

(a) Delete for Non-Convention Application.

(b) Delete for Convention Application.

Declaration in Support of
(a) A Convention Application
~~(b) An Application~~
for a Patent ~~or Patent of Addition~~

(c) Insert Full Name of Applicant.

In support of the ~~Application/Convention~~ Application made by
(c) EDUARD KÜSTERS MASCHINENFABRIK GmbH & Co. KG (hereinafter termed "the applicant")

for a patent/~~patent of addition~~ for an invention entitled:

(d) Insert Title of Invention.

(d) "A METHOD OF AN PLANT FOR THE MANUFACTURE OF WOOD CHIPBOARDS AND SIMILAR BOARD MATERIALS"

(e) Insert Full Names of Declarant(s).

~~I/We~~ (e) Peter Heintz and Bernhard Brendel

(f) Insert Address(es) of Declarant(s).

of (f) Gladbacher Stra e 457, D-4150 Krefeld 1, Federal Republic of Germany

do solemnly and sincerely declare as follows:—

(g) Delete when Applicant is a Company.

1. ~~I am/we are the applicant(s) for the patent/patent of addition~~
~~or~~

(h) Delete when Applicant is an individual. Fill in Name of Applicant if a Company.

(h) ~~I am/we are authorised by~~ the applicant

the applicant for the patent/~~patent of addition~~ to make this declaration on its behalf.

(i) For Non-Convention Application, delete. For Convention Application, fill in details of basic application.

2. (i) The basic application(s) as defined by Section 141 of the Act was/were made in Federal Republic of Germany on the 17th day of February, 1987 by the applicant

(j) Delete for Non-Convention Application by Assignee of Inventor and for Convention Application.

3. (j) ~~I am/we are the actual inventor(s) of the invention~~
~~or~~

(k) Delete for Non-Convention Application by Inventor and for Convention Application by Assignee.

(k) ~~I am/we are the actual inventor(s) of the invention referred to in the basic application.~~
or

Karl-Heinz Ahrweiler,
Bündericher Strasse 87,
D-4156 Willich 1,
Federal Republic of Germany

Bernd Heimes,
Benhütter Strasse 125,
D-4050 Mönchengladbach,
Federal Republic of Germany

(l) Delete for Application by Inventor. For Application by Assignee, insert name, address and occupation of Inventor.

(l) ~~is/are the actual inventor(s) of the invention and the facts upon which the applicant I am/we are/the said Company is entitled to make the application are as follows:~~

(m) Insert details of Assignment, etc. Date of Assignment only is insufficient.

(m) The applicant is a person who would, if a patent were granted upon an application made by the said actual inventors, be entitled to have the patent assigned to it.

(4) Delete for Non-Convention Application.

4. The basic application referred to in paragraph 2 of this Declaration was the first application made in a Convention country in respect of the invention the subject of the application.

(n) Insert place and date of signature.

(n) Declared at Krefeld,

this 14th day of June 1989

SIGN

X

Peter Heintz

(11) AU-B-12958/88
(10) 605557

-2-

press with two metal forming belts disposed one above the other in a pressing zone and bearing against a support structure, between which forming belts a material is compressible in the pressing zone under the action of pressure and heat, and comprising a spreading device by means of which the particles provided with the binder are adapted to be spread on a horizontal run of the bottom forming belt to form a filling, characterised in that another spreading device is provided by means of which an edge filling (36) of particles free from binder can be spread on to the bottom forming belt (2), such edge filling (36) extending outside the edges (32) of the main filling (33) producing the boards to the vicinity of the edge of the pressing zone.



PCT

WELTORGANISATION FÜR GEISTIGES EIGENTUM
(Internationales Büro)

INTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE
INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

605557

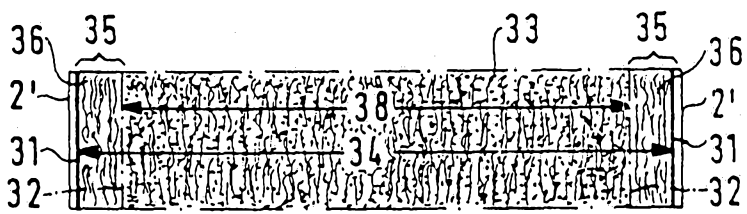
<p>(51) Internationale Patentklassifikation 4 : B27N 3/24, 3/14</p>	<p>A1</p>	<p>(11) Internationale Veröffentlichungsnummer: WO 88/ 06082 (43) Internationales Veröffentlichungsdatum: 25. August 1988 (25.08.88)</p>
<p>(21) Internationales Aktenzeichen: PCT/DE88/00064 (22) Internationales Anmeldedatum: 11. Februar 1988 (11.02.88) (31) Prioritätsaktenzeichen: P 37 04 940.2 (32) Prioritätsdatum: 17. Februar 1987 (17.02.87) (33) Prioritätsland: DE (71) Anmelder (für alle Bestimmungsstaaten ausser US): EDUARD KÜSTERS MASCHINENFABRIK GMBH & CO. KG [DE/DE]; Gladbacher Straße 457, D-4150 Krefeld 1 (DE). (72) Erfinder;und (75) Erfinder/Anmelder (nur für US) : AHRWEILER, Karl- Heinz [DE/DE]; Budericher Straße 87, D-4156 Willich 1 (DE). HEIMES, Bernd [DE/DE]; Benhütter Straße 125, D-4050 Mönchengladbach (DE).</p>	<p>(74) Anwalt: PALGEN, Peter; Mulvanystasse 2, D-4000 Düsseldorf (DE). (81) Bestimmungsstaaten: AT (europäisches Patent), AU, BE (europäisches Patent), BR, CH (europäisches Pa- tent), DE (europäisches Patent), DK, FI, FR (euro- päisches Patent), GB (europäisches Patent), HU, IT (europäisches Patent), JP, LU (europäisches Patent), NL (europäisches Patent), NO, SE (europäisches Pa- tent), SU, US. Veröffentlicht Mit internationalem Recherchenbericht. Vor Ablauf der für Änderungen der Ansprüche zugelas- senen Frist. Veröffentlichung wird wiederholt falls An- derungen eintreffen. A. O. J. P 13 OCT 1988</p>	

This document contains the amendments made under Section 49 and is correct for printing

AUSTRALIAN
14 SEP 1988
PATENT OFFICE

(54) Title: PROCESS AND EQUIPMENT FOR THE MANUFACTURE OF CHIP-BOARD AND BOARD OF SIMILAR MATERIALS

(54) Bezeichnung: VERFAHREN UND ANLAGE ZUR HERSTELLUNG VON HOLZSPANPLATTEN UND ÄHNLICHEN PLATTENWERKSTOFFEN



(57) Abstract

In the manufacture of chip-board and boards of similar materials in a double band press, where the board is to have a width (38) less than the nominal working width (34), the moulding bands (1, 2) are held on the support structure (17, 18) in a position enduring the transfer of heat to the marginal zone (35) extending from beyond the edge of the material which forms the boards to within a short distance of the edge (31) of the moulding zone. At this point marginal material (36) consisting of binder-free particles is incorporated by pressing, or a compressible band is set into motion therewith.

(57) Zusammenfassung

In einer Doppelbandpresse zur Herstellung von Holzspanplatten und dgl. werden, wenn Platten mit einer die Nenn-Arbeitsbreite (34) unterschreitenden Breite (38) hergestellt werden sollen, in der Außerhalb des Randes (32) der die Platten ergebenden Schüttung (33) bis in die Nähe des dortigen Randes (31) der Preßstrecke sich erstreckenden Randzone (35) die Formbänder (1, 2) in einer die Wärmeübertragung sichernden Anlage an der Stützkonstruktion (17, 18) gehalten, indem dort eine Randschüttung (36) aus bindemittelfreien Partikeln mitgepreßt oder ein komprimierbares Band mitlaufen gelassen wird.

A method of and plant for the manufacture of wood chipboards and similar board materials

The invention relates to a method of the kind corresponding to the preamble of claim 1, and a corresponding plant, of the kind which are known from DE-PS 23 55 797.

A plant of this kind represents a considerable investment and operators therefore wish not only to be able to produce board widths corresponding to the nominal working width on such a plant, but also, if necessary, boards of a smaller width. For example, board widths of 210 and 185 cm are conventional on the market. In an attempt to make the smaller board width on plants designed for the larger board width, the width of the filling being made correspondingly smaller, problems occurred previously since the edges of the forming belts projecting out beyond the edge of the filling had no counter-pressure and could not be adequately pressed against the support structure from which not only the pressure but also the heat is transmitted to the forming belts. Consequently, the forming belts had at the edge no heat contact with the support structure or the rollers which, in the construction known from DE-PS 23 55 797, transmit the heat from the support structure to the forming belts, and which roll over the entire width thereof, so that the temperature of the forming belts dropped considerably towards the edge. Consequently, the edge zones contracted longitudinally, and since the wide middle zone of the forming belts was at working temperature, considerable thermal stresses occurred. Such thermal stresses became critical in the area of the reversing drums, because there the thermal stresses had superimposed on them the additional stresses due to the considerable longitudinal tension of the forming belts and the stresses resulting from the elongation of the outer fibre due to the belt reversal. The resulting total tensile stresses on the outside of the zones of the forming belts trained over the reversing drums were close to, and in



some cases exceeded, the yield stress, but in any case led to problems in continuous operation, particularly since the forming belts are made of stainless steel which is not particularly resistant to repeated flexural stresses.

Similar problems occurred in double-belt presses previously, even when the nominal width was used. The reason for this is that the filling does not extend exactly as far as the edge of the forming belts, and the latter project somewhat transversely beyond the filling and also beyond the edge of the zone covered by the rollers. Here again there were temperature drops with resultant stresses.

In the press according to DE-PS 22 43 465 the attempt was made to keep the temperature drop within limits by heating the projecting edges of the forming belts. However it was found necessary to heat the edges of the forming belts practically over their entire length, because otherwise the temperature immediately drops off behind a heating zone. Heating over the entire length, however, gives rise to considerable structural problems and is generally also disregarded because of the considerable expenditure.

According to DE-PS 28 19 943, another solution has been found in corrugating the projecting edge of the forming belts so that in the event of a temperature drop towards the edge there is as it were more material available there and the longitudinal tensile stresses are not so high in the event of thermally caused contraction. Although this step is practicable in the case of projecting edges of just a few centimetres, that is not the case if these edges in which there is a temperature drop are equivalent to several tens of centimetres.

The object of the invention is so to devise a method according to the preamble and a plant such that board-producing webs of smaller width



can be run on a double-belt press of a predetermined nominal working width.

This problem is solved according to the invention by the features of claim 1 as regards the method.

The temperature drop at the edge of the forming belts which would otherwise occur due to the contact which is absent at smaller working widths, and the accompanying poorer heat transfer to the forming belts, is avoided, since the contact is now produced artificially. As a result, heat still passes from the support structure to the forming belts even in the edge zone so that the temperature drop is absent or can at least be limited to a harmless amount. The contact pressure need not be absolutely identical to the contact pressure in the middle part of the width corresponding to the filling, although this would naturally be preferable in order to create ideally identical conditions. It is, however, sufficient if the contact pressure is just so high that the temperature can be kept at a value which restricts the thermal stresses to a tolerable extent. The contact between the forming belts and the support structure under pressure to guarantee the heat transfer is produced in the invention with simple means, namely using the particles which are in any case available. Because of the character of these particles, this pressure is automatically adapted to the compression properties of the filling in the middle zone. The particles for the edge filling should be free from binder, because otherwise they would also be cured and the cured edge parts of the resulting board would have to be rejected, something that is just as uneconomic as making a wider board from the outset and trimming it to the required smaller width by discarding a wide edge strip.

According to claim 2 the particles for the edge filling can be taken from the stock for the main filling.



According to claim 3 it may be advantageous to adjust the moisture content of these particles independently of the moisture content of the particles for the main filling.

The reason for this is that the moisture content is of decisive importance in respect of the amount of heat withdrawn from the forming belt, because the liquid, mainly water, contained in the particles does of course evaporate and the amount of heat required for this has to be applied. Thus if the temperature of the edge zone of the forming belts is to be kept high, it is advantageous to ensure that the minimum amount of heat is lost in this zone to evaporate water, i.e., the particles here, including the binder, have a lower moisture content than the particles of the main filling.

If the same quantity of particles were always used for the edge filling, they would in the course of time be spoiled and their mechanical properties would differ from those of the particles of the main filling.

For this reason the procedure according to the claim 4 is advisable, according to which the particles of the edge filling are returned to the stock which also feeds the main filling, so that at least some of the particles of the edge filling are processed into a board after a single pass, and basically it is new particles that are always used for the edge filling.

The apparatus aspect of the invention is reproduced in claims 5 to 7.

Exemplified embodiments of the invention are illustrated in the drawing in the form of a plant for the manufacture of wood chip boards and the like.

Fig. 1 is a side elevation of a double-belt press to which the invention can be applied.



Fig. 2 is a vertical longitudinal section through the double-belt press on the line II-II in Fig. 3.

Fig. 3 is a cross-section through the double-belt press on the line III-III in Fig. 1.

Fig. 4 is a partial cross-section through the edge zone IV shown in chain-dotted framing in Fig. 3.

Fig. 5 is a partial top view of the transverse zone of the filling marked V-V in Fig. 2.

Fig. 6 is a chip flow diagram of the filling shown in Fig. 5.

Fig. 1 shows a two-belt press for making wood chip boards, wood fibre boards and other materials in board form, consisting of particles bonded by a binder which is cured under pressure and heat. It comprises a top forming belt 1 made of sheet steel of a thickness of about 1 to 1.5 mm, and a similar bottom forming belt 2. The web 4 of a filling 4' consisting of a pourable material is compressed between the forming belts 1, 2 in a pressing zone 3 and after the pressing operation gives one of the aforementioned materials.

The top forming belt 1 revolves around rollers or drums 5, 6 disposed transversely of the web 4, drum 6 being mounted in a stationary upright 7, and drum 5 being mounted in an upright 9 pivotable about an axis extending transversely of the web 4 in a bracket 8 on the ground. The upright 9 is moved by hydraulic cylinder 10 and thus tensions the forming belt 1.

The forming belt 2 revolves correspondingly over drums 11, 12 disposed transversely of the web 4, drum 11 being mounted in a stationary upright 13, while the drum 12 is mounted in an upright 14 movable on rails. The upright 14 can be moved in the longitudinal



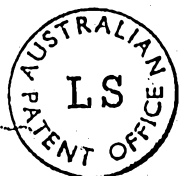
direction relative to the web by hydraulic cylinder 15 and the forming belt 2 can be tensioned in this way. The forming belts are driven via the drums.

The forming belts 1, 2 move through the apparatus in the direction indicated by arrows 16, so that the filling 4' applied by means not shown on the right-hand side of Fig. 1 is drawn into the pressing zone 3. The emerging compressed web 4 is taken off in the left-hand zone of the forming belt 2 with respect to Fig. 1 by suitable means not shown. A top support structure 17 is provided in the pressing zone 3 in the inner region of the forming belt 1 and cooperates with a bottom support structure 18 provided in the inner region of the bottom forming belt 2. The support structures 17, 18 brace those areas of the forming belts 1, 2 which face the web with respect to the latter and press them snugly against one another with considerable force.

Each of the support structures 17, 18 consists of individual members 19, 20 each disposed opposite one another above and below the forming belts 1, 2 and the web 4 (Fig. 2). Each pair of members 19, 20 is clamped by lateral spindles 21 (Fig. 3) so that individual pressure elements are formed which are self-contained in respect of forces.

Thick plates 26, 27 are disposed between the members 19, 20 and the forming belts 1, 2 and transmit evenly to the forming belts 1, 2 the force exerted by the individual members 19, 20 and contain ducts 40 (Fig. 4) in which heater elements are disposed or through which a heating medium is passed.

Roller chains 30 are disposed between the facing sides of the plates 26, 27 and the forming belts 1, 2, the latter rolling on the roller chains opposite the plates 26, 27, said roller chains revolving endlessly in a vertical longitudinal plane around the plates 26, 27.



The rollers of the roller chains 30 transmit both the pressure and the heat of the plates 26, 27 to the forming belts 1, 2 and hence the web 4 in formation.

Once a given point of the roller chains 30 has reached the end of the longitudinal section 3, they can be returned either in the actual pressing zone, i.e. between the members 19, 20 and the plates 26, 27, as shown in Fig. 2 in the case of plate 26 and in Fig. 4. This construction has the advantage that the roller chains 30 as they revolve maintain a substantially constant temperature. Alternatively, however, the roller chains 30 can be guided externally around the support structure as will be seen at the bottom of Fig. 2 in the case of support structure 18.

Referring to Fig. 4, the plates 26, 27 are constructed from a heating and support plate 43 and a return plate 44 separate therefrom and having return grooves 42 for the roller chains 30. This is a partial cross-section through an edge zone situated above the web 4 with respect to Fig. 2.

The plates 43 have the heating ducts 40 which at their ends are interconnected via bends 45 to form a closed pathway, and smooth surfaces 41 which form the common rolling surfaces for the roller chains 30 disposed side by side, which chains are visible in Fig. 4.

On forward movement of the forming belts 1, 2 the roller chains 30 roll between the latter and the facing running surfaces 41 of the plates 43. Adjacent roller chains 30 are situated with their outer end faces directly opposite one another.

An essential point in respect of the chain arrangement is the fact that each pair of adjacent roller chains 30 is adapted to be propelled independently of one another. The support elements for the forming belts 1, 2 together form a bay which is divided into



Individual lengths in the longitudinal direction, which lengths can move relatively to one another longitudinally in response to corresponding stress. Thus no constraining forces can form inside the roller chain arrangement due to varying drive by the forming belts.

When the full working width 34 is used on the double belt press illustrated, the right-hand edge 31 of the filling and of the board web 4 with respect to Fig. 4 is situated substantially at the height of the right-hand edge of the roller chains 30. Let us assume that it is now required to make a narrower board web on the same press, with the right-hand edge 32 with respect to Fig. 4 being situated inside the rolling zone of the roller chains.

A filling 33 of wood chips or other appropriate particles is then applied conventionally to the forming belt 2, the width 38 thereof being less than the nominal working width 34 and being characterised by the position of the edge 32 in Fig. 4. These wood chips or other particles are provided with binder, as indicated by the dots drawn in the dropping zone 39 in Fig. 2 and in Figs. 4 to 6.

If the filling 33 provided with the binder were to enter the pressing zone 3, the forming belts 1, 2 would lack any counter-pressure in the edge zone 35 (Figs. 4 and 5) because the filling 33 is of course narrower than the nominal working width 34. For this reason, the heat would be transmitted to the forming belts 1, 2 by the roller chains 30 to a much lesser degree in the outer edge zone and there would form there transversely a distinct temperature drop with the corresponding thermal stresses in the longitudinal direction.

To prevent this, additional edge fillings 36 are applied to the two edge zones 35 of the pressing zone 3 which are not covered by the filling 33, and extend from the edge 32 of the main filling 33 outwards as far as the edge 31 of the pressing zone, where they



provide a counter-pressure which holds the forming belts 1, 2 in contact with the roller chains 30 at the edge zones 35 in a comparable way to what is the case in the area of the main filling 33.

The material of the edge filling 36 is the same as that of the main filling 33. It is taken from the common stock 50 (Fig. 6) of unglued chips via conveyors 51, from which the material for the main filling 33 is also taken via conveyor 52. Binder is also added, however, to the material for the main filling 33 from the binder stock 53 before the spreading operation in the conveyor zone 52. After passing through the pressing zone 3, the main filling 33 has set to form the board web 4, while the material of the edge fillings 36, which contains no binder, is still loose and spreadable. After leaving the pressing zone, therefore, this material can be returned to the stock 50 via the return zones 54 and be mixed with the main quantity of material there. It therefore participates in the manufacture of the board web 4 and does not rotate endlessly for example as a separate quantity just to form the edge fillings 36.

If required, the moisture content of the particles for the edge fillings 36 can be adjusted independently of the moisture content of the particles for the main filling 33, by moisture control means 55 provided in the conveyor zones 51. The adjustment can, for example, be to a lower value so that not so much heat is lost at the edge purely for the evaporation of existing moisture, and the required temperature increase at the edge can be obtained more easily.



C L A I M S

1. A method of continuously manufacturing wood chip boards and similar board materials consisting of particles bonded by a bonding agent which is cured under pressure and heat, in a double-belt press in which the particles provided with a binder are spread to form a filling on a horizontal run of a bottom forming belt and are cured in a pressing zone between the bottom and top metal forming belts which co-rotate in the feed direction of the double-belt press, to form a web which results in the boards, the working pressure and the heat required for the forming operation in the pressing zone being transmitted from the double-belt press support structure to the forming belts and from the latter to the filling, characterised in that in the edge zone (35) extending outside at least one edge (32) of the filling (33) forming the boards (4) to the vicinity of the edge (31) of the pressing zone there an edge filling (36) of particles free from binder is spread on to the bottom forming belt (2) and is jointly pressed.

2. A method according to claim 1, characterised in that the particles for the edge filling (36) are taken from the stock (50) forming the main filling (33), before the binder is added.

3. A method according to claim 1 or 2, characterised in that the moisture content of the particles for the edge filling (36) is set independently of the moisture content of the particles for the main filling (33).

4. A method according to any one of claims 1 to 3, characterised in that after passing through the pressing zone (3) the particles of the edge filling (36) are returned to the stock (50) from which the main filling (33) is fed.



5. Plant for the continuous manufacture of wood chip boards and similar board materials consisting of particles bonded by a binder which is cured under pressure and heat, comprising a double-belt press with two metal forming belts disposed one above the other in a pressing zone and bearing against a support structure, between which forming belts a material is compressible in the pressing zone under the action of pressure and heat, and comprising a spreading device by means of which the particles provided with the binder are adapted to be spread on a horizontal run of the bottom forming belt to form a filling, characterised in that another spreading device is provided by means of which an edge filling (36) of particles free from binder can be spread on to the bottom forming belt (2), such edge filling (36) extending outside the edges (32) of the main filling (33) producing the boards to the vicinity of the edge of the pressing zone.

6. A plant according to claim 5, characterised in that a means (55) is provided through the agency of which the moisture content of the particles of the edge filling (36) is adjustable independently of the moisture content of the particles of the main filling (33).

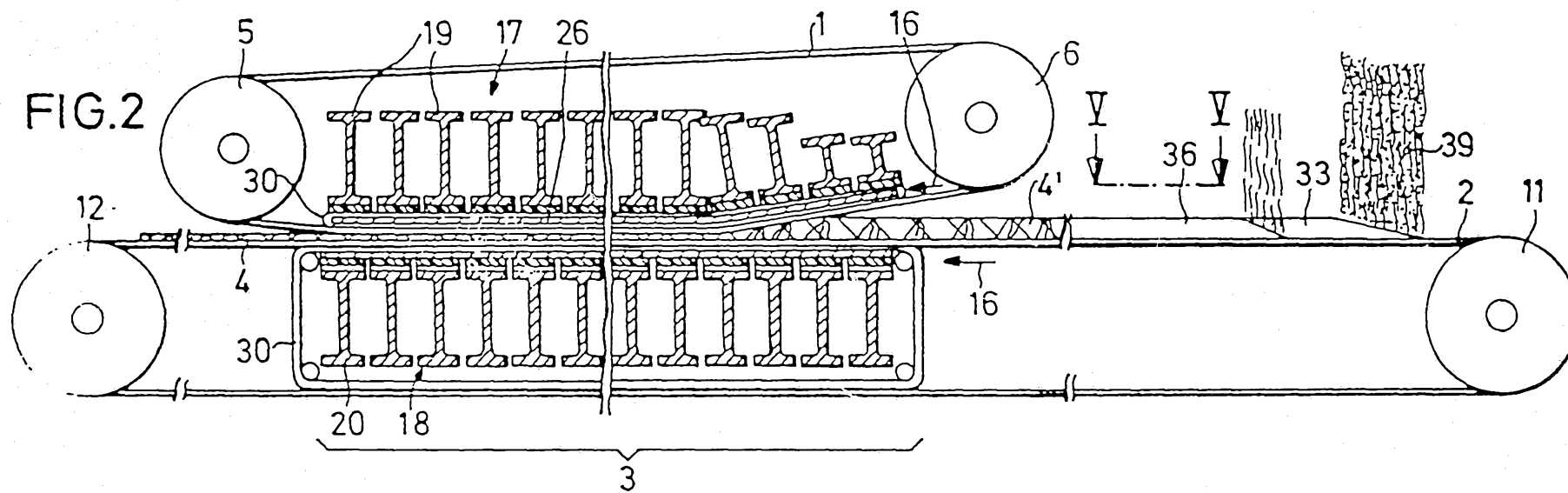
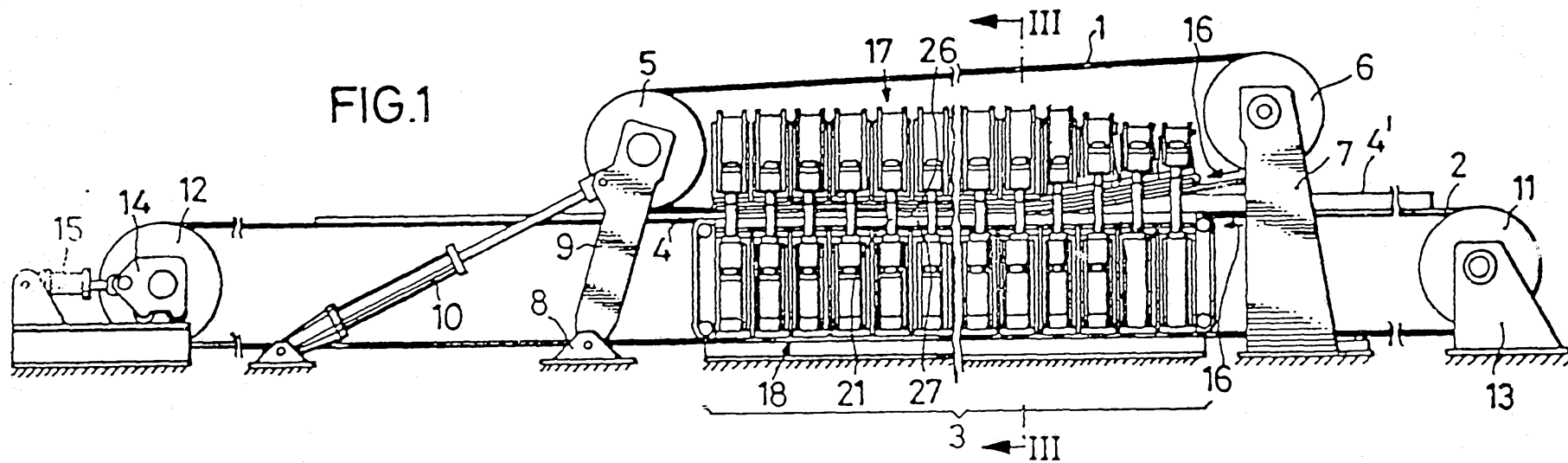
7. A plant according to claim 5 or 6, characterised in that a conveyor means is provided by means of which the particles of the edge filling (36) are returnable to the stock (50) from which the main filling (33) is also fed.

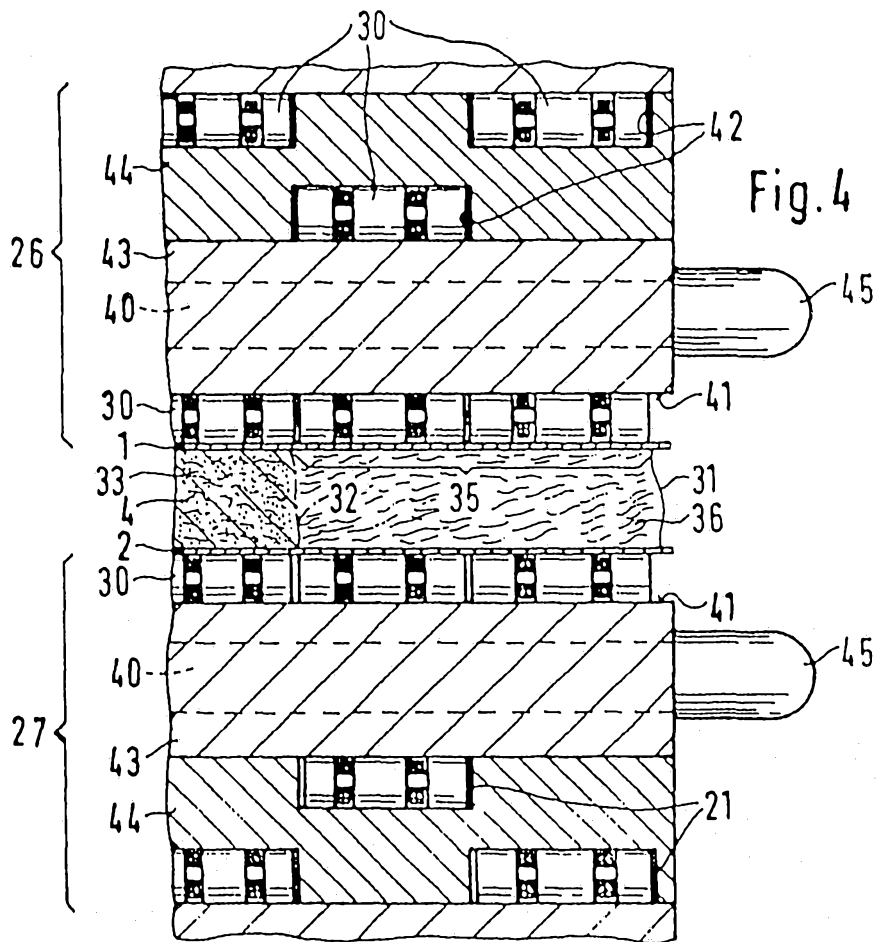
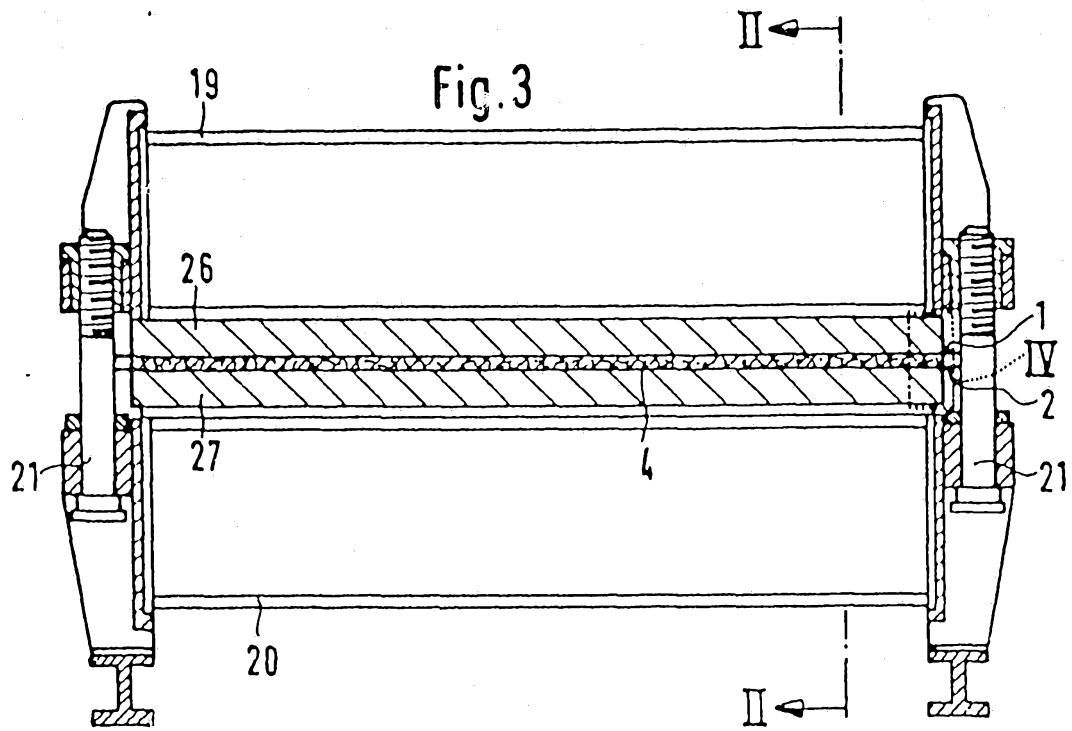


A B S T R A C T

In a double-belt press for the manufacture of wood chip boards and the like, for the production of boards having a width (38) less than the nominal working width (34), the forming belts are held in contact with the support structure (17, 18) so as to guarantee heat transfer, in the edge zone (35) extending outside the edge (32) of the filling (33) which produces the boards to the vicinity of the edge (31) of the pressing zone there, an edge filling (36) of particles free from binder being jointly pressed there or a compressible belt being made to co-rotate. (Fig. 5).







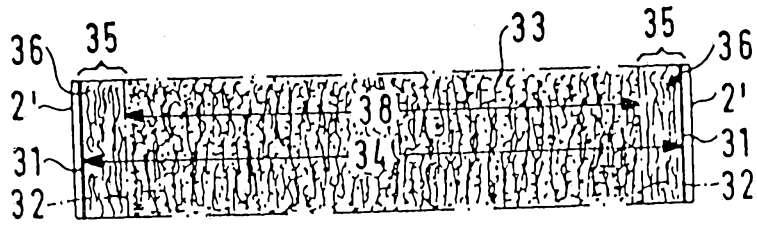


Fig. 5

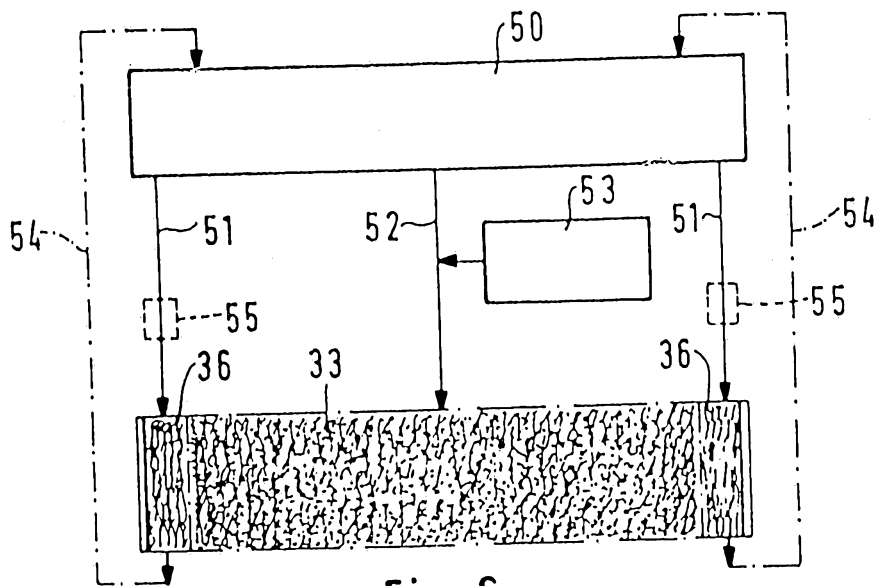


Fig. 6

INTERNATIONAL SEARCH REPORT

International Application No PCT/DE 88/00064

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. ⁴ B27N 3/24; B27N 3/14		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl. ⁴	B27N	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category [*]	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	US, A, 3993426 (KUSTERS) 23 November 1976 see the whole document (cited in the application) ---	1,5
A	DE, B, 1149159 (POHL) 22 May 1963 ---	
A	DE, A, 2407642 (CASSELBRANT) 29 August 1974 -----	
<p>[*] Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the International filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the International filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search		Date of Mailing of this International Search Report
2 May 1988 (02.05.88)		23 June 1988 (23.06.88)
International Searching Authority EUROPEAN PATENT OFFICE		Signature of Authorized Officer

ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.

DE 8800064

SA 20709

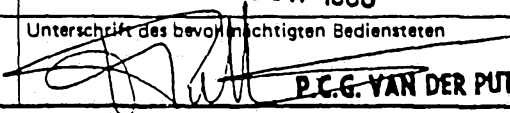
This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 09/06/88. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 3993426	23-11-76	US-A- 3965769	29-06-76
		FR-A, B 2250629	06-06-75
		DE-A, B, C 2355797	15-05-75
		GB-A- 1481060	27-07-77
		AT-B- 340125	25-11-77
		SE-B- 409673	03-09-79
		SE-A- 7412626	09-05-75
		NL-A- 7215812	24-05-73
		FR-A- 2163014	20-07-73
		DE-A, B, C 2157746	07-06-73
		BE-A- 791762	16-03-73
		CH-A- 552463	15-08-74
		US-A- 3851685	03-12-74
		AU-A- 4909772	21-02-74
		AT-B- 325294	10-10-75
		CA-A- 968625	03-06-75
		GB-A- 1405634	10-09-75
		AU-B- 445398	21-02-74
		JP-A- 48063374	03-09-73
		SE-C- 392239	30-06-77
DE-A- 2248760	11-04-74		
DE-B- 1149159		Keine	
DE-A- 2407642	29-08-74	SE-B- 379679	20-10-75

INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen

PCT/DE 88/00064

I. KLASSIFIKATION DES ANMELDUNGSGEGENSTANDS (bei mehreren Klassifikationssymbolen sind alle anzugeben) ⁶		
Nach der Internationalen Patentklassifikation (IPC) oder nach der nationalen Klassifikation und der IPC		
Int. Cl. ⁴	B 27 N 3/24; B 27 N 3/14	
II. RECHERCHIERTE SACHGEBIETE		
Recherchiertes Mindestprüfstoff ⁷		
Klassifikationssystem	Klassifikationssymbole	
Int. Cl. ⁴	B 27 N	
Recherchierte nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Sachgebiete fallen ⁸		
III. EINSCHLÄGIGE VERÖFFENTLICHUNGEN⁹		
Art*	Kennzeichnung der Veröffentlichung ¹¹ , soweit erforderlich unter Angabe der maßgeblichen Teile ¹²	Betr. Anspruch Nr. ¹³
A	US, A, 3993426 (KUSTERS) 23. November 1976 siehe das ganze Dokument in der Anmeldung erwähnt --	1,5
A	DE, B, 1149159 (POHL) 22. Mai 1963 --	
A	DE, A, 2407642 (CASSELBRANT) 29. August 1974 -----	
<p>* Besondere Kategorien von angegebenen Veröffentlichungen¹⁰:</p> <p>"A" Veröffentlichung, die den allgemeinen Stand der Technik definiert, aber nicht als besonders bedeutsam anzusehen ist</p> <p>"E" älteres Dokument, das jedoch erst am oder nach dem internationalen Anmeldedatum veröffentlicht worden ist</p> <p>"L" Veröffentlichung, die geeignet ist, einen Prioritätsanspruch zweifelhaft erscheinen zu lassen, oder durch die das Veröffentlichungsdatum einer anderen im Recherchenbericht genannten Veröffentlichung belegt werden soll oder die aus einem anderen besonderen Grund angegeben ist (wie ausgeführt)</p> <p>"O" Veröffentlichung, die sich auf eine mündliche Offenbarung, eine Benutzung, eine Ausstellung oder andere Maßnahmen bezieht</p> <p>"P" Veröffentlichung, die vor dem internationalen Anmeldedatum, aber nach dem beanspruchten Prioritätsdatum veröffentlicht worden ist</p> <p>"T" Spätere Veröffentlichung, die nach dem internationalen Anmeldedatum oder dem Prioritätsdatum veröffentlicht worden ist und mit der Anmeldung nicht kollidiert, sondern nur zum Verständnis des der Erfindung zugrundeliegenden Prinzips oder der ihr zugrundeliegenden Theorie angegeben ist</p> <p>"X" Veröffentlichung von besonderer Bedeutung; die beanspruchte Erfindung kann nicht als neu oder auf erfinderischer Tätigkeit beruhend betrachtet werden</p> <p>"Y" Veröffentlichung von besonderer Bedeutung; die beanspruchte Erfindung kann nicht als auf erfinderischer Tätigkeit beruhend betrachtet werden, wenn die Veröffentlichung mit einer oder mehreren anderen Veröffentlichungen dieser Kategorie in Verbindung gebracht wird und diese Verbindung für einen Fachmann naheliegend ist</p> <p>"&" Veröffentlichung, die Mitglied derselben Patentfamilie ist</p>		
IV. BESCHEINIGUNG		
Datum des Abschlusses der internationalen Recherche		Absenddatum des internationalen Recherchenberichts
2. Mai 1988		23 JUN 1988
Internationale Recherchenbehörde		Unterschrift des bevollmächtigten Bediensteten
Europäisches Patentamt		 P.C.G. VAN DER PUTTEN

ANHANG ZUM INTERNATIONALEN RECHERCHENBERICHT
 ÜBER DIE INTERNATIONALE PATENTANMELDUNG NR.

DE 8800064
 SA 20709

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten internationalen Recherchenbericht angeführten Patentedokumente angegeben.
 Die Angaben über die Familienmitglieder entsprechen dem Stand der Datei des Europäischen Patentamts am 09/06/88
 Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

Im Recherchenbericht angeführtes Patentedokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
US-A- 3993426	23-11-76	US-A- 3965769	29-06-76
		FR-A, B 2250629	06-06-75
		DE-A, B, C 2355797	15-05-75
		GB-A- 1481060	27-07-77
		AT-B- 340125	25-11-77
		SE-B- 409673	03-09-79
		SE-A- 7412626	09-05-75
		NL-A- 7215812	24-05-73
		FR-A- 2163014	20-07-73
		DE-A, B, C 2157746	07-06-73
		BE-A- 791762	16-03-73
		CH-A- 552463	15-08-74
		US-A- 3851685	03-12-74
		AU-A- 4909772	21-02-74
		AT-B- 325294	10-10-75
		CA-A- 968625	03-06-75
		GB-A- 1405634	10-09-75
		AU-B- 445398	21-02-74
		JP-A- 48063374	03-09-73
		SE-C- 392239	30-06-77
DE-A- 2248760	11-04-74		

DE-B- 1149159		Keine	

DE-A- 2407642	29-08-74	SE-B- 379679	20-10-75

EPO FORM 100/83

Für nähere Einzelheiten zu diesem Anhang : siehe Amtsblatt des Europäischen Patentamts, Nr.12/82