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(54) A method for pressing mats with a continuous press and an apparatus for performing the method

(57) A method of pressing mats with a continuous press comprises: detecting the thickness of the mat on the conveyor belt; comparing the detected thickness of the mat with a predetermined thickness of the mat to determine a start point of the conveyor belt with respect to an feed inlet with a fixed press curved surface shape and a press gap between upper and lower heated press plates; controlling a driving device of the conveyor belt by a controller to move the conveyor belt to make the front of the conveyor belt reach the start point, and adjusting the press gap between the upper and lower heated press plates to a preset value by controlling control cylinders. The invention further provides an apparatus for performing the method. According to the invention, the method may produce press panels with high quality.

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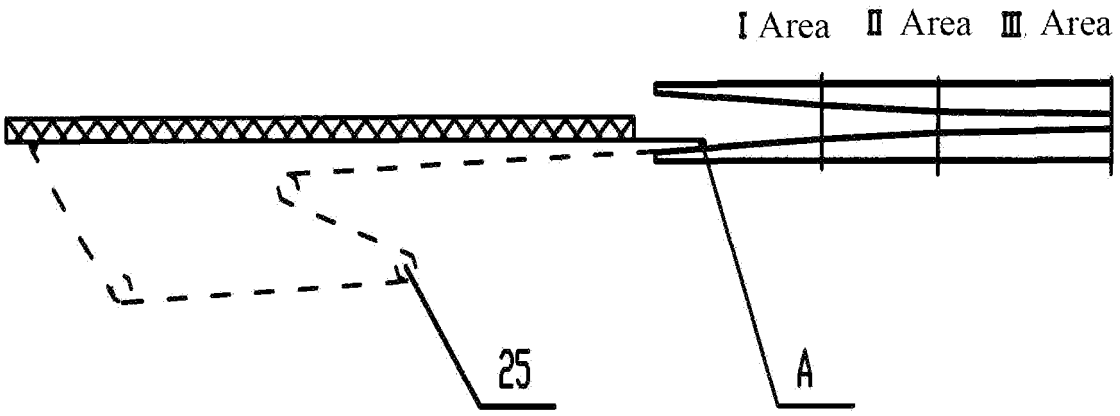

Fig. 1

Description

Field of technology

[0001] The invention relates to a method of pressing mats continuously with a continuous press and an apparatus for performing the method. The apparatus comprises a continuous press for continuously pressing mats and a conveyor belt for transporting the mats to be pressed to the press.

Background of the invention

[0002] In the conventional production of pressed board, the profile shape of the feed inlet of the press is changed based on the thickness of the pressed mats. For example, when pressing a thick press plate, the feed inlet should be wide; while pressing a thin press plate, the feed inlet is opened narrowly. In the actual production, the profile or the shape of the feed inlet is adjusted in time based on the thickness of the mats to be pressed to adapt to different mats. In the prior art, the profile of the feed inlet of the press is adjusted by bending the whole heated press plates at the entrance side of the press or by dividing the heated press plates at the entrance side into some sections and adjusting each section.

[0003] A continuous press for pressing mats into press plates is disclosed in Chinese patent application ZL 98124377.0. A device for controlling the feed inlet and a device for controlling the profiles at the entrance of the feed inlet are provided in the press. The device for controlling the profile at the entrance of the feed inlet comprises a plurality of piston cylinder mechanism such as two-way operation differential cylinders. According to a predetermined distributing mode, one end of the differential cylinders is hinged on the upper and/or lower feeding plates, while the other end is hinged on the upper and/or bottom of the press. The differential cylinders are connected to a hydraulic system controlled or adjusted by a computer. In the press, the upper and/or lower feeding plates are elastically deformed by a plurality of differential cylinders to adjust the profile and the shape of the feed inlet. The disadvantage of the method for adjusting the feed inlet is that the structures of controlling devices are complicated per se. That is to say, many differential cylinders are provided above and/or under the corresponding feed inlet. These cylinders may occupy large space in the press. Meanwhile, many cylinders and their corresponding controlling oil-ways and controllers increase the manufacture cost of the press. Since the elastic force of the hot press plates exists, and the pressure for controlling a plurality of raising cylinders with a curved arc shape may not be too large, this results in a less force exerted on the surfaces of the mats during the gradual process, which makes surfaces of the finished product not dense and easy to fluff, especially in the process of pressing thin board and un-sanded finished board.

[0004] A method of continuous manufacture of a flake board and thereof apparatus is disclosed in the Chinese patent application ZL 94100748.0. According to the method, at the feed inlet of the press, the pressurizing process of the mats is performed in the two press sections by controlling a variable angle of two support plates functioning as press plates and hinged with each other. The feed inlet is divided into three support plates hinged to each other. The three independent sections may be controlled by their respective control cylinder, respectively, thus changing press angles of the three support plates. Nevertheless, there are joints for connecting between the support plates hinged to each other. At these joints, curves forming the surfaces of feed inlet are not very even. So, the running belts wear strongly, and mats continuously entering the feed inlet at high speed may be restricted. Thus it is impossible to press the mats at high speed.

Summary of the invention

[0005] It is an object of the present invention to provide an improved method of pressing mats using a continuous press. If the shape of the curved surface of the feed inlet into which the mats to be pressed may enter is fixed, the method may continuously press mats with different thickness in a good quality at high speed. It is a further object of the invention to provide an apparatus for performing above-mentioned method.

[0006] In order to achieve above-mentioned aims, according to the invention the method of continuously pressing mats with a continuous press comprises:

- detecting the thickness of the mat on a conveyor belt;
- comparing the detected thickness of the mats with a predetermined thickness of the mat to determine a start point of the conveyor belt with respect to a feed inlet with a fixed curved surface shape and a press gap between upper and lower heated press plates;
- controlling a driving device of the conveyor belt by a controller to drive the movement of the conveyor belt so as to make the front part of the conveyor belt reach the start point, and adjusting the press gap between the upper and lower heated press plates to a preset value by controlling control cylinders.

[0007] In accordance with the invention, two opposite heated press plates form an inlet section of the press. The opposite surfaces of the two press plates are curved surfaces, and the other surfaces of them are flat surfaces. In accordance with the method of the invention, the shape of the feed inlet is relatively fixed. That is, the opposite surfaces of the two inlet sections forming the feed inlet of the press are fixed in shape. Therefore, it can adjust the position of the front parts of the conveyor with relation to the feed inlet to press the mats with different thickness. According to the method of the invention, it is possible

to finely adjust the feed inlet to adapt to the different thickness of the panels.

[0008] In accordance with the invention, while deciding and moving the start point of the front parts of the conveyor on the feed inlet of the press, the controller controls the cylinders by controlling the cylinders to adjust the distance of the upper and lower press plates to the press gap. In the pressing process, a pressure is applied to the feed inlet from the upside or downside or the upside together with the downside along a direction perpendicular to the moving direction of the mats.

[0009] According to the invention, following the shape of the lower curved surface of the feed inlet, the movement of the front parts of the conveyor is led. That is to say, the movement track of the front part of the conveyor is similar with the profile of the lower curved surface of the feed inlet. The shape of said feed inlet is defined by two heat press plates. The opposite surfaces of the heated press plates are curved surfaces. The profiles of said curved surfaces consist of at least a curved line or a plurality of straight lines smoothly interconnected together.

[0010] In accordance with the invention, the shape of the feed inlet is fixed at the entrance of the press, which is different from the prior art in which the shape of the feed inlet is adjusted according to the thickness of the panels to be pressed. Under the premise, according to the invention, after detecting the thickness of the mats to be pressed, the start point of the conveyor front part on the feed inlet and the size of the press gap are obtained by comparing the detected thickness with a prestored thickness of the mats. Thus, the amount of movement of the conveyor with respect to the feed inlet and the expansion amount of the cylinder are determined according to the thickness of the mats to be pressed. The press plates with a high quality may be manufactured at a high speed.

[0011] In accordance with the method of the invention, the shape of the feed inlet is determined by the opposite curved surfaces of the upper and lower inlet sections, so the shape of the feed inlet keeps fixed. The operation of pressing the mats with different thickness is performed by adjusting the length of the conveyor moving into the feed inlet without adjusting the shape of the feed inlet. That is to say, after the shape of inlet mouth is determined, the start position of the conveyor front part on the feed inlet of the press is adjusted so that the front part of the conveyor may reach the different points of the feed inlet, rather than adjusting the shape of the feed inlet during the press of the mats into different thickness. The operating mode may remarkably simplify the structure of the press and save manufacturing cost.

[0012] Before pressing, the thickness of the mats to be pressed on the conveyor is detected and the detected values are transmitted to the controller. The controller calculates the amount of movement of the conveyor according to the thickness of the mats to be pressed, and transmits the control signal to a driving device for driving the conveyor on that basis to move the conveyor a defined distance according to the control signal.

[0013] Comparing with the prior art in which the start point of the conveyor front part on the feed inlet is fixed and the mats with different thickness are pressed by adjusting the shape of the feed inlet, according to the invention, the mats with different thickness are pressed by adjusting the position of the conveyor and the shape of the feed inlet is fixed. Since the whole press plates of the feed inlet are not bent or have no joints, the structure of the press is simplified, and an even pressure is applied on the mats at the entrance. Thus, the surfaces of the final boards are dense and the running steel belts are not dramatically worn. Also, it is possible to press the mats at a high speed.

[0014] In accordance with the invention, when the amount of movement is determined based on the thickness of the mats to be pressed, the controller determines the pressure and the stroke of the cylinder. A hydraulic system transfers a pressure medium to a control cylinder according to a signal of the controller so that the mats are pressed and different pressures are applied on different parts of the mats.

[0015] In accordance with the invention, the shapes of the opposite surfaces at the inlet section of the feed inlet are fixed and the start point of the conveyor front part on the entrance is determined according to the different thickness of the mats, thus, during the operation of the press, the whole inlet sections or a part of the inlet sections are heated according to the different thickness of the plates. This is helpful to reduce the heat applied to the conveyor rubber belt and also to save energy and manufacture cost.

[0016] In accordance with the invention, the front positions of the inlet sections are adjusted by the adjusting device connected with the front part of the press inlet sections. That is to say, the front positions of the inlet sections are moved along a direction perpendicular to a moving direction of the mats to be pressed by the adjusting device, so it is possible to finely adjust the shape of the front part of the feed inlet and fix the shape of the front part of the feed inlet.

[0017] In accordance with the invention, there is provided an apparatus for performing the above mentioned method, including a continuous press for continuously pressing mats and a conveyor belt for transporting the mats to be pressed into the continuous press. The press also comprises a controller, which controls a front part of the conveyor belt following the shape of the curved surfaces of the lower inlet section and moving to a preset start point based on the thickness of the mats to be pressed, and a preset press gap is formed by controlling a control cylinder of the press according to the mats to be pressed.

[0018] The controller includes a computer control unit. The conveyor has a drive unit for moving the conveyor with respect to the press and a guiding mechanism for guiding the conveyor following the curved surfaces of the lower inlet. The control cylinders are hydraulically con-

nected to the hydraulic controller. The drive unit and the hydraulic controller are electrically connected with the controller.

[0019] A sensor for detecting the thickness of the mats to be pressed is provided on the front part of the conveyor belt, and said sensor is connected with the controller.

[0020] An upper and a lower press roller for adjusting the upper and the lower inlet section are provided on the front part of the press. The upper and the lower press roller are mounted on support members for the press rollers. One end of the support member is hinged to the upper or the lower adjusting devices, and the other end is hinged to the cylinders.

[0021] The thickness of the upper and lower inlet sections turns gradually small from a longitudinal direction of the press towards the feed inlet of the press or shows a wave shape. The curved surface is made up of one curved line or many straight lines smoothly interconnected together.

[0022] The apparatus for performing the invention includes a continuous press for continuously pressing the mats. An inlet section of the press plates with curved surfaces is used at the feed inlet of the press. These curved surfaces at the inlet sections of the press plates are disposed oppositely, thus forming the shape of the feed inlet. The shape of the feed inlet has different sections suitable for thin plates, medium plates and thick plates. One surface of these sections may be a curved surface. The curved surfaces on the different sections are smoothly transient. Thus, there are no inflexion points which prevent the mats from moving at the joints and the running steel belts will not suffer from wearing or impact.

[0023] The radian of the curved surfaces is fixed. Therefore, it is unnecessary to provide a cylinder for adjusting an angle of the press plates at the feed inlet in the press. In accordance with the press of the invention, an adjusting device for finely adjusting the steel strip around the feed inlet and the front part of the inlet section may be provided at the front part of the press. The upper and the lower press rollers for adjusting the shape of the steel strip are provided in a front part of the adjusting device. The cylinders corresponding to the curved surfaces at the entrance are used to exert the essential pressure on the mats. The structures of the press according to the invention are simplified and the manufacturing cost of the press is reduced.

[0024] In accordance with the invention, the profile of the curved surfaces may be a complete curved line or several curved lines with different curvature radius connected with each other. Also it may consist of many straight lines. The length of the straight lines is chosen to ensure the surfaces consisting of these straight lines are smooth enough and this may reduce the difficulty in the manufacture. That is to say, the straight lines are short enough to assure that there are no inflexion points and the panels to be pressed can pass through smoothly.

Brief description of the drawings

[0025] For a more complete understanding of embodiments, and the advantages thereof, reference is now made to the following description taken in conjunction with the accompanying drawings.

FIGS.1 to 3 are schematic diagrams showing that the conveyor reaches different positions of the feed inlet with regard to differently thick panels.

FIG.4 is schematically illustrating the front part of the continuous press for continuously pressing the mats according to the invention.

FIG.5 is a schematic view of the upper and lower inlet section of the upper and lower press plates.

Detailed description of specific embodiments

[0026] With respect to one embodiment shown in FIGS. 1 to 3, the method of the invention will be described in detail. I.

[0027] FIGS. 1 to 3 show schematically the positions of the front part of the conveyor 24 with respect to the press feed inlet (an area E shown in FIG.4) during the pressing process. The conveyor 24 is shown as a conveyor belt indicated by a dotted line for simplification. The conveyor belt is supported by a roller, and the position of the roller adjacent to the feed inlet E of the press is movable.

[0028] As shown in FIG.1, three areas I, II and III form the feed inlet E of the press.

[0029] FIG.1 shows the situation for pressing medium plates. The front part of the conveyor 24 leans against the point A of the feed inlet E. The point A is the start point of the front part of the conveyor 24 for pressing the medium panels.

[0030] Similarly, FIG. 2 and FIG. 3 show the situations for pressing thin and thick plates. The point A is the start point of the front part of the conveyor 24 for pressing thin and thick panels.

[0031] In accordance with the invention, firstly, the thickness of the mats on the conveyor 24 is detected by a sensor or similar devices. As shown in FIG.1, a mat for pressing the medium plate is on the conveyor 24. The detected thickness values are then transformed into electrical signals and the signals are sent into the controller. The controller compares the detected thickness of the mat with a prestored thickness of the mat, thus, the thickness of the mats suitable for the pressing finished plates on the conveyor is determined.

[0032] After obtaining the thickness of the finished boards, controller concludes the corresponding start point of the conveyor front part on the feed inlet E and the size of the press gap. Then a controller sends a starting signal to the drive device of the conveyor 24 to move the front part of the conveyor 24 to the start point on the

feed inlet E. In the meantime, the controller controls the control cylinder through a hydraulic system of the press thus forming a press gap corresponding to the detected thickness of the panels.

[0033] FIG.1 shows the situation of pressing thin boards. The front part of the conveyor 24 extends a longer length into the press feed inlet E during pressing a thin plate. By this time, the front part of the conveyor 24 almost reaches a position where curved surfaces I and II are connected with each other. As shown in FIGS. 4 and 5, the length of the conveyor 24 extending into the feed inlet E is gradually reduced as the thickness of the mats to be pressed increases.

[0034] The length of the conveyor 24 entering the feed inlet corresponds to the thickness of the mats to be pressed. The correspondence between them is prestored in the computer of the controller. The length of the conveyor 24 entering the feed inlet E actually determines the start point of the conveyor 24 with respect to the feed inlet E. From the start point, the transported mats are transported to the feed inlet E from the conveyor 24. The position of the start point is changed according to the thickness of the mats to be pressed. In the process of pressing the mats, after the thickness of the mats is detected, the detected thickness of the mats is compared with a preset thickness of a predetermined mat to determine the start point of the conveyor with respect to the feed inlet E with a fixed curved surface and a press gap between upper and lower heated press plates.

[0035] Though not specifically shown in the figures, the apparatus according to the invention comprises a continuous press for continuously pressing mats and a conveyor 24 matched with the continuous press. The front part of said conveyor 24 is disposed at the feed inlet E of the press and the conveyor locates different positions according to the different thickness of the mats to be pressed.

[0036] In accordance with the invention, the front part of the conveyor 24 is moved following the shape of the curved surfaces on the lower inlet section 17 of the feed inlet E by a supporting member and a guiding mechanism. The movement following the shape of the curved surfaces at the lower inlet section 17 means that the running track of the front part of the conveyor 24 tallies with the shape of the curved surface at the lower inlet section 17. It guarantees that the front part of the conveyor 24 always moves following the waves of the lower inlet section 17.

[0037] As shown in FIG.4, the continuous press of the invention for continuously pressing mats includes press frames 8, which are arranged along the longitudinal direction of the press at regular intervals.

[0038] The upper and lower heated press plates 1, 2 are provided on the press frames 8. The upper and lower heated press plates 1, 2 comprise inlet sections 16, 17 and main heated press plates 18, 19, respectively. The main heated press plates 18, 19 are rectangular plates with rectangular cross sections. That is to say, the upper and lower surfaces of the cross sections of the main heated press plates are parallel to each other. The rectangular plates are connected together end to end in the press and lengthwise arranged along the press. The inlet sections 16, 17 of said upper and lower heated press plates 1, 2 are mounted on the side of the inlet sections of the press with their curved surfaces arranged oppositely, thus forming the feed inlet E.

[0039] Stainless-steel belts 15 circularly running are provided on the opposite surfaces of the upper and lower heated press plates 1, 2. The belts 15 are endless and may circularly rotate around the heated press plates 1, 2. Arrays of rollers 20 are disposed between the belts 15 and the heated press plates 1, 2.

[0040] As shown in FIG. 5, upper and lower adjusting devices 9, 10 for the feed inlet E are mounted on the front part of the press. The upper and lower press rollers 13, 14 are articulately mounted on the front part of the upper and lower adjusting devices 9, 10 for the feed inlet E. The adjusting devices 9, 10 for the upper and lower feed inlet E stretch or retract in an opposite direction or in a direction away from each other along a direction approximately perpendicular to the working direction. The extent of the expansion and contraction is small, so only the front part of the inlet sections 16, 17 at the feed inlet E is adjusted. Thus, a fine adjustment is performed on the feed inlet E. Moreover, the adjustment may be used for fixing the shape formed by the belts 15 in front of the feed inlet and apply a pressure to the belts 15.

[0041] As shown in FIG. 5, upper and lower press rollers 13, 14 are rotatably mounted on the respective roller supporting member 25, 26. One end of the control cylinders 22, 23 is hinged to the upper or the lower roller supporting members 25, 26, and the other end is hinged to the upper or lower controlling devices 9, 10. When the upper and the lower control cylinders 22, 23 extend or retract synchronously, supporting member 25, 26 connected to the cylinders relatively swing to put the upper and the lower press roller 13, 14 in motion. The press rollers 13, 14 are operated such that the circular running steel belts 15 move in an opposite direction or in a direction away from each other, thus a shape of the belts 15 before the feed inlet E is finely adjusted.

[0042] These adjustments on the front part of the feed inlet and the shape of the steel belts before the feed inlet E are fine or auxiliary in the invention. According to the invention, it is unnecessary to drastically adjust the feed inlet of the press. The mutual adaptation between the mats and the feed inlet E is performed by moving the conveyor 24 forward or backward with respect to the feed inlet E.

[0043] Control cylinders 3, 4, 6 and 7 for applying a pressure necessary for manufacturing the plates to the upper and the lower heated press plates 1, 2 are provided on the press frames 8. The control cylinders 3, 6 and 4, 7 are arranged at intervals and in rows. There are two or more in each row. In the embodiment, the upper of control cylinders 4,7 is connected to the lower heated press plate

2 through beams 21 to drive the lower heated press plates and apply a pressure to the lower heated press plates. In FIG.1, two rows of control cylinders 4, 7 for the inlet section 17 of the lower heated press plate 2 are provided. Certainly, a plurality of rows of control cylinders could be arranged according to the different length of the inlet sections 17.

[0044] In the accordance with the invention, one surface of the upper and the lower inlet sections 16, 17 is a curved surface, and the other surface is a plane which also keeps flat in the pressing process, hence the control cylinders 3,4,6,7 are connected with the upper and lower inlet sections 16, 17 vertically. The connection between the control cylinders 3, 6 and 4, 7 and the upper and lower inlet sections 16, 17 is simplified. The advantage of the invention different from the prior art is that spherical joints or universal joints are not necessary for the connections between the cylinder 3, 6 and 4, 7 and the upper and the lower inlet plates 16, 17 of the heated press plates. According to the invention, the feed inlet E is formed by the curved surfaces of the upper and lower inlet sections 16, 17, and a pressure applied by the control cylinder 3, 6 and 4, 7 is received by the other surface. In this way, the surface receiving the pressure is a substantially flat surface, so the control cylinder 3, 6 and 4, 7 may be directly connected to the flat surface and also may directly exert a pressure on said surface. This design advantageously prevents oblique pressure from being applied on the heated press plates, so it completely eliminates components of forces in other directions except the vertical direction. It simplifies the structure of the press, extends the service life and improves operational reliability.

[0045] In the example of the invention, the control cylinders 4, 7 are hinged to the moveable horizontal beams 21. In the pressing process, the control cylinders 4, 7 vertically apply the pressure on the horizontal beams 21.

[0046] As shown in FIG.5, in the embodiment of the invention, the opposite surfaces of inlet sections 16, 17 are continuous and smoothly curved surfaces. FIG.2 indicates a cross section of the upper and lower inlet sections 16, 17. In the embodiment, the curved surface of the upper and the lower inlet sections 16, 17 consists of a complete curve line. That is to say, the curved surface from the left side to the right side in the drawing consists of a complete curved line. The shape of any cross section in the width of the upper and the lower inlet sections 16, 17 (a direction perpendicular to the principal plane of FIG. 2) is similar. So, according to the invention, on each cross section of the upper or the lower inlet sections 16, 17, the curved surface indicates a smooth curve. The curve is a complete curve line or formed of a plurality of curve lines, for example three curve lines (such as for relatively thick plates, medium plates and thin plates). In order to achieve the aims of the invention, these curved surfaces may be formed by connecting these line segments with suitable length. The length of the lines segments are arranged such that the curved surface is smooth and flat and will not damage the panel surface. The greatest advantage is to simplify the manufacture difficulty and reduce cost.

[0047] In addition, the opposite surfaces are curved surfaces, hence seen from the left to the right in FIG.2, the feed inlet made up of the upper and the lower inlet sections 16, 17 is trumpet-shaped which shows a bigger left side and a smaller right side in the drawings. Correspondingly, the thickness of the upper and lower inlet sections 16, 17 turn gradually large from the left side to the right side. In order to exhaust the air from the pressed mats, the curved surfaces may also be designed wave-shaped (not shown in the drawings). According to one of the embodiments, the curved surfaces of the upper and the lower inlet sections 16, 17 may be shaped so that the middle is depressed to the inlet sections and two sides are protruded. It is helpful to discharge the air from the mats.

[0048] Though it is not evidently shown in the drawings, according to the invention, the curved surface of the inlet sections 16, 17 may include a plurality of curves. These lines are connected together smoothly. That is to say, there are no protrusions or sudden changes in the connections of the two curved surfaces which makes sure that the surfaces are smoothly curved. For example, according to an example of the invention, the curved surface may be made of three curve lines with different curvatures. Each curve line corresponds to the areas I, II, III in FIG. 1, respectively. These curved lines correspond to thick pressed mats, medium pressed mats and thin pressed mats, respectively.

[0049] Alternatively, the curved surfaces may consist of many shorter line segments. This contributes to the easy manufacture. Those lines are also connected together smoothly to form even curved surfaces, i.e. smoothly curved surfaces are formed on the upper and the lower inlet sections 16, 17. And, the curved surface should ensure that the surface of the pressed finished panels has no concave/convex parts not according with the requirement.

[0050] In the embodiment, the lengths of straight lines are selected to meet the requirement for simplifying manufacture and assuring the finished panels quality.

[0051] In FIG.5, the upper and lower inlet sections 16, 17 are divided into three parts, i.e. curved section III for thick boards, curved section II for medium boards, and curved section I for thin boards. The three curve lines forming the three curved surface sections have different curvatures and these lines are connected smoothly end to end.

[0052] As a whole, in the embodiment, the cross sections of the upper and lower inlet sections 16, 17 become gradually small towards the feed inlet E along the longitudinal direction of the press. However, the curvature of each curved surface may be different based on different mats to be pressed. For example, the curved surface section II for medium boards on the inlet section 16 or 17 is depressed upwards or downwards rather than being

protruded in the opposite direction. In the same way, each curved surface section may be depressed upwards or downwards or be protruded out as needed. Theoretically, each curve is made up of smooth curved lines. In practice, several short straight lines may substitute curved lines. This may simplify the difficulty in the manufacturing process and there is no adverse effect on the finished boards.

[0053] According to FIG. 5, there are three groups of channels through which the heated oil may pass corresponding to curve section I, II, III on the upper and the lower inlet sections 16, 17. The channels are independent and do not communicate with each other. In this way, the heated oil is controlled to pass through different curved surfaces I, II, III according to the different working conditions in the pressing process, so that different curved surface sections I, II, III are heated independently. For example, during the pressing of the thin boards, the curved surface section III is heated and the other segments are not heated. This may reduce the heating applied on the adhesive tape of the conveyor entering the inlet sections and save energy.

[0054] In addition, in the embodiment of the invention, the curved surface section II for medium board is lengthened, so it benefits to process medium boards. Of course, other sections could be lengthened to press different boards.

[0055] As shown in FIG.5, in the embodiment of the invention, the length of upper inlet sections 16 is shorter than that of the lower inlet sections 17. Thus, the connection between the upper and lower inlet sections 16, 17 and main heated press plates 1, 2 are staggered to prevent defects (such as a protrusion) on the connection on the pressed mats from being formed.

Claims

1. A method for pressing a mat with a continuous press, comprising:

   detecting the thickness of the mat on a conveyor belt ;
   comparing the detected thickness of the mat with a predetermined thickness of the mat to determine a start point of the conveyor belt with respect to a feed inlet (E) comprising a fixed curved surface shape and a press gap between upper and lower heated press plates;
   controlling a driving device of the conveyor belt by a controller to move the conveyor belt such that a front part of the conveyor belt reaches the start point; and
   adjusting the press gap (S) between the upper and lower heated press plates to a predetermined value by controlling control cylinders.

2. The method according to claim 1, **characterized in that** a controller adjusts a front position of the feed inlet (E) based on the detected thickness of the mat.

3. The method according to claim 1 or 2, **characterized in that** the pressure is applied on the feed inlet (E) from one direction or from two directions along a direction perpendicular to a moving direction of the mat during the pressing process.

4. The method according to any one of the preceding claims, **characterized in that** a lower curved surface following the feed inlet (E) leads the front part of the conveyor belt.

5. The method according to any one of the preceding claims, **characterized in that** the shape of the feed inlet (E) is determined by two heated press plates, and opposite surfaces of the heated press plates are curved surfaces which become gradually small or change in a wave shape along the feed inlet of the press, and the curved surface is made up of one curved line or many straight lines smoothly interconnected together.

6. The method according to any one of the preceding claims, **characterized in that** the whole feed inlet or a part of the feed inlet is heated according to the detected thickness of the mat to be pressed.

7. An apparatus for performing the method according to any of claims 1 to 6, comprising:

   a continuous press for continuously pressing mats, and
   a conveyor belt for transporting the mat to be pressed into the press,
   characterized in that
   the press also comprises a controller which controls the movement of a front part of the conveyor belt (24) following the shape of a curved surfaces of a lower inlet section (17) to a preset start point based on the thickness of the mat to be pressed, and
   a preset press gap (S) is formed by controlling control cylinders (4, 7) of the press according to the mat to be pressed.

8. The apparatus according to claim 7, **characterized in that** the controller includes a computer control unit, and the conveyor belt (24) has a drive unit for moving the conveyor belt with respect to the press and a guiding mechanism for guiding the conveyor belt following the curved surfaces of the lower inlet section (17), wherein the control cylinders (4, 7) are hydraulically connected to the hydraulic controller, and the drive unit and the hydraulic controller are electrically connected with the controller.

9. The apparatus according to claim 7 or 8, **character-**

ized in that a sensor for detecting the thickness of the mat to be pressed is provided on the front part of the conveyor belt (24), and the sensor is connected with the controller.

10. The apparatus according to claim 7, **characterized in that** an upper and a lower press roller (13, 14) for adjusting steel belts (15) are provided on the front part of the press, and the upper and the lower press roller (13, 14) are mounted on support members (25, 26) for the press rollers, wherein one end of the support members (25, 26) is hinged to an upper or a lower adjusting device (9, 10), and the other end is hinged to control cylinders (22, 23), and the thickness of the upper and lower inlet sections (16, 17) becomes gradually smaller towards the feed inlet of the press along a longitudinal direction of the press or shows a wave shape, and the curved surface is made up of one curved line or many straight lines smoothly interconnected together.

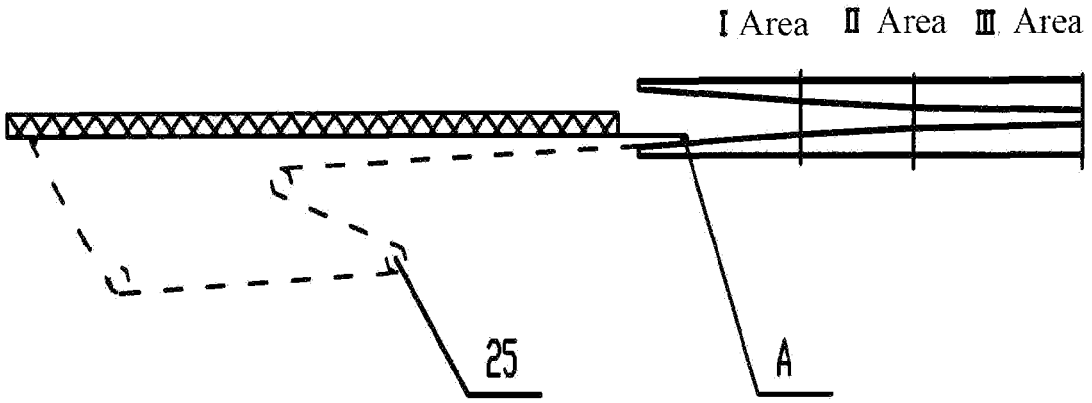

Fig. 1

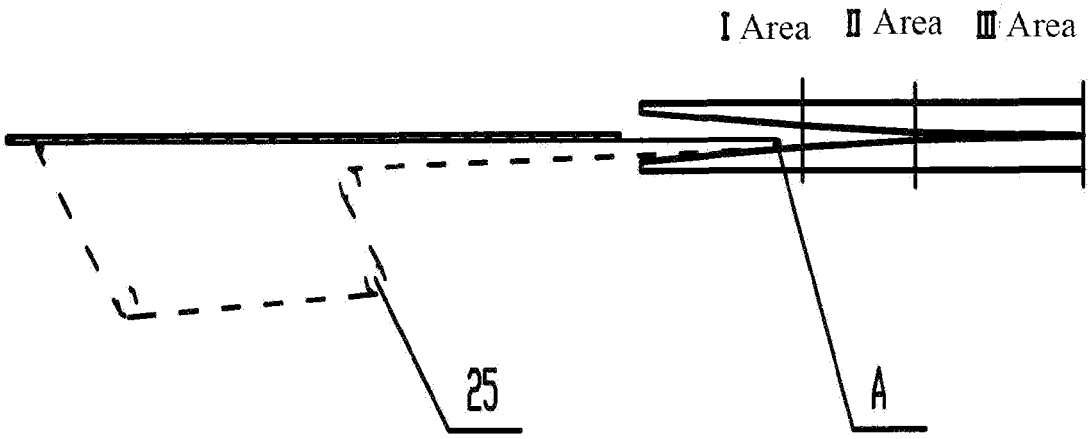

Fig. 2

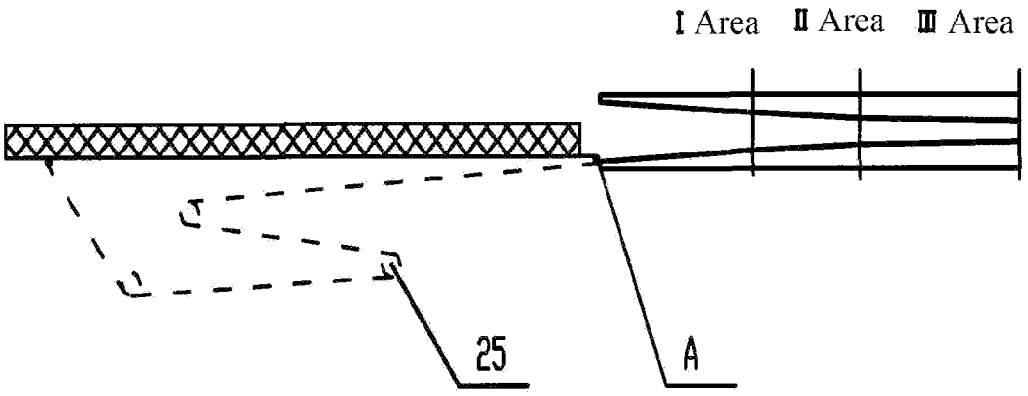
I Area
II Area
III Area
25
A

Fig. 3

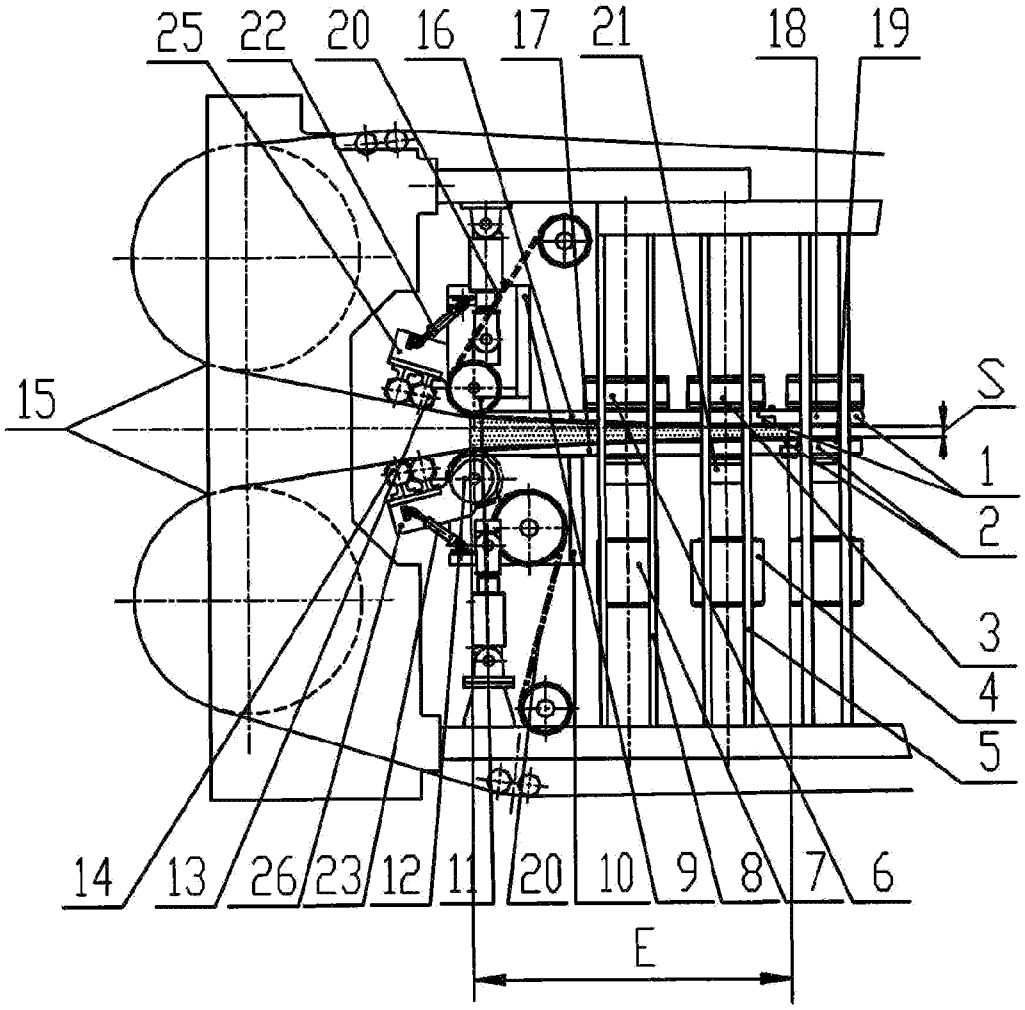
25
22
20
16
17
21
18
19
15
S
1
2
3
4
5
14
13
26
23
12
11
20
10
9
8
7
6
E

Fig. 4

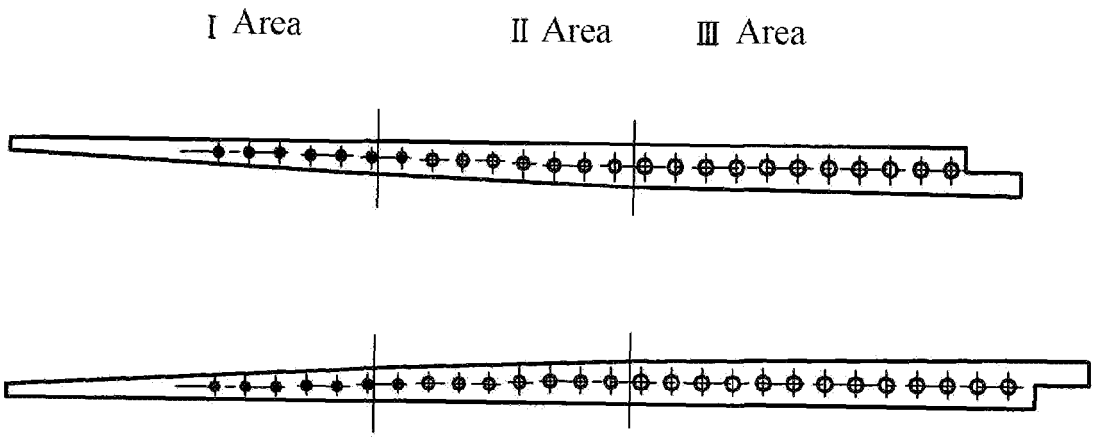

Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 10 15 7362

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Place of search	Date of completion of the search	Examiner
The Hague	8 June 2010	Söderberg, Jan-Eric

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