



(12) **EUROPEAN PATENT APPLICATION**

(21) Application number : **93202995.2**

(51) Int. Cl.⁵ : **B21D 1/00, B21D 37/14**

(22) Date of filing : **26.10.93**

(30) Priority : **26.10.92 NL 9201858**

(43) Date of publication of application :
13.07.94 Bulletin 94/28

(84) Designated Contracting States :
BE DE ES FR GB IT NL SE

(71) Applicant : **Coymans, Petrus Armin Michiel Marie**
Nieuwstraat 12
NL-4901 JH Oosterhout (NL)

(72) Inventor : **Coymans, Petrus Armin Michiel Marie**
Nieuwstraat 12
NL-4901 JH Oosterhout (NL)

(54) **A device for processing articles by means off pulling or pushing forces.**

(57) A device for processing articles by means of pulling or pushing forces, such as moulds consisting of at least two parts, comprising a frame, a bracket-like carrier for a power unit such as a cylinder supported by the frame, a clamping table supported by the frame for receiving the article, wherein the bracket-like carrier is arranged for rotation on an axis parallel to the clamping surface in order to carry the bracket from a position above the clamping surface to a position adjacent to the clamping surface and vice-versa, and the bracket is provided with a beam which is supported by at least one arm and to which is fixed the power unit, which beam is mounted on the arm for pivoting on an axis parallel to the first axis such that the beam can come to lie adjacently of the clamping table in a position turned through 180° in order to enable easy processing of the parts of the article.

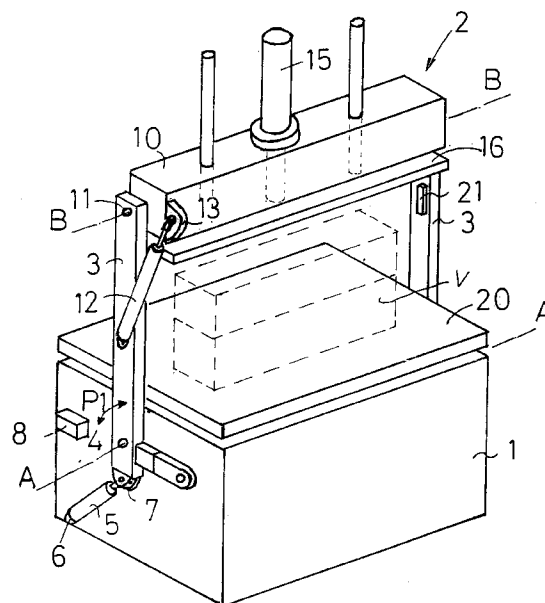


Fig 1

The invention relates to a device for processing articles by means of pulling or pushing forces, such as moulds consisting of at least two parts, comprising a frame, a bracket-like carrier for a power unit such a cylinder supported by the frame, a clamping table supported by the frame for receiving the article, wherein the bracket-like carrier is arranged for rotation on an axis parallel to the clamping surface in order to carry the bracket from a position above the clamping surface to a position adjacent to the clamping surface and vice-versa.

The above stated device is described in EU-A-0315281 which device serves to place under pressure an article fastened to a clamping table. This article is herein subjected to bending or other forming operations.

The invention has for its object to improve the above stated device whereby it becomes possible to assemble respectively disassemble articles consisting of two parts which must fit together precisely, wherein during assembly respectively disassembly the two parts are guided accurately and wherein the two parts can undergo separate processing.

The device according to the invention is distinguished in that the bracket is provided with a beam which is supported by at least one arm and to which is fixed the power unit, which beam is mounted on the arm for pivoting on an axis parallel to the first axis.

Because the beam can now be pivoted on a lying axis relative to the arm, a part of the article for disassembly can be fixed to the beam and tilted for easy accessibility in order to allow this part to undergo a processing. The re-placing of the one part on the other part of the article can be carried out precisely due to the simply controllable return pivoting movement of the beam.

According to a further development the body is provided with a counter clamping surface wherein the power unit placed on the beam engages onto the body so that in the one position of the bracket the body is movable toward and away from the table, wherein the counter clamping surface extends parallel above the clamping surface of the table in this one position of the bracket-like carrier.

With this embodiment not only a turning movement but also a translation movement can be performed of the parts of the article for processing.

Finally, it is possible to embody the clamping table height-adjustably relative to the frame, whereby the power unit embodied as cylinder on the beam can take a shorter form, whereby in the other position of the bracket this power unit does not have to be accommodated in separate recesses in the floor.

It is recommended to guide the movement of the body in the one position of the bracket by means of a guide along this bracket in order to enable the most precise possible reproduction of the position of the two parts of the article.

Above mentioned and other features of the invention will be further elucidated in the figure description hereinbelow of an embodiment. In the drawing:

fig. 1 shows a perspective front view of the device according to the invention, wherein the bracket-like carrier stands in the one position, fig. 2 shows a perspective view corresponding with fig. 1 wherein the bracket-like carrier stands in the other position, fig. 3 shows a front view of the device of fig. 1 with the body with clamping surface moved downward.

Designated with the numeral 1 in fig. 1 is the frame which can take a random form. Here it consists of a frame of beams covered with plates. Diverse drive means such as cylinders and hydraulic motors are arranged in the frame housing.

The frame supports a bracket-like carrier 2 consisting of two standing arms 3 on either side of the frame housing 1, wherein each arm is mounted on a stub 4 for pivoting in the direction of the arrow P1 relative to the frame 1.

The pivoting movement is brought about by a cylinder 5 which is arranged on the outside of the frame 1 and which on one side is supported on the frame wall at 6 and on the other side is rotatably connected at 7 to the bottom end of the arm 3. The cylinder 5 is double-action and it will be apparent that when energized in one sense the arm can fold downward from the one position in fig. 1 to the other position in fig. 2, wherein the arm supports on a support 8 arranged on the outside of the frame housing.

According to the invention the beam 10 of the bracket-like carrier 2 is embodied as a swivel beam, for which purpose the beam 10 is mounted for swivelling in the top end of each arm 3 by means of a stub. The stubs 11 lie mutually in line and thus form a swivel axis B-B which runs parallel to the swivel axis A-A through the stubs 4 of the arms 3.

Arranged between at least the foremost arm in fig. 1 and the beam 10 is a double-action cylinder 12 which supports on one side on the side of the arm 3 and the piston rod of which is connected pivotally to an eye 13 on the beam 10. With this cylinder 12 the beam 10 can be swivelled on the axis B-B.

The beam 10 bears a power unit 15, for instance in the form of a hydraulic cylinder.

Arranged on the underside of beam 10 is a body 16 which is slidable up and downward relative to beam 10, for which purpose body 16 is embodied with two guide rods 17 which are carried through guides in the beam 10 and provide a parallel movement of body 16 relative to beam 10.

The power unit 15 is connected to the top side of the body 16, for instance the piston rod of the cylinder 15, so that when cylinder 15 is energized the body 16 can be moved up and downward.

It is noted that frame 1 further supports a clamping table 20 on the upper surface of which an article V can be clamped. The body 16 can have a counter clamping surface which is the bottom surface thereof.

Finally, it is noted that a guide 21 is arranged on the inside of the arms 3, which guide co-acts with a guide on the side of body 16, see also fig. 3.

The operation of the above described device is as follows.

After clamping of an article V, see the shape of the article designated with broken lines on the clamping surface 20, the article V, which consists for instance of an upper and lower portion, can also be fixed to the clamping surface on the body 16 by moving the latter downward on the inside of the arms 3 after energizing the cylinder 15, see also the broken line of the body 16 in fig. 3. This can be made possible by also moving the clamping table 20 upward which is supported on a random lifting means, for instance a lifting cylinder.

After releasing the possible connecting means between the two parts of the article V the cylinder 15 can be energized once again in opposite sense, whereby the upper part of article V can be lifted from the lower part on clamping table 20.

By energizing cylinder 5 and cylinder 12 the bracket-like carrier 2 can then be carried into the position according to fig. 2 and, by tilting the beam 10, the body 16 can be swivelled through 90° so that the clamping surface thereof is oriented upward with the upper part of article V arranged thereon.

In this way the two parts of the article are accessible in simple manner, whereby for instance repair operations are possible.

In order to once again mount the two parts one on the other, the reverse movement can take place by reversing the driving direction of cylinders 5 and 12, whereby the processed one part comes to lie on the processed other part of the article. During this mounting movement accuracy is herein enhanced in that the body 16 co-acts by means of the guide 22 on the side of plate-like body 16 with an elongate protrusion or wedge 21 on the inside of the arms 3. Any play is hereby avoided as far as possible.

Through being able to lift the table 20 the article V can be moved upward in the direction of the clamping surface on the underside of body 16 whereby cylinder 15 requires a less long stroke so that in the position of fig. 2 the cylinder 15 remains above the support floor of frame 1.

The invention is not limited to the above described embodiment.

ing or pushing forces, such as moulds consisting of at least two parts, comprising a frame, a bracket-like carrier for a power unit such as a cylinder supported by the frame, a clamping table supported by the frame for receiving the article, wherein the bracket-like carrier is arranged for rotation on an axis parallel to the clamping surface in order to carry the bracket from a position above the clamping surface to a position adjacent to the clamping surface and vice-versa, **characterized in that** the bracket is provided with a beam which is supported by at least one arm and to which is fixed the power unit, which beam is mounted on the arm for pivoting on an axis parallel to the first axis.

2. Device as claimed in claim 1, **characterized in that** a double-action cylinder is arranged between the beam and the arm in order to turn the beam through an angle of a maximum of 90°.
3. Device as claimed in claims 1 and 2, **characterized in that** the beam is embodied with a body provided with a counter clamping surface, wherein the power unit placed on the beam engages onto the body such that in the one position of the bracket the body is movable toward and away from the table, wherein the counter clamping surface extends parallel above the clamping surface of the table in this one position of the bracket-like carrier.
4. Device as claimed in claim 3, **characterized in that** at least one of the arms is provided with a guide (21) for a guide (22) co-acting with the counter clamping surface in the body.
5. Device as claimed in claims 1-4, **characterized in that** the table is height-adjustable relative to the frame.
6. Device as claimed in claims 1-5, **characterized in that** the guide is embodied on the one hand as a key arranged on the arm and on the other hand as a groove arranged in the body.

Claims

1. Device for processing articles by means of pull-

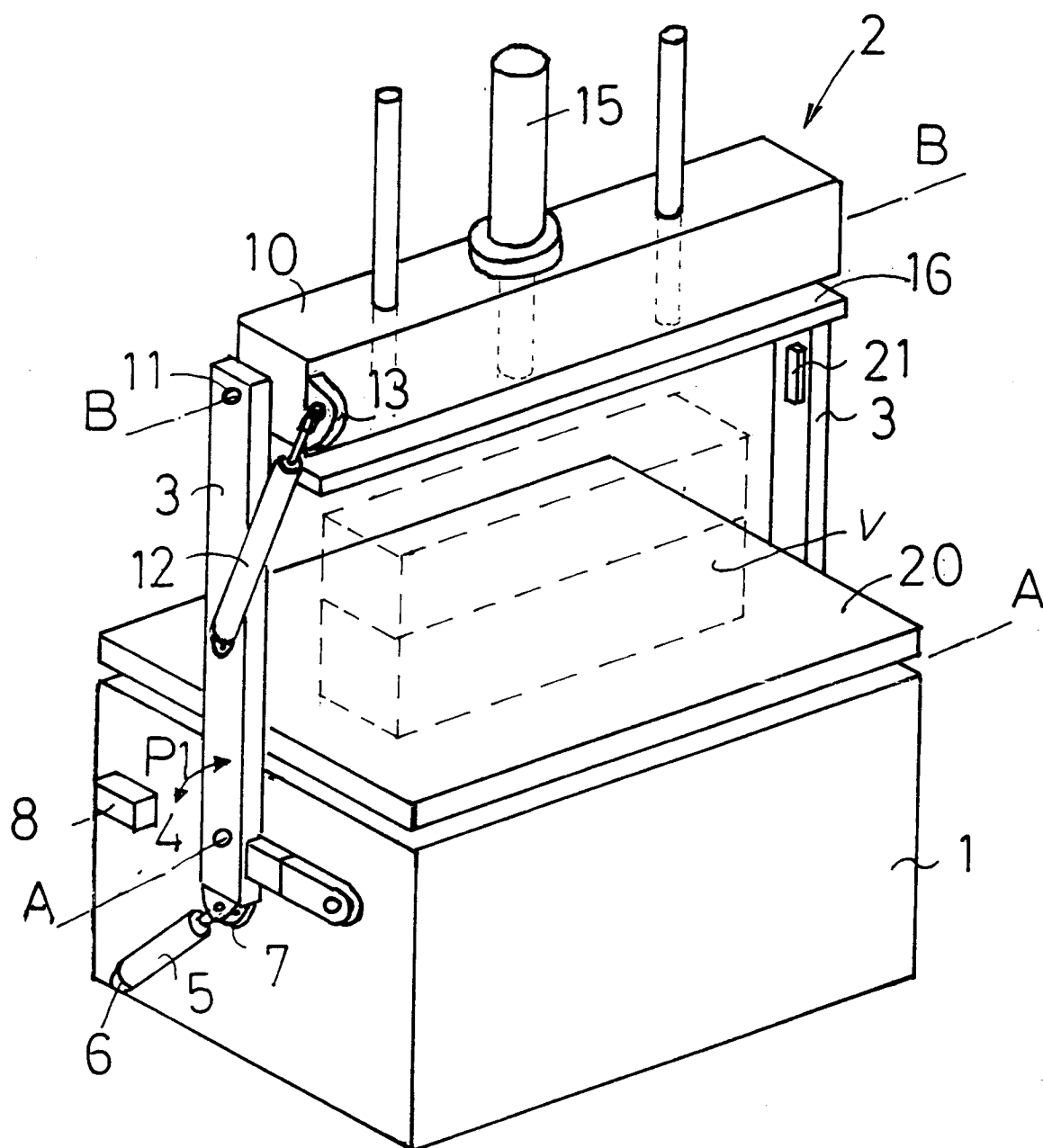


Fig 1

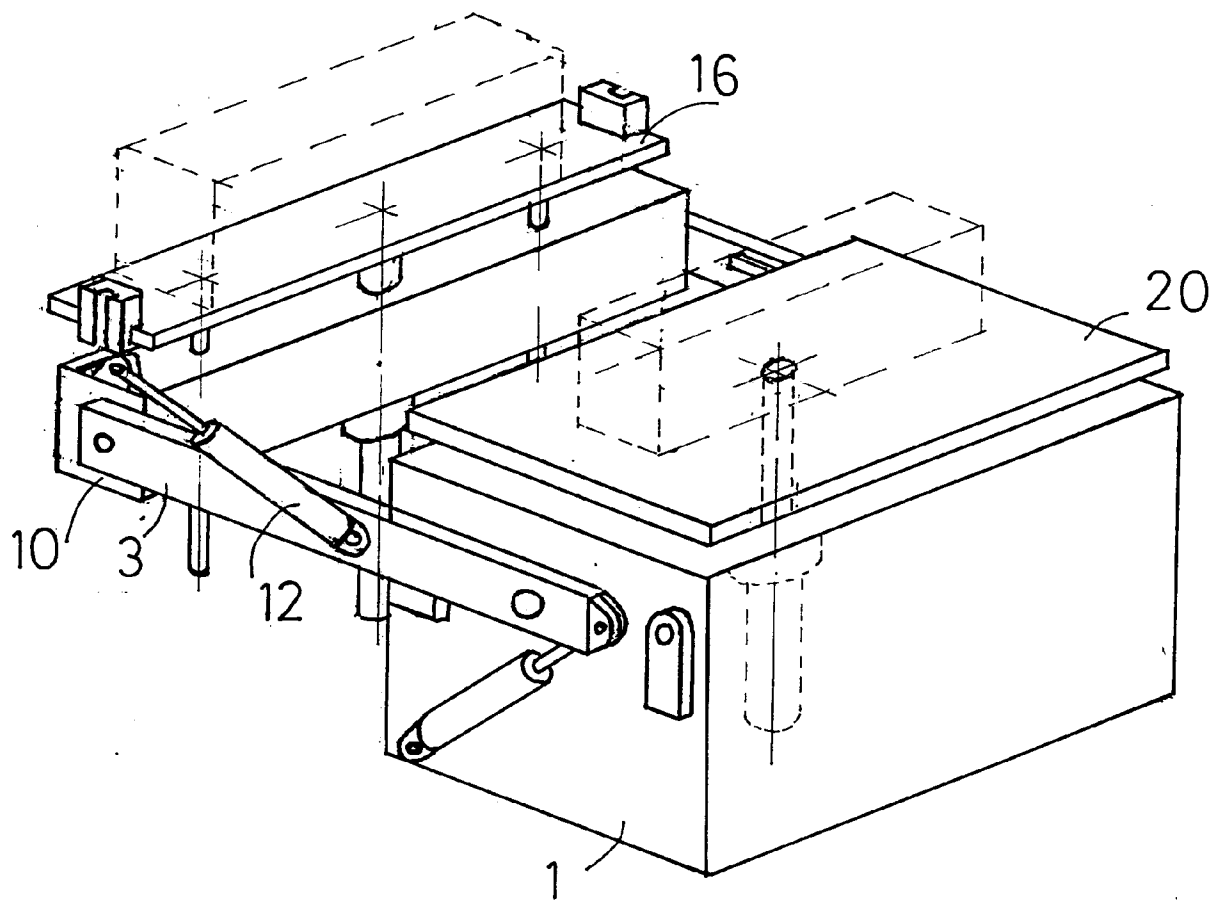


Fig 2

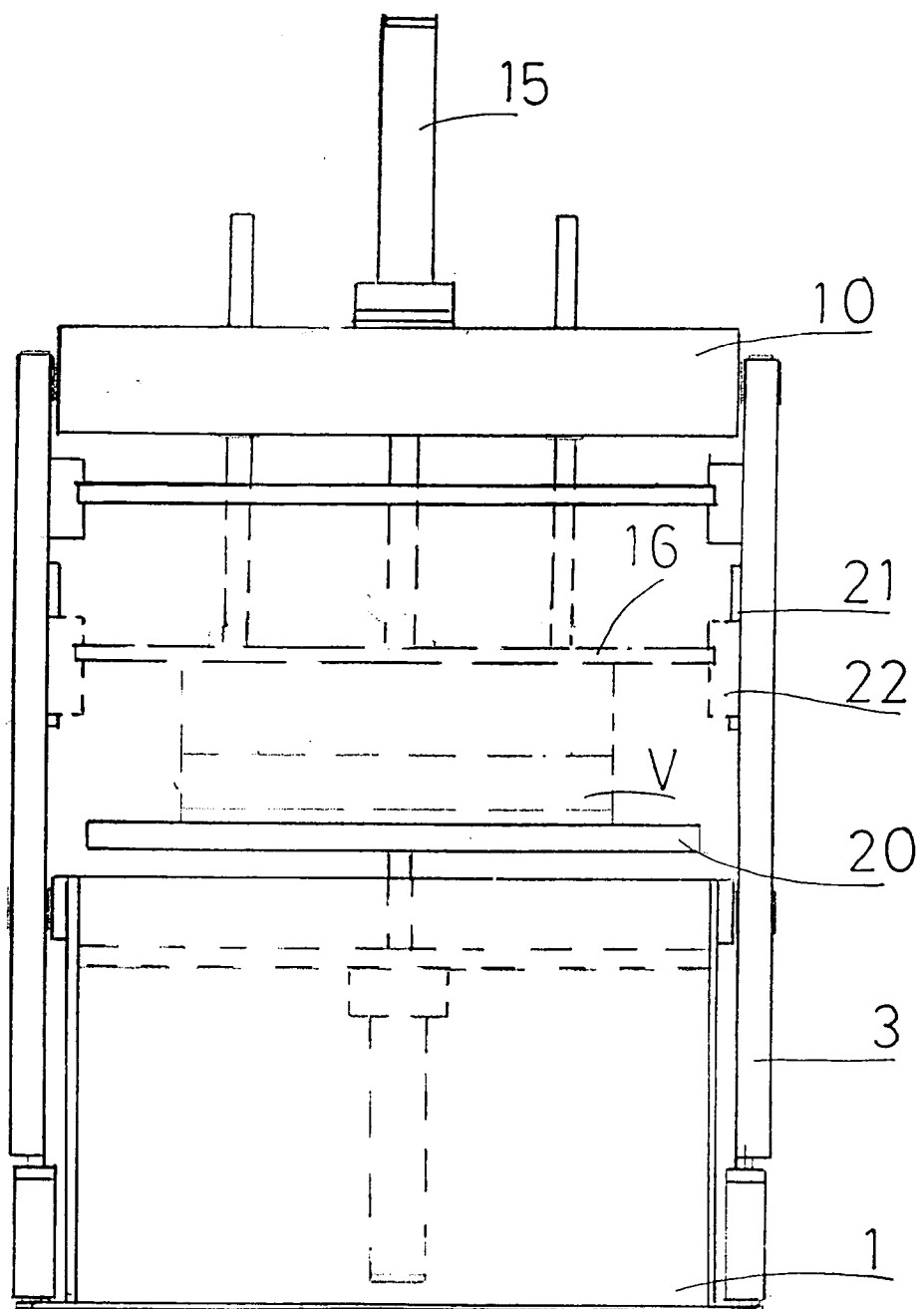


Fig 3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 20 2995

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X	FR-A-2 067 765 (REIS) * claims; figures * ---	1-3,5	B21D1/00 B21D37/14
X	DE-A-26 59 556 (HALLER) * page 9, line 16 - page 11, line 1; claims; figure 1 * ---	1-3,5	
X	FR-A-1 394 803 (HITOSUGI) * the whole document * ---	1-3,5	
X	EP-A-0 106 824 (OLSSON) * the whole document * ---	1-3,5	
A	FR-A-1 223 477 (DURAND) ---		
A	DE-A-15 02 291 (MUELLER) -----		
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			B21D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 14 April 1994	Examiner Peeters, L
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.92 (P04C01)