Dec. 20, 1966 A. S. STEINBERG 3,292,222

REVERSE TENSIONING LEVER DEVICE FOR JOINING TWO BORDERS TO BE UNITED

Filed May 6, 1965

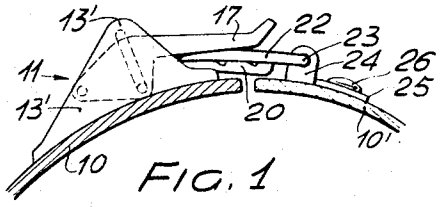


FIG. 1

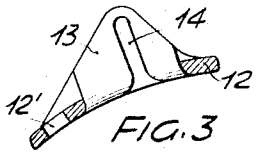


FIG. 3

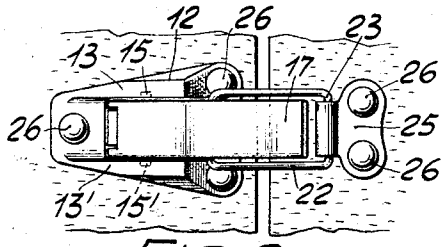


FIG. 2

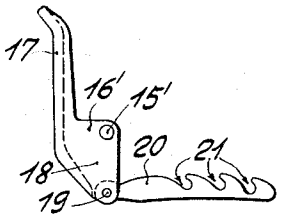


FIG. 4

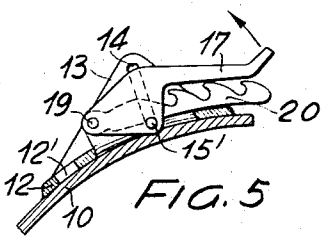


FIG. 5

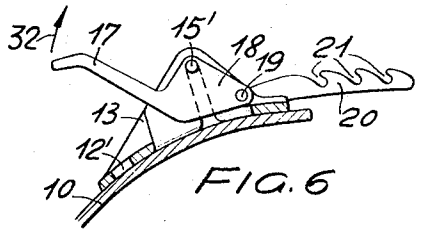


FIG. 6

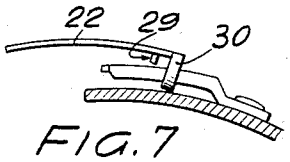


FIG. 7

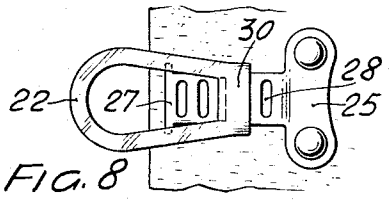


FIG. 8

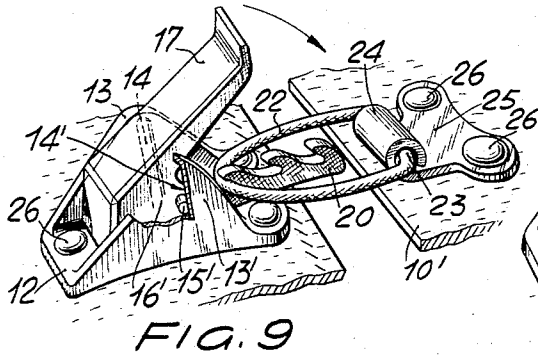


FIG. 9

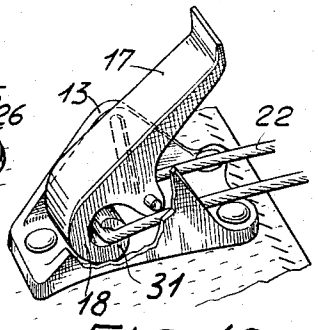


FIG. 10

INVENTOR

Adalberto Sussman Steinberg

BY Bailey, Stephens & Huettig

ATTORNEYS

United States Patent Office 3,292,222
Patented Dec. 20, 1966

3,292,222

REVERSE TENSIONING LEVER DEVICE FOR JOINING TWO BORDERS TO BE UNITED

Adalberto S. Steinberg, Via Frassinetti 25, Milan, Italy

Filed May 6, 1965, Ser. No. 453,678
Claims priority, application Italy, Sept. 1, 1964, 18,810/64
3 Claims. (Cl. 24—68)

Lever actuated connecting devices for bringing close together and firmly joining two borders, for instance of boots, suitcases, bags and the like, are available in the trade in several more or less complicated, more or less efficient embodiments, but always comprising defects and inconveniences, that so far have not been overcome.

The present invention refers to a new connecting device of the lever actuated type, that appears particularly simple and efficient, as well as of low cost, due to the minimum number of parts constituting same, to the scope of connecting together two borders to be united.

The device according to the invention is characterized by a first class actuating lever having its mobile fulcrum guided between two vertical shoulders projecting from a base support secured on one of said borders to be joined together, said lever carrying at its resisting end at least one hook apt to be latched by a tensioning element fastened on the other border.

The attached drawing represents schematically in the way of a non-limiting example some embodiments of the tensioning and connecting device according to the invention. In the drawing:

FIGURE 1 represent a side view of the closed device;

FIGURE 2 shows a top view of same;

FIGURES 3 and 4 show separately the parts constituting one of the members of the device, and namely the base support secured to one of the borders, and the lever which in this instance carries an articulated tensioning element;

FIGURE 5 also shows the device in the closed position, as seen from a side, but with its base support sectioned to make more visible the lever, and its guided mobile pivots;

FIGURE 6 represents the same device as in FIGURE 5, with its support sectioned, but in the opened position;

FIGURES 7 and 8 represent respectively a side and a plan view of the other member forming the connecting device, and namely that which is applied to the other border to be joined, and which in this embodiment is the adjustable type.

FIGURE 9 represents a perspective view, with some parts broken away, and at a larger scale, of the connecting device forming the subject of the invention in a semi-opened position.

FIGURE 10 is also a partial perspective view of a device wherein the rack type tensioning member, articulated on the lever, is substituted by a hook integral with the inner end of the lever itself.

The embodiment of the tensioning and connecting device represented in the drawing has been chosen so as to enable it to be applied to the vamp borders of ski boots to constitute a binding; but evidently a device according to the invention may be utilized also for other applications such as for closing suitcases, bags, belts, purses and the like.

On the two opposite borders **10** and **10'**, that have to be drawn close together and connected together, there are mounted respectively, on one side, the support **11**, formed by a plate **12**, secured on the border **10** by rivets **26**, passing through the holes **12'**, and, on the other side, the support **24** carrying the connecting loop **22**. The support plate **12** has two shoulders **13** and **13'**, a groove, respectively **14** and **14'** being provided on the inner face

of each shoulder **13**, **13'**. The width of this groove is such as to be enabled to receive with a certain play and a low to slide therien the small pivots **15** and **15'**, protruding from the two sides **16**, **16'**, in the form of a triangle, of a lever **17**, having a U-shaped transversal section, of the first class type, the resistance end **18** whereof carries pivotally mounted at **19** a rack type tensioning element **20** with slanted, hook-shaped teeth **21**, wherein the intervals between the teeth are facing towards the mobile pivots **15**. The hooks provided on the rack element **20** can be either on the upper or on the lower side of the tensioning element.

On the other border **10'** there is applied the second member of the tensioning and connecting device, and namely the loop **22**, pivoted at **23** on the support **24**, protruding from the small plate **25**, secured on the border **10'** by means of rivets **26**.

In FIGURES 1, 2 and 9, the second member, applied on the border **10'**, is not adjustable, and the adjustment, if required, has to be effected by choosing at will one of the notches **21** of the rack element **20** as a latch for the tensioning element **22**. This second element might be replaced by an adjustable one, as represented in FIGURES 7 and 8, wherein also the loop **22**, instead of being pivoted directly at **23** on the protruding shoulders **24** of the small plate **25**, presents an end **30**, transversely bent in the shape of a C, so that the two arms of the C embrace slidably, without being able to fall off, the tail **27** of the small plate **25**, which tail extends almost as far as the end of the border **10'**, and has a series of openings **28**, in each of which may fit in and engage therein a tooth **29**, protruding downwardly from the end **30** of the loop **22**.

In FIGURE 10 there is represented in a perspective view a still simpler semi-open embodiment wherein the rack type tensioning element **20** of the preceding figures is replaced by a hook **31** obtained directly integral with the lower end **18** of the lever **17**. On this hook **31** engages the tensioning element **22**, that in this embodiment shall have preferably to be of the adjustable type shown in FIGURES 7 and 8.

The operation of the tensioning and connecting device as described and illustrated is at once evident in particular from the FIGURES 9 and 10, representing two embodiments of the device in a partially closed position. Indeed, the loop **22**, pivoted in **23** on the small plate **25**, is inserted in one of the notches **21** of the rack **20**, when this is in the position shown in FIGURE 6. Hereafter, the lever **17** is raised by moving it in the direction of the arrow **32** and carried towards the right so that at a certain point it reaches the position shown in FIGURE 9, wherein the pair of small pivots **15** has moved about midway of the groove **14**. By further lowering the lever **17**, the rack **20** moves back to the left side, dragged away by the articulation **19**, the small pivots **15** move further down, and the lever **17** snaps down on the loop **22**, as shown in FIGURES 1, 2 and 5.

As already stated, the teeth of the rack **20** represent a first possibility of adjustment. In FIGURES 7 and 8 the second possibility of adjustment is clearly evident; herein, before latching the loop **22** in one of the hooks **21**, the loop **22** is lifted as far as required to disengage the tooth **29** (FIG. 7) from the slits **28**, and the rear portion **30** of the loop **22** is made to slide back and forth to choose the most suitable among the slits **28** for the tensioning it is wanted for the device in the closed position. In the embodiment of FIGURE 10, since the lever has no adjustment possibility, having a single integral hook **31**, the adjustment to be utilized will be the one shown in FIGURES 5 and 6.

Among the evident advantages afforded by this device as compared to those already known, besides its simple

design, there is also the advantage that all the different parts may be made of pressure molded plastic material, without any additional difficult machining. In fact the only piece to be added is the pivot **19** between the lever **17–18** and the rack **20**. This however is avoided in the embodiment of FIGURE 10. The assembling of the lever **17** on one of the vamp borders is effected by inserting from the bottom the two small pivots **15**, **15'**, in the grooves **14**, **14'** and then by applying the support **12** on the border **10** by means of the rivets **26**.

The embodiment in which the rack **20** is articulated on the lever **17–18** at the point **19**, represents a preferred one, but it is evident that the device does not change its nature if in the articulation **19** there is applied instead of a loop, while the rack may be applied on the second member, by articulating it in **23** on the support **25** of the other border.

The device as described supplies a lever that acts within minimum space and operates over the whole 180°, from the fully open position (FIGURE 6) to the closed position (FIGURES 1, 2 and 5), with very few pieces, that is: the supporting basis **12** and the lever **17'**, with the rack **20**, on one side; the supporting basis **25** and the loop **22** on the other side, while previously, in order to obtain a 180° rotation it was necessary to have recourse to a third articulated element between the lever **17** and the articulation with the tensioning element **20**.

An additional advantage of the device as described consists in the fact that the two parts of which it is constituted, one applied to one border, and the other to the other border, are drawn close together during the closing operation, with absolutely equal travels, what allows especially in the instance of boots, a closing with a minimum effort and pressure, a part of the effort being absorbed by the vertical movement of the mobile fulcrum **15'**.

Another advantage of the device according to the invention is that the lever is placed about in the front center-line of the uppers and that in its closed position it remains protected from outside stresses, so that for instance in case of its application to ski boots, if the skier, during a down-hill run should stumble upon foreign bodies, the lever device remains unaffected and closed, preventing the known disastrous consequences of the unintentional opening of the levers and a loosening of the boot. This last advantage derives from the fact that in the present device the lever is being closed by means of a reverse tension in respect to all other levers so far available in the trade, and that its free end lies just on the front centerline of the instep.

To sum up, the advantageous features of the new device are:

Minimum size, reverse tension, minimum effort and pressure, absence of projections vulnerable by foreign bodies, easy opening of the unlaced boot, due to its central position, and therefore great ease when putting on the boot.

What is claimed is:

1. Tensioning and connecting device of the lever actuated type for joining together two bodies to be united, comprising a base member attached to one of said bodies having spaced shoulders projecting upwardly therefrom having on their inner faces grooves extending substantially perpendicular with respect to the base member, a lever having pins on opposite sides thereof engaging in said grooves, said lever having side walls substantially parallel to and located between said shoulders, said pins extending from said side walls, a pivot carried by said side walls remote from said pins; a hook member connected to said pivot between said walls, said lever having a handle portion on the opposite side of said pins from said pivot, said hook member extending toward the other body, the other body having a member thereon engageable with said hook member.

2. A device as claimed in claim **1**, wherein said other body has an elongated part secured thereto at one point and projecting from said point toward said flat member and having openings spaced therealong, said hook-engaging member comprising a C-shaped part surrounding said elongated part, a projection engageable in said holes and a loop part engageable with the hook member.

3. In a device as claimed in claim **1**, said base being curved and said hook member having a curved lower edge engageable with and slidable on the base member.

References Cited by the Examiner

UNITED STATES PATENTS

2,314,270	3/1943	Elliott	24—70 X
2,562,355	7/1951	Grant	24—206 X
3,132,392	5/1964	Steinberg	24—70
3,182,366	5/1965	Teufel	24—68
3,224,118	12/1965	Teufel	36—50

FOREIGN PATENTS

1,348,377	12/1963	France.

WILLIAM FELDMAN, *Primary Examiner.*

MILTON S. MEHR, *Examiner.*