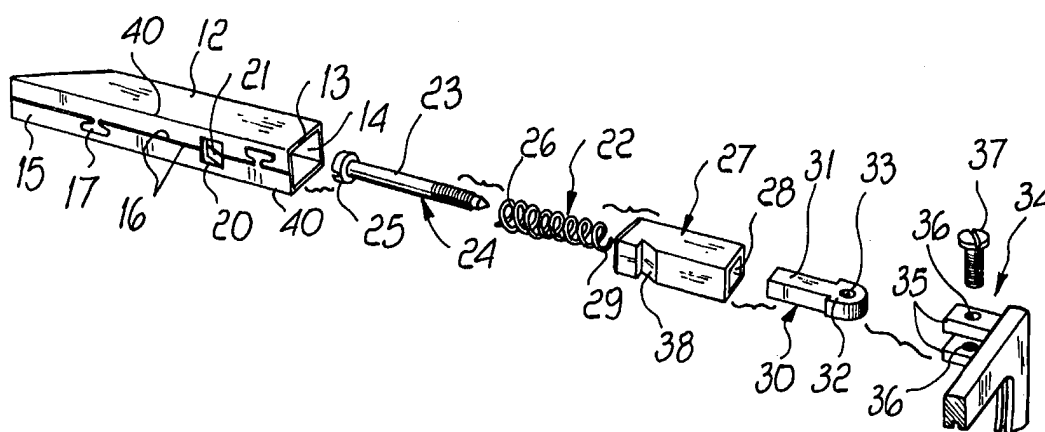




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/EP97/05785 (22) International Filing Date: 20 October 1997 (20.10.97) (30) Priority Data: PD97A000060 21 March 1997 (21.03.97) IT (71) Applicant (for all designated States except US): VISOT-TICA S.P.A. [IT/IT]; Via Vecchia Trevigiana, 11, I-31058 Susegana (IT). (72) Inventor; and (75) Inventor/Applicant (for US only): MONTALBAN, Rinaldo [IT/IT]; San Marco 5462/A, I-30124 Venezia (IT). (74) Agent: MODIANO, Guido; Modiano & Associati, Via Meravigli, 16, I-20123 Milano (IT).		(81) Designated States: AL, AM, AU, AZ, BA, BB, BG, BR, BY, CA, CN, CU, CZ, EE, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, RO, RU, SD, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>

(54) Title: IMPROVED ELASTIC HINGE FOR EYEGLASSES



(57) Abstract

An improved elastic hinge for eyeglasses comprising, at the end of a temple, an elongated hollow body (12) which forms a seat in which an elastic means (22) is inserted; the elastic means (22) is arranged between the head (25) of a screw (24), which passes therethrough axially, and a contrast element (27) to be locked in the body (12). The screw (24) passes through the contrast element (27) and engages a first hinge element (30), to which a second hinge element (34) is pivoted, the second hinge element (34) being rigidly coupled to the front of the eyeglasses. The hollow body (12) is box-shaped, is obtained starting from a metal lamina, and a blanked portion (20) is formed thereon which defines a tab (21) which is folded inward so as to partially obstruct the seat, the contrast element (27) having, on one face (15), a seat (38) for the tab (21). The contrast element (27) enters the hollow body (12) through the elastic deformation of the lowered tab (21) and locks itself therein through the elastic return of the tab (21) in abutment against the seat (38).

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IMPROVED ELASTIC HINGE FOR EYEGLASSES

Technical Field

The present invention relates to an improved elastic hinge for eyeglasses.

Background art

Currently known elastic hinges, in widespread use, are manufactured according to widely variable types and structures, all of which are meant to ensure elastic extra-
5 wide opening of the temples with respect to the front as well as stable opening and closure positions.

In particular, the present invention relates to an elastic hinge provided by means of a temple the end whereof
10 comprises an elongated hollow body containing a cylindrical helical spring.

Said spring is interposed between the head of a pin, which passes axially therethrough with its shank, and a contrast element, which is also locked inside said hollow
15 body (for example by means of an elastic snap ring).

The pin passes through said contrast element and engages a first element of the hinge which is shaped like an eyelet.

Said eyelet-shaped element is associated by means of a
20 pivot with a second element of the hinge which is rigidly coupled to the front of the eyeglasses and is also eyelet-shaped.

In this manner, the rotatable assembly of the two hinge elements, which are rigidly coupled to the temple and to the
25 front respectively, provides the articulation of the hinge.

The elastic ring that retains the contrast element inside the hollow body is conveniently accommodated between

a bore formed in said hollow body and an annular seat of the contrast element.

Assembly of said hinge must be carried out by preassembling all of its components and then inserting them
5 in the hollow body, while making the snap ring fit in the bore formed inside said hollow body.

Although it is optimum from the point of view of operation, the above elastic hinge requires a rather complicated preassembly; most of all, it can be produced
10 only with extremely accurate and precise machining.

In particular, the insertion and correct positioning of the snap ring in the corresponding seat is not at all easy and causes hinge assembly to be difficult and slow.

Elastic hinges for eyeglasses, according to Italian
15 patent no. 01243287 in the name of the same Applicant, are currently manufactured in which the pin around which the spring is arranged is inserted in a substantially cylindrical contrast element.

Said contrast element has two semicylindrical raised
20 sectors that are separated by a diametrical gap.

Said two semicylindrical sectors are suitable to fit, by elastic expansion, in a corresponding bore formed inside the hollow body.

This elastic hinge is highly satisfactory from the
25 point of view of operation, although it too requires a rather complex manufacturing process.

Moreover, all currently available hinges, once preassembled, can no longer be disassembled if required in order to replace a defective or damaged component.

30 Moreover, it is essential that the contrast element be

unable to rotate with respect to its longitudinal axis, since this ensures that the hinge, in turn, also cannot allow movements other than those for the rotation of the articulation.

Disclosure of the Invention

5 The aim of the present invention is to provide an improved elastic hinge for eyeglasses which eliminates all the drawbacks of the prior art mentioned above.

A consequent primary object of the present invention is to provide an improved elastic hinge which can be
10 assembled according to a simple and rapid method.

Another important object of the present invention is to provide an improved elastic hinge which can be installed without having to resort to any particular tool.

Another object of the present invention is to provide
15 an elastic hinge which can be manufactured with less chip-forming machining operations than conventional hinges.

Another object of the present invention is to provide an improved elastic hinge which ensures optimum durability in operation.

20 A further object of the present invention is to provide an improved elastic hinge which can be manufactured at low cost and with conventional techniques.

This aim, these objects and others which will become apparent hereinafter are achieved by an improved elastic
25 hinge for eyeglasses of the kind which comprises, at the end of a temple, an elongated hollow body which forms a seat in which an elastic means is inserted, said elastic means being arranged between the head of a screw, which passes therethrough axially, and a contrast element to be locked in

said body, said screw passing through said contrast element and engaging a first hinge element, to which a second hinge element is pivoted, said second hinge element being rigidly coupled to the front of the eyeglasses, the improvement
5 consisting in that said hollow body is box-shaped and obtained starting from a metal lamina, and in that a blanked portion is formed thereon which defines a tab which is folded inward so as to partially obstruct said seat, and in that said contrast element has, on one face, a seat for said
10 tab, said contrast element entering said hollow body through the elastic deformation of said lowered tab and locking itself therein through the elastic return of said tab in abutment against said seat.

Brief description of the drawings

Further characteristics and advantages of the present
15 invention will become apparent from the following detailed description of a preferred embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a sectional view of an improved elastic
20 hinge according to the invention;

figure 2 is an exploded view of an improved elastic hinge according to the invention;

figure 3 is a front view of a detail of an improved elastic hinge according to the invention;

25 figures 4a-4b show two sectional views of a detail of an improved elastic hinge according to the invention;

figure 5 is a perspective view of a detail of an improved elastic hinge according to the invention in a different embodiment;

figure 6 is a sectional view of a detail of an improved elastic hinge according to the invention in a different embodiment.

Ways of carrying out the Invention

With reference to the above figures, an elastic hinge
5 for eyeglasses according to the present invention is generally designated by the reference numeral 10 and comprises, at one end of a temple 11, a hollow body 12, which in this case is substantially shaped like a parallelepiped and has a flat face 13 at a first end which
10 is directed toward the articulation of the hinge 10.

A hole 14 having a rectangular cross-section opens onto said flat face 13 and passes longitudinally through the entire hollow body 12.

In particular, said hollow body 12 is obtained by
15 blanking and bending starting from a lamina (or a strip) of metallic material, so as to provide its hollow box-like shape with a base 15 which is obtained by placing the two adjacent longitudinal edges 16 parallel to each other.

Said two longitudinal edges 16 are stably associated
20 with each other by the mutual engagement of coupling elements 17.

Each one of said coupling elements 17 couples the two edges 16 by means of a lug 18 which protrudes from a first one of said edges 16 which folds and engages in a
25 complementarily shaped seat 19 formed on the other edge 16.

In particular, a central U-shaped blanked portion 20 is formed longitudinally on said base 15 and forms a tab 21 which is folded toward the inside of the hollow body 12 at an acute angle.

Said blanked portion 20 is formed in the central part of the base 15 so as to be symmetrical on the two longitudinal edges 16.

Said hollow body 12 has, in this particular embodiment,
5 a second end which tapers along the extension of the temple 11.

A cylindrical helical spring 22 is accommodated in the hole 14 inside said hollow body 12 and surrounds the shank 23 of a screw 24.

10 Said screw 24 has a head 25 which abuts against a first end 26 of said cylindrical helical spring 22.

The shank 23 of the screw 24 passes through a contrast element 27 which has a substantially box-like structure, is specified more clearly hereinafter and is shaped
15 complementarily to the hole 14 of the hollow body 12, inside which it is accommodated when assembly is complete; a cylindrical hole 28 is formed axially in said contrast element.

Said cylindrical hole 28 is therefore a seat for the
20 insertion of the shank 23, around which the cylindrical helical spring 22 is wound, and the second end 29 of said spring 22 abuts against it.

The end of the shank 23 of said screw 24, after passing through the contrast element 27, is associated by means of a
25 threaded coupling with a first hinge element 30.

Said first hinge element 30 has a body 31 which is shaped substantially like a parallelepiped and in which the threaded coupling seat for the shank 23, not shown in the figures, is formed, and has an eyelet-shaped end 32 with a
30 through hole 33.

Said first hinge element 30 enters a second hinge element 34, which is substantially fork-shaped, has the structure of a parallelepiped, and from which two eyelets 35 extend; said eyelets form holes 36 which are coaxial to said hole 33 of the first hinge element 30.

Said first and second hinge elements 30 and 34, respectively, once inserted in each other, are mutually rotatably associated by means of a threaded pivot 37 which passes through the holes 36 and the through hole 33, forming the articulation of said hinge 10.

In particular, said contrast element 27 has a face on which a seat 38 is provided which is formed, by chip-forming machining or by pressing, with a wedge-like shape in a position and with dimensions which correspond to the tab 21.

The hinge 10 is assembled by inserting the screw 24 so that it passes axially with its shank 23 sequentially through the cylindrical helical spring 22 and the contrast element 27 and then screws into the first hinge element 30.

Said screw 24 and said contrast element 27 are then inserted in the hollow body 12.

The contrast element 27 is locked inside the hollow body 12 by the engagement of the tab 21 in the complementarily shaped seat 38.

In fact, while the contrast element 27 is entering the hollow body 12, the tongue 21 is caused, by elastic deformation, to flex toward the base 15 thereof, and can return to the original inactive configuration by elastic return once the seat 38 has been reached.

The mutual assembly of the hollow body 12 and of the contrast element 27 is thus permanent, since the tab 21, if

pulled for extraction, locks against the wall 39 of the seat 38; accordingly, the tab cannot flex and therefore the contrast element 27 cannot exit.

In particular, the wall 39 against which the tab 21
5 locks can be obtained by right-angled milling, as shown in figure 4a, or by acute-angle milling, as in figure 4b, in order to enhance its locking action.

Conveniently, the base 15 is associated with the temple 11 by means of welds which are formed, according to
10 conventional methods, at the edges 40 of the hollow body 12.

In a first different embodiment, shown in figure 4, the contrast element, now designated by the reference numeral 27a, has an end portion with walls 41 which are deformed plastically so as to retract inward.

15 Said first different embodiment allows to increase the useful surface of the contrast element 27a against which the second end 29 of the spring 22 abuts and at the same time allows to fix in the contrast element 27a the screw 24 that passes through said contrast element.

20 In a second different embodiment, illustrated in figure 6, the hollow body, now designated by the reference numeral 12a, has a cambered region at the part lying opposite to the base 15a associated with the temple 11.

In a further different embodiment, not shown in said
25 figures, the contrast element 27 can be provided starting from a pressed and shaped plate which has a substantially U-shaped transverse cross-section.

Another possible different embodiment can be achieved by providing a contrast element 27 which has a hollow box-
30 like structure and a rectangular or square cross-section

with a blanked portion.

Conveniently, the contrast element 27 can be obtained by molding plastics.

In all of these embodiments, the contrast element 27, although being structurally different, performs the same function of locking the screw 24, ensuring that the hinge 10 has a correct elastic extra-wide opening and stable opening and closure positions.

In practice, it has been observed that the present invention fully achieves the intended aim and objects.

In particular, an advantage has been achieved with the present invention in that an elastic hinge for eyeglasses has been provided having a simple structure.

Another important advantage is achieved with the present invention by providing an elastic hinge which can be assembled very simply without having to resort to particular tools or instruments.

Another advantage is achieved with the present invention by providing an improved elastic hinge which allows only rotations of the temple with respect to its pivot.

Another advantage is that an elastic hinge has been provided which can be produced with a considerable reduction in chip-forming machining operations with respect to conventional hinges.

The present invention is susceptible of numerous modifications and variations, all of which are within the scope of the same inventive concept.

All the details may furthermore be replaced with other technically equivalent elements.

The materials employed, as well as the dimensions, may be any according to requirements.

CLAIMS

1 1. An improved elastic hinge for eyeglasses of the kind
2 which comprises, at the end of a temple (11), an elongated
3 hollow body (12) which forms a seat in which an elastic
4 means (22) is inserted, said elastic means (22) being
5 arranged between the head (25) of a screw (24), which passes
6 therethrough axially, and a contrast element (27,27a) to be
7 locked in said body (12), said screw (24) passing through
8 said contrast element (27) and engaging a first hinge
9 element (30), to which a second hinge element (34) is
10 pivoted, said second hinge element (34) being rigidly
11 coupled to the front of the eyeglasses, the improvement
12 consisting in that said hollow body (12) is box-shaped, is
13 obtained starting from a metal lamina, and in that a blanked
14 portion (20) is formed thereon which defines a tab (21)
15 which is folded inward so as to partially obstruct said
16 seat, and in that said contrast element (27,27a) has, on one
17 face, a seat (38) for said tab (21), said contrast element
18 (27,27a) entering said hollow body (12) through the elastic
19 deformation of said lowered tab (21) and locking itself
20 therein through the elastic return of said tab (21) in
21 abutment against said seat (38) .

1 2. An improved elastic hinge according to claim 1,
2 characterized in that said contrast element (27) is obtained
3 starting from a pressed metal plate which is shaped so as to
4 have a box-like structure.

1 3. An improved elastic hinge according to claim 2,
2 characterized in that said seat (38) for said tab (21)
3 formed on a face of said contrast element (27) is obtained

4 through a chip-forming machining operation, said seat (38)
5 being shallower than the thickness of said metal plate.

1 4. An improved elastic hinge according to claim 2,
2 characterized in that said seat (38) for said tab (21)
3 formed on one face of said contrast element (27) is formed
4 by plastic deformation of said metal plate with a pressing
5 process, said seat being shallower than the thickness of
6 said metal plate.

1 5. An improved elastic hinge according to claim 3 or 4,
2 characterized in that said elongated hollow body (12) is
3 formed by pressing, starting from a metal plate, and has a
4 box-like structure in which one of the faces (15) is formed
5 by the mutually adjacent arrangement of the two longitudinal
6 edges (16).

1 6. An improved elastic hinge according to claim 5,
2 characterized in that said blanked portion (20) is formed on
3 said face (15) in a central position and forms said tab (21)
4 which is folded inward, said blanked portion (20) being
5 substantially U-shaped with its ends directed toward the
6 front.

1 7. An improved elastic hinge according to claim 6,
2 characterized in that said two longitudinal edges (16) of
3 said base (15) are mutually associated by the coupling of
4 lugs (18), which protrude from a first edge, in
5 complementarily shaped seats (19) formed on the second edge
6 so as to form coupling elements.

1 8. An improved elastic hinge according to claim 5,
2 characterized in that said tab (21) is thinner than the
3 depth of said seat (38) formed on said contrast element
4 (27).

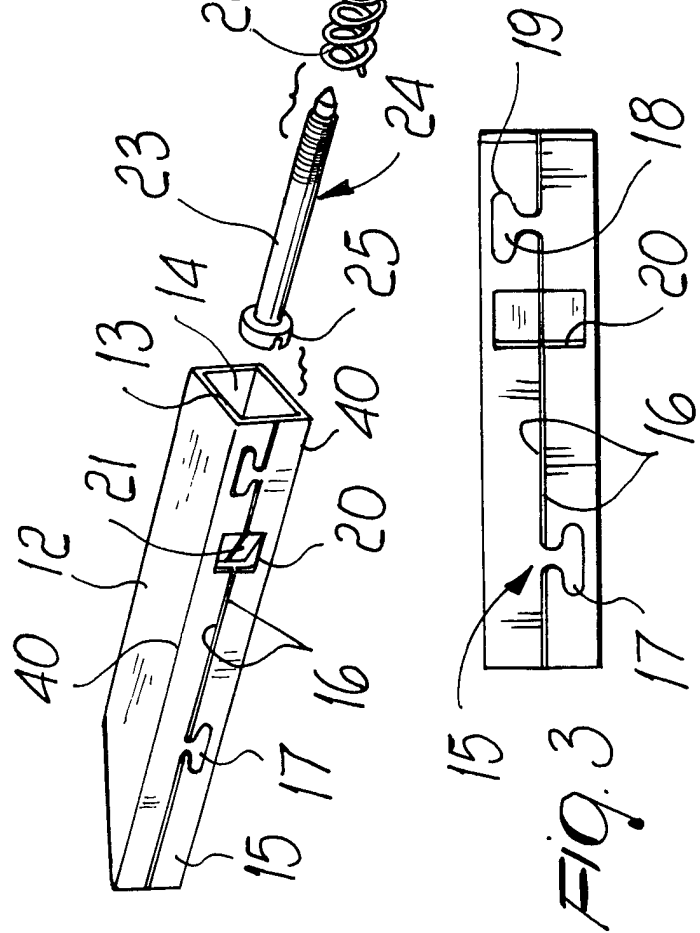
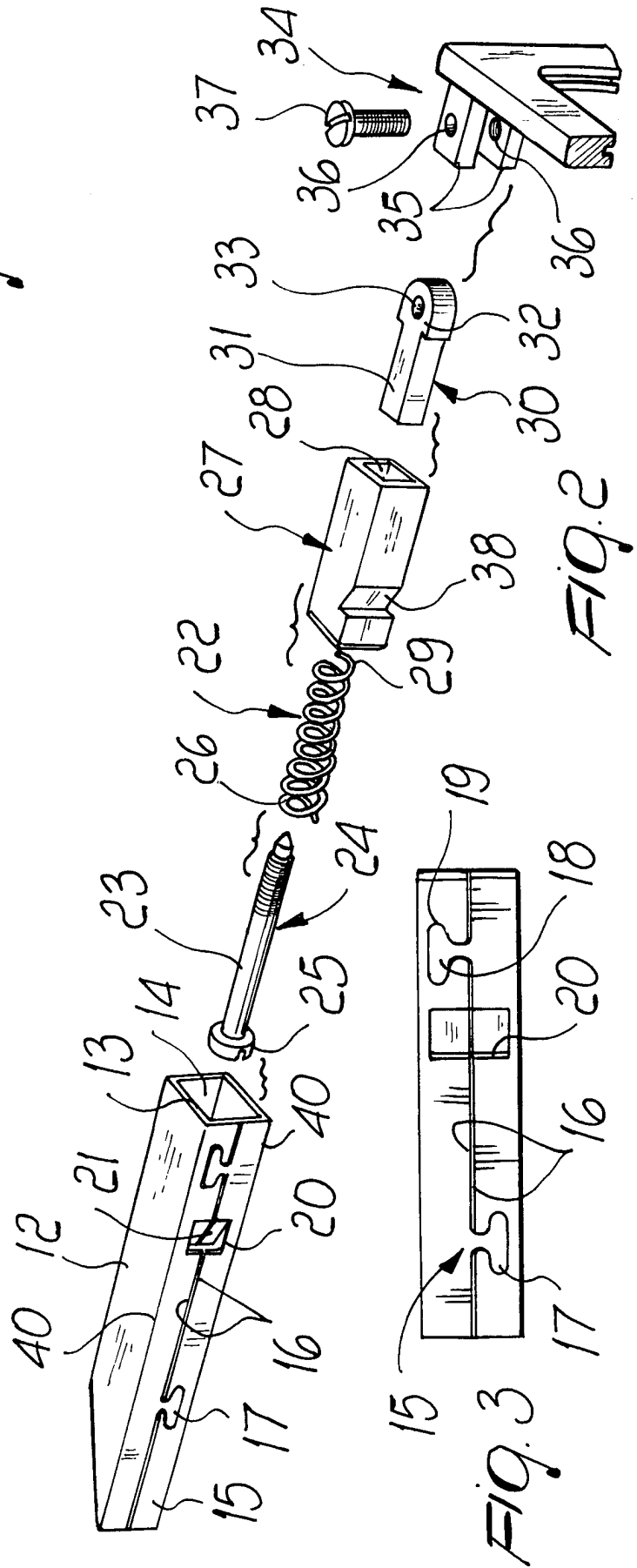
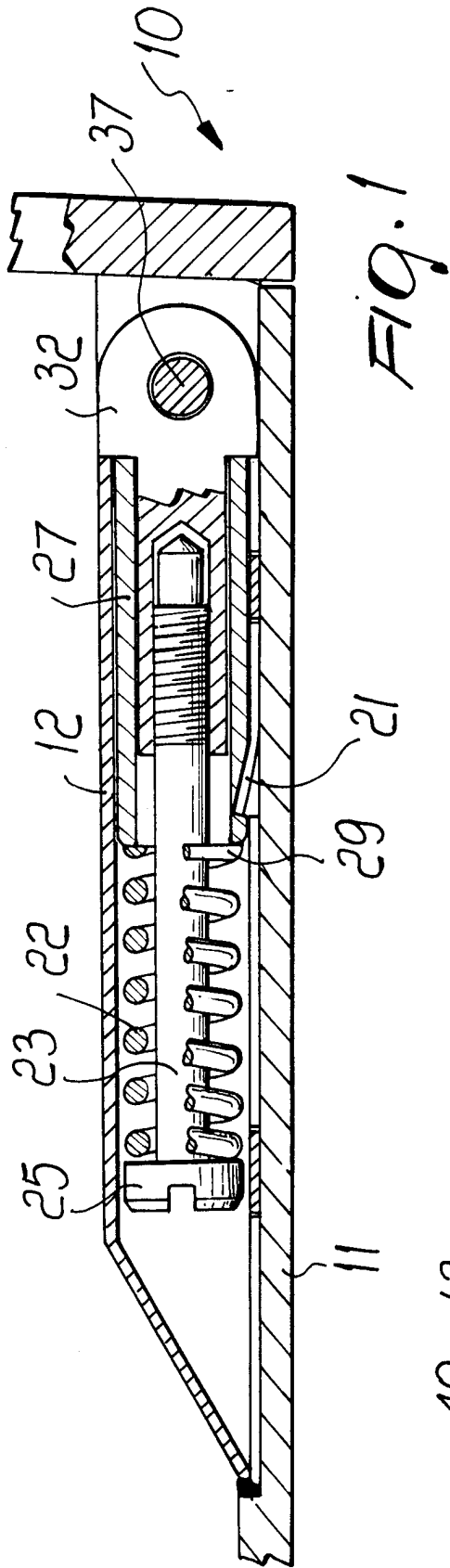
1 9. An improved elastic hinge according to claim 1,
2 characterized in that said hollow body (12) is associated
3 with said temple (11) through the face provided with said
4 tab (21).

1 10. An improved elastic hinge according to claim 1,
2 characterized in that said contrast element (27a) has an end
3 portion which is directed toward the head of said screw (24)
4 and has walls (41) which curve inward by plastic deformation
5 to provide greater abutment contact against said elastic
6 means (22), said end portion not affecting said first hinge
7 element (30), which abuts against said second hinge element
8 (34).

1 11. An improved elastic hinge according to claim 1,
2 characterized in that said elongated hollow body (12) has an
3 external cambered region (12a).

1 12. An improved elastic hinge according to claim 1,
2 characterized in that said contrast element (27) is obtained
3 starting from a metal lamina and has a U-shaped transverse
4 cross-section.

1 13. An improved elastic hinge according to claim 2,
2 characterized in that said contrast element (27) has a
3 rectangular cross-section and a longitudinally open portion
4 at one face.



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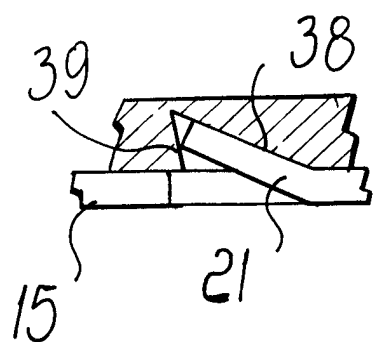


Fig. 4b

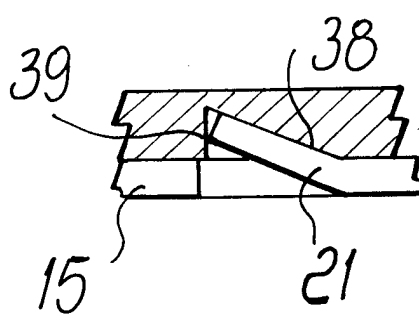


Fig. 4a

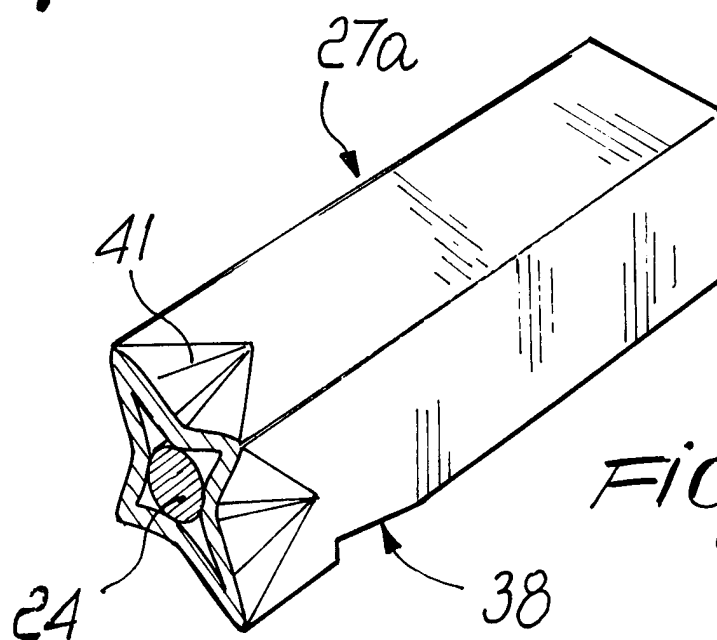


Fig. 5

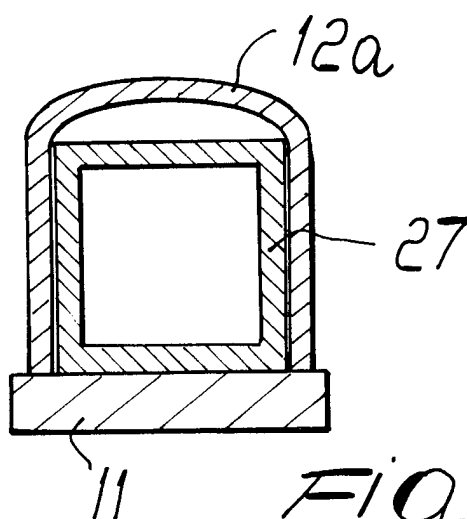


Fig. 6

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 97/05785

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 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 6 G02C

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	EP 0 652 456 A (VISOTTICA SPA) 10 May 1995 see abstract; figures ---	1,9
A	EP 0 596 265 A (VISOTTICA SPA) 11 May 1994 see abstract; figures ---	1,9
A	US 4 991 258 A (DRLIK GUENTHER) 12 February 1991 see abstract ---	1,9
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A	DE 93 06 387 U (OBE-WERK) 8 July 1993 see claims ---	1,9
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

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Date of mailing of the international search report

17/02/1998

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 97/05785

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Information on patent family members

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