sides 22 and 24 and is provided with a slot 30 for receiving the looped end of the belt 12.

The base 20 has an elongated ridge 32 raised toward the flanges 26 and 28 and perpendicular to sides 22 and 24. A second ridge 34, which is parallel to the ridge 32 but shorter, is also formed in the base 20. The flanges 26 and 28 have short ridges 36 which are parallel to the ridge 32, and a pair of short ridges 38 which are parallel to the ridge 34. The ridges 32 and 34 form a slidable contact with one face of the tongue 14 as it is received into the shell 18, and the ridges 36 and 38 form a slidable contact with the opposite face of the tongue 14. Preferably, as best shown in FIGS. 4 and 5, the distance between the ridges 32 and 34 in the base and the ridges 36 and 38 in the flanges prevent motion of the tongue normal to the base 20 when it is disposed in the shell 18.

A pair of locking members 40 and 42 are supported in the shell 18 by rivets 44 and 46 which depend from flanges 26 and 28, respectively. Both locking members are movable parallel to the base 20 between a closed position, illustrated in FIG. 3, in which an ear 48 on each locking member is engaged with the tongue 14 to prevent its removal

from the shell 18 and a position in which the ears 48 are pivoted toward the sides 22 and 24 of the shell to allow passage of the tongue 14 between them. A spring 50 is connected between the locking members 40 and 42 to bias them toward the closed position.

Referring to FIG. 2, a cover 52 is mounted on the flanges 26 and 28. A retainer 54 has a central opening 56 for receiving the cover, a pair of tabs 58 which snap into openings 60 in the sidewalls of the shell 18, and a pair of tabs 62 that snap into a second pair of openings 64 in the sides of the shell in order to lock the cover 52 on the shell. A release member 64 is slidably mounted on the flanges 26 and 28 within the cover 52. A button 66 carried by the release member 64 extends through an elongated opening 68 in the cover so as to be accessible.

The release member 64 has two depending lugs 70 and 72 which extend between the flanges 26 and 28 into elongated angularly extending openings 74 and 76 of the locking members 42 and 40, respectively. Normally, when the locking members are in their closed positions, the release member 64 is in the position illustrated in FIG. 4. By moving the release member 64 from the position shown in FIG. 4 toward an upturned tab 78 formed in the base 20, as shown in FIG. 5, the lugs 70 and 72 acting upon the sides of the slots 76 cam the locking members toward their open positions. Releasing the release member 64, permits the spring 50 to return the locking members toward their closed position, and the release member toward a position in which it is in abutment with the flanges 26 and 28.

As best illustrated in FIGS. 1 and 3, the tongue 14 is formed of metal plate with a slot 79 for receiving the looped end of belt 16. The tongue 14 also has a slot 80 which extends perpendicular to the slot 79 and opens to the tongue's leading edge. The leading edge of the tongue, that is the portion that is initially received into the buckle housing, is narrowed and formed with a pair of ears 82 and 84 that extend laterally with respect to the slot 80. The tongue 14 also has a pair of shoulders 86 and 88 on its side edges.

Referring to FIGS. 2 and 3, the cover 52 has a tab 90 that extends between the flanges 26 and 28 of the shell to a position closely adjacent the base 20 to receive the slot 80 of the tongue. As the tongue 14 is received into the shell 18, the tab 90 guides the tongue towards its latched position in which it is disposed parallel to the planar base 20. As the tongue is received by the shell, the ears 82 and 84 contact the ears 48 to cam the two locking members toward their open position to permit insertion of the tongue therebetween. As the ears 82 and 84 move past the ears 48 the locking members then are returned toward their closed position with the ears 48 moving behind the ears 82 and 84 of the tongue to prevent it from being removed from the housing.

As the tongue is received into the shell 18, the shoulders 86 and 88 engage the sides 22 and 24 to limit the tongue's motion into the shell, as well as to limit any lateral displacement of the tongue from its latched position.

Referring to FIGS. 4 and 5, the tongue slidably engages the ridges 32, 34, 36 and 38 as it is received into the shell. The ridges, therefore, locate the tongue for the locking members 40 and 42, prevent the tongue from being moved

perpendicular to the base, and also reduce the surface area of the shell that is in contact with the tongue.

Thus, it is to be understood that I have described in detail a novel seat belt buckle assembly in which both the locking and the release members are movable parallel to the base of the buckle housing thereby allowing the buckle to have a thin, compact configuration. In addition, the release member has a minimum area that is exposed for accidental release while still providing a movement that allows the tongue to be easily released from the buckle housing.

Having described my invention, I claim:

1. A buckle assembly comprising; a buckle housing having an opening, a tongue provided with two outwardly extending ears affixed thereto, pair of longitudinally immovable locking members rotatably supported within said housing toward and away from each other for movement between a locking position and a release position, said locking members provided with inwardly extending ears for engagement about the ears of said tongue whereby said locking members enclose the ears of said tongue and retain said tongue within said housing in the locking position and being operable to allow the tongue to be removed from said housing when in said release position, a release member movably supported on said housing for movement in the direction in which the tongue is inserted into said housing through said opening, a pin and slot means interconnecting each of said locking members and said release member for moving said locking members from said locking position to said release position, each pin and slot means including an elongated slot having a longitudinal axis disposed at an acute angle to said direction in which the tongue is inserted into said housing through said opening so that said locking members are moved generally laterally of said direction upon movement of said release member.

2. An assembly as set forth in claim 1 including biasing means interconnecting said locking members for urging said locking members toward said locking position.

3. An assembly as set forth in claim 1 including guide means in said housing for guiding the tongue into said housing in said direction.

4. An assembly as set forth in claim 1 wherein each of said locking members has one of said slots therein and one of said pins extends from said release member through each slot, said slots being disposed so that their longitudinal axes cross one another.

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BERNARD A. GELAK, Primary Examiner