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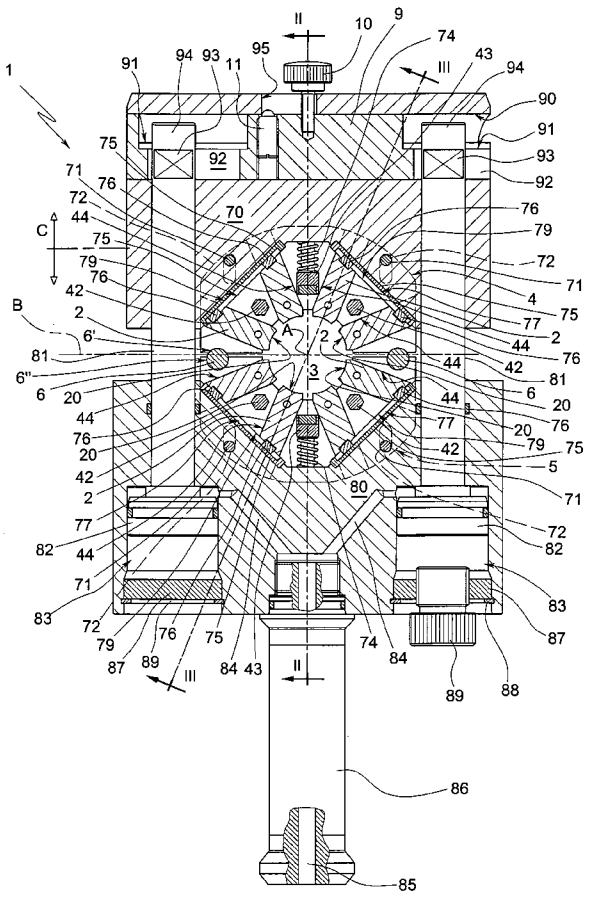
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(54) **Title:** UNIVERSAL PRESS FOR DEFORMING PIPE CONNECTION SLEEVES, AND FOR OTHER USES



(57) **Abstract:** Universal press (1) comprising two crosspieces (7, 8) movable relative to each other in a rectilinear direction (C) with mutual approach and withdrawal movement, to act on a series of crimping inserts (2) disposed to define an annular housing seat (3) for a connection sleeve, such as to urge them simultaneously towards this latter and to retract them simultaneously in the opposite direction, following respectively a mutual approach movement and a mutual withdrawal movement of said crosspieces (7, 8) . Said press comprises an insert carrier frame (4, 5) which is interposed between said crosspieces (7, 8) and comprises an assembly of slide seats (44) disposed radially about a common central axis (A) and each arranged to receive a respective crimping insert (2) and to slidably guide it in a radial direction with to-and-fro movement with respect to said central axis (A) .

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DESCRIPTION

UNIVERSAL PRESS FOR DEFORMING PIPE CONNECTION SLEEVES, AND FOR OTHER USES

TECHNICAL FIELD

The present invention relates to a manually or hydraulically operated press generally used to deform the connection sleeves positioned on the ends of flexible pipes, in order to form a connection between the pipes.

PRIOR ART

Currently available presses are know to generally comprise a fixed first crosspiece which supports a movable second crosspiece by means of two projecting shafts.

One of these presses is described in detail in IT 1298002, which is to be considered as included herein.

Specifically, the fixed crosspiece comprises a polygonal seat facing an identical polygonal seat provided in the movable crosspiece, each of said seats receiving an active part formed from a group of crimping inserts disposed as a fan, and from an elastic clamp which connects the inserts together. The clamp also comprises the spacer elements of deformable elastic material which are interposed between the crimping inserts.

Said active parts define a generally elliptical closed annular seat for encircling the connection sleeve.

The movable crosspiece is removable from the slide shafts to enable the connection sleeve to be initially positioned within said annular seat; then after being remounted, it is made to approach the fixed crosspiece until the respective active parts come into mutual contact and tighten about the

connection sleeve by the deformation of the elastic clamps and of the relative spacer elements.

In this manner, the crimping inserts are progressively pressed against said connection sleeve, to deform it and hence fix it to the pipes.

A drawback of these known presses is the fact that during deformation of the active parts, the annular seat contracts to vary its shape in a substantially random manner, with the result that the inserts are pressed against the connection sleeve in different directions and with varying force, so that reliable crimping is not always guaranteed.

DISCLOSURE OF THE INVENTION

An object of the present invention is to overcome the aforestated drawback within the framework of a simple, rational and low-cost solution.

A further object of the invention is to provide a press of the aforestated type which can be adapted to carry out further operations other than crimping.

This object is attained by the invention by virtue of the characteristics defined in the claims.

Specifically, the present invention provides a universal press comprising:

- two crosspieces movable relative to each other in a rectilinear direction with mutual approach and withdrawal movement, to act on a series of crimping inserts disposed to define an annular housing seat for a connection sleeve, such as to urge them simultaneously towards this latter and to retract them simultaneously in the opposite direction, following respectively a mutual approach movement and a mutual withdrawal movement of said crosspieces;

- an insert carrier frame which is interposed between said crosspieces and comprises an assembly of slide seats disposed radially about a common central axis and each arranged to receive a respective crimping insert and to slidably guide it in a radial direction with to-and-fro movement with respect to said central axis (A).

By virtue of this solution, the positioning of the crimping inserts and their movement relative to the connection sleeve is uniquely determined by the slide seats, which hence always ensure effective crimping of the pipes to be connected together.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and the advantages of the invention will be apparent on reading the ensuing description given by way of non-limiting example with reference to the figures illustrated in the accompanying drawings, in which:

Figure 1 is the section I-I indicated in Figure 2 through a press of the invention, complete with all its components;

Figure 2 is the section II-II indicated in Figure 1, with certain components of the press being omitted for greater clarity;

Figure 3 is the section III-III indicated in Figure 1, with certain components of the press being omitted for greater clarity;

Figures 4 and 5 show the press of Figure 1 in a rest position and in a working position respectively;

Figures 6a and 6b are a plan view of the press of Figure 1, with the locking latch in the engagement and release positions respectively;

Figure 7 shows the press of Figure 1 with the crosspieces separated;

Figure 8 is a partial section through the press of Figure 1 adapted as a punch.

BEST MODE FOR CARRYING OUT THE INVENTION

As shown in Figure 1, the press comprises eight crimping inserts 2 which are radially disposed, angularly equidistant, about a common central axis (A), and are each formed from a metal block presenting, facing said central axis A, an active part 20 shaped as a circular sector tapered towards its end.

The active parts 20 of all the crimping inserts 2 define a perfectly circular annular seat 3 for axially housing a connection sleeve positioned at the ends of two pipes to be connected together.

Specifically, each active part 20 comprises three separate teeth aligned along a direction parallel to the central axis A (see Figures 2 and 3), they being intended to be pressed radially against said connection sleeve, such as to deform it and fix it securely to the pipes.

The crimping inserts 2 are carried by an insert carrier frame formed from two separate identical half-frames, an upper 4 and lower 5 respectively, symmetrically opposing about an ideal plane of symmetry B passing through the central axis A.

Said half-frames 4 and 5 carry respectively one half of the crimping inserts 2, and close onto two cylindrical spacers 6 individually locked between two receiving cradles 6' and 6" which face each other and are provided in one and the other half-frame 4 and 5 respectively (see Figures 1, 4 and 5).

Each half-frame 4 and 5 consists of two specularly disposed identical profiled plates, namely a rear 40 and a front 41, which are perpendicular to the central axis A and are connected together by two hexagonal side spacers 42

and a rectangular central spacer 43 (also see Figures 2 and 3).

The facing sides of said rear plate 40 and front plate 41 are each grooved by four full-length prismatic channels 44 (see Figure 1) which, arranged as a fan, extend longitudinally, each along its own radial direction from the central axis A.

Between each pair of facing channels 44, pertaining respectively to the rear plate 40 and front plate 41, there is contained a crimping insert 2, which is orientated with its active part 20 facing the central axis A and is free to slide in a radial direction guided by the channels 44.

Specifically, the depth of each guide channel 44 is substantially less than the width of the crimping inserts 2, and equal to about 8% of this width, to achieve a limited friction surface which facilitates sliding and reduces wear.

It should be noted that from the constructional aspect, the two rear plates 40 and the two front plates 41 are formed from a monolithic flange having a profile symmetrical about the said plane of symmetry B, and which is firstly machined to form the guide channels 44 and then divided, along said plane B, into two identical half-flanges to form said rear plates 40 or front plates 41 (see Figures 4 and 5 as reference).

Specifically, to prevent the inevitable loss of material along the cutting line from prejudicing correct radial positioning of the guide channels 44 with respect to the central axis A, two lateral holes are initially provided in the flange with their centre slightly below the plane of symmetry B and their diameter equal to the diameter of the spacer cylinders 6.

In this manner, after the cut has been made, in each resultant half-flange there remain defined the stated receiving cradles 6' and 6" for the spacer cylinders 6, which enable the thickness of the lost material to be

compensated, so ensuring correct positioning of the guide channels 44.

As shown in the accompanying figures, the upper half-frame 4 and lower half-frame 5 are supported respectively by an upper crosspiece 7 and lower crosspiece 8, which are mutually movable along a direction C, perpendicular to the ideal plane of symmetry B.

Said crosspieces 7 and 8 are each provided with a central rib, 70 and 80 respectively, of thickness substantially equal to the distance which separates the rear plates 40 from the front plates 41, and partially interposed between these latter.

The central rib 70 comprises a recess of lunette shape symmetrically faced by another lunette provided in the opposing central rib 80 (see Figure 1).

Each lunette presents a substantially V-shaped profile, with two mutually perpendicular oblique walls, both inclined to the direction C in which the crosspieces 7 and 8 mutually move.

Said oblique walls are both provided with a reinforcement plate 75, preferably of very hard metal, which provides a thrust surface 79 on which two respective crimping inserts 2 rest; said crimping inserts 2 have their rear cut to flute mouthpiece shape, to rest on said thrust surface 79 along an extended contact surface.

Specifically, a magnetic pad 76 is interposed between each reinforcement plate 75 and a respective crimping insert 2, to always maintain them in mutual contact, it being partially housed in a hole provided in the rear of the crimping insert 2, and projects therefrom to engage the interior of a rectilinear groove 77 provided in the reinforcement plate 75.

Preferably, the housing hole has a depth of about one third of the thickness of the magnetic pad 76, while the groove 77 has a depth of about three

quarters of said thickness, in order to leave a suitable clearance.

In an alternative embodiment, not shown, each magnetic pad 76 is rigidly fixed in a hole of the relative reinforcement plate 75 and projects therefrom to partially engage in a groove in the rear of the insert 2.

As shown in Figure 1, each half-frame 4 and 5 is connected to the relative crosspiece 7 and 8 by two cylindrical pins 71 which project from both sides of the central rib 70 and 80 to engage in two corresponding slots 72 provided in the rear plate 40 and front plate 41, said slots 72 extending along the movement direction C of the crosspieces 7 and 8, to enable their relative movement.

Between each half-frame 4 and 5 and the relative crosspiece 7 and 8, two springs 74 are interposed (see Figure 2), each of which is carried by a respective guide rod 45 fixed to the central spacer 43 of the half-frame 4 and 5, and is partially housed axially within a corresponding dead-ended hole 73 provided in the central ribs 70 and 80.

In this manner, the springs 74 perform the double function of constantly pressing the half-frames 4 and 5 against the spacer cylinders 6, to ensure correct positioning of the crimping inserts 2, and to oppose the mutual approach movement of the crosspieces 7 and 8.

As shown in Figure 1, the lower crosspiece 8 slidably receives two shafts 81 projecting in the said movement direction C, these passing through two respective receiving holes 78 in the upper crosspiece 7, where they are removably locked by locking means described in detail hereinafter.

Each projecting shaft 81 is provided with a wide disc 82 slidably inserted into a respective cylindrical chamber 83 of the lower crosspiece 8, closed lowerly by a metal plug 87 retained by a retaining ring 88.

Specifically, pressurized oil is fed into each cylindrical chamber 83 from a conduit 84 connected to an external source (not shown), via a manifold 85 provided in a sleeve 86 fixed to the lower crosspiece 8.

In this manner, on feeding pressurized oil into the cylindrical chambers 83, the projecting shafts 81 are urged to slide in the direction C, in the sense of causing the upper crosspiece 7 to approach the lower crosspiece 8.

Both the central ribs 70 and 80 move simultaneously between the rear plate 40 and the front plate 41 of the respective half-frame 4 and 5, to cause the thrust surfaces 79 to slide in contact with the rear of the corresponding crimping inserts 2, and hence cause these latter to slide simultaneously in a radial direction towards the central axis A, to deform the connection sleeve (see Figure 5).

Obviously during this stage, the magnetic pads 76 slide rigid with the respective crimping insert 2 within the groove 77 provided in the thrust surface 79.

On interrupting pressurized oil feed, the upper crosspiece 7 and lower crosspiece 8 withdraw from each other, urged by the springs 74; the crimping inserts 2, which remain in forced contact with the reinforcement plates 75 because of the magnetic pads 76, are compelled to slide radially outward within the guide channels 44, to release the deformed connection sleeve (see Figure 4).

Obviously, to position the connection sleeve to be crimped within the annular seat 3 or, vice versa, to extract it after deformation, it merely has to be inserted axially into or withdrawn from the annular seat 3. However, if this is not possible, for example because of the shape of the sleeve or the application for which it is intended, the upper crosspiece 7 and lower

crosspiece 8 have merely to be separated from each other, as shown in Figure 7.

It should be noted that although the extended contact surface by which the crimping inserts 2 rest on the thrust surface 79 results in non-negligible friction during mutual sliding, it ensures however a uniform wear of the contacting parts, and an optimal thrust under all conditions.

It should also be noted that as the radial movement of the crimping inserts 2 is produced by the relative movement of the upper crosspiece 7 and lower crosspiece 8, it is advantageously possible to adjust the minimum diameter assumed by the annular seat 3 during crimping, and hence adapt the press 1 to operate on connection sleeves of different dimensions, simply by varying the stroke of the projecting shafts 81.

For this purpose (see Figure 1), an adjustment screw 89 is provided, associated with the metal closure plug 87 of one of said cylindrical chambers 83, and movable in the direction in which the wide disc 82 slides: by screwing down the screw 89 the stroke of the projecting shafts 81 is reduced and the crimping diameter increased, whereas by unscrewing it, said stroke is increased and the crimping diameter reduced.

The said means for locking the upper crosspiece 7 to the projecting shafts 81 comprise a generally cylindrical latch 9 slidably inserted into a transverse hole 90 which is provided at the top of the upper crosspiece 7, and into which the receiving holes 78 open.

As shown in Figure 1, the top of said latch 9 presents two separate recesses 91, provided lowerly with a respective aperture 92 passing through its thickness. The apertures 92 are shaped to both present a substantially circular wide portion 92' and a narrow portion 92" which extends as a slot in

the direction in which the latch 9 slides, and in the same sense (see Figures 6a and 6b).

The latch 9 can slide within the transverse hole 90 between two separate positions, one being a release position in which the wide portions 92' of the apertures 92 are aligned with the holes 78 receiving the projecting shafts 81, and the other an engagement position in which they are offset.

In proximity to their free end, the projecting shafts 81 present two parallel cuts defining an intermediate portion 93 of reduced cross-section to slidably engage with one of said narrow portions 92", they bounding a cylindrical end head 94.

With the latch 9 in its release position (see Figure 6b), the projecting shafts 81 can be inserted into the holes 78 of the upper crosspiece 7 and through the wide portions 92' of the apertures 92, until their cylindrical heads 94 are positioned within the recess 91; then on moving the latch 9 into the engagement position (see Figure 6a), the narrow portions 92" slide as an exact fit along the narrow cross-section portions 93 of the projecting shafts 81, to secure the upper crosspiece 7 to the lower crosspiece 8.

As shown in Figure 1, to fix the latch 9 in said engagement and release positions, a manual screw 10 is screwed into it, this being slidably received in a slot 95 provided in the top of the upper crosspiece 7; furthermore, to further ensure correct location of the of the latch 9 in the engagement position, it is provided with an elastic stop 11 which, when this position has been attained, snaps into said slot 95.

It should be noted that the aforedescribed fixing ensures considerable safety should the projecting shafts 81 fracture, as the fractured pieces remain connected at one end to the upper crosspiece 7, locked by the latch 9, and

at the other end to the lower crosspiece 8, retained by the cylindrical chambers 83 closed by the metal plugs 87.

The invention can be adapted for other uses, without changing the configuration of the press 1.

In particular, with the upper crosspiece 7 and lower crosspiece 8 separated, the crimping inserts 2 can be advantageously replaced by simply pulling them towards the end of the respective guide channel 44 until the magnetic attraction of the magnetic pad 76 is overcome (see Figure 7), this remaining attached to the reinforcement plate 75 because of its greater metallic mass compared with the insert 2.

Again, the press 1 can be provided with accessories which enable it to operate for example as a punch, as shown in Figure 8.

In this version, all the crimping inserts 2 are absent, and the central spacers 43 of both half-frames 4 and 5 are connected to a respective metal support fork 12, which is retained in position by a magnet 46 associated with the spacer 43 and has its arms resting on a flat surface of the V-shaped lunette of the relative crosspiece 7 and 8.

Said forks 12 are insertedly coupled to a punch 120 and die 121 respectively, which are made to mutually approach by the movement of the crosspieces 7 and 8 in the direction C.

Numerous modifications of a practical and applicational nature can be made to the invention concerned, but without leaving the scope of the inventive idea as claimed below.

CLAIMS

1. A universal press comprising two crosspieces (7, 8) movable relative to each other in a rectilinear direction (C) with mutual approach and withdrawal movement, to act on a series of crimping inserts (2) disposed to define an annular housing seat (3) for a connection sleeve, such as to urge them simultaneously towards this latter and to retract them simultaneously in the opposite direction, following respectively a mutual approach movement and a mutual withdrawal movement of said crosspieces (7, 8),

characterised by comprising an insert carrier frame (4, 5) which is interposed between said crosspieces (7, 8) and comprises an assembly of slide seats (44) disposed radially about a common central axis (A) and each arranged to receive a respective crimping insert (2) and to slidably guide it in a radial direction with to-and-fro movement with respect to said central axis (A).

2. A press as claimed in claim 1, characterised in that each crosspiece (7, 8) comprises thrust surfaces (79), each of which is arranged to remain constantly in contact with the rear of at least one respective crimping insert (2) by virtue of retention means (76), such as to drive said crimping insert (2) in its movement within the relative slide seat (44).

3. A press as claimed in claim 2, characterised in that said thrust surfaces (79) are inclined to the direction of relative movement (C) of the crosspieces (7, 8).

4. A press as claimed in claim 2, characterised in that the rear of the crimping inserts is shaped such that it rests on the corresponding thrust surface (79) with an extended contact surface.

5. A press as claimed in claim 2, characterised in that said thrust surfaces (79) are associated with the walls of two symmetrically opposing identical

lunettes which are provided respective in one and in the other crosspiece (7, 8).

6. A press as claimed in claim 5, characterised in that said lunettes present a substantially V-shaped profile, the oblique walls of which each carry a respective thrust surface (79).

7. A press as claimed in claim 6, characterised in that said oblique walls are mutually perpendicular.

8. A press as claimed in claim 2, characterised in that each thrust surface (79) is provided by a reinforcement plate (75) rigidly fixed to the relative crosspiece (7, 8).

9. A press as claimed in claim 2, characterised in that said retention means comprise, for each crimping insert (2), a magnet (76) interposed between the rear of the crimping insert (2) and the thrust surface (79).

10. A press as claimed in claim 2, characterised in that the support frame is formed from two separate symmetrically opposing identical half-frames (4, 5), each of which is supported by a respective crosspiece (7, 8).

11. A press as claimed in claim 10, characterised in that each half-frame (4, 5) is supported by the relative crosspiece (7, 8) via elastic means (74) which constantly press it against the other half-frame, while enabling the crosspiece (7, 8) to move relative to it.

12. A press as claimed in claim 10, characterised in that each of said half-frames (4, 5) comprises two spaced-apart identical facing plates (40, 41), each individual slide seat being defined by two opposing guide channels (44) provided respectively in the facing faces of said facing plates (40, 41); the crosspieces (7, 8) each comprising a respective central rib (70, 80) slidable between the facing plates (40, 41) of the corresponding half-frame (4, 5), and

carrying said thrust surfaces (79).

13. A press as claimed in claim 10, characterised in that between said half-frames (4, 5) there are interposed two spacer cylinders (6) disposed parallel to the central axis (A) and individually retained between two cradles (6', 6") provided respectively in one and in the other half-frame (4, 5).

14. A press as claimed in claim 1, characterised in that a first crosspiece (8) comprises two projecting shafts (81) which penetrate into two corresponding receiving holes (78) provided in the second crosspiece (7), and are removably lockable to their interior by locking means (9);

said projecting shafts (81) sliding simultaneously in said movement direction (C) to cause the crosspieces (7, 8) to approach or withdraw from each other.

15. A press as claimed in claim 14, characterised in that said locking means comprise a latch (9) slidably received within a transverse hole (90) provided in the second crosspiece (7) and into which said receiving holes (78) for the projecting shafts (81) open;

said latch (9) being able to be located in an engagement position, in which it fits by insertion into both projecting shafts (81) to lock them to said second crosspiece (7), and in a release position, in which it disengages from said insertion fit, to enable the projecting shafts (81) to be inserted into and withdrawn from the receiving holes (78).

16. A press as claimed in claim 15, characterised in that said latch (9) comprises two separate apertures (92) passing through its thickness, each of which is shaped to present:

- a wide portion (92') which faces a respective receiving hole (78) when the latch (9) is in its release position, to enable the relative projecting shaft (81) to pass; and

- a narrow portion (92"), elongated as a slot in the direction in which the latch (9) slides, to engage as an exact fit an intermediate reduced cross-section portion (93) of said projecting shaft (81), when this latter is inserted into the aperture (92) and the latch (9) is in its engagement position.

17. A press as claimed in claim 15, characterised in that said latch (9) is of generally cylindrical shape and presents two recesses (91) which, positioned in correspondence with said through apertures (92) on the opposite side to the receiving holes (78), are each able to receive the end portion (94) of a respective projecting shaft (81) to enable the insertion fit to be achieved.

18. A press as claimed in claim 14, characterised in that each projecting shaft (81) comprises a wide disc (82) slidably received within a relative cylindrical chamber (83) of the first crosspiece (8), which chamber is fed with a pressurized fluid urging the disc (82) in the direction causing the crosspieces (7, 8) to approach each other.

19. A press as claimed in claim 18, characterised in that at least one of said cylindrical chambers (83) is closed by an element (89) which is movable in the sliding direction of the wide disc (82), and enables the stroke of this latter to be varied.

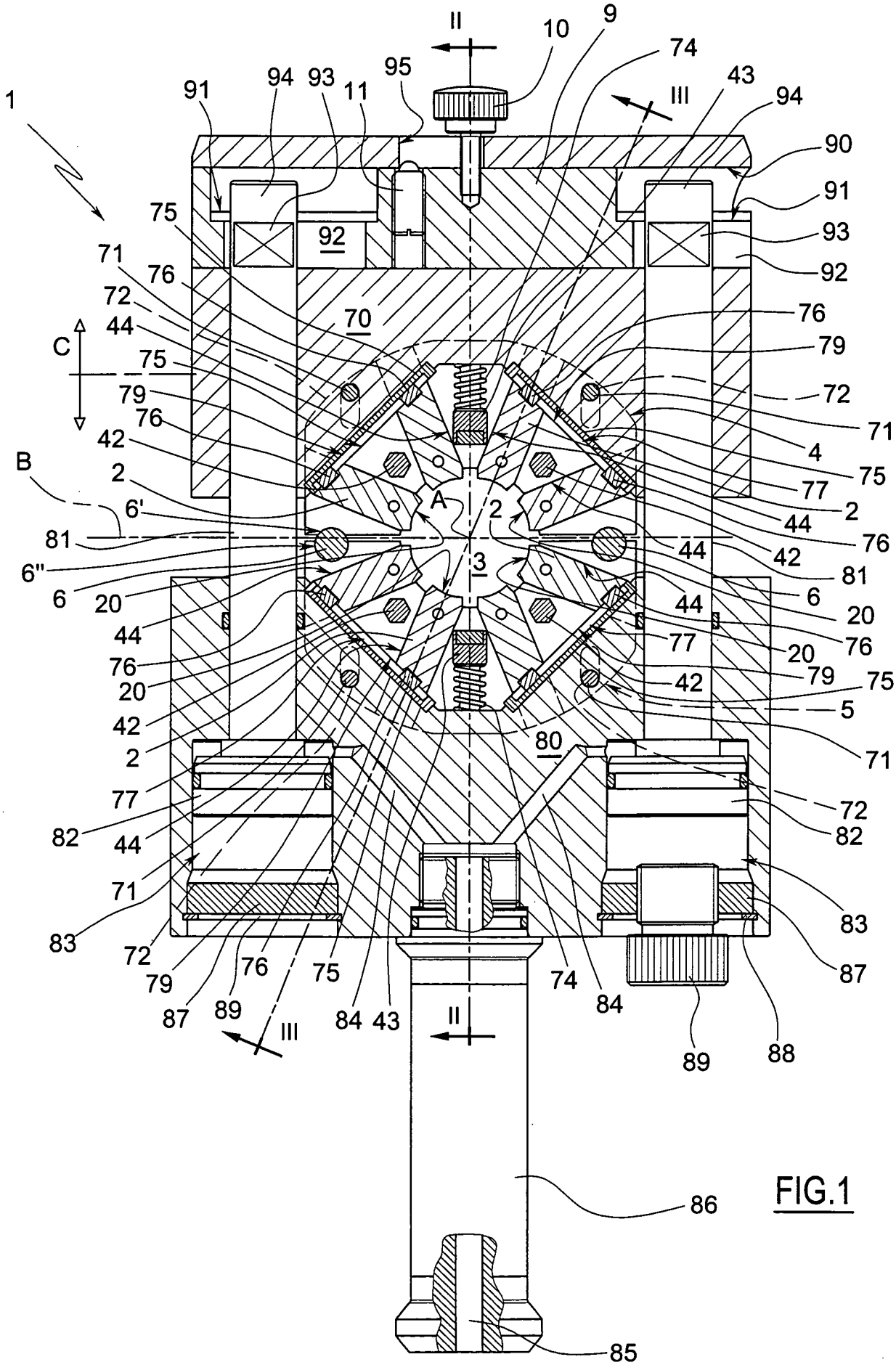

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FIG.1

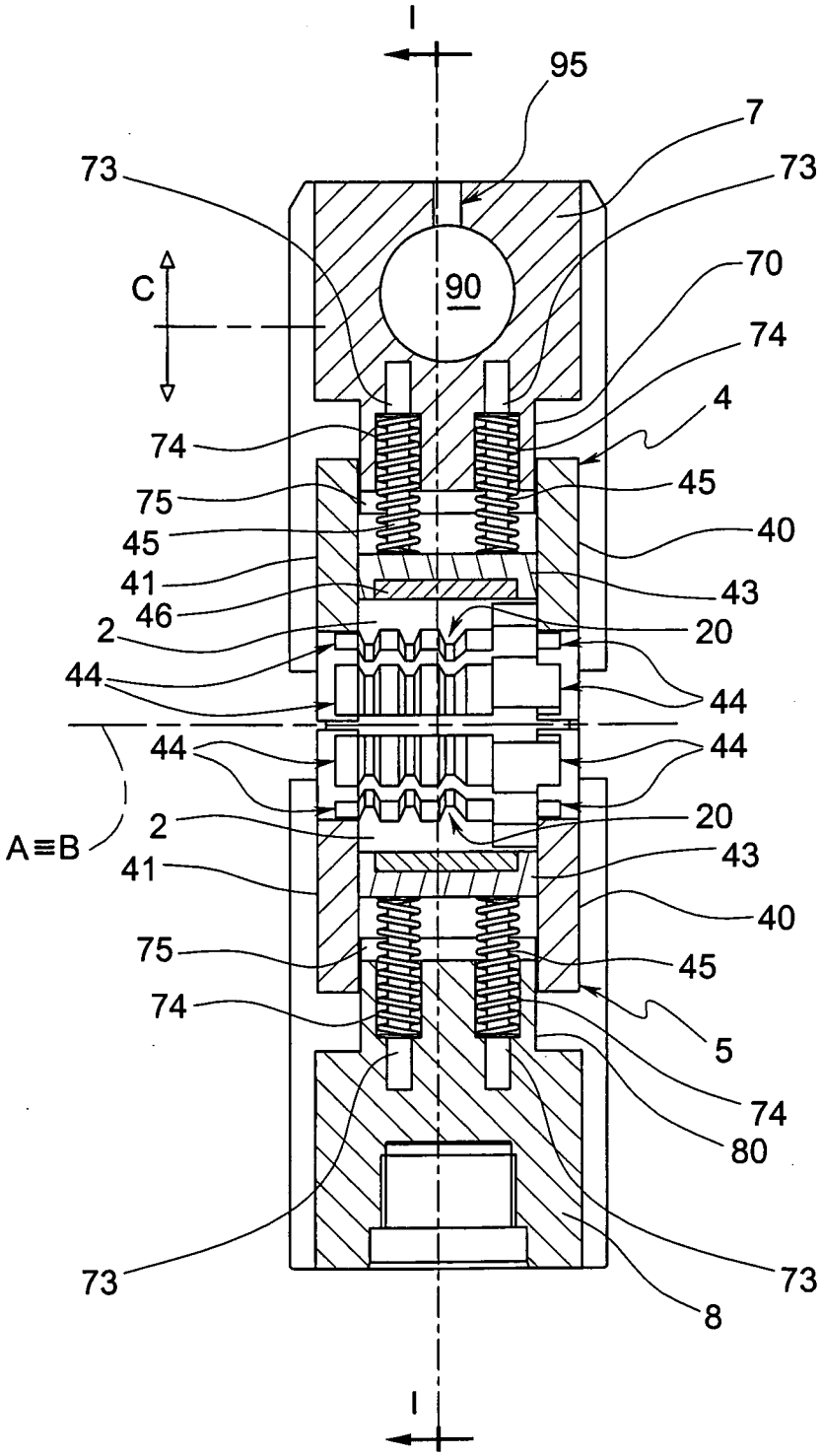

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FIG.2

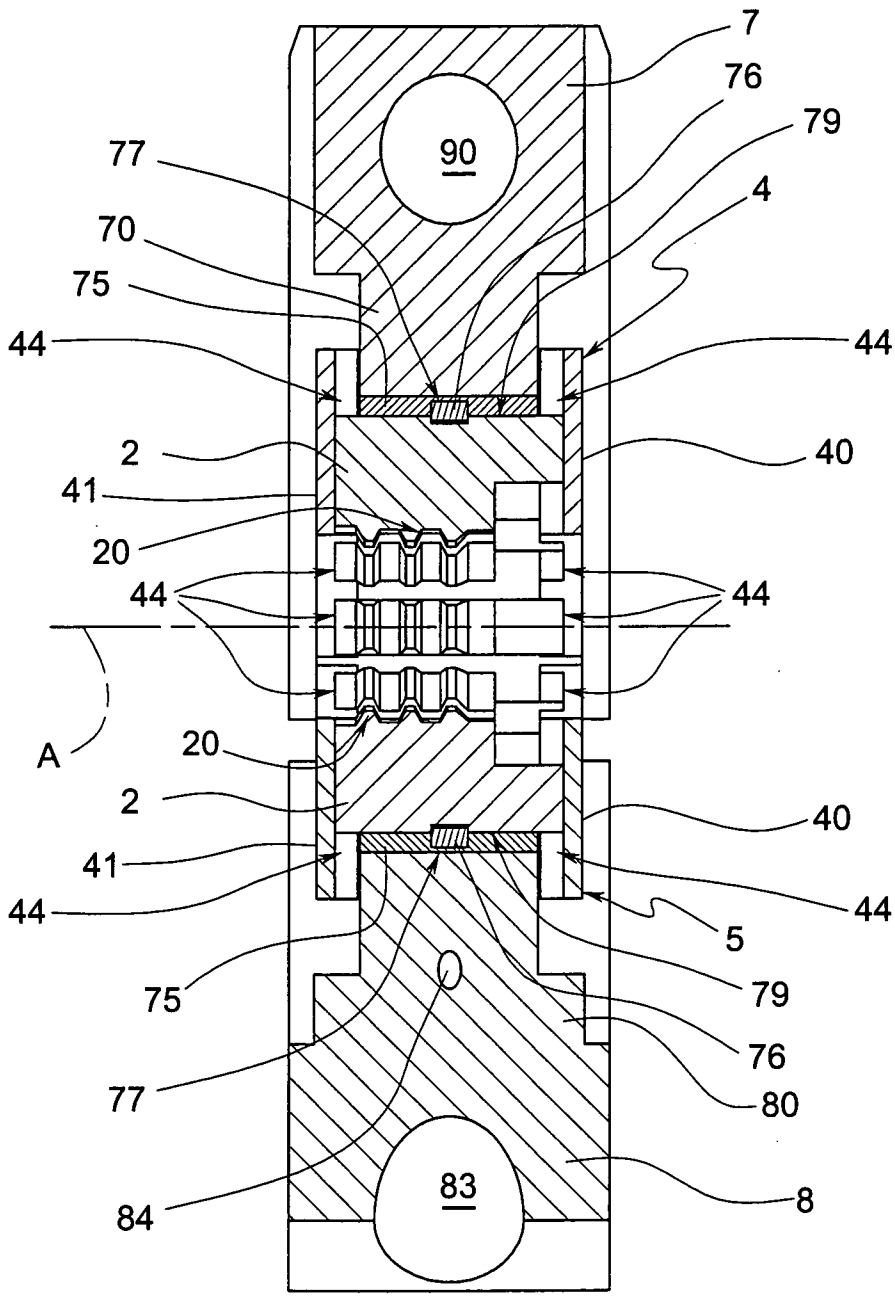

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FIG.3

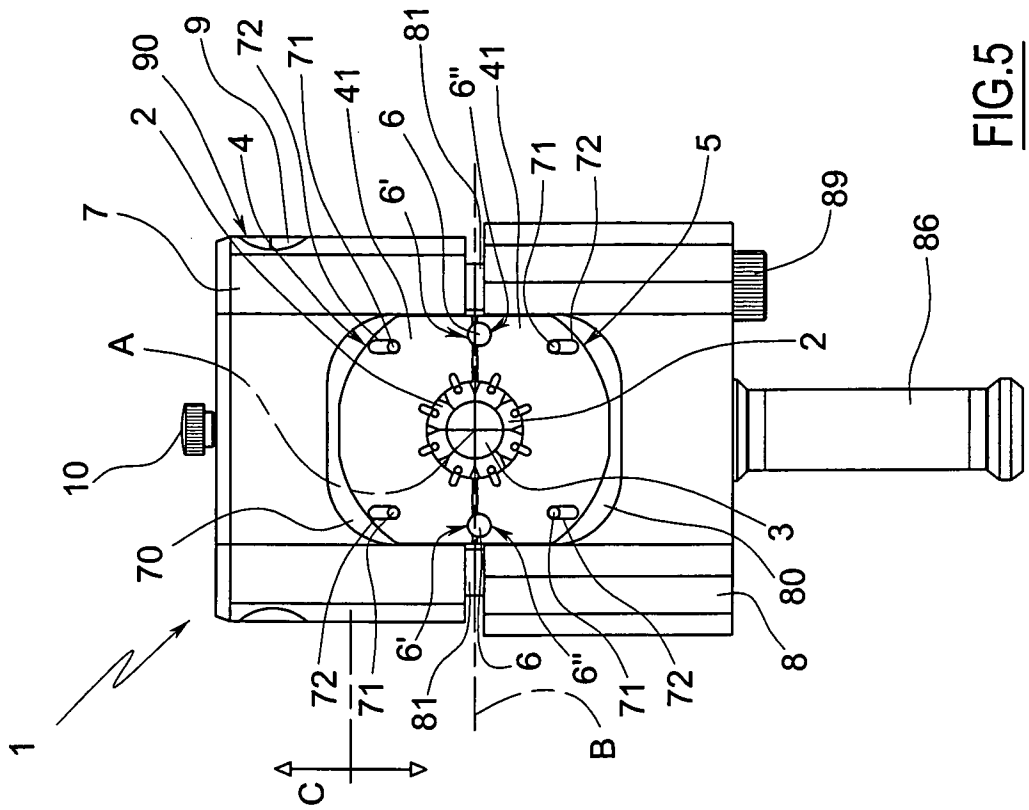

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6'
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FIG.5

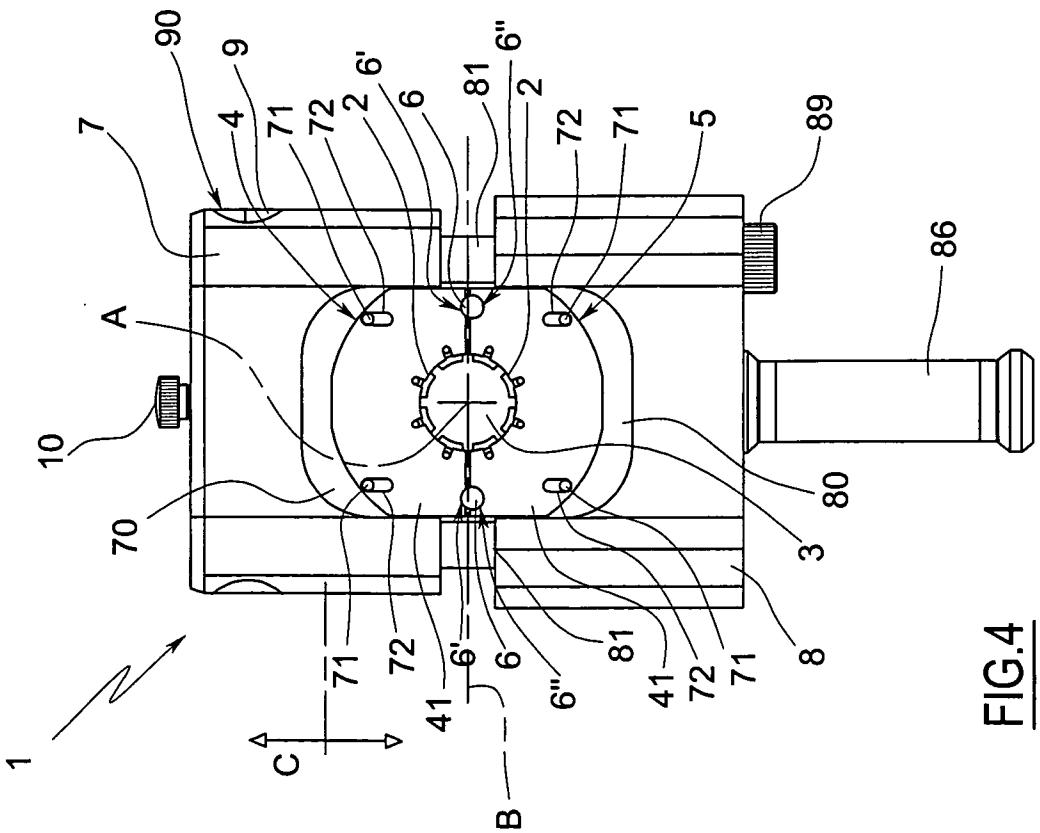

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FIG.4

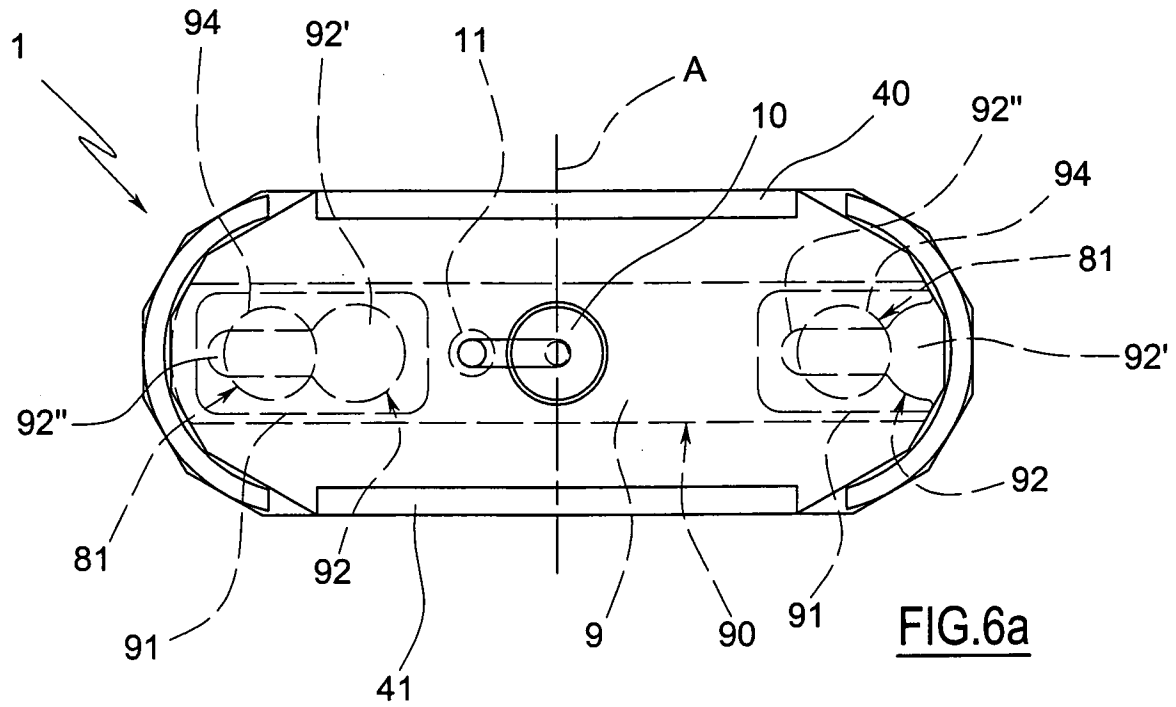

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FIG.6a

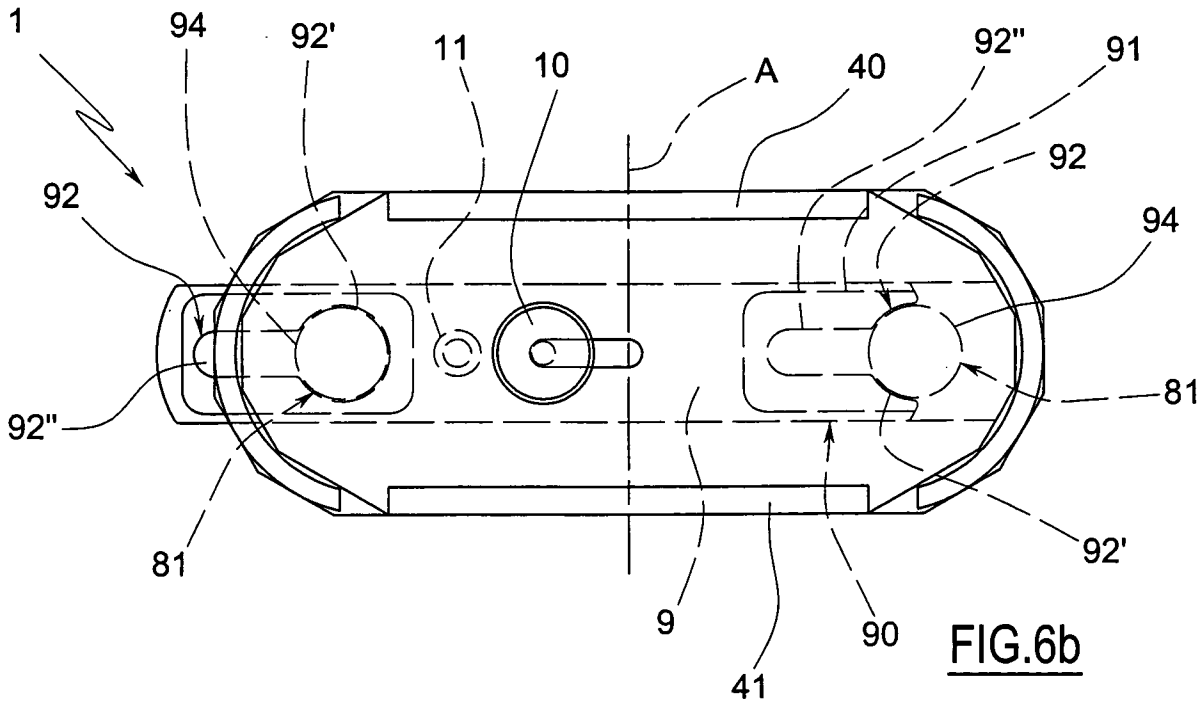

1
94
92'
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92
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92"
81
92'
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90

FIG.6b

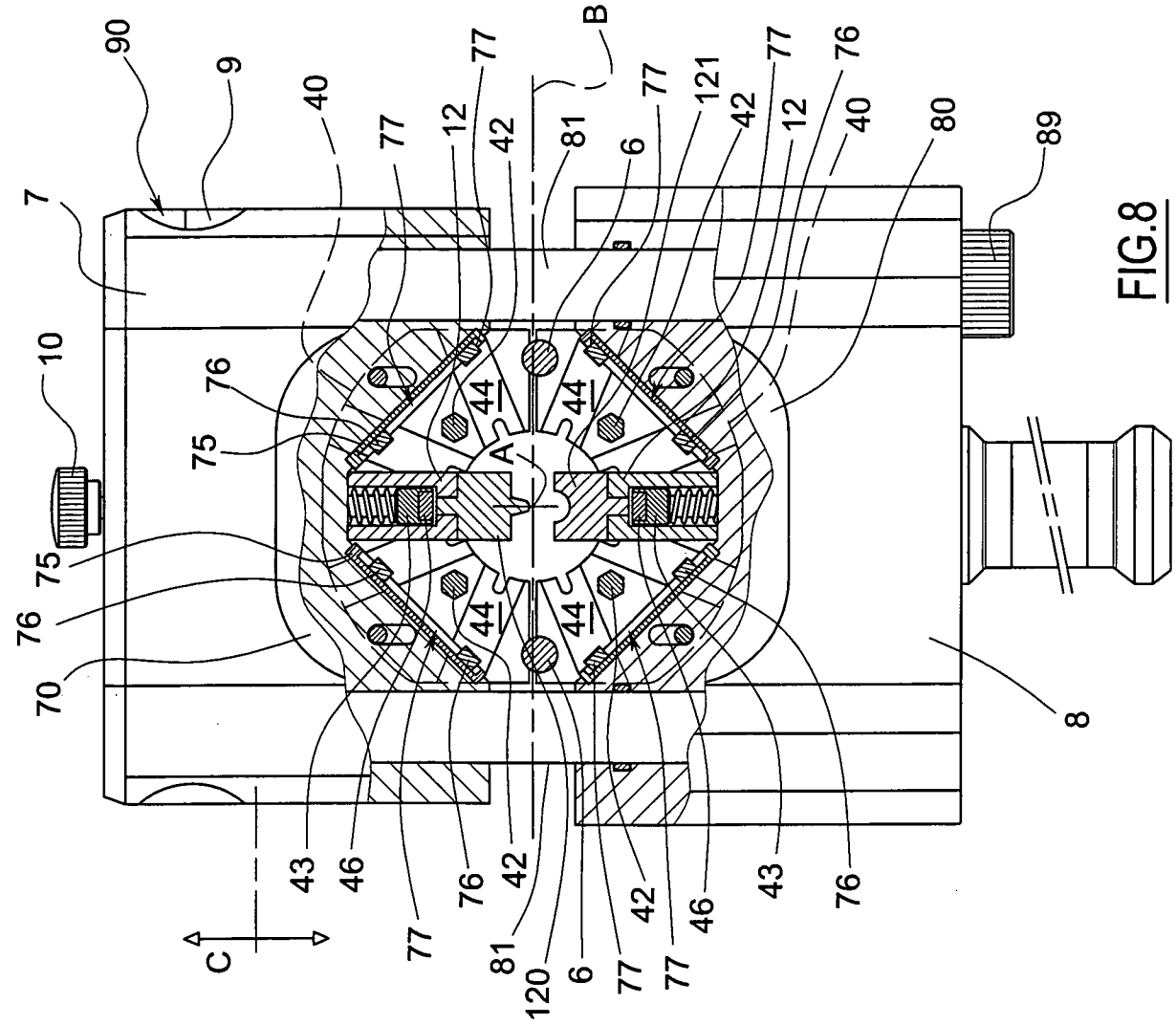

90
9
40
77
12
42
81
B
6
77
121
42
12
77
76
40
80
89
7
10
76
75
A
44
44
75
76
70
44
44
8
43
46
77
76
42
81
120
6
77
77
42
46
43
76
C

FIG.8

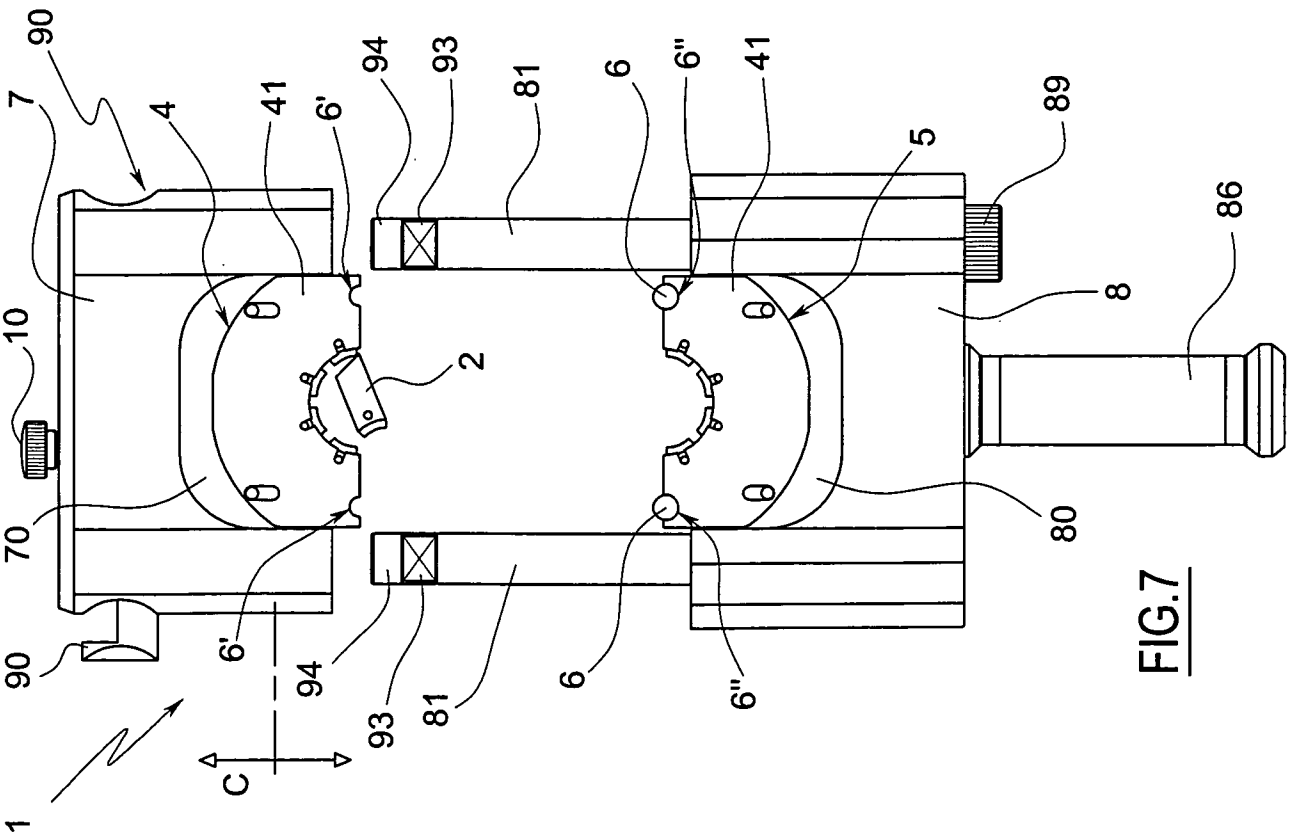

90
7
4
41
6'
94
93
81
6
6"
41
5
89
86
8
10
2
70
80
90
6'
94
93
81
6
6"
C
1

FIG.7

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2006/006875

A. CLASSIFICATION OF SUBJECT MATTER
INV. B21D39/04

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)
B21D B25B B30B

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 092 152 A (MILLER WILLIAM P [US] ET AL) 3 March 1992 (1992-03-03) column 2, lines 23-25,31-41,44-49,53,62-67; figures column 3, lines 10-22,27-31	1-8,10, 11,13
Y		12
X	EP 1 106 276 A2 (SCHROECK PETER DIPL ING [DE] SCHROECK PETER DIPL-ING [DE]) 13 June 2001 (2001-06-13) column 12, paragraph 32 columns 13-14, paragraphs 36,39; figures 7-9,13	1,14
Y		12,15-19

-/--

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

[X] See patent family annex.

* Special categories of cited documents :

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"E" earlier document but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 October 2006	23/10/2006

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	Knecht, Frank

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2006/006875

C(Continuation). *DOCUMENTS CONSIDERED TO BE RELEVANT*

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Y	WO 97/32679 A (AEROQUIP CORP [US]; LOMAR MACHINE AND TOOL COMPANY [US]) 12 September 1997 (1997-09-12) page 4, lines 16-30; figures 3,4	15-17
Y	DE 38 08 344 A1 (BALTSCHUN HORST [DE]) 28 September 1989 (1989-09-28) figure 1a	18,19
X	DE 198 14 474 C1 (SCHROECK PETER DIPL ING [DE]) 8 July 1999 (1999-07-08) the whole document	1-6,10, 14
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A	EP 0 539 787 A1 (SCHROECK PETER DIPL ING [DE] VON WAITZISCHE BETEILIGUNGEN G [DE]) 5 May 1993 (1993-05-05) the whole document	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2006/006875

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