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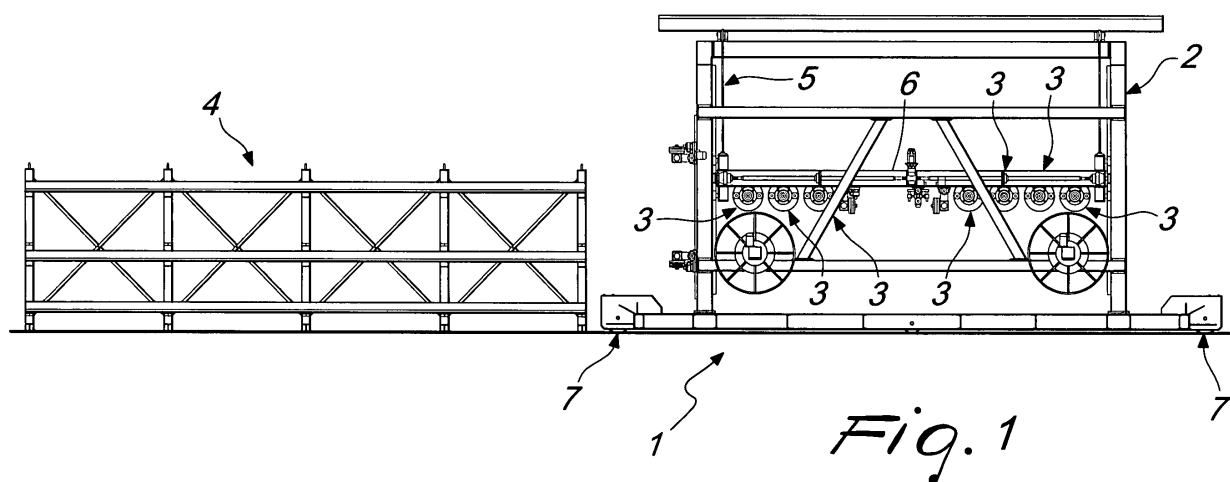
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(54) Automated device for machining panels

(57) An automated device (1) for machining panels made of inert, stone-like or similar material, comprising a supporting frame (2) for at least one surface machining device (3), associated with at least one supporting structure (4) which supports, on a substantially vertical plane,

at least one panel (10) having at least one machinable portion which can be engaged by the at least one machining device (3), means (5) being provided for relative movement between the at least one machining device and the at least one panel.



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Description

[0001] The present invention relates to an automated device for machining panels.

[0002] Currently, surface machining processes, such as polishing, brushing, bushhammering, etc on panels made of stone-like material or inert material are performed by using frames which support one or more movable spindles associated with a respective head which is designed to perform a particular type of machining.

[0003] The frame is movable with respect to a supporting base for a panel, which lies on a substantially horizontal plane so that the surface to be machined is directed upwardly.

[0004] Although these types of apparatus are widely used, they are not devoid of drawbacks.

[0005] If it is necessary to perform machining on large panels, the step of moving the panels to be machined, and typically their arrangement on the supporting bases and their removal once the machining cycle has been completed, are particularly problematic.

[0006] The panels are in fact stored (both before and after machining) by arranging them facing each other, so that they lie on a substantially vertical plane.

[0007] It is evident that accordingly it is awkward (and often not devoid of risks) to perform the movements, and especially the rotations, of the panels in order to allow the various types of machining.

[0008] The aim of the present invention is to provide an automated device for machining panels which is capable of eliminating, or in any case reducing drastically, the drawbacks noted in currently used apparatuses.

[0009] Within this aim, an object of the present invention is to provide an automated device for machining panels which is capable of performing a number of panel machinings without having to continuously move and turn such panels.

[0010] Another object of the invention is to provide an automated device for machining panels which has a competitive production cost, so that its use is advantageous also from an economical standpoint.

[0011] This aim and these and other objects, which will become better apparent hereinafter, are achieved by an automated device for machining panels made of inert, stone-like or similar material, characterized in that it comprises a supporting frame for at least one surface machining device, which is associated with at least one supporting structure which supports, on a substantially vertical plane, at least one panel which has at least one machinable portion which can be engaged by said at least one machining device, means being provided for relative movement between said at least one machining device and said at least one panel.

[0012] Further characteristics and advantages of the invention will become better apparent from the description of some preferred but not exclusive embodiments of an automated device for machining panels according to the invention, illustrated by way of non-limiting example

in the accompanying drawings, wherein:

Figure 1 is a front elevation view of an automated device for machining panels according to the present invention;

Figure 2 is an enlarged-scale front view of the supporting frame associated with a plurality of machining devices;

Figure 3 is an enlarged-scale front view of the supporting structure;

Figure 4 is a side elevation view of the automated device for machining panels shown in Figure 1.

[0013] In the exemplary embodiments that follow, individual characteristics, given in relation to specific embodiments, may actually be interchanged with other different characteristics that exist in other exemplary of embodiments.

[0014] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0015] Initially with reference to Figure 1, the reference numeral 1 generally designates an automated device for machining panels 10.

[0016] These panels 10, which can have different dimensions according to the requirements, can be made of inert material (such as concrete), stone-like material (marble and granite), or similar materials.

[0017] According to the present invention, the automated device 1 comprises a supporting frame 2 for at least one surface machining device 3.

[0018] The automated device 1 is further associated with at least one supporting structure 4, which supports, on a substantially vertical plane, at least one panel 10 which has at least one machinable portion 11.

[0019] As clearly shown in Figure 4, the machining portion 11 faces the machining device or devices 3, so as to allow them to engage the machining portion 11 during the various machinings.

[0020] Also according to the present invention, means for relative movement between the machining device or devices 4 and the panel or panels 10 are provided.

[0021] In greater detail, the relative movement means comprise a first device 5 for moving the machining device or devices 3 with respect to the supporting frame 2. Said first movement device 5 can be provided, for example, by supporting the machining device or devices 3 by means of a supporting cross-member 6.

[0022] Linear actuators, for example, act between the supporting cross-member 6 and the supporting frame 2 and are adapted to actuate the movement of the supporting cross-member 6 (and accordingly of the machining device or devices 3) with respect to the supporting frame 2.

[0023] Moreover, it is advantageous for the movement means to also be constituted by a second movement device, which is adapted to move the supporting frame

2 with respect to the at least one supporting structure 4.

[0024] In greater detail, each machining device 3 can be constituted by a respective spindle 3a, which can be actuated by an actuation device and is associated with an engagement head 3b.

[0025] On a merely exemplifying level, the engagement head 3b can be a polishing head and/or a bushhammering head and/or a brushing head.

[0026] Advantageously, the first movement device 5 is adapted to move the machining device or devices 3 along a movement path having a component which is parallel, during use, to the vertical axis and naturally lies on the plane of arrangement of the machining portion 11.

[0027] As regards instead the second movement device, it is adapted to move the supporting frame 2 along a movement path which lies on a substantially horizontal plane; more particularly, the supporting frame 2 can be provided with supporting wheels 7 which are designed to engage a rectilinear rail which runs parallel to the plane of arrangement of the panel 10 on which the machining is to be performed.

[0028] Nothing prevents the supporting frame from being also associated with a spindle having a vertical axis, which is adapted to produce a border or to perform machinings for forming grooves and/or false gaps.

[0029] Conveniently, the spindles are associated with pneumatic actuators.

[0030] It is also possible to associate the automated device 1 with a PLC device, which is adapted to control the various movement means; nothing prevents the use of a control system associated with a PC (Personal Computer) or with similar devices to control the various movements and the various types of machinings to be performed on the panels.

[0031] Operation of an automated device for machining panels made of inert, stone-like or similar material is evident from what has been described above.

[0032] In particular, in order to perform the various machinings on panels, even large ones, it is sufficient to arrange the panels to be machined on the corresponding supporting structures. Since these structures allow to support the panels by arranging them on a vertical plane, it is evident that their arrangement is facilitated, since it is not necessary to perform particular types of rotation during movement.

[0033] Therefore, after setting, by programming the PLC, the cycle of machinings to be performed, the supporting frame starts to move (for example along the rails) with respect to the panel 10, and at the same time the machining devices are moved (with respect to the supporting frame 2) by the first movement device so as to allow the movement of the corresponding head 3b along the entire surface of the panel which faces the supporting frame.

[0034] All the characteristics of the invention described above as advantageous, convenient or the like may also be omitted or be replaced with equivalents.

[0035] The invention thus conceived is susceptible of

numerous modifications and variations, all of which are within the scope of the appended claims.

[0036] In practice it has been found that the invention has achieved the intended aim and objects in all of its embodiments.

[0037] In practice, the materials used, as well as the dimensions, may be any according to requirements.

[0038] All the details may further be replaced with other technically equivalent elements.

[0039] The disclosures in Italian Utility Model Application No. VR2005U000013 from which this application claims priority are incorporated herein by reference.

[0040] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. An automated device for machining panels made of inert, stone-like or similar material, **characterized in that** it comprises a supporting frame for at least one surface machining device, which is associated with at least one supporting structure which supports, on a substantially vertical plane, at least one panel which has at least one machinable portion which can be engaged by said at least one machining device, means being provided for relative movement between said at least one machining device and said at least one panel.
2. The device according to claim 1, **characterized in that** said relative movement means comprise a first device for moving said at least one machining device with respect to said supporting frame.
3. The device according to one or more of the preceding claims, **characterized in that** said movement means comprise a second movement device, which is adapted to move said supporting frame with respect to said at least one supporting structure.
4. The device according to one or more of the preceding claims, **characterized in that** said at least one machining device comprises at least one spindle, which can be actuated by an actuation device and is associated with an engagement head.
5. The device according to one or more of the preceding claims, **characterized in that** said engagement head comprises a polishing head and/or a bushhammering head and/or a brushing head.
6. The device according to one or more of the preceding

claims, **characterized in that** said first movement device is adapted to move said at least one machining device along a movement path having a component which is parallel, during use, to the vertical axis.

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7. The device according to one or more of the preceding claims, **characterized in that** said second movement device is adapted to move said supporting frame along a movement path which lies on a substantially horizontal plane.

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8. The device according to one or more of the preceding claims, **characterized in that** said supporting frame is associated with a spindle having a vertical axis, which is adapted to form a border.

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9. The device according to one or more of the preceding claims, **characterized in that** said supporting frame is associated with a spindle having a horizontal axis, which is adapted to machine grooves and/or false gaps.

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10. The device according to one or more of the preceding claims, **characterized in that** said supporting frame is associated with a brushing and/or high pressure washing device.

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11. The device according to one or more of the preceding claims, **characterized in that** said spindles are associated with pneumatic actuators.

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12. The device according to one or more of the preceding claims, **characterized in that** it comprises a PLC device adapted to control said movement means.

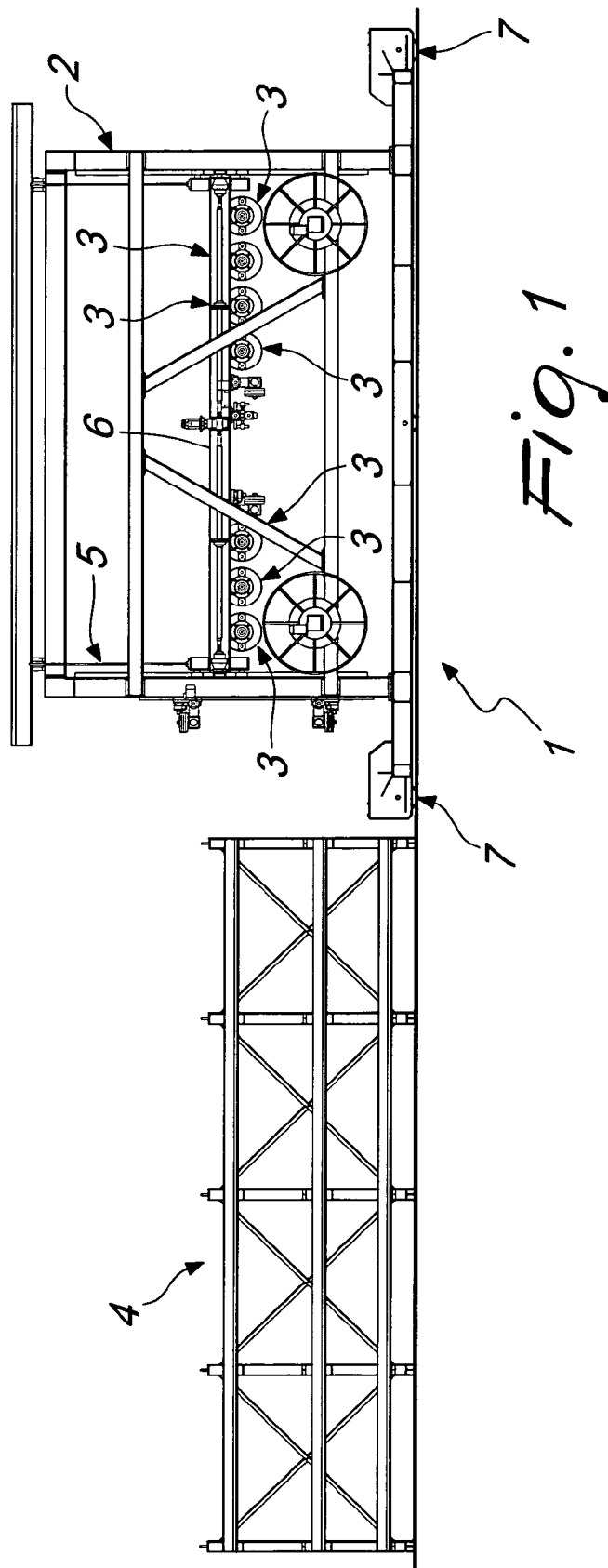
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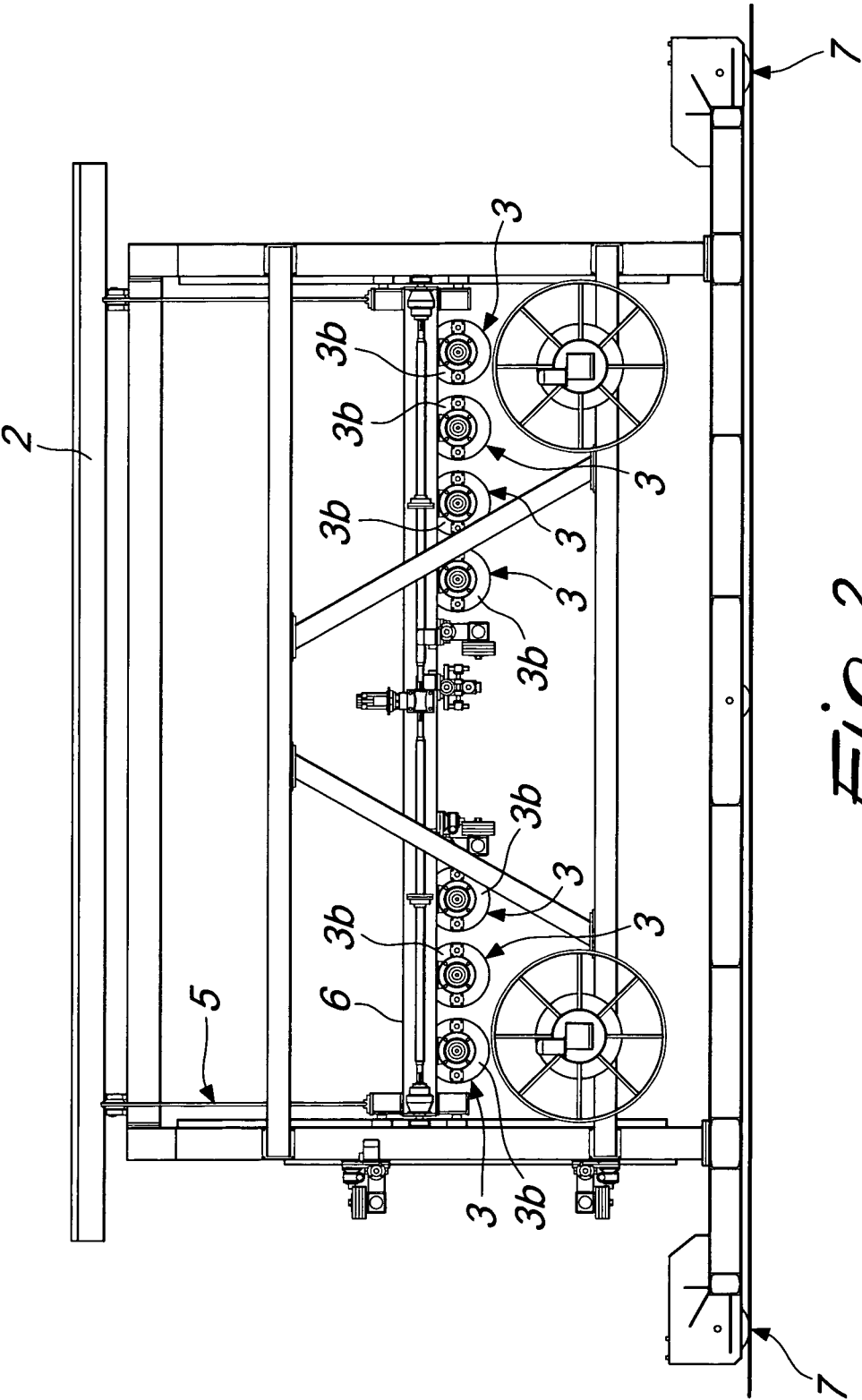


Fig. 2

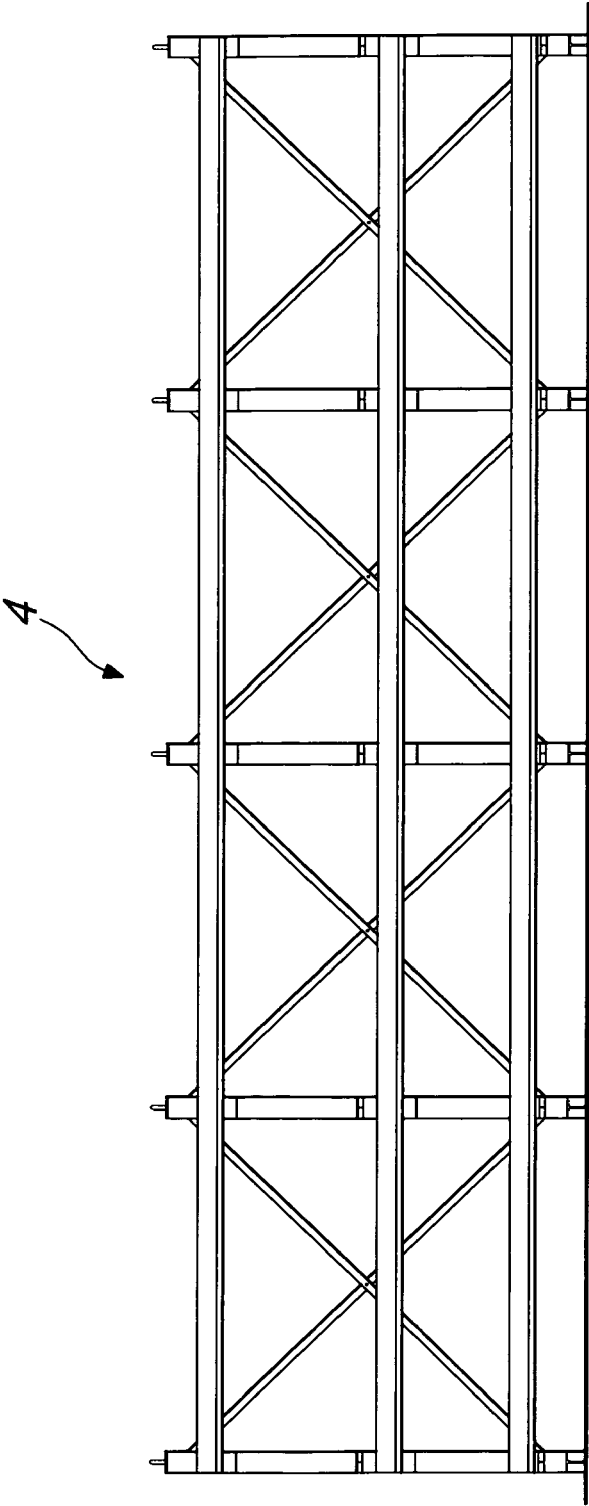
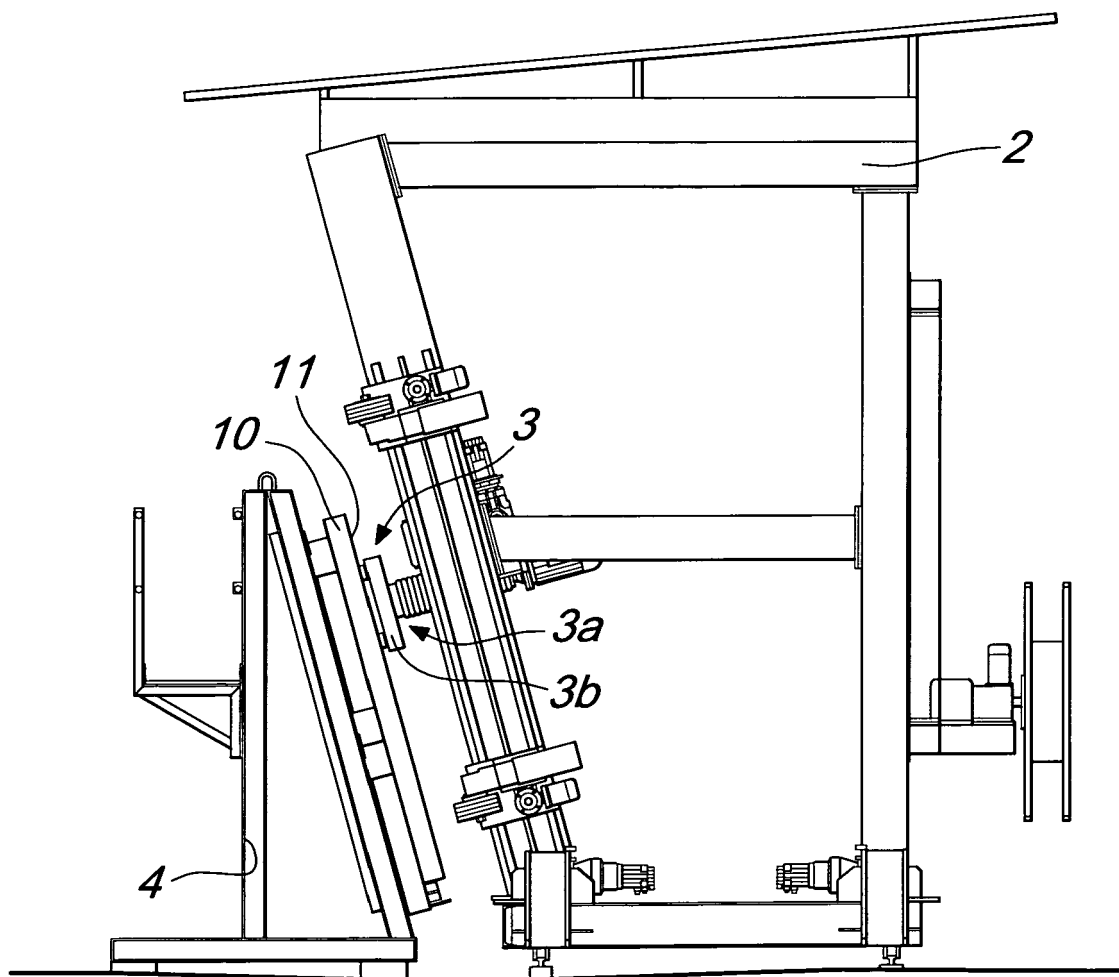


Fig. 3



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Fig. 4



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 06 00 4802

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 296 21 422 U1 (KRAUS, HERMANN, 84503 ALTOETTING, DE) 9 April 1998 (1998-04-09) * page 11, line 24 - page 18, line 19; figures 1,2 *	1-12	INV. B28D1/00
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			TECHNICAL FIELDS SEARCHED (IPC)
			B28D B27B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 July 2006	Examiner Frisch, U
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 00 4802

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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- IT VR20050013 U [0039]