(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 834 986 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
16.06.2021 Bulletin 2021/24

(51) Int Cl.:
B24B 21/04 *(2006.01)* ***B24B 21/20*** *(2006.01)*
B24B 21/18 *(2006.01)*

(21) Application number: **20210045.9**

(22) Date of filing: **26.11.2020**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
KH MA MD TN

(30) Priority: **11.12.2019 IT 201900023637**

(71) Applicant: **SCM Group S.p.A.**
47921 Rimini (RN) (IT)

(72) Inventor: **VENTURINI, Marco**
47921 RIMINI (IT)

(74) Representative: **Tiburzi, Andrea et al**
Barzanò & Zanardo Roma S.p.A.
Via Piemonte 26
00187 Roma (IT)

(54) SANDING MACHINE PROVIDED WITH AN AUXILIARY DEVICE TO FACILITATE MOUNTING AN ABRASIVE BELT

(57) The present invention relates to a Sanding machine (1, 1') for sanding panels or similar items, comprising: advancing means (2, 2') for advancing, in use, at least one panel or similar item according to a predetermined advancing direction(A, A'); at least one sanding device (5, 5') for sanding, in use, at least one panel or similar item during the advancement of said at least one panel or similar item according to said predetermined advancing direction (A, A'), said at least one sanding device (5, 5') comprising a removable abrasive belt (6), directed transversely to said predetermined advancing direction (A, A'); and at least one auxiliary device (11) to promote, in use, fitting of said abrasive belt (6), by an operator, in said at least one sanding device (5, 5'), said at least one auxiliary device (11) comprising movement means (12, 13, 14) for moving, in use, at least one portion of said abrasive belt (6) transversely to said predetermined advancing direction (A, A') from a first position, which is reachable by an operator and adjacent to a first outer edge (10a) of said sanding machine (1, 1'), to a second position reachable by an operator and adjacent to a second outer edge (10b) of said sanding machine (1, 1') opposite said first outer edge (10a).

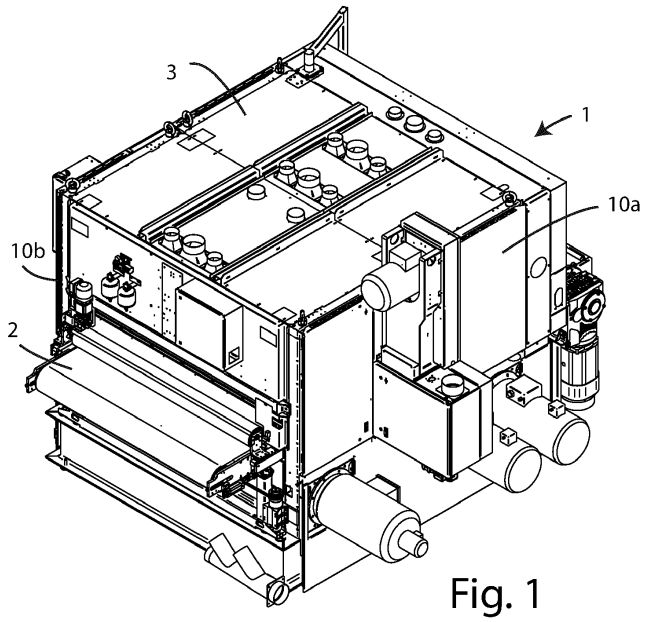

Fig. 1

EP 3 834 986 A1

Description

[0001] The present invention relates to a sanding machine provided with an auxiliary device to facilitate mounting an abrasive belt.

[0002] More specifically, the invention relates to a sanding machine provided with an auxiliary device for facilitating the assembly, by an operator, of a closed-loop abrasive belt for sanding panels, arranged transversely with respect to the advancing direction of the panels to be machined.

[0003] In the following, the description will be addressed to the sanding of wooden panels, but it is clear that the same should not be considered limited to this specific use, as it can also be extended to panels of different materials.

[0004] Currently, in sanding machines, the assembly of the closed-looped abrasive belts transversal to the advancing direction of the panels to be machined is carried out by the operators in a completely manual way by winding, in sequence, a portion of the belt on a first pulley and the opposite portion of the same belt on the opposite pulley.

[0005] Normally, this kind of manual operation is not easy to carry out, above all due to the remarkable transverse dimensions of the sanding machines, which do not allow the assembly of this belt by a single operator, who is stationary in a determined position adjacent to the machine.

[0006] Moreover, very often these operations for manual assembly of the abrasive belt are made difficult by the presence of other operating or auxiliary members in the areas adjacent to the sanding devices incorporating this belt.

[0007] In light of the above, it is therefore an object of the present invention to provide a sanding machine equipped with an auxiliary device to facilitate the assembly of an abrasive belt, which simplifies the assembly operations of this abrasive belt.

[0008] Another object of the invention is to provide a sanding machine equipped with an auxiliary device to facilitate the assembly of an abrasive belt, which is polyvalent, i.e., which can be adapted to different types of sanding machines.

[0009] A further object of the present invention is to provide a sanding machine equipped with an auxiliary device to facilitate the assembly of an abrasive belt, which is not complex from the structural point of view.

[0010] It is therefore specific object of the present invention a sanding machine for sanding panels or similar items, comprising: advancing means for advancing, in use, at least one panel or similar item according to a predetermined advancing direction; at least one sanding device for sanding, in use, at least one panel or similar item during the advancement of said at least one panel or similar item according to said predetermined advancing direction, said at least one sanding device comprising a removable abrasive belt, directed transversely to said predetermined advancing direction; and at least one auxiliary device to promote, in use, fitting of said abrasive belt, by an operator, in said at least one sanding device, said at least one auxiliary device comprising movement means for moving, in use, at least one portion of said abrasive belt transversely to said predetermined advancing direction from a first position, which is reachable by an operator and adjacent to a first outer edge of said sanding machine, to a second position reachable by an operator and adjacent to a second outer edge of said sanding machine opposite said first outer edge.

[0011] Conveniently according to the invention, in said sanding machine an advancing surface may be provided on which said advancing means advances, in use, said at least one panel or similar item according to said advancing direction, said movement means may be configured for moving, in use, said at least one portion of said abrasive belt transversely to a second surface arranged orthogonally to said advancing surface according to said advancing direction, and in that said at least one abrasive belt may be directed transversely to said second surface.

[0012] Preferably according to the invention, said at least one sanding device comprises a driven pulley and a drive pulley and in that said at least one abrasive belt has a loop shape so as to be windable on said driven pulley and on said drive pulley.

[0013] Advantageously according to the invention, said movement means may comprise a guide element, a movable member movably engaged with said guide element, and a gripping element connected to said movable member and configured for gripping, in use, said at least one portion of said abrasive belt.

[0014] Further according to the invention, said gripping element may be movable between a substantially vertical position and a substantially horizontal position.

[0015] Conveniently according to the invention, said gripping element may be rotatable in a vertical direction.

[0016] Still according to the invention, said guide element may be a substantially rectilinear guide.

[0017] Advantageously according to the invention, said at least one auxiliary device may face said at least one sanding device.

[0018] Further according to the invention, said at least one sanding device and said at least one auxiliary device may be arranged below said advancing surface, and in that said sanding machine comprises at least one component that is movable between a raised position, wherein said at least one component is interposed between said at least one sanding device and said at least one auxiliary device, and a lowered position, in which said at least one component is arranged below said at least one sanding device and said at least one auxiliary device.

[0019] 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 is an overall axonometric view of a sanding

machine according to a first embodiment of the present invention;
figure 2 is a longitudinal sectional view of the sanding machine shown in figure 1;
figure 3 is an axonometric view of a sanding device of the sanding machine shown in figure 1, combined with an auxiliary device according to the invention for mounting an abrasive belt;
figure 4 is a side view of the assembly illustrated in figure 3;
figure 5 is a sectional view along the A-A section line indicated in figure 4;
figure 6 is an axonometric view showing in detail the auxiliary device for assembling an abrasive belt of figure 3, in the rest position with the relative gripping member arranged vertically and in the operative position with this gripping member arranged horizontally;
figure 7 is a longitudinal section view of a sanding machine according to a second embodiment of the present invention; and
figure 8 is a detail view extracted from figure 7.

[0020] In the various figures, similar parts will be indicated by the same reference numbers.

[0021] With reference to the attached figures, the numerical reference 1 indicates a first sanding machine according to the invention, comprising a conveyor belt 2 to allow the advancement of the panels to be machined through said sanding machine 1 according to the advancing direction A.

[0022] The sanding machine 1 also comprises a containment cabinet 3, or a covering and protection casing, through which the aforementioned conveyor belt 2 is arranged.

[0023] Inside the containment cabinet 3 and above the conveyor belt 2 there are provided a plurality of abrasive rollers 4 oriented transversely to said advancing direction A, and also a sanding device 5, equipped with an abrasive belt 6, arranged transversely to the same advancing direction A, and wound on a drive pulley 7, driven by a motor 8, and on a driven pulley 9.

[0024] During the operation of the sanding machine 1, the sanding action exerted by the sanding device 5 on the upper face of each panel passing under it, is performed by the sliding of the abrasive belt 6 on the drive pulley 7 and on the driven pulley 9 produced by the rotation of the drive pulley 7, driven by the motor 8.

[0025] Adjacent to the sanding device 5, and in a position facing the latter, an auxiliary device 11 is provided to facilitate the assembly of the abrasive belt 6 on the drive pulley 7 and the driven pulley 9 of the same sanding device 5 by an operator.

[0026] In particular, this auxiliary device 11 comprises a rectilinear guide 12 fixed transversely to the aforementioned advancing direction A, parallel to the abrasive belt 6 of the sanding device 5.

[0027] More precisely, both the abrasive belt 6 of the sanding device 5 and the respective rotation axes of the abrasive rollers 4 and the rectilinear guide 12 of the auxiliary device 11 are directed transversely, in particular perpendicularly, to a plane orthogonal to the plane on which they are made to advance the panels to be machined and directed according to the advancing direction A; furthermore, the drive pulley 7 and the driven pulley 9 are arranged, respectively, in correspondence with the opposite sides 10a, 10b, or rather the sides of the containment cabinet 3.

[0028] More specifically, this rectilinear guide 12 has a length such that the relative ends are, respectively, arranged substantially opposite the drive pulley 7 and the driven pulley 9.

[0029] The auxiliary device 11 also includes a carriage 13 movable along the rectilinear guide 12 through the use of actuator means.

[0030] A gripping member 14 oscillating vertically between a vertical rest position and a horizontal operating position, is rotatably engaged with the carriage 13 (see figure 6).

[0031] Specifically, this gripping member 14 has an oblong shape, such as to allow, precisely, when arranged in a horizontal position, the gripping of a portion of the abrasive belt 6 by winding the latter to the same gripping member 14.

[0032] When there is the need to replace the abrasive belt 6, for example, due to the excessive wear of the latter, it is sufficient, after having removed the worn abrasive belt 6, to manually wind a portion of the new belt abrasive on one of the two pulleys 7, 9 and another portion of the same belt on the gripping member 14, arranged horizontally in a position adjacent to said pulley, and then, after having brought the gripping member 14 on the opposite side of the rectilinear guide 12 by operating the aforesaid actuator means, manually picking up the portion of the abrasive belt from the gripping member 14, and mounting it on the other pulley.

[0033] The above operations of replacing the abrasive belt can be easily carried out by a single operator, who, after winding up the new abrasive belt on one of the two pulleys 7, 9, positioning himself in correspondence with this, can move to the opposite side of the sanding machine 1 to take the other portion of abrasive belt, carried there by the auxiliary device 11, and wind it on the other of the two pulleys 7, 9 to complete the assembly.

[0034] Clearly, the same operations for replacing the abrasive belt can also be performed jointly by two operators arranged adjacent to the two opposite sides of the sanding machine 1, in correspondence with the two pulleys 7, 9.

[0035] According to a technical variant of the sanding machine 1, the gripping member 14 can also be provided fixed in the operative position in the cases in which in the same sanding machine 1 there are no obstacles to the movement of this gripping member 14 from one side to the other rectilinear guide 12.

[0036] Referring now to figures 7 and 8, there is shows

a second sanding machine 1' according to the invention, in which the panels to be machined are interposed between the overlying conveyor belt 2' and a plurality of sliding rollers 3', 3", idle, underneath the panels, and are made to advance due to the sliding of the conveyor belt 2' according to the advancing direction A'.

[0037] Similarly to the first sanding machine 1 described above, the sanding rollers 4', the sanding belt of the sanding device 5', and the relative auxiliary device of the second sanding machine 1' are oriented transversely to the advancing direction A', according to which the conveyor belt 2' advances the panels to be machined.

[0038] Furthermore, the sanding device 5' and the relative auxiliary device of the second sanding machine 1' are substantially identical, respectively, to the sanding device 5 and the auxiliary device 11 described above in relation to the first sanding machine 1.

[0039] On the other hand, unlike the first sanding machine 1, in the second sanding machine 1' the abrasive rollers 4', the sanding device 5' and the relative auxiliary device are provided under the conveyor belt 2', thus allowing the sanding of the lower face of the panels.

[0040] In some cases, as in the one shown in figures 7 and 8, it may be necessary to lower one or more sliding rollers 3" to create the space necessary for the gripping member 14' of the auxiliary device to arrange itself in the relative horizontal position, and move transversely with respect to the advancing direction A'.

[0041] Therefore, said one or more sliding rollers 3" should be such as to be able to move between a raised position, in which they are interposed between the sanding device 5' and the relative auxiliary device, and a lowered position, in which said one or more sliding rollers 3" are arranged under the sanding device 5' and the relative auxiliary device, and vice versa.

[0042] As can be seen from the foregoing description, both the first sanding machine 1 and the second sanding machine 1' described above allow the abrasive belt of the transversal sanding device to be replaced easily and quickly, avoiding that the belt can become entangled or get stuck in some other members or component of the machine when replacing the abrasive belt.

[0043] 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, 1') for sanding panels or similar items, comprising:

   advancing means (2, 2') for advancing, in use, at least one panel or similar item according to a predetermined advancing direction (A, A');

   at least one sanding device (5, 5') for sanding, in use, at least one panel or similar item during the advancement of said at least one panel or similar item according to said predetermined advancing direction (A, A'), said at least one sanding device (5, 5') comprising a removable abrasive belt (6), directed transversely to said predetermined advancing direction (A, A'); and

   at least one auxiliary device (11) to promote, in use, fitting of said abrasive belt (6), by an operator, in said at least one sanding device (5, 5'), said at least one auxiliary device (11) comprising movement means (12, 13, 14) for moving, in use, at least one portion of said abrasive belt (6) transversely to said predetermined advancing direction (A, A') from a first position, which is reachable by an operator and adjacent to a first outer edge (10a) of said sanding machine (1, 1'), to a second position reachable by an operator and adjacent to a second outer edge (10b) of said sanding machine (1, 1') opposite said first outer edge (10a).

2. Sanding machine (1, 1') according to claim 1, **characterized in that** in said sanding machine (1, 1') an advancing surface is provided on which said advancing means (2, 2') advances, in use, said at least one panel or similar item according to said advancing direction (A, A'), **in that** said movement means (12, 13, 14) is configured for moving, in use, said at least one portion of said abrasive belt (6) transversely to a second surface arranged orthogonally to said advancing surface according to said advancing direction (A, A'), and **in that** said at least one abrasive belt (6)is directed transversely to said second surface.

3. Sanding machine (1, 1') according to claim 1 or 2, **characterized in that** said at least one sanding device (5, 5') comprises a driven pulley (9) and a drive pulley (7) and **in that** said at least one abrasive belt (6) has a loop shape so as to be windable on said driven pulley (9) and on said drive pulley (7).

4. Sanding machine (1, 1') according to any one of the preceding claims, **characterized in that** said movement means comprises a guide element (12), a movable member (13) movably engaged with said guide element (12), and a gripping element (14, 14') connected to said movable member (13) and configured for gripping, in use, said at least one portion of said abrasive belt (6).

5. Sanding machine (1, 1') according to claim 4, **characterized in that** said gripping element (14, 14') is movable between a substantially vertical position and a substantially horizontal position.

6. Sanding machine (1, 1') according to claim 4 or 5, **characterized in that** said gripping element (14, 14') is rotatable in a vertical direction.

7. Sanding machine (1, 1') according to any one of claims 4 to 6, **characterized in that** said guide element (12) is a substantially rectilinear guide.

8. Sanding machine (1, 1') according to any preceding claim, **characterized in that** said at least one auxiliary device (11) faces said at least one sanding device (5, 5').

9. Sanding machine (1') according to claim 2, **characterized in that** said at least one sanding device (5') and said at least one auxiliary device are arranged below said advancing surface, and **in that** said sanding machine (1') comprises at least one component (3") that is movable between a raised position, wherein said at least one component (3") is interposed between said at least one sanding device (5') and said at least one auxiliary device, and a lowered position, in which said at least one component (3") is arranged below said at least one sanding device (5') and said at least one auxiliary device.

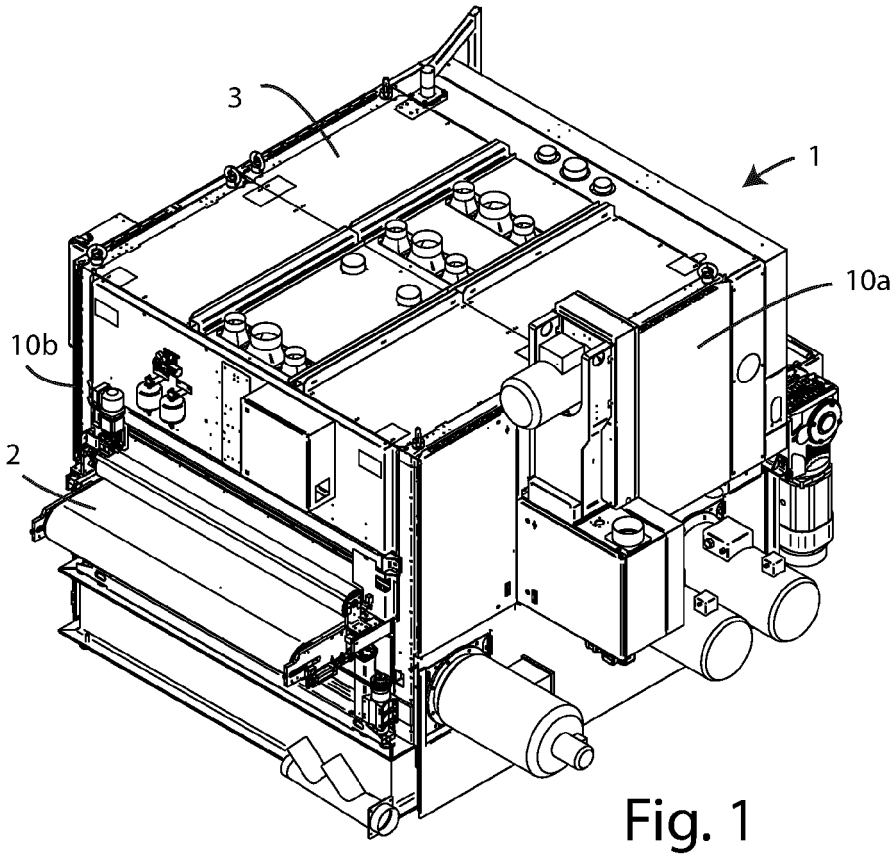

Fig. 1

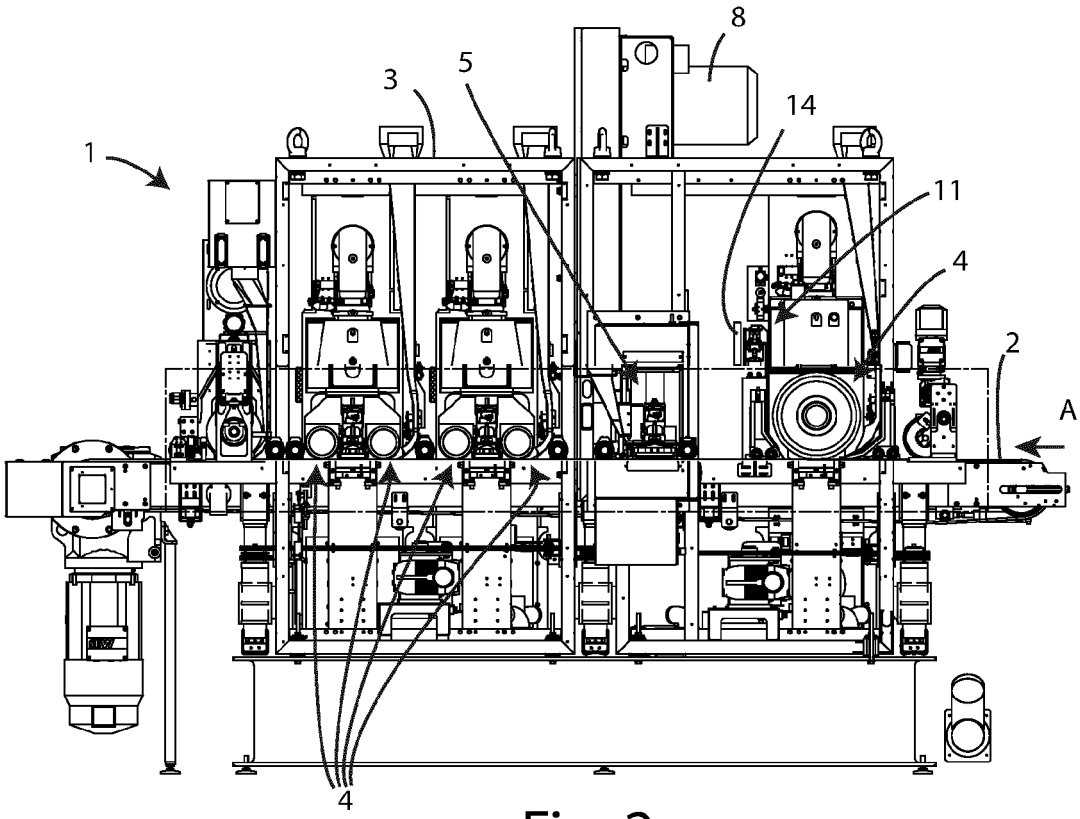

Fig. 2

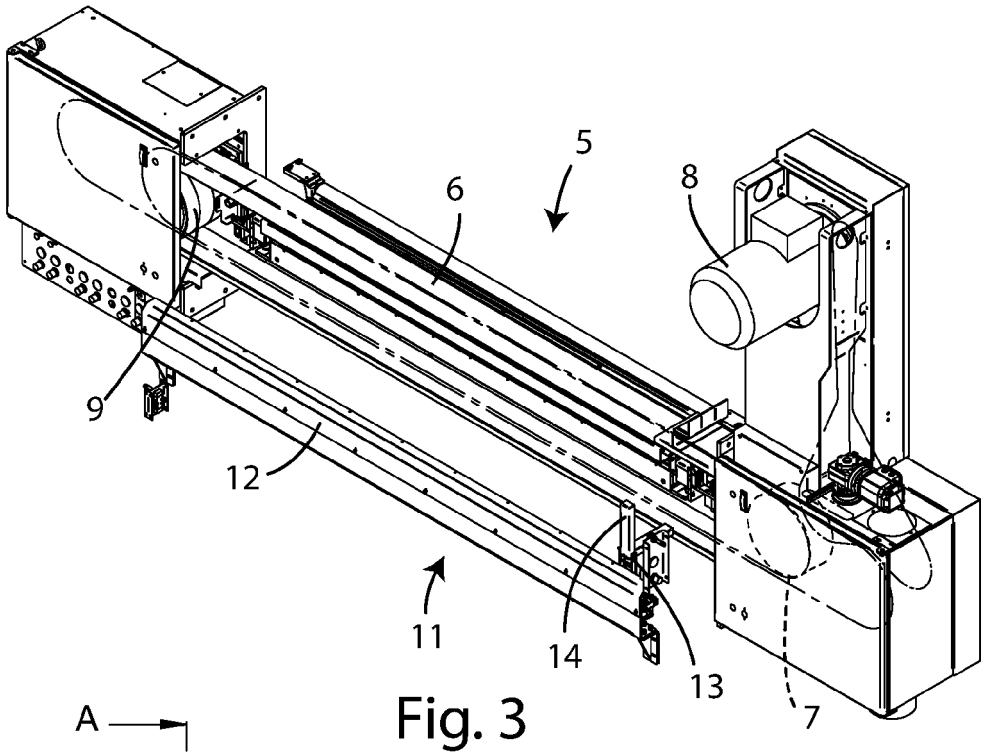

Fig. 3

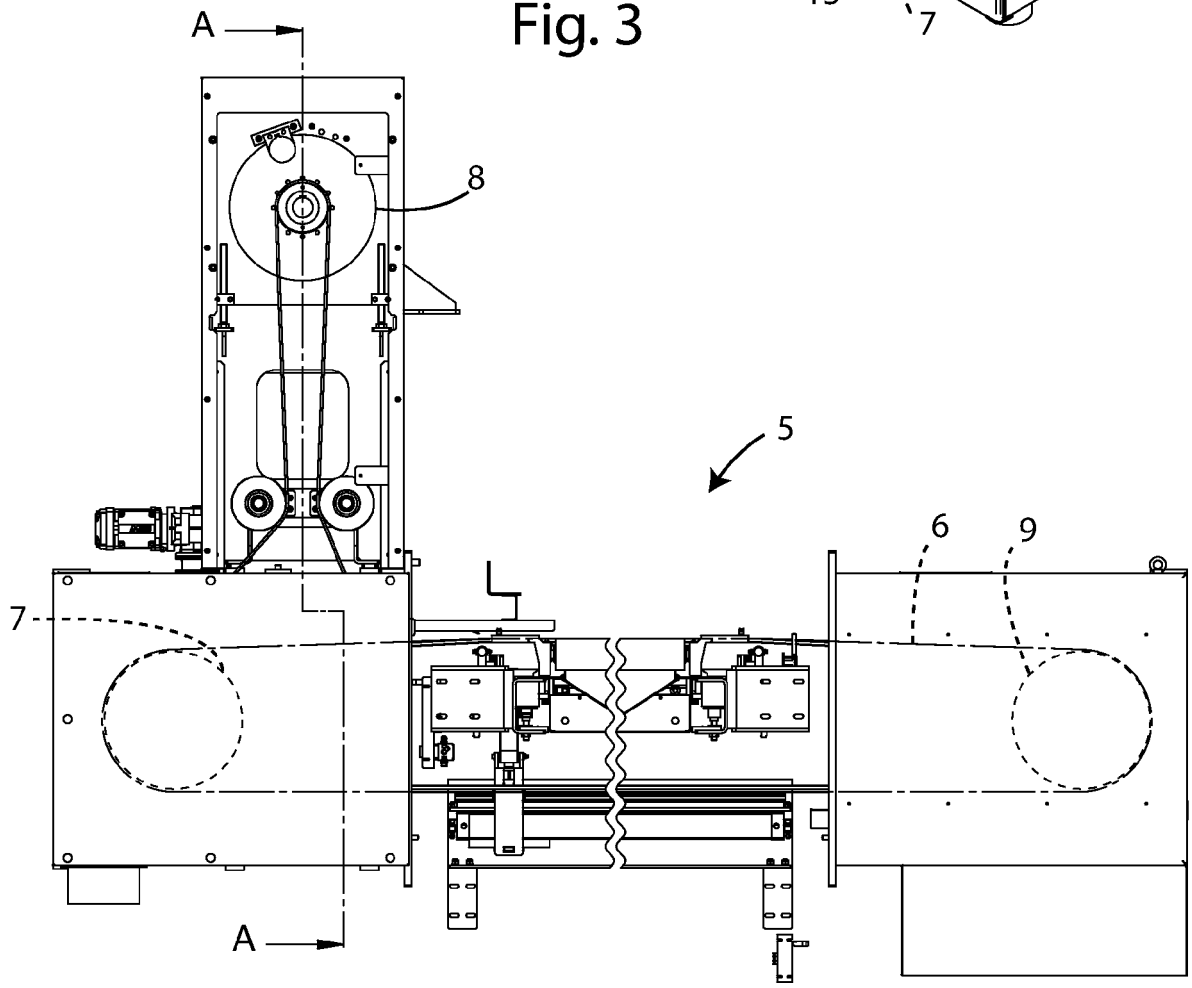

Fig. 4

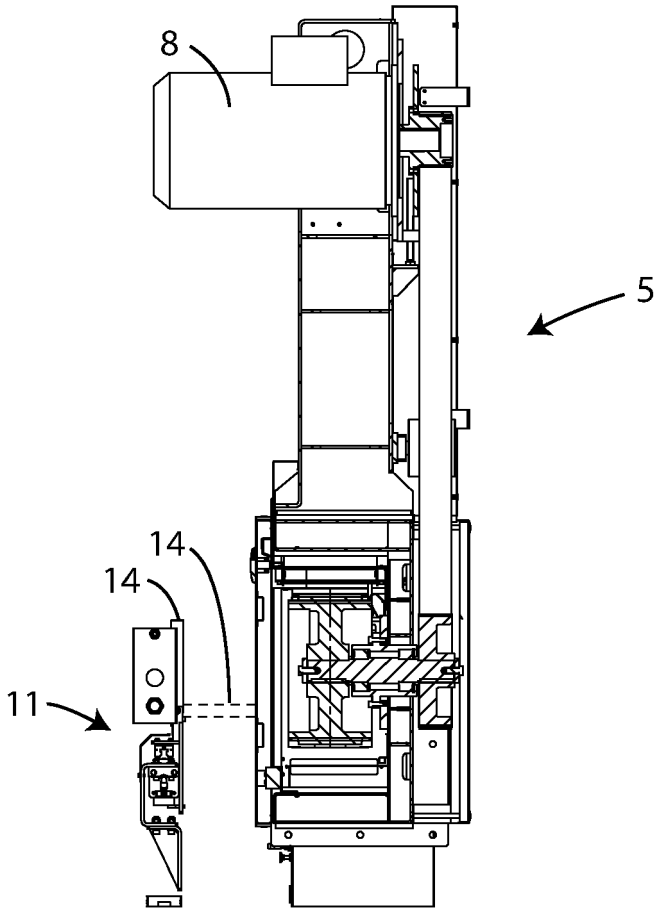

Fig. 5

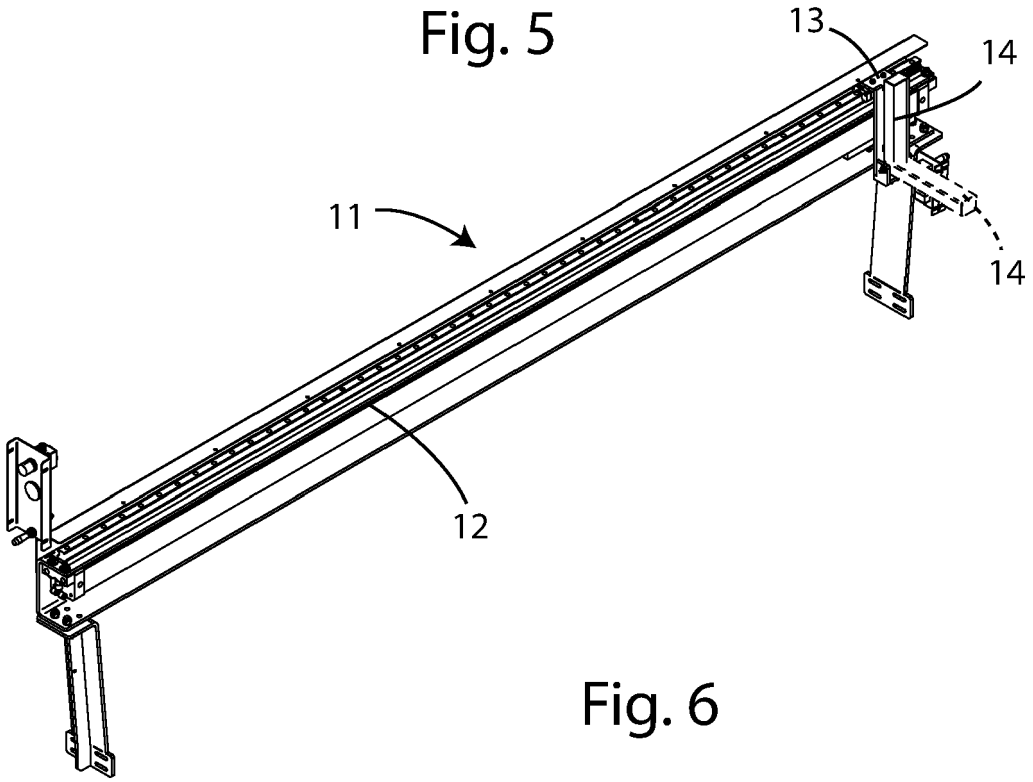

Fig. 6

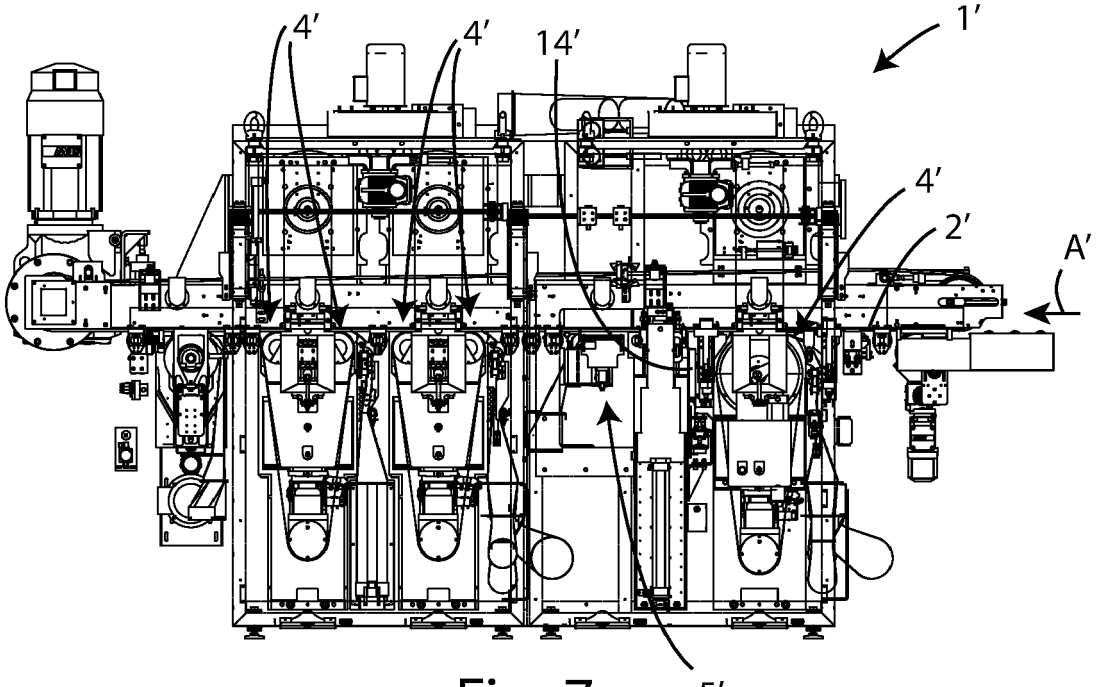

Fig. 7

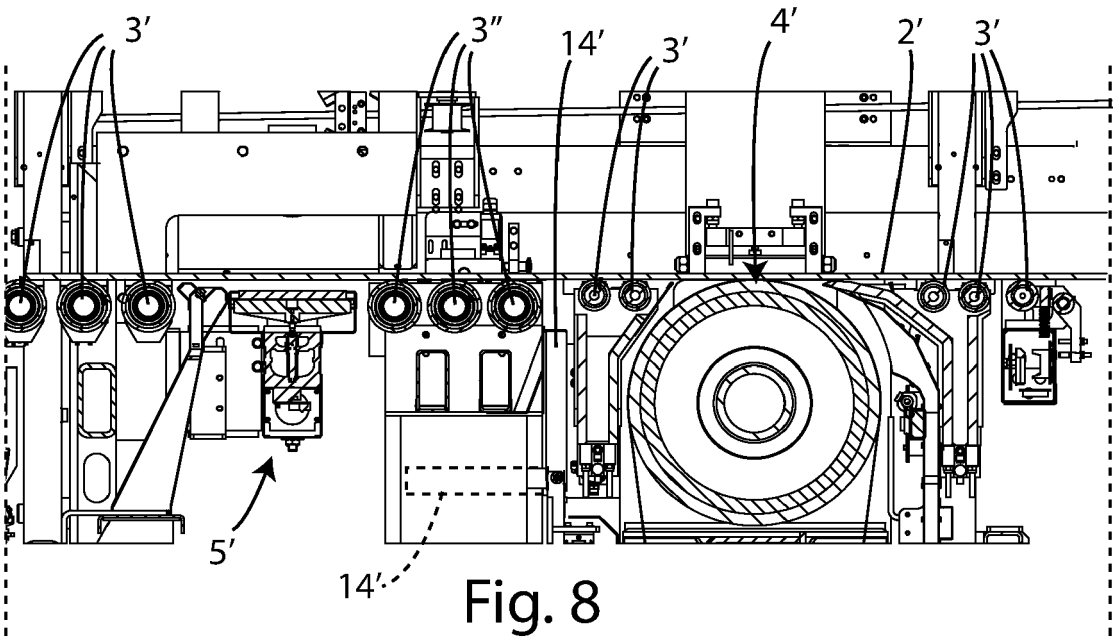

Fig. 8

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 20 21 0045

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	GB 1 332 626 A (ERNST MASCHF GMBH PAUL) 3 October 1973 (1973-10-03) * page 1, line 83 - page 2, line 75; figures 1a,1b,2 * -----	1-9	INV. B24B21/04 B24B21/20 B24B21/18
A	EP 0 980 740 A2 (BENETTI MEYERS INTERNATIONAL S [IT]) 23 February 2000 (2000-02-23) * paragraphs [0046] - [0048]; figures 1-3 * -----	1-9	

TECHNICAL FIELDS SEARCHED (IPC)

B24B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	23 April 2021	Koller, Stefan

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 ON EUROPEAN PATENT APPLICATION NO. EP 20 21 0045

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

23-04-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 1332626 A	03-10-1973	CH 553623 A	13-09-1974
		DE 2136597 A1	01-02-1973
		FR 2146723 A5	02-03-1973
		GB 1332626 A	03-10-1973
		IT 959864 B	10-11-1973
EP 0980740 A2	23-02-2000	AT 283145 T	15-12-2004
		DE 69922095 T2	14-07-2005
		EP 0980740 A2	23-02-2000
		ES 2234191 T3	16-06-2005
		IT SV980046 A1	21-02-2000

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82