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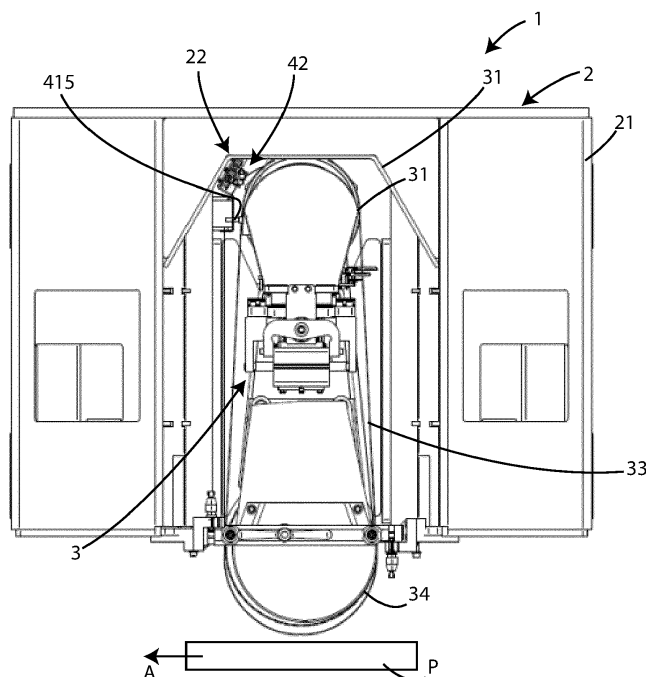
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(54) **MACHINE FOR SANDING PANELS AND CLEANING ASSEMBLY OF SUCH MACHINE**

(57) The present invention concerns a sanding machine (1) for sanding panels (P), such as panels made of wood, fiberglass, plastic, metal, and the like, comprising an abrasion unit (3) for abrading said panel (P) using an abrasive belt (33), and a cleaning assembly (4), having a blowing unit (42), for cleaning said abrasive belt (33),

wherein said cleaning assembly (4) comprises an adjustment unit (41), configured to maintain said blowing unit (42) at a predefined distance from said abrasive belt (33).  
The present invention also concerns a cleaning assembly (4).



**Fig. 1**

## Description

**[0001]** The present invention concerns a machine for sanding panels and a cleaning assembly of such a machine.

## Field of invention

**[0002]** More in detail, the invention concerns a machine for a system of the aforementioned type, designed and realized in particular for sanding the surface of wooden panels, but which can be used for any material for which a sanding operation is necessary.

**[0003]** In the following, the description will be directed to a machine for sanding panels made of wood and the blowing assembly installed in it, but it is clear that it should not be considered limited to this specific use.

## Prior art

**[0004]** As is well known currently in woodworking plants, various machining sections are provided, which carry out, for example, cutting, drilling, edging, etc. operations. Among the various workings, sanding is also provided, which has the aim of making the surface of the wooden panel homogeneous, mechanically removing impurities, splinters, reliefs, and the like. Such machined panels are usually used in industry for the production of furniture or for interior design.

**[0005]** The machines for sanding panels generally smooth a surface of a panel by abrasion, which is carried out by means of abrasive belts, even large ones, having an abrasive surface.

**[0006]** For sanding panels with considerable surfaces, e.g., a few square meters, belts of similar dimensions are needed. In particular, belts up to 2200 mm wide are used, which are rotated by appropriate rollers. These belts, due to their size, may have irregularities.

**[0007]** Sanding machines, therefore, typically include a belt tensioning roller and a calibrating roller, the latter equipped with means to modify the position of the rotation axis, precisely to compensate for any irregularities in the abrasive belt when it is mounted on the two rollers and allow optimal tensioning and thus correct smoothing of the surfaces. In fact, this also guarantees better adhesion of the tape to the surface of the panel and therefore improved smoothing.

**[0008]** The rotation axis of the calibrating roller can vary its position both vertically, typically for an interval of 5 millimeters, and horizontally, for an interval that can even reach 60-100 millimeters.

**[0009]** Generally, sanding machines are also equipped with appropriate means for cleaning the abrasive belts from dust and impurities. Said means are generally ducts, arranged near the lateral surface of the calibrating roller, and having a plurality of nozzles, uniformly obtained along these ducts, from which a blow of compressed air comes out to remove impurities from the belt.

**[0010]** In machines for sanding panels, the cleaning nozzles are arranged fixed with respect to the calibration cylinder, therefore, by varying the position of the latter they can be at different distances from the sanding belt.

**[0011]** In other words, in the case of "extra-large" type machines, two working positions can occur, in which said nozzles are alternatively too far away or too close to said belt to be cleaned.

**[0012]** This causes the fact that in these machines the cleaning of the belt may not be homogeneous since the system is characterized by the fact that the nozzles are not always at a constant distance from the abrasive belt during use.

## Purpose of the invention

**[0013]** In light of the above, it is therefore the purpose of the present invention to allow optimal cleaning of the abrasive belt in panel abrasive machines.

**[0014]** Another purpose of the invention is to allow the easy replacement of the abrasive belt.

## Object of the invention

**[0015]** It is, therefore, specific object of the present invention is a machine for sanding panels as defined in claim 1.

**[0016]** Also the object of the present invention is a cleaning assembly as defined in claim 8.

**[0017]** Preferred embodiments are defined in the dependent claims.

## Brief description of the drawings

**[0018]** The present invention will be now described, for illustrative but not limitative purposes, according to its preferred embodiments, with particular reference to the figures of the enclosed drawings, wherein:

figure 1 shows a front view of a machine according to the present invention;  
figure 2 shows a side view of the calibrating roller of the machine of figure 1;  
figure 3 shows a top view of the calibrating roller of the machine in figure 1;  
figure 4 shows a perspective view of figure 2;  
figure 5 shows a perspective view of the cleaning assembly of the machine of figure 1;  
figure 6 shows a front view of the cleaning assembly of figure 5; and  
figure 7 shows a front view of a machine according to the present invention in the abrasive belt change configuration.

## Detailed description

**[0019]** In the various figures the similar parts will be indicated with the same numerical references.

**[0020]** Referring to figures 1 - 6, a sanding machine for sanding panels P is shown, wholly indicated with the reference 1.

**[0021]** Said sanding machine 1 for sanding panels comprises a support frame 2, an abrasion unit 3, arranged in said support frame 2, and a cleaning assembly 4 operatively coupled to said abrasion unit 3.

**[0022]** The support frame 2 of the machine 1, comprises a containment casing 21, which in turn comprises an internal hood 22, for the protection of said abrasion unit 3 and for the containment of any chips or dust that may be projected during machining.

**[0023]** In the present embodiment, the abrasion unit 3 includes a calibrating roller 31, arranged under said hood 21, which protects it. Said calibrating roller 31 rotates around a rotation axis R, the position of which, as will be better described below, is adjustable. The calibrating roller 31 has a cylindrical shape and has a lateral surface 311.

**[0024]** The abrasion unit 3 also comprises adjustment means 32, in turn having a bearing box 321, mechanically connected to a rotation pin 312 of the calibrating roller 31, not visible in the figures. Said rotation pin 312 of the calibrating roller 31 is in fact an end of the axis, on which said calibrating roller 31 rotates and which is evidently arranged on the rotation axis R.

**[0025]** The bearing box 321 can be operated by a pneumatic cylinder 322. The adjustment means 32 allow, through the operation of the gear box 32 by the pneumatic cylinder 322, the adjustment of the position of the pin 312 of the calibrating roller 31, and therefore of the axis of rotation R. As can be seen in particular in figure 3, said rotation axis R can be moved along a solid angle  $\alpha$ , which, in the embodiment, is equal to  $\pm 0.86^\circ$ , allowing a maximum excursion of the calibrating roller 31 of even 60-100 mm.

**[0026]** The abrasion unit 3 also comprises a belt tensioning roller 34, arranged below the calibrating roller 31, having a fixed rotation axis arranged substantially parallel to the rotation axis R of the calibrating roller 31.

**[0027]** Finally, the abrasion unit 3 includes an abrasive belt 33, partially wrapped both on the external surface 311 of the calibrating roller 31 and on the external surface of the tensioning roller 34.

**[0028]** Generally, the belt tensioning roller 34 is rotated by a motor (not shown in the figures), so as to also rotate the calibrating roller 31 and the abrasive belt 33. The abrasive belt 33 is then put in contact with, for example, the panel P to be machined, which is moving under said tensioning roller 34 in an advancement direction A.

**[0029]** The cleaning assembly 4 comprises an adjustment unit 41 and a blowing unit 42. The adjustment unit 41 comprises a fixed element 411, fixed by means of screws 412 to the support frame 2, and in particular to a lateral edge of the hood 21. Said fixed element 411 has a guide 413, oriented substantially perpendicular to the axis of rotation of the tensioning roller 34.

**[0030]** The adjustment unit 41 also comprises a mov-

able member 414, which in the present embodiment is a piston, mobile along said guide 413, so as to be slidably movable within it. The piston 414, has its end facing the external surface 311 of the calibrating roller 31, has a feeler 415, capable of assuming an operating position, in which it is extracted and in contact with the abrasive belt 33 or with an integral reference portion to the calibrating roller 31, and a rest position, in which it is retracted and not in contact with the abrasive belt 33 or with said reference portion integral with the calibrating roller 31.

**[0031]** In other embodiments said movable member 414 can be a shuttle, a skate or the like.

**[0032]** The adjustment unit 41 also comprises an actuator 416, for the pneumatic movement of said piston 414. Said actuator 416 is preferably of the pneumatic type, such as an electric drive motor, but in other embodiments, other actuation systems of piston 414 can be provided.

**[0033]** The blowing unit 42 comprises in the present embodiment a support flange 421, fixed, on a portion, to said piston 414, and blowing means 422, fixed to said support flange 421. Said blowing means 422 are suitable to emit a flow of compressed air, directed towards the lateral surface 311 of the calibrating roller 31, to remove any residues from the sanding of the panels from the abrasive belt 33.

**[0034]** In the present embodiment, the blowing means 422 are one or two hollow barrels or ducts 422, arranged aligned substantially parallel to said rotation axis R of said calibrating roller 31.

**[0035]** Said ducts 422 are connected to a source of compressed air and have lateral holes, on which nozzles are installed (not visible in the figures), facing the lateral surface 311 of the calibrating roller 31.

**[0036]** The operation of the sanding machine 1 described above is as follows.

**[0037]** When a change of abrasive belt 33 is carried out, since said abrasive belts 33 can also have a width of up to 2200 mm, they can present tapers. Therefore, when they are arranged between the calibrating roller 31 and the belt tension roller 34, the abrasive belt 33 may not carry out correct abrasion on the panel P if not correctly tensioned.

**[0038]** In this case, the adjustment means 32 are suitable for moving the position of the rotation axis R of the calibrating roller 31, with a positioning stroke, as mentioned, of up to 60-100 mm, being able to position the abrasive belt 33, i.e., the calibrating roller 31, in two working positions even distant from each other.

**[0039]** When the calibrating roller 31, and in particular its rotation axis R, is moved by the adjustment means 32 and in particular by the bearing box 321 suitably moved by said pneumatic cylinder 322, the piston 414 is moved by said driving motor 416 so that the feeler 415 remains in contact with the abrasive belt 33 or with the reference portion integral with the calibrating roller 31.

**[0040]** At the same time, following the movement of said piston 414, the blowing unit 42 is translated, main-

taining the distance between the ducts 422, and in particular between the nozzles installed on them, and the lateral surface 311 of the calibrating roller 31, guaranteeing optimal cleaning of the abrasive belt 33 during the use, i.e. while it is moved by said belt tensioning roller 34. In particular, the compressed air passing through the ducts 422 exits through the nozzles applied to the ducts 422 themselves, interacting with the surface of the abrasive belt 33.

**[0041]** The feeler 415 is kept at a constant distance from the abrasive belt 33 by means of the actuator 416. This contact is ensured by an appropriate control unit (not shown in the figure), which controls the actuator 416.

**[0042]** When it is necessary to replace the abrasive belt 33, said control unit always moves said feeler 415 from said operating position to said rest position, in which said feeler 415 is retracted, as shown in figure 7.

### Advantages

**[0043]** An advantage of the machine according to the following invention is that it allows optimal cleaning of the abrasive belt.

**[0044]** It is also an advantage of the present invention that it allows the possibility of installing a cleaning assembly according to the invention in a sanding machine.

**[0045]** A further advantage of the present invention is that of adapting the position of the cleaning assembly according to the position of the calibrator roller.

**[0046]** The present invention has been described for illustrative but not limitative purposes, according to its preferred embodiments, but it is to be understood that modifications and/or changes can be introduced by those skilled in the art without departing from the relevant scope as defined in the enclosed claims.

### Claims

1. Sanding machine (1) for sanding panels (P), such as panels made of wood, fiberglass, plastic, metal, and the like, comprising

an abrasion unit (3) for abrading said panel (P) using an abrasive belt (33), and  
a cleaning assembly (4), having a blowing unit (42), for cleaning said abrasive belt (33),  
**characterized in that** said cleaning assembly (4) comprises an adjustment unit (41), configured to maintain said blowing unit (42) at a pre-defined distance from said abrasive belt (33).

2. Sanding machine (1) according to the preceding claim, **characterized in that** it comprises a feeler (415), capable of assuming an operating position, wherein it is in contact with the abrasive belt (33) or with a reference integral with the calibrating roller (31), and a rest position.

3. Sanding machine (1) according to any one of the preceding claims, **characterized in that** when said feeler (415) is extracted when, it is in said operative position, while when it is in said rest position, it is retracted.

4. Sanding machine (1) according to any one of the preceding claims, **characterized**

**in that** it comprises a support frame (2),  
**in that** said cleaning assembly (4) comprises:

a fixed element (411), fixed to said support frame (2), wherein said fixed element (411) has a guide (413); and  
a movable member (414), movable in said guide (413),  
wherein said feeler (415) is arranged on said movable member (414); and

**in that** said blowing unit (42) is fixed to said movable member (414).

5. Sanding machine (1) according to the preceding claim, **characterized in that** said movable member is a piston (414).

6. Sanding machine (1) according to any one of claims 4 or 5, **characterized in that** said blowing unit (42) comprises

a support flange (421), fixed to said movable member (414), and  
blowing means (422), fixed to said support flange (421), capable of emitting a flow of compressed air towards the lateral surface (311) of said calibrating roller (31), to remove the sanding residues of said panel (P) from said abrasive belt (33).

7. Sanding machine (1) according to the preceding claim, **characterized**

**in that** said blowing means (42) comprise at least one duct (422), which can be connected to a source of compressed air,  
wherein said at least one duct (422) has one or more lateral holes, on which nozzles are installed for the release of the compressed air, wherein said nozzles are directed towards said abrasive belt (33).

8. Sanding machine (1) according to any one of the preceding claims, **characterized in that** said abrasion unit (3) comprises

a calibrating roller (31), having a rotation axis (R),

a tensioner roller (34), arranged below said calibrating roller (31), wherein said abrasive belt is arranged between said calibrating roller (31) and said tensioner roller (34), and adjustment means (32), for adjusting the position of said rotation axis (R) of said calibrating roller (31).

9. Cleaning assembly (4), comprising

a blowing unit (42), for cleaning an abrasive belt (33), and  
an adjustment unit (41), configured to keep said blowing unit (42) at a predefined distance from said abrasive belt (33).

10. Cleaning assembly (4) according to claim 9, **characterized in that** it comprises a feeler (415), capable of assuming an operating position, wherein it is extracted and in contact with the abrasive belt (33) or with a reference integral with the calibrating roller (31), and a rest position, wherein it is retracted.

11. Cleaning assembly (4) according to any one of claims 9 or 10, **characterized**

**in that** it comprises

a fixed element (411), having a guide (413), and  
a movable member (414), movable in said guide (413),  
wherein said feeler (415) is arranged on said movable member (414); and

**in that** said blowing unit (42) is fixed to said movable member (414).

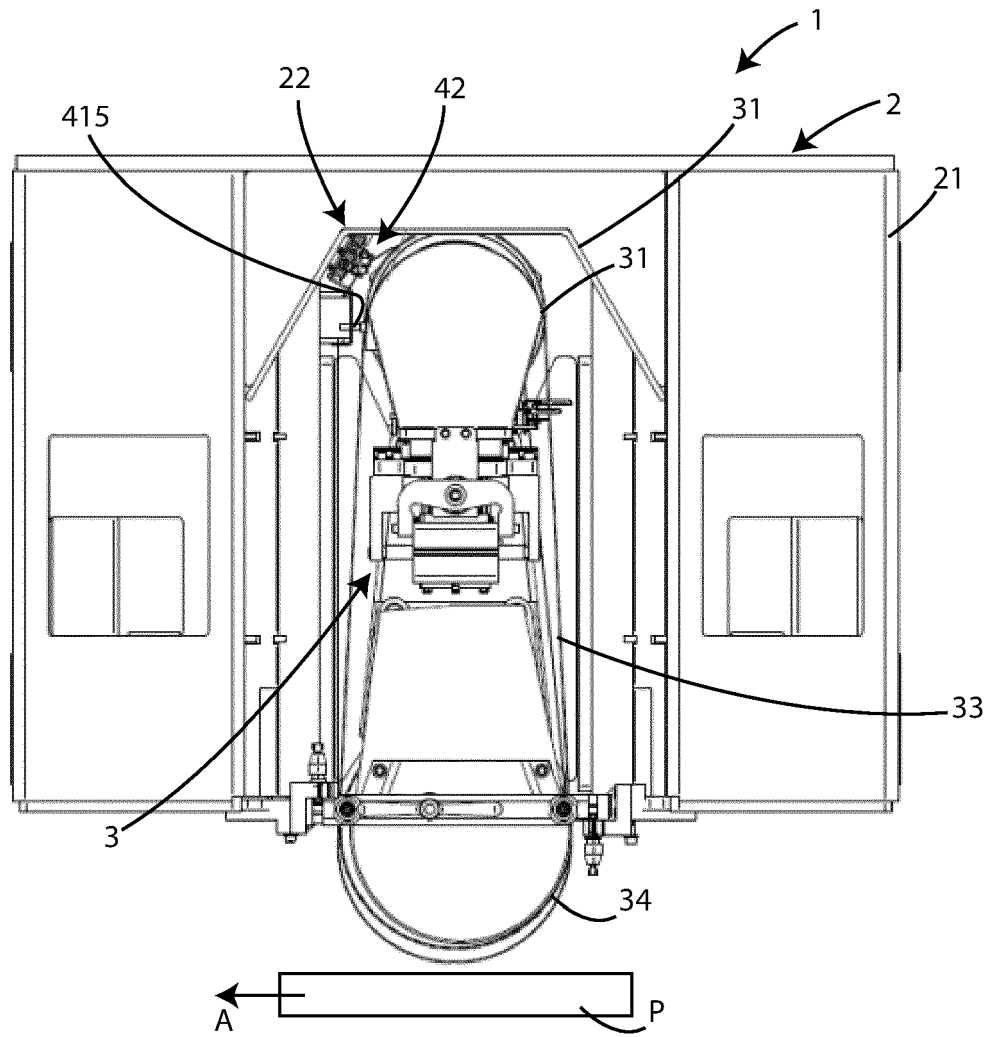


Fig. 1

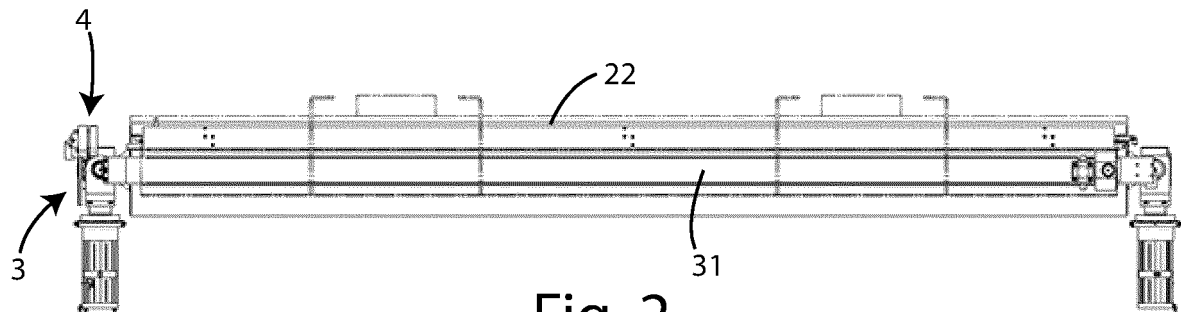
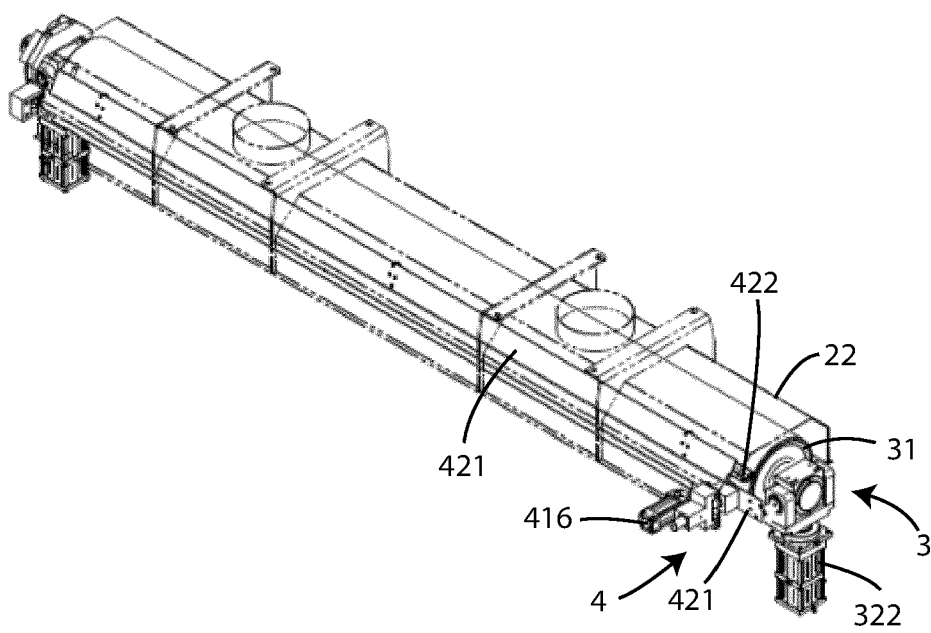
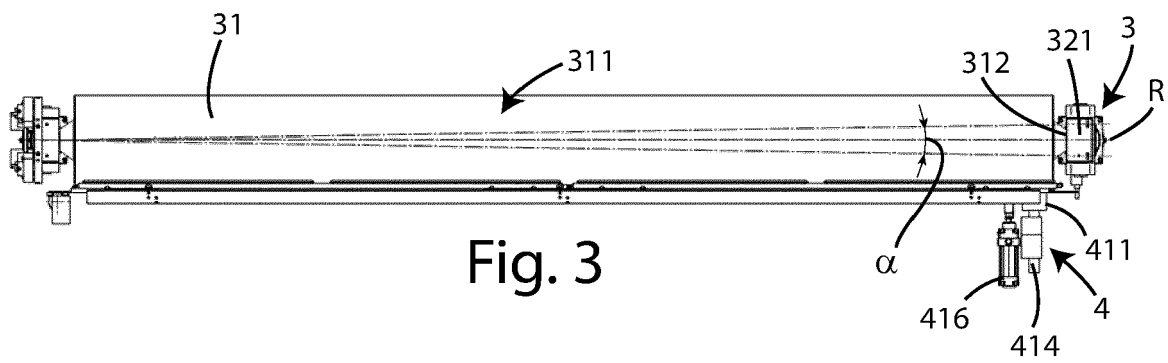


Fig. 2







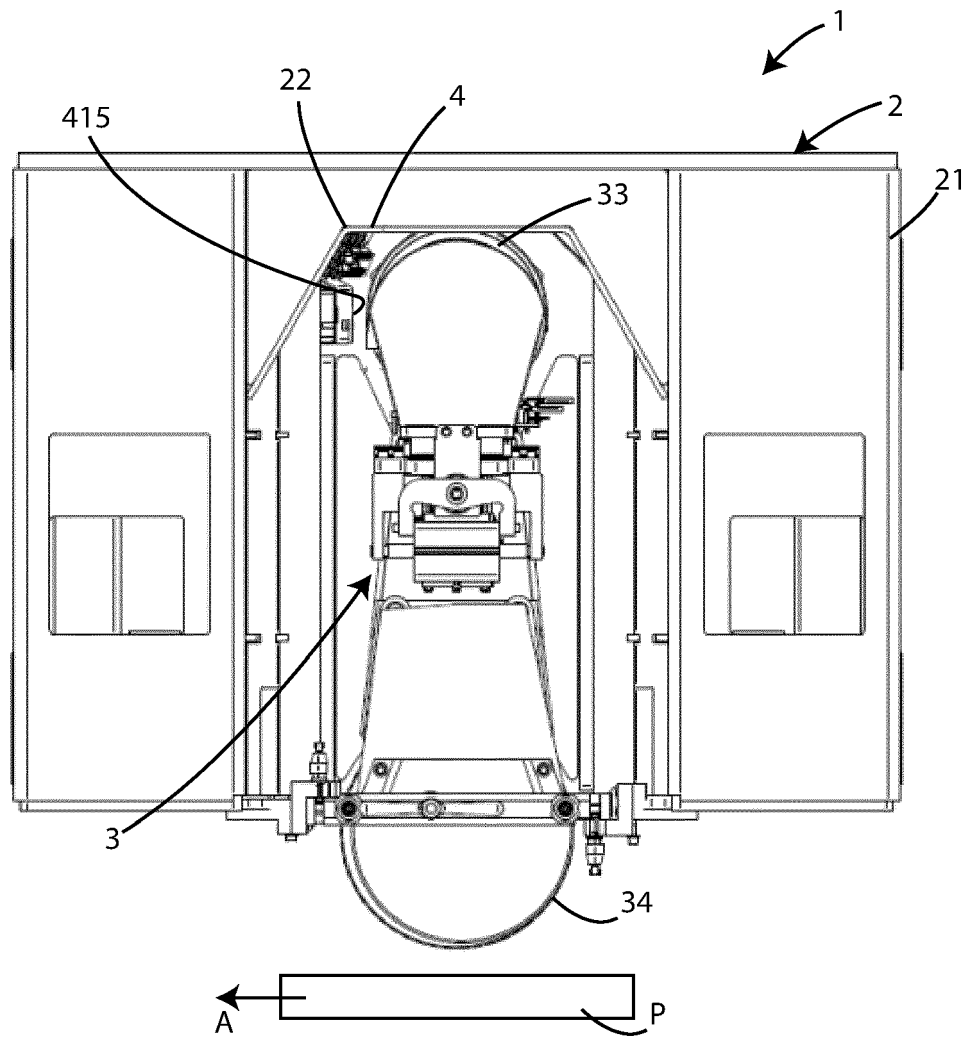


Fig. 7



## EUROPEAN SEARCH REPORT

Application Number

EP 23 21 5776

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EPO FORM 1503 03.82 (P04C01)

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A	* figures 1, 6 * * paragraph [0002] * * paragraph [0009] * * paragraph [0012] * * paragraph [0019] * * paragraph [0021] * * paragraph [0027] * -----	2-7, 10, 11	B24B21/18 B24B53/017 B24B53/00 B24B53/007 B24B21/12 B24B7/00 B24B7/28
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			TECHNICAL FIELDS SEARCHED (IPC)
			B24B
The present search report has been drawn up for all claims			
Place of search <b>Munich</b>		Date of completion of the search <b>1 February 2024</b>	Examiner <b>Herrero Ramos, J</b>
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	

ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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