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(71) Applicant *(for all designated States except US)*: **IRIDE S.R.L.** [IT/IT]; Via Garibaldi, 415, I-31030 San Vito di Valdobbiadene (IT).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **DALLA LONGA, Claudio** [IT/IT]; Via Ponteggio, 33A, I-31049 Valdobbiadene (IT).

(74) Agent: **BESZÉDES, Stephan, G.**; Münchener Strasse 80A, 85221 Dachau (DE).

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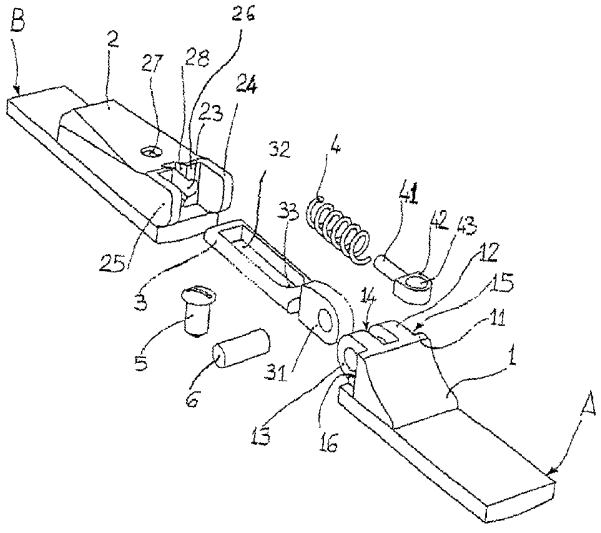
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(54) Title: RESILIENT HINGE FOR SPECTACLES WITH A HIDDEN HINGING PIN



(57) Abstract: Resilient hinge, particularly for spectacles, for the movement of an end of an arm (B) on an end of a front piece (A) of glasses by means of loops (12, 13, 112, 113) which are comprised by a body (1) which is to be fixed to the front piece (A) comprising a casing (2) which is linked with one end of the arm (B) and has a pair of projecting side walls (24, 25, 124, 125) which are spaced to each other by a central opening (21) allowing the housing of a slider (3, 142), said side walls (24, 25, 124, 125) projecting with respect to the central opening (21), and said slider (3) being provided with elastic means (4) and having at least one head loop (42, 131) which is to be inserted between and actually aligned with the loops (12, 13, 112, 113) of the body (1) for being linked and hinged by means of a transversal pivot (6, 106), wherein the projecting side walls (24, 25, 124, 125) are arranged such that the pivot (6, 106) is blocked and closed by the projecting side walls (24, 25, 124, 125), when the body (1), the casing (2) and the slider (3, 142) are assembled.

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RESILIENT HINGE FOR SPECTACLES WITH A HIDDEN HINGING PIN

Object of this invention is a new end hinging resilient device, particularly an elastic hinge for spectacles, for arms placed at the end of their glasses front piece, accomplished so as not to require the screwing of the hinging pivot and to assure its concealment from sight, besides presenting a minimal bulk, particularly in its thickness on the plain part of the arm.

Main feature of this invention is to provide a hinging resilient device for the movement of the ends of the arms on the end part of the glasses front piece by means of a pair of fixed loops or eyes, for instance, engaging with the end of a nose piece and being provided with a proper outer shoulder, while at the other end of the opposite arm to be linked a pair of side walls is provided. Such side walls are properly square and spaced to each other by a middle opening that allows the housing of a carriage which supports an elastic

means and is capable to compress the elastic means against the bottom of the opening, the carriage being also provided with a head loop to be linked to the above-mentioned pair of fixed loops, while the same side walls are pulled by the elastic means against the shoulder of the pair of fixed loops, in order to cause the opening, divarication and closing trips, i.e. movements, of the arm at the end of the front piece of glasses, blocking the hinging pivot in the loops and concealing it from sight.

The resilient hinges on the glasses frame notoriously have the task of making the adhesion of the glasses on the face of the person better, in addition to the advantage of permitting the release of the arms in their usual opening and closing positions onto the front piece.

The elasticity of the mentioned glasses hinges is actually accomplished in different constructive ways and embodiments generally based on the compression of elastic means kept in a box linked to the end of the arm or placed in a bored end of the arm, said elastic means being linked to an arm hinging loop that can slide into the same seat of the elastic means, to overcome, thanks to the movement of the arm, the eccentricity of the loop of the end of the front piece.

The producer of this kind of elastic hinges faces the problem of assuring a proper life time of the resilient device, both with respect to its efficiency during the time and to the wear of its parts under sliding.

A particular problem, a solution to which is not known till today, except using a screw to be linked to a nut or to a loop provided with a thread, is relative to, i.e. exists with respect to, the blocking system of the linking pivot of the loops to be hinged.

This problem constitutes a great uncomfortable condition for the worker that has to apply and close the little screw or pivot, after having forced the alignment of the loops of the two parts of the hinge, dealing with extremely little components which are difficult to assemble because of the reaction of the elastic means that has to be shut up with an adequate preloading.

Moreover, frequently an unscrewing happens, causing the fall or loss of this screw or pivot, as a consequence of the repeated movement of the arm, frequently requiring adjustments by an optician or other person having proper tools for small fastenings.

The present invention provides a solution to that and other problems. The invention has the characteristic that it provides a pair of linked loops, for instance, engaged with the end of the glasses front piece, and is provided with a proper outer shoulder, while, at the end of the opposite arm to be linked, a pair of side walls is provided, the side walls being properly square, and spaced to each other by a middle opening that allows the housing of a carriage supporting an elastic means shut up in the carriage, the carriage being also provided with a head loop to be linked to

the previous pair of fixed loops, while the side walls of the case that contains and blocks said carriage are pulled by the elastic means against the shoulder of the fixed loops.

In fact, the use of the case containing the elastic means was already disclosed in patent EP 615149 B1 dated 21.02.1994, while its changed application was disclosed also in patent EP 952475 A1 dated 06.04.1999, assuring a minimal bulk of the resilient hinge so accomplished.

According to the present embodiment, an inventive application of the carriage containing the elastic means allows to link the advantages of a reduced bulk of the hinge to the possibility of eliminating the screwing of the pivot, in addition to the possibility of concealing the hinging pivot from sight.

Main object of the present innovation is, as a matter of fact, to accomplish a resilient hinge, particularly for the glasses arms, that assures their hinging onto their respective end of a front piece, without having to screw the pivot into a thread loop or into a nut placed at the bottom of the hinging end loop.

Another object of the present device is to conceal from sight the presence of the hinging pivot with consequent aesthetical gain, giving to the glasses a more plain aspect.

A further object of the innovation is to accomplish a kind of hinge that combines minimal bulk and the possibility

of applying a pivot that can be screwed and cannot be seen from the outside.

These and other objects are perfectly achieved by the present invention.

Subject matter of the invention is a resilient hinge, particularly for spectacles, for the movement of an end of an arm on an end of a front piece of glasses by means of loops which are comprised by a body which is to be fixed to the front piece comprising:

a casing which is linked with one end of the arm and has a pair of projecting side walls which are spaced to each other by a central opening allowing the housing of a slider,

said side walls projecting with respect to the central opening, and

said slider being provided with elastic means and having at least one head loop which is to be inserted between and actually aligned with the loops of the body for being linked and hinged by means of a transversal pivot,

characterized in that

the projecting side walls are arranged such that the pivot is blocked and closed by the projecting side walls, when the body, the casing and the slider are assembled.

Suitably the loops are provided with a shoulder.

Preferably the projecting side walls are properly square.

Advantageously the slider comprises an axial port for supporting the elastic means.

Preferably the port comprises a cylindrical side for engaging with a half-cylindrically shaped head which has a hole and is connectable to the elastic means.

Advantageously the central opening has a cylindrical shape.

Preferably laterally to the central opening two grooves are arranged, wherein the central opening is adapted for housing the elastic means, and the lateral grooves are adapted for housing the slider. Particularly preferably the depths of the grooves are greater than the depth of the central opening such that the elastic means is pressed against the bottom of the central opening for being preloaded.

It is also preferred that the resilient hinge further comprises fixing means, for fixing the slider to the casing in the assembled state. Particularly preferably the fixing means comprise a screw which is insertable into a further opening of the casing.

According to a special advantageous variant the resilient hinge with blocked and hidden pivot is characterized by the fact that it comprises a resilient hinging device for the movement of the ends of the arms on the end of the front piece of glasses, by means of loops

provided with shoulder and linked to a body fixed, for instance, to an end of the front piece, while at the end of the respective arm to be linked a case is applied provided with a pair of extended side walls properly squared spaced to each other by a middle opening that allows the housing of a slider or rod to support an elastic means to be loaded in said opening, said slider or strut frame being also provided with one or more head loops to be inserted and axially aligned with respect to the loops of the body of the front piece, to be linked and hinged by means of a transverse pivot that is then blocked and closed by the extended side walls of the case joint to the arm to be hinged, under previous blockage of the carriage or cage in the same case.

Advantageously the resilient hinge comprises an end of front piece steadily linked to a fixed body, said body being provided with a pair of rings and projecting from a base that determines shoulders symmetrical and external to said rings.

The following embodiments are given only by the way of example and being not intended to limit the present invention and is shown in schematical drawings disclosed in the attached five sheets in which:

Fig. 1 shows a perspective and exploded view of the different components of the hinge of the present invention;

Fig. 2 shows a vertical view of the mobile hinging element that can be seen also in Fig. 1;

Fig. 3 shows a perspective and partially exploded view of the same components of Fig. 1, which are illustrated with elastic means already placed in a cage or slider of the mobile part;

Fig. 4 shows a perspective and partially exploded view of the same components of Figs. 1 and 3, illustrating the hinging loops being already linked and aligned to each other;

Fig. 5 shows a perspective and partially exploded view of the same components of Fig. 4, illustrating the hinging loops being already linked to their linking pivot;

Fig. 6 shows a perspective view of the hinge that can be accomplished with the components already illustrated in Figs. 1 to 5, being already linked to each other and only need to be fixed with a closing screw;

Fig. 7 shows a perspective view of the same hinge of Fig. 6, which is illustrated completed also by the screw linking the fixed part and the mobile part which are aligned to each other along the same longitudinal axis for a usual opening condition of the arm on the glasses front piece;

Fig. 8 shows a perspective view of the same hinge of Fig. 7, the hinge being illustrated in a condition of largest divarication of the arm on the front piece;

Fig. 9 shows a perspective view of the same hinge of Figs. 7 and 8, the hinge being illustrated in a condition of the arm on the glasses front piece when passing from the usual opening position to a closing, or reverse.

Fig. 10 shows a perspective exploded view of the parts constituting the variant;

Fig. 11 shows a perspective view of the same parts of Fig. 10 partly assembled;

Fig. 12 shows a perspective view of the same parts of Fig. 10 almost completely assembled, already hinged to the end of the front piece and ready for being associated to the end of the arm to be hinged;

Fig. 13 shows two ends of front piece and arm united between themselves and hinged by means of the device constituted by the parts of Fig. 10.

In all figures the same details are represented or are understood to be represented by the same reference numbers.

According to a preferred embodiment, an end of glasses front piece A is steadily linked to a fixed hinging element 1, for instance by means of screwing or other means of steady linking, as well as an end of arm B is steadily linked to a mobile hinging element 2, for instance by means of screwing or other means of steady linking.

Said hinging element 1 comprises a base 11 and a pair of loops, respectively eyes, 12 and 13 spaced by an opening 14, besides being provided with outer shoulders 15 and 16 accomplished on the base or fixing body 11.

The mobile hinging element 2 comprises a container or casing body 2 that is shaped as to house and block a slider or cage 3, which houses an elastic means 4, besides being hinged to its loop head 31 in the opening 14 between the loops 12, 13 of the fixed element 1.

More in detail, the container body 2 of the arm B is provided with a blind axial hole, having a cylindrical shape 21 and side grooves 22 and 23 which are able to house the cage 3 when laid flat, while the diameter of the hole 21 allows the passing and leading of the elastic means 4.

The same body 2 is further provided with a pair of side wings 24 and 25 projecting with respect to an inlet plane 26 of the hole 21 and being properly square in order to determine the usual opening or closing positions of the arms onto the front piece, according to a known technique.

The distance between the inner sides of the wings 24 and 25 is equal or lightly longer than the distance between the outer sides of the loops 12 and 13 of the fixed element 1. A vertical groove 28 of the body 2 is so shaped that it can house the thickness of the loop head 31, when the slider 3 is completely inserted into the holes 21, 22 and 23.

The same body 2 is then completed by the presence of an opening 27 that can also reach to the lower surface of the hole 21 and that is able to house and block a closing screw 5. The slider 3, as already mentioned, comprises a cage with the head loop 31 and with an axial port 32, preferentially provided with a cylindrical side 33.

According to a preferred embodiment a guide 41 is applied to the axle (axis) of the elastic means 4, the guide being joined to a half-cylindrical head 42 a hole 43 of which allows the passing of the closing screw 5.

Said elastic means 4 is destined to be housed with a proper previous loading (preloading) in the port 32 of the cage or slider 3 in such a way that the cylindrical part of the head 42 of the guide 41 is contained in the cylindrical hollow 33 of the port 32. That means, the element 3 has two functions. The first function is to slide in the corresponding holes 21-23 of the body 2 while connecting the mobile hinging element 2 to the fixed element 1. The second function is to house the elastic means 4.

According to the present invention hole 21 of the container body 2 has a depth lower than the depth of the grooves 22 and 23, i.e. grooves 22 and 23 go deeper into the body 2 than the hole 21 does, so that the cage 3 can be completely contained in the container body 2, while the bottom of the elastic means 4 is engaged, i.e. pressed, against the bottom of the hole 21 to be therein properly

compressed during the linking of the arm B to the front piece A and so to reach the wished resilience loading.

The present resilient device is completed by the presence of a pivot or hinging pin 6 characterized by the fact that it has a diameter equal to the diameter of the holes of the loops 12, 13 and 31 and a maximal length corresponding to the distance existing between the outer walls of the loops 12 and 13.

Having so described the few and simple parts constituting the present hinge, its operation is hereinafter summarized with the help of the attached drawings also with respect to the mentioned objects.

At first, the bases of the fixed body 1 and of the mobile or containment body 2 are steadily applied to the front piece or end of front piece A and end of arm B, in such a position that, when the end of the wings 24 and 25 of the body 2 are aligned and contact the little shoulders 15 and 16 of the body 1, also the respective ends of front piece A and arm B are in contact to each other as illustrated in Figs. 6 and 7, so that the contact of the corresponding ends of front piece A and arm B contributes to determine the position of usual opening of the arm B on the front piece A.

The end of front piece A and the end of arm B is provided with a fixed body 1 and a containment body 2, respectively, besides having at disposal the other parts above described and singled out in Fig. 1. The elastic means

4 is housed by the axial port 32 of the cage 3 and linked with the guide 41 and the half-cylindrical head 42 as illustrated in Fig. 3.

So the loop head 31 of the cage 3 is inserted into the opening 14 defined by the space between the loops 12 and 13 of the fixed body 1, as illustrated in Fig. 4, then the pivot 6 is threaded into the loops 12, 31 and 13 which are previously aligned, as illustrated in Fig. 5.

At this point it is sufficient to insert the cage 3 and its elastic means 4 into the hole 21 and into its side slots 22 and 23, so that the bulk of the elastic means 4 is housed in the hole 21 to bring the front end of the wings 24 and 25 in contact with the respective shoulders 15 and 16 of the fixed body 1 under previous compression of, i.e. while compressing, the elastic means 4, as illustrated in Fig. 6, and then apply the closing screw 5 that, going into the hole 27, penetrates into the hole 43 of the head 42 of the guide 41, already aligned in the port 32 of the cage 3, preventing the cage or slider 3 from coming out from its opening 21 in the case 2.

Putting the wings 24, 25 onto the walls 15 and 16 of the loops 12 and 13, the double aim of preventing the pivot 6 from coming out from the loops 12, 31 and 13 and concealing it from sight is reached, according to some of the specified objects.

In this way a resilient hinge presenting both an easy embodiment and minimal bulk, besides the elimination of any screwing of the pivot is reached, according to other specified objects.

With reference to Figs. 10 to 13, as already specified, identical advantages and purposes can be achieved substantially by a further advantageous embodiment of the invention by substituting the cage 3 by a conventional pull rod 103 to which the elastic means 104 is attached after a slider 142 has been attached provided with a notch 141 for receiving and guiding the loops of hinging 131 of the same pull rod 103.

The same pull rod 103, after the slider 142 and the elastic means 104 had been attached, blocks the issue by means of a flattening or fastener 103′ or with a cube provided with a thread or with another known blocking system.

According to this constructive solution, the slider 142 is provided with a hole having a thread 143 for receiving the screw 105 for fastening the arm B such that it can be provided with shoulders 126 for the abutment against the pair of loops 112 and 113 of the front piece A which on its part is provided with shoulders 115 and 116 for receiving in abutment the square ends 124 and 125 of the arm B.

Also in this case there is an attachment between the associated and aligned loops 115, 131 and 116, by a pin 106 which then will be closed and blocked by the walls 124 and

125 of the arm B, which cannot be seen from outside, whereas the same arm B is linked to the slider 142 and hence to the entire system of making elastic of the elastic means 104 by means of the screw 105 which follows to the jerks of rotation in the positions of opening, closing, and spreading, by the effect of the squaring of their ends 124 and 125.

By the elimination of the blocking of the cage 3 the presence of the grooves 22 and 23 of the first illustrated embodiment is not absolutely necessary, whereas the presence of a hole 21 (not illustrated) between the walls 124 and 125, for the housing of the pull rod 103 with its elastic means 104 and with the course of the slider 142 remains such that the reaction of the elastic means 104 develops against the bottom of the slider 142 for determining the intended predetermined elasticity through the blocking head 103.

Of course the embodiments till now described and illustrated are to be understood as examples only and are not to limit the scope of the present invention. In fact, it is possible, for example, to accomplish the cage 3 with a pair of hinging loop heads 31, while the fixed body 1 can be completed with one or more hinging loops, as well as it is possible to reverse the position of the hinge, placing the container body 2 on the front piece A and the fixed element 1 on the end of the arm B.

These and other similar changes or adjustments are to be understood anyway as belonging to the originality of the found to be protected.

Claims

Claims

1. Resilient hinge, particularly for spectacles, for the movement of an end of an arm (B) on an end of a front piece (A) of glasses by means of loops (12, 13, 112, 113) which are comprised by a body (1) which is to be fixed to the front piece (A) comprising:

a casing (2) which is linked with one end of the arm (B) and has a pair of projecting side walls (24, 25, 124, 125) which are spaced to each other by a central opening (21) allowing the housing of a slider (3, 142),

said side walls (24, 25, 124, 125) projecting with respect to the central opening (21), and

said slider (3) being provided with elastic means (4) and having at least one head loop (42, 131) which is to be inserted between and actually aligned with the loops (12, 13, 112, 113) of the body (1) for being linked and hinged by means of a transversal pivot (6, 106),

characterized in that

the projecting side walls (24, 25, 124, 125) are arranged such that the pivot (6, 106) is blocked and closed by the projecting side walls (24, 25, 124, 125), when the body (1), the casing (2) and the slider (3, 142) are assembled.

2. Resilient hinge according to claim 1, characterized in that the loops (12, 13, 112, 113) are provided with a shoulder (15, 16, 126).

3. Resilient hinge according to claim 1 or 2, characterized in that the projecting side walls (24, 25, 124, 125) are properly square.

4. Resilient hinge according to any of the preceding claims, characterized in that the slider (3) comprises an axial port (32) for supporting the elastic means (4).

5. Resilient hinge according to claim 4, characterized in that the port (32) comprises a cylindrical side (33) for engaging with a half-cylindrically shaped head (42) which has a hole (43) and is connectable to the elastic means (4).

6. Resilient hinge according to one of claims 1 through 5, characterized in that the central opening (21) has a cylindrical shape.

7. Resilient hinge according to claims 4 and 6, characterized in that laterally to the central opening (21) two grooves (22, 23) are arranged, wherein the central opening (21) is adapted for housing the elastic means (4), and the lateral grooves (22, 23) are adapted for housing the slider (3).

8. Resilient hinge according to claim 7, characterized in that the depths of the grooves (22, 23) are greater than the depth of the central opening (21) such that the elastic means (4) is pressed against the bottom of the central opening (21) for being preloaded.

9. Resilient hinge according to one of preceding claims, characterized by further comprising fixing means (5, 105) for fixing the slider (3) to the casing (2) in the assembled state.

10. Resilient hinge according to claim 9, characterized in that the fixing means (5, 105) comprise a screw (5, 105) which is insertable into a further opening (27) of the casing (2).

11. Resilient hinge with blocked and hidden pivot (6), particularly for glasses arms (B), characterized by the fact that it comprises a resilient hinging device for the movement of the ends of the arms (B) on the end of the front piece (A) of glasses, by means of loops (13, 14) provided with shoulder (15, 16) and linked to a body (1) fixed, for instance, to an end of the front piece (A), while at the end of the respective arm (B) to be linked a case (2) is applied provided with a pair of extended side walls (24, 25) properly squared spaced to each other by a middle opening (21, 22, 23) that allows the housing of a slider (3) or rod (3) to support an elastic means (4) to be loaded in said opening (21, 22, 23), said slider (3) or strut frame (3) being also provided with one or more head loops (31) to be inserted and axially aligned with respect to the loops (12, 13) of the body (1) of the front piece (A), to be linked and hinged by means of a transverse pivot (6) that is then blocked and closed by the extended side walls (24, 25) of the case (2) joint to the arm (B) to be hinged, under previous blockage of the carriage (3) or cage (3) in the same case (2).

12. Resilient hinge according to claim 1 or 11, characterized by the fact that it comprises an end of front piece (A) steadily linked to a fixed body (1), said body (1) being provided with a pair of rings (12) and (13) projecting from a base (11) that determines shoulders (15 and 16) symmetrical and external to said rings (12) and (13).

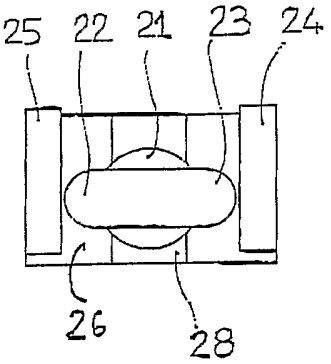


Fig. ②

Fig. ①

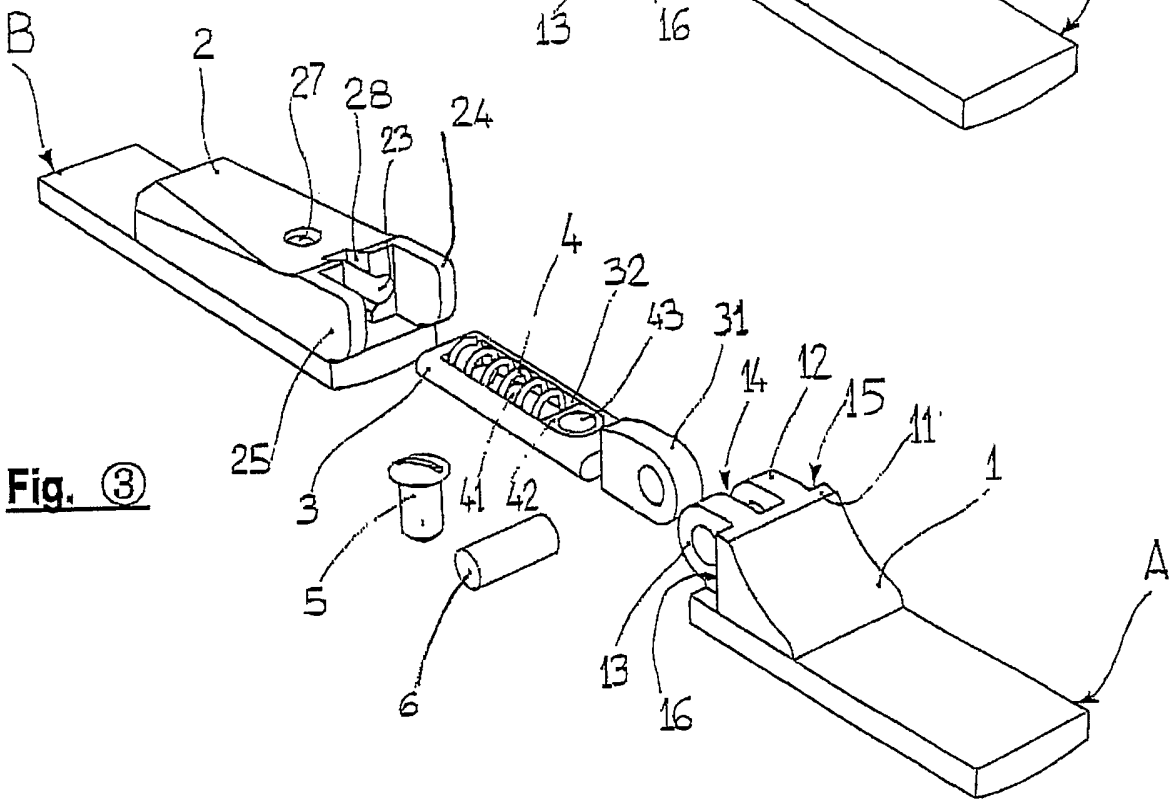


Fig. ③

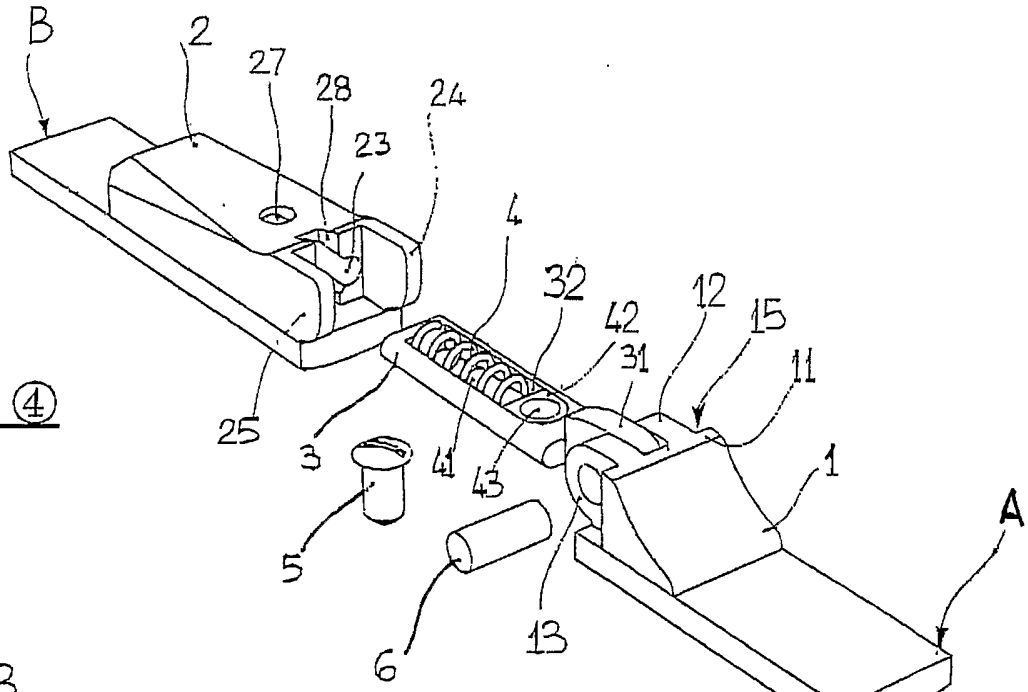

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Fig. ④

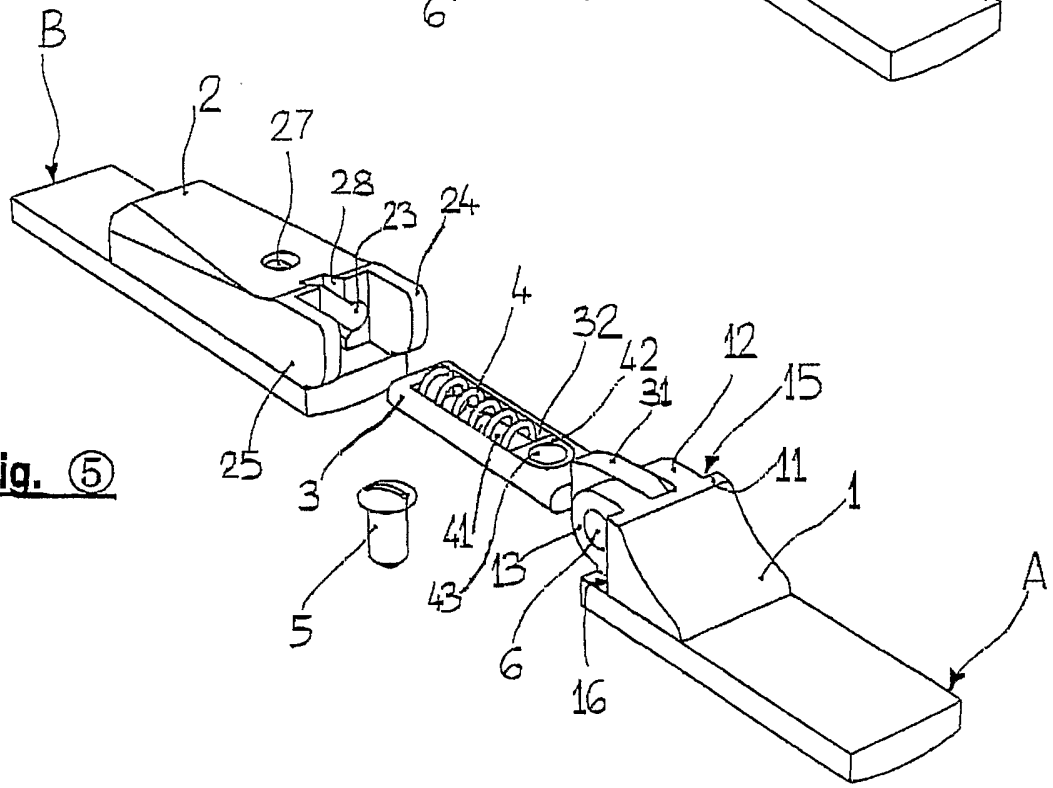

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Fig. ⑤

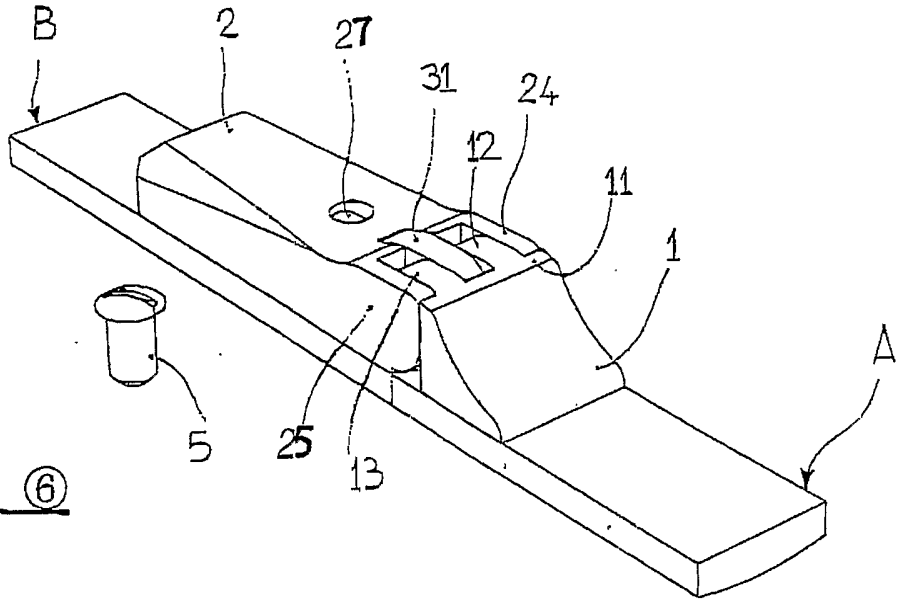


Fig. ⑥

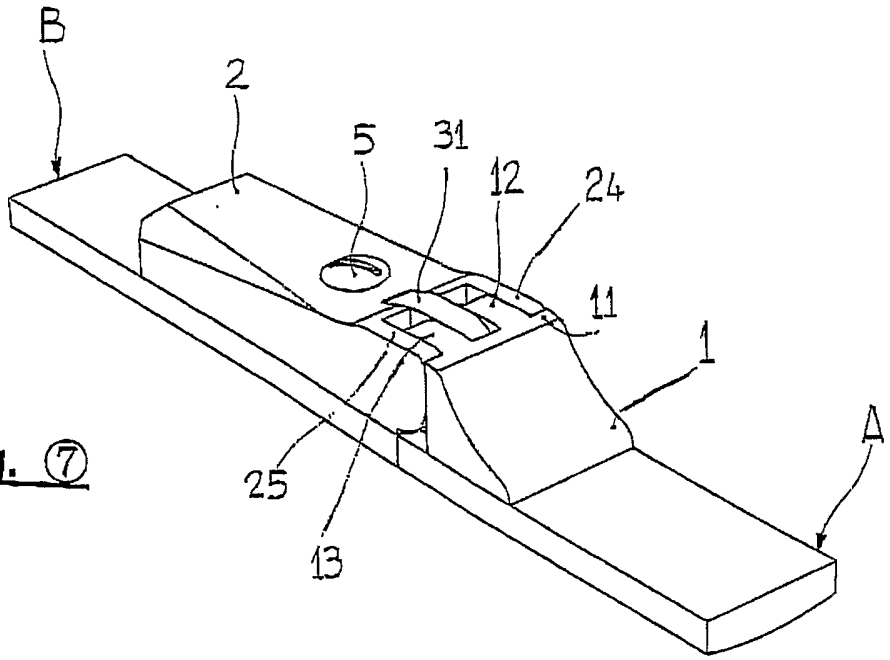


Fig. ⑦

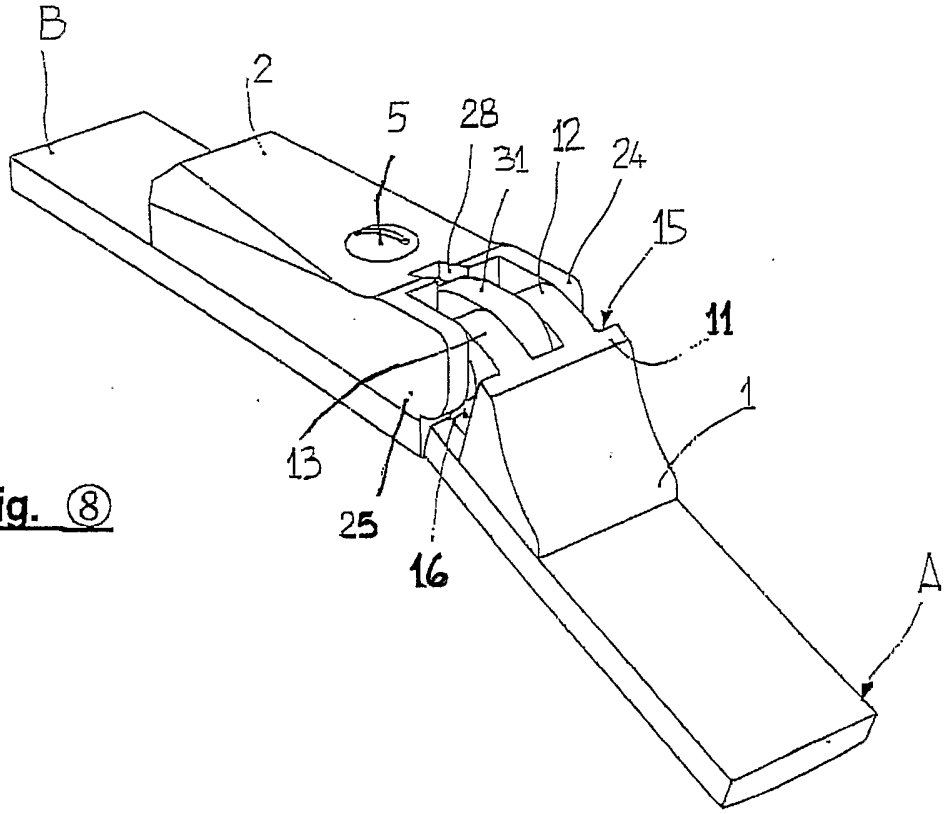


Fig. ⑧

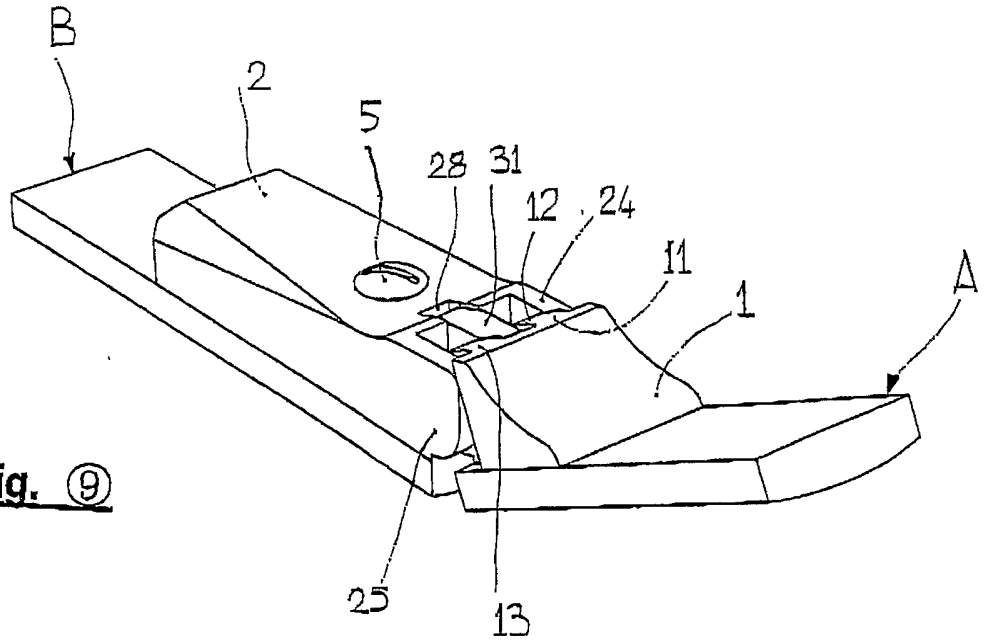


Fig. ⑨

Fig. ⑩

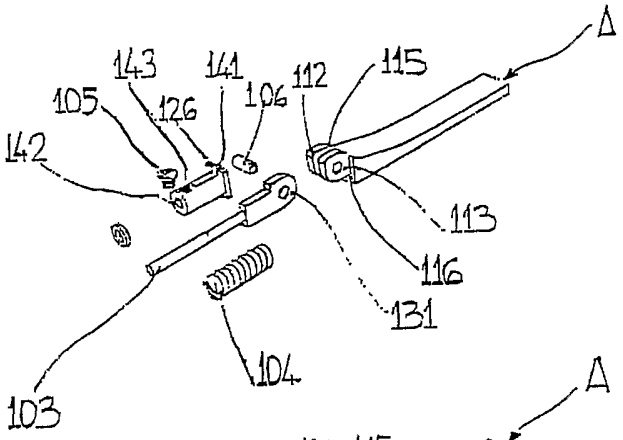


Fig. ⑪

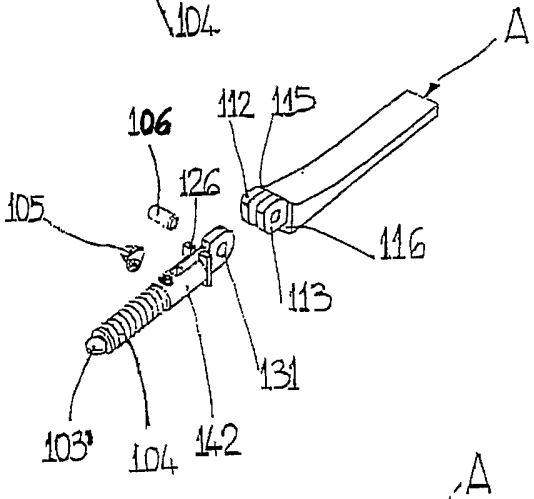


Fig. ⑫

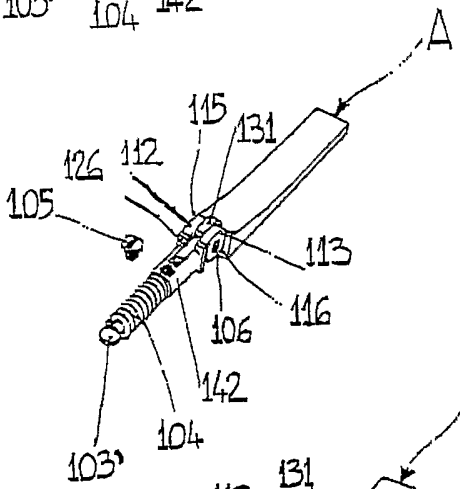
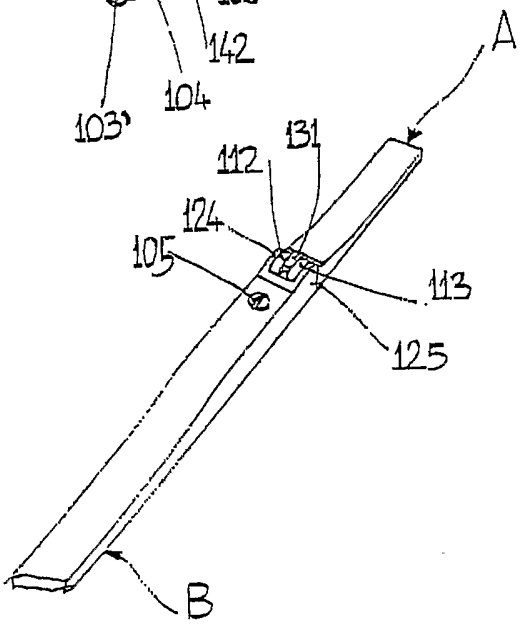


Fig. ⑬



INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 03/12002

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G02C5/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G02C E05D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	DE 93 20 469 U (KOCH HUBERT) 26 January 1995 (1995-01-26) page 1, line 1-9 page 6, line 19 -page 9, line 3; claim 1; figures 1-4	1-4,11, 12 5-10
A	EP 0 615 149 A (CHEVASSUS SA) 14 September 1994 (1994-09-14) column 2, line 47 -column 4, line 21; claims 1-3; figures 1,2	1-12
A	EP 0 952 475 A (SIMON REDTENBACHER SEEL WWE &) 27 October 1999 (1999-10-27) column 2, line 22-34 column 3, line 42 -column 5, line 1; claim 1; figures 1,6,7	1-12

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
30 January 2004	09/02/2004

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Balice, M

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 03/12002

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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