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(54) **Glueing group with adjustable approach device in an embosser-laminator, relative embosser-laminator and method for adjusting the approach**

(57) A glueing group (10) with adjustable approach device in an embosser-laminator, comprising a glue distribution roll (12), a dosing roll (13) of the same glue and a glue tank (14), comprises, on each side, a slide (21), consisting of a side frame carrying the distribution roll (12), wherein the slide (21) is applied onto a fixed side frame (11) of the glueing group (10) through at least one linear guide (22), oriented in an orthogonal direction with respect to the axes of such rolls, the slide (21) being connected to a driving group (23) comprising an adjustable actuator (24), connected at a mobile end to the same slide (21) and at an opposite end to a fixed load cell (25) that continuously checks the load applied.

A relative embosser-laminator and the method for adjusting the approach between a distribution roll (12) of a glueing group (10) and an embossing roll (120) of the embosser-laminator (100) further form part of the invention.

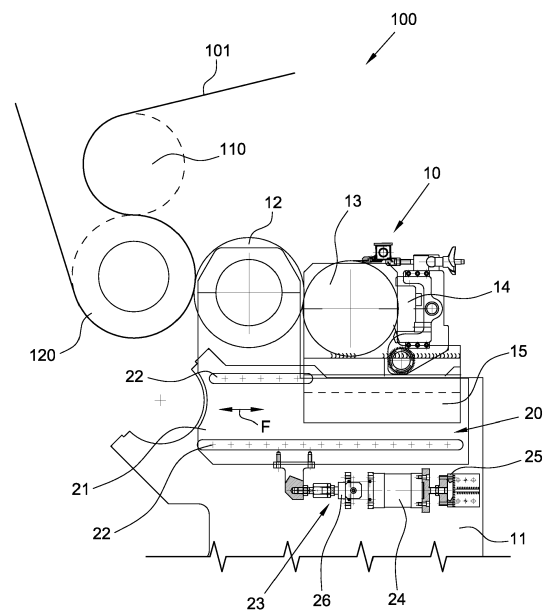


Fig. 1

Description

[0001] The present invention refers to a glueing group with an adjustable approach device in an embosser-laminator, to a relative embosser-laminator and to a method for adjusting the approach.

[0002] In general embossers-laminators for paper comprise at least one embossing roll, at least one embossing counter-roll and a glueing group comprising a glue distribution roll, a dosing roll of the same glue and a glue tank.

[0003] Generally, on one side the embossing roll is in abutment against the embossing counter-roll, for embossing at least one sheet of supplied paper, and on the other side it is in abutment against the distribution roll for distributing the glue on the same sheet of embossed paper.

[0004] The dosing roll in such groups has the purpose of feeding the glue on the distribution roll and in order to do this it is in turn coupled, with its external surface, on one side to a glue tank and on another side to the distribution roll.

[0005] Thanks to such a roll coupling, in which the dosing roll is generally called "screen" and the distribution roll "block", the glue is taken from the tank, also called "doctor blade chamber" and is arranged on the at least one embossed sheet passing on the same block.

[0006] In order for the glue to be correctly applied from the distribution roll to the sheet of paper arranged on the embossing roll it is necessary to adjust the approach distance between the distribution roll of the glueing group and the steel embossing roll, which is expressed in glueing pressure. The distance between the rolls, in the order of a few hundredths of a millimetre must be such as to allow the sheet of paper to pass completely, since it has to receive the glue through a light pressure, and varies based upon the type of paper, the number of sheets and to the requirement of distributing more or less glue.

[0007] In order for the embosser-laminator to operate optimally it is essential for the approaching distance to be adjusted in a precise manner and for it to be kept constant when the machine is working.

[0008] Generally, the approaching distance is adjusted manually "positionally" through the use of adjustment screws, that are positioned laterally, which operate on abutments. By acting on such systems it is possible to make the distribution roll approach the embossing roll in a sufficient manner with the aid of comparators.

[0009] These operations are carried out manually with centesimal thicknesses to be interposed between glue dispensing roll and steel roll and must be carried out by experienced workers.

[0010] These manual systems necessarily depend upon the ability of the operator and on his subjective precision and do not therefore make it possible to carry out adjustments that can be identically reproduced over time.

[0011] Moreover, a further drawback concerns the impossibility of carrying out these operations in complete

safety and especially while the machine is in motion.

[0012] Other, more advanced, known systems make it possible to adjust the position of the distribution roll through a "positional control" that is carried out from a control panel, however these are systems that require advanced technology and have very high costs.

[0013] Moreover, typically, conventional systems that operate "positionally" require continuous adjustments over time, that is to say for example upon the first start up or the replacement of the distribution roll, like control and check of the state of the machine during production and for a new setting of the "zero" during the wearing of the distribution roll.

[0014] The purpose of the present invention is to make a glueing group with adjustable approach device in an embosser-laminator, a relative embosser-laminator and a method for adjusting the approach that overcome the drawbacks mentioned above.

[0015] Another purpose of the present invention is to make a glueing group with adjustable approach device in an embosser-laminator, a relative embosser-laminator and a method for adjusting the approach that is capable of identifying and acting in the case in which there is the accidental formation of an accumulation of paper between the distribution roll and the embossing roll.

[0016] Another purpose of the present invention is that of making a glueing group with adjustable approach device in an embosser-laminator, a relative embosser-laminator and a method for adjusting the approach that are particularly simple and functional, with low costs.

[0017] These purposes according to the present invention are achieved by making a glueing group with adjustable approach device in an embosser-laminator, a relative embosser-laminator and a method for adjusting the approach as outlined in the independent claims.

[0018] Further characteristics are provided in the dependent claims.

[0019] The characteristics and the advantages of a glueing group with adjustable approach device in an embosser-laminator, of a relative embosser-laminator and of a method for adjusting the approach according to the present invention shall become clearer from the following description, given as an example and not for limiting purposes, with reference to the attached schematic drawing, attached hereto as figure 1, of an embosser-laminator carrying a glueing group with adjustable approach device according to the invention, in a side elevational view.

[0020] With reference to the figures, one side of an embosser-laminator 100 is shown carrying a glueing group 10 which is provided with an adjustable approach device 20. The opposite side, which is not shown, has the same components.

[0021] According to the example embodiment shown in the aforementioned figure 1 the embosser-laminator 100 comprises an embossing roll 120 and an embossing counter-roll 110, between which at least one sheet of paper 101 is returned by.

[0022] The glueing group 10 comprises a glue distri-

bution roll 12 and a dosing roll 13 of the same glue. By the word glue, in general, a glueing substance preferably with a fluid behaviour is meant.

[0023] In particular, the embossing roll 120 is respectively coupled along two different generatrices with the embossing counter-roll 110 for embossing the at least one sheet of paper 101 and with the distribution roll 12 that distributes the glue on the at least one sheet of embossed paper 101.

[0024] The dosing roll 13 is in turn respectively coupled along two different generatrices with a glue tank 14 for picking up the glue and with the distribution roll 12 for feeding the glue picked up onto the distribution roll 12, respectively.

[0025] The glue tank 14 consists of a so-called doctor blade chamber, comprising a "C"-shaped body, which is suitable for containing the glue, which is arranged laterally substantially along the entire development of the dosing roll 13. In particular, the "C"-shaped body of the glue tank 14 is delimited at the ends by two side walls that are provided, at the end facing the dosing roll 13, with sealing elements, like for example gaskets. The side walls indeed extend up to the proximity of the side surface portion of the dosing roll 13, defining the axial development of the dosing roll 13 on which the glue is distributed.

[0026] The adjustable approach device 20 of the glueing group 10 towards the embossing roll 120 comprises, on each side, a slide 21, consisting of a side frame carrying the distribution roll 12, which is in turn applied onto a fixed side frame 11 of the glueing group 10 through one or more linear guides 22, which are oriented so as to allow the distribution roll 12 to carry out linear movements towards/away from the steel embossing roll 120 in the direction that is orthogonal to the axes of the rolls, as schematically shown in the figure by the double arrow F.

[0027] The guides 22 are preferably low-friction guides, like for example recirculating ball guides, to make the approach device 20 more sensitive to low loads.

[0028] The dosing roll 13 and the glue tank 14 associated with it are in turn removably constrained to the slide 21 through a second side frame 15.

[0029] Each slide 21, which constitutes the side frame of the distribution roll 12 is actuated by a driving group 23 comprising an adjustable actuator 24, which is connected at one mobile end to the slide 21 and at the opposite end to a fixed load cell 25 which continuously checks the load applied.

[0030] The adjustable actuator 24, according to a preferred embodiment, consists of a pneumatic piston/cylinder device that is equipped with a proportional valve that proportionally controls the approach pressure exerted, i.e. the thrust between the steel embossing roll 120 and the rubber distribution roll 12. A control system continuously checks that, through the load cell 25 which it is connected to, the approach pressure value set by the panel remains unvaried during operation.

[0031] According to further embodiments of the invention different linear actuators can be used, still connected

to the load cell 25.

[0032] According to a preferred embodiment the actuator 24 is coupled with a selectively-actuable blocking system 26, for example a brake, which ensures that the actuator 24 does not have movements or yielding, thus making it behave as a rigid element during the normal operation of the embosser-laminator 100. The brake 26, on the other hand, is loosened so as to carry out the adjustment of the approach pressure or for moving the glueing group 10 away from the embossing roll 120 in the case in which paper is accidentally accumulated. It is particularly advantageous to apply the brake 26 in the case in which the actuator is of the pneumatic type, or other devices that for their nature do not behave rigidly at low pressure.

[0033] The adjustable approach device 20 of the glueing group 10 towards the embossing roll 120 according to the invention, actuates a method for adjusting the approach between the distribution roll 12 and the embossing roll 120 with a pressure control instead of a distance control.

[0034] Indeed, the correct approach between the distribution roll 12 and the embossing roll 120 is identified through the detection of a light pressure exerted by the distribution roll 12 on the embossing roll 120 carrying the sheet of paper 101. The predetermined approach pressure at the moment of the initial adjustment of the machine and set through the action of the adjustable actuator 24, on each of the sides of the machine, is indicatively selected in the range between 0.02 Kg/linear cm up to 1.5 kg/linear cm, that is expressed according to a unit of measurement that is typically used in the field.

[0035] The approach pressure is detected continuously by the load cell 25 and, in the case in which variations are detected that can be set in the order of 1 to 20 Kg, it is possible to command an emergency stop of the machine by unlocking the brakes 26 and inverting the actuation of the actuator 24 since such a variation is considered an anomaly of the process.

[0036] The adjustment of a new approach pressure value during the operation of the machine can also be set from the panel if it is desired to modify the predetermined values of the machine and not only in the case in which the load cell 25 detects values that are different from the predetermined value.

[0037] In the preferred embodiments provided with a brake 26, this must be temporarily loosened in order to adjust a new predetermined pressure value by the actuator 24, both in the case in which the adjustment is carried out when the machine is still and in the case in which it occurs during operation.

[0038] It should be easy to understand how the glueing group 10 with adjustable approach device 20 in an embosser-laminator 100, object of the present invention operates.

[0039] Indeed, the method for adjusting the approach between the glueing group 10 and the embossing roll 120 in an embosser-laminator 100 provides carrying out

the following steps:

- setting a predetermined value of the approach pressure between the distribution roll 12 and the embossing roll 120,
- continuously controlling the instantaneous value of the approach pressure exerted.

[0040] The glueing group with adjustable approach device in an embosser-laminator, the relative embosser-laminator and the method for adjusting the approach object of the present invention have the advantage of carrying out the control on the approach pressure continuously during the operation of the embosser-laminator and not only during the initial setting of the operation parameters.

[0041] Advantageously, according to the invention, by operating "in pressure" it is not therefore necessary to carry out continuous adjustments, like what occurs, on the other hand, with conventional systems which operate "positionally". That is to say, no calibration or zeroing operation is necessary the first time the machine is started up or during the replacement of the glue distribution roll; it is not necessary to repeat these operations as a control during the production like checking the state of the machine; it is not necessary to carry out a new zeroing procedure gradually as the glue distribution roll is consumed so as to keep the same distance between the distribution roll and the steel embossing roll.

[0042] Advantageously, according to the invention, it is not necessary for there to be complicated manual adjustment operations that would require the use of trained personnel.

[0043] Moreover, with the adjustable approach device object of the present invention, it is advantageously possible to control, from the panel, the approach pressure between the steel embossing roll and the rubber distribution roll in any state of the machine, i.e. both when the machine is still and when the machine is in motion, by carrying out modifications to the adjustments without stopping the machine.

[0044] Moreover, advantageously, the adjustable approach device object of the present invention also allows to detect possible accidental accumulation of paper between the steel embossing roll and the rubber distribution roll, automatically commanding an emergency stop of the embosser-laminator.

[0045] The adjustment device can be advantageously applied to common known glue groups.

[0046] The glueing group with adjustable approach device in an embosser-laminator, the relative embosser-laminator and the method for adjusting the approach thus conceived can undergo numerous modifications and variants, all covered by the invention; moreover, all the details can be replaced by technically equivalent elements. In practice the materials used, as well as the dimensions, can be any according to the technical requirements.

Claims

1. Glueing group (10) with adjustable approach device in an embosser-laminator, comprising a glue distribution roll (12), a dosing roll (13) of the same glue and a glue tank (14), **characterised in that** it comprises, on each side, a slide (21), consisting of a side frame carrying said distribution roll (12), wherein said slide (21) is applied onto a fixed side frame (11) of said glueing group (10) through at least one linear guide (22), oriented in an orthogonal direction with respect to the axes of said rolls, said slide (21) being connected to a driving group (23) comprising an adjustable actuator (24), connected at a mobile end to said slide (21) and at an opposite end to a fixed load cell (25) that continuously checks the load applied.
2. Group according to claim 1, **characterised in that** said adjustable actuator (24) is coupled with a selectively-actuable blocking system (26), such as a brake, to make said actuator (24) a rigid element without movements or yieldings.
3. Group according to any of claims 1 or 2, **characterised in that** said adjustable actuator (24) consists of a pneumatic piston/cylinder device equipped with a proportional valve that proportionally controls the approach pressure exerted.
4. Group according to any of the previous claims, **characterised in that** it comprises a control system of the approach pressure which is connected to said load cell (25).
5. Group according to any of the previous claims, **characterised in that** said at least one guide (22) is a low-friction guide.
6. Group according to any of the previous claims, **characterised in that** said dosing roll (13) and said glue tank (14) associated with it are in turn removably constrained to said slide (21) through a second side frame (15).
7. Embosser-laminator comprising at least one embossing roll (120), at least one embossing counter-roll (110) and a glueing group (10), said glueing group (10) comprising a glue distribution roll (12), a dosing roll (13) of the same glue and a glue tank (14), **characterised in that** said glueing group (10) is made according to any claims 1 to 6.
8. Method for adjusting the approach between a glueing group (10) and an embossing roll (120) in an embosser-laminator (100), **characterised in that** a control on the approach pressure between a distribution roll (12) of said glueing group (10) and said embossing roll (120) is carried out continuously.

9. Method according to claim 8, **characterised in that** it provides the following steps:

- setting, on each side, a predetermined value of the approach pressure between said rolls, 5
- continuously controlling, on each side, the instantaneous value of the approach pressure exerted.

10. Method according to claim 9, **characterised in that** 10
said step of setting a predetermined value of the approach pressure between said rolls can be carried out with the machine being still or in motion, without distinction.

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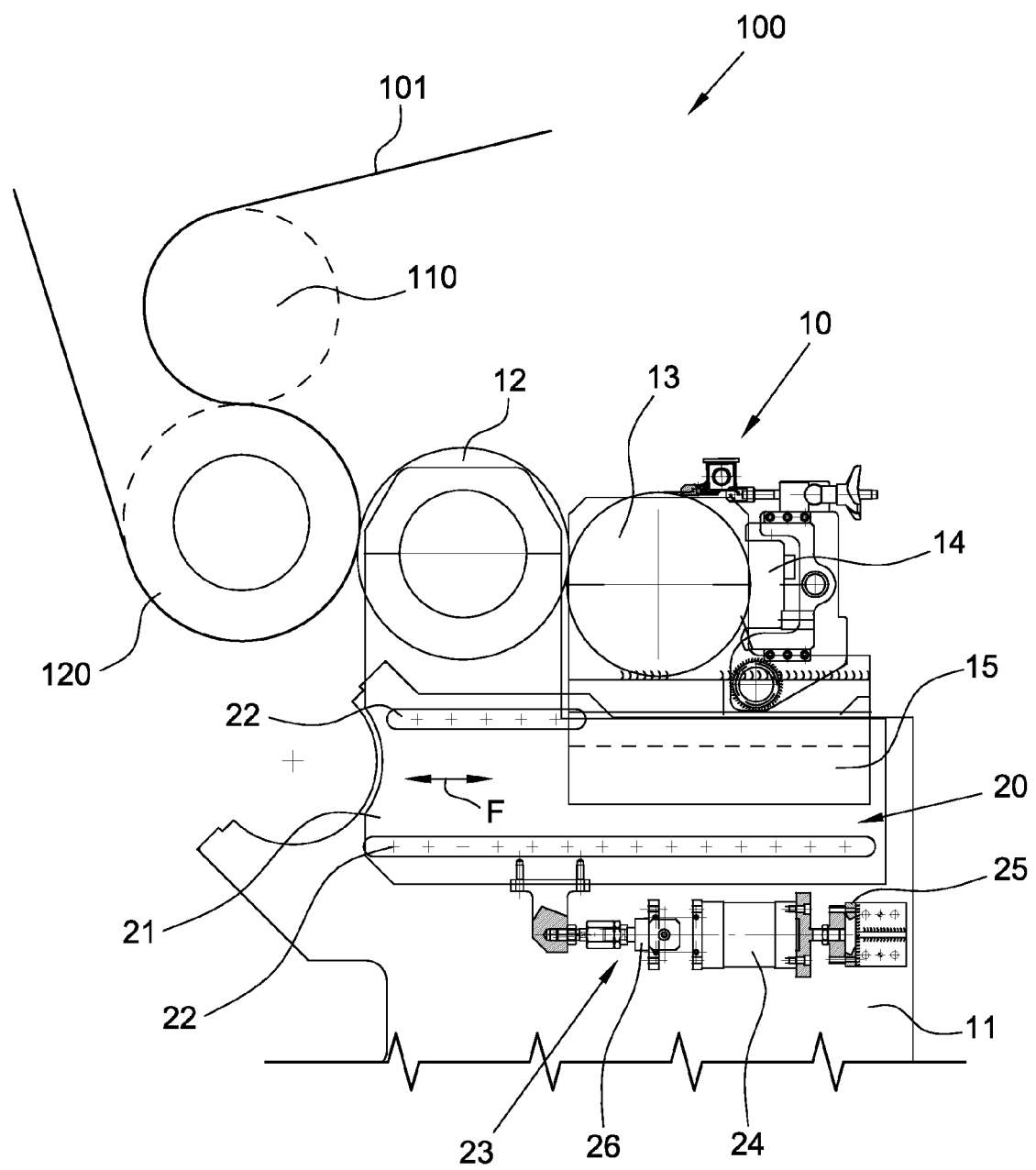


Fig. 1



EUROPEAN SEARCH REPORT

Application Number
EP 14 17 3088

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 October 2014	Examiner Farizon, Pascal
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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			
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 14 17 3088

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