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54 **Buckle for use with ties.**

57 A buckle for securing both ends of a tie in a closed loop comprising a substantially planar base portion, a retaining band extending from said base and dimensioned to accommodate the two ends of said tie, and fastening means comprising at least one locking lug extending from said base adapted to be folded over a portion of a tie within the buckle such that a first end of the tie may be inserted in the buckle through the retaining band and along the base and thereafter folded through 180° under the base and the second end of the tie may be inserted through the retaining band and folded through 180° over the retaining band and thereafter the fastening means bent over to secure said second end, characterised in that the buckle additionally comprises at least one securing lug adapted to be folded over a first end portion of the tie positioned within the buckle thereby preventing displacement of said first end of the tie from the buckle.

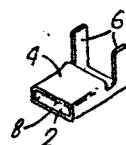


Fig. 1A.

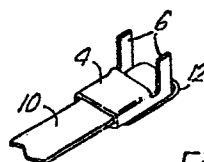


Fig. 1B.

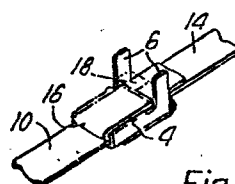


Fig. 1C.

BUCKLE FOR USE WITH TIES

5 This invention relates to a buckle and in particular to a buckle for securing both ends of a tie, e.g. a metal or plastics band, in a closed loop.

 It has become common practice to secure packing cases, cables, pipes and other items by means of a tie
10 which is tensioned and secured in a closed loop. The ties may be in the form of a metal band or ribbon optionally having a plastics coating. The tie is generally secured in a closed loop by means of a metal buckle through which both ends of the tie are inserted
15 and folded back through 180°. Known buckles generally comprise fastening means in the form of lugs which are folded over the tie to secure the ends of the tie. Examples of such securing systems are disclosed in British Patent Specification Nos. 949 230, 1 572 742
20 and 1 583 360 and European Patent Publication No. 19 432.

 Fastening system comprising ties and buckles are commercially available in the form of separate buckles and a roll of metal band which is cut to the
25 desired length. Fastening systems are also available in the form of discrete lengths of tie having a buckle attached to one end. Whilst the latter arrangement is particularly convenient when the fastening system is to be used with standard size packaging it has been found
30 that the buckles often become detached from the ends of the tie. European Patent Publication No. 19 432 discloses a system in which the end of the tie is spot welded to the buckle. Whilst this technique firmly

secures the buckle to the tie it is a labour intensive and costly exercise.

The present invention provides a modified buckle which may be secured to the end of a tie prior
5 to fastening.

According to the invention there is provided a buckle for securing both ends of a tie in a closed loop comprising a substantially planar base portion, a retaining band extending from said base and dimensioned
10 to accommodate the two ends of said tie, and fastening means comprising at least one locking lug extending from said base adapted to be folded over a portion of a tie within the buckle such that a first end of the tie may be inserted in the buckle through the retaining
15 band and along the base and thereafter folded through 180° under the base and the second end of the tie may be inserted through the retaining band and folded through 180° over the retaining band and thereafter the fastening means bent over to secure said second end,
20 characterised in that the buckle additionally comprises at least one securing lug adapted to be folded over a first end portion of the tie positioned within the buckle thereby preventing displacement of said first end of the tie from the buckle.

25 The invention also extends to the combination of a tie and a buckle as defined above, the buckle being attached to the tie by said securing means.

The securing means may comprise one or more securing lugs extending from the base portion which may
30 be bent or crimped over the end of the tie thereby clamping the tie between the base portion and the lugs. This arrangement allows simple and effective attachment of the buckle to one end of the tie and

ensures that the buckle and tie do not become detached prior to fastening. The securing lugs may conveniently be positioned between the retaining band and locking lug(s). However, the invention is not limited to this
5 arrangement and the securing lugs may readily be positioned at either end of the buckle.

In accordance with a further embodiment of the invention the securing lug is positioned at one end of the buckle and is adapted to be folded across the end
10 of the buckle to abut the 180° fold of the first end of the tie thereby preventing displacement of the tie from the buckle.

The invention will now be illustrated with reference to the accompanying drawings, in which:

15 Figures 1A to 1C represent a known buckle showing the mode of fastening to the ends of the tie;

Figure 2 represents an isometric view of a buckle in accordance with the invention;

Figure 3 represents a blank of a buckle in
20 accordance with the invention; and

Figure 4 represents an isometric view of an alternative buckle in accordance with the invention.

Figure 1A shows a known buckle comprising a substantially planar base 2, a retaining band 4 and
25 fastening means comprising two lugs 6 extending from the base. The buckle is produced by folding a blank stamped from metal sheet and has a seam 8 extending longitudinally of the base.

Figure 1B shows the buckle with one end 10 of
30 the tie positioned therein. The end 10 extends through the retaining band 4 along the base 2 of the buckle and is turned back at fold 12 through 180°. Whilst this method of attachment provides an effective fastening

means since upon tensioning the band the buckle will be urged against the fold 12, this procedure does not prevent the buckle sliding down the tie before the other end of the tie is secured to the buckle.

- 5 Figure 1C illustrates the manner in which the buckle is fastened to secure the tie in a closed loop. The second end of the tie 14 is inserted through the retaining band 4 of the buckle and the tie is tensioned to clamp the object(s) around which it is positioned.
- 10 Thereafter the end 14 is turned back through 180° at fold 16 such that the end passes between the lugs 6. Thereafter the lugs 6 are bent over to the position shown in dotted outline at 18. The fastening means prevents the fold 16 from opening thereby ensuring that
- 15 the tie is firmly clamped.

Tensioning tools are commercially available for applying tension to the tie prior to folding the end 14 and for fastening the buckle. It is often necessary to employ a tool for fastening the buckle even when narrow

20 lightweight buckles and ties are employed since the length of the lugs 6 is generally insufficient to provide the necessary leverage to fold the lugs by means of finger or thumb pressure. In the example illustrated the length of the lugs 6 is limited by the

25 fact that the buckle is folded from a blank with the seam running along the base.

Figure 2 illustrates a buckle in accordance with the invention comprising a substantially planar base portion 20, retaining band 22, fastening means

30 comprising a locking lug 24 and a pair of securing lugs 26.

The buckle is made by folding a metal blank as shown in Figure 3. The retaining band 22 is positioned

at one end of the buckle and is produced by folding portions 22a and 22b along fold lines a^1, a^2 and b^1, b^2 , respectively. The securing means 26 is produced by folding portions 26a and 26b along fold lines a^1, a^2 and b^1, b^2 , respectively. In practice, when the buckle is originally formed the fold lines a^1 and a^2 will be completed so that the portions 26a and 26b upstand from the base in a similar manner to lug 24. Upon insertion of the first end of a tie, shown in dotted outline in Figure 2, the lugs 26 are crimped or folded along fold line a^2, b^2 to the position shown in Figure 2 thereby clamping the end of the tie firmly between the base 20 and lugs 26.

The fastening means comprising a lug 24 is formed by folding the portion 24a along fold line b^1 . When both ends of the tie have been inserted in the buckle and turned back through 180° , in a similar manner to that shown in Figure 1C, the fastening means is closed by folding lug 24 along fold line b^2 . A short projection 28 is provided to prevent the end of the tie slipping sideways out of the buckle.

In the embodiment illustrated in Figures 2 and 3 the seam of the buckle is not through the base portion and accordingly the fastening means 24 can comprise a lug of any desired length. In the illustrated embodiment the length of the lug 24 is sufficient such that upon folding along fold line b^2 during the fastening operation the end of the lug will substantially abut the projection 28 such that the ends of the tie are completely surrounded by the fastening means. The length of the lug 24 is sufficient to allow folding along the fold line b^2 by means of finger or thumb pressure. In order to facilitate this action the

amount of metal along the fold line b^2 may be reduced by providing cutaway portions 30 shown in dotted outline in Figure 3. Additionally, the lug 24 may be provided with an extension 32 shown in dotted outline
 5 in Figure 3 to provide a suitable area for application of a finger or thumb pad.

Figure 4 illustrates an alternative embodiment of the invention in which the buckle comprises a substantially planar base portion 20, retaining band
 10 22, locking lug 24 and projection 28 in a similar manner to the buckle of Figure 2. The locking lug 40 is positioned at the end of the buckle and is folded across the buckle to provide a stop preventing displacement of the folded end of the tie shown in
 15 dashed outline, thus securing the buckle to the tie. This arrangement is simple and effective and does not require the locking lug to exert a clamping action on the tie. Thus, the lug 40 may be folded under finger pressure.

20 The buckles of the invention may readily be manufactured by stamping blanks from a strip of sheet metal, e.g. stainless steel, and thereafter folding the blank in the manner described above. The buckle may be dimensioned to accommodate any desired size of tie.

25 The ties for use in the invention are generally in the form of a band of plastics or metal material, e.g. stainless steel. Metal bands may be provided with a plastics coating, e.g. polypropylene.

CLAIMS:

1. A buckle for securing both ends of a tie in a closed loop comprising a substantially planar base portion, a retaining band extending from said base and dimensioned to accommodate the two ends of said tie,
5 and fastening means comprising at least one locking lug extending from said base adapted to be folded over a portion of a tie within the buckle such that a first end of the tie may be inserted in the buckle through the retaining band and along the base and thereafter
10 folded through 180° under the base and the second end of the tie may be inserted through the retaining band and folded through 180° over the retaining band and thereafter the fastening means bent over to secure said second end, characterised in that the buckle
15 additionally comprises at least one securing lug adapted to be folded over a first end portion of the tie positioned within the buckle thereby preventing displacement of said first end of the tie from the buckle.

20

2. A buckle as claimed in Claim 1, characterised in that said at least one locking lug extends from the base and is adapted to be folded over an end of the tie positioned within the buckle thereby clamping said end
25 of the tie between the lug(s) and the base.

3. A buckle as claimed in Claim 2, comprising a pair of locking lugs.

30 4. A buckle as claimed in Claim 1, characterised in that the securing lug is positioned at one end of the buckle and is adapted to be folded across the end of the buckle to abut the 180° fold of the first end of

the tie thereby preventing displacement of the tie from the buckle.

- 5 5. A buckle as claimed in any preceding claim, characterised in that the locking lug extends from the base and is adapted to be folded over the tie positioned within the buckle.
- 10 6. A buckle as claimed in Claim 5, characterised in that the locking lug has a length such that upon folding it extends substantially completely across the width of the buckle.
- 15 7. A buckle as claimed in any preceding claim, characterised in that the locking lug is adapted to be folded by application of finger or thumb pressure.
- 20 8. A buckle as claimed in Claim 7, characterised in that the end of the locking lug has an enlarged portion to provide an area for application of a finger or thumb pad.
- 25 9. A buckle as claimed in any preceding claim, characterised in that the buckle is formed by folding from a blank of sheet metal.
10. A buckle as claimed in Claim 9, characterised in that the base portion does not incorporate a seam.
- 30 11. The combination of a buckle as claimed in any preceding claim and a tie comprising a band of plastics or metal material, characterised in that the band is secured to the buckle by the securing lug.

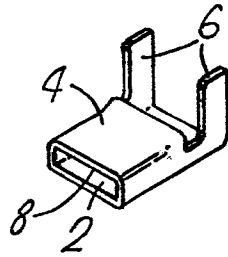
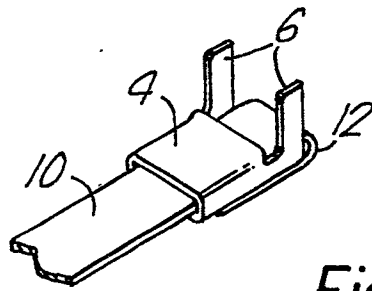
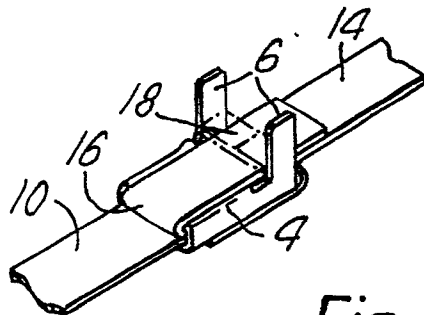
*Fig. 1A.**Fig. 1B.**Fig. 1C.*

Fig. 2.

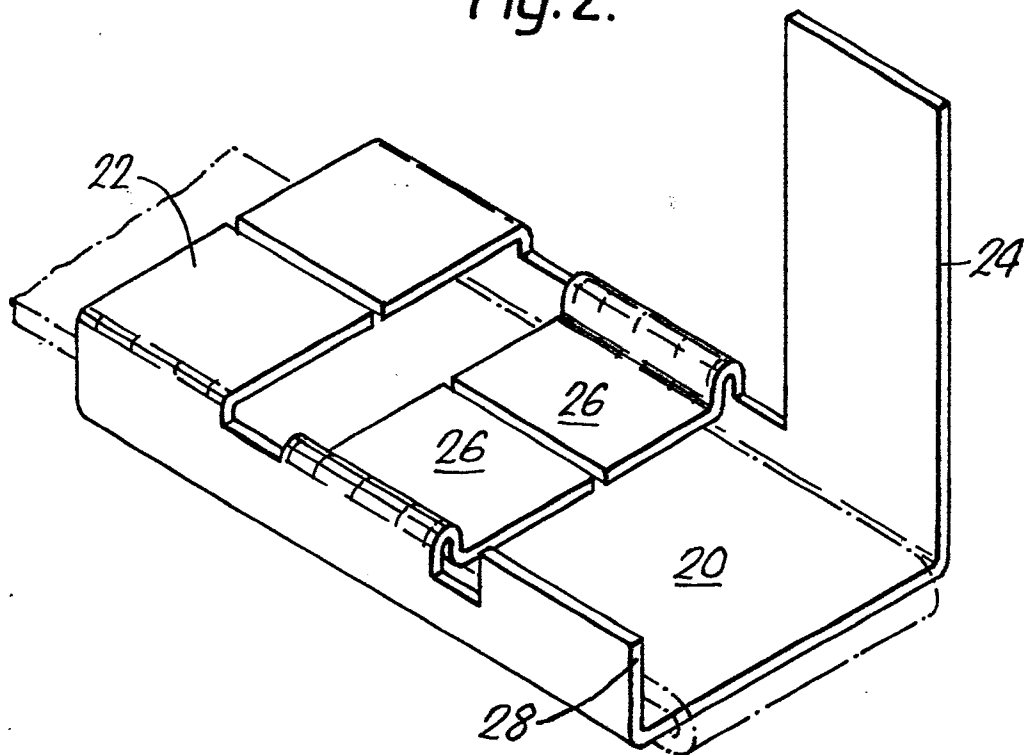


Fig. 4.

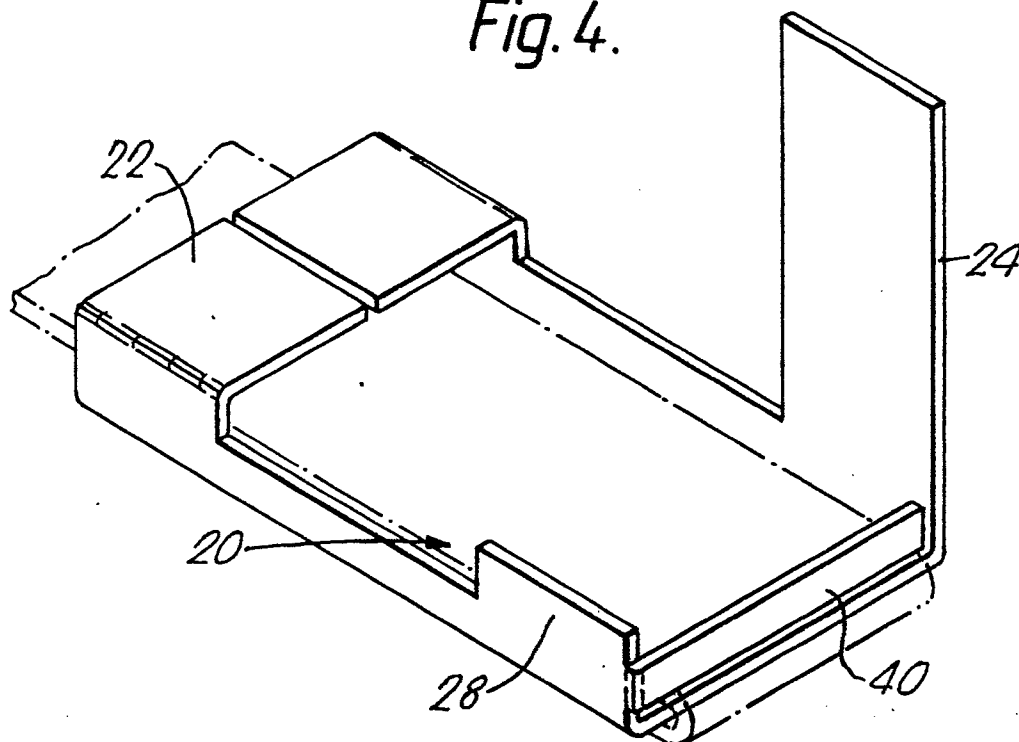


Fig. 3.

