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

UNIVERSALPRESSE ZUR DEFORMIERUNG VON ROHRVERBINDUNGSHÜLSEN UND FÜR
ANDERE EINSÄTZE

PRESSE UNIVERSELLE SERVANT A DEFORMER DES MANCHONS-RACCORDS ET A D'AUTRES
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Description

TECHNICAL FIELD

[0001] The present invention relates to a universal press according to the preamble of claim 1. Manually or hydraulically operated presses are generally used to deform the connection sleeves positioned on the ends of flexible pipes, in order to form a connection between the pipes.

[0002] Such a universal press is disclosed in US-A-5 092 152.

PRIOR ART

[0003] Currently available presses are known to generally comprise a fixed first crosspiece which supports a movable second crosspiece by means of two projecting shafts.

[0004] One of these presses is described in detail in IT 1298002.

[0005] 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.

[0006] Said active parts define a generally elliptical closed annular seat for encircling the connection sleeve.

[0007] 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.

[0008] In this manner, the crimping inserts are progressively pressed against said connection sleeve, to deform it and hence fix it to the pipes.

[0009] 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.

[0010] US 5,092,152 discloses a crimping machine having two crosspieces and comprising an insert carrier frame interposed between the crosspieces. The crimping machine comprises slide seats disposed about a common central axis which receive and guide slidable crimping inserts towards and from the central axis, the crimping inserts being disposed in such a way as to form an annular configuration.

[0011] EP 1 106 276 discloses a press tool with a plu-

ality of press surfaces displaced radially relative to the press axis in synchronism, via a pair of outer control bodies, each of which has two control surfaces at 90 degrees to one another, with the angular bisector between them lying in a symmetry plane passing through the press axis. Each control surface is provided with two inner control bodies, for acting on the press surfaces, positioned symmetrical to further symmetry planes at 45 degrees to the first symmetry plane.

[0012] WO 97/32679 discloses a crimper assembly assembly for crimping a workpiece such as a hose fitting. The crimper assembly includes a pair of tie rods of differing diameters which mount a lower stationary die carriage and an upper movable die carriage. A central rod is mounted on the movable carriage and extends through a press bar, whereby a driving force is applied to the central rod. A couple of die retainer plates are attached to the carriages and include guide slots. A spring biased disconnect plate is slidably attached to the tie rods adjacent the press bar. When the disconnect plate is moved to a disconnect position, the movable carriage can be moved upwardly for access to the flexible die set retainers for changing individual dies.

[0013] DE 3 808 344 discloses a press which has at least two piston/cylinder units which are arranged in the lower part of the press. An abutment screw in the chamber of cylinder is provided to vary the stroke of the piston.

DISCLOSURE OF THE INVENTION

[0014] An object of the present invention is to overcome the aforesaid drawback within the framework of a simple, rational and low-cost solution.

[0015] This object is attained by the invention by virtue of the characteristics defined in claim 1. Preferred aspects of the invention are described in the dependent claims.

[0016] 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).

[0017] 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

[0018] 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 cross-pieces separated;

Figure 8 is a partial section through the press of Figure 1 adapted as a punch (this embodiment does not form part of the invention).

BEST MODE FOR CARRYING OUT THE INVENTION

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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 receiv-

ing 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).

[0024] 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).

[0025] 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.

[0026] 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.

[0027] 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.

[0028] 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).

[0029] 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.

[0030] 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.

[0031] 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.

[0032] 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.

[0033] 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).

[0034] 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.

[0035] 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.

[0036] 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.

[0037] 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.

[0038] 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.

[0039] 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.

[0040] 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.

[0041] 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.

[0042] 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.

[0043] 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.

[0044] 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.

[0045] 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.

[0046] 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).

[0047] 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.

[0048] 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).

[0049] 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.

[0050] 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.

[0051] 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.

[0052] 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.

[0053] The said means for locking the upper cross-

piece 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.

[0054] 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).

[0055] 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.

[0056] 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.

[0057] 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.

[0058] 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.

[0059] It should be noted that the aforescribed 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.

[0060] 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.

[0061] In an embodiment that does not form part of the invention, the press can be adapted for other uses, with-

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

[0062] In this version, that does not form part of the invention 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.

[0063] 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.

[0064] 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), further 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), each crosspiece (7, 8) comprising 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) **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).
2. A press as claimed in claim 1, **characterised in that** said thrust surfaces (79) are inclined to the direction of relative movement (C) of the crosspieces (7, 8).
3. A press as claimed in claim 1, **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.

4. A press as claimed in claim 1, **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). 5
5. A press as claimed in claim 4, **characterised in that** said lunettes present a substantially V-shaped profile, the oblique walls of which each carry a respective thrust surface (79). 10
6. A press as claimed in claim 5, **characterised in that** said oblique walls are mutually perpendicular.
7. A press as claimed in claim 1, **characterised in that** each thrust surface (79) is provided by a reinforcement plate (75) rigidly fixed to the relative crosspiece (7, 8). 15
8. A press as claimed in claim 1, **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). 20
9. A press as claimed in claim 8, **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. 25
10. A press as claimed in claim 8, **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). 30
11. A press as claimed in claim 8, **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). 35
12. 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. 40
13. A press as claimed in claim 12, **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). 45
14. A press as claimed in claim 13, **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.
15. A press as claimed in claim 13, **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. 50
16. A press as claimed in claim 13, **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.
17. A press as claimed in claim 16, **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. 55

Patentansprüche

1. Eine Universalpresse, ausgestattet mit zwei Querstücken (7, 8) gegeneinander beweglich in geradli-

- niger Richtung (C) mit wechselseitiger Annäherungs- und Entfernungsbewegung, zur Wirkung auf eine Reihe von Quetscheinsätzen (2), so angeordnet, dass sie einen ringförmigen Aufnahmesitz (3) für eine Verbindungshülse bilden, um sie gleichzeitig zu dieser zu drängen und um sie gleichzeitig in die Gegenrichtung zurückzuziehen, unter Befolgung jeweils einer wechselseitigen Annäherungsbewegung und einer Entfernungsbewegung der besagten Querstücke (7, 8), wobei sie außerdem einen eingesetzten Tragerahmen (4, 5) aufweist, der zwischen den besagten Querstücken (7, 8) eingesetzt ist und eine Gruppe von Gleitsitzen (44) umfasst, die radial um eine zentrale Achse (A) angeordnet sind und die jeweils so angeordnet sind, dass sie einen entsprechenden Quetscheinsatz (2) aufnehmen und ihn mit einer Hin- und Herbewegung in radialer Richtung gegenüber der besagten zentralen Achse (A) verschieben, wobei die einzelnen Querstücke (7, 8) Schubflächen (79) aufweisen, die jeweils so angeordnet sind, dass sie durch Rückhaltevorrichtungen (76) ständig in Kontakt mit der Rückseite von zumindest einem Quetscheinsatz (2) bleiben, um den besagten Quetscheinsatz (2) in seine Bewegung in dem entsprechenden Gleitsitz (44) zu treiben, **dadurch gekennzeichnet, dass** die besagte Rückhaltevorrichtung für jeden Quetscheinsatz (2) einen Magnet (76) umfasst, der sich zwischen der Rückseite des Quetscheinsatzes (2) und der Schubfläche (79) befindet.
2. Eine Presse gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die besagten Schubflächen (79) in Richtung der entsprechenden Bewegung (C) der Querstücke (7, 8) geneigt sind.
 3. Eine Presse gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die Rückseite der Quetscheinsätze so geformt ist, dass sie mit einer vergrößerten Kontaktfläche auf der entsprechenden Schubfläche (79) liegt.
 4. Eine Presse gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die besagten Schubflächen (79) mit den Wänden von zwei einander symmetrisch gegenüberliegenden identischen Lünetten verbunden sind, die jeweils in dem einen und in dem anderen Querstück (7, 8) enthalten sind.
 5. Eine Presse gemäß Anspruch 4, **dadurch gekennzeichnet, dass** die besagten Lünetten ein im Wesentlichen V-förmiges Profil aufweisen, wobei die schrägen Wände jeweils die Schubfläche (79) tragen.
 6. Eine Presse gemäß Anspruch 5, **dadurch gekennzeichnet, dass** sich die besagten schrägen Wände rechtwinklig zueinander befinden.
 7. Eine Presse gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die einzelnen Schubflächen (79) eine Verstärkungsplatte (75) aufweisen, die starr am entsprechenden Querstück (7, 8) befestigt ist.
 8. Eine Presse gemäß Anspruch 1, **dadurch gekennzeichnet, dass** der Halterungsrahmen aus zwei einander symmetrisch gegenüberliegenden identischen separaten Halbrahmen (4, 5) gebildet wird, die jeweils von einem entsprechenden Querstück (7, 8) getragen werden.
 9. Eine Presse gemäß Anspruch 8, **dadurch gekennzeichnet, dass** die einzelnen Halbrahmen (4, 5) von dem entsprechenden Querstück (7, 8) durch eine elastische Vorrichtung (74) gehalten werden, die sie ständig gegen die andere Rahmenhälfte drückt, während sich das Querstück (7, 8) relativ zu ihr bewegen kann.
 10. Eine Presse gemäß Anspruch 8, **dadurch gekennzeichnet, dass** die einzelnen Rahmenhälften (4, 5) zwei identische Außenplatten (40, 41) mit Abstand zueinander aufweisen, wobei die einzelnen Gleitsitze durch zwei einander gegenüberliegende Führungskanäle (44) gebildet werden, die die Außenseiten der Außenplatten (40, 41) jeweils aufweisen; die Querstücke (7, 8) weisen jeweils eine entsprechende zentrale Rippe (70, 80) auf, die zwischen den Außenplatten (40, 41) der entsprechenden Rahmenhälfte (4, 5) verschoben werden kann und die besagten Schubflächen (79) trägt.
 11. Eine Presse gemäß Anspruch 8, **dadurch gekennzeichnet, dass** sich zwischen den besagten Rahmenhälften (4, 5) zwei Abstandszyylinder (6) befinden, die parallel zur zentralen Achse (A) angeordnet sind und einzeln zwischen zwei Halterungen (6', 6'') in der einen und in der anderen Rahmenhälfte (4, 5) gehalten werden.
 12. Eine Presse gemäß Anspruch 1, **dadurch gekennzeichnet, dass** ein erstes Querstück (8) zwei überstehende Wellen (81) aufweist, die in zwei entsprechenden Aufnahmelöcher (78) im zweiten Querstück (7) eindringen und mit einer Sperrvorrichtung (9) in ihrem Inneren abnehmbar gesperrt werden können; die besagten überstehenden Wellen (81) gleiten gleichzeitig in der besagten Bewegungsrichtung (C), so dass sich die Querstücke (7, 8) aneinander annähern oder voneinander entfernen.
 13. Eine Presse gemäß Anspruch 12, **dadurch gekennzeichnet, dass** die besagte Sperrvorrichtung einen Riegel (9) aufweist, der verschiebbar in einer Queröffnung (90) im zweiten Querstück (7) enthalten ist und in dem sich die besagten Aufnahmelöcher (78) für die überstehenden Wellen (81) öffnen; der be-

sagte Riegel (9) kann in eine Eingreifposition gebracht werden, in der er in beide überstehenden Wellen (81) passt, um sie an das besagte zweite Querstück (7) zu sperren, und in eine offene Position, in der er aus dem besagten Sitz austritt, so dass die überstehenden Wellen (81) in die Aufnahmelöcher (78) eingesetzt werden und sich aus ihnen entfernen können.

14. Eine Presse gemäß Anspruch 13, **dadurch gekennzeichnet, dass** der besagte Riegel (9) zwei separate durchgehende Öffnungen (92) aufweist, die jeweils so geformt sind, dass sie Folgendes aufweisen:

- einen breiten Teil (92'), der zu einem entsprechenden Aufnahmeloch (78) weist, wenn sich der Riegel (9) in der offenen Position befindet, damit die überstehenden Wellen (81) hindurchgehen können, und
- einen schmalen Teil (92''), verlängert wie ein Schlitz in der Richtung, in der der Riegel (9) gleitet, um genau in einen Zwischenteil (93) mit reduziertem Querschnitt der besagten überstehenden Welle (81) einzugreifen, wenn die letztere in die Öffnung (92) eingesetzt ist und sich der Riegel (9) in seiner Eingreifposition befindet.

15. Eine Presse gemäß Anspruch 13, **dadurch gekennzeichnet, dass** der besagte Riegel (9) eine im Allgemeinen zylindrische Form besitzt und zwei Ausparungen (91) aufweist, die an den besagten durchgehenden Öffnungen (92) auf der Gegenseite der Aufnahmelöcher (78) positioniert sind und die jeweils in der Lage sind, das Endteil (94) einer entsprechenden überstehenden Welle (81) aufzunehmen.

16. Eine Presse gemäß Anspruch 13, **dadurch gekennzeichnet, dass** jede überstehende Welle (81) eine breite Scheibe (82) aufweist, die verschiebbar in einer entsprechenden zylindrischen Kammer (83) des ersten Querstücks (8) enthalten ist, wobei die Kammer mit unter Druck stehender Flüssigkeit gespeist wird, um die Scheibe (82) in die Richtung zu drängen, die bewirkt, dass sich die Querstücke (7, 8) einander annähern.

17. Eine Presse gemäß Anspruch 16, **dadurch gekennzeichnet, dass** zumindest eine der besagten zylindrischen Kammern (83) mit einem Element (89) verschlossen ist, das in der Gleitrichtung der breiten Scheibe (82) beweglich ist und eine Änderung des Hub der letzteren gestattet.

Revendications

1. Une presse universelle comprenant deux pièces

transversales (7, 8) pouvant être déplacées l'une par rapport à l'autre dans une direction rectiligne (C) avec un mouvement d'approche et d'éloignement mutuel, pour agir sur une série de matrices à sertir (2) disposées pour définir un siège de logement angulaire (3) pour un douille de connexion, afin de les pousser simultanément vers cette dernière et de les rétracter simultanément dans la direction opposée, suivant respectivement un mouvement d'approche mutuelle et un mouvement de d'éloignement mutuel desdites pièces transversales (7, 8), comprenant également un châssis de support de matrice (4, 5) qui est intercalé entre lesdites pièces transversales (7, 8) et comprenant un ensemble de sièges coulissants (44) disposés de façon radiale autour d'un axe central commun (A) et placé chacun de manière à recevoir une matrice à sertir correspondante (2) pour la guider par coulissement dans une direction radiale avec un mouvement de va-et-vient par rapport audit axe central (A), chaque pièce transversale (7, 8) comprenant des surfaces de butée (79), chacune d'elle étant disposée pour rester en contact permanent avec l'arrière d'au moins une matrice à sertir correspondante (2) grâce aux dispositif de rétention (76), afin de conduire ladite matrice à sertir (2) dans son mouvement au sein du siège coulissant correspondant (44) **caractérisé par le fait que** le dispositif de rétention comprend, pour chaque matrice à sertir (2), un aimant (76) intercalé entre l'arrière de la matrice à sertir (2) et la surface de butée (79).

2. Une presse selon la revendication 1, **caractérisée par le fait que** les surfaces de butée (79) sont inclinées dans la direction d'un mouvement relatif (C) des pièces transversales (7, 8).

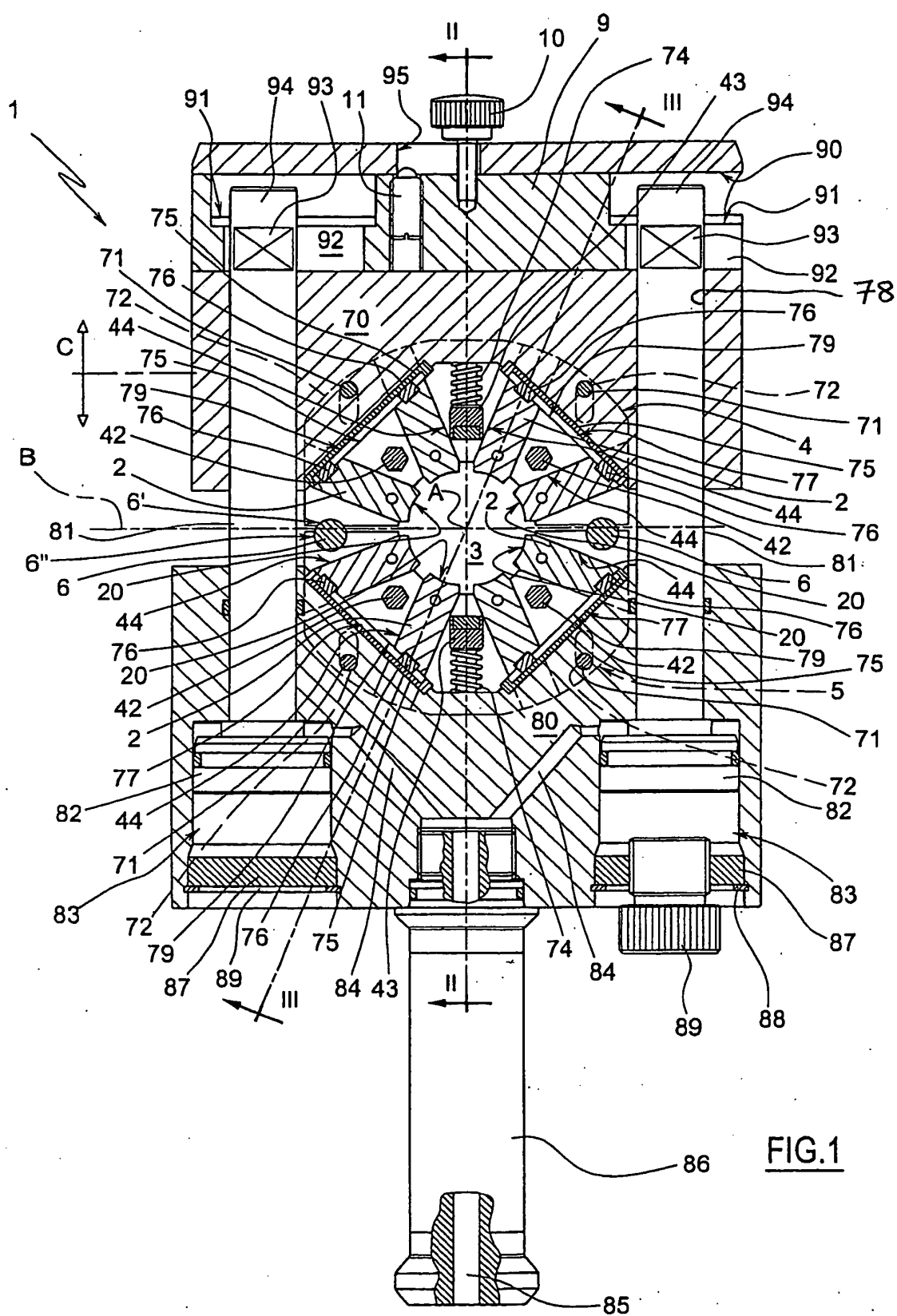
3. Une presse selon la revendication 1, **caractérisée par le fait que** l'arrière des matrices à sertir est façonné de sorte qu'il repose sur la surface de butée correspondante (79) avec une surface de contact étendue.

4. Une presse selon la revendication 1, **caractérisée par le fait que** lesdites surfaces de poussée (79) sont associées aux parois de deux lunettes identiques opposées symétriquement qui sont prévues respectivement dans l'une et l'autre des pièces transversales (7, 8).

5. Une presse selon la revendication 4, **caractérisée par le fait que** lesdites lunettes présentent un profil substantiellement en V, dont les parois obliques portent chacune une surface de butée (79).

6. Une presse selon la revendication 5, **caractérisée par le fait que** lesdites parois obliques sont mutuellement perpendiculaires.

7. Une presse selon la revendication 1, **caractérisée par le fait que** chaque surface de butée (79) est fournie par une plaque de renfort (75) fixe de façon rigide à la pièce transversale relative (7, 8).
8. Une presse selon la revendication 1, **caractérisée par le fait que** le châssis de support est formé de deux demi-châssis (4, 5) séparés identiques opposés symétriquement dont chacun est soutenu par une pièce transversale correspondante (7, 8).
9. Une presse selon la revendication 8, **caractérisée par le fait que** chaque demi-châssis (4, 5) est soutenu par la pièce transversale relative (7, 8) à l'aide d'un dispositif élastique (74) qui l'appuie en permanence contre l'autre demi-châssis, en permettant à la pièce transversale (7, 8) de se déplacer par rapport à celui-ci.
10. Une presse selon la revendication 8, **caractérisée par le fait que** chaque demi-châssis (4, 5) comprend deux plaques frontales espacées identiques (40, 41), chaque siège coulissant individuel étant défini par deux canaux de coulissement opposés (44) respectivement prévus dans les faces frontales desdites plaques frontales (40, 41) ; les pièces transversales (7, 8) comprenant chacune une nervure centrale correspondante (70, 80) pouvant coulisser entre les plaques frontales (40, 41) du demi-châssis correspondant (4, 5) et portant lesdites surfaces de butée (79).
11. Une presse selon la revendication 8, **caractérisée par le fait qu'**entre chaque demi-châssis (4, 5) sont intercalés deux cylindres d'écartement (6) disposés parallèlement à l'axe central (A) et retenus individuellement entre deux arceaux (6', 6'') prévus respectivement dans l'un et dans l'autre des demi-châssis (4,5).
12. Une presse selon la revendication 1, **caractérisée par le fait qu'**une première pièce transversale (8) comprend deux arbres saillant (81) qui pénètrent dans deux trous de réception correspondants (78) prévus dans la deuxième pièce transversale (7), et qui peuvent être verrouillés de façon amovible à leur intérieur par un dispositif de verrouillage (9) ; lesdits arbres saillant (81) coulissant simultanément dans ladite direction de mouvement (C) pour faire approcher ou éloigner les pièces transversales (7, 8) l'une de l'autre.
13. Une presse selon la revendication 12, **caractérisée par le fait que** ledit dispositif de verrouillage comprend un verrou (9) reçu par coulissement dans un trou transversal (90) prévu dans la deuxième pièce transversale (7) et dans lequel lesdits trous de réception (78) pour les arbres saillant (81) sont
- ouverts ; ledit verrou (9) étant capable d'être placé dans une position d'engagement, dans laquelle il s'engage par introduction dans les deux arbres saillant (81) pour les verrouiller à ladite deuxième pièce transversale (7), et dans une position de désengagement, dans laquelle il se désengage de ladite introduction, pour permettre aux arbres saillant (81) d'être introduits et retirés des trous de réception (78).
14. Une presse selon la revendication 13, **caractérisée par le fait que** ledit verrou (9) comprend deux ouvertures séparées (92) passant à travers son épaisseur, chacune d'elle étant façonnée pour présenter :
- une portion large (92') qui fait face à un trou de réception correspondant (78) lorsque le verrou (9) se trouve en position de désengagement, pour permettre le passage de l'arbre saillant (81) correspondant ; et
 - une portion étroite (92''), allongée comme une fente dans la direction de coulissement du verrou (9), pour engager parfaitement une portion de section intermédiaire réduite (93) dudit arbre saillant (81), lorsque ce dernier est introduit dans l'ouverture (92) et que le verrou (9) est dans sa position d'engagement.
15. Une presse selon la revendication 13, **caractérisée par le fait que** ledit verrou (9) possède une forme générale cylindrique et présente deux creux (91), positionnés au niveau desdites ouvertures passantes (92) sur le côté opposé des trous de réception (78), et qui sont capables de recevoir la portion finale (94) d'un arbre saillant respectif (81) pour permettre de parvenir à l'introduction.
16. Une presse selon la revendication 13, **caractérisée par le fait que** chaque arbre saillant (81) comprend un disque large (82) reçu par coulissement dans une chambre cylindrique relative (83) de la première pièce transversale (8), dont la chambre est alimentée par un fluide sous pression qui pousse le disque (82) dans la direction permettant aux pièces transversales (7, 8) de s'approcher l'une de l'autre.
17. Une presse selon la revendication 16, **caractérisée par le fait qu'**au moins l'une desdites chambres cylindriques (83) est fermée par un élément (89) qui est mobile dans la direction de coulissement du disque large (82) et permet de modifier la course de ce dernier.



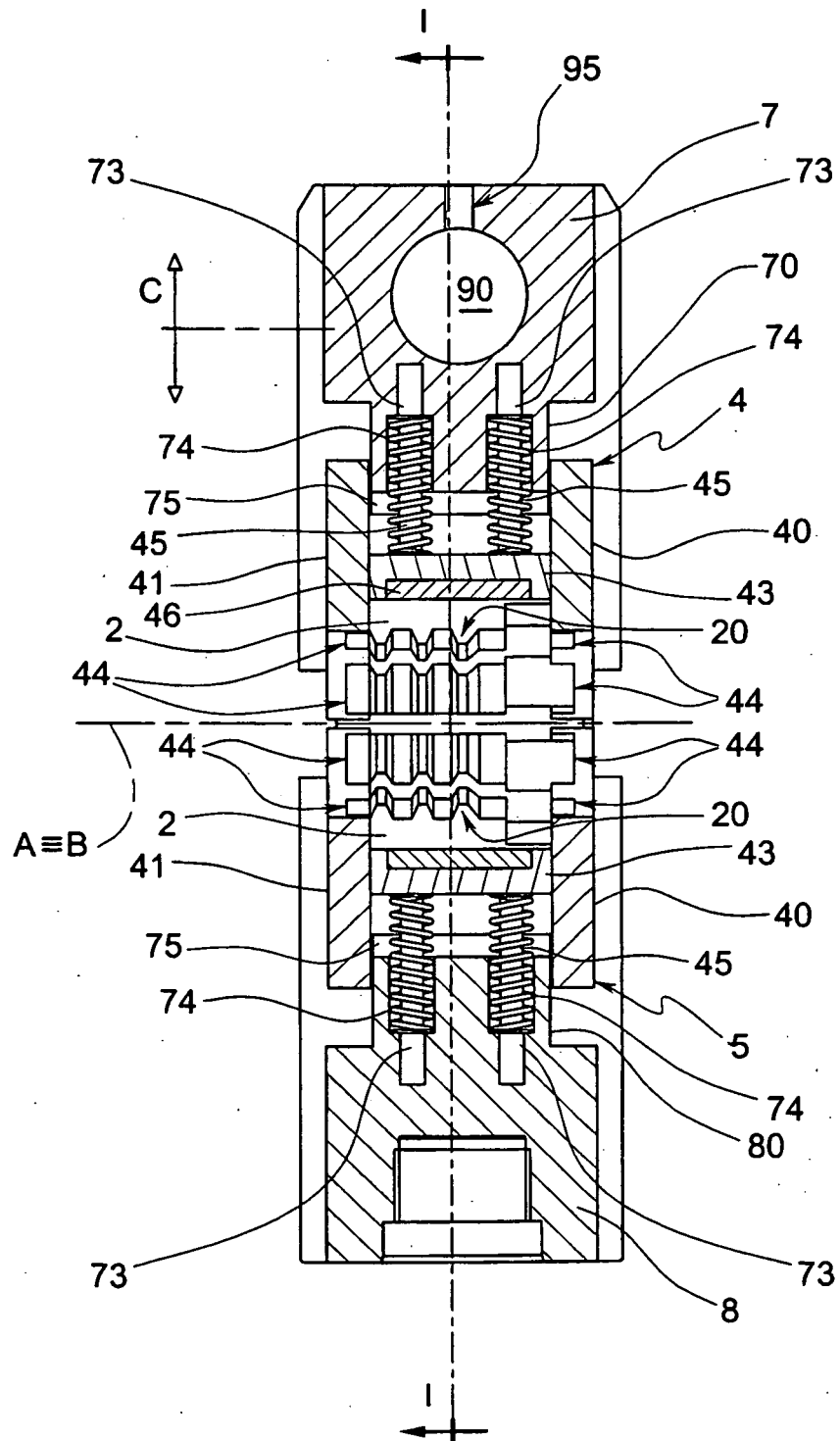


FIG.2

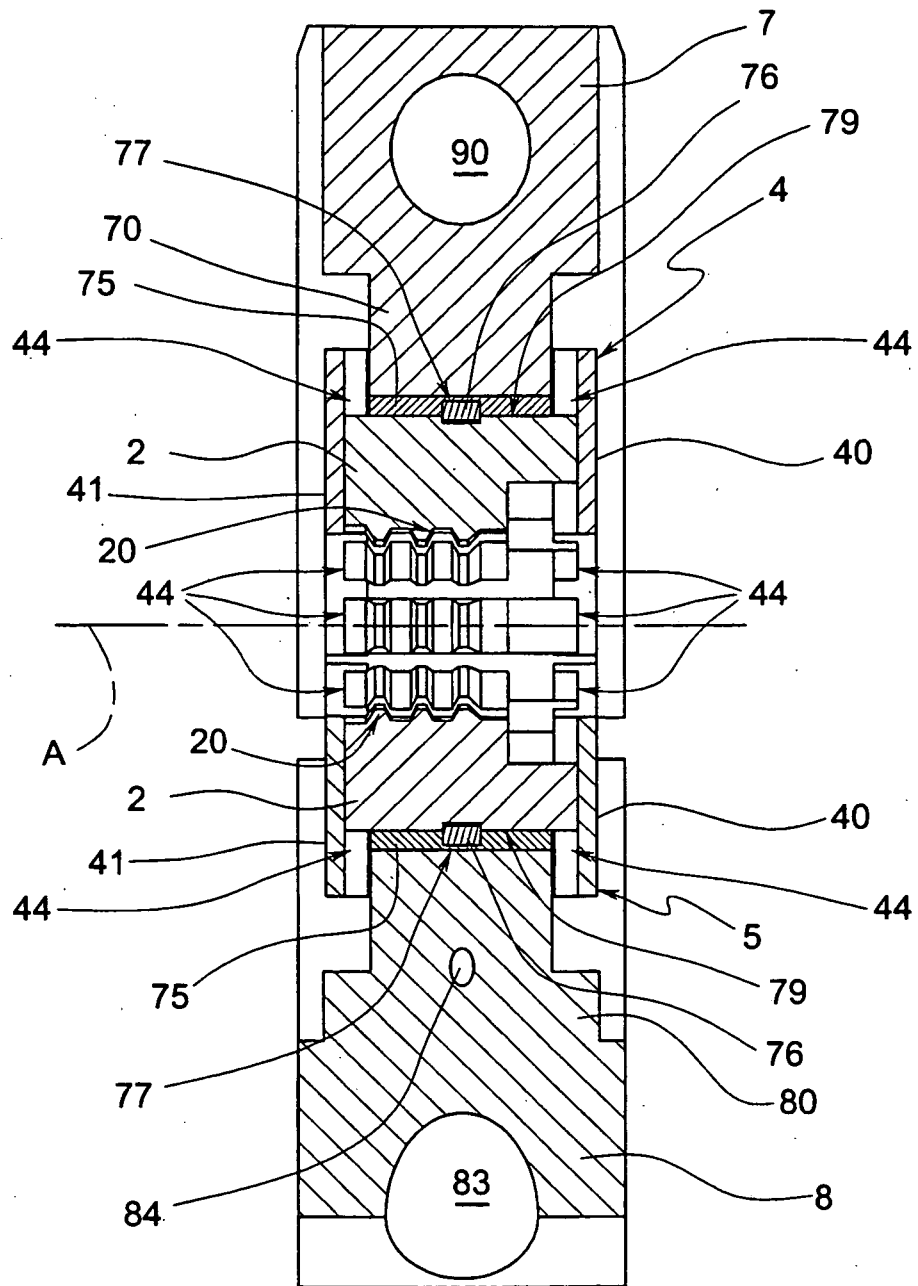


FIG.3

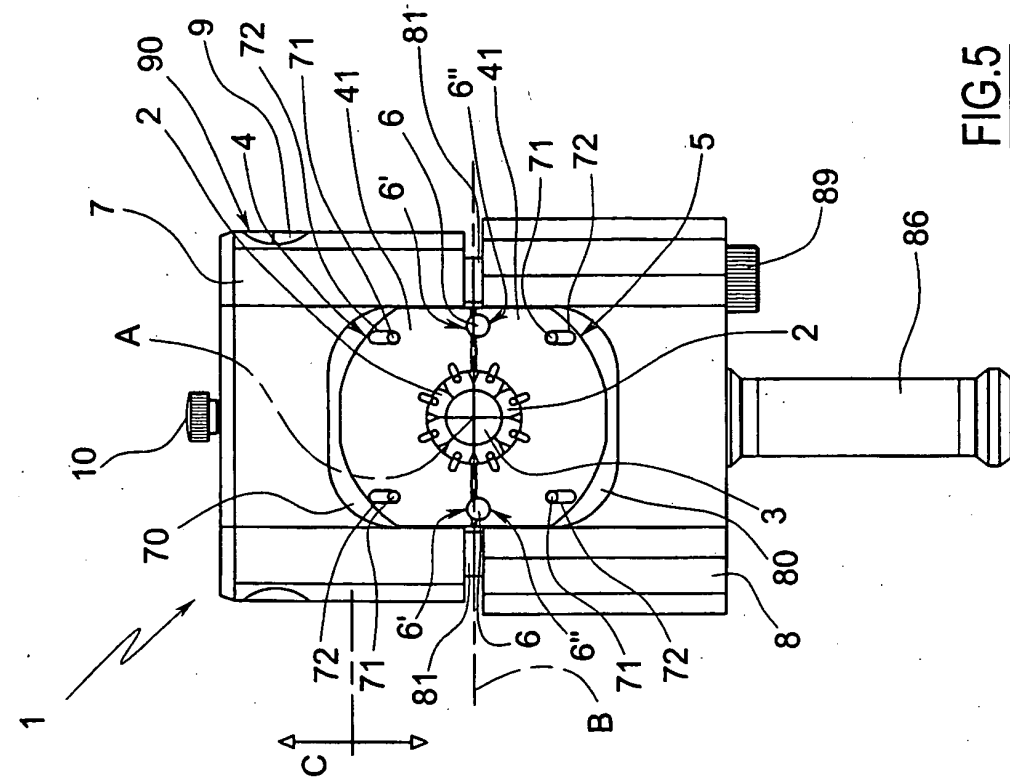


FIG. 4

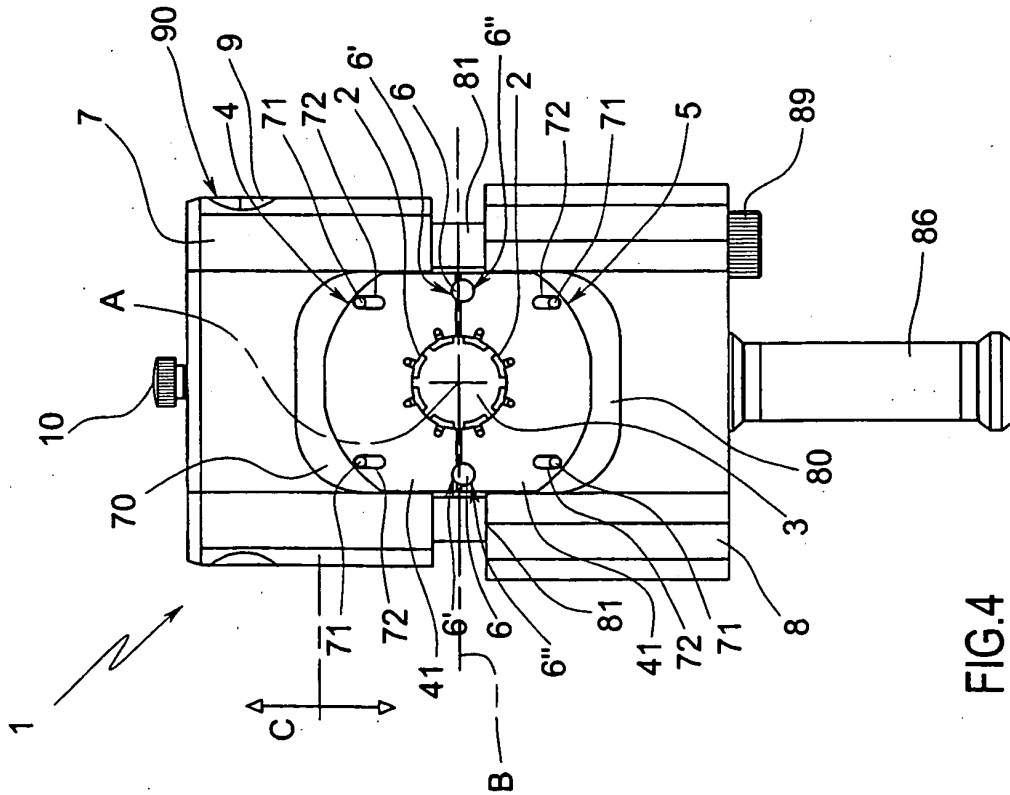
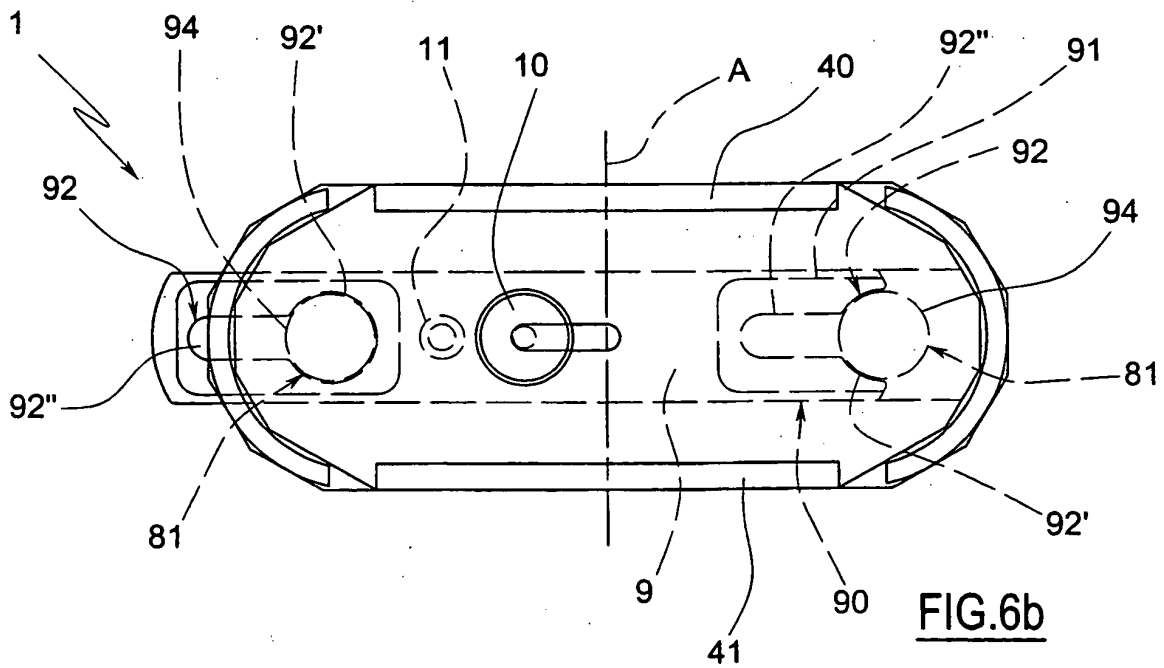
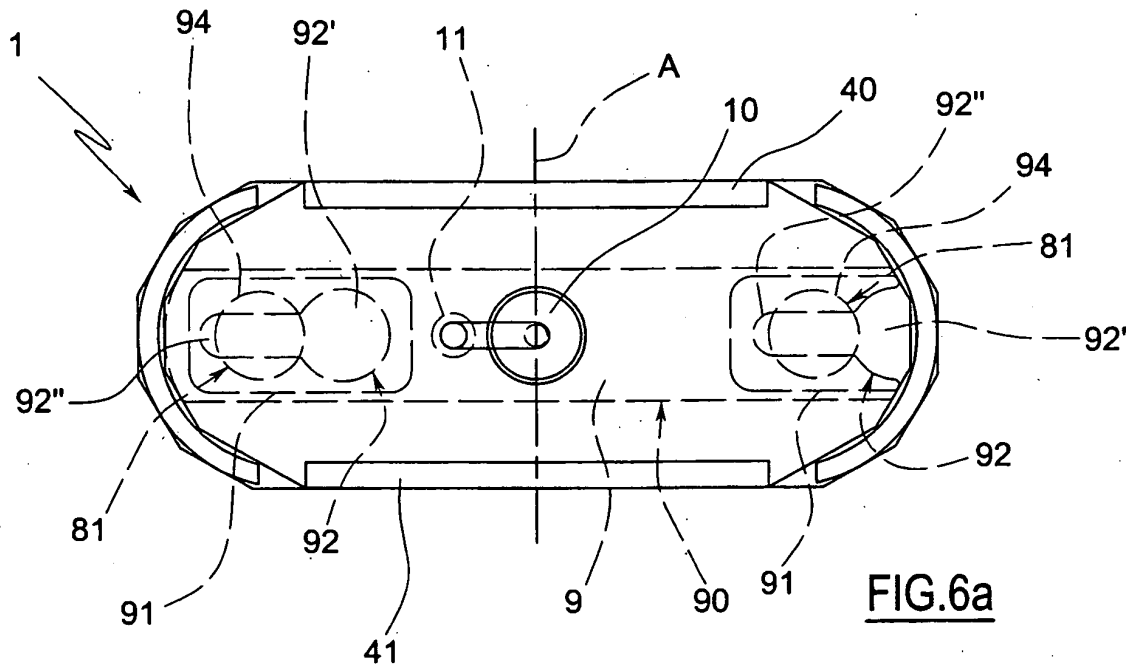
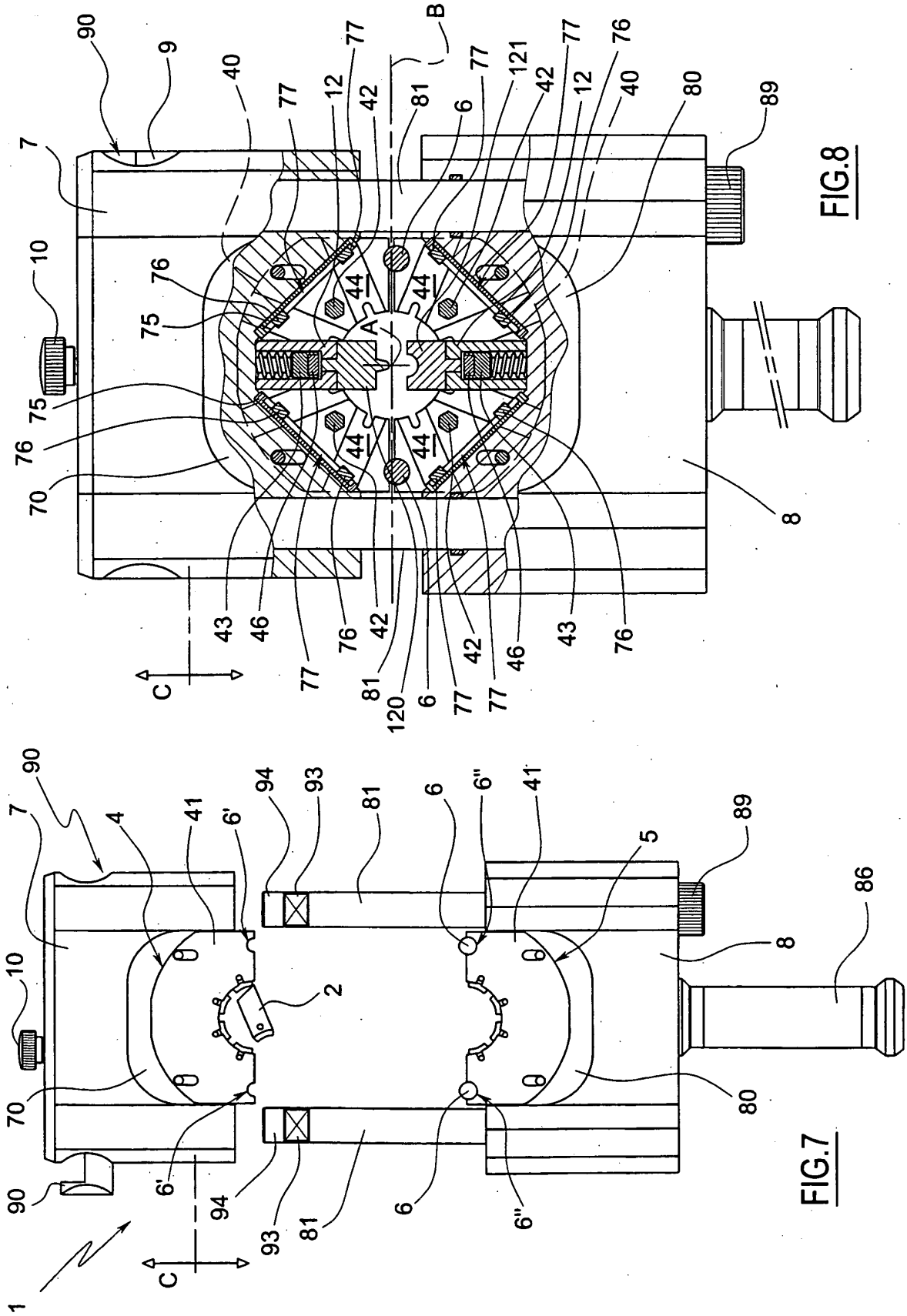


FIG. 5





REFERENCES CITED IN THE DESCRIPTION

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