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Buckle for seat belt.

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FR-A- 2 552 641
US-A- 3 523 342
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Description

This invention relates to a buckle for a seat belt, comprising a buckle housing and two tongues, the buckle housing containing a latching mechanism having a latching formation for each tongue.

US-A-3523342 discloses a buckle of this type in which the latching formations are arranged for angular movement about respective spaced mutually parallel pivot axes between locking positions in which they engage with respective latch-engaging surfaces on the tongues to prevent removal of the tongues from the buckle housing and a release position in which the tongues are removable from the buckle housing. The latching formations are shaped so that a force applied to a tongue in a direction to remove it from the buckle housing tends to cause displacement of the corresponding latching formation from its locking position to its release position.

EP-A-0289762 discloses a buckle of this type in which the latching formations are arranged for angular movement between a locking position in which they confront one another and the two tongues are retained therebetween in the buckle housing, and a release position in which the tongue is removable from the buckle housing.

US-A-3648333 discloses a buckle having a single tongue, in which the latching formations are arranged for angular movement about respective spaced mutually parallel pivot axes between locking positions in which they engage with respective latch-engaging surfaces on the tongue to prevent removal of the tongue from the buckle housing and a release position in which the tongue is removable from the buckle housing. Blocking means are manually movable between a release position and a blocking position in which movement of the latching formations from their locked positions to their release positions is obstructed. Each latching formation is arranged so that, when in its release position, it prevents movement of the blocking means into its blocking position.

The invention provides a buckle for a seat belt, comprising a buckle housing and two tongues, the buckle housing containing a latching mechanism having a latching formation for each tongue, the latching formations being arranged for angular movement about respective spaced mutually parallel pivot axes between locking positions in which they engage with respective latch-engaging surfaces on the tongues to prevent removal of the tongues from the buckle housing and a release position in which the tongues are removable from the buckle housing, blocking means being manually movable between a blocking position in which it obstructs movement of the latching formations from their locked positions to their release positions and a release position in which the latching formations are free to move between their locking positions and their release positions, each latching forma-

tion being shaped so that a force applied to a tongue in a direction to remove it from the buckle housing tends to cause displacement of the corresponding latching formation from its locking position to its release position, and each latching formation being arranged so that, when in its release position, it prevents movement of the blocking means into its blocking position.

This arrangement prevents the buckle being fastened with only one tongue in place.

Preferably each latching formation includes an ejector formation shaped to engage with its respective tongue so that movement of the latching formation from its locking position to its release position ejects the tongue, and insertion of the tongue moves the latching formation from its release position to its locked position.

In one form of the invention, each latching formation comprises a latching lever mounted with its pivot axis at an intermediate position along its length, one end of each latching lever being arranged to engage with the corresponding tongue and the other end of each latching lever being arranged to engage with the blocking means.

Embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a cross-sectional view of a three-part buckle in accordance with the invention, with the mechanism in its release position and the tongues ejected, taken on the line 1 - 1 in Figure 2; Figures 2 and 3 are cross-sectional views taken on respective lines 2 - 2 and 3 - 3 in Figure 1;

Figure 4 is a cross-sectional view taken on the line 4 - 4 in Figure 3;

Figure 5 is a cross-sectional view taken on the line 5 - 5 in Figure 2;

Figure 6 is a cross-sectional view, similar to Figure 1, but showing the buckle in its engaged condition;

Figure 7 is a cross-sectional view taken on the line 7 - 7 in Figure 6;

Figure 8 is a side view of the buckle shown in Figures 6 and 7 with one side of the buckle housing removed;

Figures 9, 10 and 11 are cross-sectional views taken on respective lines 9 - 9, 10 - 10 and 11 - 11, in Figure 8 but with the buckle housing in place; and

Figure 12 is a cross-sectional view, similar to Figure 6, of an alternative three-part buckle in accordance with the invention.

Referring first to Figures 1 to 5, the buckle comprises a buckle housing 10 and two tongues 12 and 14, having respective slots 16, 18 and 20 whereby they may be connected to respective straps (not shown) of a seat belt system. As can be seen from Figures 2 and 3, the housing 10 is formed in two parts

22 and 24 for ease of assembly. In Figures 4 and 5 (and also in Figures 9 to 11), the two parts 22 and 24 are shown as integral with one another.

As can best be seen from Figure 1, the portions of the tongues 12 and 14 which are insertable into the housing 10 have respective hook formations with latch-engaging surfaces 26 and 28 and ejector-engaging surfaces 30 and 32. To facilitate simultaneous insertion of the two tongues, the upper tongue 12 (as viewed in Figure 1) has a peg 34 which can be inserted into a corresponding recess 36 in the other tongue 14.

The buckle housing 10 has two openings 34 and 36 for receiving the tongues 12 and 14 respectively. The openings 34 and 36 are separated by a central partition 38, behind which are located a pair of latching levers 40 and 42. As can be seen from Figures 3 and 4, these latching levers 40 and 42 have pivot axes formed by respective upper stub axles 44, 46 and lower stub axles 48, 50 which are journaled in respective recesses in the housing 10.

As can be seen from Figures 1 and 3, the ends of the latching levers 40 and 42 nearer to the openings 34 and 36 are of substantially the same thickness as the adjacent parts of the tongues 12 and 14 and carry hook formations 52 and 54 with surfaces shaped to engage with the latch-engaging surfaces 26 and 28 of the tongues 12 and 14 at locations offset from the respective stub axles 44, 46 so that a force applied to either tongue 12, 14, in a direction to remove it from the buckle housing 10, tends to cause displacement of the corresponding latching lever 40, 42 towards its release position. On the other side of their stub axles 44 and 46, the latching levers 40 and 42 taper towards end portions 56 and 58 which are bent outwardly to a small extent, as can be seen in Figure 1. On its outer edge, each latching lever 40, 42 has a respective flange 60, 62 with an ejector surface 64, 66 at the end nearer to the openings 34 and 36 shaped so as to be engagable with the ejector-engaging surfaces 30 and 32 on the tongues 12 and 14. The left hand end of the latching levers 40 and 42 are biased apart by a compression spring 68 so that the formations 52 and 54 are clear of the openings 34 and 36.

A push-button 70 is accommodated in an opening in the top of the housing 10 and hinged thereto along one edge 72 thereof. Flanges 74 and 76 (Figure 5) on the sides of the push-button 70 prevent it from moving above the top surface of the housing 10. Opposite the edge 72, the push-button 70 has a downwardly extending formation 78 (Figure 2) which carries a blocking bar 80 extending under the ends 56 and 58 of the latching levers 40 and 42. The blocking bar 80 has a central recess 82 in its upper surface (see Figures 3 and 5). However, with the latching levers 40 and 42 in the position illustrated in Figures 1 to 5, the ends 56 and 58 thereof engage with the ends of the block-

ing bar 80 to hold the push-button in its depressed position, against the action of a leaf spring 84 (Figures 2, 7 and 11).

If the two tongues 12 and 14 are placed in abutment with one another so that the peg 34 engages in the recess 36, and the ends of the tongues are inserted into the openings 34 and 36, the ejector-engaging surfaces 30 and 32 thereon abut against the corresponding ejector surfaces 64 and 66 on the latching levers 40 and 42, rotating the latching lever 40 in the counter-clockwise direction and the latching lever 42 in the clockwise direction so as to compress the spring 68 and bring the offset ends 56 and 58 of the latching levers 40 and 42 into abutment with one another, in alignment with the recess 82 in the blocking bar 80, as shown in Figure 6. The leaf spring 84 is then free to displace the blocking bar 80 and, with it, the push-button 70 upwardly, as shown in Figure 11 so that the ends 56 and 58 of the latching levers 40 and 42 are prevented from moving apart by the side walls of the recess 82. The tongues 12 and 14 are then held in the buckle housing by engagement of their latching surfaces 26 and 28 with the hook formations 52 and 54 on the latching levers 40 and 42 as shown in Figure 6.

If the push-button 70 is now depressed, the blocking bar 80 is moved clear of the ends 56 and 58 of the latching levers 40 and 42 which are therefore free to return to the position illustrated in Figure 1 under the influence of the spring 68. Abutment of the ejector surfaces 64 and 66 on the flanges 60 and 62 with the ejector-engaging surfaces 30 and 32 on the tongues 12 and 14 causes the latter to be ejected from the housing 10. If movement of the latching levers 40 and 42 is impeded to such an extent that the force exerted by the spring 68 is insufficient, disengagement can be initiated by a force applied to either tongue 12, 14, in a direction to remove it from the buckle housing 10, as described above.

If an attempt is made to insert only one of the tongues, for example the tongue 12, into the housing 10 without the other tongue 14, then the corresponding latching lever 40 is displaced to the position shown in Figure 6 but the other latching lever 42 remains in the position shown in Figure 1, holding the push-button 70 in its depressed position. Consequently, as soon as the tongue 12 is released, it is ejected by the action of the spring 68.

The buckle illustrated in the drawings requires the two tongues 12 and 14 to be inserted in mutually parallel directions. However, the mechanism can be modified to allow the two tongues to be inserted in non-parallel directions, for example, at right angles to one another. In order to do this, the latching levers are bent in the region of their pivots so that the ends 56 and 58 which engage with the blocking member 80 are set at a different angle the hook formations 50, 52 and the ejector surfaces 64 and 66.

Figure 12 illustrates an alternative embodiment, in which the buckle comprises a buckle housing 90 and two tongues 92 and 94, having respective slots 96, 98 and 100 whereby they may be connected to respective straps (not shown) of a seat belt system. The tongues 92 and 94 differ from the tongues 12 and 14 of the embodiment illustrated in Figures 1 to 11 in that their hook formations 102 and 104 face outwardly and the buckle housing 90 has a single opening 106 through which both tongues can be inserted simultaneously. A pair of latching levers 108 and 110, mounted on respective pivot axes 112 and 114, have inwardly facing hook formations 116, 118 shaped to embrace the outwardly facing hook formations 102 and 104 of the tongues 92 and 94. A push-button (not shown), similar to the push-button 70 carries a blocking bar which differs from the blocking bar 80 of Figures 1 to 11 in that the central recess 82 therein is replaced by a central projection 120 which engages between ends 122 and 124 of the latching levers 106 and 108 to hold them in their engaged position as illustrated in Figure 12. The operation of the buckle shown in Figure 12 is analogous to that of the buckle shown in Figures 1 to 11.

Claims

1. A buckle for a seat belt, comprising a buckle housing (10, 90) and two tongues (12, 14, 92, 94), the buckle housing (10, 90) containing a latching mechanism having a latching formation (40, 42, 108, 110) for each tongue (12, 14, 92, 94), the latching formations (40, 42, 108, 110) being arranged for angular movement about respective spaced mutually parallel pivot axes (44, 46, 112, 114) between locking positions in which they engage with respective latch-engaging surfaces (26, 28, 102, 104) on the tongues (12, 14, 92, 94) to prevent removal of the tongues (12, 14, 92, 94) from the buckle housing (10, 90) and a release position in which the tongues (12, 14, 92, 94) are removable from the buckle housing (10, 90), blocking means (80) being manually movable between a blocking position in which it obstructs movement of the latching formations (40, 42, 108, 110) from their locked positions to their release positions and a release position in which the latching formations (40, 42, 108, 110) are free to move between their locking positions and their release positions, each latching formation (40, 42, 108, 110) being shaped so that a force applied to a tongue (12, 14, 92, 94) in a direction to remove it from the buckle housing (10, 90) tends to cause displacement of the corresponding latching formation (40, 42, 108, 110) from its locking position to its release position, and each latching formation (40, 42, 108, 110) being arranged so

that, when in its release position, it prevents movement of the blocking means (80) into its blocking position.

2. A buckle according to claim 1, wherein the latching formations (40, 42, 108, 110) are biased towards their release positions by a spring (68) and each latching formation (40, 42, 108, 110) includes an ejector formation (64, 66) shaped to engage with its respective tongue (12, 14, 92, 94) so that movement of the latching formation (40, 42, 108, 110) from its locking position to its release position ejects the tongue, and insertion of the tongue (12, 14, 92, 94) moves the latching formation (40, 42, 108, 110) from its release position to its locked position.
3. A buckle according to claim 1 or 2, wherein each latching formation comprises a latching lever (40, 42, 108, 110), mounted with its pivot axis (44, 46, 112, 114) at an intermediate position along its length, one end (52, 54) of each latching lever (40, 42, 108, 110) being arranged to engage with the corresponding tongue (12, 14, 92, 94) and the other end (56, 58) of each latching lever (40, 42, 108, 110) being arranged to engage with the blocking means (80).
4. A buckle according to claim 3, wherein each latching lever (40, 42) carries an outwardly facing hook formation (52, 54) and each tongue (12, 14, 92, 94) engages between a respective latching lever (40, 42) and a respective part of the housing (10).
5. A buckle according to claim 3, wherein each latching lever (108, 110) carries an inwardly facing hook formation (116, 118) and the tongues (92, 94) engage between the two latching levers (108, 110).

Patentansprüche

1. Ein Koppelschloß für einen Sicherheitsgurt, welches ein Schloßgehäuse (10, 90) und zwei Zungen (12, 14, 92, 94) aufweist, wobei das Schloßgehäuse (10, 90) einen Verriegelungs- oder Einrastmechanismus mit einem Verriegelungsglied (40, 42, 108, 110) für eine jede Zunge (12, 14, 92, 94) enthält, die Verriegelungsglieder (40, 42, 108, 110) zum Zwecke einer Winkelbewegung um jeweilige, gegenseitig beabstandete, parallele Drehachsen (44, 46, 112, 114) zwischen Verriegelungspositionen, in welchen sie mit entsprechenden, in die Verriegelung einrückbaren Oberflächen (26, 28, 102, 104) an den Zungen (12, 14, 92, 94) in Eingriff gelangen, um ein Entfernen der

Zungen (12, 14, 92, 94) aus dem Schloßgehäuse (10, 90) zu verhindern, und einer Freigabeposition, in welcher die Zungen (12, 14, 92, 94) aus dem Schloßgehäuse (10, 90) entfernbar sind, angeordnet sind, ein Sperrorgan (80) zwischen einer Sperrstellung, in welcher es eine Bewegung der Verriegelungsglieder (40, 42, 108, 110) aus ihren verriegelten Stellungen in ihre Freigabestellungen verhindert, und einer Freigabestellung von Hand bewegbar ist, in welcher die Verriegelungsglieder (40, 42, 108, 110) frei sind, um sich zwischen ihren Verriegelungsstellungen und ihren Freigabestellungen zu bewegen, ein jedes Verriegelungsglied (40, 42, 108, 110) so ausgestaltet ist, daß eine auf eine Zunge (12, 14, 92, 94) in einer Richtung zum Zwecke ihrer Entfernung aus dem Schloßgehäuse (10, 90) ausgeübte Kraft dazu neigt, eine Verschiebung des entsprechenden Verriegelungsglieds (40, 42, 108, 110) von seiner Verriegelungsstellung in seine Freigabestellung zu verursachen, und wobei ein jedes Verriegelungsglied (40, 42, 108, 110) so angeordnet ist, daß es, wenn es sich in seiner Freigabestellung befindet, eine Bewegung des Sperrorgans (80) in seine Sperrstellung verhindert.

2. Schloß nach Anspruch 1, bei welchem die Verriegelungsglieder (40, 42, 108, 110) durch eine Feder (68) gegen ihre Freigabestellungen vorgespannt sind und ein jedes Verriegelungsglied (40, 42, 108, 110) ein Auswerfglied (64, 66) aufweist, welches so gestaltet ist, daß es mit seiner entsprechenden Zunge (12, 14, 92, 94) in Eingriff gelangt, so daß eine Bewegung des Verriegelungsglieds (40, 42, 108, 110) von seiner Verriegelungsstellung zu seiner Freigabestellung die Zunge auswirft und ein Einsetzen oder Einschieben der Zunge (12, 14, 92, 94) das Verriegelungsglied (40, 42, 108, 110) von seiner Freigabestellung in seine Verriegelungsstellung bewegt.

3. Schloß nach Anspruch 1 oder 2, bei welchem jedes Verriegelungsglied einen Verriegelungshebel (40, 42, 108, 110) aufweist, der mit seiner Drehachse (44, 46, 112, 114) in einer mittleren oder Zwischenstellung entlang seiner Längserstreckung angeordnet ist, wobei das eine Ende (52, 54) eines jeden Verriegelungshebels (40, 42, 108, 110) so angeordnet ist, um mit der entsprechenden Zunge (12, 14, 92, 94) in Eingriff zu gelangen, und wobei das andere Ende (56, 58) eines jeden Verriegelungshebels (40, 42, 108, 110) so angeordnet ist, um mit dem Sperrorgan (80) in Eingriff zu gelangen.

4. Schloß nach Anspruch 3, bei welchem ein jeder Verriegelungshebel (40, 42) ein außwärts weisendes, hakenförmiges Gebilde (52, 54) trägt

und eine jede Zunge (12, 14, 92, 94) zwischen einem jeweiligen Verriegelungshebel (40, 42) und einem jeweiligen Abschnitt des Gehäuses (10) einrückt.

5. Schloß nach Anspruch 3, bei welchem ein jeder Verriegelungshebel (108, 110) ein einwärts weisendes hakenförmiges Gebilde (116, 118) trägt und die Zungen (92, 94) zwischen den zwei Verriegelungshebeln (108, 110) einrücken.

Revendications

1. Une boucle pour ceinture de sécurité comprenant un boîtier de boucle (10, 90) et deux languettes (12, 14, 92, 94), le boîtier de boucle (10, 90) contenant un mécanisme de verrouillage présentant une formation de verrouillage (40, 42, 108, 110) pour chaque languette (12, 14, 92, 94), les formations de verrouillage (40, 42, 108, 110) étant agencées en vue d'un déplacement angulaire, autour d'axes de pivot respectifs parallèles espacés entre eux (44, 46, 112, 114), entre des positions de verrouillage dans lesquelles elles sont en prise avec des surfaces respectives de prise de verrouillage (26, 28, 102, 104) sur les languettes (12, 14, 92, 94) pour empêcher l'enlèvement des languettes (12, 14, 92, 94) hors du boîtier de boucle (10, 90) et une position de libération dans laquelle les languettes (12, 14, 92, 94) peuvent être enlevées du boîtier (10, 90) de boucle, un moyen de blocage (80) étant déplaçable manuellement entre une position de blocage dans laquelle il empêche un déplacement des formations de verrouillage (40, 42, 108, 110) depuis leur position verrouillée vers leur position de libération et une position de libération dans laquelle les formations de verrouillage (40, 42, 108, 110) sont libres de se déplacer entre leurs positions de verrouillage et leurs positions de libération, chaque formation de verrouillage (40, 42, 108, 110) étant configurée d'une manière telle qu'une force appliquée à une languette (12, 14, 92, 94) dans une direction tendant à l'enlever du boîtier (10, 90) de boucle tend à provoquer un déplacement de la formation de verrouillage correspondante (40, 42, 108, 110) depuis sa position de verrouillage vers sa position de libération, et chaque formation de verrouillage (40, 42, 108, 110) étant agencée d'une manière telle qu'elle empêche un déplacement du moyen de blocage (80) vers sa position de blocage, lorsqu'elle est dans sa position de libération.

2. Une boucle selon la revendication 1, dans laquelle les formations de verrouillage (40, 42, 108, 110) sont sollicitées vers leurs positions de libé-

ration par un ressort (68) et chaque formation de verrouillage (40, 42, 108, 110) inclut une formation d'éjecteur (64, 66) configurée de façon à venir en prise avec sa languette respective (12, 14, 92, 94) d'une manière telle qu'un déplacement de la formation de verrouillage (40, 42, 108, 110) depuis sa position de verrouillage vers sa position de libération éjecte la languette, et qu'une insertion de la languette (12, 14, 92, 94) déplace la formation de verrouillage (40, 42, 108, 110) de sa position de libération vers sa position verrouillée.

3. Une boucle selon la revendication 1 ou 2, dans laquelle chaque formation de verrouillage comprend un levier de verrouillage (40, 42, 108, 110), monté de manière que son axe de pivotement (44, 46, 112, 114) se trouve à une position intermédiaire sur sa longueur, une extrémité (52, 54) de chaque levier de verrouillage (40, 42, 108, 110) étant agencée pour venir en prise avec la languette correspondante (12, 14, 92, 94) et l'autre extrémité (56, 58) de chaque levier de verrouillage (40, 42, 108, 110) étant agencée pour venir en prise avec le moyen de blocage (80).
4. Une boucle selon la revendication 3, dans laquelle chaque levier de verrouillage (40, 42) porte une formation en crochet tournée vers l'extérieur (52, 54) et chaque languette (12, 14, 92, 94) vient en prise entre un levier respectif de verrouillage (40, 42) et une partie respective du boîtier (10).
5. Une boucle selon la revendication 3 dans laquelle chaque levier de verrouillage (108, 110) porte une formation en crochet tournée vers l'intérieur (116, 118) et les languettes (92, 94) viennent en prise entre les deux leviers de verrouillage (108, 110).

40

45

50

55

Fig. 1.

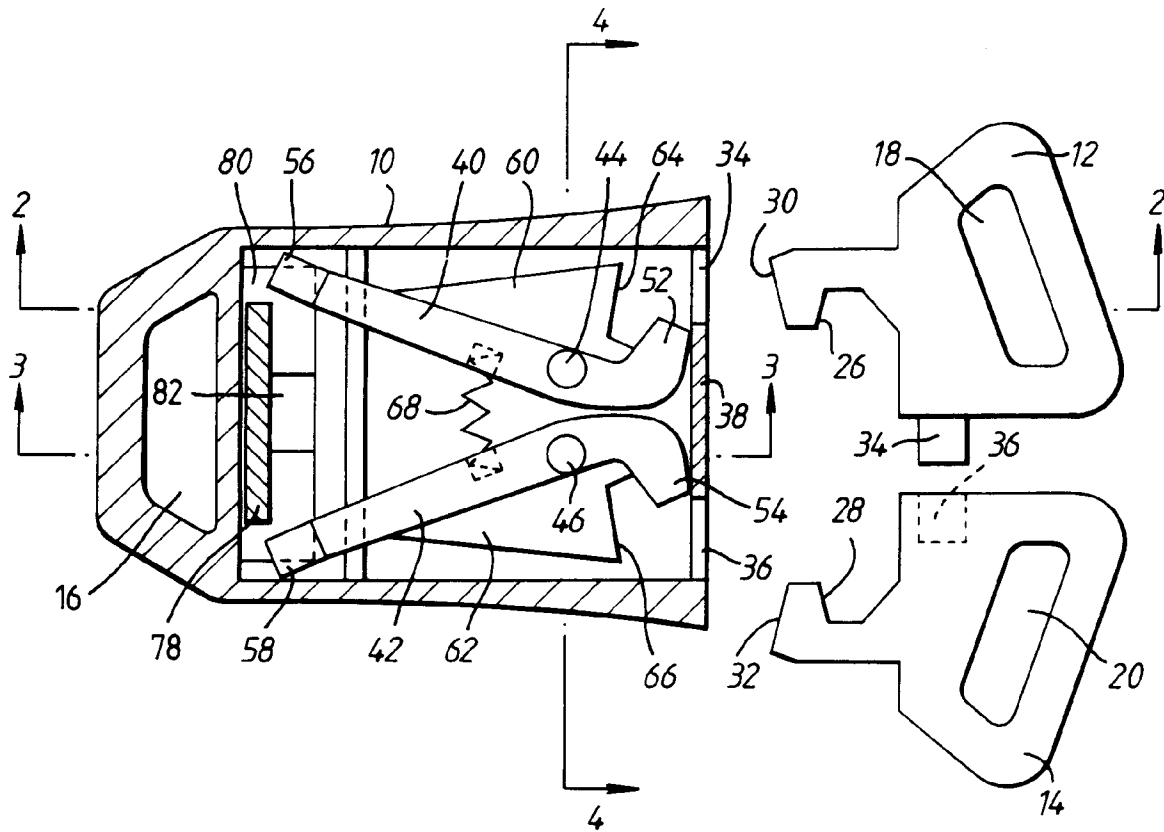


Fig. 2.

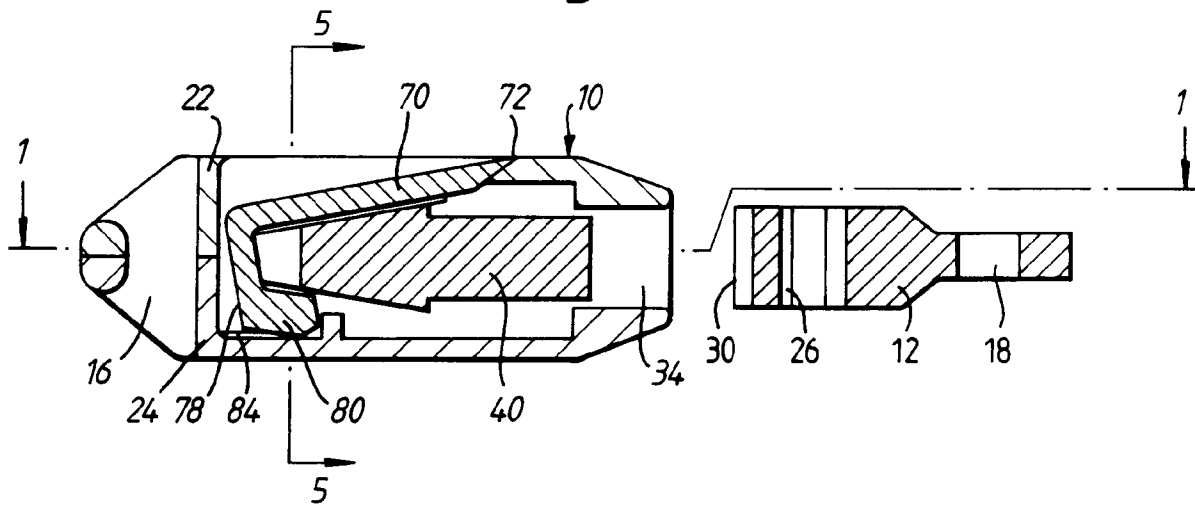


Fig. 3.

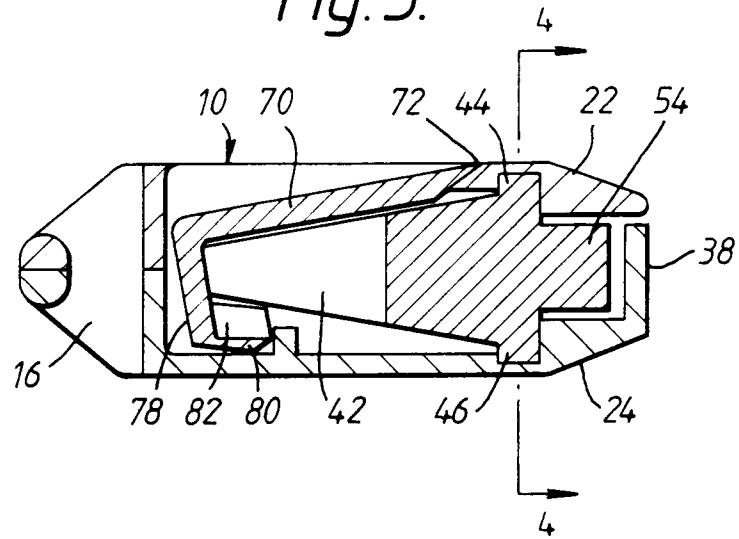


Fig. 4.

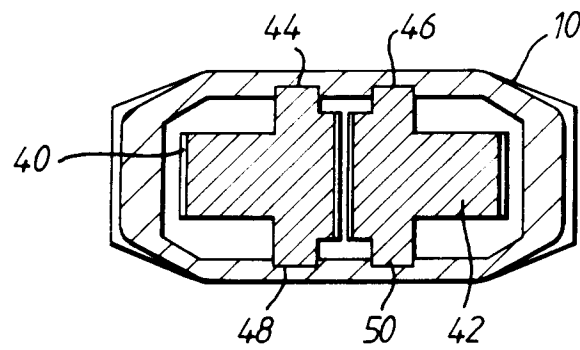


Fig. 5.

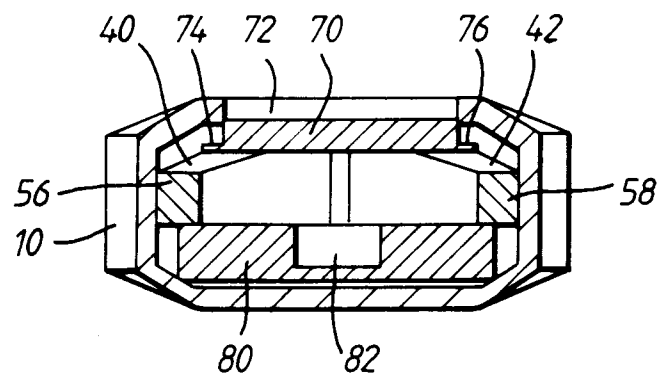


Fig. 6.

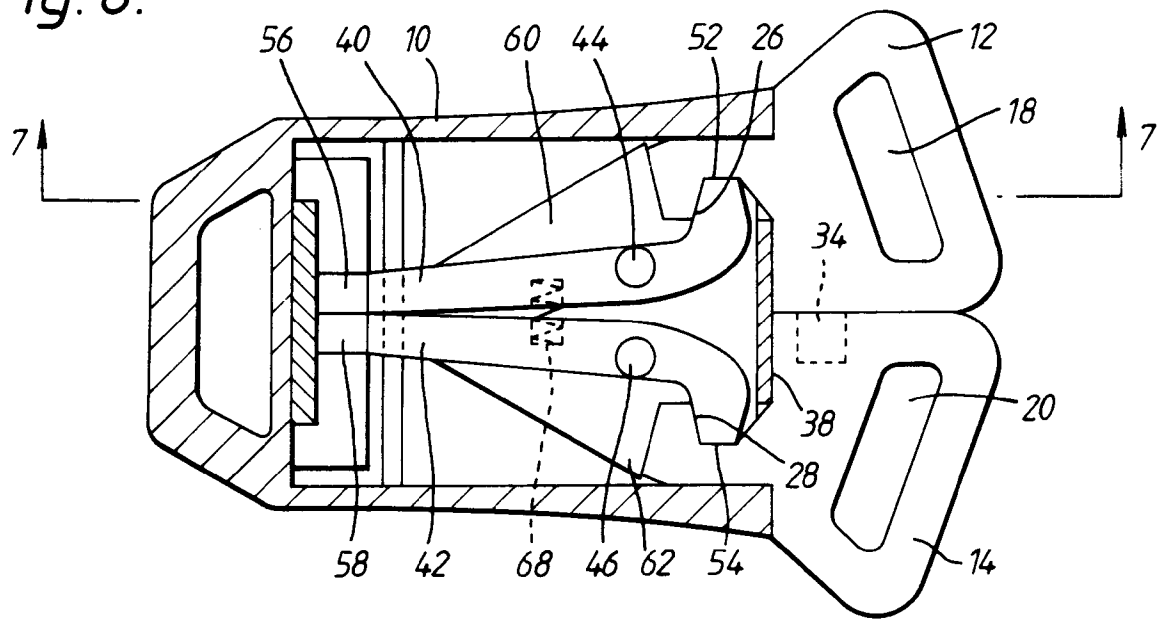


Fig. 7.

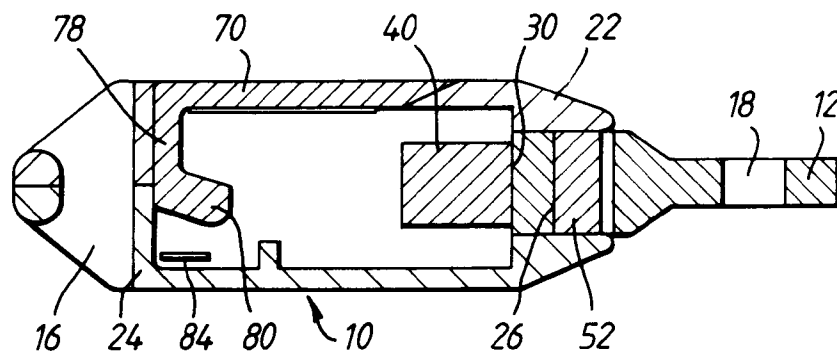


Fig. 8.

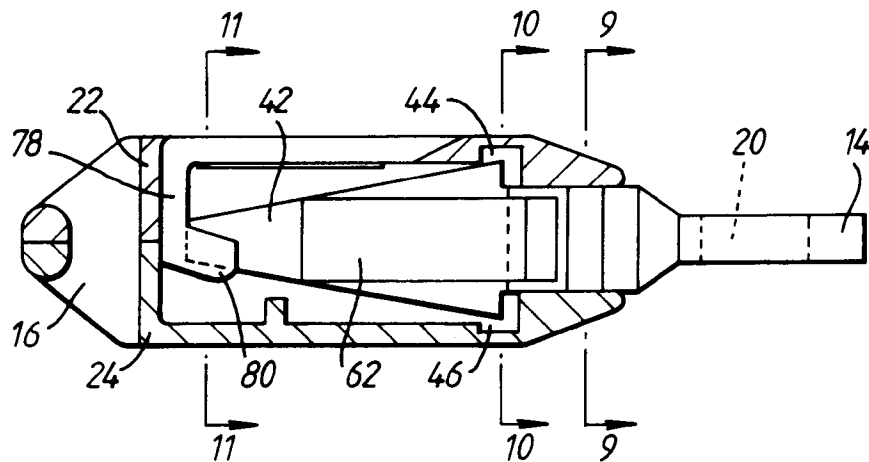


Fig. 9.

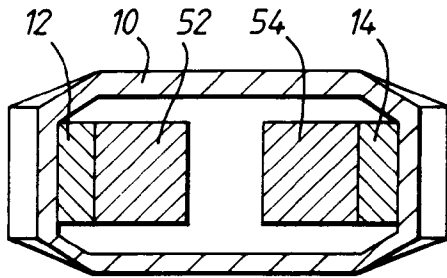


Fig. 10.

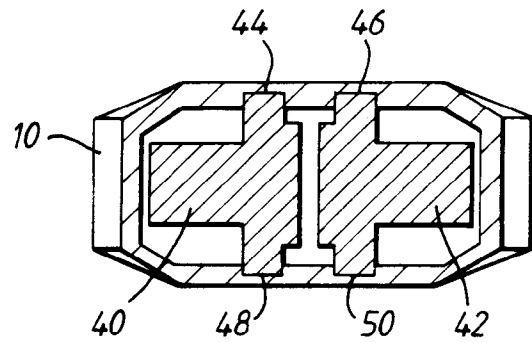


Fig. 11.

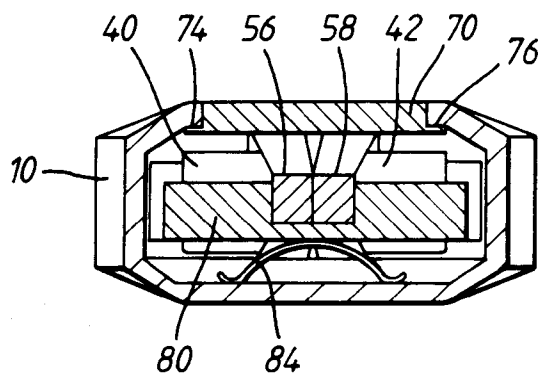


Fig. 12.

