

(19)



(11)

**EP 4 541 542 A1**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**23.04.2025 Bulletin 2025/17**

(21) Application number: **23383075.1**

(22) Date of filing: **20.10.2023**

(51) International Patent Classification (IPC):  
**B27N 3/04** (2006.01) **B27N 3/18** (2006.01)  
**B27N 3/24** (2006.01) **B30B 5/06** (2006.01)  
**B27N 3/08** (2006.01) **B27N 3/02** (2006.01)

(52) Cooperative Patent Classification (CPC):  
**B27N 3/24; B27N 3/04; B27N 3/083; B27N 3/18;**  
**B30B 5/06; B27N 3/02**

(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 ME MK MT NL**  
**NO PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA**  
Designated Validation States:  
**KH MA MD TN**

(71) Applicant: **IPCO Germany GmbH**  
**70736 Fellbach (DE)**

(72) Inventors:  
• **Zumaeta Bäcktröm, Eduardo**  
**Gävle (SE)**  
• **Gil, Oscar**  
**Barcelona (ES)**

(74) Representative: **Patentanwälte**  
**Ruff, Wilhelm, Beier, Dauster & Partner mbB**  
**Kronenstraße 30**  
**70174 Stuttgart (DE)**

(54) **DOUBLE BELT PRESS FOR PRODUCING WOOD BASED PANELS AND METHOD FOR PRODUCING WOOD BASED PANELS**

(57) The invention relates to a double belt press for producing wood-based panels, especially medium-density fiberboard, having a first endless belt and a second endless belt, the first endless belt being guided around two guide rollers and the second belt being guided around two guide rollers, wherein the first endless belt is arranged at least in sections above the second endless

belt and wherein a product gap is defined between a lower run of the first belt and an upper run of the second belt and having a plurality of spray nozzles for applying a release agent to the first belt and/or the second belt, wherein the spray nozzles are two-substance-spray-nozzles for producing a spray of release agent by using compressed air.

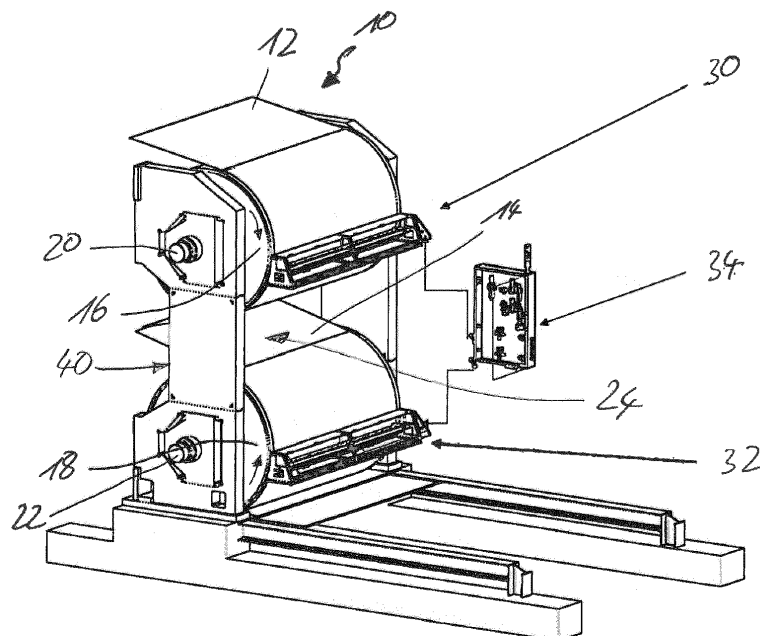


Fig. 1

**EP 4 541 542 A1**

## Description

**[0001]** The invention relates to a double belt press for producing wood-based panels, especially medium-density fiberboard. The invention also relates to a method for producing wood-based panels, especially medium-density fiberboard.

**[0002]** By means of the invention a double belt press and a method for producing wood-based panels should be improved.

**[0003]** This is achieved by a double belt press for producing wood-based panels with the features of claim 1 and a method for producing wood-based panels having the features of claim 12, respectively. Advantageous further features are mentioned in the respective sub-claims.

**[0004]** A double belt press for producing wood-based panels, especially medium-density fiberboard, has a first endless belt and a second endless belt, the first endless belt being guided around two guide rollers and the second belt being guided around two guide rollers. The first endless belt is arranged at least in sections above the second endless belt and a product gap is defined between a lower run of the first belt and an upper run of the second belt. A plurality of spray nozzles is provided for applying a release agent to the first belt and/or the second belt. The spray nozzles are two-substance-spray-nozzles for producing a spray of release agent by using compressed air.

**[0005]** By using two-substance-spray-nozzles for applying a release agent to the first belt and/or the second belt it is possible to significantly reduce the amount of release agent needed to produce high-quality wood-based panels. The inventors have found that the amount of release agent needed can be reduced by more than 80% especially 83%. By means of two-substance-spray-nozzles a continuous and even film of release agent having constant thickness over the entire width of the first belt and/or the second belt can be produced. The film of release agent can be produced with a very low thickness. With two-substance-spray-nozzles it is possible to precisely set the thickness of the film of release agent applied to the first belt and/or the second belt. As a consequence, the thickness of the film of release agent can be precisely set to the thickness needed. Applying too much release agent for the respective process needed can thereby be avoided. For example, by means of two-substance-spray-nozzles the thickness of a film of release agent can be chosen so that the release agent does not flow or run away on the belt but adheres to the belt. Surprisingly, two-substance-spray-nozzles can be used on a double belt press for wood-based panels even if the temperature of the belts of such a double belt press is very high and in the range between 100 °C and 200 °C, especially between 120 °C and 160 °C. The release agent is applied to the surfaces of the first belt and/or the second belt before these surfaces enter the product gap. In the product gap wood-based fibers are pressed

together and compacted to form a wood-based panel. It was expected that such high temperatures of the belts of a double belt press would make it necessary to apply a rather thick layer of release agent. However, it has been found by the inventors that even with such high temperatures of the surfaces of the belt big savings of the amount of release agent can be achieved when using two-substance-spray-nozzles.

**[0006]** According to a development of the invention the two-substance-spray-nozzles are arranged upstream of the product gap, with respect to a movement of the lower run of the first belt and an upper run of the second belt defining the product gap.

**[0007]** According to a further development of the invention the two-substance-spray-nozzles are arranged in an area upstream of the product gap, where the first belt and the second belt contact one of the guide rollers, respectively.

**[0008]** By using two-substance-spray-nozzles the release agent can be applied in a continuous film and very evenly distributed onto the surface of the first belt and the second belt, respectively. Thereby, the release agent can be applied only a very short distance before the sprayed surface of the belt enters the product gap. Especially, the thickness of the layer of release agent can be precisely set by the use of two-substance-spray-nozzles to the thickness needed in the product gap. This is possible because no flowing movement of the drops of release agent are necessary on the surface of the first belt and/or the second belt in order to achieve continuous film with a constant and even thickness of release agent over the entire width of the first belt and/or the second belt. Two-substance spray nozzles combine release agent and compressed air and produce a spray of this combination and apply the spray to the belts. By means of the two-substance spray nozzles a mist of release agent and compressed air is produced and applied to the belts. The position of the spray bar containing the two-substance-spray nozzles and the temperature of the belts at the inlet position of the double belt press, where the spray bar is located, are taken into account when controlling pressure of compressed air and release agent and are also taken into account when designing the two-substance spray nozzles with respect to the quantity of compressed air and release agent contained in the spray. The spray bar contains a plurality of two-substance spray nozzles arranged side by side across the width of the belts to wet or cover the belts very evenly with the mist of release agent and compressed air.

**[0009]** According to a further development of the invention the two-substance-spray-nozzles are arranged for spraying release agent immediately adjacent a vertical section or on the vertical section of the first belt and/or the second belt.

**[0010]** Adjacent a vertical section or on the vertical section of the first belt and/or the second belt there is usually sufficient space available for arranging the two-substance-spray-nozzles.

**[0011]** According to a further development of the invention the two-substance-spray-nozzles are arranged for spraying release agent immediately adjacent and downstream the vertical section of the first belt with respect to a movement of the first belt.

**[0012]** It has been found by the inventors that it is advantageous to spray the release agent onto the first belt immediately adjacent and downstream the vertical section of the first belt.

**[0013]** According to a further development of the invention the two-substance-spray-nozzles are arranged for spraying release agent immediately adjacent and upstream the vertical section of the second belt with respect to a movement of the second belt.

**[0014]** It has been found by the inventors that it is advantageous to spray the release agent onto an area of the second, lower belt immediately adjacent and upstream the vertical section of the second belt.

**[0015]** According to a development of the invention the two-substance-spray-nozzles are arranged side by side and perpendicular to the moving direction of the first belt and/or the second belt.

**[0016]** According to a further development of the invention a distance between two adjacent two-substance-spray-nozzles lies in a range between 90 mm and 110 mm, especially the distance is 100 mm.

**[0017]** According to a further development of the invention a cleaning device is provided for cleaning exit openings of the two-substance-spray-nozzles, wherein the cleaning device has a plurality of needles, wherein each two-substance-spray-nozzle is assigned one of the needles and wherein each needle is connected to an actuator for pushing the needle through the exit opening of the two-substance-spray-nozzle.

**[0018]** By means of a needle being pushed through an exit opening of a two-substance-spray-nozzle a very quick and reliable cleaning of the exit opening can be achieved.

**[0019]** According to a further development of the invention the actuators are driven by compressed air.

**[0020]** Compressed air is available at each two-substance-spray-nozzle simply because the spray of release agent is produced by the two-substance-spray-nozzle by using compressed air.

**[0021]** According to a further development of the invention the needle is at least partly arranged within a housing of the two-substance-spray-nozzle for being pushed through the exit opening in an outflow direction through the exit opening.

**[0022]** Thereby, possible dirt and debris being accumulated in the exit opening or immediately upstream the exit opening can be pushed through and out of the exit opening. Thereby, a very reliable and long-lasting cleaning of the exit opening is achieved. In case smaller particles of dirt and debris remain within the exit opening after the needle has been pushed through and after the needle has again been retracted, such smaller particles will be washed out the exit opening by the mixture of

release agent and compressed air flowing through the exit opening during spray operation.

**[0023]** According to the invention there is also provided a method for producing wood-based panels, especially medium-density fiberboard, by means of an inventive double belt press, wherein a release agent is applied to a first endless belt and a second endless belt of the double belt press by means of at least one two-substance-spray-nozzle, wherein the two-substance-spray-nozzle produces a spray of release agent using compressed air.

**[0024]** The inventors have found that even when considering the high temperatures of endless belts in a double belt press for producing wood-based panels, such temperature being in the range between 100 °C and 200 °C, especially between 120 °C and 160 °C, using two-substance-spray-nozzles for applying release agent can provide significant advantages. It is believed that these advantages are due to the possibility of producing a thin, but continuous layer of release agent onto the surface of the first belt and/or the second belt and by the possibility of setting a thickness of such a continuous and even layer very precisely to the thickness being best suited for a special process. The exact thickness of the layer of release agent can be easily found out by a very limited number of trials during production of wood-based panels with a double belt press.

**[0025]** According to a further development of the invention release agent is applied immediately adjacent a vertical section or on a vertical section of the first belt and/or the second belt in an area where the first belt and/or the second belt contact one of the guide rollers.

**[0026]** According to a further development of the invention release agent is applied immediately adjacent and downstream a vertical section of the first belt with respect to a movement of the first belt.

**[0027]** According to a further development of the invention release agent is applied immediately adjacent and upstream a vertical section of the second belt with respect to a movement of the second belt.

**[0028]** According to a further development of the invention each of the two-substance-spray-nozzles is cleaned by means of a needle being pushed through the exit opening of the two-substance-spray-nozzle.

**[0029]** A cleaning device used can be provided with one needle for each two-substance-spray-nozzle in order that all two-substance-spray-nozzles can be cleaned by one needle each at the same time.

**[0030]** According to a further development of the invention the needle is pushed through the exit opening in an outflow direction through the exit opening.

**[0031]** According to a further development of the invention the needle is pushed through the exit opening in regular intervals.

**[0032]** By regularly cleaning the exit openings a deterioration of the spray of the two-substance-spray-nozzles is prevented and a very constant quality of the wood-based panels being produced can be achieved.

**[0033]** Further advantageous features of the invention are described and shown in the following description of a preferred embodiment of the invention in conjunction with the drawings. In the drawings:

- fig. 1 shows a perspective partial view of a double belt press according to an embodiment of the invention,
- fig. 2 shows a front view of the double belt press of fig. 1,
- fig. 3 shows a further perspective view of the double belt press of fig. 1,
- fig. 4 shows a side view of the partly shown double belt press of fig. 1, and
- fig. 5 shows a partial sectional view of the double belt press of fig. 1 on to the sectional plane V-V.

**[0034]** Fig. 1 shows a part view of a double belt press 10 for producing wood-based panels, especially medium-density fiberboard panels. The double belt press 10 has a first endless belt 12 and a second endless belt 14. The first endless belt 12 and the second belt 14 are each guided around two guide rollers. The first belt 12 forms an upper belt and the second belt 14 forms a lower belt. Of the two guide rollers the first belt 12 is guided around, only one guide roller 16 is shown. Of the two guide rollers the second endless belt 14 is guided around, only one guide roller 18 is shown. The guide rollers 16, 18 are each mounted on a shaft 20, 22, said shafts 20, 22 being rotatably mounted in a machine frame 40. The shafts 20, 22 and thereby the guide rollers 16, 18 can be driven by a motor not being shown in order to move the first endless belt 12 and the second endless belt 14, respectively. A lower run of the upper, first belt 12 and an upper run of the lower, second belt 14 form a product gap 24, which is only partly shown in fig. 1. The guide roller 16 rotates clockwise and the guide roller 18 rotates anti-clockwise with the same velocity as is shown in fig. 1 by curved arrows. Thereby, the lower run of the first belt 12 and the upper run of the second belt 14 have the same velocity within the product gap 24. Wood-based fibers are provided on a transport belt not shown in fig. 1 and are distributed on the transport belt to form a layer of constant thickness. This layer of wood fibers is then introduced into the product gap 24 and is compressed and densified within the product gap 24 between the lower run of the first belt 12 and the upper run of the second belt 14. Double belt presses 10 for producing wood-based panels are known in the art and, therefore, the double belt press 10 will not be further described with respect to compressing and densifying a layer of wood-based fibers in order to form a wood-based panel.

**[0035]** In order to prevent that the layer of wood-based fibers sticks to the first belt 12 and the second belt 14 in

the product gap, an outer surface of the first belt 12, which is partly visible in fig. 1, and an outer surface of the second belt 14, which is partly visible in fig. 1, are provided with a layer of release agent. By means of such a release agent it is prevented that during compressing and densifying the layer of wood-based fibers within the product gap 24 the fibers stick to the surfaces of the first belt 12 and the second belt 14 which form the product gap 24.

**[0036]** The release agent is, according to the invention, applied by means of a first spray bar 30 which is arranged radially outward of the circumference of the first guide roller 16 and radially outward of the first belt 12 in the area where the first belt 12 is guided around the first guide roller 16.

**[0037]** In order to apply the release agent to the second belt 14, a second spray bar 32 is provided. The second spray bar 32 is arranged radially outward of the periphery of the second guide roller 18 and radially outward of the second belt 14 where the second belt 14 is guided around the second guide roller 18.

**[0038]** Each spray bar 30, 32 is provided with a plurality of two-substance-spray-nozzles. The plurality of two-substance-spray-nozzles is arranged side by side across the width of the first belt 12 within the spray bar 30 and across the width of the second belt 14 within the second spray bar 32. The two-substance-spray-nozzles are thereby arranged side by side and perpendicular to the moving direction of the first belt 12 and the second belt 14, respectively. A distance between two adjacent two-substance-spray-nozzles lies in a range between 90 mm and 110 mm, especially the distance is 100 mm. Thereby, the outer surface of the first endless belt 12 can be sprayed with a spray of release agent. This spray is produced by using the release agent as well as compressed air. Compressed air and release agent are provided to the first spray bar 30 and the second spray bar 32 by means of suitable line and a control device 34 connected to the lines. By means of the control device 34 a supply of release agent as well as a supply of compressed air to the two-substance-spray-nozzles within the spray bars 30 and 32 can be enabled or stopped. The control unit 34 is provided with start and stop signals of a control device of the entire double belt press 10, such control device being not shown in fig. 1.

**[0039]** The layer of wood-based fibers can be introduced into the product gap 24 directly so that the layer of wood-based fibers is contacted by the first belt 12 and the second belt 14.

**[0040]** According to an embodiment of the invention not shown the layer of wood-based fibers can also be placed in between two transport belts, e.g. plastic transport belts, and the two transport belts are together with the inbetween placed layer of wood-based fibers introduced into the product gap 24. The release agent sprayed onto the first belt 12 by the spray bar 30 and the release agent sprayed onto the second belt 14 by means of the spray bar 32 then serves to prevent sticking of the transport belts to the first belt 12 and the second

belt 14, respectively.

**[0041]** By means of the two-substance-spray-nozzles within the spray bars 30, 32 a continuous and even layer of release agent can be produced onto the first belt 12 and the second belt 14, respectively. The thickness of such a layer can be precisely set. This is due to the spray of the two-substance-spray-nozzles having very evenly distributed drops of release agent, such drops not varying significantly in size. As a consequence, by means of the spray of the two-substance-spray-nozzles a continuous layer of release agent with constant thickness can be produced onto the surface of the first belt 12 and the second belt 14 and no waiting time is necessary in order that a continuous film with constant thickness of release agent is formed onto the surface of the belts. In case of big drops of release agent a waiting time would be necessary in order that the drops of release agent distribute onto the surface of the belts in order to form a continuous layer of release agent.

**[0042]** Since a continuous layer of release agent of a constant and precisely predefined thickness is formed by means of the two-substance-spray-nozzles on the surfaces of the first belt 12 and the second belt 14, the amount of release agent can be reduced compared to known methods of applying release agent to a belt. The inventors have found that the amount of release agent can be significantly reduced by more than 80% especially 83% compared to conventional methods of applying release agent. In the case of a double belt press for producing wood-based panels it has to be taken into account that the endless belts 12, 14 have a rather high temperature when being guided around the guide rollers 16, 18. Especially, the temperature of the first belt 12 and the second belt 14 in the area before entering the product gap 24 and being guided around the guide roller 16 and the guide roller 18, respectively, is in a range between 100 °C and 200 °C, especially between 120 °C and 160 °C. It was expected that release agent being applied to the belts having a temperature above 100 °C would quickly evaporate. However, the inventors have found that applying only a very thin but continuous layer of release agent of constant thickness to the first belt 12 and the second belt 14, respectively, by means of two-substance-spray-nozzles can reliably prevent sticking of wood-based fibers or transport belts to the first belt 12 and the second belt 14, respectively.

**[0043]** Fig. 2 shows a front view of the partly shown double belt press 10 of fig. 1. In fig. 2 one can see into the product gap 24 which is formed between the lower run of the upper, first belt 12 and the upper run of the lower, second belt 14.

**[0044]** In fig. 2 it can further be seen that the upper guide roller 16 for guiding the first belt 12 is by means of its shaft 20 rotatably journaled in a machine frame 40. The second guide roller 16 for guiding the second belt 14 is also rotatably journaled by means of its shaft 22 in the machine frame 40. An end 42 of the shaft 20 of the first guide roller 16 and an end 44 of the shaft 22 of the second

guide roller 16 can be seen in fig. 2. As has already been explained, the ends 42, 44 can be driven by suitable devices, e.g. electric motors, in order to turn the guide rollers 16, 18 to thereby move the first belt 12 and the second belt 14.

**[0045]** Fig. 2 shows a middle plane 46 of the product gap 24 in dot and dash lines. The middle plane 46 is simply to indicate the middle of the product gap 24, the middle plane 46 having the same distance to the lower run of the first belt 12 and to the upper run of the second belt 14.

**[0046]** It can be seen that the first spray bar 30 is arranged in a distance A above the middle plane 46. The second spray bar 32 is arranged in a distance B below the middle plane 46. The distance A and the distance B are different. Especially, the distance A is smaller than the distance B. It can already be seen in fig. 2 that the first spray bar 30 is arranged slightly below of a middle axis of the shaft 20 of the first guide roller 16, whereas the second spray bar 32 is arranged slightly below the middle axis of the shaft 22 of the second guide roller 18.

**[0047]** Fig. 3 shows a perspective view of the partly shown double belt press of fig. 1.

**[0048]** Fig. 4 shows a side view of the partly shown double belt press 10 of fig. 1. In this side view it can be seen that the first spray bar 30 is arranged in order that the two-substance-spray-nozzles within the spray bar 30 are arranged for spraying release agent immediately adjacent and downstream of a vertical section of the first belt 12. In contrast thereto, the second spray bar 32 is arranged so that the two-substance-spray-nozzles of the second spray bar 32 are arranged for spraying release agent immediately adjacent and upstream the vertical section of the second belt 14. The turning direction of the first guide roller 16 and the second guide roller 18 is shown in fig. 4 by curved arrows. The first, upper guide roller 16 turns clockwise, whereas the lower, second guide roller 18 rotates in the anti-clockwise direction. It can be seen that the first spray bar 30 is arranged downstream of the vertical section of the first belt 12 in the area where the first belt 12 is guided around the first guide roller 16. The second spray bar 32 is arranged upstream of the vertical section of the second belt 14 in the area where the second belt 14 is guided around the second guide roller 18.

**[0049]** Fig. 5 shows a partly shown sectional view onto the sectional plane V-V in fig. 2. It should be noted that only the first spray bar 30 is shown in a sectional view. The second spray bar 32 is designed identically to the first spray bar 30 and therefore not shown.

**[0050]** The first spray bar 30 is arranged radially outward of the periphery of the first guide roller 16 and radially outward of the first belt 12 in the area where it is guided around the first guide roller 16. Fig. 5 shows a two-substance-spray-nozzle 50. The two-substance-spray-nozzle 50 is provided with compressed air and release agent in order to produce a spray of release

agent which is directed against the radially outer surface of the first belt 12. The spray nozzle 50 as well as a plurality of further spray nozzles 50 are arranged side by side and perpendicular to the moving direction of the first belt 12. As a consequence, only one two-substance-spray-nozzle 50 can be seen in fig. 5. The spray nozzles 50 are partly surrounded by a spray bar box 52 having a flap which can be opened in order to provide easy access to the two-substance-spray-nozzles 50 as well as to the lines for providing compressed air as well as liquid release agent.

**[0051]** Each two-substance-spray-nozzle 50 also is provided with a cleaning device 54, which is not shown in detail in fig. 5. The cleaning device comprises one needle within each two-substance-spray-nozzle 50. The needle is arranged partly within the housing of the two-substance-spray-nozzle 50 and can be moved by an actuator in order to be pushed through the exit opening of the two-substance-spray-nozzle 50 in the outflow direction through the exit opening. The actuator is driven by compressed air. The actuator is activated in regular intervals. Thereby, possible dirt and debris being accumulated in or upstream of the exit opening can be pushed out of the exit opening by means of the needle. Thereby, a constant quality of the spray of the two-substance-spray-nozzles 50 can be provided.

## Claims

1. Double belt press for producing wood based panels, especially medium density fibreboard, having a first endless belt and a second endless belt, the first endless belt being guided around two guide rollers and the second belt being guided around two guide rollers, wherein the first endless belt is arranged at least in sections above the second endless belt and wherein a product gap is defined between a lower run of the first belt and an upper run of the second belt, and having a plurality of spray nozzles for applying a release agent to the first belt and/or the second belt, wherein the spray nozzles are two-substance-spray-nozzles for producing a spray of release agent by using compressed air.
2. Double belt press according to claim 1, **characterized in that** the two-substance-spray-nozzles are arranged upstream of the product gap, with respect to a movement of the lower run of the first belt and an upper run of the second belt defining the product gap.
3. Double belt press according to claim 1 or 2, **characterized in that** the two-substance-spray-nozzles are arranged in an area upstream of the product gap, where the first belt and the second belt contact one of the guide rollers, respectively.
4. Double belt press according to claim 3, **characterized in that** the two-substance-spray-nozzles are arranged for spraying release agent immediately adjacent a vertical section or on the vertical section of the first belt and/or the second belt.
5. Double belt press according to claim 4, **characterized in that** the two-substance-spray-nozzles are arranged for spraying release agent immediately adjacent and downstream the vertical section of the first belt with respect to a movement of the first belt.
6. Double belt press according to claim 4 or 5, **characterized in that** the two-substance-spray-nozzles are arranged for spraying release agent immediately adjacent and upstream the vertical section of the second belt with respect to a movement of the second belt.
7. Double belt press according to one of the preceding claims, **characterized in that** the two-substance-spray-nozzles are arranged side by side and perpendicular to the moving direction of the first belt and/or the second belt.
8. Double belt press according to claim 7, **characterized in that** a distance between two adjacent two-substance-spray-nozzles lies in a range between 90 mm and 110mm, especially the distance is 100mm.
9. Double belt press according to at least one of the preceding claims, **characterized in that** a cleaning device is provided for cleaning exit openings of the two-substance-spray-nozzles, wherein the cleaning device has a plurality of needles, wherein each two-substance-spray-nozzle is assigned one of the needles, and wherein each needle is connected to an actuator for pushing the needle through the exit opening of the two-substance-spray-nozzle.
10. Double belt press according to claim 9, wherein the actuators are driven by compressed air.
11. Double belt press according to claim 9 or 10, **characterized in that** the needle is at least partly arranged within a housing of the two-substance-spray-nozzle for being pushed through the exit opening in an outflow direction through the exit opening.
12. Method for producing wood-based panels, especially medium density fibreboard, by means of a double belt press according to at least one of the preceding claims, **characterized by** applying a release agent to a first endless belt and a second endless belt of the double belt press by means of at least one two-substance-spray-nozzle, wherein the two-substance-spray-nozzle produces a spray of release agent using compressed air.

13. Method according to claim 12, **characterized by** applying release agent immediately adjacent a vertical section or on a vertical section of the first belt and/or the second belt in an area where the first belt and/or the second belt contacts one of the guide rollers. 5
14. Method according to claim 13, **characterized by** applying release agent immediately adjacent and downstream a vertical section of the first belt with respect to a movement of the first belt. 10
15. Method according to claim 13 or 14, **characterized by** applying release agent immediately adjacent and upstream a vertical section of the second belt with respect to a movement of the second belt. 15
16. Method according to at least one of claims 12 to 15, **characterized by** cleaning each of the two-substance-spray-nozzles by means of a needle being pushed through the exit opening of the two-substance-spray-nozzle. 20
17. Method according to claim 16, **characterized by** pushing the needle through the exit opening in an outflow direction through the exit opening. 25
18. Method according to claim 16 or 17, **characterized by** pushing the needle through the exit opening in regular intervals. 30

35

40

45

50

55

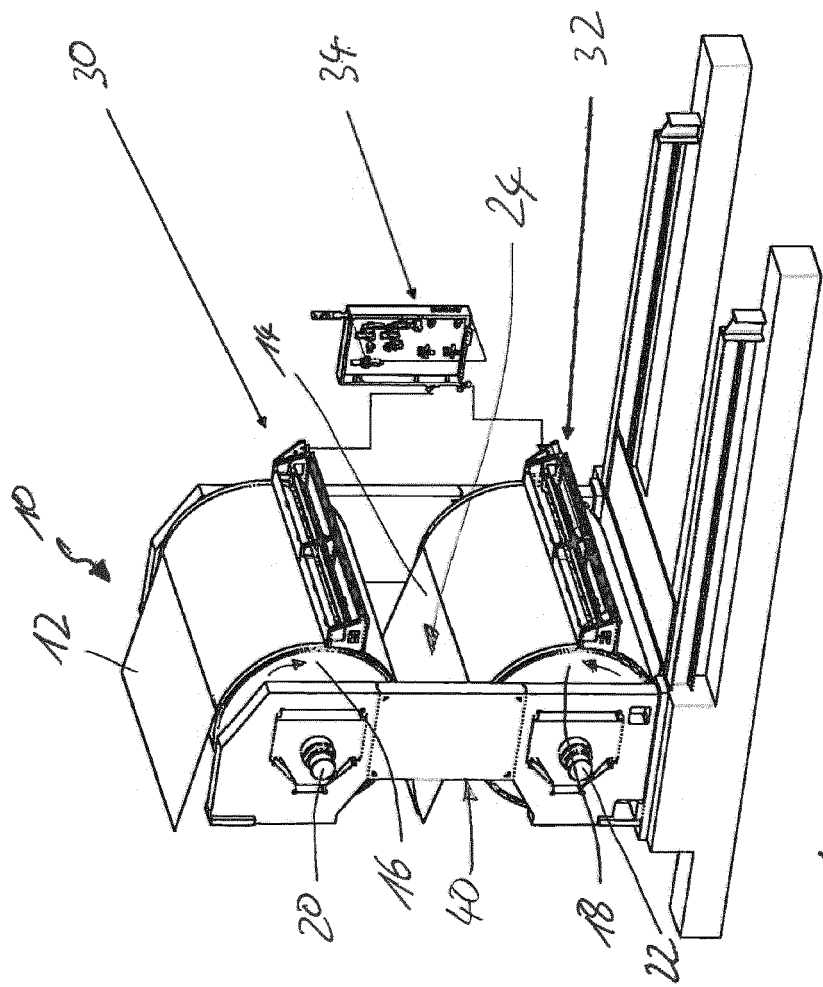


Fig. 1



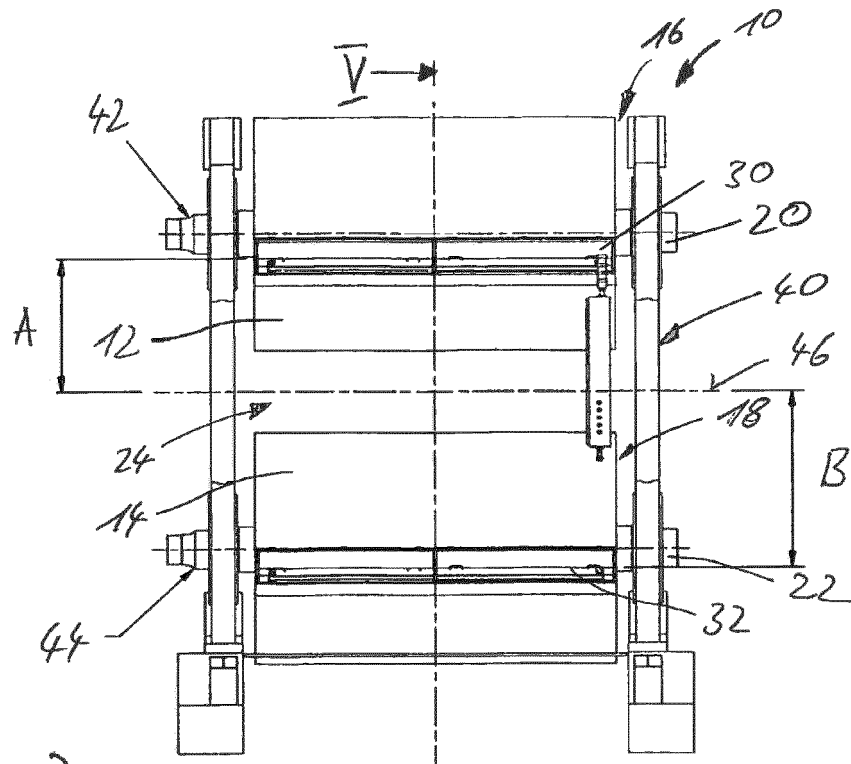


Fig. 2

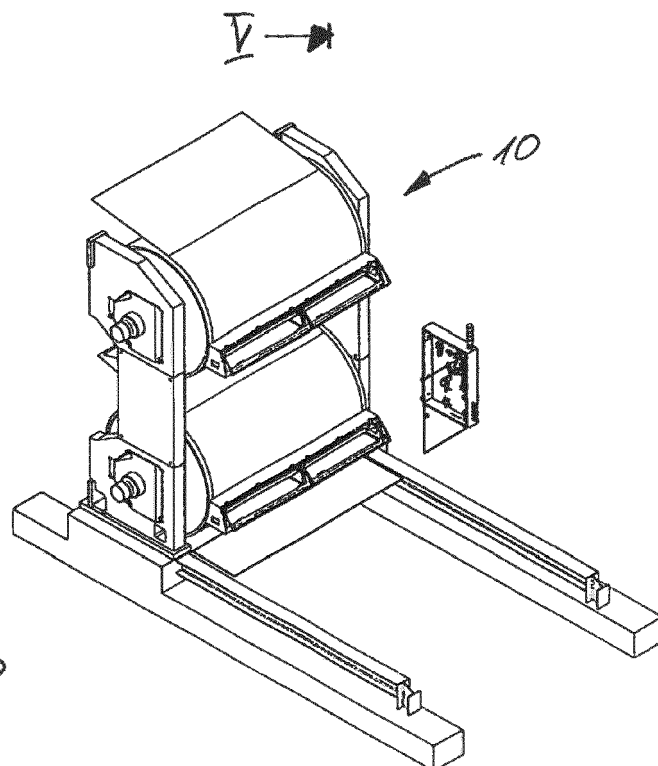


Fig. 3

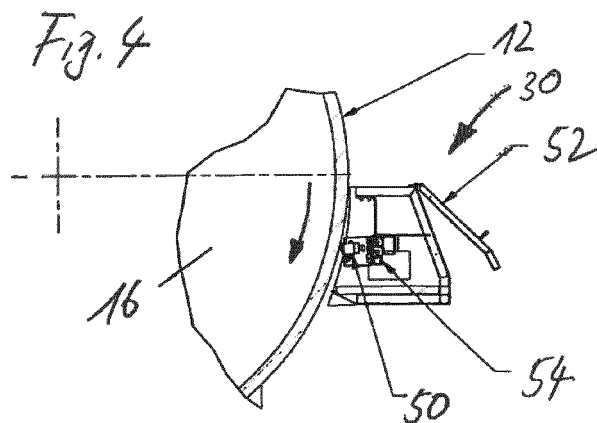
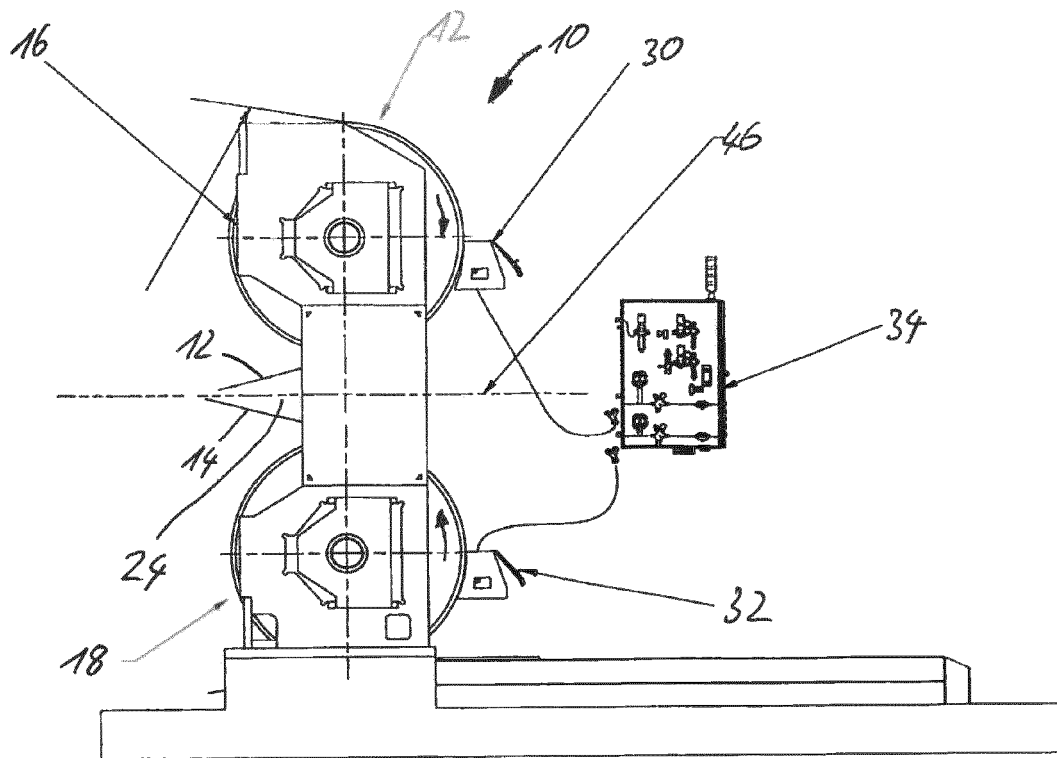


Fig. 5



## EUROPEAN SEARCH REPORT

Application Number

EP 23 38 3075

## 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 41 34 562 A1 (HYMMEN THEODOR GMBH [DE]) 22 April 1993 (1993-04-22)	1-3, 7, 8, 12	INV. B27N3/04
Y	* claims 1,2,5-8; figure 1; example 1 * * column 2, lines 44-45 * * column 3, lines 2-9 *	9-11, 16-18	B27N3/18 B27N3/24 B30B5/06 B27N3/08
X	CN 201 745 078 U (HUBEI BAORYUAN WOOD INDUSTRY LTD) 16 February 2011 (2011-02-16) * see also attached automated translation; claim 1; figure 1; example 1 * * the whole document * * abstract *	1-7, 12-15	ADD. B27N3/02
Y	US 2015/107749 A1 (HEYEN GUENTER [US] ET AL) 23 April 2015 (2015-04-23) * paragraph [0054]; figure 5 *	9-11, 16-18	
Y	US 5 185 114 A (HELD KURT [DE]) 9 February 1993 (1993-02-09) * column 13, lines 16-20 *	9-11, 16-18	
			TECHNICAL FIELDS SEARCHED (IPC)
			B27N B30B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		3 July 2024	Baran, Norbert
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)



Application Number

EP 23 38 3075

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

**LACK OF UNITY OF INVENTION  
SHEET B**

Application Number

EP 23 38 3075

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 2-8, 13-15 (completely); 1, 12 (partially)

Double belt press and method for producing wood based panels.

---

2. claims: 9-11, 16-18 (completely); 1, 12 (partially)

Double belt press and method for producing wood based panels involving specific cleaning of the nozzles.

---

# ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 23 38 3075

5

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.

03 - 07 - 2024

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 4134562 A1	22 - 04 - 1993	NONE	
-----	-----	-----	-----
CN 201745078 U	16 - 02 - 2011	NONE	
-----	-----	-----	-----
US 2015107749 A1	23 - 04 - 2015	US 2015107749 A1	23 - 04 - 2015
		WO 2015056174 A2	23 - 04 - 2015
-----	-----	-----	-----
US 5185114 A	09 - 02 - 1993	NONE	
-----	-----	-----	-----

15

20

25

30

35

40

45

50

55

EPO FORM P0459

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