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(54)

A SANDING MACHINE FOR SANDING/FINISHING PANELS MADE OF WOOD, METAL OR THE LIKE

(57)

In a sanding machine for sanding/finishing panels (2) made of wood, metal or the like, an abrasive belt (11) is moved to be brought into contact with a panel (2) by a plurality of thrust elements (24), which are distributed inside the abrasive belt (11), are movable perpendicular

to the panel (2), and define a pressing assembly (19) having a resting face (29) whereby the thrust elements (24) rest on the abrasive belt (11); the resting face (29) being provided with a plurality of teeth (30) projecting towards the abrasive belt (11).

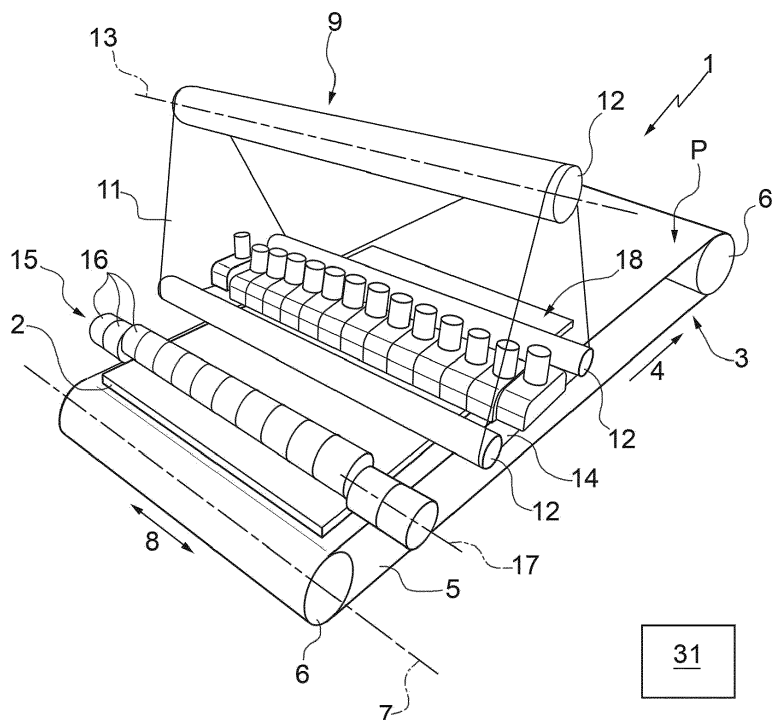


FIG.1

Description

[0001] The present invention relates to a sanding machine for sanding/finishing panels made of wood, metal or the like.

[0002] In the field of sanding/finishing panels made of wood, metal or the like, it is well known to provide a sanding machine of the type comprising a conveyor belt, which has an upper transport branch defining a substantially horizontal support surface for at least one panel, and is designed to feed the panel in a given first direction; a sanding device mounted above the support surface and comprising, in turn, an abrasive belt wound in a ring shape around a plurality of pulleys so as to sand an upper face of the panel; and a detection device for detecting a width of the panel in a second direction parallel to the support surface and transverse to the first direction.

[0003] The sanding machine also comprises a plurality of thrust elements, which are distributed inside the abrasive belt in the second direction, and are movable independently of one another in a third direction orthogonal to the support surface between respective lowered operating positions, in which the corresponding portions of the abrasive belt are moved to be brought into contact with the upper face of the panel, and respective raised rest positions.

[0004] The thrust elements are fixed to the output rods of respective pneumatic actuator cylinders, and are selectively moved into their lowered operating positions according to the width of the panel.

[0005] The upper face of the panel is either entirely sanded through the simultaneous lowering of all the thrust elements or partially sanded through the selective lowering of only part of the thrust elements.

[0006] In other words, the sanding device is configured either to sand the entire upper surface of the panel evenly or to provide at least one groove parallel to the first direction on the upper face of the panel.

[0007] The known sanding machines of the type described above have a few drawbacks mainly resulting from the fact that the sanding device is incapable of forming shaped grooves on the upper face of the panel, and therefore has relatively low versatility and flexibility.

[0008] The object of the present invention is to provide a sanding machine for sanding/finishing panels made of wood, metal or the like, which is free from the drawbacks described above and simple and inexpensive to implement.

[0009] According to the present invention, there is provided a sanding machine for sanding/finishing panels made of wood, metal or the like as claimed in the appended claims.

[0010] The present invention will be described now with reference to the accompanying drawings, which illustrate a non-limiting embodiment thereof, in which:

sanding machine of the present invention;

Figure 2 is a schematic perspective view, with parts removed for clarity, of a detail of the sanding machine in Figure 1;

Figure 3 is a schematic side view, with parts removed for clarity, of a detail of Figure 2; and

Figure 4 is a bottom view of the detail of Figure 3.

[0011] With reference to Figure 1, number 1 indicates, as a whole, a sanding machine for sanding/finishing panels 2 made of wood, metal or the like, substantially parallelepiped in shape.

[0012] The sanding machine 1 comprises a feeding device 3 for successively feeding the panels 2 in a horizontal direction 4.

[0013] The device 3 comprises a conveyor belt 5, which has an upper transport branch defining a horizontal support surface P for the panels 2, and is wound in a ring shape around a pair of motorized pulleys 6 mounted so as to rotate about respective longitudinal axes 7 parallel to each other and to a horizontal direction 8 transverse to direction 4.

[0014] The sanding machine 1 also comprises a sanding unit 9 comprising, in turn, a support frame 10 (Figures 2-4) and an abrasive belt 11 wound in a ring shape around a plurality of pulleys 12 (in this case three pulleys 12).

[0015] The pulleys 12 are mounted so as to rotate, relative to the frame 10, about respective longitudinal axes 13 parallel to direction 8, and are arranged so as to give the belt 11 a substantially triangular cross section.

[0016] In particular, the arrangement of the pulleys 12 is such that the belt 11 has a substantially flat lower branch 14 parallel to the surface P.

[0017] The sanding machine 1 comprises a detection device 15 mounted above and at the entrance of the surface P in order to detect a width of panel 2 in direction 8.

[0018] In this case, the device 15 is a mechanical detection device comprising a plurality of contact rollers 16, which are distributed above the surface P in direction 8, and are mounted so as to rotate about respective rotation axes 17 parallel to direction 8.

[0019] As a result of the forward movement of the panel 2 in direction 4, the rollers 16 arranged within the feeding path of the panel 2 are lifted by the panel 2 so as to allow the device 15 to detect the width of the panel 2 in direction 8.

[0020] According to a variant not shown, the rollers 16 are eliminated and replaced with an optical detection device.

[0021] The lower branch 14 of the belt 11 is selectively brought into contact with an upper face 18 of each panel 2 by a pressing assembly 19 mounted inside the belt 11.

[0022] As illustrated in figures 2, 3 and 4, the assembly 19 comprises a support frame 20, which has an elongated shape, extends inside the belt 11 in direction 8, and is coupled in a sliding manner to the frame 10 so as to move, relative to the frame 10 and under the thrust of an operating device 21, in direction 8.

Figure 1 is a schematic perspective view, with parts removed for clarity, of a preferred embodiment of the

[0023] The device 21 comprises an electric motor 22, which is fixed to the frame 10 and has an output shaft 23, which extends in direction 8 and is coupled to the frame 20 via a screw-and-nut coupling.

[0024] The frame 20 supports a plurality of thrust elements 24, which are distributed inside the belt 11 in direction 8, are mounted above the branch 14, and are moved by the operating device 21 in direction 8.

[0025] The elements 24 are coupled to the frame 20 so as to move, relative to said frame 20, in a vertical direction 25 orthogonal to directions 4 and 8 and perpendicular to the surface P.

[0026] Each element 24 is moved independently of the other elements 24 in direction 25 between a lowered operating position, in which the corresponding portion of the belt 11 is moved to be brought into contact with the face 18, and a raised rest position by a respective actuator cylinder 26 fixed to the frame 20 parallel to direction 25.

[0027] Each element 24 has the shape of a substantially flat plate, is fixed to the free end of an output rod of the corresponding cylinder 26 perpendicularly to direction 25, and is delimited by a thrust surface 27 facing the belt 11.

[0028] The pressing assembly 19 also comprises, in this case, a flexible plate 28, which extends between the belt 11 and the elements 24 perpendicularly to direction 25, and has two free ends releasably fixed to the frame 20.

[0029] The plate 28 is mounted so as to be elastically deformed by each element 24 after the movement of said element 24 from its raised rest position to its lowered operating position.

[0030] In other words, the plate 28 is mounted at a distance from the elements 24 less than the travel of the output rods of the cylinders 26.

[0031] The plate 28 has a resting face 29 for resting on the abrasive belt 11. The face 29 is provided with a plurality of shaped teeth 30, which protrude from the plate 28 towards the belt 11 in direction 25, and are distributed along the face 29 in direction 8.

[0032] The teeth 30 are made in one piece together with the plate 28 or are fitted to the plate 28 in a removable manner, for example by means of respective fastening screws.

[0033] In use, by combining the movements of the panel 2 in direction 4 with the movements of the support frame 20, and therefore of the thrust elements 24, in direction 8, and with the selective movements of the thrust elements 24 between the respective raised rest positions and the respective lowered operating positions, the abrasive belt 11 is moved so as to be brought into contact with the upper face 18 of the panel 2 in order to form shaped grooves (not shown) on the upper face 18 in the most varied shapes.

[0034] According to a variant not shown, the plate 28 is eliminated and the surface 27 of each thrust element 24 is shaped so as to define, together with the surfaces

27 of the other thrust elements 24, a resting face whereby the thrust elements 24 rest on the abrasive belt 11, the resting face being absolutely similar to the face 29.

[0035] The sanding machine 1 lastly comprises an electronic control unit 31, which is provided with a memory to store data concerning a pattern to be reproduced on the face 18 of the panel 2 by means of the belt 11, and is configured to control the selective lowering of the thrust elements 24 based on the data stored in the memory.

Claims

1. A sanding machine for sanding/finishing panels (2) made of wood, metal or the like, the sanding machine comprising a feeding device (3), which defines a support surface (P) for at least one panel (2) and is designed to feed the panel (2) in a first direction (4); a sanding unit (9), which is mounted above the support surface (P) and comprises, in turn, an abrasive belt (11), which is wound in a ring shape around a plurality of pulleys (12) so as to sand an upper face (18) of the panel (2); a pressing assembly (19), which comprises a plurality of thrust elements (24), which are distributed inside the abrasive belt (11) in a second direction (8), which is transverse to the first direction (4) and parallel to the support surface (P), the pressing assembly (19) having a resting face (29) whereby the thrust elements (24) rest on the abrasive belt (11); and, for each thrust element (24), a respective operating device (26) to move the thrust element (24) between a lowered operating position, in which the thrust element (24) moves the abrasive belt (11) so as to bring it into contact with the upper face (18) of the panel (2), and a raised rest position; and being **characterized in that** the resting face (29) has a plurality of teeth (30), which project from the resting face (29) towards the abrasive belt (11) and are distributed along the resting surface (29) in the second direction (8).
2. The sanding machine according to claim 1, wherein the pressing assembly (19) comprises a first support frame (20); each thrust element (24) being coupled to the first support frame (20) so as to move, relative to the support frame (20), between said lowered operating position and said raised rest position.
3. The sanding machine according to claim 2 and comprising, furthermore, an actuator device (22) to move the first support frame (20) and, therefore, the thrust elements (24) in the second direction (8).
4. The sanding machine according to claim 3, wherein the sanding unit (9) comprises a second support frame (10), which is configured to support, in a rotary manner, at least part of the pulleys (12); the first sup-

port frame (20) being coupled to the second support frame (10) so as to move, relative to the second support frame (10) and under the thrust of the actuator device (22), in the second direction (8).

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5. The sanding machine according to any of the previous claims, wherein each thrust element (24) is delimited, on the lower side, by a thrust surface (27) facing the abrasive belt (11); a flexible plate (28) being interposed between the thrust surfaces (27) and the abrasive belt (11) so as to define said resting face (29). 10
6. The sanding machine according to claim 5, wherein the flexible plate (28) is provided with said teeth (30). 15
7. The sanding machine according to claim 6, wherein the teeth (30) are manufactured as one single piece together with the flexible plate (28) or are fitted to the flexible plate (28) in a removable manner. 20
8. The sanding machine according to any of the claims from 5 to 7, wherein the flexible plate (28) is arranged so as to be elastically deformed after the movement of each thrust element (24) from its raised rest position to its lowered operating position. 25
9. The sanding machine according to any of the claims from 1 to 4, wherein each thrust element (24) is delimited, on the lower side, by a thrust surface (27), which faces the abrasive belt (11) and is shaped so as to define, together with the thrust surfaces (27) of the other thrust elements (24), said resting face (29). 30
10. The sanding machine according to any of the previous claims, wherein the operating device (21) of each thrust element (24) comprises an actuator cylinder (22). 35
11. The sanding machine according to any of the previous claims and comprising, furthermore, an electronic control unit (31), which is provided with a memory to store data concerning a pattern to be reproduced on the upper face (18) of the panel (2) by means of the abrasive belt (11) and is configured to control the selective lowering of the thrust elements (24) based on the data stored in the memory. 40

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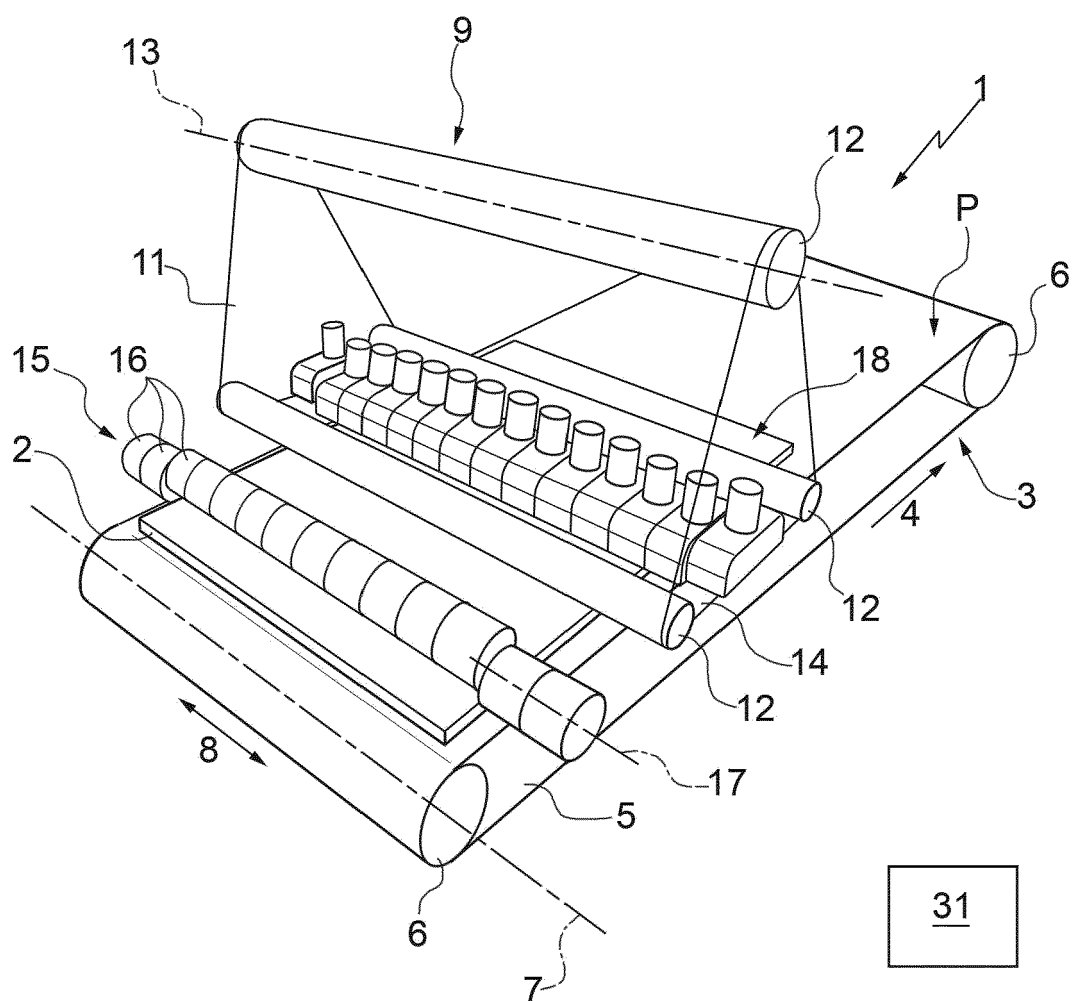


FIG.1

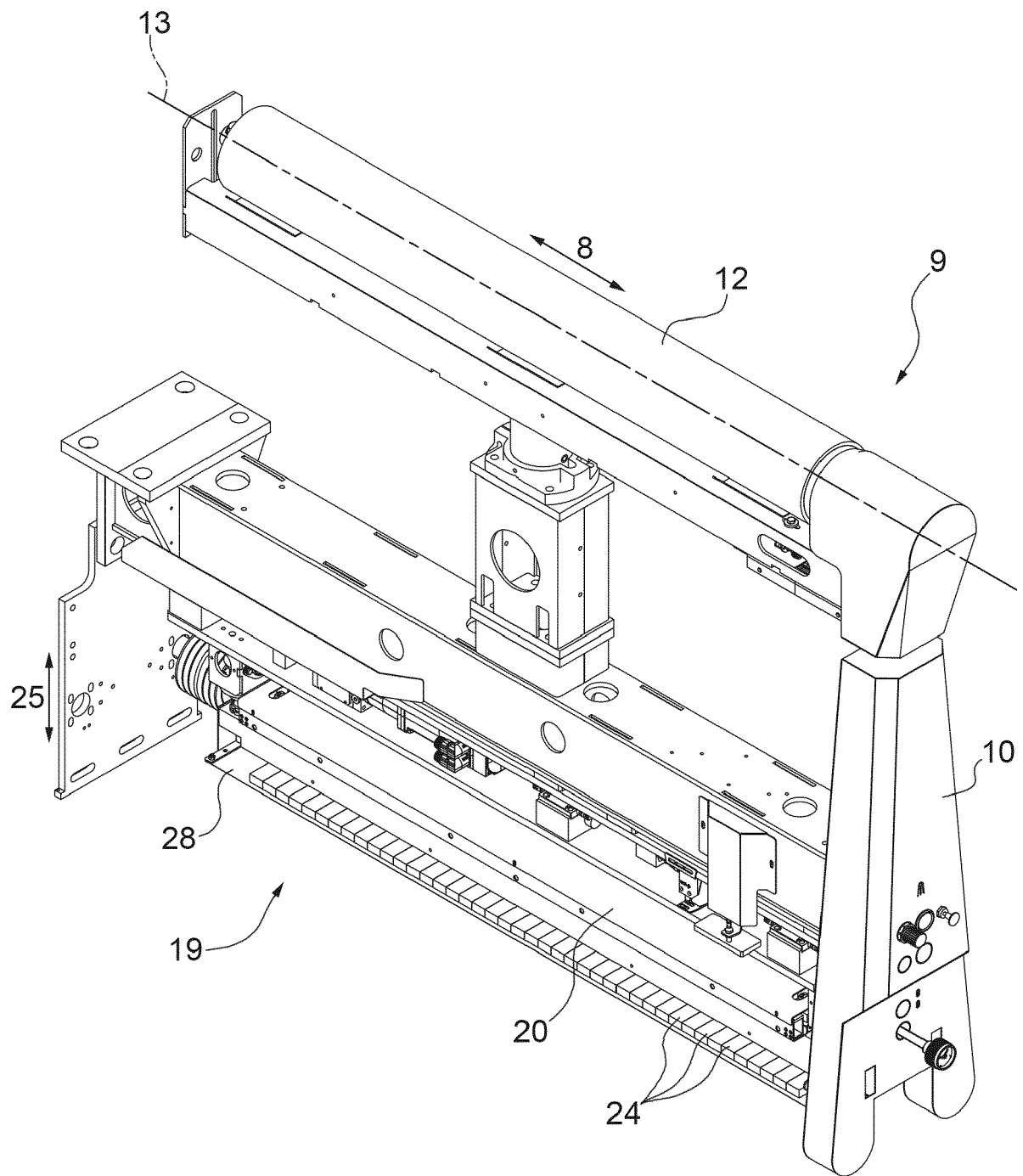
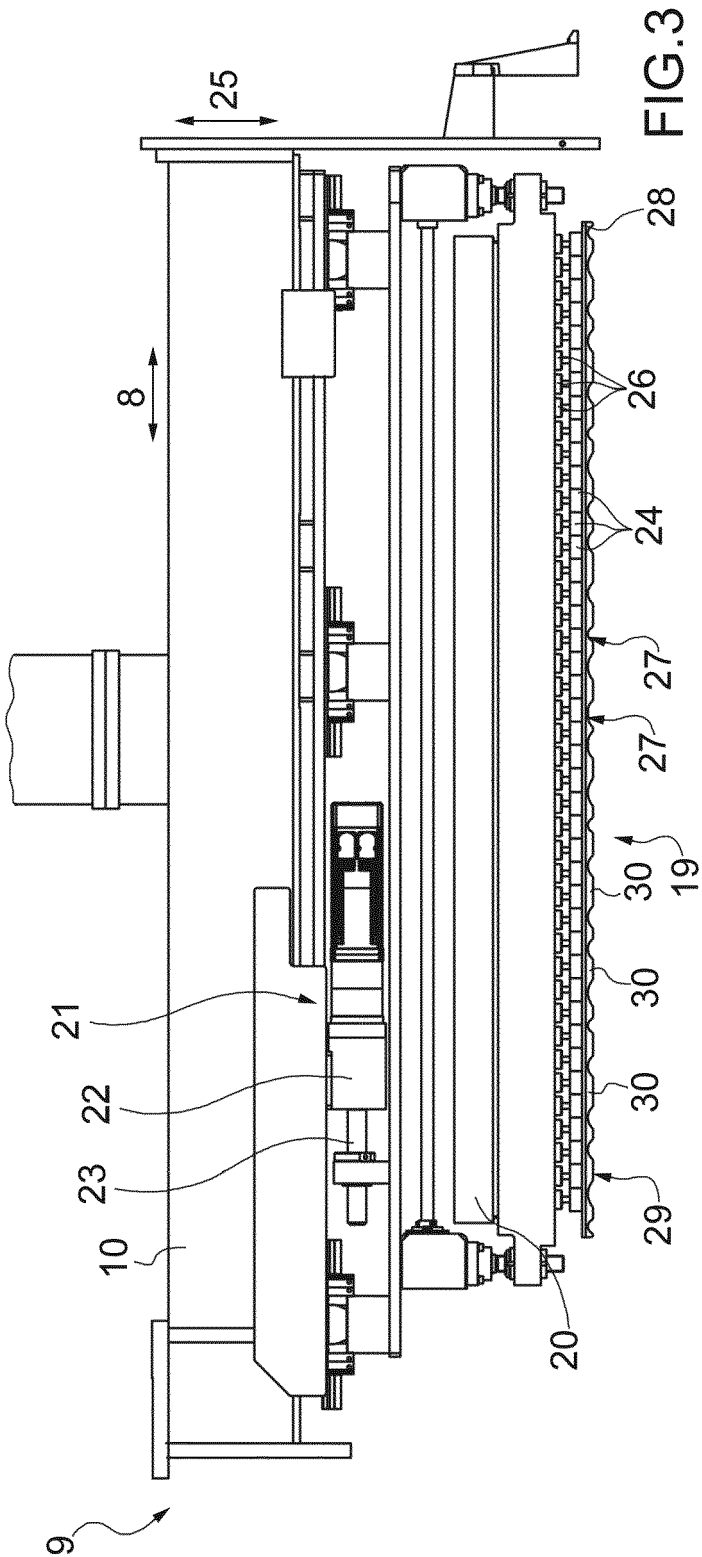
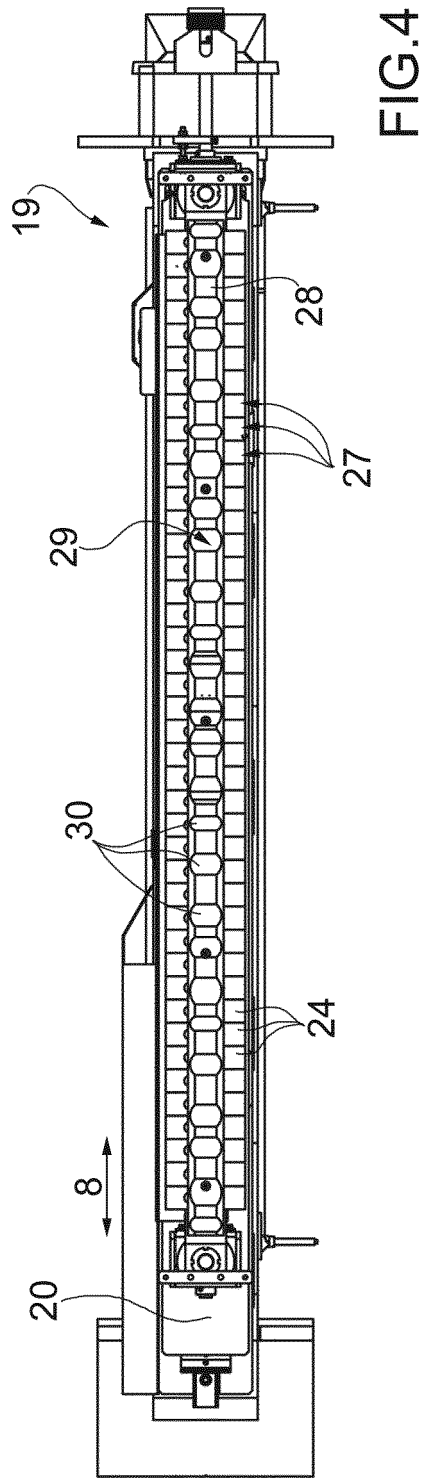


FIG.2





EUROPEAN SEARCH REPORT

Application Number
EP 17 19 5626

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 January 2018	Examiner Ngo Si Xuyen, G
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 17 19 5626

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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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