

Description

The present invention relates to an adjustable fastener for use on a garment such as a pair of trousers, a skirt, a jacket or the like, a bag, a cap or some other article for adjustably fastening loose ends of the article or loose ends of a strap attached to the article.

Various adjustable fasteners are known in the art which are attached to garments, bags, caps or other articles for adjustably connecting loose ends of the respective articles. One prior adjustable fastener is shown in Japanese Patent Publication No. 62-33882. The disclosed adjustable fastener is composed of a toothed rail or rack secured to one loose end of a pair of trousers, and a slider connected to the other loose end of the trousers and slidably mounted on the rack, the slider being releasably lockable at a desired position on the rack. This adjustable fastener is defective from the aesthetic point of view because the rack is exposed to view.

Japanese Patent Publication No. 53-32289 and Japanese Patent Laid-open Publication No. 54-88439 disclose adjustable fasteners of the type which comprise a cover strip overlying a rack, and a slider slidably movable on and along the rack without interference with the cover strip and releasably lockable at a desired position on the rack. The slider includes an outwardly extending flap lever having an opening through which the cover strip extends, so that the rack and the slider are concealed by the cover strip, out the flap lever is not. The substantially concealed adjustable fastener is slightly in appearance and the exposed flap lever provides an improved manoeuvrability of the adjustable fastener. The adjustable fastener is however relatively thick or high in profile because of the presence of the cover strip. Yet, the cover strip is susceptible to abrasive wear due to frictional engagement with the flap lever when the slider moves along the rack. Another difficulty is found that since the flap lever is stamped from sheet metal into a bent or curved shape and since it is difficult to be detached from the garment, the flap lever is likely not to be deformed or broken when subjected to force or pressure during ironing of the garment.

FR-A-742 939, on which the preamble to claim 1 is based, discloses an adjustable fastener for interconnecting a first part and a second part, said adjustable fastener comprising: a flat hollow sleeve having a longitudinal guide channel extending from an end of said sleeve, a guide groove extending transversely of and opening to the guide channel, and a first connecting portion for attachment to said first part; a plug having a flat body slidably receivable in said guide channel, first and second rows of teeth extending along opposite longitudinal edges of said body, and a second connecting portion disposed at an end of said body for attachment to said second part; locking means slidably disposed within said guide groove for

locking said plug in said sleeve; and spring means held within said sleeve.

However, the fastener disclosed in FR-A-742 939 is not easy to use, as two locking projections must be pressed simultaneously to disengage the plug from the sleeve.

With the foregoing difficulties in view, the present invention seeks to provide an adjustable fastener which is slightly in appearance per se and hence obviates the need for a cover strip, which is rigid enough to withstand force or pressure applied during ironing of an article in which the adjustable fastener is attached, which is low in profile, and which can be manipulated with utmost ease.

Briefly stated, an adjustable fastener according to the present invention is of the buckle type which is composed of male and female members coupled together and adjustably movable relative to one another.

The present invention is characterised in that said locking means comprises a locking member slidably disposed within said guide groove, first and second pusher heads provided at opposite ends of said locking member, and first and second locking projections disposed adjacent to said first and second pusher heads respectively, said first and second locking projections being releasably engageable with said first and second teeth respectively;

in that said spring means normally acts so as to retain one of said first and second locking projections in locking engagement with a corresponding one of said first and second teeth thereby locking said plug into said sleeve, said other of said first and second locking projections not being in locking engagement with said corresponding other of said first and second teeth, said spring means pressuring said locking member so that one of said first and second pusher heads projects outwardly from said sleeve when said plug is locked in said sleeve;

and in that said locking member is movable along said guide groove against the force of said spring means when said one of said first and second pusher heads which projects from said sleeve is depressed, so as to disengage said one of said first and second locking projections from said corresponding one of said first and second teeth and thereby release said plug from said sleeve.

In use, the adjustable fastener is attached to a garment such as a pair of trousers by connecting the connecting portion of the sleeve and the connecting portion of the plug, respectively, to loose ends of a waistband of the trousers. When the adjustment of the effective length of the waistband is necessary, the pusher head of the locking member is depressed by the user's finger to move the locking member in a direction to disengage the locking projection from one of the teeth on the plug against the force of the spring means. While keeping the depressed condition of the

pusher head, the plug is moved along the guide channel toward a desired position. Upon arrival of the plug at the desired position, the locking member is released whereupon the locking projection is returned to its normal position under the force of the spring means. Thus, the locking projection again engages the one tooth on the plug, hereby holding the plug in the desired position.

According to a preferred embodiment, the teeth on the plug comprise saw-teeth and the locking projection on the locking member comprises a saw-tooth complementary in contour to the saw-teeth on the plug. One of the sleeve and the plug may have a guide recess extending parallel to the direction of movement of said plug, the other of the sleeve and the plug includes a stopper projection slidably received in the guide recess for holding the sleeve and the plug in an assembled condition against accidental detachment.

Figure 1 is a bottom view of an adjustable fastener according to the invention, with a back plate removed for showing the inside of the adjustable fastener;

Figure 2 is a cross-sectional view taken along line II - II of Figure 1;

Figure 3 is a cross-sectional view taken along line III - III of Figure 1;

Figure 4 is a cross-sectional view taken along line IV - IV of Figure 1;

Figure 5A is an exploded perspective view of the adjustable fastener shown in Figure 1;

Figure 5B is a perspective view of a male member or plug of the adjustable fastener shown in Figure 5A as it is viewed from the top of the adjustable fastener;

Figure 6 is a perspective view of the adjustable fastener shown in Figure 5A, with male and female members coupled together;

Figure 7 is a perspective view of a modified adjustable fastener and a retainer associated therewith according to the present invention;

Figure 8 is a perspective view, with part cut away for clarity, of a modified retainer;

Figure 9 is an end elevational view of the retainer shown in Figure 8;

Figure 10 is a perspective view of the adjustable fastener shown in Figure 6 as the fastener is attached to a waistband of a pair of trousers;

Figure 11 is a view similar to Figure 10, but showing a different manner of application of the adjustable fastener according to the present invention;

Figure 12 is a fragmentary perspective view of a sleeve of an adjustable fastener having a modified connecting portion; and

Figure 13 is a plan view, with part in cross section, of the adjustable fastener shown in Figure 12, illustrative of the manner in which the fastener is attached to a waistband.

The present invention will be described hereinbe-

low in greater detail by way of example and with reference to certain preferred embodiments shown in the accompanying drawings. Like reference characters denote like or corresponding parts throughout several views.

As shown in Figures 1 through 6, an adjustable fastener according to the present invention is of the form of an adjustable buckle composed of male and female members coupled together. The female member of the adjustable buckle is composed of a flat hollow socket or sleeve 1 of a substantially rectangular shape having a longitudinal guide channel 4 extending from an end of the sleeve 1 and terminating short of an opposite end of the sleeve 1. The sleeve 1 is composed of a recessed rectangular top plate 2 and a flat rectangular back plate 3 assembled with the top plate 2 to close a recessed side of the top plate 2. The top plate 2 has a longitudinal recess substantially constituting the guide channel 4, and a transverse guide groove 6 extending perpendicular to and opening toward the longitudinal guide channel 4. The sleeve 1 further has a connecting portion 5 integrally formed with the top plate 2 at the opposite end of the sleeve 1, and a pair of openings 7 contiguous to opposite ends, respectively, of the transverse guide groove 6.

The male member of the adjustable buckle comprises a flat plug 8 which can be coupled with the sleeve 1. The plug 8 includes a substantially rectangular body 9, a narrow locking leg 10 extending from an end of the body 9, and a connecting portion 11 at an opposite end of the body 9. The locking leg 10 and the body 9 are slidably received in the guide channel 4 in the sleeve 1 while the C-shaped ring connector 11 is disposed outside the sleeve 1. The plug 8 further has a pair of rows of first and second teeth 12, 13 disposed on and extending along opposite longitudinal edges of the locking leg 10. The first and second teeth 12, 13 are in the form of saw-teeth each having a straight edge extending transverse to the locking leg 10 and facing toward the connecting portion 11, and an inclined edge facing away from the connecting portion 11. The first and second teeth 12, 13 are not used at the same time, but either one of them is used depending upon selection determined by the mode of attachment of the adjustable fastener to an article, as described later on. It is therefore possible to omit one row of saw-teeth 12 or 13 when the mode of attachment of the adjustable fastener is fixed.

The plug 8 has in its underside an elongate longitudinal recess 14 in which a stopper projection 15 on an inner surface of the back plate 3 is received for holding the plug 8 in position against accidental removal from the sleeve 1. The recess 14 and the stopper projection 15 may be omitted when the sleeve 1 and the plug 8 are intended for releasable coupling.

In the illustrated embodiment, the connecting portions 5, 11 of the sleeve 1 and the plug 8 are formed of generally C-shaped ring connectors. The

C-shaped ring connectors 5, 11 may be replaced with O-ring connectors.

The illustrated adjustable buckle is used on a pair of trousers for adjustably connecting a loose end of a waistband to adjust the effective length of the waistband, hence the sleeve 1 and the plug 8 are bent or curved so as to substantially conform to a curve of the waistband when the user wears the trousers.

The adjustable buckle further includes a locking member 16 slidably received within the guide groove 6 and movable in a direction perpendicular to the direction of movement of the plug 8. The locking member 16 has a hat-like shape in cross section and has a pair of pusher heads 17, 18 at opposite ends thereof, as shown in Figure 4. The locking member 16 is disposed astride the locking leg 10 of the plug 8, with the pusher heads 17, 18 disposed in registry with the respective openings 7 in the sleeve 1. The locking member 16 further has a pair of rows of first and second locking projections 19, 20 disposed on and along confronting inner edges of the respective pusher heads 17, 18 for locking engagement with the teeth 12, 13 on the plug 8. The locking projections 19, 20 comprise saw-teeth complementary in shape with the saw-teeth 12, 13 on the plug 8. The locking member 16 further has a pair of parallel spaced longitudinal recesses 21, 22 extending from opposite ends in staggered relation to one another. A compression coil spring 23 is disposed in the recess 21 and acts between the sleeve 1 and the locking member 16 for urging the latter in a direction to retain the locking saw-teeth 19 in locking engagement with the saw-teeth 12 on the plug 8. In this locking position, the pusher head 18 projects from the corresponding opening 7 to the outside of the sleeve 1.

Likewise one row of saw-teeth 12 or 13 on the plug 8 and one row of locking saw-teeth 19 or 20 on the locking member 16, one of the openings 7 in the sleeve 1 and one of the recesses 21 or 22 in the locking member 16 can be omitted depending on the mode of application of the adjustable buckle.

When the pusher head 18 is depressed against the force of the spring 23, the locking saw-teeth 19 are released from the locking engagement with the saw-teeth 12 of the plug 8, thereby allowing sliding movement of the plug 8 along the guide channel 4 in the sleeve 1. A further movement of the locking member 16 causes the locking saw-teeth 20 to be engaged with the saw-teeth 13 on the plug 8, thus preventing movement of the plug 8 relative to the sleeve 1. In order to prevent this undesired engagement between the locking saw-teeth 20 and the saw-teeth 13, there is provided a stopper 24 for limiting the movement of the locking member 16 to a certain predetermined range. The stopper 24 is disposed within the guide groove 6 adjacent to the pusher head 17, as shown in Figure 4. The stopper 24 thus provided is engageable with the locking member 16 to limit movement of

the locking member 16 in a direction opposite to the direction of the force of the spring 23. The stopper 24 may be formed integrally with the sleeve 1 if the adjustable buckle is used in the fixed mode of application in which the pusher head 18 projects outwardly from the sleeve 1. On the other hand, when the adjustable buckle is used in an inverted mode of application in which the pusher head 17 projects outwardly of the sleeve 1, then the stopper 24 is disposed adjacent to the pusher head 18 to limit movement of the locking member 16 within the predetermined range when the pusher head 17 is depressed.

The connecting portion in the form of a C-shaped connector ring 5 may be replaced with a plurality (four in the illustrated embodiment) of prongs 5a projecting from a rectangular back plate 3a of a sleeve 1a, the prongs 5a being disposed adjacent to the respective corners of the back plate 3a. For attachment of the sleeve 1a to an article such as a pair of trousers, the prongs 5a pierce the fabric of the trousers and openings 25 in a retainer plate 26 thereon and are clinched to the retainer plate 26. The retainer plate 26 is curved at the same radius of curvature as the back plate 3a of the sleeve 1a. The retainer plate 26 may be replaced with a flat hollow retainer 26' shown in Figures 8 and 9. The hollow retainer 26' is formed from an elongate sheet of metal longitudinally bent or folded over itself with an elongate guide slot 27 defined between upper and lower plates of the folded sheet metal. The retainer 26' includes a pair of inclined guide flaps 28 extending along opposite longitudinal edges of the lower plate and projecting outwardly therefrom for guiding the prongs 5a smoothly therealong into the guide slot 27 when the prongs 5a are clinched with the retainer 26'. Then, the guide flaps 28 are bent inwardly against the prongs 5a. Since the guide slot 27 has a width W1 substantially the same as or slightly larger than the maximum distance W2 (Figure 7) between two adjacent prongs 5a, the prongs 5a are held firmly in the retainer 26' without wobbling.

When the adjustable buckle shown in Figures 1 through 6 is to be attached to a pair of trousers for adjusting the effective length of a waistband, as shown in Figure 10, the C-shaped ring connector 5 of the sleeve 1 is connected to a first belt or strap 31 secured by sewing stitches to an upper part 29 of the waistband, while the C-shaped ring connector 11 of the plug 8 is connected to a second belt or strap 32 secured by sewing stitches to a lower part 30 of the waistband,

The adjustable buckle thus attached operates as follows. The push head 18 of the locking member 16 is pushed by the user's finger against the force of the spring 23 to cause the locking saw-teeth 19 to disengage from the saw-teeth 12 on the plug 8. While keeping the depressed condition of the locking member 16, the plug 8 is moved along the guide channel 4 toward a desired position in the sleeve 1. Upon arrival to the

desired position, the user releases the locking member 16 so that the locking member 16 is automatically returned to its normal position under the force of the spring 23. Thus, the locking saw-teeth 19 on the locking member 16 again engage the saw-teeth 12 on the plug 8 thereby holding the plug 8 in position against movement relative to the sleeve 1.

The adjustable buckle may be attached to the waistband in a different manner such as shown in Figure 11, in which the C-shaped ring connector 5 of the sleeve 1 is connected to the second strap 32 while the C-shaped ring connector 11 of the plug 8 is connected to the first strap 31. In this instance, the pusher head 17 (Figure 1) of the locking member 16 is disposed outside of the sleeve 1. This arrangement is achieved by displacing the spring 23 from the recess 21 to the recess 22 in the locking member 16 and placing the stopper 24 adjacent to the pusher head 18.

Figures 12 and 13 show a modified sleeve 1b having a stepped C-shaped ring connector 5b extending in a place which is offset outwardly from the back plate of the sleeve 1b. For attachment, the stepped C-shaped ring connector 5b passes through a slit 33 in the lower part 30 of the waistband from the front side to the rear side of the lower part 30. When the socket 1b is used in combination with the plug 8 shown in Figure 10, the connecting portions 5, 11 are concealed by the lower and upper parts of 30, 29 of the waistband, with the result that the overall appearance of the adjustable fastener is improved.

As described above, the adjustable fastener, composed of a thin flat sleeve 1 and a flat plug 8 slidably received therein, is low in profile and slight in appearance. Furthermore, the plug 8 and the locking member 16 received in the sleeve 1 are substantially free from damage. The adjustable fastener is rigid enough to withstand force and pressure applied when ironing the trousers. With the provision of two rows of saw-teeth 12, 13, two rows of locking saw-teeth 19, 20, two recesses 21 and a stopper 24 structurally separated from the sleeve 1, the mode of application of the adjustable fastener can be changed only by changing the position of the spring 23 and the stopper 24. This arrangement is particularly useful when two adjustable fasteners are attached to the waistband at diametrically opposite portions thereof, with the respective locking members partly projecting outwardly of the corresponding sleeve in the same direction. When the trousers or the other article is subjected to cleaning, the adjustable fastener having C-shaped ring connectors 5, 11 can be detached from the article by removing looped portions of the respective straps 31, 32 from the C-shaped ring connectors 5, 11.

Claims

1. An adjustable fastener for interconnecting a first part and a second part, said adjustable fastener comprising:- a flat hollow sleeve (1) having a longitudinal guide channel (4) extending from an end of said sleeve (1), a guide groove (6) extending transversely of and opening to the guide channel (4), and a first connecting portion (5) for attachment to said first part;

a plug (8) having a flat body (9) slidably receivable in said guide channel (4), first and second rows of teeth (12, 13) extending along opposite longitudinal edges of said body (9), and a second connecting portion (11) disposed at an end of said body (9) for attachment to said second part;

locking means slidably disposed within said guide groove (6) for locking said plug (8) in said sleeve (1);

and spring means (23) held within said sleeve (1);

said adjustable fastener being characterised in that said locking means comprises a locking member (16) slidably disposed within said guide groove (6), first and second pusher heads (17, 18) provided at opposite ends of said locking member (16), and first and second locking projections (19, 20) disposed adjacent to said first and second pusher heads (17, 18) respectively, said first and second locking projections (19, 20) being releasably engageable with said first and second teeth (12, 13) respectively;

in that said spring means (23) normally acts so as to retain one of said first and second locking projections (19, 20) in locking engagement with a corresponding one of said first and second teeth (12, 13) thereby locking said plug (8) into said sleeve (1), said other of said first and second locking projections not being in locking engagement with said corresponding other of said first and second teeth (12, 13), said spring means (23) pressuring said locking member (16) so that one of said first and second pusher heads (17, 18) projects outwardly from said sleeve (1) when said plug (8) is locked in said sleeve (1);

and in that said locking member (16) is movable along said guide groove (6) against the force of said spring means (23) when said one of said first and second pusher heads (17, 18) which projects from said sleeve (1) is depressed, so as to disengage said one of said first and second locking projections (19, 20) from said corresponding one of said first and second teeth (12, 13) and thereby release said plug (8) from said sleeve (1).

2. An adjustable fastener according to claim 1, wherein said locking member (16) has a recess



desired position, the user releases the locking member 16 so that the locking member 16 is automatically returned to its normal position under the force of the spring 23. Thus, the locking saw-teeth 19 on the locking member 16 again engage the saw-teeth 12 on the plug 8 thereby holding the plug 8 in position against movement relative to the sleeve 1.

The adjustable buckle may be attached to the waistband in a different manner such as shown in Figure 11, in which the C-shaped ring connector 5 of the sleeve 1 is connected to the second strap 32 while the C-shaped ring connector 11 of the plug 8 is connected to the first strap 31. In this instance, the pusher head 17 (Figure 1) of the locking member 16 is disposed outside of the sleeve 1. This arrangement is achieved by displacing the spring 23 from the recess 21 to the recess 22 in the locking member 16 and placing the stopper 24 adjacent to the pusher head 18.

Figures 12 and 13 show a modified sleeve 1b having a stepped C-shaped ring connector 5b extending in a place which is offset outwardly from the back plate of the sleeve 1b. For attachment, the stepped C-shaped ring connector 5b passes through a slit 33 in the lower part 30 of the waistband from the front side to the rear side of the lower part 30. When the socket 1b is used in combination with the plug 8 shown in Figure 10, the connecting portions 5, 11 are concealed by the lower and upper parts of 30, 29 of the waistband, with the result that the overall appearance of the adjustable fastener is improved.

As described above, the adjustable fastener, composed of a thin flat sleeve 1 and a flat plug 8 slidably received therein, is low in profile and slight in appearance. Furthermore, the plug 8 and the locking member 16 received in the sleeve 1 are substantially free from damage. The adjustable fastener is rigid enough to withstand force and pressure applied when ironing the trousers. With the provision of two rows of saw-teeth 12, 13, two rows of locking saw-teeth 19, 20, two recesses 21 and a stopper 24 structurally separated from the sleeve 1, the mode of application of the adjustable fastener can be changed only by changing the position of the spring 23 and the stopper 24. This arrangement is particularly useful when two adjustable fasteners are attached to the waistband at diametrically opposite portions thereof, with the respective locking members partly projecting outwardly of the corresponding sleeve in the same direction. When the trousers or the other article is subjected to cleaning, the adjustable fastener having C-shaped ring connectors 5, 11 can be detached from the article by removing looped portions of the respective straps 31, 32 from the C-shaped ring connectors 5, 11.

Claims

1. An adjustable fastener for interconnecting a first part and a second part, said adjustable fastener comprising:- a flat hollow sleeve (1) having a longitudinal guide channel (4) extending from an end of said sleeve (1), a guide groove (6) extending transversely of and opening to the guide channel (4), and a first connecting portion (5) for attachment to said first part;

a plug (8) having a flat body (9) slidably receivable in said guide channel (4), first and second rows of teeth (12, 13) extending along opposite longitudinal edges of said body (9), and a second connecting portion (11) disposed at an end of said body (9) for attachment to said second part;

locking means slidably disposed within said guide groove (6) for locking said plug (8) in said sleeve (1);

and spring means (23) held within said sleeve (1);

said adjustable fastener being characterised in that said locking means comprises a locking member (16) slidably disposed within said guide groove (6), first and second pusher heads (17, 18) provided at opposite ends of said locking member (16), and first and second locking projections (19, 20) disposed adjacent to said first and second pusher heads (17, 18) respectively, said first and second locking projections (19, 20) being releasably engageable with said first and second teeth (12, 13) respectively;

in that said spring means (23) normally acts so as to retain one of said first and second locking projections (19, 20) in locking engagement with a corresponding one of said first and second teeth (12, 13) thereby locking said plug (8) into said sleeve (1), said other of said first and second locking projections not being in locking engagement with said corresponding other of said first and second teeth (12, 13), said spring means (23) pressuring said locking member (16) so that one of said first and second pusher heads (17, 18) projects outwardly from said sleeve (1) when said plug (8) is locked in said sleeve (1);

and in that said locking member (16) is movable along said guide groove (6) against the force of said spring means (23) when said one of said first and second pusher heads (17, 18) which projects from said sleeve (1) is depressed, so as to disengage said one of said first and second locking projections (19, 20) from said corresponding one of said first and second teeth (12, 13) and thereby release said plug (8) from said sleeve (1).

2. An adjustable fastener according to claim 1, wherein said locking member (16) has a recess



(21) extending from an opposite end of said locking member (16) and terminating short of said one end of said locking member (16), said spring means (23) comprising a compression coil spring disposed within said recess (21).

3. An adjustable fastener according to claim 1, wherein said locking member (16) has a first recess (21) extending from one end of said locking member and terminating short of an opposite end of said locking member (16) and a second recess (22) extending from an opposite end of said locking member (16) and terminating short of said one end of said locking member (16), said spring means (23) comprising a compression coil spring disposed within one of said first and second recesses (21, 22).
4. An adjustable fastener according to any preceding claim, said teeth (12, 13) on said plug (8) comprise sawteeth each having a straight edge extending transverse to the direction of movement of said plug (8) and an inclined edge facing in a direction away from said one end of said sleeve (1), said locking projection (19, 20) on said locking member (16) comprising a saw-tooth complementary in contour to said saw-teeth (12, 13) on said plug (8).
5. An adjustable fastener according to any preceding claim and further comprising a stopper (24) disposed within said guide groove (6) adjacent to the other of said first and second pusher heads (17, 18) and engageable with said locking member (16) to limit the movement of said locking member (16) when said one of said first and second pusher heads (17, 18) is depressed and thereby to prevent said other of said first and second locking projections (19, 20) from engaging with the corresponding other of said teeth (12, 13) when said one of said first and second pusher heads (17, 18) is depressed.
6. An adjustable fastener according to any preceding claim, one of said sleeve (1) and said plug (8) having a guide recess (14) extending parallel to the direction of movement of said plug (8), the other of said sleeve (1) and said plug (8) having a stopper projection (15) slidably receivable in said guide recess (14) for holding the sleeve (1) and said plug (8) in an assembled condition against accidental detachment.
7. An adjustable fastener according to any preceding claim, said connecting portion (5) of said sleeve (1) comprising a substantially C-shaped ring connector disposed at an opposite end of said sleeve (1), said connecting portion (11) of

said plug (8) comprising a generally C-shaped ring connector.

8. An adjustable fastener according to any preceding claim, said connecting portion (5a) of said sleeve (1a) comprising a plurality of prongs projecting from an underside of said sleeve (1a) for piercing said first part, said connecting portion (11) of said plug (8) comprising a substantially C-shaped ring connector, said connecting portion of said sleeve (1a) further including a retainer (26, 26') to which said prongs are clinched with said first part disposed between said sleeve (1a) and said retainer (26, 26').
9. An adjustable fastener according to claim 8, said retainer (26) having a plurality of openings (25) for the passage therethrough of the respective prongs (5a) when said prongs (5a) are clinched with said retainer (26).
10. An adjustable fastener according to claim 8, said retainer (26) having a hollow construction and having an internal slot (27) and a pair of inclined guide flaps (28) disposed adjacent to opposite open ends of said slot (27) for guiding said prongs (5a) into said slot (27) when said prongs (5a) are clinched with said retainer (26').

Patentansprüche

1. Einstellbarer Verschluss zum Verbinden eines ersten Teils und eines zweiten Teils, wobei der einstellbare Verschluss umfaßt: eine flache hohle Hülse (1) mit einem längsgerichteten Führungskanal (4), der sich von einem Ende der Hülse (1) erstreckt, einer Führungsnut (6), die quer zu dem Führungskanal (4) verläuft und in diesen mündet, und einem ersten Verbindungsbereich (5) zur Befestigung an dem ersten Teil;
einen Stecker (8) mit einem flachen Körper (9), der in den Führungskanal (4) verschiebbar einsetzbar ist, ersten und zweiten Reihen von Zähnen (12, 13), die sich entlang den gegenüberliegenden Längsrändern des Körpers (9) erstrecken, und einem zweiten Verbindungsbereich (11), der an einem Ende des Körpers (9) zur Befestigung an dem zweiten Teil angeordnet ist;
Verriegelungsmittel, die in der Führungsnut (6) verschiebbar angeordnet sind zum Verriegeln des Steckers (8) in der Hülse (1);
und Federmittel (23), die in der Hülse (1) gehalten sind;
dadurch gekennzeichnet, daß die Verriegelungsmittel ein Verriegelungsteil (16), das in der Führungsnut (6) verschiebbar angeordnet ist, erste und zweite Druckköpfe (17, 18), die an ge-



genüberliegenden Enden des Verriegelungsteils (16) vorgesehen sind, und erste und zweite Sperrvorsprünge (19, 20) umfassen, die neben dem ersten bzw. zweiten Druckkopf (17, 18) angeordnet sind, wobei die ersten und zweiten Sperrvorsprünge (19, 20) mit den ersten und zweiten Zähnen (12, 13) lösbar in Eingriff bringbar sind;

daß die Federmittel (23) normalerweise wirksam sind, um einen der ersten und zweiten Sperrvorsprünge (19, 20) mit einem zugeordneten ersten oder zweiten Zahn (12, 13) in Sperr-eingriff zu halten, um dadurch den Stecker (8) in der Hülse (1) zu verriegeln, wobei der andere der ersten und zweiten Sperrvorsprünge mit dem zugeordneten anderen ersten und zweiten Zahn (12, 13) nicht in Verriegelungseingriff steht, wobei die Federmittel (23) das Verriegelungsteil (16) so belasten, daß einer der ersten und zweiten Druckköpfe (17, 18) von der Hülse (1) nach außen ragt, wenn der Stecker (8) in der Hülse (1) verriegelt ist;

und daß das Verriegelungsteil (16) gegen die Kraft der Federmittel (23) längs der Führungsnut (6) bewegbar ist, wenn einer der ersten und zweiten Druckköpfe (17, 18), der aus der Hülse (1) herausragt, gedrückt wird, um den besagten einen der ersten und zweiten Sperrvorsprünge (19, 20) mit dem zugeordneten einen ersten und zweiten Zahn (12, 13) außer Eingriff zu bringen und dadurch den Stecker (8) von der Hülse (1) zu trennen.

2. Einstellbarer Verschluss nach Anspruch 1, wobei das Verriegelungsteil (16) eine Ausnehmung (21) hat, die von einem gegenüberliegenden Ende des Verriegelungsteils (16) ausgeht und kurz vor dem besagten einen Ende des Verriegelungsteils (16) endet, wobei die Federmittel (23) aus einer in dieser Ausnehmung (21) angeordneten Schraubendruckfeder bestehen.
3. Einstellbarer Verschluss nach Anspruch 1, wobei das Verriegelungsteil (16) eine erste Ausnehmung (21) hat, die von einem Ende des Verriegelungsteils ausgeht und am gegenüberliegenden Ende des Verriegelungsteils (16) endet, und eine zweite Ausnehmung (22) hat, die von einem gegenüberliegenden Ende des Verriegelungsteils (16) ausgeht und kurz vor dem besagten einen Ende des Verriegelungsteils (16) endet, wobei die Federmittel (23) aus einer Schraubendruckfeder bestehen, die in einer der ersten und zweiten Ausnehmungen (21, 22) angeordnet ist.
4. Einstellbarer Verschluss nach einem der vorhergehenden Ansprüche, wobei die Zähne (12, 13) an dem Stecker (8) aus Sägezähnen bestehen,

die jeweils eine quer zu der Bewegungsrichtung des Steckers (8) verlaufende gerade Kante und eine von dem besagten einen Ende der Hülse abgekehrte geneigte Kante haben, wobei der Sperrvorsprung (19, 20) des Verriegelungsteils (16) aus einem Sägezahn besteht, der eine zu dem Sägezahn (12, 13) des Steckers (8) komplementäre Kontur hat.

5. Einstellbarer Verschluss nach einem der vorhergehenden Ansprüche und ferner umfassend einen Anschlag (24), der in der Führungsnut (6) nahe dem anderen der ersten und zweiten Druckköpfe (17, 18) angeordnet und mit dem Verriegelungsteil (16) in Eingriff bringbar ist, um die Bewegung des Verriegelungsteils (16) zu begrenzen, wenn der eine der ersten und zweiten Druckköpfe (17, 18) gedrückt wird, um dadurch den anderen der ersten und zweiten Sperrvorsprünge (19, 20) am Eingriff mit dem zugeordneten anderen Zahn (12, 13) zu hindern, wenn der eine der ersten und zweiten Druckköpfe (17, 18) gedrückt wird.
6. Einstellbarer Verschluss nach einem der vorhergehenden Ansprüche, wobei die Hülse (1) oder der Stecker (8) eine sich parallel zur Bewegungsrichtung des Steckers (8) erstreckende Führungsausnehmung (14) hat, wobei der Stecker (8) oder die Hülse (1) einen Anschlagvorsprung (15) hat, der in die Führungsausnehmung (14) verschiebbar eingreift, um die Hülse (1) und den Stecker (8) gegen eine versehentliche Trennung im zusammengefügt Zustand zu halten.
7. Einstellbarer Verschluss nach einem der vorhergehenden Ansprüche, wobei der Verbindungsbereich (5) der Hülse (1) aus einem im wesentlichen C-förmigen Ringverbinder besteht, der am gegenüberliegenden Ende der Hülse (1) angeordnet ist, wobei der Verbindungsbereich (11) des Steckers (8) aus einem im allgemeinen C-förmigen Ringverbinder besteht.
8. Einstellbarer Verschluss nach einem der vorhergehenden Ansprüche, wobei der Verbindungsbereich (5a) der Hülse (1a) aus mehreren Dornen besteht, die von einer Unterseite der Hülse (1a) abstehen, um das erste Teil zu durchstoßen, wobei der Verbindungsbereich (11) des Steckers (8) aus einem im wesentlichen C-förmigen Ringverbinder besteht, wobei der Verbindungsbereich der Hülse (1a) ferner ein Gegenstück (26, 26') aufweist, um das die Dorne herumgebogen werden, wobei das erste Teil zwischen der Hülse (1a) und dem Gegenstück (26, 26') angeordnet ist.
9. Einstellbarer Verschluss nach Anspruch 8, wobei das Gegenstück (26) mehrere Öffnungen (25) für



den Durchgang der zugeordneten Dorne (5a) aufweist, wenn die Dorne (5a) um das Gegenstück (26) herumgebogen werden.

10. Einstellbarer Verschluss nach Anspruch 8, wobei das Gegenstück (26) hohl ausgebildet ist und einen inneren Schlitz (27) und zwei geneigte Führungsklappen (28) aufweist, die neben den gegenüberliegenden offenen Enden des Schlitzes (27) angeordnet sind, um die Dorne (5a) in den Schlitz (27) einzuführen, wenn die Dorne (5a) mit dem Gegenstück (26') verklemt werden.

Revendications

1. Attache réglable pour relier entre elles une première pièce et une seconde pièce, ladite attache réglable comprenant : un manchon creux plat (1) comportant un canal de guidage longitudinal (4) s'étendant depuis une première extrémité du manchon (1), une rainure de guidage (6) s'étendant transversalement au canal de guidage (4) et débouchant dans ce canal, et une première partie de raccordement (5) destinée à être fixée à ladite première pièce ;

une broche (8) comportant un corps plat (9) pouvant être reçu de façon coulissante dans le canal de guidage (4), des première et seconde rangées de dents, ou dentures, (12, 13) s'étendant le long des bords longitudinaux opposés du corps (9), et une seconde partie de raccordement (11) disposée à une extrémité du corps (9) pour être fixée à la seconde pièce ;

un moyen de verrouillage disposé de façon coulissante à l'intérieur de la rainure de guidage (6) pour verrouiller la broche (8) dans le manchon (1) ;

et un moyen élastique (23) maintenu à l'intérieur du manchon (1) ;

l'attache réglable sus-visée étant caractérisée en ce que le moyen de verrouillage comprend un élément de verrouillage (16) disposé de façon coulissante à l'intérieur de la rainure de guidage (6), des première et seconde têtes-poussoirs (17, 18) disposées aux extrémités opposées de l'élément de verrouillage (16), et des première et second rangées de saillies de verrouillage (19, 20) disposées de façon adjacente aux première et seconde têtes-poussoirs (17, 18), respectivement, les première et seconde rangées de saillies de verrouillage (19, 20) pouvant venir en prise libérable avec les première et seconde dentures (12, 13), respectivement ;

en ce que le moyen élastique (23) agit normalement de manière à retenir une des première et seconde rangées de saillies de verrouillage (19, 20) en prise de verrouillage avec une denture

correspondante des première et seconde dentures (12, 13) en verrouillant de cette manière la broche (8) dans le manchon (1); l'autre rangée des première et seconde rangées de saillies de verrouillage n'étant pas en prise de verrouillage avec ladite autre denture correspondante des première et seconde dentures (12, 13), le moyen élastique (23) exerçant une pression sur l'élément de verrouillage (16) de manière qu'une des première et seconde tête-poussoirs (17, 18) fasse saillie vers l'extérieur depuis le manchon (1) lorsque la broche (8) est verrouillée dans le manchon (1) ;

et en ce que le moyen de verrouillage (16) peut se déplacer le long de la rainure de guidage (6) à l'encontre de la force du moyen élastique (23) lorsque celle-ci précède des dites première et seconde têtes-poussoirs (17, 18) qui fait saillie du manchon (1) est enfoncée, de manière à dégager de ladite denture correspondante des première et seconde dentures (12, 13) de celle précitée des dites première et seconde rangées de saillies de verrouillage (19, 20) qui est retenue en prise de verrouillage et à libérer de cette manière la broche (8) du manchon (1).

2. Attache réglable selon la revendication 1, dans laquelle l'élément de verrouillage (16) comporte un évidement (21) s'étendant depuis l'extrémité de l'élément de verrouillage (16) et se terminant en deça de l'extrémité opposée de l'élément de verrouillage (16), le moyen élastique (23) comprenant un ressort hélicoïdal de compression disposé à l'intérieur de l'évidement (21).

3. Attache réglable selon la revendication 1, dans laquelle l'élément de verrouillage (16) comporte un premier évidement (21) s'étendant depuis une première extrémité de l'élément de verrouillage et se terminant en deça de l'extrémité opposée dudit élément de verrouillage (16) et un second évidement (22) s'étendant depuis ladite extrémité opposée de l'élément de verrouillage (16) et se terminant en deça de ladite première extrémité de l'élément de verrouillage (16), le moyen élastique (23) comprenant un ressort hélicoïdal de compression disposé à l'intérieur d'un des premier et second évidements (21, 22).

4. Attache réglable selon l'une quelconque des revendications précédentes, les dentures (12, 13) se trouvant sur la broche (8) comprennent des dents en forme de dents de scie comportant chacune un bord rectiligne s'étendant transversalement à la direction de déplacement de la broche (8) et un bord incliné dirigé dans un sens opposé à ladite première extrémité du manchon (1), les rangées de saillies de verrouillage (19, 20) de



l'élément de verrouillage (14) comprenant des dents de forme complémentaire à celle des dents des dentures (12, 13) se trouvant sur la broche (8).

5. Attache réglable selon l'une quelconque des revendications précédentes et comprenant, en outre, une butée (24) disposée à l'intérieur de la rainure de guidage (6) en un point adjacent à l'autre des première et seconde têtes-poussoirs (17, 18) et pouvant venir en contact avec l'élément de verrouillage (16) pour limiter le déplacement de cet élément de verrouillage (16) lorsque ladite tête des première et seconde têtes-poussoirs (17, 18) est enfoncée et pour empêcher de cette manière ladite autre saillie des première et seconde saillies de verrouillage (19, 20) de venir en prise avec l'autre dent correspondante desdites dentures (12, 13) lorsque ladite tête des première et seconde têtes (17, 18) de poussoir est enfoncée. 5 10 15 20
6. Attache réglable selon l'une quelconque des revendications précédentes, un des manchons (1) et broche (8) comportant un évidement de guidage (14) s'étendant parallèlement à la direction de déplacement de la broche (8) l'autre des manchons (1) et broche (8) comportant une saillie d'arrêt (15) pouvant être reçus de façon coulissante dans l'évidement de guidage (14) pour maintenir le manchon (1) et la broche (8) dans un état assemblé à l'encontre d'une séparation accidentelle. 25 30
7. Attache réglable selon l'une quelconque des revendications précédentes, la partie de raccordement (5) du manchon (1) comprenant un élément de raccordement annulaire sensiblement en forme de C disposé à une extrémité opposée du manchon (1), la partie de raccordement (11) de la broche (8) comprenant un élément de raccordement annulaire en forme de C dans son ensemble. 35 40
8. Attache réglable selon l'une quelconque des revendications précédentes, la partie de raccordement (5a) du manchon (1a) comprenant une pluralité de pointes faisant saillie du côté de dessous du manchon (1a) pour percer la première pièce, la partie de raccordement (11) de la broche (8) comprenant un élément de raccordement annulaire sensiblement en forme de C, ladite partie de raccordement du manchon (1a) comprenant, en outre, un élément de retenue (26, 26') dans lequel sont accrochées lesdites pointes avec la première pièce disposée entre le manchon (1a) et l'élément de retenue (26, 26'). 45 50 55

9. Attache réglable selon la revendication 8, l'élément de retenue (26) comportant une pluralité d'ouvertures (25) pour le passage à travers ces dernières des pointes respectives (5a) lorsque l'on accroche lesdites pointes (5a) dans l'élément de retenue (26).

10. Attache réglable selon la revendication 8, l'élément de retenue (26) ayant une structure creuse et comportant une fente intérieure (27) et une paire d'ailes de guidage inclinées (28) disposées de façon adjacente aux extrémités ouvertes opposées de la fente (27) pour guider les pointes (5a) jusque dans la fente (27) lorsque l'on accroche lesdites pointes (5a) dans l'élément de retenue (26').