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Remarks:

Amended claims in accordance with Rule 86 (2) EPC.

(54) **Drum-type press for clay products, trimmer unit and functioning method therefor**

(57) The present invention relates to a drum-type press (50) for manufacturing clay products comprising a trimmer unit (70) mechanically connected to the press (50) and having a plurality of supports arranged to grasp the products from a face of the drum (58) according to a grasp configuration and to lay them on transport means according to a laying configuration. The trimmer unit (70)

comprises means arranged to modify the grasping configuration into a different laying configuration by moving at least one of the supports (86) in a selectively adaptable way. The invention also relates to trimmer units (70) for trimming and laying the products manufactured made by such presses (50) and to a relating method for pressing and trimming the products.

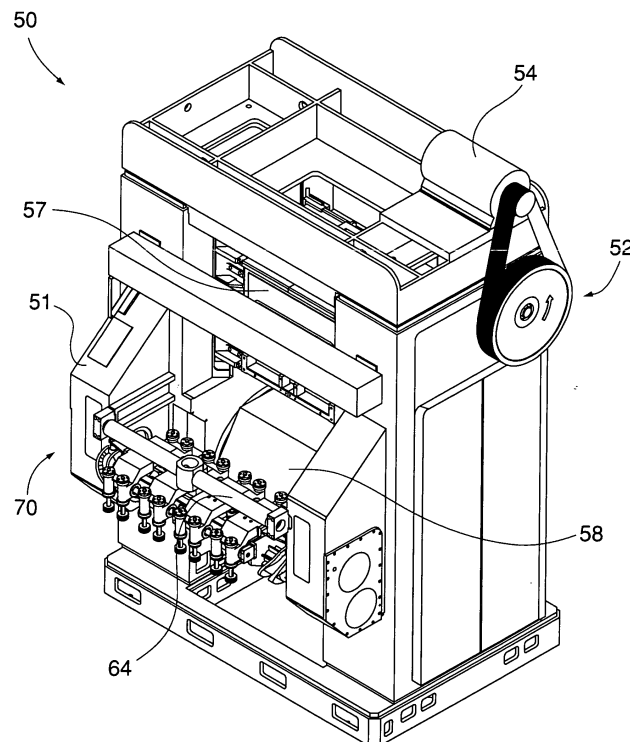


Fig. 2

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Description

Technical field

[0001] The present invention relates, in general, to drum-type presses for making clay products and to trimmer units for trimming and laying down the clay products made by said presses.

The present invention also relates to operation methods associated to said devices.

In particular, the present invention relates to presses and devices for making tiles.

Background Art

[0002] Drum-type presses for making clay products starting from clay pigs named "biscuits", by means of pairs of opposite dies (top and bottom die) are known. Such presses comprise, in general, a machine body 1 (Fig. 1a and Fig. 1b) that constitutes the support structure of the press, a press unit and a slobber-laying down unit (trimmer unit or laying down unit) 17. The press unit comprises a plurality of gears 2 that, receiving motion from an electric motor 3, actuate a camshaft 4 and a Maltese cross 5; the camshaft 4, by means of an orthodromic system of cams 6, actuates a "compressor" or head hammer 7, on which the top dies are positioned (in the number of 1 - 2 - 3 or 4 according to the press type), for transforming a rotating motion in an alternated rectilinear up and down motion; the Maltese cross 5 is firmly connected to a drum having several faces 8 (having in general 6 faces) on which the bottom dies are positioned (having a number corresponding, for any drum face, to those of the top die) that transforms the continuous rotation motion of a gear in the intermittent rotation motion of the drum.

The camshaft 4 also actuates a connecting rod-shaft device 9 that directly or, for instance, by means of a gear transmission 10 actuates, through two levers 11, the trimmer unit 17, which is arranged to clean up the products from the pressing waste, to grasp them and to lay them down on suitable supports named "telaioni"; the trimmer unit 17 is guided in the grasp and lay down motion by a shaft 13 sliding in a guide 14 pivoted to the machine body or chassis 1 and carries out an alternated rotating motion between two extreme points of its travel, that is the point of the product grasp on the drum, as shown in Fig. 1a, and the product lay down point, as shown in Fig. 1b.

[0003] A common problem for drum-type presses for clay products is that the distance between the dies on the drum, in the case of a press with two or more dies by drum face, is, in general, different from the distance between products that is useful in order to kiln-dry them and to bake them in a dryer and/or a kiln.

Such a problem exists as it is necessary to guarantee a first determined distance between the down dies positioned on the drum so as to avoid that the burr generated by the product or piece moulding can end up in the im-

mediately adjacent die by generating defects on the products; moreover, at the same time, it is necessary to position the products on the "telaioni" according to a second determined distance, for instance distances as close as possible in order to reduce the dimensions of the "telaioni" and allowing to reduce the dimensions of the dryer and/or the kiln with remarkable economic savings on dryer and/or kiln construction and management.

In order to solve such a problem, the background art proposes, in the case of presses having two or three dies for each drum face, a group (trimmer unit) arranged to trim, to separate and to lay down the products, as for instance disclosed in the Applicant's brochure published on October 1, 2004 relating to the press model 13 PV with two dies and to the press model 16 PV with three dies.

In the case of the 13 PV model, for instance, though the same principle applies to the 16 PV model wherein a central fixed trimmer unit is provided, the trimmer unit comprises two mobile trimmers 15 (Fig. 1c) arranged to grasp the products at a first determined distance between their centres X and to put them down on the "telaione" at a second determined distance between their centres Y, different from X.

The known trimmer unit provides that the two mobile trimmers 15 are assembled on respective mobile supports sliding on guides 16, and are directly operated by two arms 20 connected to two semicircular cams 19 positioned at the end of levers 11.

The known solution is apt to allow that the trimmers be approached by a distance $(X-Y)/2$ so as to position the two products, to be kiln-dried and/or baked, on the "telaioni" according to an optimal distance between their centres in order to kiln-dry and/or bake the same products.

[0004] Alternatively to the above described solution, the background art teaches, as for instance disclosed in patent publication JP 10-316237, to free the group arranged to trim and lay down or position the products from the group arranged to separate the products in order to optimise the distance between products externally to the used press; the optimisation is obtained by means of a complex movement of the same products during the transport from the press to the kilns for drying and/or baking.

[0005] The Applicant finds that the first type of background art is not flexible, even if it presents the advantage that the trimmer unit is arranged to trim, separate and position the products and that works synchronously with the press, as the mobile trimmers are rigidly connected to two symmetrical arms of the trimmer unit and, therefore, rigidly determine the entity of the movement of the products.

Moreover, the Applicant finds that the first type of background art does not satisfy the requirement to operate with drum-type presses apt to handle at least four dies. As a matter of fact, in the case of four dies, the simple movement of the trimmers by a distance $(X-Y)/2$, as is

easily comprehensible for a technician in the field, would not allow to optimise the distances between trimmers. Moreover, the Applicant finds that the known trimmer unit of said first type of background art is particularly inflexible, as, once installed, it can only operate with a number of trimmers equal to the number of mounted mobile supports, 2 or 3, and cannot be adapted to diversified production requirements.

[0006] Finally, the Applicant finds that the second type of solution, even though it may be used in order to optimise the distance between more than three products, has the disadvantage that the alignment is carried out in a way mechanically independent from the press operation and that therefore such a solution is subject to all the typical problems of such groups in case of unexpected malfunctioning of one of the two, either the press unit or the unit arranged to separate the products.

Disclosure of the Invention

[0007] Object of the present invention is a drum-type press and a trimmer unit that overcome the background art illustrated problems.

Further object of the present invention is a drum-type press and a trimmer unit easily adaptable to handle a diversified number of dies being equal the number of mobile supports.

According to the present invention, this object is achieved through a drum-type press and a trimmer unit having the characteristics set forth in the claims that follow.

The invention relates also to the method of operation of the press.

The Claims are an integral part of the teaching of the present invention.

[0008] According to a preferred embodiment the drum-type press comprises a press unit and a trimmer unit; the trimmer unit is mechanically connected to the press unit and arranged to handle in easily adaptable way a plurality of mobile supports so as to transfer the products from a grasp position to a laying position, in accordance with diversified grasping and laying configurations.

[0009] According to a further characteristic of the present invention, the trimmer unit comprises, according to a first embodiment, a pair of cranks each associated to a respective pair of connecting rods shaped so as to flexibly handle the mobile supports.

[0010] According to another characteristic of the present invention, the trimmer unit comprises, according to a second embodiment, at least a pair of devices having each a pair of movement components and at least one rotary element with a double diameter geared with the pair of movement components shaped so to flexibly move the mobile supports.

[0011] Moreover, according to another characteristic of the present invention, the press and the trimmer unit are adaptable to handle a number of products equal to the number of mobile supports or to a subset of said number.

Brief Description of Drawings

[0012] These and further features and advantages of the present invention will appear more clearly from the following detailed description of preferred embodiments, provided by way of non-limiting example with reference to the attached figures, wherein components designated by same or similar reference numerals indicate components having same or similar functionality and construction and wherein:

Fig. 1a depicts a known type press for clay products in a first operation position;

Fig. 1b depicts a known type press for clay products in a second operation position;

Fig. 1c depicts a known type press for clay products having mobile trimmers;

Fig. 2 depicts a perspective view of a press according to the invention;

Fig. 3 depicts a perspective view of a trimmer unit according to the invention in a first embodiment;

Fig. 4 depicts a perspective view of a trimmer unit according to the invention in a second embodiment;

Fig. 5a depicts the trimmer unit according to the invention in a first operation mode;

Fig. 5b depicts the trimmer unit according to the invention in a second operation mode.

Best mode for Carrying Out the Invention

[0013] With reference to Fig. 2, a drum-type press (press) 50 according to the invention comprises a support structure (press chassis) 51, a press unit 52 and a multifunction unit (trimmer unit or positioning unit) 70, mechanically connected to the press unit 52.

In the course of the remaining description and in the ensuing claims the multifunction unit will be, preferably, named trimmer unit according to the use to call trimmer unit, in such a technical field, the group arranged to trim, grasp and position the products.

Obviously, it is self evident that, for the objects of the present invention, the trimming function is not strictly necessary for obtaining the objects of the present invention.

[0014] The press unit 52 comprises a drum 58, having for instance six faces of sufficient dimensions in order to accommodate at least 4 bottom dies for making clay products.

Drum 58, for instance, is 1850 mm wide and is arranged to comprise 4 dies being equidistant and positioned, for instance, at a distance of 440 mm.

The press unit 52 also comprises a camshaft, of known type having, for instance, cams of orthodromic type and arranged to rotate under the control of a motor 54, and a compressor or head hammer 57, having reciprocating rectilinear motion and dimensions sufficient for accommodating at least 4 top dies for making clay products; the top dies being arranged in positions corresponding to those of the bottom dies comprised in the drum 58.

The head hammer 57, controlled, in known way, by the camshaft, is apt to cooperate with the drum 58 for pressing, in known way, the biscuits made, for instance, of clay, and obtaining the moulded products (products).

The camshaft actuates also, in known way, one or more mechanical devices, for instance a pair of connecting-rod/crank devices having gear transmission of known type associated to a pair of levers 55 (Fig. 2, Fig. 3); the levers comprise a first end 55a which is pivotally connected to the press chassis 51 and a second end 55b associated to a respective pair of cams 75, for instance semicircular cams extending helicoidally.

Each lever 55, in particular the second end 55b of each lever 55 and the associated cam 75, handled, in known way, by the cam-shaft, is apt to mechanically control, as it will be disclosed later on in detail, the movement of the trimmer unit 70 along a circle arc.

The press unit 52 comprises also a shaft-guide 64, of known type, pivotally connected to the press chassis 51, apt to rotate so as to control, in a known way the movement of the trimmer unit 70, as it will be disclosed later on in detail.

[0015] The trimmer unit 70 comprises, in the preferred embodiment, a frame (trimmer frame or frame) 71, a pair of guides 72, rigidly associated to the frame 71, and a shaft 74, of known type; the shaft 74, too, being associated to the frame 71 and arranged to slide in the shaft-guide 64.

The frame 71 is arranged to be handled in a known way along a circle arc trajectory by lever 55, so to alternatively move from a first position to a second position.

The first position corresponds to a position in which the frame 71 is close to a predetermined face of the drum 58 (grasping position); the second position corresponds to a position in which the frame 71 is close to a positioning plane, which for instance may be a conveyor belt, a truck or "telaione" (laying position).

[0016] The trimmer unit 70 comprises, in the preferred embodiment, a pair of arms, respectively 76a and 76b, each associated, to respective supports 86a and 86d arranged to slide along the guides (support guides) 72.

Each arm, respectively 76a and 76b, comprises respective brackets 78a and 78b, for instance brackets with small wheels of known type, apt to slide, for instance, into the helicoidal semicircular cams 75 so to move the arms 76a and 76b with reciprocating and opposed movement during the movement of the frame 71 along the circle arc trajectory.

[0017] The trimmer unit 70 comprises, in the preferred embodiment, at least 4 supports, respectively 86a, 86b, 86c and 86d, sequentially positioned along the support guides 72, arranged to slide along the same support guides 72, as it will be disclosed later on in detail, and to grasp, in known way, the products from the grasping position (grasp) and to transfer them, in known way, to the laying position (laying).

[0018] According to a first embodiment, the trimmer unit 70 comprises a pair of cranks, respectively a first

89a and a second crank 89b, each pivoting around a pivot fixed to the frame 71, and two pairs of movement components, for instance two pairs of connecting-rods, respectively a first pair 87a, 87b, and a second pair 88a, 88b, pivotally connected to the ends of the respective cranks 89a and 89b, as it is disclosed later on in detail. In particular, a first connecting-rod 87a, of the first pair of connecting-rods, has, in the preferred embodiment, a first end which is pivotally connected to the mobile support 86a and a second end which is pivotally connected to the end of a first arm 97a of the first crank 89a.

[0019] According to further embodiments, the first connecting-rod 87a, of the first pair of connecting-rods, has a first end pivotally connected to the first mobile arm 76a and a second end pivotally connected to the end of a first arm 97a of the first crank 89a; the first connecting-rod 87a is also connected to the first mobile support 86a so as to move it in accordance with the movement of the first mobile arm 76a.

A second connecting-rod 87b, of the first pair of connecting-rods, has a first end pivotally connected to the end of a second arm 98a of the first crank 89a and a second end connected to the third mobile support 86c so that the third mobile support 86c is moved in opposite direction to the movement direction of the first mobile support 86a, as is easily comprehensible for a technician in the field. The above disclosed structure of the first pair of connecting-rods, 87a and 87b, and the first crank 89a, is repeated in an equivalent way, in the second pair of connecting-rods, 88a and 88b, and in the second crank 89b and the arms 97b and 98b associated therewith.

[0020] Preferably, according to this first embodiment, the first crank arms, 97a and 97b, are equivalent and of different length with respect to the length of the second arms, 98a and 98b, so that the movement of the supports 86a and 86d is different as compared to the movement of the supports 86b and 86c, as is easily comprehensible for a technician in the field.

Still more preferably, the cranks 89a and 89b are configured so that the first arms, 97a and 97b, and the respective second arms, 98a and 98b, are dimensioned so that the movement distance of the supports 86a and 86d is three times the movement distance of the supports 86b and 86c; thanks to such a configuration, starting from an equidistance of grasping position, it is possible to obtain an equidistance of laying position of the products, different from the equidistance of the grasping position.

Preferably, the grasp position equidistance corresponds to an optimal distance between dies for carrying out the biscuits pressing (pressing distance), while the laying position equidistance (laying distance) corresponds to an optimal distance for carrying out the laying down of the formed products; such a laying distance, in general, is lower than the pressing distance.

[0021] Obviously, in other embodiments, advantageously, the cranks can be dimensioned at will and have, for instance, all the arms diversified so that to obtain diversified grasping and laying positions as a function of

different manufacturing requirements.

[0022] According to a second embodiment, the trimmer unit 70 (Fig. 2, Fig. 4) comprises a pair of mobile devices, respectively a first 189a and second 189b mobile device, each comprising rotating elements, for instance dual pinions having different diameter, respectively a first 197a and second diameter 198a of the first mobile device 189a, and a first 197b and second diameter 198b of the second mobile device 189b, and two pairs of movement components, for instance two pairs of racks, respectively a first pair 187a, 187b, and a second rack pair 188a and 188b, coupled to the respective pinions 197a, 198a and 197b, 198b.

In particular, the first mobile device 189a is associated to the first mobile arm 76a and the first mobile support 86a, and is arranged to slide driven by the mobile arm 76a in the direction of the support guides 72.

A first rack 187a of the first pair of racks, has the ends fixed to the frame 71 and is coupled to the first pinion 197a of the first mobile device 189a so to make the pinion spin during the sliding or movement of the first mobile arm 76a and of the associated mobile device 189a.

A second rack 187b of the first pair of racks, has an end fixed to the third mobile support 86c and is coupled to the second pinion 198a of the mobile device 189a so that the spin of the first pinion 197a, forced by the first rack 187a, acts as a motor for a forced dragging of the second rack 187b that, as is easily comprehensible for a technician in the field, induces the movement of the third mobile support 86c in the opposite direction to that of the first mobile support 86a.

The above disclosed structure of the first pair of racks, 187a and 187b, and the dual pinion, 197a, 198a, according to the second embodiment, is repeated in equivalent way, in the second pair of racks, 188a and 188b, and in the second dual pinion 197b and 198b.

[0023] Also according to this second embodiment, the movement of the supports 86a and 86d is different from the movement of the supports 86b and 86c as a function of the diameters, for instance, of the dual pinions, 197a and 198a and/or 197b and 198b.

In the preferred embodiment, the dual pinions, 197a and 198a and/or 197b and 198b are dimensioned so that the movement distance of the supports 86a and 86d is three times the movement distance of the supports 86b and 86c; thanks to such a configuration, it is possible to obtain, starting from a grasp position equidistance, a laying position equidistance of the products.

[0024] Obviously, in other embodiments, advantageously the dual pinions, 197a and 198a and/or 197b and 198b can be dimensioned at will and have, for instance, diameters diversified in order to obtain grasp positions and laying positions diversified as a function of manufacturing requirements.

[0025] According to further embodiments using, for instance, architectures based on pinions and racks, it is also possible to provide, as is easily comprehensible for a technician in the field, that the mobile supports, for in-

stance 86a and 86d, be fastened to the racks and that the devices, disclosed as mobile in the second embodiment, be fastened to the frame. In such an embodiment it is also possible to fasten the second rack to the second mobile support rather than to the third mobile support.

[0026] According to still other embodiments using, for instance, architectures based on pinions and racks, it is possible to provide that the racks of each pair of racks be coupled to the pinions in diametrically opposite positions.

[0027] Anyway, all the disclosed embodiments provide that the mechanical movement of the press unit 52 (Fig. 2) mechanically controls by means of, for instance, a pair of connecting-rod/crank devices and/or a pair of gears, the mechanical movement of the trimmer unit 70 without the necessity of electronic or electrical devices.

Moreover, in all the disclosed and possible architectures, as inferable from those disclosed, it is provided that the entity of movement of each mobile support, from the grasp position to the laying position, can be easily adapted and rendered selectively independent, in a predetermined way, from the entity of movement of any other mobile support.

Such a feature is possible, preferably, thanks to the use of selectable movement means arranged to free the movement of the mobile supports 86a-86d from the movement of the cams 75 and of the mobile arms 76a and 76b.

[0028] The operation of the press 50 as disclosed is the following.

[0029] Keeping the first embodiment as a reference, in a first step, for instance the pressing and grasp step, the press unit 52 submits the top face of the drum 58 comprising the biscuits to be formed to the head-hammer 57 and, at the same time, it submits a lateral face of the drum 58, for instance a face contiguous to the top face comprising products already formed, to the mobile supports 86a-86d.

In particular, during this first step, for instance, the head-hammer 57 presses the biscuits, so as to form the products, and, at the same time, the mobile supports, 86a, 86b, 86c, and 86d pick up, in known way, the formed products from the lateral face.

According to the preferred embodiment, in this first step, in particular, the mobile arms 76a, 76b mechanically guided by semicircular cams 75 by means of the respective brackets (small-wheels) 78a, 78b, drive the mobile supports so as to place them equidistant and according to a configuration corresponding to the pressing or grasping position.

[0030] In a second step, for instance a rotation and laying step, simultaneously, the head-hammer 57 is raised, the drum 58 rotates so as to position the face comprising the formed products into the grasping position, and the mobile supports 86a-86d lay the formed products, for instance, on the "telaione" to be used for a following drying/baking step.

In particular, during the second step, the mobile arms

76a, 76b, mechanically guided by the helicoidally extending cams 75 and by means of the respective small-wheels 78a, 78b, drive, associated with their respective connecting-rods 87a, 88a, 87b, 88b, the mobile supports 86a, 86b, 86c, 86d, so to place them, for instance, equidistant and according to a configuration corresponding to the laying position configuration.

[0031] As soon as the second step has been completed, the press 50 returns to the first pressing and grasping step and the described steps are cyclically repeated without interruption.

[0032] Obviously, the above described operation, as is easily comprehensible for a technician in the field, does not change by varying the trimmer unit 70 embodiment. In particular, the operation does not change if the first or the second embodiment is used.

Moreover, the operation does not change by varying the dimensions of the mechanical particulars that compose the trimmer unit, as for instance the mobile arms 76a, 76b, the pairs of connecting-rods 87a, 87b and 88a, 88b, the pairs of cranks 89a, 89b or the pairs of racks 187a, 187b, and 188a, 188b or the pairs of dual pinions 197a, 197b and 197b, 198b.

[0033] The press has been described by keeping as a reference a trimmer unit arranged to handle four products.

According to still another embodiment, it is also possible to transform the trimmer unit 70 (Fig. 5a) arranged to have four dies, as illustrated, in a trimmer unit arranged to have three dies 170 (Fig. 5b), by disengaging the mobile supports 86b, 86c from the respective movement components, and by rigidly fixing them to the frame 71 and shaping them so as to exercise a grasp and laying function on a central product.

Such an architecture, therefore, renders possible the adaptation of the press according to the invention for manufacturing, for instance, clay products by groups of 4 or 3 in case of change in product dimensions, maintaining the same number of mobile supports and though guaranteeing to optimise the grasping and laying of the products in both manufacturing configurations.

[0034] Obviously, in other embodiments it is possible to provide architectures having trimmer units arranged to handle a number of products higher than four and adapted to be transformed in trimmer units arranged to handle a lower number of products.

[0035] The press has been described above by keeping as reference a trimmer unit arranged to handle four products.

Obviously, the solution according to the invention is also applicable to presses and trimmer units arranged to handle two products.

[0036] Obvious changes and variations are possible to the above disclosure, as regards dimensions, shapes, materials, components, as well as details of the described construction and operation method without departing from the scope of the invention as defined by the claims that follow.

Claims

1. Drum-type press comprising

- a press unit having
 - a drum (58) with a plurality of faces, and
 - a head-hammer (57) arranged to press a plurality of clay biscuits positioned on a first face of said drum (58) in order to generate a respective plurality of formed products; -
 - a trimmer unit having
- a plurality of supports (86a, 86b, 86c, 86d) arranged to grasp from a second face of said drum (58) said products according to a grasping position and to lay them according to a laying position,
- driving means (75, 76a, 76b, 78a, 78b) mechanically connected to the press unit and arranged to mechanically drive said plurality of supports (86a-86d) from said grasping position to said laying position;

characterised in that

- said grasping position is associated to a determined grasping configuration of the products;
 - said laying position is associated to a determined laying configuration of the products; and
- in that**
- said trimmer unit comprises

- selectively adaptable movement means (87a, 87b, 88a, 88b, 89a, 89b, 187a, 187b, 188a, 188b, 189a, 189b) mechanically connected to said driving means and to said plurality of supports (86a-86d) and arranged to convert said grasp configuration into said laying configuration by moving at least one of said supports (86a-86d) in a selectively adaptable way.

2. Press according to claim 1, **characterised in that** said movement means comprises

- at least one double pair of connecting-rods (87a, 87b, 88a, 88b) wherein each connecting-rod is associated to each mobile support;
- at least one pair of cranks pivotally associated to the trimmer unit (70) wherein each crank comprises
- arms (97a, 98a) of predetermined length respectively associated to one of said pairs of connecting-rods (87a, 87b) and shaped so as to determine the movement of at least two supports (86a-86d) in a selectively adaptable way.

3. Press according to claim 2, **characterised in that** at least one connecting-rod of said pairs of connecting-rods is mechanically connected to said driving means.

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4. Press according to claim 1, **characterised in that** said movement means comprises

- at least one pair of devices (189a, 189b) having each

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- at least one pair of movement components (187a, 187b, 188a, 188b),
- at least one respective rotating element having at least one double diameter (197a, 198a, 197b, 198b) geared to said pair of movement components; and **in that** each of said devices is shaped so as to determine the movement of at least two supports (86a-86d) in a selectively adaptable way.

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5. Press according to claim 4 **characterised in that** at least one of said devices is a mobile type device and is mechanically connected to said driving means.

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6. Press according to claim 4 **characterised in that** said pair of movement components (187a, 187b or 188a, 188b) comprises racks wherein at least one of said racks is connected to at least one of said supports.

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7. Press according to any one of the previous claims **characterised in that** said supports of said plurality are at least four supports (86a-86d).

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8. Press according to claim 7 **characterised in that** said trimmer unit (70) comprises

- adaptation means shaped in order to adapt said press to press said plurality of biscuits or a subset of said plurality.

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9. Trimmer unit for a drum-type press of clay products comprising

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- a plurality of supports (86a, 86b, 86c, 86d) arranged to grasp from said drum (58) a respective plurality of clay products according to a grasping position and to lay them according to a laying position,
- driving means (75, 76a, 76b, 78a, 78b) mechanically connected to the press and arranged to mechanically drive said plurality of supports (86a-86d) from said grasping position to said laying position;

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characterised in that

- said grasping position is associated to a determined grasping configuration of the products;
- said laying position is associated to a determined laying configuration of the products; and **in that** it comprises

- selectively adaptable movement means (87a, 87b, 88a, 88b, 89a, 89b, 187a, 187b, 188a, 188b, 189a, 189b) mechanically connected to said driving means and to said plurality of supports (86a-86d) and arranged to convert said grasp configuration into said laying configuration by moving at least one of said supports (86a-86d) in a selectively adaptable way.

10. Trimmer unit according to claim 9 **characterised in that** said movement means comprises

- at least one double pair of connecting-rods (87a, 87b, 88a, 88b) wherein each connecting-rod is associated to each support;
- at least one pair of cranks wherein each crank comprises

- arms (97a, 98a) of predetermined length respectively associated to one of said pairs of connecting-rods (87a, 87b) and shaped so as to determine the movement of at least two supports (86a-86d) in a selectively adaptable way.

11. Trimmer unit according to claim 10, **characterised in that** at least one connecting-rod of said pairs of connecting-rods is mechanically connected to said driving means.

12. Trimmer unit according to claim 9, **characterised in that** said movement means comprises

- at least one pair of devices (189a, 189b) having each
- at least one pair of movement components (187a, 187b, 188a, 188b),
- at least one respective rotating element having at least one double diameter (197a, 198a, 197b, 198b) geared to said pair of movement components; and **in that** each of said devices is shaped so as to determine the movement of at least two supports (86a-86d) in a selectively adaptable way.

13. Trimmer unit according to claim 12 **characterised in that** at least one of said devices is a mobile type device and is mechanically connected to said driving means.

14. Trimmer unit according to claim 12 **characterised in that** said pair of movement components (187a, 187b or 188a, 188b) comprises racks wherein at

least one of said racks is connected to at least one of said supports.

15. Trimmer unit according to any one of claims 9 to 14 **characterised by**

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- adaptation means arranged to adapt said trimmer unit to grasp a subset of said respective plurality of products.

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16. Method for pressing clay biscuits by means of a drum-type press (50) having a press unit (52) and a trimmer unit (70) mechanically connected to said press unit (the 50), comprising the steps of

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- pressing through a head-hammer (57) of said press unit (52) a plurality of biscuits and generating a plurality of formed products;
- grasping said products by means of a plurality of supports (86a, 86b, 86c, 86d) of said trimmer unit (70) from a grasping position and laying said products by means of said plurality of supports (86a, 86b, 86c, 86d) of said trimmer unit (70) on a laying position;

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characterised in that said step of grasping and laying comprises

- to determine a grasping configuration in said grasping position;
- to determine a laying configuration in said laying position;
- to convert said grasping configuration into said laying configuration by moving at least one of said supports (86a-86d) in a selectively adaptable way.

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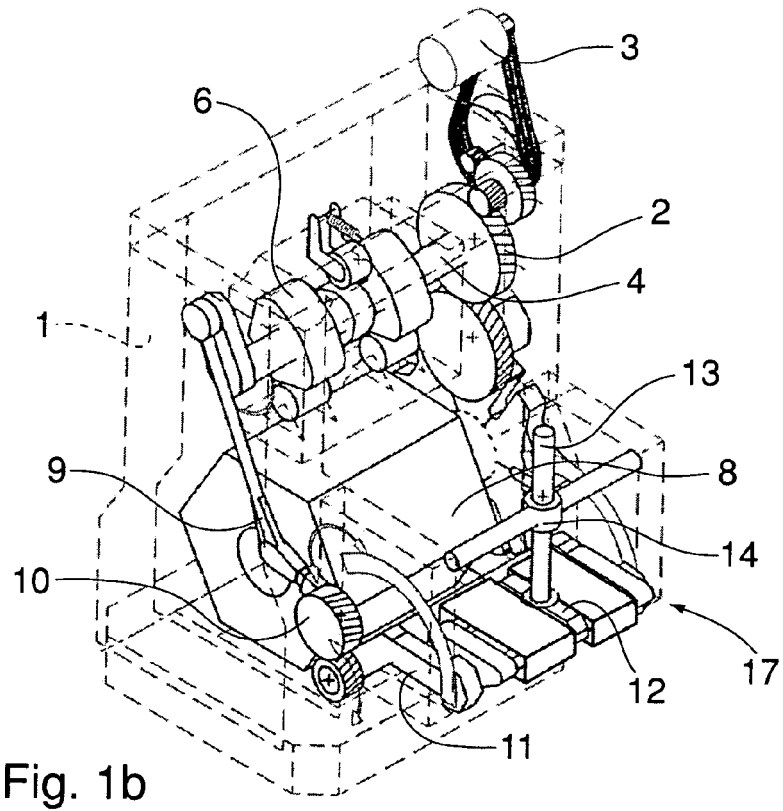
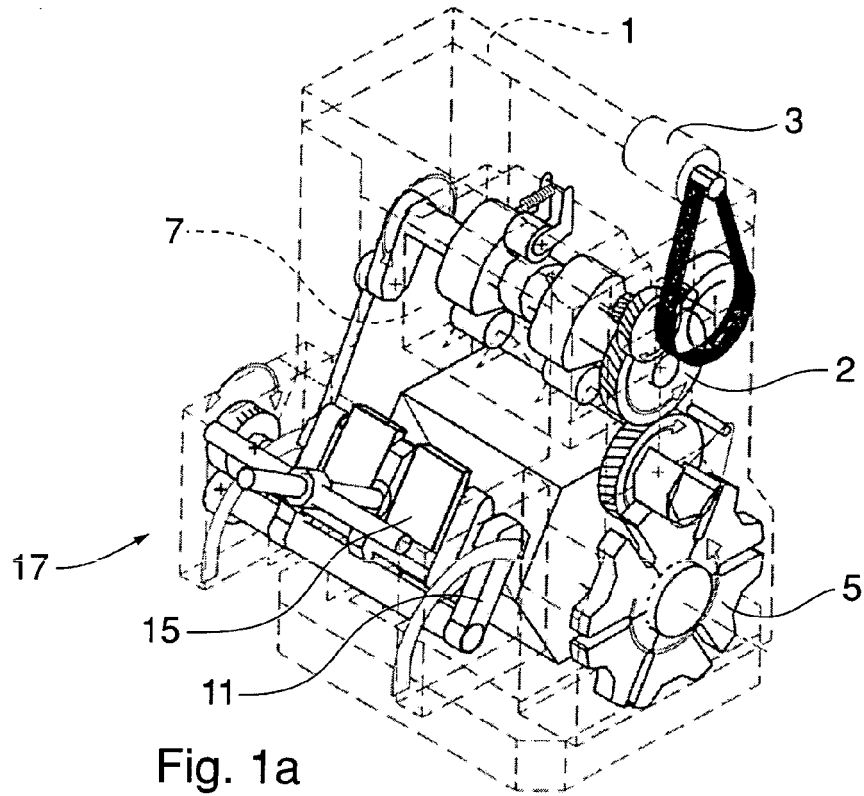
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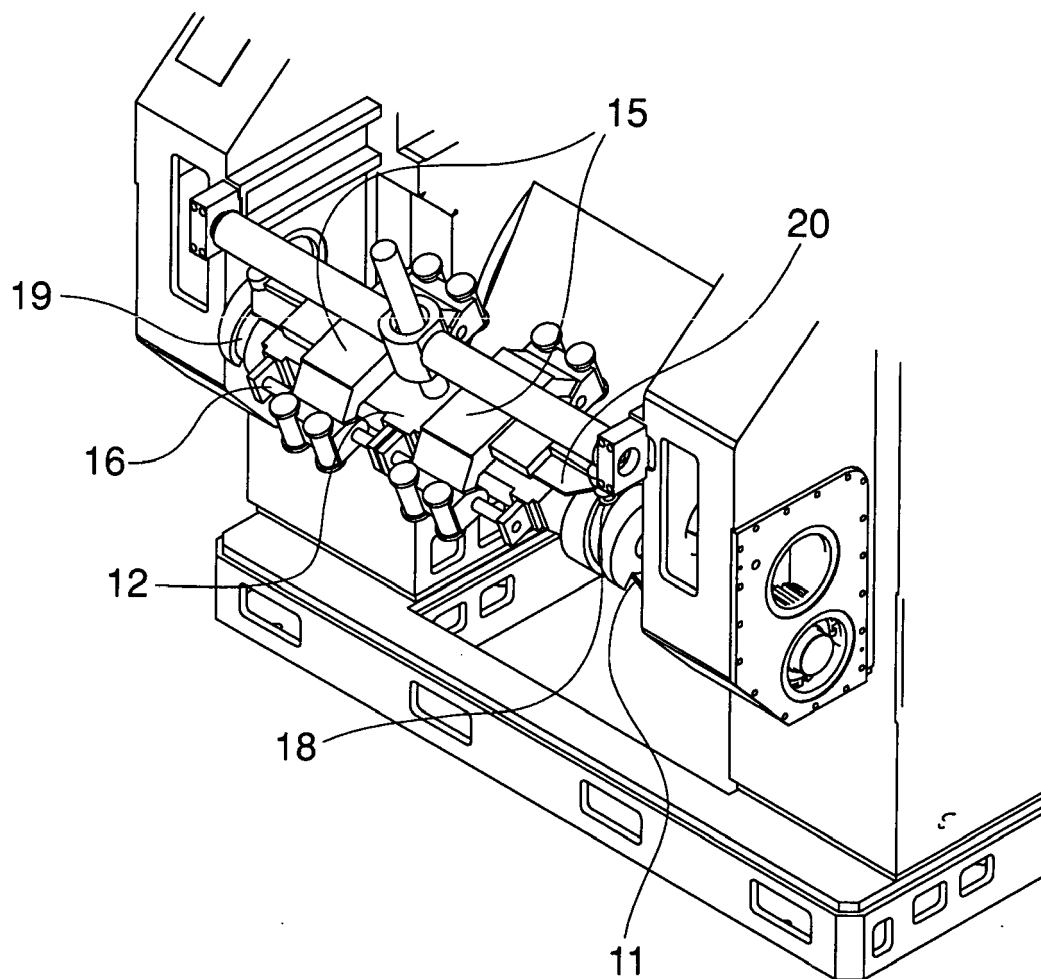


Fig. 1c

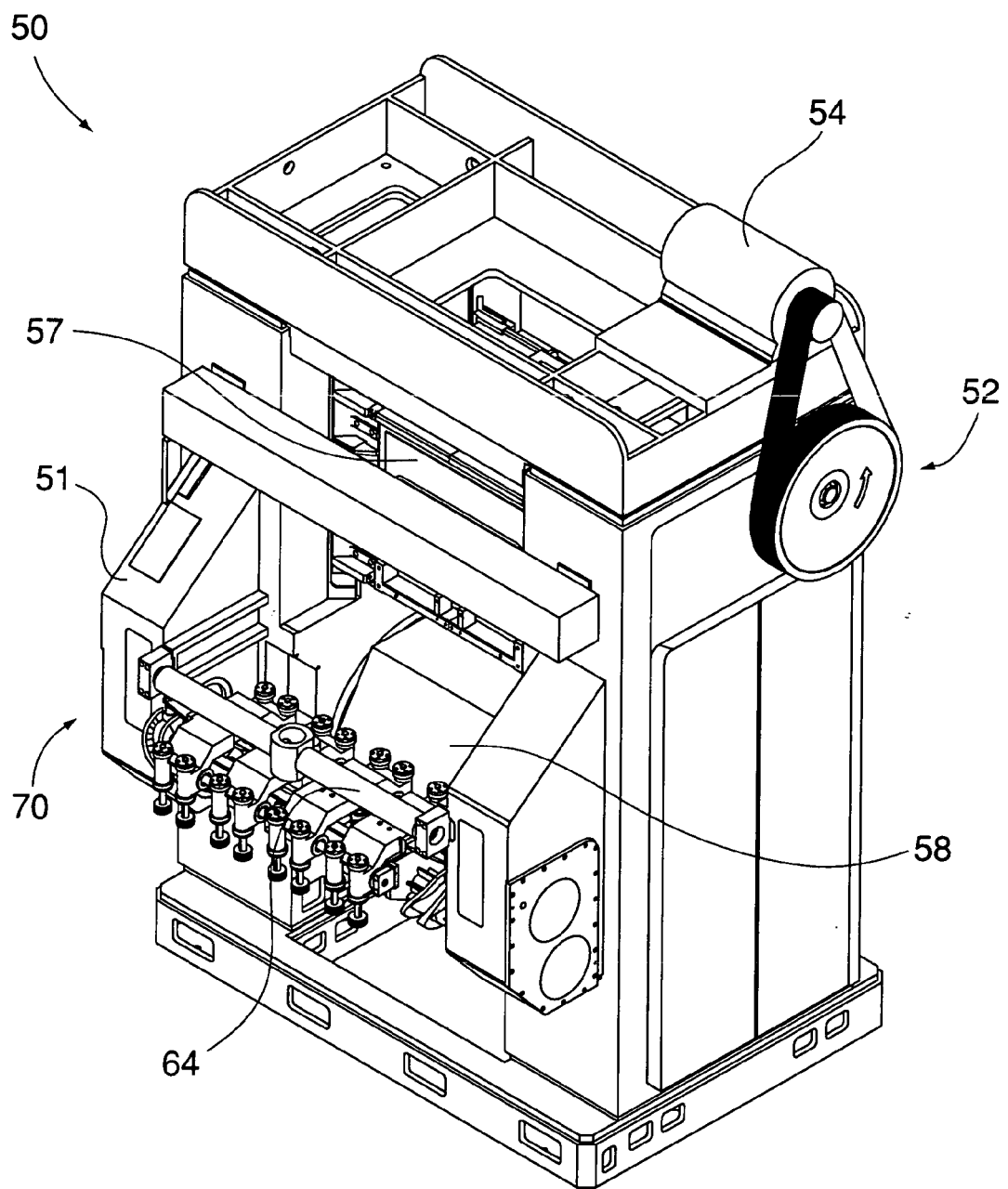


Fig. 2

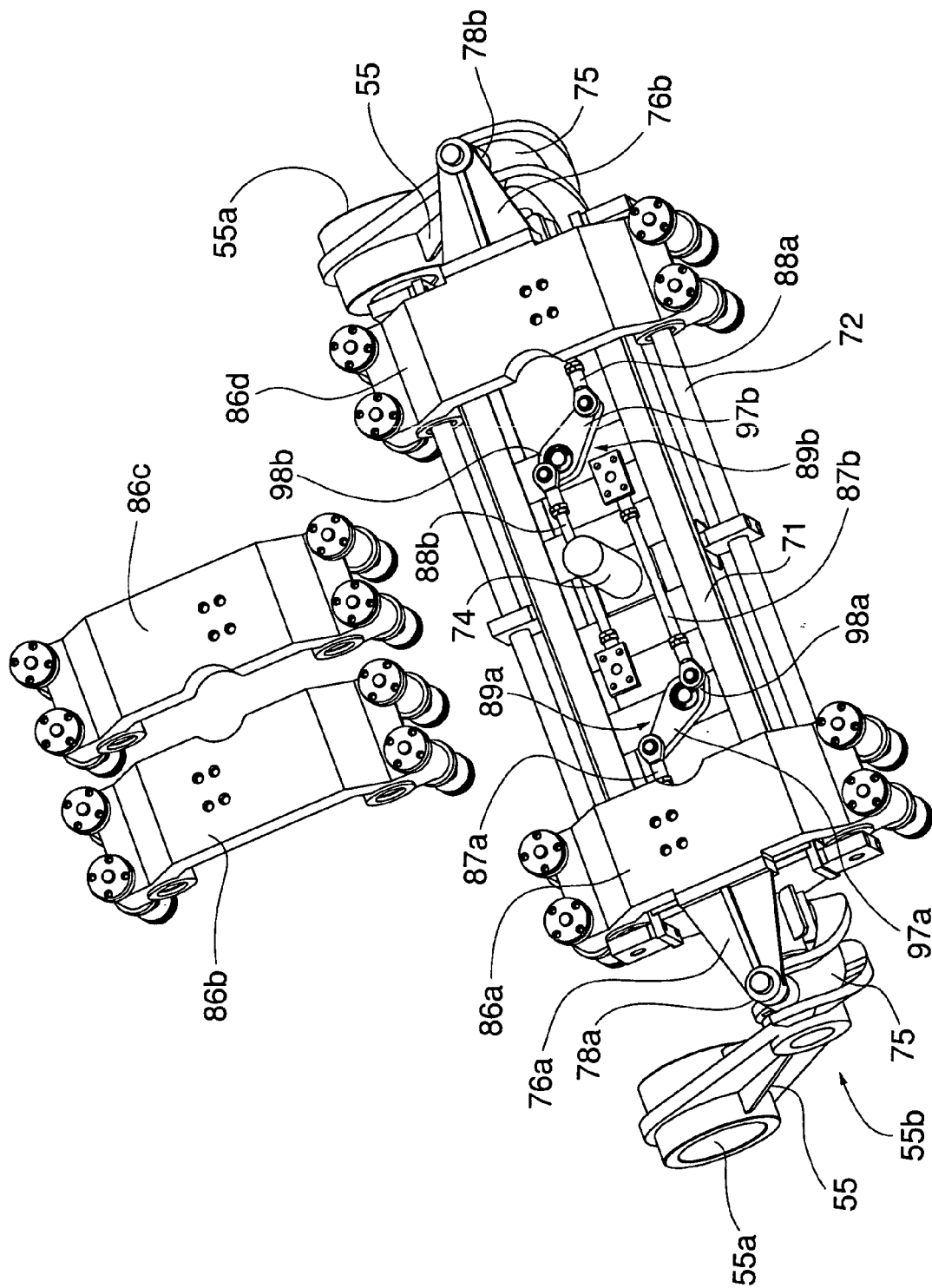


Fig. 3

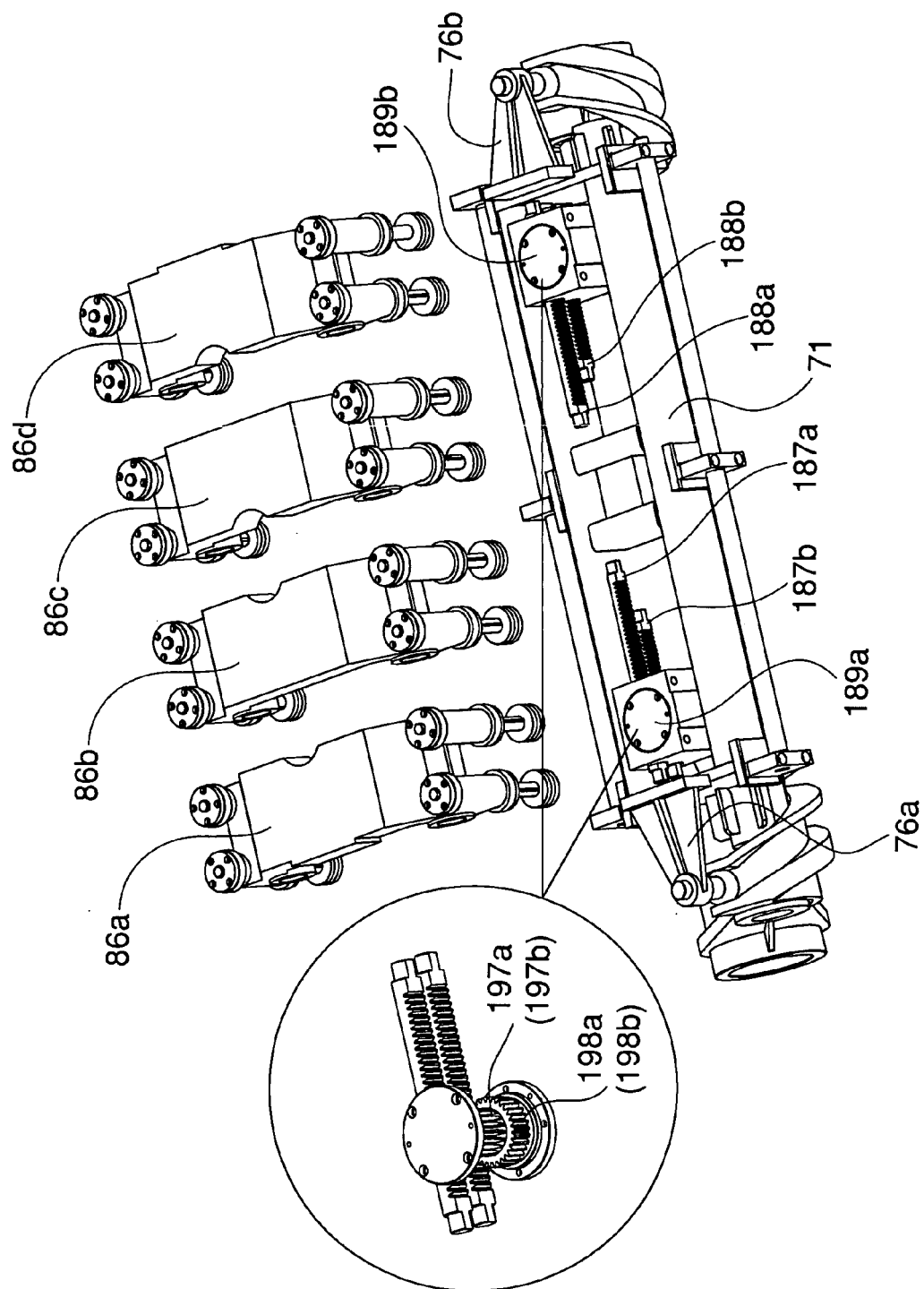


Fig. 4

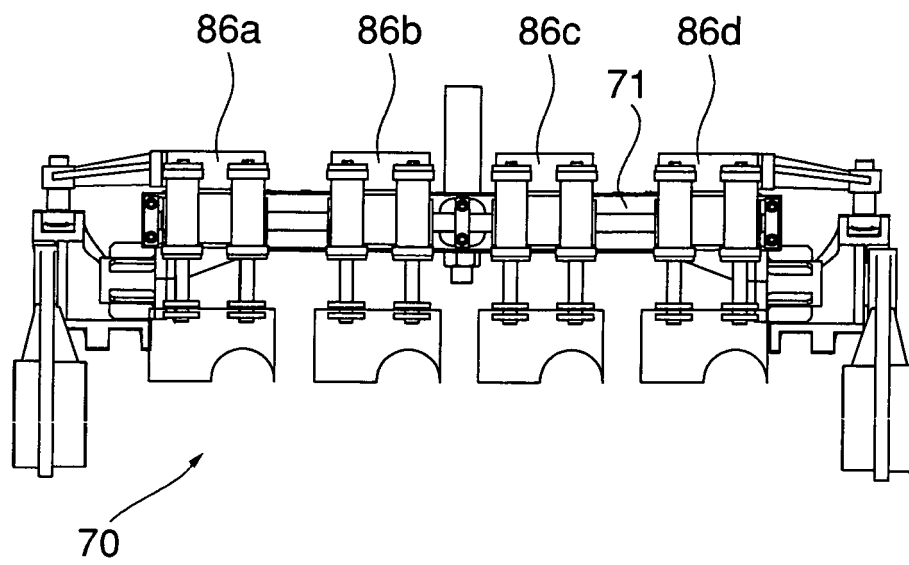


Fig. 5a

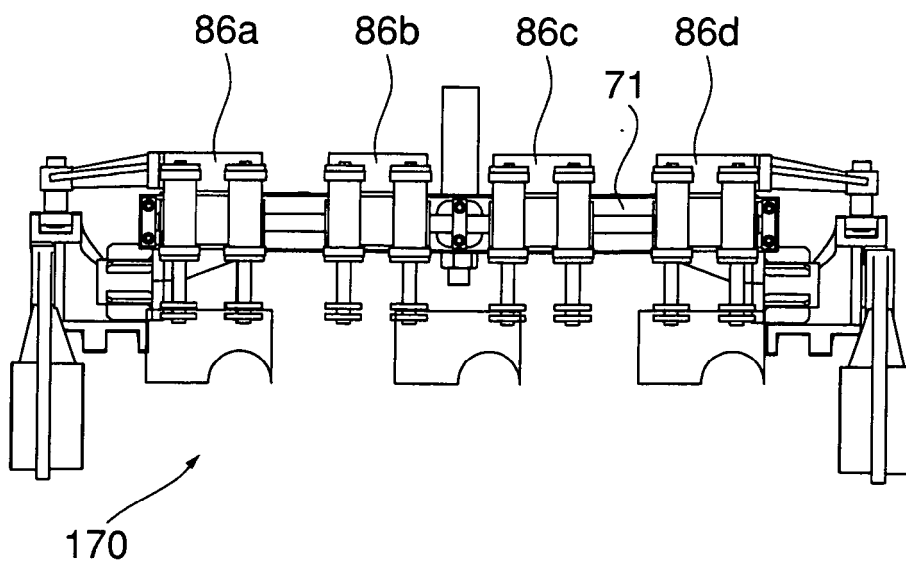


Fig. 5b



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 05 42 5553

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			B28B B65G B30B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 10 January 2006	Examiner Orij, J
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	

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