

- (21) Application No **7919814**
(22) Date of filing **7 Jun 1979**
(23) Claims filed **7 Jun 1979**
(30) Priority data
(31) **7806704**
(32) **9 Jun 1978**
(33) **Sweden (SE)**
(43) Application published
16 Jan 1980
(51) **INT CL³**
A44B 11/04
(52) Domestic classification
E2A 400 GRB
(56) Documents cited
GB 1543762
GB 1249675
GB 1061951
GB 999026
(58) Field of search
E2A
(71) Applicant
Sigurd Walter Bengtsson,
Bruksgatan 17, 41451
Goteborg, Sweden
(72) Inventor
Sigurd Walter Bengtsson
(74) Agents
Marks & Clerk

(54) **A strap fastening means**

(57) A strap buckle (10 or 11) comprises a generally planar housing in which at least three bars (18, 19, 20) extend in parallel relationship between opposite side walls for the retention of a strap end (13). A first strap passage extends substantially parallel to the plane of the housing and is defined, at one side by at least one of the bars (18), while the other

side of the passage is defined by the other two bars (19, 20) separated by a second strap passage (24).

The strap end passes through the first strap passage around one of the two further bars (19), in through the second strap passage (24), and out through portion of the first strap passage, between the incoming part of the strap and the other of the two further bars (20).

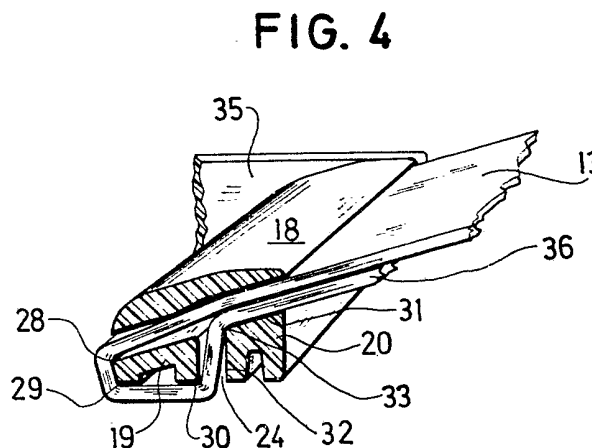
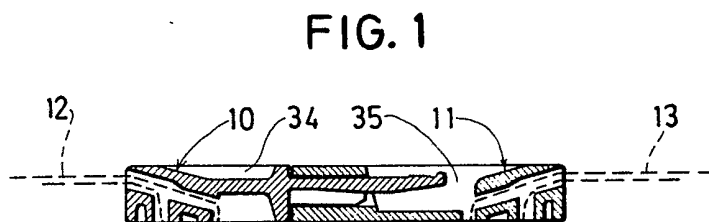


FIG. 1

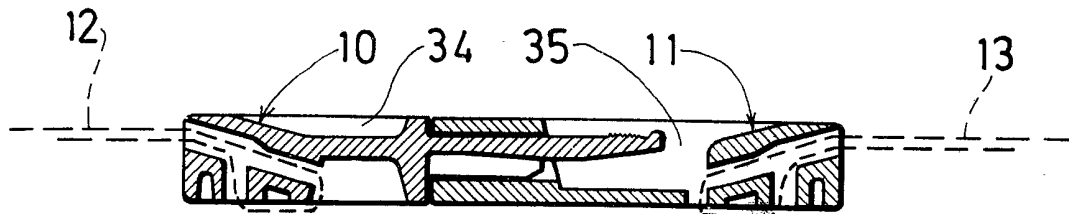


FIG. 2

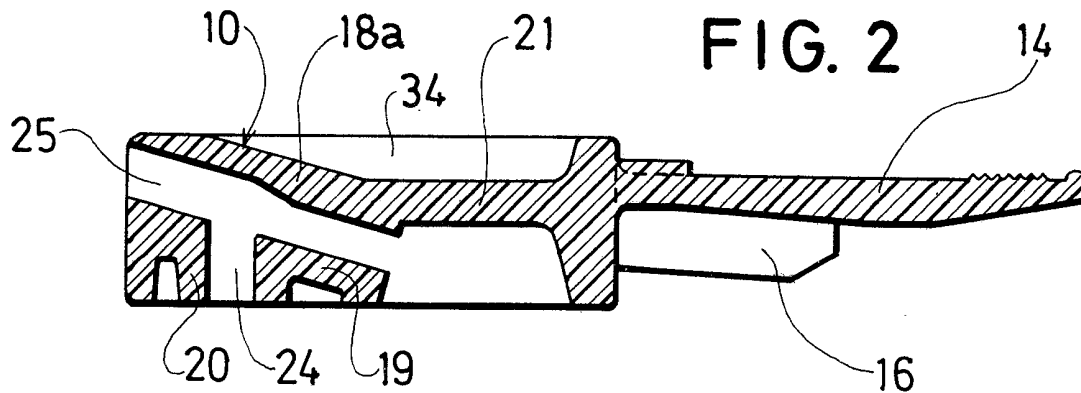


FIG. 3

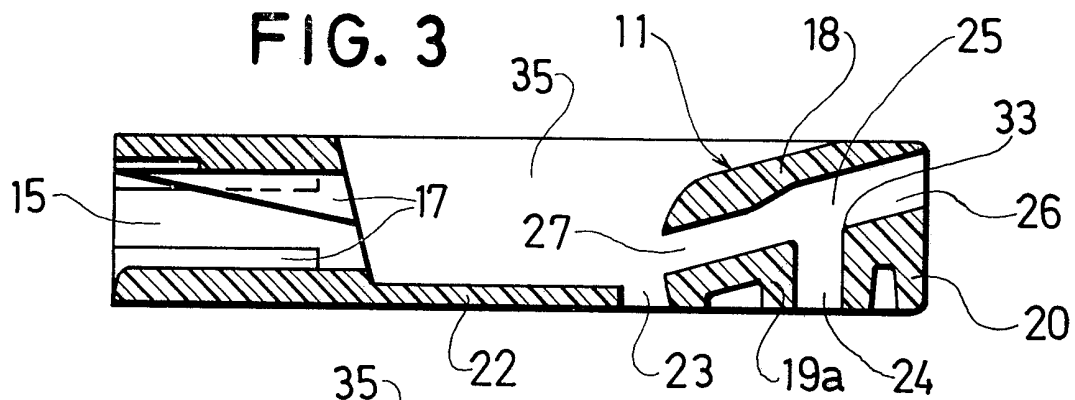
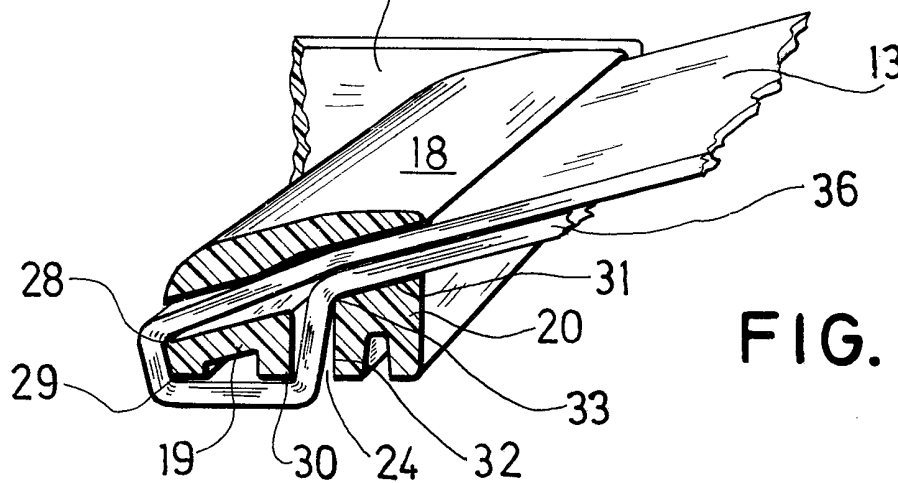


FIG. 4



SPECIFICATION

A strap fastening means

When using a strong strap for various purposes there is usually a demand that the length of the strap be adjustable, and it is also desirable, that the strap shall not slip, even if it is subjected to a heavy load.

In order to prevent slipping of the strap it has been proposed to use buckles provided with dented, or sharp edges, over which the strap was bent. Such action causes wear of the strap after some time of use, the strength of the strap being thus reduced. According to other proposals the strap has been forced to form complicated loops, which however means that no simple and rapid adjustment of the length of the strap can be made. There are buckles including parts which are movable in relation to each other, but those designs create increased production and mounting costs, and are furthermore unsuitable, when heavy loads may occur. There is furthermore a tendency with such buckles to release the grip when the load is removed.

Such a buckle is especially suited to be used with seat belts in cars, and also with certain types of life vests, which are designed to permit lifting of the wearer out of the sea by applying a hoisting device to the vest.

The object of the invention is to provide a means for fastening a strap which is easily adjusted, simple to construct and effective in use in all load conditions.

According to the invention a strap fastening means comprises a substantially planar housing having a locking portion and an attachment portion comprising at least three parallel bars extending between two side walls of the housing and adapted for engagement with said strap, the bars defining a first strap passage extending substantially parallel to the plane of the housing, and two bars located to one side of the first passage are separated by a second strap passage arranged substantially perpendicularly to the plane of the housing.

One bar, located to the side of said first passage opposite to the two further bars preferably has an extension in the direction of said passage corresponding to said two further bars, plus the breadth of the second passage separating the latter.

The second bar remotely located with respect to the entrance end of the first strap passage is preferably defined by plane surfaces, meeting substantially at right angles, at sharp corners.

The surfaces defining the second bar at the outlet end of the first strap passage preferably meet at an angle being less than 90°.

The second bar is preferably dimensioned so that, at a maximum load, it will be elastically deformed so as to decrease the height of the second strap passage. By this means the friction between the strap and the bars will be increased, while simultaneously the second bar, being supported by adjacent bar, will be better suited to

take up heavy loads without any risk of breaking.

The first strap passage preferably is arranged with an inclination with respect to the plane of the housing, so the heights of the second and of the third bars will decrease in the direction from the entrance end of the first strap passage towards its outlet end. This strap passage may however be arranged so that its inclination runs in the opposite direction.

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

Figure 1 shows a strap buckle constructed in accordance with the invention having two interengaging parts.

Figures 2 and 3, on a large scale, show a male and a female component forming part of the buckle shown in Figure 1, and

Figure 4 in a perspective view shows how the strap passes past the three bars.

Figure 1 shows a double strap attaching means forming a buckle including a male part and a female part adapted to be interconnected. Each part is provided with a means 10 and 11, respectively, for the attachment of a strap end 12 or 13 respectively.

The male part 10, and the female part 11 are shown separately in Figures 2 and 3, and have interengaging locking members which however may take the form of a number of known designs. They may for instance be formed as shown in British Design Registration No. 990,008. Each part is formed as a substantially planar housing, the male part having a protruding, resilient tongue 14 which may be slid into a passage 15 in the female part. The tongue 14 is provided with laterally extending projections, which engage mating shoulders on the female part. Separation of the parts is obtainable by pressing the tongue downwards. There are further co-operating grooves and ledges 16 and 17, respectively, on the male and female parts, which govern the male part, while it is being introduced into the female part, and which prevent the parts being fitted together in a position rotated through 180°.

One of the parts, preferably the female one, may be designed in such manner that it may be sewn or riveted to a piece of clothing, or to an object, for instance a harness, where it is desirable to attach a strap.

When there are strap attaching means to both parts of a buckle, as shown in figure 1, it is, on most occasions, sufficient that the length of one of the straps is adjustable. Experience has however shown, that the attaching means is so safe, i.e. the strap will not slide, that it is simpler and cheaper to introduce a strap end into the buckle than sewing or riveting the strap to the buckle in a conventional manner.

The attachment portion proper includes three bars 18, 19 and 20, which extend in parallel between two side walls 34 and 35, in the male part, and in the female part. The shape of bars 18 and 19 will vary somewhat, depending upon the bars being fitted in a male part, or in a female part.

In order to increase the strength, bar 18a will, in a male part, merge into a flat member 21 which, in turn, merges into tongue 14. For the same purpose the female part includes a wall member 22, and bar 19a will be spaced from the latter by a slot 23. Members 21 and 22 have been included, as it is expected, that the buckle shown will be subjected to heavy loads. These members may be disregarded, when the attachment of the straps is concerned. With a lighter expected load there could have been material saving openings instead.

The extension of bar 18 in the plane of the associated housing corresponds to that of the two other bars 19 and 20, plus the breadth of passage 24 separating the same.

There is a further passage 25 between bar 18 and the two bars 19 and 20, said passage running substantially in the plane of the housing in question. In the embodiments shown each passage 25 is designed in such a manner that it, from an entrance end 26, is slightly inclined towards an outlet end 27. The second bar 19 will thus have a lesser height at the outlet end 27 of the passage, than the height of the third bar 20 at the entrance end 26 of the passage.

The height of the strap passage 15 at its entrance end 26 substantially corresponds to twice the thickness of the strap to be used, while passage 25 at its outlet end 27, as well as passage 24, has a height substantially corresponding to the thickness of the strap.

Figure 1 indicates how the strap is fitted into the attachment portion and Figure 4, which may be portion 11, shows the fitting of the strap in more detail.

The strap 13 is introduced into passage 25 at its entrance end 26, and is folded around bar 19, whereupon it is pushed upwards through passage 24, and thereafter passes out through passages 15, on top of bar 20.

The intention is that the issuing strap end shall be forced against the surface defining bar 20 towards passage 25. When the buckle is used on a life vest, or on a harness the strap will be turned away from the plane of the housing (downwardly as shown in the drawing), and it will then be possible to obtain the desired pressure even if passage 25 runs more in parallel to the plane of the housing than is shown in the drawing.

Bar 19 is defined by surfaces, of which one is substantially parallel to the juxtaposed wall at bar 18, and furthermore by surfaces which form substantially 90°-corners 28, 29 and 30, when meeting each other. The surfaces defining bar 19 at the outlet end of passage 25 are preferably arranged so they meet at a corner, which is less than 90°. A first folding and retention of a strap occurs at this corner.

Bar 20 is partly defined by a surface 31, which is substantially parallel with the juxtaposed surface of bar 18, and furthermore by a surface 32, which is turned towards passage 24. Those surfaces meet at a corner 33, being at about 90°.

When the entering part of strap 13 is subjected to tensioning, away from the buckle, the outgoing

end 36 of the strap, will be pressed against side surface 31, which prevents the end part being drawn backwards through the buckle. Bar 19 will be fully enveloped by a loop of the strap, which is retained by friction at corners 28, 29, 30 at bar 19, as well as at corner 33 at bar 20.

The buckle is preferably formed so that bar 19 will be elastically deformed, when the strap is subjected to a heavy load. The strap will then be forced against side surface 32 at bar 20, which initially will increase the retention, but also provides a support for bar 19, which will thus be able to withstand a high load.

An adjustment of the length of the strap is easily brought about by pushing in incoming portion of the strap inwards. This means that the engagement at corners 28, 29, 30 and 33 is released and it will be possible to pull at, or to push in the issuing band end 36, so the useful length of the strap be shortened or extended, as desired.

The embodiment shown is an example only, and variations of the components may be performed within the scope of the appended claims. With life vests and harnesses it may be advantageous to let the buckle have a slightly vaulted shape. It is also possible to arrange passage 25 so it will be inclined in a direction opposite to that shown in the drawing, i.e. so the height of bars 19 and 20 will increase in the direction from the entrance end towards the outlet end.

Bar 18 must not extend the full length of the first strap passage 25, and in order to reduce weight and save material it is possible to substitute the broad bar 18 by two narrower bars, one at the entrance end, and one at the outlet end of passage 25.

CLAIMS

1. A means for fastening a strap comprising a substantially planar housing having a locking portion and an attachment portion comprising at least three parallel bars extending between two side walls of the housing and adapted for engagement with said strap, the bars defining a first strap passage extending substantially parallel to the plane of the housing, and the two bars located to one side of the first passage are separated by a second strap passage arranged substantially perpendicularly to the plane of the housing.

2. A means according to claim 1, wherein a first one of the bars located to one side of the first strap passage has about the same extension as the other two bars located to the opposite side of said passage, plus the breadth of the second strap passage.

3. A means according to either of claims 1 or 2, wherein the first strap passage at its entrance end is located remotely with respect to the locking portion, has a height at least corresponding to twice the thickness of the strap, and the second strap passage has a height substantially corresponding to the thickness of the strap.

4. A means according to either of the

preceeding claims, wherein a second one of the bars remotely located with respect to the entrance end of the first strap passage is defined by plane surfaces, meeting, substantially at right angles at sharp corners.

5 5. A means according to claim 4, wherein the surfaces defining the second bar at the outlet end of the first strap passage meet at an angle being less than 90°C.

10 6. A means according to either of claims 4 or 5, wherein the second one of the bars is dimensioned so that, at a maximum load, it will be elastically deformed so as to decrease the height of the second strap passage.

15 7. A means according to any one of the preceeding claims, wherein the first strap passage

is arranged with an inclination with respect to the plane of the housing, in such a manner that the heights of the second and of the third bars will decrease in the direction from the entrance end of the first strap passage towards its outlet end.

20 8. A means according to any one of the preceeding claims, wherein the first strap passage is inclined with respect to the plane of the housing in such a manner that the heights of the second and the third bars will increase in the direction from the entrance end of the first strap passage towards its outlet end.

25 9. A means for fastening a strap substantially as hereinbefore described with reference to and as shown in the accompanying drawings.