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LENGTH ADJUSTMENT DEVICE FOR
A FOLDING ARM TYPE BRACELET CLASP

The present invention relates to a device for adjusting the length of a bracelet having a clasp made of
5 folding arms arranged between the two ends of the bracelet to form therewith an endless attachment whose length can vary between two values, one where said folding arms are folded, the other where they are unfolded, comprising an adjustment link having two parallel articulation axes
10 transversal to the attachment, these two articulation axes being associated respectively with two elements of the attachment to allow, by pivoting of said adjustment link about one of said axes, inversion of the respective positions of these two articulation axis relative to one
15 another along said attachment to hence define two determined adjusted lengths of this attachment.

The purpose of this adjustment device is to provide the user, for each set length of the bracelet adjusted by conventional adjustment means, with an available
20 supplementary length that corresponds to a small fixed difference with the initially adjusted length so that it is possible to easily go from one length of the bracelet to the other, without dexterity and without using a special tool. The difference between these two lengths is
25 selected to take into account the differences in the wrist size depending on the ambient temperature and/or as a function of efforts that could be made by the user's arm and that could lead to swelling of the wrist. By means of such a device, it is possible to easily pass from one
30 determined length to the other depending on whether the bracelet tightly grips the wrist or to the contrary does not sufficiently hold the wrist. This is important particularly, but not exclusively, for a wrist-watch.

A device of this type arranged in a folding clasp
35 loop has already been described in Swiss patent CH-A5-



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663 522. The purpose of such a device is to be able to provide the bracelet with two determined lengths and hence permit the user to choose between these two different lengths simply by pivoting the adjustment link between its
5 two positions; this pivoting from the longer adjusted position to the shorter one being carried out simply by applying a pressure on one of the arms of the clasp.

This device however has two major drawbacks, one from a practical standpoint, the other relating to
10 aesthetic considerations, which detract largely from the advantages it offers. The first of these disadvantages resides in the fact that when the adjustment link is pivoted into its position corresponding to the shorter adjusted length, it is held in this position solely by the
15 closure of the clasp. As soon as the clasp is opened, the adjustment link returns to the other position so that when the user puts the bracelet back on, he has to check whether the adjustment link is folded in the desired position and must pay attention that this does not alter
20 during closing of the clasp.

The second of these drawbacks is due to the fact that the thickness of the adjustment link adds to that of the clasp's arms. This extra thickness is visible and detracts from the clasp's aesthetic appearance. Moreover,
25 this extra thickness can interfere with passing a shirt cuff over the bracelet.

There are of course many other devices for adjusting the length of bracelets that enable the user to set the length himself. However, these devices generally are not
30 designed to resolve the above-mentioned problem and are either too complicated or do not enable a choice between only two given lengths.

An object of the present invention is to at least partly remedy the above-mentioned drawbacks.

To achieve this, the present invention concerns a device for adjusting the length of a bracelet provided with a folding-arm clasp of the above type, as set out in claim 1.

5 The accompanying drawings illustrate, schematically and by way of example, an embodiment of the adjustment device according to the present invention and variations.

Figure 1 is a perspective view of a portion of a bracelet fitted with this embodiment of the adjustment
10 device.

Figure 2 is a partial view in cross-section along line II-II of Figure 1.

Figures 3 and 4 are cross-sectional views similar to that of Figure 2, in two different positions of the
15 adjustment device.

Figure 5 is a partial perspective view of a variation of the adjustment device in the long adjusted position.

Figure 6 is a partial perspective view of a
20 variation of the adjustment device in the short adjusted position.

Figures 7 and 8 are partial perspective views similar, respectively, to Figures 5 and 6 of two further variations of the adjustment device.

25 The first embodiment of the adjustment device according to the present invention, illustrated in Figures 1 to 4, comprises a partly-shown metal bracelet made of links 1, whose two ends 1a, 1b are attached to a folding-arm clasp 2 comprising two arms 2a, 2b articulated to one
30 another about a pin 3. One of these arms 2a is articulated to the end 1a of the bracelet, whereas the other end 1b of the bracelet is articulated to a third arm 2c of the clasp

having two parallel lateral walls $2c_1, 2c_2$ forming a housing under which the arms $2a, 2b$ fold. The two parallel lateral walls $2c_1, 2c_2$ of this housing $2c$ comprise two respective series of apertures 4 in two-by-two facing relationship, for receiving a pivoting axis 5 (called "bar") for attaching the other end $1b$ of the bracelet, and which constitute conventional first means for adjusting the length of the bracelet.

It is at this other end $1b$ of the bracelet that there is provided another device for adjusting the bracelet length, viz. the device according to the invention.

A link 6 is pivotally mounted about the axis of the bar 5 fixed in two apertures 4 of the facing lateral walls $2c_1, 2c_2$ of the cover $2c$. This link 6 constitutes the bracelet-length adjustment link. For this, this adjustment link 6 (Figures 2 to 4) includes a second articulation axis 7 to which is articulated one end of a second link 8 whose other end is articulated to the remainder of the bracelet end $1b$ about an axis 9 . As can be seen in particular on Figure 4, this link 8 includes a curved blade $8a$ which is tangential to a portion $8b$ of cylindrical section coaxial with the articulation axis 7 at one end, whereas at its other end, this curved blade $8a$ is folded over to form, with the portion $8b$ of cylindrical section and the blade $8a$, a wall $8d$, providing a recess $8c$ adapted to receive the adjustment link 6 , as illustrated in Figure 2. This wall $8d$ has an S-shaped profile hence forming a restricted opening leading into the recess $8c$, whose dimension is calculated to be slightly less than the corresponding dimension of the part of the adjustment link 6 that engages in the recess $8c$, as can be seen in particular in Figure 3. This wall $8d$ thus serves as a locking means for the adjustment link 6 when it is engaged in this recess $8c$ by elastic deformation.

It can be observed on Figure 2 that in this position of the adjustment device, a straight line d, drawn in a chain-line, joining the articulation axes 7 and 9 between, on the one hand, the two links 6 and 8 and, on the other hand, the link 8 and the remainder of the bracelet, is spaced apart by a given distance from the pivoting axis 5 of the adjustment link 6 under the clasp's cover 2c, hence forming a lever arm about the axis 5. The side of axis 5 where this lever arm is situated is chosen to provide a couple tending to turn the adjustment link 6 in the direction of arrow F₁ when a traction is exerted on the bracelet in the direction of arrow F₂ (Figure 2). This couple tends to hold the adjustment link 6 engaged in the recess 8c of link 8. To disengage it, it suffices to exert, on the axis 9 of link 8 at the end of the bracelet's part 1b (Figure 1), a traction in the direction of arrow F₃ (Figure 2) whereafter the adjustment link can pivot in the direction of arrow F₄ by exerting on the link 8 a traction in the direction of arrow F₂ (Figure 3). This pivoting of the adjustment link 6 is limited by an abutment 6a which comes to contact the internal face of the cover 2c of clasp 2 (Figure 4).

As can be seen on Figure 4 which illustrates the adjustment device in the longer position of the bracelet provided by this device, the straight line d in chain lines, joining the axes 7 and 9 of link 8, once again does not pass through the pivoting axis 5 of the adjustment link 6. In this case, the lever arm about the axis 5 tends to produce a couple in direction F₅ when a force in direction F₆ is exerted on the link 8 (Figure 4), tending to return the adjustment link 6 back to the position of Figure 2, after having exerted a pressure on the link 8 in direction F₇ (Figure 3) to engage it in the recess 8c.

The adjustment device according to the invention allows a choice between two given bracelet lengths. Passing from one position to the other can only be done

voluntarily and by a simple manipulation that does not require any particular dexterity on the part of the user. Once set in a position, there is no risk that the length changes unwantedly. The adjusted length is maintained as long as the user does not decide to change. The clasp can be opened and closed without modifying the setting. It can also be remarked that in either of the adjusted positions, the height of the clasp remains practically unchanged, so that the device does not detract from the aesthetic appearance.

In the four variations illustrated by Figures 5 to 8, the clasp has not been illustrated, given that it remains the same. The adjustment link 6 is also identical to that of Figures 1 to 4. The modifications thus principally relates to the link 8 articulated about the axis 7 of adjustment link 6. The part 1b of the bracelet proper connected to the articulation axis 9 of link 8 can have any suitable form. In the examples, metal bracelets composed of links are shown. However, other bracelets, for example of leather or plastics, could be used. Moreover, the bracelet can be a watch bracelet or any other type of bracelet fitted with a folding-arm clasp or a comparable clasp, or generally any bracelet forming with its clasp an endless attachment.

In the variation illustrated in Figure 5, the wall 8d of the recess 8'c of link 8 which serves as means for locking the adjustment link 6 is constituted by a piece 8'd welded to the link 8'. This variation enables this piece 8'd, constituting elastic locking means, to be made specifically for this purpose to obtain the required elastic force independently of the link 8'. Thus, this fitted element 8'd can have a different thickness than the link 8' or can be made of a different material. For example, for a gold bracelet, it can be advantageous to have a fitted element of another material, for example steel, because of its better elasticity.

The variation of Figure 6, which shows the adjustment device in the other adjusted position, differs from that of Figure 5 only by the fact that the blades 8"d forming the locking means are machined in the link 8" itself and are not formed by a fitted piece.

In the variation illustrated by Figures 7 and 8, the link 8* is in two parts articulated to one another about a pin 10. The locking element of the adjustment link 6 is hence directly constituted by the two parts 8*d of this link 8* surrounding the pin 10 about which they are articulated. In the case, the elasticity of the locking means 8*d is conferred solely by the curved part 8*a of link 8*. Figures 7 and 8 show different bracelets, both metallic with articulated links but, as mentioned, the invention is not limited to a particular type of bracelet.

Furthermore, the variations of Figures 5 to 8 have all of the advantages mentioned in connection with the embodiment of Figures 1 to 4.

CLAIMS

1. A device for adjusting the length of a bracelet having a clasp (2) made of folding arms (2a,2b,2c) arranged between the two ends (1a,1b) of the bracelet to
5 form therewith an endless attachment whose length can vary between two values, one where said folding arms are folded, the other where they are unfolded, comprising an adjustment link (6) having two parallel articulation axes (5,7) transversal to the attachment, these two
10 articulation axes being associated respectively with two elements (2c,8) of the attachment to allow, by pivoting of said adjustment link (6) about one (5) of said axes (5,7), inversion of the respective positions of these two articulation axes (5,7) relative to one another along said
15 attachment to hence define two determined adjusted lengths of this attachment,

characterized by the fact that one (8) of said two elements (2c,8) of said attachment comprises locking means (8d,8'd,8"8d,8*d) arranged in the trajectory described by a
20 portion of said adjustment link (6) when it pivots from its position corresponding to the longer adjusted length to the position corresponding to the shorter adjusted length of the attachment, to come into engagement with said portion of this adjustment link (6) in its position
25 corresponding to the shorter adjusted length of said attachment.

2. An adjustment device according to claim 1, characterized by the fact that said locking means (8d,8'd,8"8d,8*d) are elastic means.

30 3. An adjustment device according to either of the preceding claims, characterized by the fact that said adjustment link (6) is arranged between one of said ends (1a,1b) of the bracelet and said folding-arm clasp (2).

4. An adjustment device according to any one of the preceding claims, characterized by the fact that said locking means (8d,8'd,8"d,8*d) are solid with a second link (8,8',8",8*) articulated on the one hand to one (7) of the transverse axes (5,7) of said adjustment link (6) and on the other hand to one end (1b) of the bracelet, and the other (2c) of said elements (2c,8,8',8",8*) to which the other transverse axis (5) of said adjustment link is articulated is one of the arms (2b) of said clasp (2), and said adjustment link (6) has an abutment (6a) adapted to limit angular displacement thereof against a face of the arm (2c) of the clasp (2) to which it is articulated, in the position in which said adjustment link (6) defines the longer adjusted length.
5. An adjustment device according to any one of the preceding claims, characterized by the fact that when said adjustment link (6) is in engagement with said locking means (8d,8'd,8"d,8*d), the pivoting axis (5) of this adjustment link (6) is situated on one side of a straight line passing through the two articulation axes (7,9) of said second link (8,8',8",8*) selected such that a tractive force (F₂) exerted in the direction of this straight line generates, about the pivoting axis (5) of said adjustment link, a couple tending to hold this link (6) in engagement with said locking means (8d,8'd,8"d,8*d).
6. An adjustment device according to claim 4, characterized by the fact that when said abutment (6a) of said adjustment link (6) bears against said face of the clasp's arm (2c), the pivoting axis (5) of this adjustment link (6) is situated on one side of a straight line passing through the two articulation axes (7,9) of said second link (8,8',8",8*) selected such that a pressure (F₆) exerted in the direction of this straight line generates, about the pivoting axis (5) of said adjustment link (6), a couple tending to turn said adjustment link

(6) from its position corresponding to the longer adjusted length to the other position corresponding to the shorter adjusted length of said attachment.

5 7. An adjustment device according to claim 2, characterized by the fact that the elasticity of said locking means (8,8*d) is provided by a curved blade (8a,8*a) of said second link (8,8*), the locking means (8d,8*d) being arranged at one end of this curved blade (8a,8*a).

10 8. An adjustment device according to any one of the preceding claims, characterized by the fact that the elastic locking means (8'd) are fitted on said second link (8').

15 9. An adjustment device according to any one of the preceding claims, characterized by the fact that said second link (8,8',8",8*) has a recess (8c) for receiving said adjustment link (6) in the locking position of the adjustment link (6).