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(54) METHOD AND MACHINE FOR PROCESSING PANELS MADE OF WOOD, PLASTIC MATERIAL, GLASS OR THE LIKE

(57) A method and a machine for processing panels (2) made of wood, plastic material, glass or the like, according to which at least one panel (2) is locked on a support surface and is cut by a cutting blade (12); a heating device (13) being provided in order to heat the cutting blade (12) and/or the portion (14) of the panel (2) suited to be cut by the cutting blade (12).

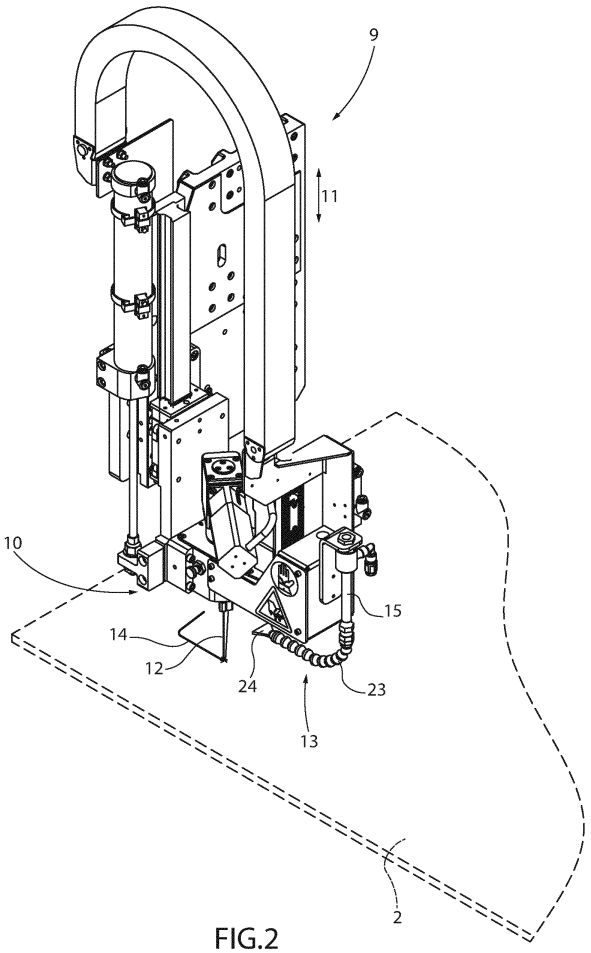

FIG.2

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority from European patent application no. 102021000002372 filed on February 3, 2021.

TECHNICAL FIELD

[0002] The invention relates to a machine for processing panels made of wood, plastic material, glass or the like.

[0003] The invention especially finds advantageous application in the processing of panels made of plastic material, to which explicit reference will be made in the description below without because of this losing in generality.

PRIOR ART

[0004] When dealing with the processing of plastic material panels, a machine is known, which comprises an elongated base, which extends in a first direction and defines a support surface for at least one panel; a locking device to lock the panel on the support surface; and an overhead crane, which extends above the base in a second direction that is transverse to the first direction, is movable along the base in the first direction and is provided with at least one operating head to process the panel.

[0005] The operating head is movable along the overhead crane in the second direction and is provided with an operating unit, which is movable in a third direction that is orthogonal to the aforesaid first and second directions and to the support surface.

[0006] The operating unit supports a cutting blade, which is movable in the third direction in order to engage/disengage the panel.

[0007] Known plastic material panel processing machines of the type described above suffer from some drawbacks, which are mainly due to the fact that, when the plastic material has a relatively high resistance and hardness, the cutting blade can break, the cutting speed must be relatively low and the productivity of the machine is relatively low as well.

SUBJECT-MATTER OF THE INVENTION

[0008] The object of the invention is to provide a machine for processing panels made of wood, plastic material, glass or the like, which is not affected by the aforementioned drawbacks and can be manufactured in a simple and economic fashion.

[0009] According to the invention, there is provided a machine for processing panels made of wood, plastic material, glass or the like as claimed in claims 1 to 7.

[0010] The invention further relates to a method for processing panels made of wood, plastic material, glass or the like.

[0011] According to the invention, there is provided a method for processing panels made of wood, plastic material, glass or the like as claimed in claims 8 to 12.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The invention will now be described with reference to the accompanying drawings showing a non-limiting embodiment thereof, wherein:

figure 1 is a schematic perspective view, with parts removed for greater clarity, of a preferred embodiment of the machine according to the invention;
figure 2 is a schematic perspective view, with parts removed for greater clarity, of a detail of the machine of figure 1; and
figure 3 is a longitudinal section, with parts removed for greater clarity, of a detail of figure 2.

PREFERRED EMBODIMENT OF THE INVENTION

[0013] With reference to figure 1, number 1 indicates, as a whole, a machine for processing panels 2 (figure 2) with a substantially rectangular shape, in this case panels 2 made of a plastic material.

[0014] The machine 1 comprises an elongated base 3, which extends in a horizontal direction 4 and is delimited by a substantially horizontal upper face 5 provided with a plurality of openings 6, which can be connected to a known pneumatic suction device, which is not shown herein.

[0015] The panels 2 are locked on the face 5, in this case, with the interposition of at least one intermediate sheet (not shown), which is commonly referred to as "support panel" and defines a support surface for the panels 2.

[0016] In particular, the panels 2 are locked on the face 5 with the interposition of a relatively stiff first sheet, which is in contact with the face 5, and of a relatively soft second sheet, which defines the support surface for the panels 2.

[0017] The base 3 is engaged in a sliding manner by an overhead crane 7, which extends above the base 3 in a horizontal direction 8 transverse to the direction 4, is movable along the base 3 in the direction 4 and supports at least one operating head 9 to process the panels 2.

[0018] The head 9 is coupled to the overhead crane 7 in a sliding manner so as to move, relative to the overhead crane 7, in the direction 8 and supports an operating unit 10, which is coupled to the head 9 so as to move, relative to the head 9, in a vertical direction 11, which is orthogonal to the directions 4 and 8 and to the aforesaid support surface (which is not shown herein).

[0019] According to figure 2, the unit 10 is provided with a cutting blade 12, which is moved by the overhead crane 7 in the direction 4, by the head 9 in the direction

8 and by the unit 10 in the direction 11.

[0020] The movement of the unit 10 in the direction 11 allows the blade 12 to move between a lowered operating position (figure 2), in which the blade 12 engages the panel 2, and a raised rest position (not shown), in which the blade 12 disengages the panel 2.

[0021] The unit 10 is further provided with a heating device 13 to heat the blade 12 and/or a portion 14 of panel 2 suited to be processed by the blade 12.

[0022] With reference to figure 3, the device 13 comprises, in this case, a vortex tube 15 comprising, in turn, an outlet duct 16, which has a longitudinal axis 17 and is provided with two free ends 18, 19 opposite one another.

[0023] The end 18 is axially open and the end 19 is closed by a distribution valve 20, which is designed to selectively control the air flow fed through the end 19.

[0024] The tube 15 further comprises an inlet duct 21, which has a longitudinal axis 22 transverse to the axis 17, is connected to the duct 16 and is further connected to a known compressed air feeding device, which is not shown herein.

[0025] The duct 21 is obtained in the area of an intermediate point of the duct 16 so that the distance between the end 18 and the duct 21 is smaller than the distance between the end 19 and the duct 21.

[0026] Compressed air is fed, at first, through the duct 21 and, then, in the duct 16 in a tangential manner so as to generate a compressed air flow, which flows towards the end 19 with a helical motion around and along the aforesaid axis 17, thus heating up.

[0027] In the area of the end 19, the flow of heated compressed air is divided into two compressed air flows, one of them being discharged through the valve 20, while the other one is fed again along the duct 16 and, at the end 18, releases its kinetic energy in the form of heat and cools down.

[0028] The device 13 further comprises, in this case, a flexible tube 23, which is connected to the end 19 in order to receive, at the inlet, the heated compressed air fed through the valve 20 and has, in this case, an outlet 24 oriented towards the blade 12.

[0029] According to a variant which is not shown herein, the tube 23 has two outlets 24, one of them being oriented towards the blade 12 and the other one being oriented towards the portion 14.

[0030] According to a further variant which is not shown herein, the tube 23 is eliminated and the heated compressed air discharged through the valve 20 is fed onto the blade 12 and/or onto the portion 14.

[0031] With regard to what discussed above, it should be pointed out that the blade 12 and/or the portion 14 are heated before the processing of the blade 12 and/or during the processing of the blade 12.

[0032] Obviously, according to variants which are not shown herein, the heating device 13 is eliminated and replaced by different heating devices configured to heat the blade 12 and/or the portion 14, such as, for example, infrared light sources, ultrasound sources, magnetic field sources, microwave sources, plasma sources or laser sources.

[0033] The heating device 13 allows the blade 12 and/or the portion 14 to be heated so as to facilitate the cutting of the panel 2. As a consequence, the blade 12 has a relatively high cutting speed and the machine 1 has a relatively high productivity.

Claims

1. - A machine for processing panels (2) made of wood, plastic material, glass or the like, the machine comprising a base (3), which extends in a first direction (4) and defines a support surface for at least one panel (2); an overhead crane (7), which extends above the base (3) in a second direction (8) transverse to the first direction (4) and has at least one operating head (9) provided with a cutting blade (12) for processing the panels (2); and being **characterized in that** it further comprises a heating device (13) to heat the cutting blade (12) and/or a portion (14) of the panel (2) suited to be processed by the cutting blade (12) .

2. - The machine according to claim 1, wherein the overhead crane (7) is movable along the base (3) in the first direction (4) and the operating head (9) is movable along the overhead crane (7) in the second direction (8).

3. - The machine according to claim 1 or 2, wherein the cutting blade (12) is movable in a third direction (11), which is orthogonal so said first and second directions (4, 8) and to the support surface.

4. - The machine according to any one of the preceding claims and further comprising a locking device to lock the panel (2) on the support surface.

5. - The machine according to claim 4, wherein the locking device comprises a plurality of openings (6), which are obtained in the base (3) and can be connected to a pneumatic suction device.

6. - The machine according to any one of the preceding claims, wherein the heating device (13) comprises at least one vortex tube (15) provided with an inlet (21) to receive compressed air and with at least one outlet (20; 24) oriented so as to release heated compressed air onto the cutting blade (12) and/or onto the portion (14) of the panel (2).

7. - The machine according to claim 6, wherein the heating device further comprises a tube (23) connected to the vortex tube (15) and provided with a first outlet (24), which is oriented towards the cutting

blade (12), and with a second outlet (24), which is oriented towards the portion (14) of the panel (2) suited to be processed by the cutting blade (12).

8. - A method for processing panels (2) made of wood, plastic material, glass or the like in a machine comprising a base (3), which extends in a first direction (4) and defines a support surface for at least one panel (2); an overhead crane (7), which extends above the base (3) in a second direction (8) transverse to the first direction (4) and has at least one operating head (9) provided with a cutting blade (12) for processing the panels (2); the method being **characterized in that** it comprises the step of:
heating, in particular by means of a flow of heated compressed air, the cutting blade (12) and/or a portion (14) of the panel (2) suited to be processed by the cutting blade (12) .

9. - The method according to claim 8, wherein the cutting blade (12) and/or the portion (14) of the panel (2) suited to be processed by the cutting blade (12) are heated before processing the portion (14) itself.

10. - The method according to claim 8 or 9, wherein the cutting blade (12) and/or the portion (14) of the panel (2) suited to be processed by the cutting blade (12) are heated during the processing of the portion (14) itself.

11. - The method according to any one of the claims from 8 to 10 and further comprising the steps of:

moving the overhead crane (7) along the base (3) in the first direction (4); and
moving the operating head (9) along the overhead crane (7) in the second direction (8).

12. - The method according to any one of the claims from 8 to 11 and further comprising the step of:
moving the cutting blade (12) in a third direction (11), which is orthogonal to said first and second directions (4, 8) and to the support surface, so as to engage/disengage the cutting blade (12) in/from the panel (2).

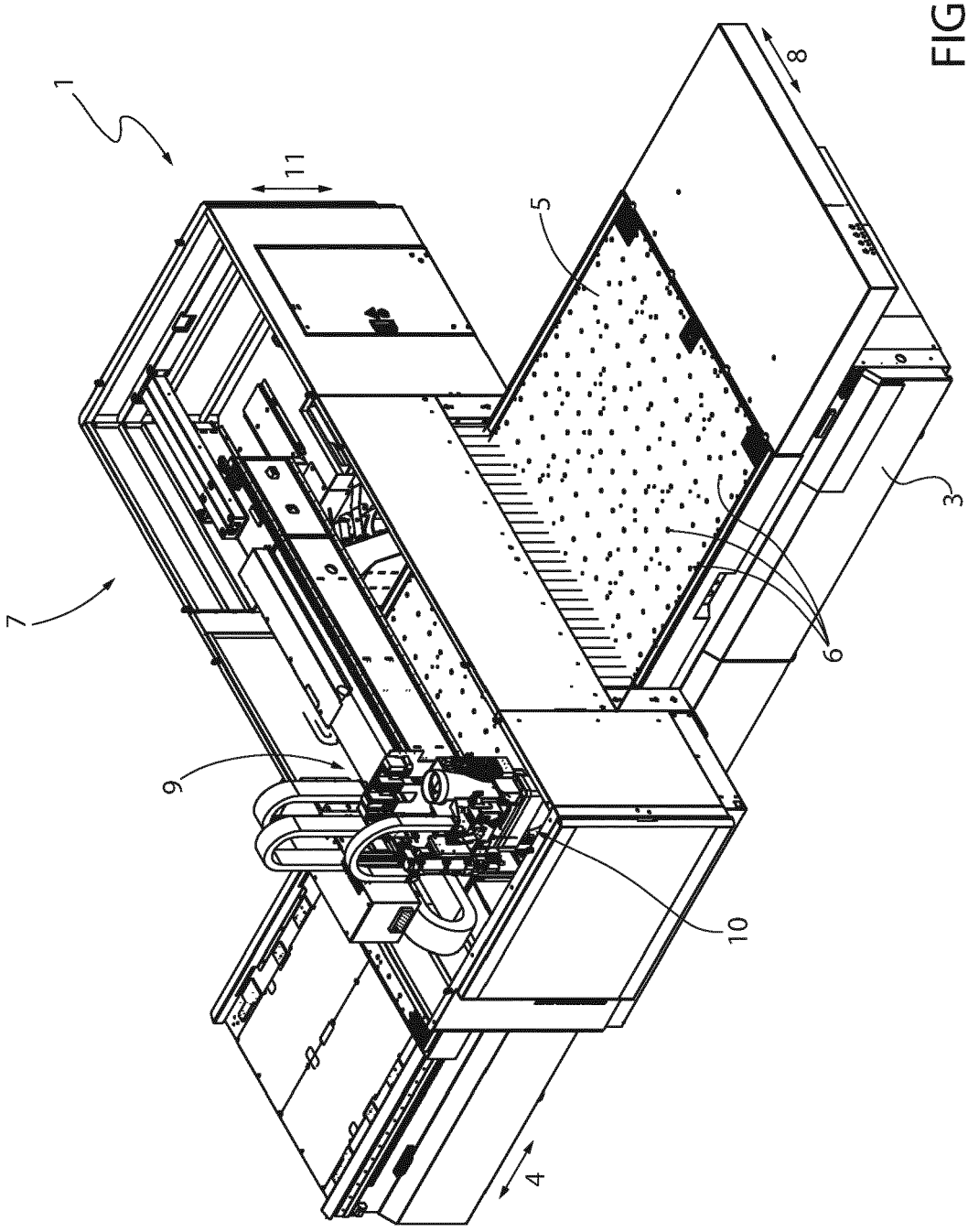

FIG.1

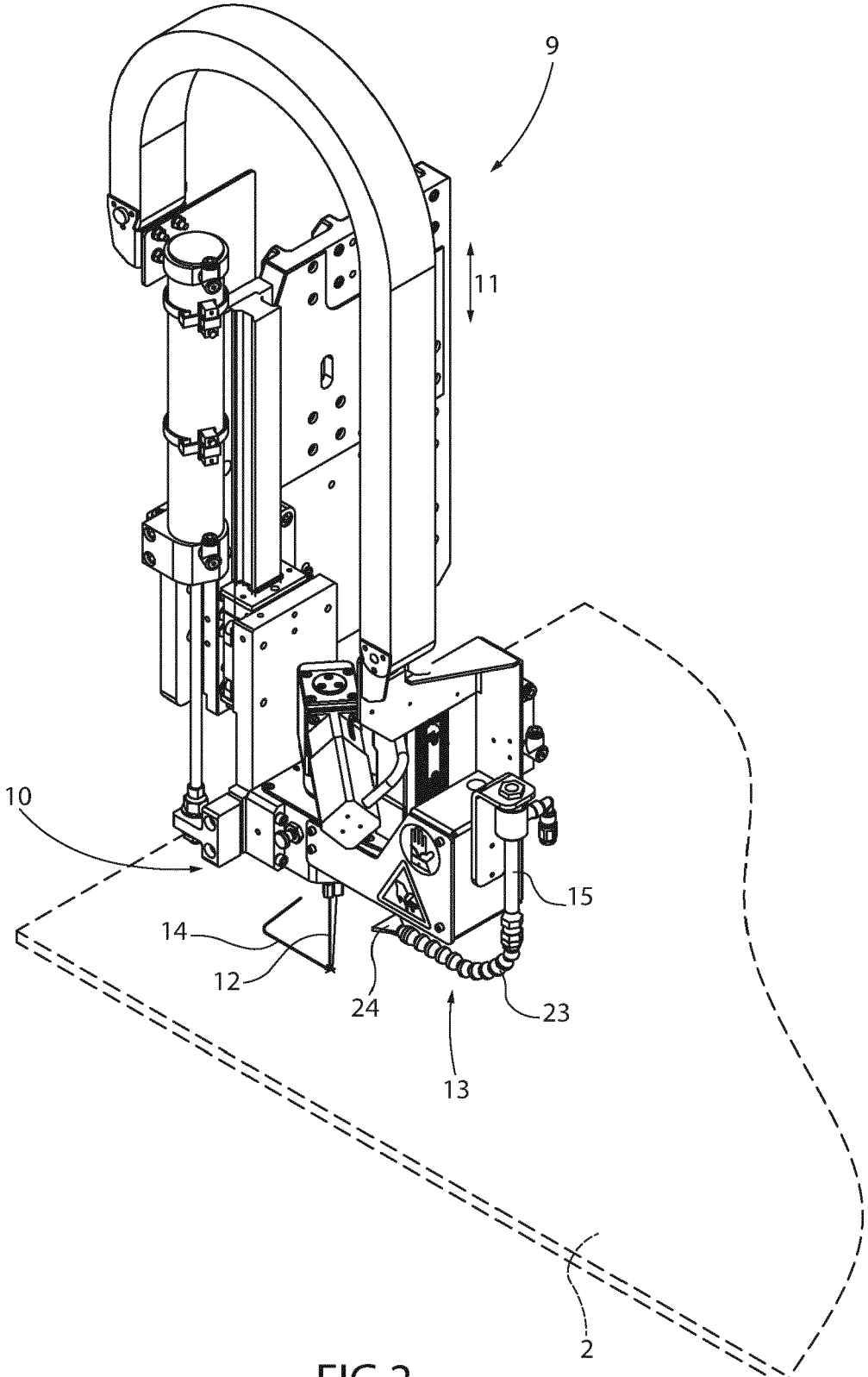

FIG.2

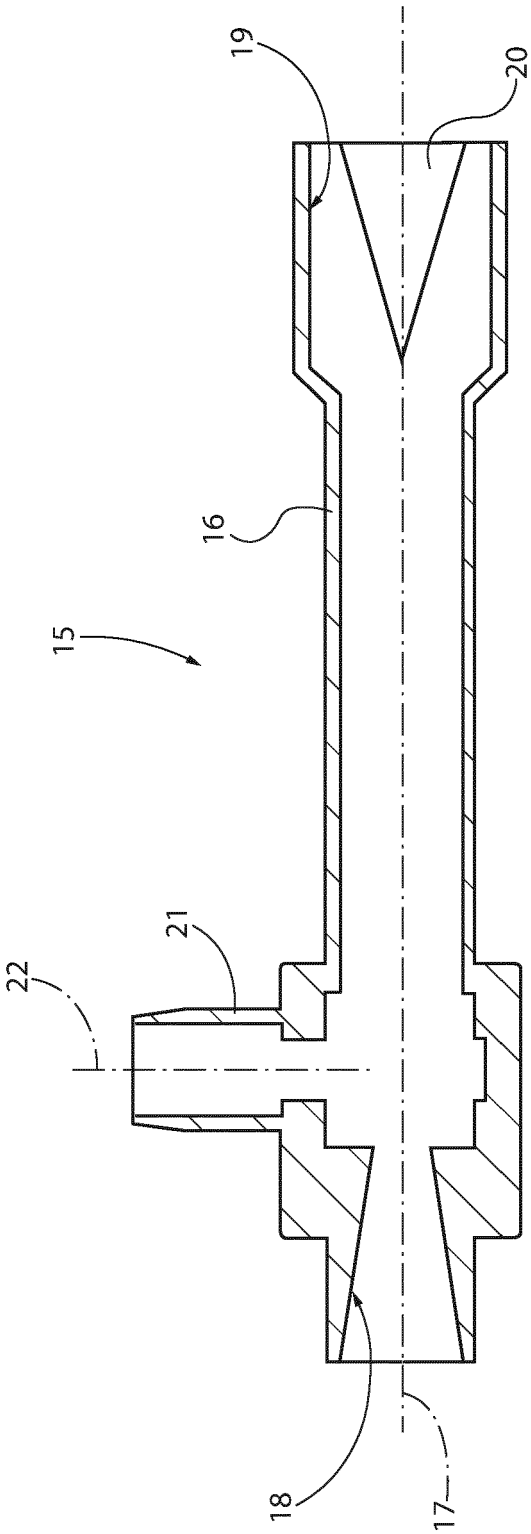

FIG.3

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EUROPEAN SEARCH REPORT

Application Number
EP 22 15 5074

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 A	KR 101 923 344 B1 (HAN CHEONG SU [KR]) 28 November 2018 (2018-11-28) * figure 3 * * paragraphs [0006], [0024], [0030], [0035], [0036], [0039], [0044] *	1-5,8-12 6,7	INV. B23Q11/00 B23Q11/14 B27M1/08
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TECHNICAL FIELDS SEARCHED (IPC)

B23Q
B27M

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	24 May 2022	Schmitt, Michel

CATEGORY OF CITED DOCUMENTS

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24-05-2022

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

REFERENCES CITED IN THE DESCRIPTION

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