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(54) IMPROVEMENTS IN A BUCKLE PART SECURING ARM

(71) We, BRITAX (LONDON) LIMITED, a British Company of Proctor Works, Chertsey Road, Byfleet, Surrey, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to improvements in a safety belt buckle part supporting arm.

The most common and popular types of safety belts for motor vehicles are those having lap and diagonal straps. These consist of one piece of belt webbing, the ends of which are anchored respectively adjacent the top and bottom of a door pillar, the webbing, intermediate its ends carrying a buckle tongue for insertion into a buckle part mounted on the one end of a further length of webbing, the other end of which is rigidly attached to the vehicle floor adjacent the transmission tunnel.

One of the disadvantages of such a safety belt is that it requires two hands to fit and fasten it, one hand for grasping the belt tongue and the other for grasping the buckle part so that they may be brought together and fastened. Unless therefore the vehicle user is well disciplined and does up his safety belt prior to driving off it is a dangerous, if not impossible task to fit and fasten the safety belt once the vehicle is in motion. Furthermore, some vehicle users, unless both the tongue and buckle part are readily available, are too lazy or their attitude is too indifferent to fasten the safety belt.

The present invention seeks to overcome this problem by suitably locating the safety belt buckle part in the vehicle so that the belt can be fitted and the buckle fastened with one hand. It will be appreciated that the invention can be used with types of safety belt installation other than the lap and diagonal strap type, such as for example the single lap strap type or the single diagonal strap type, and of course, it can be used with so called "static" belts or those of the inertia reel type.

According to the present invention, we provide a buckle part supporting arm for supporting a buckle part of a two part safety belt buckle, the buckle part being secured to a length of belt webbing, said arm having a buckle part locating and retaining means adjacent one end thereof and having means adjacent its other end for securing the arm to a vehicle, the arrangement being such that, when in use, a buckle part is supported on the arm by the locating and retaining means, it is convenient to use as it is so orientated that the other buckle part, which is a buckle tongue, secured to a second length of webbing may be connected to the buckle part with one hand.

The arm may be adapted for rigid or pivotal connection to a motor vehicle, preferably between the front seats of the vehicle.

If the arm is adapted for pivotal connection to a motor vehicle, it is preferably biassed towards a horizonal forwardly extending position. By horizontally, forwardly extending position, it is meant that if the arm was mounted between the front seats of a vehicle, it would extend substantially horizontally towards the front of the vehicle to occupy a "3 o'clock" position. When a safety belt buckle part is to be mounted on the arm, the arm is moved against its spring bias, to about a "10 o'clock" position, and the buckle part is connected to it and the strap connected to the buckle part is then adjusted to hold thearm in this position. An advantage of this arrangement is that the tension in the belt will prevent the belt slipping through the buckle part, e.g. over a friction bar and will also prevent rattling of the part(s) connecting the belt to the buckle part. A heavy torsion spring may be used to bias the arm to its "3 o'clock" position, the spring acting between the arm and a mounting bracket for the arm. The spring strength should be greater than the force required to latch a belt tongue within the buckle part.

When the arm is so spring biased, the buckle part (or two buckle parts) may be connected to the arm by means of the rear edge of the buckle part(s) engaging in some way with a leading edge of the arm, the ten-

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sion in the belt(s) connected to the buckle part(s) holding the buckle part(s) on the arm.

In an alternative construction the buckle supporting arm is attached (pivotally or in fixed manner at one end to a mounting bracket adapted to be secured to a vehicle frame e.g. the floor, so that the arm projects upwardly from the floor, and adjacent its free end, the arm is provided either on one side face only or on a pair of opposite side faces with a pair of projecting buckle locating lugs and between each pair of lugs a safety belt buckle part may be located, the lugs gripping the side walls of the buckle part housing. A clamping screw may be located in one lug of each pair for clamping against a side wall of a buckle part housing.

The arrangement is such that the majority, if not all, known types of safety belt buckle part can be secured to the arm.

In an alternative embodiment of the invention, in which the arm is pivotally connected to a mounting bracket, the arm is secured in such a manner that it may be retained in any one of a plurality of positions relative to the bracket. In this way the orientation of the arm and buckle part thereon can be altered to suit the users requirements. In this embodiment, the arm need not be spring biased to any particular position.

When the buckle, in use, is subjected to load, it may remain on its arm, or alternatively, may be pulled from the arm. In any event, the webbing attached to the buckle preferably takes the load, rather than the arm.

Embodiments of the invention are illustrated in the accompanying drawings in which:—

Figure 1 is a perspective view of a biased, pivoted, buckle support arm, and

Figure 2 is a perspective view of a compliant buckle part supporting arm which can be bent into the required position.

In the embodiment of Figure 1, a support arm 1 is pivotally mounted on a bracket 2 secured to a part 3 of a vehicle. A torsion spring 4 biases arm 1 into a storage position shown by chain-and-dot lines 5. The arm 1 is provided with spaced locating lugs 6 to receive and to grip a safety belt buckle part 7 attached by webbing 8 to a fixed point within the vehicle. Buckle part 7 receives a tongue 9 attached by webbing 10 to another fixed point in the vehicle. The tongue 9 can be fitted to buckle part 7 with one hand when arm 1 is pushed back against a stop 11 on bracket 2.

In the embodiment of Figure 2, a buckle support arm 20 has a head 21 attached at one end for supporting a safety belt buckle part 22. The head 21 has two side plates projecting at right angles from its body, a threaded hole 23 being provided in each side plate. Clamping screws screwed into the holes 23 and 25 secure the buckle part 22 in the head 21. The other end of arm 20 has a hole 26.

The buckle part 22 is provided with means releasably to secure a length of webbing 27. The webbing 27 is looped through a slot 28 in an anchor plate 29. A hole 30 in anchor plate 29 is provided for receiving a bolt 31.

In order to assemble the parts shown in Figure 2, bolt 31 is passed through hole 30, spring washer 32, spacer 33, hole 26 and then into a threaded hole 34 in a structural portion 35 of a vehicle. The buckle part 22 is then secured in head 21 by means of screws, as explained above, and the arm 20, which is made of compliant material, is bent and/or twisted to a position which, in use, is at hip level and convenient for fitting the tongue of a safety belt (not shown) in the buckle part 22. This embodiment enables the buckle tongue to be secured in the buckle part with one hand.

As a safety precaution, the webbing 27 is shortened so that no load is carried by arm 20 when the safety belt tightens to restrain movement of the wearer.

WHAT WE CLAIM IS:—

1. A buckle part supporting arm for supporting a buckle part of a two-part safety buckle, the buckle part being secured to a length of belt webbing, said arm having a buckle part locating and retaining means adjacent one end thereof and having means adjacent its other end for securing the arm to a vehicle, the arrangement being such that, when in use, a buckle part is supported on the arm by the locating and retaining means, it is convenient to use as it is so orientated that the other buckle part, which is a buckle tongue, secured to a second length of webbing may be connected to the buckle part with one hand.

2. An arm according to claim 1 adapted for pivotal connection to a motor vehicle.

3. An arm according to claim 1 or 2 comprising lugs at one end spaced to receive and to grip the buckle part.

4. An arm according to claim 1 or 2 comprising clamping screws at one end to secure the buckle part.

5. An arm according to any one of the preceding claims adapted, by being made of compliant material, to be bent into a convenient position.

6. In combination an arm according to any one of claims 1—4 pivotally mounted on a bracket, the bracket including stop means to abut the arm and being adapted for attachment to a motor vehicle.

7. A combination according to claim 6 including the biasing means arranged between the arm and the bracket to bias the arm into a storage position when fitted to the vehicle.

8. A buckle part supporting arm sub-

sion in the belt(s) connected to the buckle part(s) holding the buckle part(s) on the arm.

In an alternative construction the buckle supporting arm is attached (pivotally or in fixed manner at one end to a mounting bracket adapted to be secured to a vehicle frame e.g. the floor, so that the arm projects upwardly from the floor, and adjacent its free end, the arm is provided either on one side face only or on a pair of opposite side faces with a pair of projecting buckle locating lugs and between each pair of lugs a safety belt buckle part may be located, the lugs gripping the side walls of the buckle part housing. A clamping screw may be located in one lug of each pair for clamping against a side wall of a buckle part housing.

The arrangement is such that the majority, if not all, known types of safety belt buckle part can be secured to the arm.

In an alternative embodiment of the invention, in which the arm is pivotally connected to a mounting bracket, the arm is secured in such a manner that it may be retained in any one of a plurality of positions relative to the bracket. In this way the orientation of the arm and buckle part thereon can be altered to suit the users requirements. In this embodiment, the arm need not be spring biased to any particular position.

When the buckle, in use, is subjected to load, it may remain on its arm, or alternatively, may be pulled from the arm. In any event, the webbing attached to the buckle preferably takes the load, rather than the arm.

Embodiments of the invention are illustrated in the accompanying drawings in which:—

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2. An arm according to claim 1 adapted for pivotal connection to a motor vehicle.

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5. An arm according to any one of the preceding claims adapted, by being made of compliant material, to be bent into a convenient position.

6. In combination an arm according to any one of claims 1—4 pivotally mounted on a bracket, the bracket including stop means to abut the arm and being adapted for attachment to a motor vehicle.

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8. A buckle part supporting arm sub-

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stantially as herein described with reference to figure 1 of the accompanying drawings.

9. A buckle part supporting arm substantially as herein described with reference to figure 2 of the accompanying drawings.

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