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

(72) Inventor: **CONCONI, Roberto**
47921 RIMINI (IT)

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

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(54) **SYSTEM FOR EDGE BANDING OF PANELS**

(57) The present invention relates to a System (S) for edge banding a panel (P), such as a panel made of wood, fiberglass, plastic and the like by means of an edge banding tape, comprising a spreading unit (1) for coating an adhesive substance, such as glue and the like, on at least one lateral surface or edge (B) of the said panel (P), wherein said panel (P) is movable with respect to said spreading unit (1), and a pressing unit (3), for press-

ing a tape on said edge (B) of said panel (P), arranged downstream of a spreading unit (1) for coating said adhesive substance, said system (S) being characterized in that it comprises a heating unit (2), interposed between said spreading unit (1) and said pressing unit (3), wherein said heating unit (2) is configured to heat selectively said adhesive substance spread on said edge (B) of the said panel (P) by said spreading unit (1).

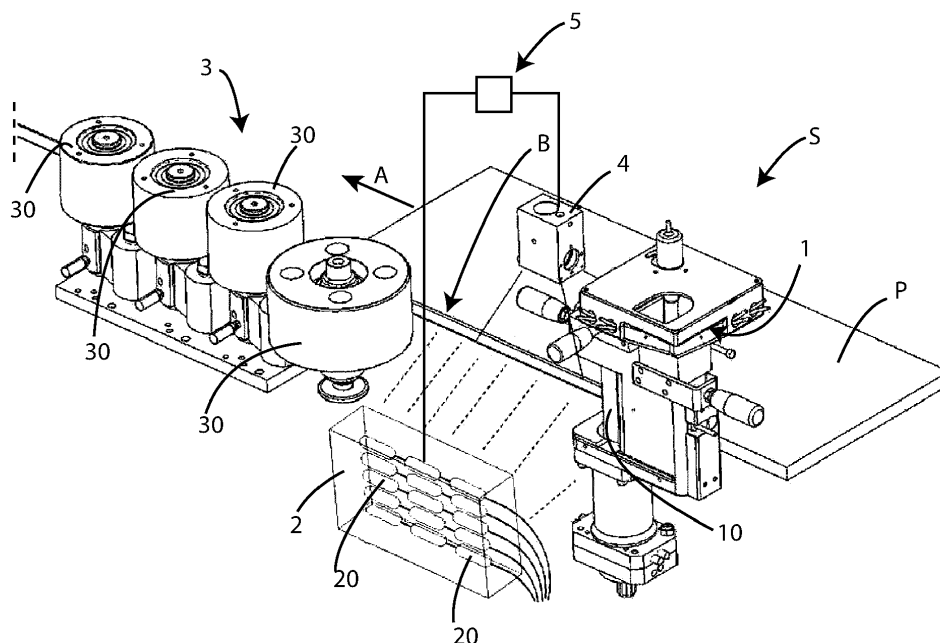


Fig. 1

Description

[0001] The present invention relates to a system for edge banding panels.

Field of the invention

[0002] More in detail, the invention relates to a system of the above-mentioned type, designed and manufactured in particular to couple an edge banding tape to the side edge of a panel, but which can be used for any application in which edge banding on surfaces is required.

[0003] In the following, the description will be addressed to the edge banding of wooden panels, but it is clear that it should not be considered limited to this specific use.

Prior art

[0004] As is well known, currently, in the finishing of wooden panels, tapes are applied to the side edges, by means of edge banding systems, generally installed on the sides of a sliding surface, on which the panels are made to slide.

[0005] Said edge banding systems generally comprise rollers for spreading the glue on the edge of the panel while it is moving on the sliding plane, so that these rollers, sliding on the lateral edge of the panel, apply the glue; and pressure rollers to press the edge banding tape on the edge of the panel to be processed and to adhere the glue.

[0006] Subsequently, the panel is further finished with appropriate cutters, in order to cut and round off the excess of the edge banding tape previously applied.

[0007] This tape can be made of different materials such as, for example, plastic or metal, and has variable dimensions according to the size of the side surface of the same panel, on which it has to be applied.

[0008] Typically, the rollers for spreading the glue on the edge of the panel and the pressure rollers are spaced from each other by a few centimeters or a few tens of centimeters.

[0009] One of the main drawbacks of these known solutions is given by the fact that they do not always allow a correct adhesion of the edge banding tape to the glue arranged on the edge of the panel.

[0010] In fact, due to the distance between the rollers for spreading the glue on the edge of the panel and the pressure rollers, the latter will exert pressure on the edge banding tape to make it adhere to the edge of the panel only after a predetermined time interval, depending on the handling speed of the panel.

[0011] Therefore, during this time interval, the glue could cool down, especially at certain points, decreasing or losing its adhesion characteristics.

[0012] Furthermore, different degrees of adhesion of the glue and therefore of the tape to the edge of the panel can occur, even if the panel has different thicknesses.

Scope of the invention

[0013] In light of the above, it is therefore an object of the present invention to overcome the limitations of the prior art described above by providing a system for the edge banding of panels.

[0014] Another object of the invention is to provide a system for the edge banding of panels, which allows the correct adhesion of the edge banding tape to the edge of the panel to be worked.

[0015] A further object of the invention is to provide a system for the edge banding of panels, which allows the adhesion to be adjusted selectively on different points of the panel edge.

[0016] Another object of the invention is to provide a system for the edge banding of panels that is highly reliable, relatively simple to manufacture, and at competitive costs if compared to the known art.

Object of the invention

[0017] It is therefore specific object of the present invention a system for edge banding a panel, such as a panel made of wood, fiberglass, plastic and the like by means of an edge banding tape, comprising a spreading unit for coating an adhesive substance, such as glue and the like, on at least one lateral surface or edge of the said panel, wherein said panel is movable with respect to said spreading unit, and a pressing unit, for pressing a tape on said edge of said panel, arranged downstream of a spreading unit for coating said adhesive substance, said system being characterized in that it comprises a heating unit, interposed between said spreading unit and said pressing unit, wherein said heating unit is configured to heat selectively said adhesive substance spread on said edge of the said panel by said spreading unit.

[0018] Advantageously according to the invention, said heating unit may be facing said edge of said panel and comprises a plurality of heating elements.

[0019] Conveniently according to the invention, said heating elements may be arranged so as to form a matrix of heating elements.

[0020] Still according to the invention, said system may comprise temperature sensing means, arranged in correspondence of said edge of said panel to which said adhesive substance is applied, wherein said temperature sensing means are capable of detecting the temperature of said adhesive substance spread on said edge of said panel, and a logic control unit, connected to said temperature sensing means and to said heating unit, wherein said logic control unit may be configured for receiving temperature values of said adhesive substance from said temperature sensing means, and sending at least one activation or deactivation signal to said heating unit to activate or deactivate one or more heating elements, so as to heat a respective portion of said edge, on which said adhesive substance is applied.

[0021] Further according to the invention, said heating

elements may be diodes or LASER.

[0022] Always according to the invention, said diodes or LASER may be infrared radiation.

[0023] Still according to the invention, said logic control unit may be configured to receive the movement relative speed of said panel with respect to said system for the edge banding of said panel, wherein said logic control unit is configured to drive said heating unit as a function of said speed.

Brief description of the figures

[0024] 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 illustrates an embodiment of a system for edge banding panels, according to the present invention; and

figure 2 illustrates a top view of the system for the edge banding of panels of figure 1.

[0025] In the various figures, similar parts will be indicated by the same reference numbers.

Detailed description

[0026] With reference to the embodiment shown in figures 1 and 2, an edge banding system according to the present invention is shown, indicated as a whole with the reference letter S, which comprises a spreading unit 1 for spreading an adhesive substance on a lateral surface or edge B of a panel P, a pressing unit 3 to press an edge banding tape (not shown in the figures) onto said edge B, and a heating unit 2, interposed between said spreading unit 1 and said pressure 3, to heat said adhesive substance.

[0027] In addition, the edge banding system S also comprises coupling means (not shown in the figures), for coupling to the edge of a moving plane (not shown in the figures), for moving the panel P to be edge banded. Said moving plane can be for example constituted by a plane with motorized rollers or with a belt.

[0028] As said, the spreading unit 1 allows spreading an adhesive substance, such as glue and the like, on at least one side surface or edge B of said panel P.

[0029] More specifically, said spreading unit 1 comprises at least one application roller 10 for spreading the glue on said edge B of said panel P, while the latter moves with respect to said spreading unit 1 in the movement direction A.

[0030] In fact, this panel P is moved at a predetermined speed by means of, for example, said sliding belt towards said spreading unit 1 of said system S, and, therefore, towards said application roller 10.

[0031] Generally, the spreading system S also comprises an applicator device (not shown in the figures)

which applies the glue taken from a container on the lateral surface of said application roller 10.

[0032] Said application roller 10 may possibly have variable dimensions according to the dimensions of the panel P surface, on which the glue must be applied.

[0033] As can be seen from figure 1, said pressing unit 3 is arranged downstream said spreading unit 1, and is configured, as said, to press an edge banding tape on said edge B of said panel P.

[0034] In particular, said pressing unit 3 comprises at least one pressure roller 30 for exerting a pressure on the edge banding tape, so that the latter adheres to said edge B of said panel P. In the case in question, as can be seen, said pressing unit 3 comprises four pressure rollers 30 arranged in series, so as to exert an optimal pressure of the edge banding tape on said edge B of said panel P.

[0035] The heating unit 2 is interposed between said spreading unit 1 and said pressing unit 3 so as to allow, as described better below, heating the glue already spread on said edge B of said panel P before the pressure unit 3 apply the edge banding tape to the same edge B.

[0036] More specifically, said heating unit 2 faces said edge B of said panel P, and comprises a plurality of heating elements 20, arranged so as to form a matrix of heating elements 20.

[0037] In the embodiment described, said heating elements 20 are IR diodes (from the English "Infrared Radiation"), intended to heat the glue spread on the edge B by irradiation. Alternatively, or in addition, said radiating elements can be LASER emitters of infrared radiation, or of electromagnetic radiation with a frequency band of the electromagnetic spectrum, possibly but not necessarily lower than that of the visible light.

[0038] However, in further embodiments, said heating elements 20 can be different from said IR or LASER diodes such as, for example, halogen lamps.

[0039] In the aforementioned configuration, said heating unit 2 is capable of selectively heating said glue spread on said edge B of said panel P by said spreading unit 1.

[0040] In fact, said heating unit 2 is capable of heating one or more portions of said edge B, on which the glue has been spread, by activating, deactivating, or partially activating one or more heating elements 20 of said heating elements 20 matrix.

[0041] In an embodiment of the present invention, said heating unit 2 is capable of activating at least one row and/or at least one column of said heating elements 20 matrix to heat the respective edge portion B located at said row and/or column of said matrix.

[0042] However, in further embodiments of the present invention, said heating unit 2 can activate or deactivate said heating elements 20 arranged in different positions of said array of heating elements 20, according to the needs.

[0043] Furthermore, again to obtain selective heating of the glue applied on the edge B of the panel P, it is also

possible to provide focal members, such as lenses and the like, to focus electromagnetic radiation in particular points or areas of the edge B of the panel P.

[0044] The system S according to the present invention further comprises temperature detection means 4, and a logic control unit 5, connected to said temperature detection means 4 and to said heating unit 2.

[0045] Said temperature sensing means 4, such as, for example, an infrared temperature sensor, are arranged in correspondence with said edge B of said panel P and are capable of detecting temperature values of the glue spread on said edge B of said panel P.

[0046] In particular, said temperature sensing means 4 are capable of detecting whether the temperature of said glue spread on said edge B is greater or less than a predetermined temperature threshold, or its distribution uniformity.

[0047] Moreover, said temperature detection means 4 are further configured to transmit temperature values to said logic control unit 5.

[0048] Said logic control unit 5 is thus able to transmit the activation or deactivation signals to said heating unit 2 to activate or deactivate each heating element 20 so as to heat in a suitable way the glue applied on the edge B of the panel, and in particular, possibly, to make its temperature distribution uniform, to ensure optimal adhesion at the time of application of the edge banding tape. It should also be considered that among the information detected by the logic control unit 5 there is also the movement speed of the panel P, as a function of which, also, each of said heating elements 20 of said heating unit 2 can be controlled or activated. Furthermore, said logic control unit 5 is further configured to receive temperature values from said temperature detection means 4.

[0049] In this way, said logic control unit 5 is capable of monitoring the temperature of said adhesive substance spread on said edge B and consequently activate or deactivate each heating element 20 of said heating unit 2.

[0050] On the basis of the above, the means for detecting the temperature 4, the logic control unit 5, and the heating unit 2 form a temperature feedback system, which allows optimum driving of the matrix of said heating elements 20.

[0051] The operation of the embodiment of said system S described above is as follows.

[0052] Initially, the panel P is moved towards said spreading unit 1. Typically, the movement of said panel P takes place by means of a conveyor belt (not shown in the figures).

[0053] Subsequently, said spreading unit 1 spreads, by means of said application roller 10, the glue on the edge B of the panel P, which moves at a predetermined speed with respect to said spreading unit 1.

[0054] Thereafter, the temperature detection means 4 detect the temperature of said glue and transmit the value of this temperature to said logic control unit 5. The latter, therefore, sends suitable activation or deactivation sig-

nals to activate or deactivate the respective heating elements 20 included in said heating unit 2.

[0055] At this point, said heating unit 2 activates or deactivates said heating elements 20, so as to heat the respective portions of said edge B of said panel P.

[0056] Finally, said pressing unit 3, by means of the rollers 30, presses the edge banding tape on said edge B of said panel P, so as to make said tape adhere to said glue spread on said edge B.

Advantages

[0057] An advantage of the system for edge banding panels according to the present invention is that of allowing the correct adhesion of the edge banding tape to the edge of the panel to be machined.

[0058] Another advantage of the system for edge banding panels according to the present invention is that of selectively heating one or more portions of the panel to be processed.

[0059] A further advantage of the system for edge banding panels according to the present invention is that of detecting the temperature of the glue present on the edge of the panel.

[0060] 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. System (S) for edge banding a panel (P), such as a panel made of wood, fiberglass, plastic and the like by means of an edge banding tape, comprising a spreading unit (1) for coating an adhesive substance, such as glue and the like, on at least one lateral surface or edge (B) of the said panel (P), wherein said panel (P) is movable with respect to said spreading unit (1), and a pressing unit (3), for pressing a tape on said edge (B) of said panel (P), arranged downstream of a spreading unit (1) for coating said adhesive substance, said system (S) being **characterized in that** it comprises a heating unit (2), interposed between said spreading unit (1) and said pressing unit (3), wherein said heating unit (2) is configured to heat selectively said adhesive substance spread on said edge (B) of the said panel (P) by said spreading unit (1).
2. System (S) according to the preceding claim, **characterized in that** said heating unit (2) is facing said edge (B) of said panel (P) and comprises a plurality of heating elements (20).

3. System (S) according to the preceding claim, **characterized in that** said heating elements (20) are arranged so as to form a matrix of heating elements (20). 5
4. System (S) according to any one of the preceding claims, **characterized in that** it comprises temperature sensing means (4), arranged in correspondence of said edge (B) of said panel (P) to which said adhesive substance is applied, wherein said temperature sensing means (4) are capable of detecting the temperature of said adhesive substance spread on said edge (B) of said panel (P), and a logic control unit (5), connected to said temperature sensing means (4) and to said heating unit (2), wherein said logic control unit (5) is configured for receiving temperature values of said adhesive substance from said temperature sensing means (4), and sending at least one activation or deactivation signal to said heating unit (2) to activate or deactivate one or more heating elements (20), so as to heat a respective portion of said edge (B), on which said adhesive substance is applied. 10 15 20 25
5. System (S) according to any one of claims 3 or 4, **characterized in that** said heating elements (20) are diodes or LASER.
6. System (S) according to the preceding claim, **characterized in that** said diodes or LASER are infrared radiation. 30
7. System (S) according to any one of claims 4-6, **characterized in that** said logic control unit (5) is configured to receive the movement relative speed of said panel (P) with respect to said system (S) for the edge banding of said panel (P), wherein said logic control unit (5) is configured to drive said heating unit (2) as a function of said speed. 35 40

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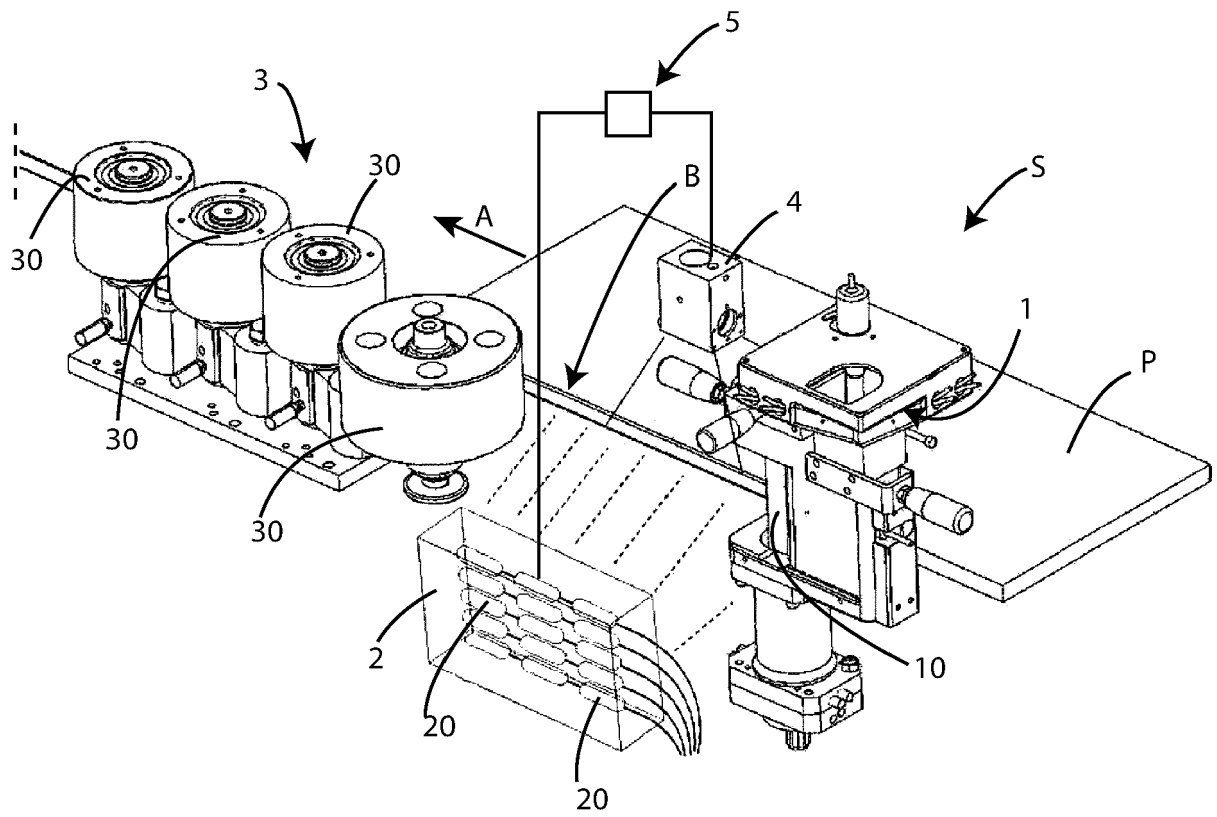


Fig. 1

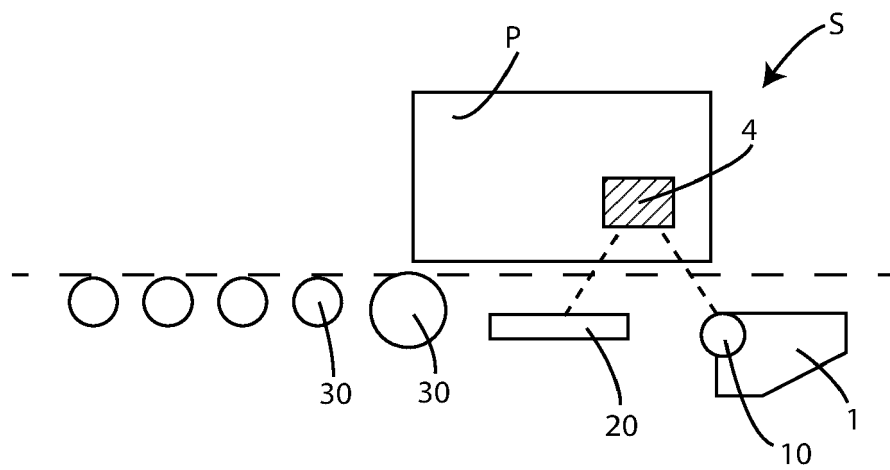


Fig. 2



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Application Number
EP 20 21 3706

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 7 May 2021	Examiner 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			



EUROPEAN SEARCH REPORT

Application Number
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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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