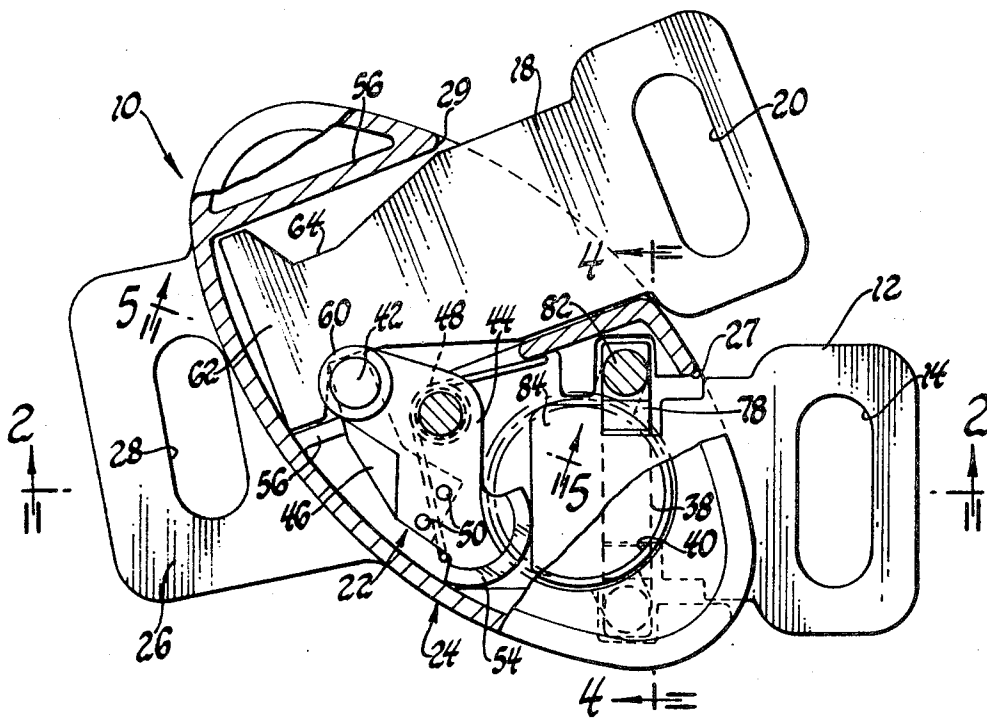


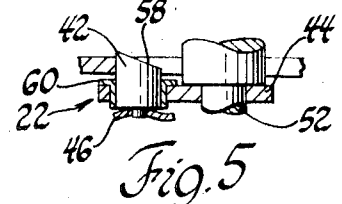
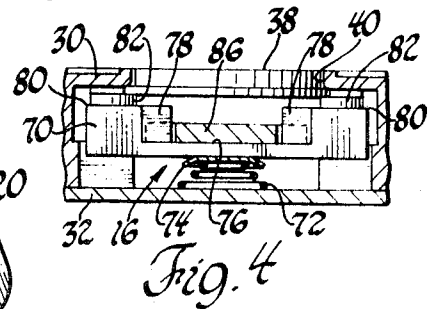
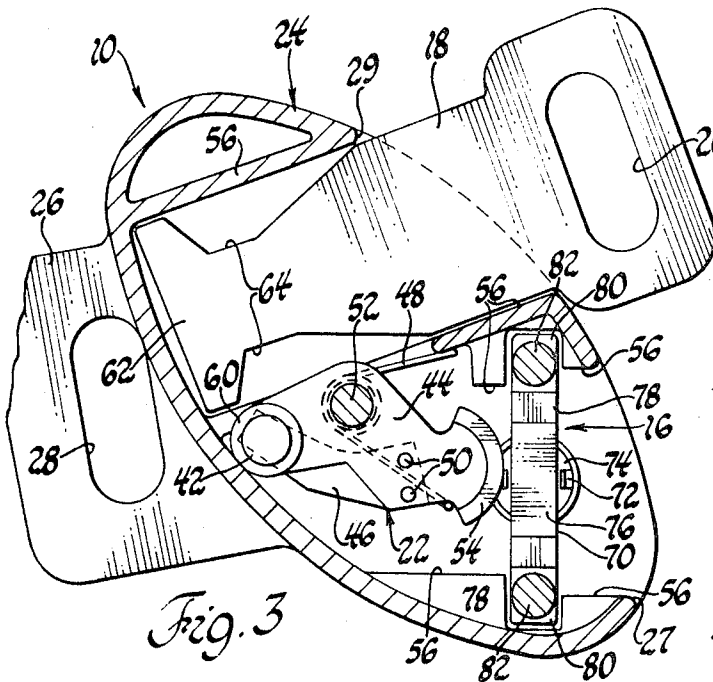
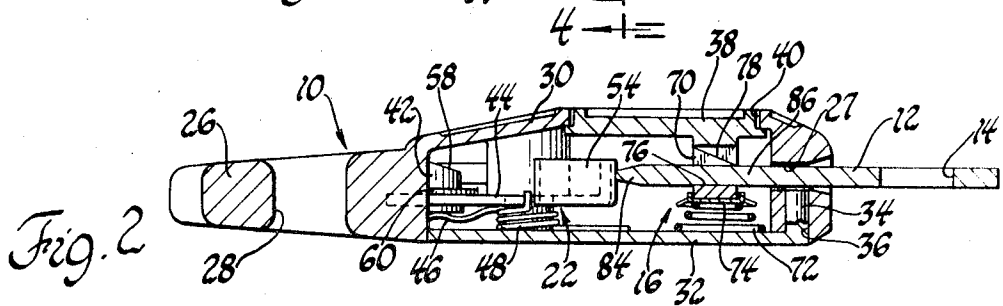
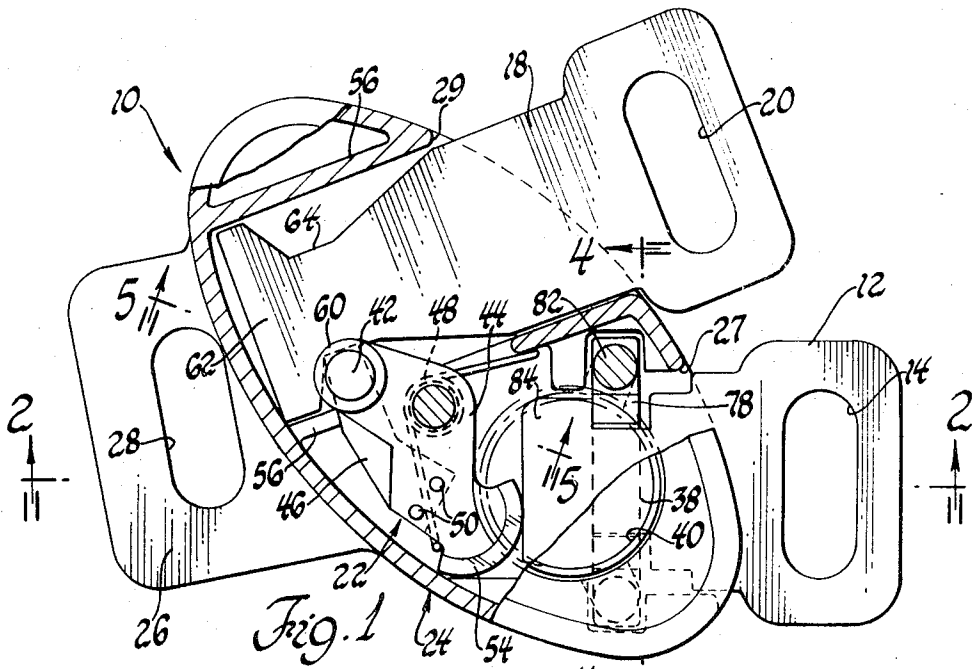
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ABSTRACT: A two-tongue buckle assembly including a housing into which first and second tongues may be inserted. A first latch means including an elongated latch bar is biased upwardly by a spring toward the latched position and is movable downwardly by a pushbutton to the unlatched position to coact with the first tongue when inserted thereto to retain the first tongue in the latched position. A second latch means is included and comprising a support member rotatably connected to the housing and having an arcuate upturned flange on one end for abutting engagement with the first tongue and having a movable latch member supported by a resilient leaf spring at the other end. The resiliently supported latch member is moved by the support member into the path of the second tongue by the first tongue being inserted into the housing and engaging the upturned flange of the support member to rotate the support member so that the latch member movably supported thereon is in the path of the second tongue for latching engagement therewith. The second tongue is therefore retained in the latched position only when the first tongue is inserted into the housing and into the latched position.

- [54] **TWO-TONGUE BUCKLE ASSEMBLY**
 17 Claims, 5 Drawing Figs.
- [52] U.S. Cl. 24/205.17,
 24/230, 297/389
- [51] Int. Cl. A44b 19/00,
 B60r 21/10
- [50] Field of Search 297/385,
 389; 24/205.17, 201 D, 75, 211 M, 230 R, 230 A,
 230 AL, 230 AV, 230 AK
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TWO-TONGUE BUCKLE ASSEMBLY

This invention relates to seat belts for vehicle occupant-restraining systems. One well-known type of restraining system is one including a lap belt including two seat belts which are connected together through a tongue and buckle and including a shoulder strap with the end thereof connected to the lap belt adjacent the buckle and tongue. There are various prior art assemblies wherein a buckle is connected to the end of one of the lap belts and receives a torque from the other lap belt as well as another tongue attached to the end of the shoulder strap. One of the problems with such assemblies is that the tongue on the shoulder strap may be inserted into the buckle and latched without the tongue on the other lap belt being inserted and latched to the buckle.

There have been assemblies developed which prevent the insertion of the tongue attached to the shoulder strap into the buckle assembly until the tongue attached to the other lap belt is inserted and latched to the buckle assembly. The instant invention however solves the problem by providing a buckle assembly which has a first latch means for latching engagement with the first tongue connected to the lap belt and a second latch means which is movable into a latching position in the path of insertion of the second tongue attached to the shoulder strap only by the insertion and latching of the first tongue attached to the lap belt.

Accordingly, it is an object and feature of this invention to provide such a buckle assembly wherein the second latch means cooperable with the shoulder strap tongue is movable to a latching position in response to positioning of the lap belt tongue in latching engagement with a first latching means for receiving and retaining the shoulder strap tongue in latching engagement therewith and which is movable to a nonlatching position out of the path of the strap tongue in response to the removal of the lap tongue from latching engagement with its latching means, thus preventing latching engagement of the strap tongue unless the lap belt tongue is inserted and latched to the buckle.

Other objects and attendant advantages of the present invention will be readily appreciated as the same become better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. 1 is a plan view partially broken away and in cross section of a preferred embodiment of the assembly of the instant invention;

FIG. 2 is a cross-sectional view taken substantially along line 2-2 of FIG. 1;

FIG. 3 is a fragmentary cross-sectional view similar to FIG. 1 but showing the assembly with neither the tongues in the latched position;

FIG. 4 is a fragmentary cross-sectional view taken substantially along line 4-4 of FIG. 1; and

FIG. 5 is a fragmentary cross-sectional view taken substantially along line 5-5 of FIG. 1.

Referring now to the drawings wherein like numerals indicate like or corresponding parts throughout the several views, a preferred embodiment of the buckle assembly of the instant assembly is generally shown at 10.

The buckle assembly 10 includes a first tongue 12 which is adapted by the hole 14 to be attached to a lap or seat belt.

There is also included a first latch means generally indicated at 16 for receiving and retaining the first tongue 12 in latching engagement therewith.

The assembly 10 also includes a second tongue 18 which is adapted by the hole 20 to be attached to a shoulder strap or the like.

The assembly 10 further includes second latch means generally indicated at 22. The second latch means 22 is movable to a latching position as illustrated in FIGS. 1 and 2 in response to the positioning of the first tongue 12 in latching engagement with the first latch means 16 for receiving and retaining the second tongue 18 in latching engagement

therewith as illustrated in FIGS. 1 and 2. The second latch means 22 is also movable to a nonlatching position illustrated in FIG. 3 out of the path of the second tongue 18 in response to the removal of the first tongue 12 from latching engagement with the first latching means 16 for preventing latching engagement thereof with the second tongue 18.

The assembly includes a housing generally indicated at 24. The housing 24 is preferably made of an integral metal member having a flange 26 with a hole 28 in the flange for receiving a lap or seat belt. The housing 24 includes a first opening 27 for receiving the first tongue 12 and a second opening 29 for receiving the second tongue 18. The housing 24 has an integral top wall 30 and a bottom wall 32 which is defined by a cap or cover member secured to the integral remaining part of the housing posts 34 inserted into holes 36.

The assembly 10 also includes a release means comprising the pushbutton 38 disposed in an opening 40 in the top wall 30 of the housing. Pushbutton 38 moves the first latch means 16 to the release portion to allow the removal of the first tongue 12 in which in turn allows movement of the second latch means 22 to the nonlatching position in response to the removal of the first tongue 12.

The second latch means 22 includes a latch member 42 for latching engagement with the second tongue 18 when in the latching position as illustrated in FIGS. 1 and 2. The second latch means 22 also includes a movable support means comprising the support member 44 and a resilient means or leaf-type spring 46. The support means supports the latch member 42 and is responsive to the first tongue 12 for moving the latch member 42 to the latching position illustrated in FIG. 1.

The second latch means 22 further includes first biasing means comprising the spring 48 for moving the support means from the latching position illustrated in FIG. 1 to the nonlatching position illustrated in FIG. 3 in response to the removal of the first tongue 12. The leaf spring 46 is riveted by the rivets 50 or the like to support member 44 at one end and is attached to the latch member 42 at the other end as illustrated in FIG. 5 to resiliently support the latch member 42 on the support member 44.

The support member 44 is rotatably supported by the housing 24 for movement between the latching and nonlatching positions. The housing 24 includes a boss 52 which is circular in cross section and which extends through a circular aperture which extends through the support member 44. The support member 44 has first and second extremities and is rotatably connected to the housing through the boss 52 intermediate the extremities. The support member is a platelike member having an upturned arcuate flange 54 at the first extremity which is engageable with the first tongue 12. The latch member 42 is movably supported by the support member 44 adjacent the second extremity thereof.

The housing 24 includes wall means 56 aligned with the first and second openings 27 and 29 for guiding the first and second tongues 12 and 18 into the housing in respective paths of movement. The latch member 42 is disposed out of the path of movement of the second tongue 18 when in the nonlatching position illustrated in FIG. 3. The latch member 42 has an inclined extremity or upper end 58 which falls away in the general direction of the second opening 29. The latch member 42 is a cylindrical member slidably supported in a guide hole in the support member 44 by a bushing 60.

The second tongue 18 includes a head portion 62 followed by voids or recesses 64. As the tongue 18 is inserted into the housing through opening 29, the head 62 engages the inclined extremity 58 of the latch member 42 to move the latch member 42 relative to the support member 44 to a position out of the path of the second tongue 18 until one of the voids 64 reaches the latch member 42 whereupon the latch member 42 moves into the void 64 under the biasing of the resilient leaf-type spring 46 and is in the latching engagement with the tongue 18 as illustrated in FIG. 1.

The torsion spring 48 is looped about the boss 52 and has one arm thereof engaging the housing for urging the support

member 44 to rotate in the counterclockwise direction from the latching position illustrated in FIG. 1 to the nonlatching position illustrated in FIG. 3.

The first latch means 16 includes a latch bar 70 guided by walls of the housing for movement generally perpendicular to the top and bottom walls 30 and 32 of the housing and perpendicular to the direction in which the first tongue 12 is inserted into the housing 24. The latch bar 70 is movable between a latched position as illustrated in FIGS. 1, 2 and 4 wherein it is in latching engagement with the first tongue 12 and a release position to allow the removal of the first tongue 12. The first latch means 16 also includes a second biasing means comprising springs 72 for urging the latch bar 70 upwardly toward the latched position. The spring 72 reacts between the bottom wall 32 and the bottom of the latch bar 70 through a washer-like retainer 74 which retains the spring 72 in engagement with the bottom of the latch bar 70. The pushbutton 38 is accessible through the opening 40 in the top wall 30 of the housing and is connected to the latch bar 70.

The side or the top of the latch bar on which the pushbutton 38 is positioned is defined by a central recessed channel 76 with an inclined ramp 78 extending upwardly on each side thereof and in a direction away from the first opening 27. The latch bar 70 also includes a shoulder disposed outwardly of each of the ramps 78 and the pushbutton is connected to the latch bar at the shoulders by way of a hole in each shoulder into which pegs 82 from the pushbutton extend.

First tongue 12 has a head 84 and a shank 86 extending therefrom so that as the first tongue 12 is inserted through the first opening 27 the head 84 thereof engages the ramps 78 of the latch bar 70 to move the latch bar 70 downward toward the release portion until the head 84 passes thereover and the latch bar 70 moves to the latched position where the head 84 is disposed behind the ramp and the shank 86 is disposed in the channel 76 for retaining the tongue 12.

In the operation of the assembly, the first tongue 12 is inserted into the opening 27 and into latched engagement with the latch bar 70 as described immediately above. In so doing, the head 84 of the first tongue 12 engages the arcuate upturned flange 54 of the support member 44 to rotate the support member 44 from the nonlatching position illustrated in FIG. 3 to the latching position illustrated in FIG. 1. Thereafter, the tongue 18 is inserted through the opening 29 and the head 62 thereof engages the inclined upper extremity 58 of the latch member 42 to move the latch member 42 downwardly. The latch member 42 remains depressed downwardly against the action of the leaf-type spring 46 until the void or recess 64 is disposed thereover whereupon the latch member 42 moves upwardly under the action of the spring 46 to the latched position in latching engagement with the tongue 18. To release the assembly, the pushbutton 38 is depressed to move the latch bar 70 downwardly so that the first tongue 12 moves out through the opening 27. Upon outward movement of the tongue 12, which outward movement may be assisted by the biasing action of the spring 48 urging the support member 44 to rotate in a counterclockwise direction, the support member 44 also moves to the nonlatching position moving the latch member 42 out of latching engagement with the second tongue 18 whereby the second tongue 18 is free to move out of the housing 24.

The invention has been described in an illustrative manner, and it is to be understood that the terminology which has been used is intended to be in the nature of words of description rather than of limitation.

Obviously, many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

The embodiments of the invention in which I claim an exclusive property or privilege are defined as follows:

1. A buckle assembly comprising; a first tongue, first latch means for receiving an retaining said first tongue in latching

engagement therewith, a second tongue, second latch means movable to a latching position in response to the positioning of said first tongue in latching engagement with said first latch means for receiving and retaining said second tongue in latching engagement therewith and movable to a nonlatching position out of the path of said second tongue in response to the removal of said first tongue from said latching engagement with said first latching means for preventing latching engagement thereof with said second tongue.

2. An assembly as set forth in claim 1 including release means for moving said first latch means to a release position to allow said removal of said first tongue and the movement of said second latch means to said nonlatching position in response to said removal of said first tongue.

3. An assembly as set forth in claim 1 wherein said second latch means includes a latch member for latching engagement with said second tongue when in said latching position, and movable support means supporting said latch member and responsive to said first tongue for moving said latch member to said latching position.

4. An assembly as set forth in claim 3 wherein said second latch means further includes first biasing means for moving said support means from said latching position to said nonlatching position in response to said removal of said first tongue.

5. An assembly as set forth in claim 4 wherein said support means includes a support member and resilient means resiliently supporting said latch member on said support member.

6. An assembly as set forth in claim 5 wherein said assembly includes a housing having a first opening for receiving said first tongue and a second opening for receiving said second tongue, said support member being rotatably supported by said housing for movement between said latching and nonlatching positions.

7. An assembly as set forth in claim 6 wherein said support member has first and second extremities and is rotatably connected to said housing intermediate said extremities, said first extremity of said support member being engageable with said first tongue, said latch member being movably supported by said support member adjacent said second extremity thereof.

8. An assembly as set forth in claim 7 wherein said housing includes wall means aligned with said first and second openings for guiding said first and second tongues into said housing in paths of movement, said latch member being disposed out of the path of movement of said second tongue when in said nonlatching position.

9. An assembly as set forth in claim 8 wherein said latch member has an inclined extremity which falls away in the general direction of said second opening, said second tongue includes a head portion followed by at least one void so that said head engages said inclined extremity of said latch member as said second tongue is inserted into said housing to move said latch member relative to said support member to a position out of the path of said second tongue until said void reaches said latch member and said latch member is moved into said void by said resilient means whereby said latch member is in said latching engagement with said second tongue.

10. An assembly as set forth in claim 9 including release means for moving said first latch means to a release position to allow said removal of said first tongue and the movement of said support member and said latch member to said nonlatching position in response to said removal of said first tongue.

11. An assembly as set forth in claim 10 wherein said support member is platelike with an upturned arcuate flange defining said first extremity for engaging said first tongue and has a guide hole therethrough adjacent said second extremity thereof, said latch member is slidably supported in said guide hole, and resilient means comprises a leaf-type spring attached to said support member at one end and attached to said latch member at the other end, said support member includes a cir-

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cular aperture therethrough and said housing includes a circular boss extending through said aperture for rotatably supporting said support member, said first biasing means comprises a torsion spring looped about said boss with one arm thereof engaging said support member and another arm thereof engaging said housing.

12. An assembly as set forth in claim 11 wherein said housing has an oval configuration and includes means for attachment to a seat belt.

13. An assembly as set forth in claim 10 wherein said first latch means includes a latch bar guided by said housing for movement generally perpendicular the direction in which said first tongue is inserted into said housing and between a latched position in said latching engagement with said first tongue and said release position to allow said removal of said first tongue, second biasing means for urging said latch bar toward said latched position, and wherein said release means includes a pushbutton for moving said latch bar from said latched position to said release position.

14. An assembly as set forth in claim 13 wherein said housing has a top wall and a bottom wall, said top wall having an opening therein overlying said pushbutton for access to said

pushbutton, said second biasing means being disposed to react between said bottom wall and said latch bar, said pushbutton being connected to said latch bar.

15. An assembly as set forth in claim 14 wherein the side of said latch bar on which said pushbutton is positioned is defined by a central recessed channel with an inclined ramp extending upwardly on each side thereof and in a direction away from said first opening, said first tongue having a head with a shank extending therefrom so that said first tongue may be inserted through said first opening to engage said head thereof with said ramps to move said latch bar toward said release position until said head passes thereover and said latch bar moves to said latched position where said head is disposed behind said ramps and said shank is disposed in said channels.

16. An assembly as set forth in claim 15 wherein said latch bar includes a shoulder outwardly of each of said ramps and said pushbutton is connected to said latch bar at said shoulders.

17. An assembly as set forth in claim 16 wherein each of said shoulder on said latch bar has a hole therein and said pushbutton has a peg extending into each of said holes.

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