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

(11) **EP 4 124 430 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
01.02.2023 Bulletin 2023/05

(21) Application number: **22185105.8**

(22) Date of filing: **15.07.2022**

(51) International Patent Classification (IPC):
B27D 5/00 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B27D 5/003

(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
Designated Validation States:
KH MA MD TN

(30) Priority: **28.07.2021 IT 202100020090**

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

(72) Inventors:
- **COLTRO, Davide**
47921 RIMINI (IT)
- **CONCONI, Roberto**
47921 RIMINI (IT)

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

(54) EDGE BANDING MACHINE FOR THE EDGE BANDING OF A LATERAL SURFACE OF A WORKPIECE AND RELATIVE EDGE BANDING METHOD

(57) The present invention relates to an edge banding machine (1) for the edge banding of at least one lateral surface or edge (B) of a workpiece (P), such as a panel made of wood, metal, glass, ceramic, fiberglass, plastic and the like with an edge banding tape, comprising a pressing unit (4), to press an edge banding tape on said edge (B) of said workpiece (P), at least one sensor (6), to detect the actual thickness value of said edge banding tape before its application by said pressing unit (4) and a logic control unit (8) connected to said at least one sensor (6) and comprising storing means to store one or more nominal thickness values of said edge banding tape, said edge banding machine (1) comprising at least one machining group (7), for machining said edge (B), placed before said pressing unit (4) and connected to said logic control unit (8), and in that said logic control unit (8) is configured to send a signal to said at least one machining group (7) to machine said edge (B) if said actual thickness value differs from said one or more nominal thickness values, in such a way to compensate for said thickness difference of said edge banding tape.

The present invention also relates to an operation method of said the edge banding machine (1).

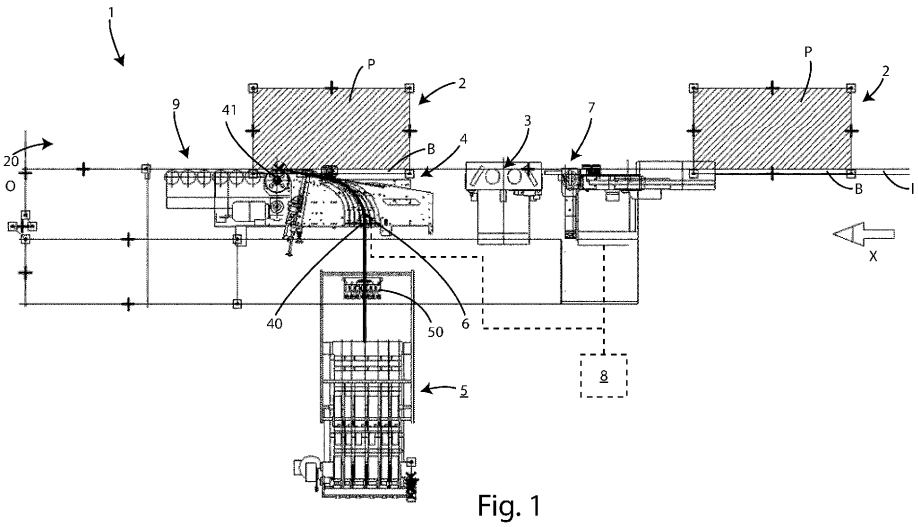

Fig. 1

EP 4 124 430 A1

Description

[0001] The present invention relates to an edge banding machine for edge-edging at least one side surface of a workpiece.

[0002] The present invention also relates to a relative edge banding method.

Field of the invention

[0003] More in detail, the invention relates to an edge banding machine of the above type, for applying a decorative edge to a panel made of wood, metal, ceramic, plastic, glass, fiberglass, and the like, in such a way that the final edge-banded panel has a homogeneous thicknesses in every point.

[0004] In the following the description will be directed to an edge banding machine for wooden panels and the like.

[0005] However, it is clear that the description itself should not be considered limited to this specific use.

Prior art

[0006] As is well known, there are currently edge banding machines for wooden panels used for finishing the surface machining of such panels by applying a decorative edge. The decorative edges are usually edge banding tapes made of plastic, wood, or metal, supplied in reels or strips.

[0007] Known edge banding machines usually comprise a sliding support surface, on which a panel comprising a lateral surface, or edge, to be edge banded is arranged and made to slide. This sliding plane is usually equipped with at least one abutment element, to keep said panel in position.

[0008] Furthermore, said known types of edge banding machines comprise an edge banding station arranged in correspondence with one side of said sliding support plane.

[0009] The edge banding station comprises, in turn, a spreading unit, for applying the glue on said lateral surface to be coated while said panel flows, a reel of edge banding tape, and a pressing unit, comprising pressing rollers, arranged downstream of the spreading unit, to make the edge banding tape adhere to said glued side surface.

[0010] Such edge banding machines of the prior art also comprise cutters, arranged downstream of the edge banding station, for cutting and rounding the excesses of the previously applied edge banding tape.

[0011] However, due to the possible variability in the thickness of the edge banding tapes, the panel leaving the edge banding machines of the prior art may have edges with non-homogeneous thicknesses. This involves the production of panels with aesthetic defects and the potential waste of such panels.

[0012] In particular, the variability in thickness can be present inside an edge banding tape belonging to the same reel or in edge banding tapes belonging to different reels used to cover the side surface of a single panel.

[0013] In order to overcome this problem, edge banding machines have been proposed, in which the edge banding station is provided with a sensor for detecting the thickness of the edge banding tape before its application and milling means, for milling the portions of said edge banding tape having thicknesses greater than a predetermined threshold.

[0014] However, not all edge banding tapes can be milled without being damaged.

[0015] Furthermore, in case of the sensor is affected by a measurement error, these machines of the prior art will produce non-homogeneous panels, which will be subsequently discarded.

Scope of the invention

[0016] In light of the above, it is therefore an object of the present invention to provide an edge banding machine, which overcomes the disadvantages of the prior art.

[0017] In particular, the object of the present invention is to provide an edge banding machine that is capable of producing panels with homogeneous edges, regardless of the type of edge banding tapes used.

[0018] A further object of the present invention is to provide an edge banding machine that is capable of reducing the number of rejected panels.

[0019] Still, the object of the present invention is to provide an edge banding machine that is safe, relatively simple to manufacture, and has competitive costs if compared to the prior art.

[0020] Finally, the object of the present invention is to provide a method for applying an edge to a panel by means of such a machine.

Object of the invention

[0021] It is, therefore, specific object of the present invention an edge banding machine for the edge banding of at least one lateral surface or edge of a workpiece, such as a panel made of wood, metal, glass, ceramic, fiberglass, plastic and the like with an edge banding tape, comprising a pressing unit, to press an edge banding tape on said edge of said workpiece, at least one sensor, to detect the actual thickness value of said edge banding tape before its application by said pressing unit and a logic control unit connected to said at least one sensor and comprising storing means to store one or more nominal thickness values of said edge banding tape, said edge banding machine comprising at least one machining group, for machining said edge, placed before said pressing unit and connected to said logic control unit, and said logic control unit is configured to send a signal to said at least one machining group to machine said edge if said actual thickness value differs from said one

or more nominal thickness values, in such a way to compensate for said thickness difference of said edge banding tape.

[0022] Further according to the invention, said logic control unit is configured to send an alarm signal if the number of actual thickness values different from said one or more nominal thickness values of said edge banding tape is greater than a predetermined number.

[0023] Still according to the invention, said edge banding machine comprises a resting plane, to support said workpiece, said resting plane comprising moving means to move said workpiece in a sliding area along a direction, from an entry position towards an exit position, a spreading unit, placed in said sliding area, to spread, while in use, an adhesive substance of a predetermined thickness on said edge of said workpiece, said pressing unit is placed in said sliding area after said spreading unit, with respect to said entry position, and it comprises an entry for said edge banding tape and pressing means to press, while in use, said edge banding tape on said edge of said workpiece, and said at least one sensor is placed at said entry or before said entry.

[0024] Preferably according to the invention, said edge banding machine comprises a tape feeding unit comprising at least one reel or slats of said edge banding tape, and sliding means, for sliding said edge banding tape towards said pressing unit.

[0025] Always according to the invention, said logic control unit is configured to start a recalibration procedure of said at least one sensor, at each start of said edge banding machine.

[0026] Furter according to the invention, said logic control unit is configured to write the actual thickness values different from said one or more nominal thickness values of said edge banding tape in said storing means and to associate to each edge banding tape the number of actual thickness values different from said one or more nominal thickness values.

[0027] Still according to the invention, said at least one sensor is an electronic caliper, and/or a laser sensor, and/or an ultrasound sensor, and/or an inductive sensor.

[0028] Preferably according to the invention, said alarm signal is a signal of block of said edge banding machine, and/or an acoustic signal, and/or a light signal, and/or a tactile signal and/or a video signal which can be displayed on a screen comprised in said edge banding machine.

[0029] Always according to the invention, said alarm signal can be sent to remote devices such as tablets or smartphones or smartwatches or cloud.

[0030] Further according to the invention, said edge banding machine comprises a further machining group for machining said workpiece after the pressing of said edge banding tape.

[0031] It is further object of the present invention an edge banding method for the edge banding of at least one lateral surface or edge of a workpiece, such as a panel made of wood, glass, ceramic, metal, fiberglass, plastic and the like with an edge banding tape, wherein said edge banding tape is pressed onto said edge of said workpiece by pressing means of a pressing unit, said method comprising the following steps:

A. reading at least one nominal thickness values of said edge banding tape stored in said storing means;
B. detecting an actual thickness value of said edge banding tape;
C. comparing said actual thickness value with said nominal thickness value; and
D. sending a signal if said actual thickness value differs from said nominal thickness value.

[0032] Further according to the invention, if said actual thickness value differs from said nominal thickness value within a predetermined threshold, said method comprises the following step:

E. sending a signal to at least one machining group to machine said edge of said workpiece before the application of said edge banding tape, in such a way to compensate for said thickness difference of said edge banding tape.

[0033] Still according to the invention, after said step D., a recalibration step of said at least one sensor is provided for.

[0034] Preferably according to the invention, said method comprises a writing step of said actual thickness values different from said nominal thickness values in said memorization means.

[0035] Finally, according to the invention, if the number of actual thickness values different from said nominal thickness values is greater than a predetermined number, a further signal sending step is provided for.

Brief description of the figures

[0036] 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 schematic view of an edge banding machine according to the present invention.

Detailed description

[0037] With reference to figure 1, an edge banding machine 1 according to the present invention can be seen.

[0038] In particular, this edge banding machine 1 is a pass-through machine and is capable of applying an edge banding or covering tape to edge band at least one side surface or edge B of a workpiece P, such as a panel made of wood, metal, glass, ceramic, metal, fiberglass, plastic and the like by means of an edge banding tape.

[0039] Specifically, the edge banding machine 1 comprises a support surface 2, sliding in a sliding area 20, to support the piece P to be edge banded and making it slide in the sliding area 20 along a direction X, from an

entry position I, towards an outlet position O.

[0040] Said edge banding machine 1 also comprises a machining group 7, for machining said edge B, arranged in the sliding area 20.

[0041] Said edge banding machine 1 also comprises a spreading unit 3, arranged in the sliding area 20, downstream of the machining group 7, with respect to said inlet position I, to spread, in use, an adhesive substance of a predetermined thickness on the edge B.

[0042] Said edge banding machine 1 also comprises a pressing unit 4, arranged in the sliding area 20 downstream of the spreading unit 3 with respect to said inlet position I, to press an edge banding tape on the edge B of the piece P after its spreading.

[0043] Said edge banding machine 1 also comprises a tape feeding unit 5, or magazine, which comprises at least one reel or strips of edge banding tape, to feed the pressing unit 4.

[0044] Said edge banding machine 1 also comprises a sensor 6, arranged between the tape feeding unit 5, and the pressing unit 4, to detect the actual thickness of the edge banding tape, before said edge banding tape is applied to the edge B of the panel P by the pressing unit 4.

[0045] Said edge banding machine 1 also comprises a logic control unit 8, connected to the sensor 6 and to the machining group 7 and comprising storage means for memorizing one or more nominal thickness values of said edge banding tape.

[0046] Said edge banding machine 1 also comprises a further machining group 9, to carry out further machining, such as finishing the edge B of the newly coated panel P, arranged in the sliding area 20 downstream of the pressing unit 4, with respect to said position input I.

[0047] In an embodiment (not shown) the edge banding machine 1 can comprise only the pressing unit 4, the sensor 6, and the logic control unit 8, in this case, connected only to the sensor 6, while the other elements can be connected to this edge banding machine 1, for example being part of other machines, or not be present at all.

[0048] In a further embodiment (not shown) an edge banding machine 1 can comprise the pressing unit 4, the sensor 6, and the logic control unit 8 and at least one of the further elements of figure 1.

[0049] In another form embodiment (not shown) the edge banding machine 1 can also comprise display or alarm means connected to the control unit 8, such as, for example, a screen, a light, or a loudspeaker, for the reasons better illustrated below.

[0050] Finally, in an embodiment (not shown), the edge banding machine 1 can also comprise measuring means connected to the control unit 8, to measure the dimensions of the edge B of said panel, as better illustrated below.

[0051] Referring now to the embodiment of figure 1, the support plane 2 is slidingly coupled to tracks (not shown) arranged parallel to the X direction

[0052] . Furthermore, the support plane 2 is connected to motor means (not shown), to the sliding, in use, of said support plane 2 on said tracks along the direction X. This sliding takes place at a predetermined first speed v_x.

[0053] Finally, the support plane 2 can comprise abutment elements (not shown), to keep the panel P in position so that the edge B can be worked by the spreading unit 3 and by the pressing unit 4 and possibly by the machining group 7 and 9, as better illustrated below.

[0054] These abutment elements can be movable and/or adapt to the dimensions of the panel P, so that the edge banding machine 1 is capable of edge banding workpieces of different sizes and shapes. In this case, said abutment elements can be configured to abut with the two ends of the edge B to be covered with the edge banding tape. Furthermore, said abutment elements can be equipped with said measuring means (for example position sensors), in such a way as to be able to measure the total length of the edge B to be edge banded, and provide indications of the relative position of said edge B in the sliding area 2.

[0055] Before the edge banding of the panel P, the support surface 2 is usually arranged upstream of the spreading unit 3, with respect to said inlet position I.

[0056] Therefore, during use, the panel P to be edge banded is placed on the support surface 2, with the edge B to be coated facing towards the spreading unit 3, the pressing unit 4, and the machining group 7 and 9. Therefore, when the edge banding machine 1 is operated, the support surface 2 moves along the direction X with said predetermined first speed v_x, meeting, in sequence, the machining group 7, the spreading unit 3, the pressing unit 4, and the further machining group 9.

[0057] The spreading unit 3 generally comprises feeding means for the adhesive substance and an edge banding roller connected to the feeding means, for receiving a quantity of an adhesive substance from the respective feeding means.

[0058] The roller is made in such a way as to be able to retain a predetermined quantity of adhesive substance and spread it, with said predetermined thickness, rotating on the edge B, under the action of the friction force exerted by the edge B on the roller 3 due to the movement of the panel P along the X direction. The adhesive substance is usually glue.

[0059] The pressing unit 4 comprises an inlet 40 for the edge banding tape, and pressing means 41 for pressing, in use, the edge banding tape on the edge B of the panel P. In particular, in the embodiment of figure 1, the inlet 40 receives the already taut tape from the tape feeding unit 5. Said edge banding tape is then diverted, for example by guides, towards the pressing means 41.

[0060] The pressing means 41 can comprise a pressure roller, to exert a pressure on the edge banding tape so that the latter adheres to edge B of the panel.

[0061] In one embodiment, said pressing means 41 can comprise a plurality of pressure rollers arranged in series, so as to exert an optimal pressure of the edge banding tape on the edge B of the panel P.

[0062] The tape feeding unit 5, or magazine, can comprise at least one housing (not shown), for housing at least one reel or strips of edge banding tape.

[0063] The tape feeding unit 5 also comprises sliding means 50, for the sliding of said edge banding tape towards the inlet 40 of the pressing unit 4. This sliding takes place at a predetermined second speed v_2.

[0064] Therefore, being known the inlet position I of the panel P in the sliding area 20, the initial size of the panel P, the first sliding speed v_x of the panel P along the X direction, the path of the edge banding tape towards the pressing means 41, and the second speed v_2, it is possible to accurately calculate the portion of the edge banding tape that will be applied to any point of said edge B.

[0065] The sensor 6 can be any sensor capable of measuring the thickness in a precise manner, and in particular an electronic gauge, and/or an inductive sensor, and/or a laser sensor, and/or an ultrasonic sensor.

[0066] However, the electronic gauge is preferable as it has a low cost compared to the other sensors available.

[0067] With reference to the embodiment of figure 1, the sensor 6 is arranged at the inlet 40 for the edge banding tape. In this way, it is possible to make a precise measurement of the thickness of the edge banding tape, since the measurement is made on the already taut edge banding tape.

[0068] Furthermore, by carrying out the measurement of the thickness of the edge banding tape in a position sufficiently distant from the pressing means 41, this advantageously allows sufficient time to be available to detect a difference in the thickness of the edge banding tape itself.

[0069] In this case, it would be possible to implement point correction mechanisms in the area of the edge B, in which this portion of the edge banding tape will be applied without having to stop the edge banding machine 1, as better illustrated below.

[0070] However, in one embodiment, the sensor 6 can be arranged at any point between the tape feeding unit 5 and the pressing means 41.

[0071] The machining group 7 is, as mentioned, arranged upstream of the spreading unit 3 and of the pressing unit 4, with respect to the inlet position I. In particular, the machining group 7 comprises cutters or other cutting means, to remove material from the edge B with a predetermined precision.

[0072] The control unit 8 comprises, as mentioned, the storage means for storing one or more nominal thickness values of the edge banding tape present in the tape feeding unit 5. In particular, said one or more nominal thickness values can be manually inserted by an operator when the edge banding tape is changed in the tape feeding unit 5. For example, this manual insertion can take place by means of an acquisition device connected to the control unit 8. Alternatively, the edge banding machine 1 can comprise a reader (not shown), such as, for example, a bar code reader, to identify the edge banding tape inserted inside the tape feeding unit 5 by means of at least a given identification of the relative bar code. In this case, the control unit 8 can be configured to connect to a database containing said at least one identifier and said one or more nominal thickness values of the edge banding tape associated with said at least one identifier, so as to storing said one or more nominal thickness values in said storage means when the edge banding tape is changed in the tape feeding unit 5. Preferably, in this case, said reader is arranged at the tape feeding unit 5, so as to be able to insert the reel or strips of the edge banding tape and to identify them with said reader in a single point of the machine 1.

[0073] The control unit 8 is configured to receive the actual value of the thickness measured by said at least one sensor 6, to detect any deviation of said actual thickness value measured with respect to said one or more nominal thickness values, and, send an alarm signal if the detected deviation is greater than a predetermined threshold.

[0074] In this way, it is possible to signal the presence of macroscopic defects in the edge banding tape.

[0075] The predetermined threshold can be stored in the storage means or calculated starting from the value of the nominal thickness during use.

[0076] The alarm signal can be a signal sent to said display or alarm means, so as to warn the operator of the deviation of the nominal thickness from said predetermined threshold.

[0077] In particular, the alarm signal can be an acoustic signal, a light signal, and/or a video signal, which can be displayed on said screen.

[0078] Following the sending of the alarm signal by the control unit 8, the edge banding machine 1 can stop, so as to allow the operator to replace the defective beading tape reel or strips.

[0079] In this case, the control unit 8 can also be configured to send a signal to start a recalibration procedure of the sensor 6. In fact, too great a deviation of the actual thickness of the edge banding tape with respect to its nominal thickness can be connected either to a particularly defective reel of the edge banding tape, or to a measurement error due to the sensor 6 itself. By way of example, the recalibration procedure can take place automatically, or semi-automatically, using a calibration tape of known thickness, arranged in correspondence with said sensor 6.

[0080] The control unit 8 can also be configured to write to the storage means the actual thickness values of the edge banding tape that differ from the nominal thickness values.

[0081] In particular, said logic control unit 8 is capable of writing in the storage means the actual thickness values different from the nominal thickness values, and it is able to associate to each edge banding tape the number of actual thickness values different from said one or more thickness nominal values.

[0082] In this way, it is possible to give an indication to

the operator if a batch of edge banding tape reels turns out to be particularly defective.

[0083] In particular, it is also possible to associate the number of actual thickness values different from nominal values to groups of reels or strips of edge banding tape produced by certain manufacturers/suppliers, in order to track the quality of the edge banding tapes, also associated to producers/suppliers to have a producers/suppliers ranking.

[0084] Furthermore, the control unit 8 can be configured to identify the number of actual thickness values of said edge banding tape that differ from its nominal thickness value. In particular, the control unit 8 can update a counter that relates to the number of actual values of measured different thicknesses. If this number is greater than a predetermined number, the control unit 8 can be configured to send a further alarm signal. This counter/further alarm signal also advantageously makes it possible to identify whether a batch of edge banding tape reels is particularly defective.

[0085] In case of the actual thickness value of the edge banding tape differs from the relative nominal thickness value by a value less than, or equal to said predetermined threshold, but in any case greater than zero, the control unit 8 of the machine 1 is also configured for sending a signal to the machining group 7 to work the edge B, in such a way as to compensate for said thickness difference of said edge banding tape. Specifically, the control unit 8 can be configured to consider this difference greater than zero if its module is greater than the machining accuracy of the machining group 7.

[0086] In particular, the control unit 8 of the machine 1 is configured to receive the relative position of said panel P in the sliding area 20, read the first speed v_x, the second speed v_2, the dimensions of the panel P and the distance of the portion of the edge banding tape measured by the sensor 6 with respect to the pressing means 41, in such a way as to be able to send said signal to the machining group 7 for machining the portion of the edge B that will be coated with the portion of the measured edge banding tape.

[0087] Finally, the further machining group 9 is configured for machining the piece P after pressing said edge banding tape. This further machining group can also comprise cutters or other cutting means and allows the edge B of the newly coated panel P to be finished.

[0088] The operation of the machine 1 according to the present invention for the edge banding of an edge B of a panel P, such as a panel P made of wood, glass, ceramic, metal, fiberglass, plastic, and the like by means of an edge banding tape, takes place as described below.

[0089] A panel P having an edge B is placed on said support plane 2, in said inlet position I.

[0090] The support plane 2 advances along the direction X, from said inlet position I towards the outlet position O.

[0091] Said control 8 carries out the following steps:

A. reads a nominal thickness value of said edge banding tape stored in storage means;

B. detects the actual thickness value of said edge banding tape, by means of said sensor 6;

C. compares said actual thickness value with said thickness nominal value; and

D. if said thickness actual value differs from said thickness nominal value in addition to a predetermined threshold, it sends an alarm signal.

[0092] On the other hand, if said effective thickness value differs from said nominal thickness value within said predetermined threshold, said control unit 8 can perform the following step:

E. sends a signal to said machining group 7, to work the edge B of said panel P before the application of said adhesive material and of said edge banding tape, in such a way as to compensate for said difference in thickness of said edge banding tape.

[0093] Furthermore, after said step D., a recalibration step of the sensor 6 can be provided.

[0094] Furthermore, such a method can comprise a step of writing said actual thickness values different from said nominal thickness value in said storage means. In addition, or alternatively, if said effective thickness values different from said nominal thickness value are greater than a predetermined number, a step for sending a further alarm signal can be provided.

[0095] In the foregoing, the preferred embodiments have been described and variants of the present invention have been suggested, but it is to be understood that those skilled in the art will be able to make modifications and changes without thereby departing from the relative scope of protection, as defined by the claims attached.

Advantages

[0096] The edge banding machine 1 just described and the relative method advantageously allow to detect the presence of macroscopic defects in the edge banding tapes, before their application, so as to avoid the production of defective panels, thus reducing possible waste production.

[0097] Furthermore, this edge banding machine 1 and the method of operation allow to signal the presence of particularly defective batches of edge banding tapes, thanks to the memorization of the data relating to the defects of said tapes.

[0098] Furthermore, this edge banding machine 1 and the relative method allow avoiding the production of defective panels even in the case, in which measurement errors occur by the sensor 6 itself, the possibility of recalibration of the sensor 6 itself being provided. This further reduces the waste of the produced panels P.

[0099] Moreover, in the case of non-macroscopic defects of the edge banding tape, the edge banding machine 1 and the relative method advantageously allow compensating for these defects, by means of the targeted

machining of the edge B of the panel before the application of the portion of the defective edge banding tape, in in such a way as to produce panels with homogeneous edges.

Claims

1. Edge banding machine (1) for the edge banding of at least one lateral surface or edge (B) of a workpiece (P), such as a panel made of wood, metal, glass, ceramic, fiberglass, plastic, and the like with an edge banding tape, comprising

   a pressing unit (4), to press an edge banding tape on said edge (B) of said workpiece (P),
   at least one sensor (6), to detect the actual thickness value of said edge banding tape before its application by said pressing unit (4) and
   a logic control unit (8) connected to said at least one sensor (6) and comprising storing means to store one or more nominal thickness values of said edge banding tape, said edge banding machine (1) being **characterized**
   in that it comprises at least one machining group (7), for machining said edge (B), placed before said pressing unit (4) and connected to said logic control unit (8), and
   in that said logic control unit (8) is configured to send a signal to said at least one machining group (7) to machine said edge (B) if said actual thickness value differs from said one or more nominal thickness values, in such a way to compensate for said thickness difference of said edge banding tape.

2. Edge banding machine (1) according to the previous claim, **characterized in that** said logic control unit (8) is configured to send an alarm signal if the number of actual thickness values different from said one or more nominal thickness values of said edge banding tape is greater than a predetermined number.

3. Edge banding machine (1) according to any one of the previous claims, **characterized**

   in that it comprises a support plane (2), to support said workpiece (P), said support plane (2) comprising moving means to move said workpiece (P) in a sliding area (20) along a direction (X), from an entry position (I) towards an exit position (O),
   in that it comprises a spreading unit (3), placed in said sliding area (20), to spread, while in use, an adhesive substance of a predetermined thickness on said edge (B) of said workpiece (P),
   in that said pressing unit (4) is placed in said sliding area (20) after said spreading unit (3), with respect to said entry position (I), and it comprises an entry (40) for said edge banding tape and pressing means (41) to press, while in use, said edge banding tape on said edge (B) of said workpiece (P), and
   in that said at least one sensor (6) is placed at said entry (40) or before said entry (40).

4. Edge banding machine (1) according to any one of the previous claims, **characterized in that** it comprises a tape feeding unit (5) comprising at least one reel or slats of said edge banding tape, and sliding means (50), for sliding said edge banding tape towards said pressing unit (4).

5. Edge banding machine (1) according to any one of the previous claims, **characterized in that** said logic control unit (8) is configured to start a recalibration procedure of said at least one sensor (6), at each start of said edge banding machine (1).

6. Edge banding machine (1) according to any one of the previous claims, **characterized in that** said logic control unit (8) is configured to write the actual thickness values different from said one or more nominal thickness values of said edge banding tape in said storing means and to associate to each edge banding tape the number of actual thickness values different from said one or more nominal thickness values.

7. Edge banding machine (1) according to any one of the previous claims, **characterized in that** said at least one sensor (6) is an electronic caliper, and/or a laser sensor, and/or an ultrasound sensor, and/or an inductive sensor.

8. Edge banding machine (1) according to any one of the previous claims, **characterized in that** said alarm signal is a signal of block of said edge banding machine (1), and/or an acoustic signal, and/or a light signal, and/or a tactile signal and/or a video signal which can be displayed on a screen comprised in said edge banding machine (1).

9. Edge banding machine (1) according to any one of the previous claims, **characterized in that** said alarm signal can be sent to remote devices such as tablets or smartphones or smartwatches or cloud.

10. Edge banding machine (1) according to any one of the previous claims, **characterized in that** it comprises a further machining group (9) for machining said workpiece (P) after the pressing of said edge banding tape.

11. Edge banding method for the edge banding of at least one lateral surface or edge (B) of a workpiece

(P), such as a panel made of wood, glass, ceramic, metal, fiberglass, plastic and the like with an edge banding tape, wherein said edge banding tape is pressed onto said edge (B) of said workpiece (P) by pressing means (41) of a pressing unit (4), said method comprising the following steps:

A. reading at least one nominal thickness values of said edge banding tape stored in said storing means;
B. detecting an actual thickness value of said edge banding tape;
C. comparing said actual thickness value with said nominal thickness value; and
D. sending a signal if said actual thickness value differs from said nominal thickness value.

12. Method according to the previous claim, **characterized in that** if said actual thickness value differs from said nominal thickness value within a predetermined threshold, said method comprises the following step:
E. sending a signal to at least one machining group (7) to machine said edge (B) of said workpiece (P) before the application of said edge banding tape, in such a way to compensate for said thickness difference of said edge banding tape.

13. Method according to any one of claims 11 or 12, **characterized in that**, after said step D., a recalibration step of said at least one sensor (6) is provided for.

14. Method according to any one of claims 11 - 13, **characterized in that** it comprises a writing step of said actual thickness values different from said nominal thickness values in said memorization means.

15. Method according to any one of claims 11 - 14, **characterized in that** if the number of actual thickness values different from said nominal thickness values is greater than a predetermined number, a further signal sending step is provided for.

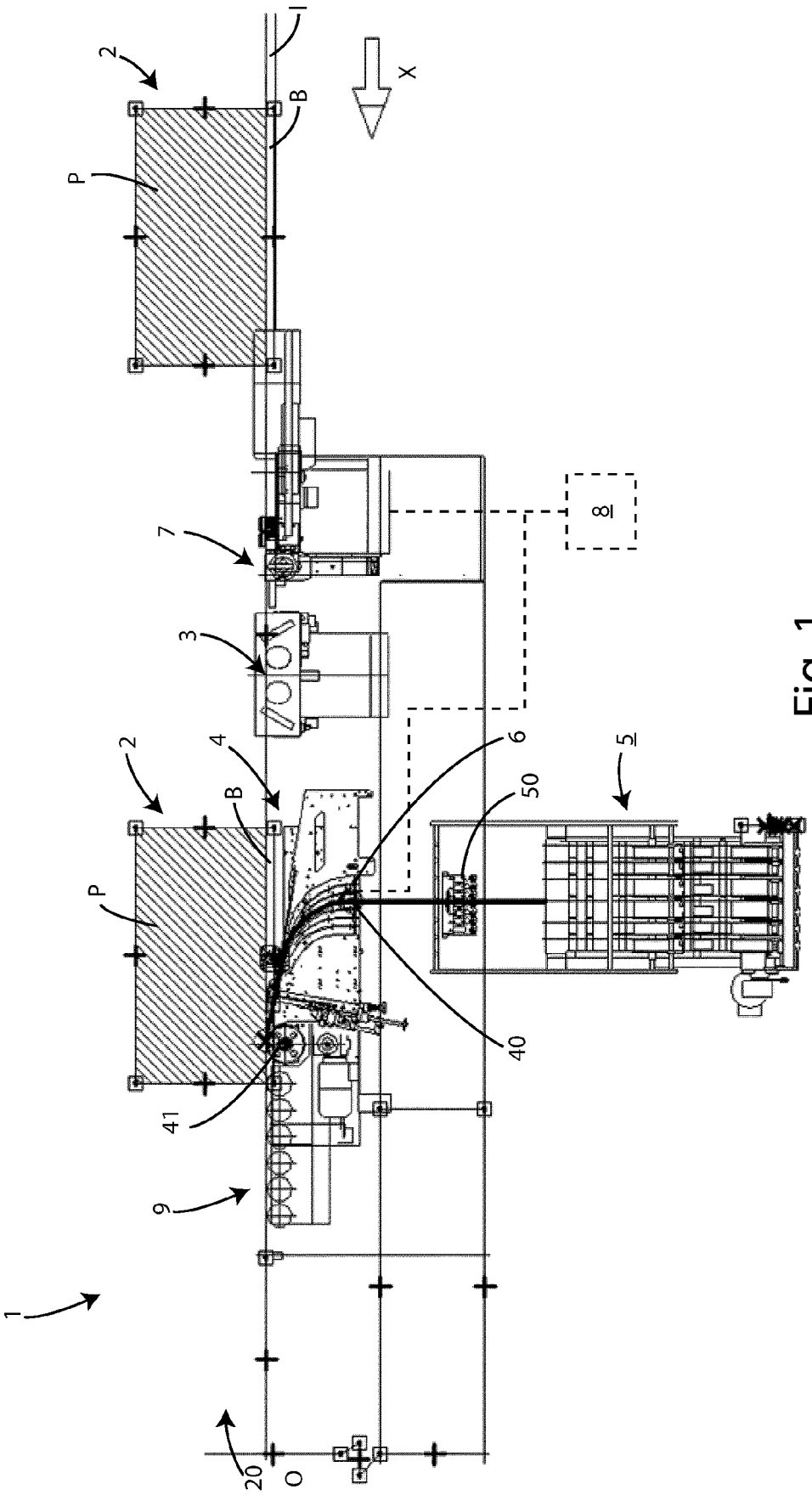

Fig. 1

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 22 18 5105

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 10 2015 008891 B3 (IMA KLESSMANN GMBH HOLZBEARBEITUNGSSYSTEME [DE]) 25 August 2016 (2016-08-25) * abstract * * paragraphs [0042] - [0045], [0048], [0022] * * figures *	1-15	INV. B27D5/00
X	EP 2 230 626 A1 (DUSTMANN DULA WERK [DE]) 22 September 2010 (2010-09-22) * abstract * * paragraphs [0054], [0055], [0056] * * figures *	1-15	

TECHNICAL FIELDS SEARCHED (IPC)

B27D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	31 October 2022	Hamel, Pascal

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 22 18 5105

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.

31-10-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102015008891 B3	25-08-2016	DE 102015008891 B3	25-08-2016
		EP 3115163 A1	11-01-2017
		PL 3115163 T3	31-01-2019
EP 2230626 A1	22-09-2010	EP 2230626 A1	22-09-2010
		RU 2010109443 A	20-09-2011

EPO FORM P0459

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