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(54) **CLICKING PRESS**

SCHWENKARMSTANZE

PRESSE À DÉCOUPER

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Description

[0001] The present invention relates to a clicking press for processing leather, hides, rubber and the like and in particular a turning arm clicking press (see for example DE-A-35 46 250).

[0002] Turning arm clicking presses generally comprise a base on the top of which a working plane is arranged allowing to place a work piece and the tool or tools provided for the processing. The base is provided with a vertical support on which an arm is arranged supporting a pressing plane substantially parallel to the working plane. The support is movable in the vertical direction and driven by driving means arranged inside the base such as, for example, a hydraulic servomechanism, and the turning arm is rotatable relative to the base around a substantially vertical axis. In order to carry out a clicking operation, the arm is so rotated to place the pressing plane over the work piece and the tools arranged on the working plane, then the support is driven pressing with a given force the pressing plane on the tools and the work piece, and finally the support is driven in the opposite direction in order to move the working plane away and thus enable the rotation of the turning arm and the access to the working plane for the removal of the work piece.

[0003] Turning arm clicking presses are extremely practical and inexpensive machines, however they exhibit the drawback of having pressing planes of a much lower size with respect to the size of the working plane and such to not allow to exploit their whole area even by rotating the pressing plane in several positions by means of the turning arm. This results in a remarkable limit to the size of the pieces processable on this type of machines. In addition, the rotation of the turning arm in order to try to cover more zones of the working plane during the processing of a work piece often results in a low quality of the processing.

[0004] It is therefore an object of the present invention to provide a turning arm clicking press, which is free from said disadvantages. Said object is achieved with a turning arm clicking press, whose main features are disclosed in the first claim and other features are disclosed in the remaining claims.

[0005] The turning arm clicking press according to the present invention is provided with rotation blocking means that define a working position of the turning arm in which the pressing plane is substantially overlapped with the working plane. The pressing plane is longitudinally slidable relative to the turning arm and has a size substantially corresponding to the size of the working plane.

[0006] The main advantage of the clicking press according to the present invention is that through a single precise and repeatable positioning of the turning arm and a single driving of the pressing plane, it is possible to entirely cover the surface of the working plane, thus being able to process work pieces of a larger size with respect to the work pieces that can be processed on clicking

presses of a similar size and to obtain processings with a high and uniform quality.

[0007] Further, the possibility of making the pressing plane slide relative to the turning arm makes it possible to access the working plane with neither the need of rotating each time the turning arm, nor the need of positioning it again for the subsequent processing, resulting in remarkable time savings, especially in the case of mass production.

[0008] The sliding of the pressing plane relative to the turning arm may be driven both manually and automatically, thus providing the user with the maximum ease of handling in any situation.

[0009] Further advantages and features of the turning arm clicking press according to the present invention will become clear to those skilled in the art from the following detailed and non-limiting description of an embodiment thereof with reference to the attached drawings, wherein:

- figure 1 shows a schematic perspective view of the clicking press according to the present invention;
- figure 2 shows a detail II of figure 1;
- figure 3 shows a front view of the clicking press of figure 1; and
- figure 4 shows a side view of the clicking press of figure 1.

[0010] Referring to figure 1, the clicking press according to the present invention comprises in a known way a base 1 on the top of which a working plane 2 is arranged. The base is provided with a vertical support 3 on which an arm 4 is fixed supporting a pressing plane 5 substantially parallel to the working plane 2. The support 3 is movable in the vertical direction and is driven by driving means arranged inside base 1, a hydraulic servomechanism for instance, in order to carry out a clicking operation and arm 4 is rotatable relative to base 1 around a substantially vertical axis 6.

[0011] According to the present invention, the clicking press also includes blocking means of arm 4, comprising a first blocking element 7 arranged on base 1 and a second blocking element 8 arranged on arm 4. The first and the second blocking elements are suitable to engage one in the other, thus defining a working position of arm 4 wherein the pressing plane 5 is substantially overlapped with the working plane 2. In addition, the pressing plane 5 is longitudinally slidable relative to arm 4, in order to enable the access to the working plane 2 between one clicking operation and the following one.

[0012] As shown in the detail of figure 2, the first blocking element may be, for instance, a fork 7 fixed to base 1 and arranged in proximity to support 3, and the second blocking element may be, for instance, a vertical rod 8 fixed to arm 4, which rod engages fork 7 in the working position.

[0013] The pressing plane 5 has a size substantially corresponding to those of the working plane 2, for example typically 900x450 mm, 1000x500 mm or 1200x500

mm.

[0014] As shown in figure 3, the arm 4 comprises two side walls 4a, 4b that are respectively provided with longitudinal guides 9a, 9b and the pressing plane 5 is slidable therealong by means of a pair of vertical supports 5a, 5b arranged in proximity to its opposite side edges and provided with bearing means 10a, 10b. Preferably, the bearing means 10a, 10b are ball bearings.

[0015] In order to enable a correct pressing action, the pressing plane 5 is arranged under the longitudinal guides 9a, 9b, substantially contacting their lower surfaces. Thus, once the arm 4 has been blocked in the working position and the pressing plane 5 has been positioned, the pressing load is transmitted from arm 4 to the pressing plane 5 through the longitudinal guides 9a, 9b.

[0016] The sliding of the pressing plane 5 relative to arm 4 is limited between a first and a second stop arranged on the longitudinal guides 9a, 9b.

[0017] The pressing plane 5 preferably further comprises centering means 11a, 11b arranged on the vertical supports 5a, 5b, and slidable on the lateral surfaces of the longitudinal guides 9a, 9b. The centering means 11a, 11b may comprise, for example, ball bearings urged against the longitudinal guides 9a, 9b by elastic means such as, for instance, Belleville springs, and serve to ensure the alignment of the pressing plane 5 with respect to the working plane 2 in the transverse direction.

[0018] The pressing plane 5 may be manually slid by acting upon pair of handles 12 arranged thereon and generally comprising the pressing drives of the clicking press. Alternatively, the sliding of the pressing plane may be automatically driven by means of a servomechanism such as, for example, a gearmotor and a worm.

[0019] As shown in figure 4, in the back portion of arm 4 a gearmotor 13 is arranged provided on the output shaft with a worm 14 fitted in a threaded collar 15, which is arranged in the back portion of the pressing plane 5. The driving of gearmotor 13 generates a rotation of worm 14, which determines a sliding of the pressing plane 5 between the two end-stroke positions by means of the threaded collar 15.

[0020] The drive of servomechanism 13, 14, 15 may be advantageously arranged in the driving handles 12 fixed on the pressing plane 5 and position sensors, suitable to automatically block the pressing plane 5, may be placed at the end-stroke locations.

[0021] Possible variants and/or additions may be made by those skilled in the art to the hereinabove disclosed and illustrated embodiment while remaining within the scope of the following claims. In particular, for example, the side walls 4a, 4b of arm 4 may be provided with a truss structure made up of struts and tie rods, which provides arm 4 with a high flexural rigidity while maintaining at the same time a low weight of the structure. Further, transverse reinforcing elements may be arranged between the side walls 4a, 4b, suitable to provide arm 4 with an improved torsional rigidity, thus enabling

arm 4 to withstand, without being deformed, pressing loads being higher than those of known turning arm clicking presses and typical of clicking presses of larger size.

Claims

1. A clicking press comprising a base (1) on the top of which a working plane (2) is arranged, said base (1) being provided with a vertical support (3) on which an arm (4) is assembled supporting a pressing plane (5) substantially parallel to the working plane (2), said support (3) being movable in the vertical direction by driving means arranged inside the base (1) and said arm (4) being rotatable relative to the base (1) around a substantially vertical axis (6), **characterized by** further comprising blocking means (7, 8) of the arm (4), said blocking means (7, 8) comprising a first blocking element (7) arranged on the base (1) and a second blocking element (8) arranged on the arm (4), said first and second blocking elements (7, 8) being suitable to engage one in the other defining a working position of the arm (4) in which the pressing plane (5) is substantially overlapped with the working plane (2), said pressing plane (5) being longitudinally slidable relative to the arm (4) in order to enable the access to the working plane (2) between a clicking operation and the following one.
2. A clicking press according to the previous claim, **characterized in that** said first blocking element (7) is a fork fixed to the base (1) and arranged in proximity to the support (3) and said second blocking element (8) is a vertical rod fixed to the arm (4), said vertical rod (8) being suitable to engage the fork (7) in said working position.
3. A clicking press according to one of the previous claims, **characterized in that** said pressing plane (5) has a size substantially corresponding to the size of the working plane (2).
4. A clicking press according to the previous claim, **characterized in that** said working plane has a size of 900x450 mm, 1000x500 mm or 1200x500 mm.
5. A clicking press according to one of the previous claims, **characterized in that** said arm (4) comprises two side walls (4a, 4b) respectively provided with longitudinal guides (9a, 9b), the pressing plane (5) being slidable along said longitudinal guides (9a, 9b) by means of a pair of vertical supports (5a, 5b) arranged in proximity to its opposite side edges and provided with bearing means (10a, 10b)
6. A clicking press according to the previous claim, **characterized in that** said bearing means (10a, 10b) are ball bearings.

7. A clicking press according to one of the previous claims, **characterized in that** the pressing plane (5) is arranged under the longitudinal guides (9a, 9b) substantially contacting their lower surfaces.
8. A clicking press according to one of claims 5 to 7, **characterized in that** the sliding of the pressing plane (5) relative to the arm (4) is limited between a first and a second stop arranged on said longitudinal guides (9a, 9b).
9. A clicking press according to one of claims 5 to 8, **characterized in that** the pressing plane (5) also comprises centering means (11a, 11b) arranged on the vertical supports (5a, 5b) and slidable on the lateral surfaces of the longitudinal guides (9a, 9b), said centering means (11a, 11b) being suitable to ensure the alignment of the pressing plane (5) to the working plane (2) in the transverse direction.
10. A clicking press according to the previous claim, **characterized in that** said centering means (11a, 11b) comprise ball bearings urged against the longitudinal guides (9a, 9b) by spring means.
11. A clicking press according to claim 1, **characterized in that** the pressing plane (5) is manually slidable relative to arm (4) by means of a pair of driving handles (12) arranged thereon, said handles (12) comprising the pressing drives of the clicking press.
12. A clicking press according to claim 1, **characterized in that** the pressing plane (5) is automatically slidable relative to arm (4) by means of a servomechanism (13, 14, 15).
13. A clicking press according to the previous claim, **characterized in that** said servomechanism (13, 14, 15) comprises a gearmotor (13) provided on the output shaft with a worm (14) suitable to engage a threaded collar (15) arranged in the back portion of the pressing plane (5).
14. A clicking press according to the previous claim, **characterized in that** said servomechanism (13, 14, 15) is directly driven from the driving handles (12) fixed on the pressing plane (5).
15. A clicking press according to the previous claim, **characterized in that** position sensors suitable to automatically block the pressing plane (5) are provided at the end-stroke positions.
16. A clicking press according to one of the previous claims, **characterized in that** the side walls (4a, 4b) of the arm (4) comprise a truss structure and that transverse reinforcing elements are arranged between said side walls (4a, 4b), said truss structure

and transverse reinforcing elements being suitable to provide the arm (4) with a high flexural and torsional rigidity.

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Patentansprüche

1. Schwenkarmstanze, umfassend ein Unterteil (1), auf dessen Oberseite eine Arbeitsebene (2) angeordnet ist, wobei das besagte Unterteil (1) mit einer vertikalen Stütze (3) versehen ist, worauf ein Arm (4) aufgebaut ist, der eine Presseebene (5) im Wesentlichen parallel zu der Arbeitsebene (2) trägt, wobei die Stütze (3) in vertikaler Richtung bewegbar ist mittels Antriebsmittel, welche innerhalb des Unterteils (1) angeordnet sind, und wobei der besagte Arm (4) relativ zu dem Unterteil (1) um eine im Wesentlichen vertikale Achse (6) schwenkbar ist, ferner **gekennzeichnet durch** Blockiermittel (7, 8) des Arms (4), wobei besagte Blockiermittel (7, 8) ein erstes, an dem Unterteil (1) angeordnetes Blockierelement (7) aufweisen, sowie ein zweites, an dem Arm (4) angeordnetes Blockierelement (8), und wobei besagtes erstes und zweites Blockierelement (7, 8) geeignet sind, ineinander einzugreifen, um eine Arbeitsposition des Arms (4) zu definieren, in welcher sich die Presseebene (5) mit der Arbeitsebene (2) im Wesentlichen überdeckt, und wobei die Presseebene (5) relativ zu dem Arm (4) longitudinal verschiebbar ist, um den Zugang zu der Arbeitsebene (2) zwischen einer Stanzoperation und der folgenden zu ermöglichen.
2. Schwenkarmstanze nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** das besagte, erste Blockierelement (7) eine an dem Unterteil (1) befestigte und in der Nähe der Stütze (3) angeordnete Gabel ist, und dass das besagte, zweite Blockierelement (8) eine an dem Arm (4) befestigte, vertikale Stange ist, wobei die besagte, vertikale Stange (8) in der Lage ist, in besagter Arbeitsposition in die Gabel (7) einzugreifen.
3. Schwenkarmstanze nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die besagte Presseebene (5) eine Größe aufweist, die im Wesentlichen mit der Größe der Arbeitsebene (2) korrespondiert.
4. Schwenkarmstanze nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** die Arbeitsebene eine Größe von 900x450 mm aufweist, von 1000x500 mm oder von 1200x500 mm.
5. Schwenkarmstanze nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der besagte Arm (4) zwei Seitenwände (4a, 4b) aufweist, die jeweils mit Longitudinal-Führungen (9a, 9b) versehen sind, wobei die Presseebene (5) entlang

- dieser Longitudinal-Führungen (9a, 9b) verschiebbar ist mittels eines Paares von vertikalen Stützen (5a, 5b), die in der Nähe ihrer gegenüberliegenden Seitenkanten angeordnet und mit Lagerungsmitteln (10a, 10b) versehen sind.
6. Schwenkarmstanze nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** die besagten Lagerungsmittel (10a, 10b) Kugellager sind.
 7. Schwenkarmstanze nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Presseebene (5) unterhalb der Longitudinal-Führungen (9a, 9b) angeordnet ist, deren untere Oberflächen im Wesentlichen kontaktierend.
 8. Schwenkarmstanze nach einem der Ansprüche 5 bis 7, **dadurch gekennzeichnet, dass** das Gleiten der Presseebene (5) relativ zu dem Arm (4) begrenzt ist zwischen einem ersten und einem zweiten, auf den besagten Longitudinal-Führungen (9a, 9b) angeordneten Anschlag.
 9. Schwenkarmstanze nach einem der Ansprüche 5 bis 8, **dadurch gekennzeichnet, dass** die Presseebene (5) ebenfalls Zentriermittel (11a, 11b) aufweist, die an den vertikalen Stützen (5a, 5b) angeordnet und an den seitlichen Oberflächen der Longitudinal-Führungen (9a, 9b) verschiebbar sind, wobei die besagten Zentrierungsmittel (11a, 11b) in der Lage sind, die Ausrichtung der Presseebene (5) gegenüber der Arbeitsebene (2) in der transversalen Richtung sicherzustellen.
 10. Schwenkarmstanze nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** die besagten Zentrierungsmittel (11a, 11b) Kugellager umfassen, welche durch Federmittel gegen die Longitudinal-Führungen (9a, 9b) gedrückt werden.
 11. Schwenkarmstanze nach Anspruch 1, **dadurch gekennzeichnet, dass** die Presseebene (5) relativ zu dem Arm (4) manuell verschiebbar ist mittels eines Paares von daran angeordneten Antriebshenkeln (12), welche Henkel (12) die Pressantriebe der Stanzpresse aufweisen.
 12. Schwenkarmstanze nach Anspruch 1, **dadurch gekennzeichnet, dass** die Presseebene (5) relativ zu dem Arm (4) manuell verschiebbar ist mittels eines Servomechanismus (13, 14, 15).
 13. Schwenkarmstanze nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** der besagte Servomechanismus (13, 14, 15) einen Getriebemotor (13) umfaßt, der an der Ausgangswelle mit einer Schnecke (14) versehen ist, die in der Lage ist, in einen mit Gewinde versehenen, im hinteren Bereich der Presseebene (5) angeordneten Kragen (15) einzugreifen.
 14. Schwenkarmstanze nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** der besagte Servomechanismus (13, 14, 15) direkt angetrieben wird von den Antriebshenkeln (12), welche an der Presseebene (5) befestigt sind.
 15. Schwenkarmstanze nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** an den End-Anschlags-Positionen Positionssensoren vorgesehen sind, welche in der Lage sind, die Presseebene (5) automatisch zu blockieren.
 16. Schwenkarmstanze nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Seitenwände (4a, 4b) des Arms (4) eine Fachwerkstruktur aufweisen, und dass transversale Versteifungselemente zwischen den besagten Seitenwänden (4a, 4b) angeordnet sind, wobei die besagte Fachwerkstruktur und die transversalen Versteifungselemente in der Lage sind, dem Arm (4) eine hohe Biege- und Torsionsfestigkeit zu verleihen.

Revendications

1. Presse à découper comprenant une base (1) sur la partie supérieure de laquelle on agence un plan de travail (2), ladite base (1) étant prévue avec un support vertical (3) sur lequel on assemble un bras (4), supportant un plan de presse (5) sensiblement parallèle au plan de travail (2), ledit support (3) étant mobile dans la direction verticale grâce à des moyens d'entraînement agencés à l'intérieur de la base (1) et ledit bras (4) pouvant tourner par rapport à la base (1) autour d'un axe sensiblement vertical (6), **caractérisée en ce qu'elle** comprend en outre des moyens de blocage (7, 8) du bras (4), lesdits moyens de blocage (7, 8) comprenant un premier élément de blocage (7) agencé sur la base (1) et un deuxième élément de blocage (8) agencé sur le bras (4), lesdits premier et deuxième éléments de blocage (7, 8) étant appropriés pour se mettre en prise entre eux, définissant une position de travail du bras (4) dans laquelle le plan de presse (5) est sensiblement recouvert avec le plan de travail (2), ledit plan de presse (5) pouvant coulisser de manière longitudinale par rapport au bras (4) afin de permettre l'accès au plan de travail (2) entre une opération de découpe et la suivante.
2. Presse à découper selon la revendication précédente, **caractérisée en ce que** ledit premier élément de blocage (7) est une fourche fixée sur la base (1) et agencée à proximité du support (3), et ledit deuxième élément de blocage (8) est une tige verticale fixée

sur le bras (4), ladite tige verticale (8) étant appropriée pour mettre en prise la fourche (7) dans ladite position de travail.

3. Presse à découper selon l'une quelconque des revendications précédentes, **caractérisée en ce que** ledit plan de presse (5) a une taille correspondant sensiblement à la taille du plan de travail (2). 5
4. Presse à découper selon la revendication précédente, **caractérisée en ce que** ledit plan de travail a une taille de 900 x 450 mm, 1 000 x 500 mm ou 1 200 x 500 mm. 10
5. Presse à découper selon l'une quelconque des revendications précédentes, **caractérisée en ce que** ledit bras (4) comprend deux parois latérales (4a, 4b) respectivement prévues avec des guides longitudinaux (9a, 9b), le plan de presse (5) pouvant coulisser le long desdits guides longitudinaux (9a, 9b) au moyen d'une paire de supports verticaux (5a, 5b) agencés à proximité de ses bords latéraux opposés et prévus avec des moyens de palier (10a, 10b). 15 20
6. Presse à découper selon la revendication précédente, **caractérisée en ce que** lesdits moyens de palier (10a, 10b) sont des roulements à billes. 25
7. Presse à découper selon l'une quelconque des revendications précédentes, **caractérisée en ce que** le plan de presse (5) est agencé sous les guides longitudinaux (9a, 9b) sensiblement en contact avec leurs surfaces inférieures. 30
8. Presse à découper selon l'une quelconque des revendications 5 à 7, **caractérisée en ce que** le coulisement du plan de presse (5) par rapport au bras (4) est limité entre une première et une deuxième butée agencées sur lesdits guides longitudinaux (9a, 9b). 35 40
9. Presse à découper selon l'une quelconque des revendications 5 à 8, **caractérisée en ce que** le plan de presse (5) comprend également des moyens de centrage (11a, 11b) agencés sur les supports verticaux (5a, 5b) et pouvant coulisser sur les surfaces latérales des guides longitudinaux (9a, 9b), lesdits moyens de centrage (11a, 11b) étant appropriés pour garantir l'alignement du plan de presse (5) sur le plan de travail (2) dans la direction transversale. 45 50
10. Presse à découper selon la revendication précédente, **caractérisée en ce que** lesdits moyens de centrage (11 a, 11 b) comprennent des roulements à billes poussés contre les guides longitudinaux (9a, 9b) par des moyens de ressort. 55
11. Presse à découper selon la revendication 1, **carac-**

térisée en ce que le plan de presse (5) peut coulisser manuellement par rapport au bras (4) au moyen d'une paire de poignées d'entraînement (12) agencées sur ce dernier, lesdites poignées (12) comprenant des dispositifs d'entraînement de presse de la presse à découper.

12. Presse à découper selon la revendication 1, **caractérisée en ce que** le plan de presse (5) peut coulisser automatiquement par rapport au bras (4) au moyen d'un mécanisme asservi (13, 14, 15).
13. Presse à découper selon la revendication précédente, **caractérisée en ce que** ledit mécanisme asservi (13, 14, 15) comprend un moteur à engrenages (13) prévu sur l'arbre de sortie avec une vis sans fin (14) appropriée pour mettre en prise un collier fileté (15) agencé dans la partie arrière du plan de presse (5).
14. Presse à découper selon la revendication précédente, **caractérisée en ce que** ledit mécanisme asservi (13, 14, 15) est directement entraîné à partir des poignées d'entraînement (12) fixées sur le plan de presse (5).
15. Presse à découper selon la revendication précédente, **caractérisée en ce que** des capteurs de position appropriés pour bloquer automatiquement le plan de presse (5) sont prévus au niveau des positions de fin de course.
16. Presse à découper selon l'une quelconque des revendications précédentes, **caractérisée en ce que** les parois latérales (4a, 4b) du bras (4) comprennent une structure d'étau et **en ce que** les éléments de renforcement transversaux sont agencés entre lesdites parois latérales (4a, 4b), ladite structure d'étau et les éléments de renforcement transversaux étant appropriés pour doter le bras (4) d'une rigidité à la flexion et à la torsion.

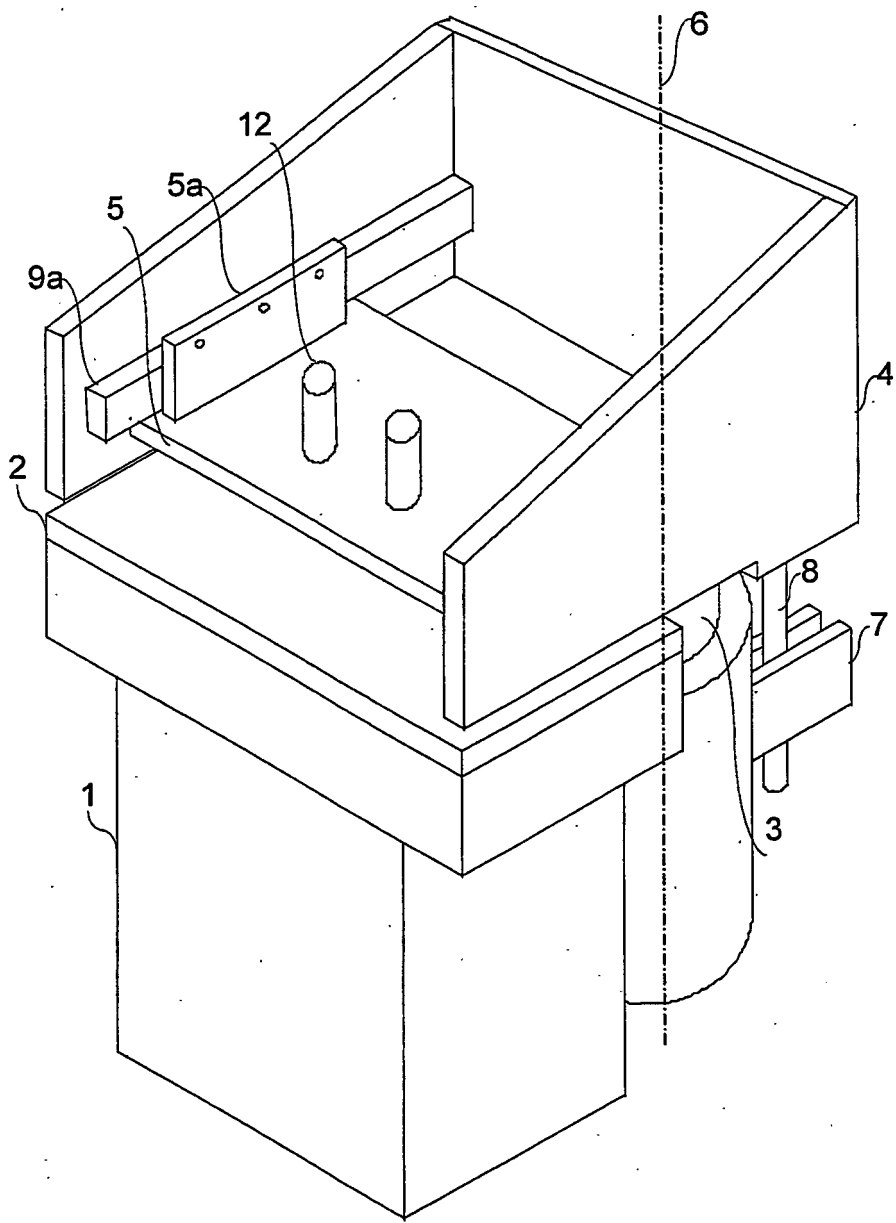


Fig.1

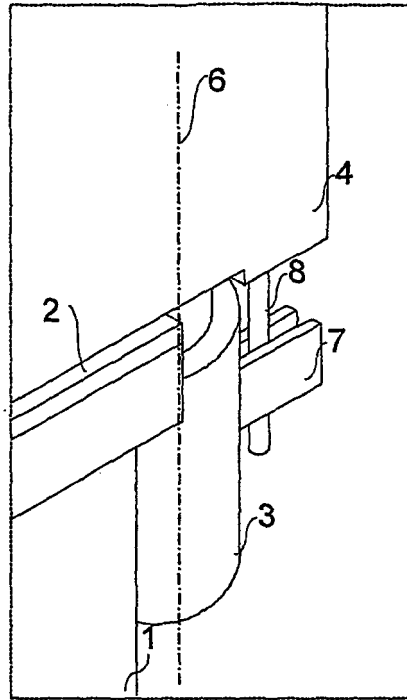


Fig.2

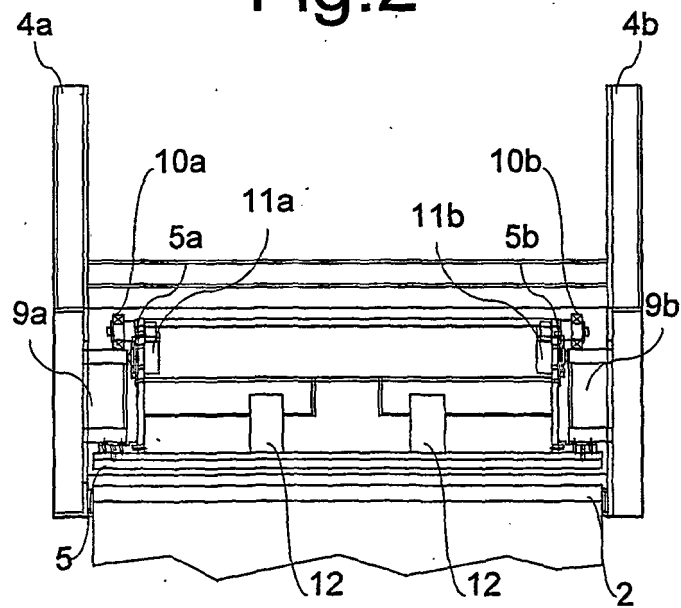


Fig.3

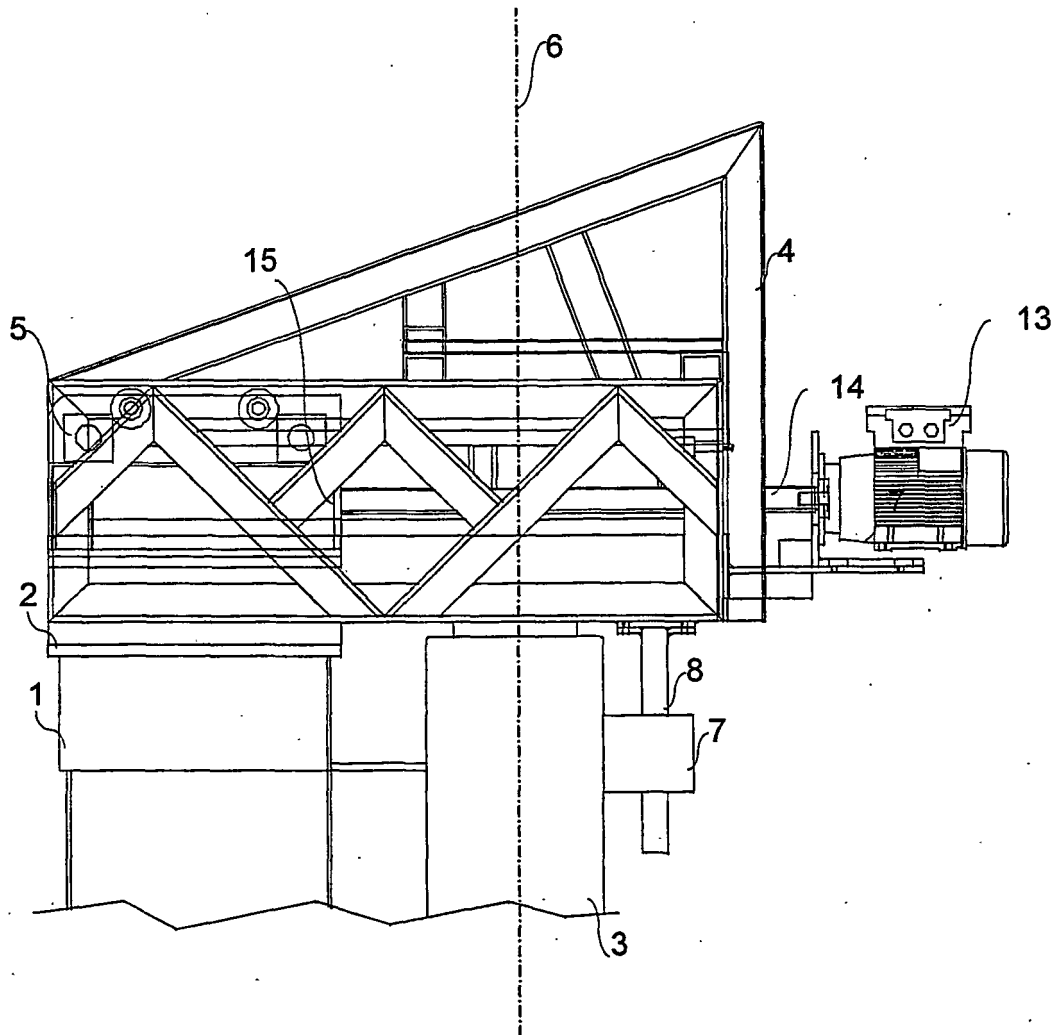


Fig.4

REFERENCES CITED IN THE DESCRIPTION

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