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2,923,968

PREPRESSING AND DIVIDING PARTICLE MATS

Filed May 17, 1956

4 Sheets-Sheet 1

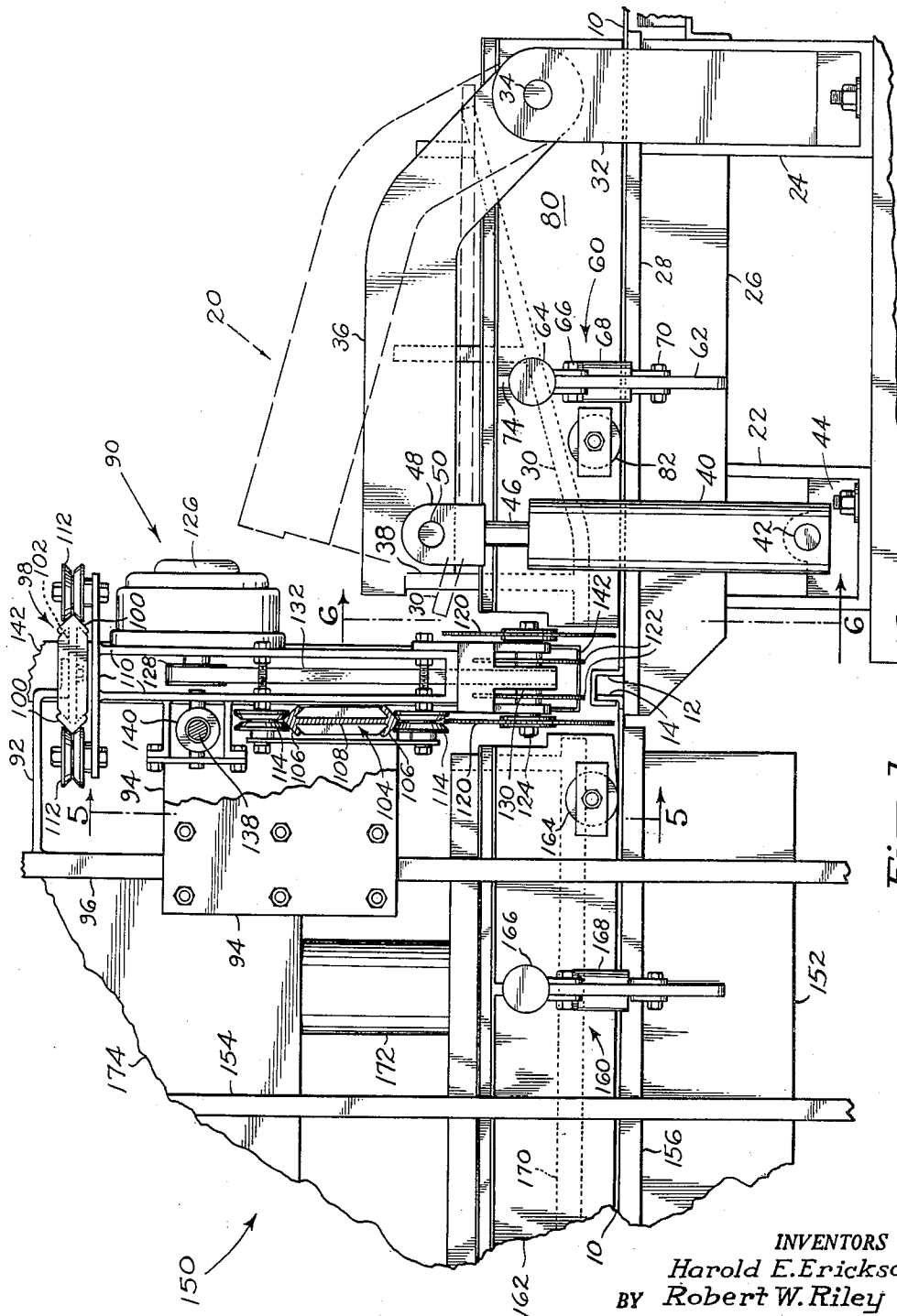


Fig. 1.

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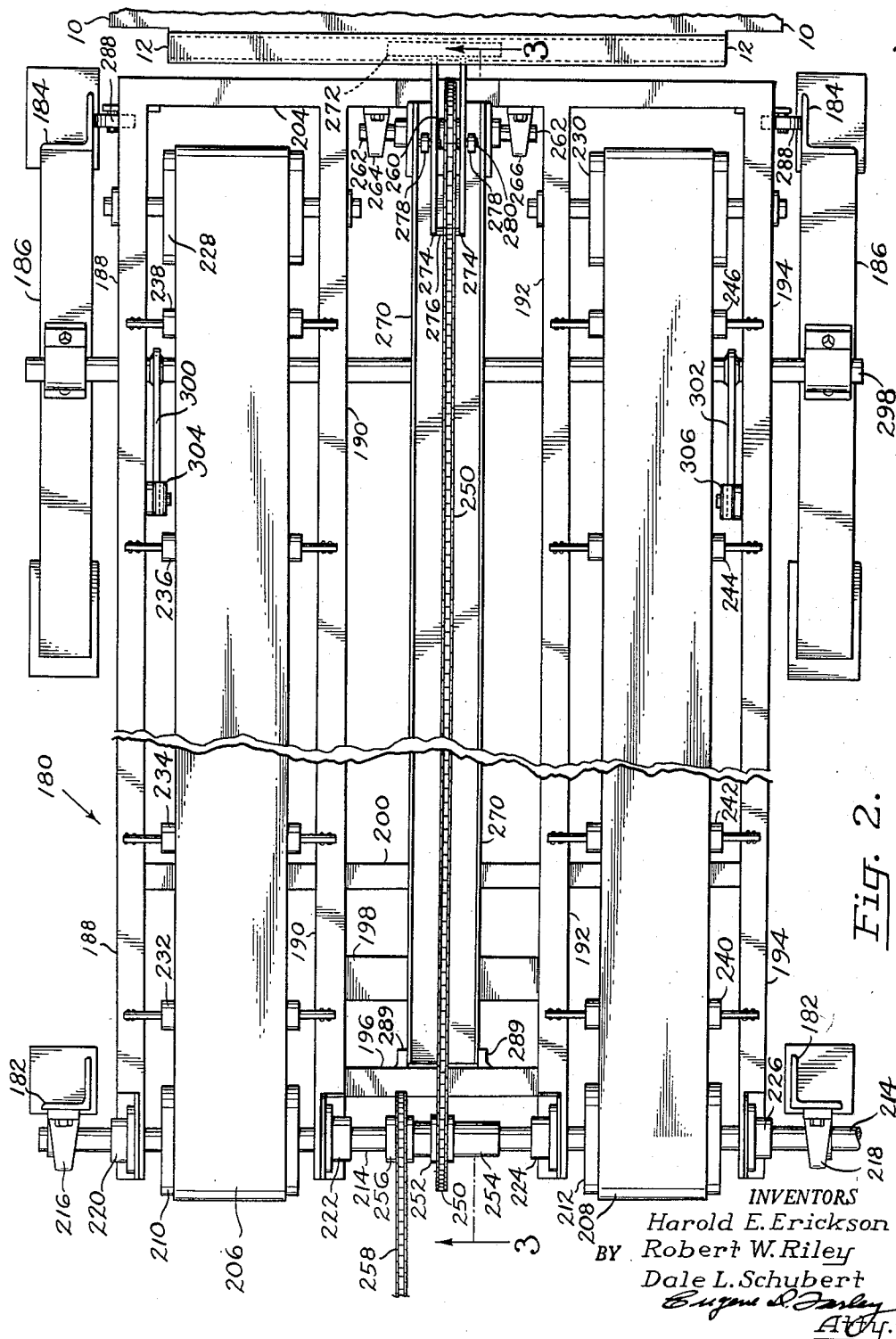
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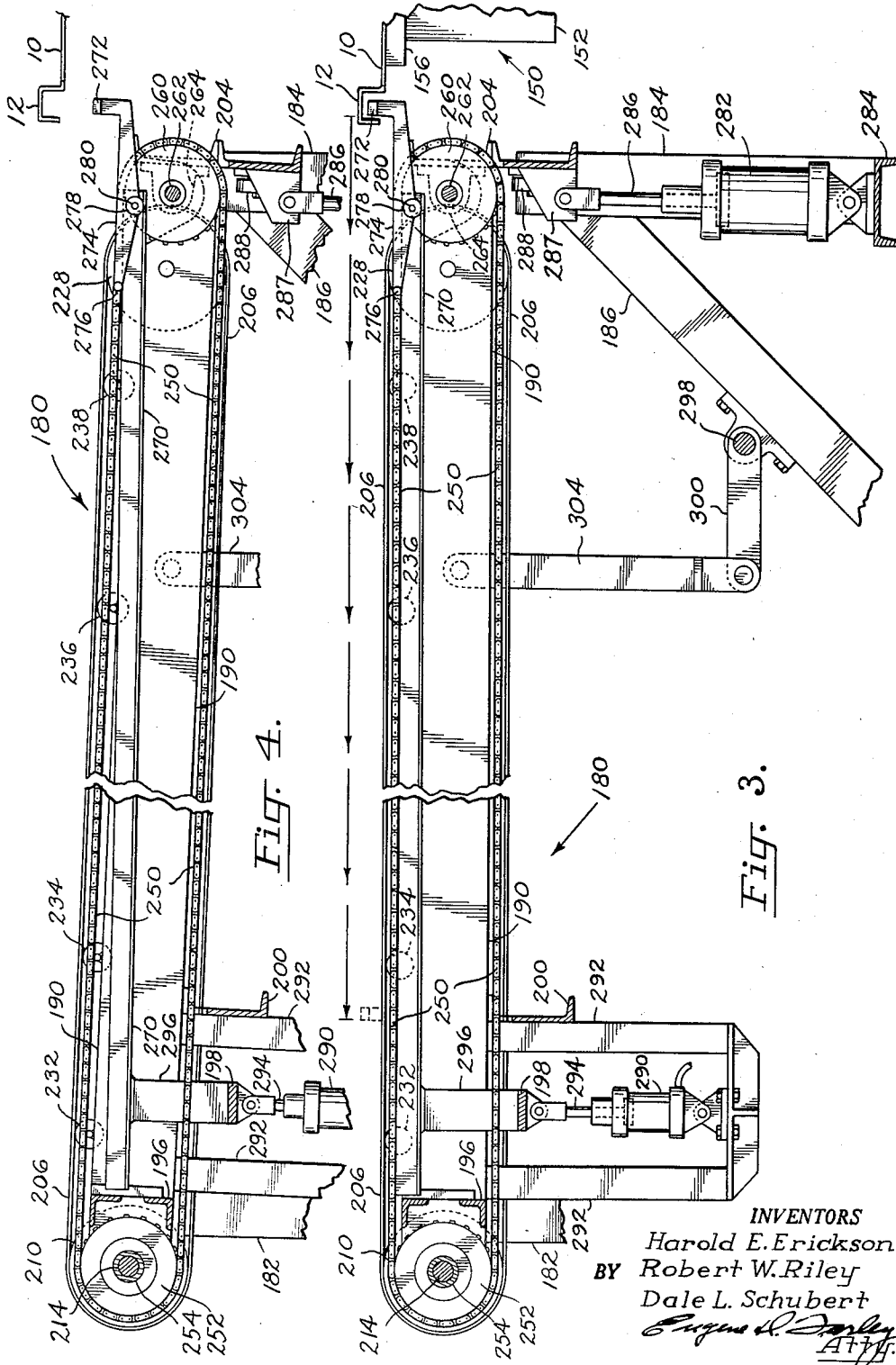
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PREPRESSING AND DIVIDING PARTICLE MATS

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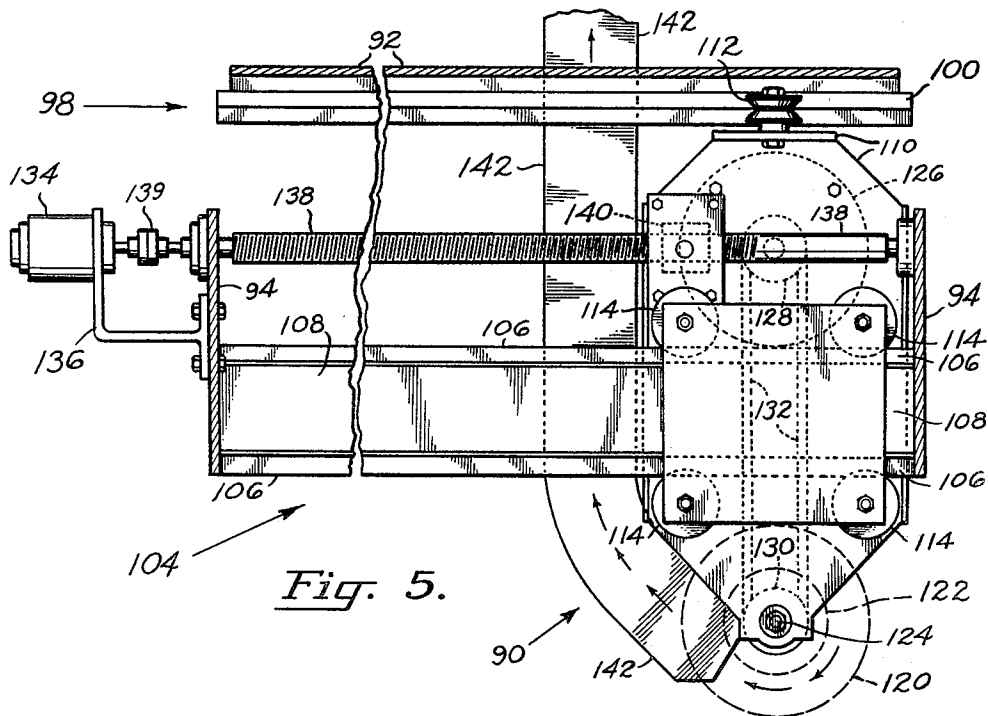


Fig. 5.

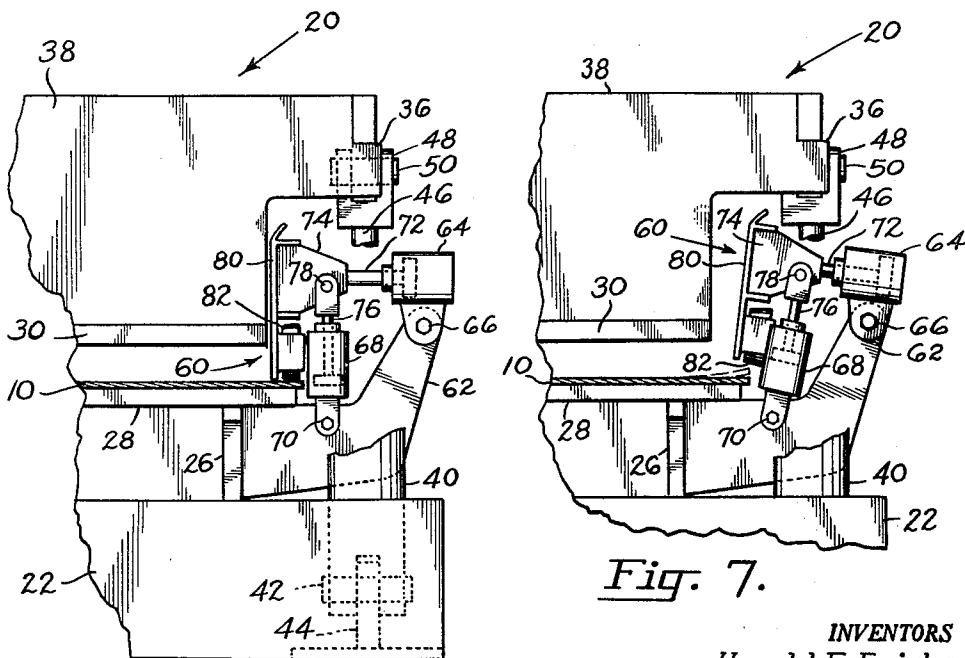


Fig. 6.

Fig. 7.

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PREPRESSING AND DIVIDING PARTICLE MATS

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5 Claims. (Cl. 18—4)

This invention pertains to method and apparatus for prepressing a mat of wood or other solid particles to a desired density, and for dividing the mat into sections preliminary to consolidating it into a composite product such as wood particle board.

In making composite products such as hardboard and related pressed composition boards, it is common practice to reduce wood, cane, straw, and other lignocellulose to the form of small particles. These are mixed with an adhesive, and formed dry or moist into a mat which thereafter is transferred into a hot press and consolidated to the desired density and thickness.

Several difficulties are inherent in this sequence of operations. First, it is difficult to form a mat having square edges of uniform density. As a consequence, the final consolidated product has irregular, non-uniform edges which conventionally are trimmed off. This practice obviously results in loss of raw material and reduction of press capacity.

Also, the caul plate on which the mat is transported and pressed is subject to warping. This makes it even more difficult to produce a uniform mat having square edges.

Furthermore, when a mat comprising a deep pile of unconsolidated particles is introduced into a press, some of the particles tend to spill from the caul plate onto the press platen and thus are deposited on an area subsequently covered by the caul plate. As a consequent, when the mat is pressed, these particles cause indentations in the mat and even damage the plate itself.

Still further, attempts to overcome the foregoing difficulties by passing the plates beneath the rolls of a roll type prepress result in orientation of the particles in their direction of travel between the rolls. This tends to produce a laminar product of reduced strength. It also causes difficulty during the pressing operation.

Accordingly it is the general object of the present invention to provide method and apparatus for prepressing and dividing particle mats which overcomes the foregoing and other difficulties using an integrated unit which produces a high quality product economically at a high production rate.

The manner in which the foregoing and other objects of this invention are accomplished will be apparent from the accompanying specification and claims considered together with the drawings, wherein like numerals of reference indicate like parts and wherein:

Fig. 1 is a fragmentary view in side elevation of the herein described mat prepressing and dividing apparatus;

Fig. 2 is a plan view of a driving and conveying mechanism for use in conveying mats through the apparatus of Fig. 1;

Figs. 3 and 4 are sectional views taken along line 3—3 of Fig. 2 and illustrating the mode of operation of the driving and conveying unit of that figure;

Fig. 5 is a detail, transverse, sectional view taken along line 5—5 of Fig. 1 and illustrating the construction of a

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traveling saw used for dividing the mat in accordance with the herein described invention; and

Figs. 6 and 7 are detail views in elevation taken along line 6—6 of Fig. 1 and illustrating the construction and mode of operation of a deckle plate assembly employed for retaining the side edges of the mat while it is being prepressed.

Generally stated, the method of the present invention for prepressing and dividing particle mats preliminary to consolidating them comprises prepressing a leading segment of a continuous mat, and prepressing also a following segment of the mat spaced from the leading segment. While the two segments are being prepressed, the portion of the mat therebetween is cut away. This may be done in such a manner as to form sharply defined end edges of uniform density because of the restraint under which the mat is held during the cutting away process. Also, the side edges of the mat may be retained between deckle plates of suitable dimensions during prepressing, thereby forming sharply defined side edges.

As a result of the foregoing, there is formed a separated, prepressed mat section and a residual, continuous mat having a prepressed leading edge. The latter mat then may be advanced and the process repeated to form a plurality of prepressed mat sections which thereafter may be consolidated in a hot press or otherwise to the desired density.

The apparatus for accomplishing the foregoing sequence of steps includes in general conveyor means for conveying a continuous particle mat supported by a train of interengaged caul plates past a plurality of stations. Mat prepress means are placed at one of these stations for prepressing a leading segment of the mat.

Mat edge prepress means are placed at another of these stations for prepressing a following segment of the mat, this segment being spaced apart from the leading segment. Deckle means are provided for retaining the side edges of the mat while it is being prepressed. Mat cutting away means are located at a third of said stations for cutting away the mat segment intermediate the first and second segments.

As a result, apparatus is provided for forming a separated, prepressed mat segment having uniform, square edges on all four sides and supported by one of the caul plates, and a residual continuous mat having a prepressed leading edge and supported by the remaining caul plates. The conveyor means then acts to convey the residual continuous mat to an advanced location wherein the operation of the apparatus may be repeated.

Considering the foregoing in greater detail and with particular reference to the drawings:

The presently described method and apparatus are applicable to the handling of mats composed of solid particles such as fibers, chips, shavings, or granules of wood, straw, cane or other lignocellulose. The lignocellulose starting material may be reduced to particle form by any suitable means, as by means of the conventional defiberizers, cutters, saws, planing machines, hammermills, or other mills of the class suitable for the reduction of such materials.

The particles formed in this manner may be mixed with a suitable proportion, for example from one-half to ten percent, of a suitable adhesive such as a thermosetting phenol-aldehyde or urea-aldehyde resin. The resulting mixture then may be formed dry or moist into a mat having a thickness determined by the thickness and density desired in the final consolidated product. Any of the conventional mat formers adaptable for use on particles of the indicated categories may be applied to this purpose.

In carrying out the present invention, the mat is formed as a continuous unit on a plurality of caul plates 10

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placed end to end in a continuous train. These serve the dual functions of conveying the mat through the subsequent processing apparatus and also of supporting it while it is being hot pressed in the final stage of the operation.

Preferably the caul plates are of the configuration illustrated in Fig. 1, being provided at each of their longitudinal ends with connecting means for releasably interconnecting them. Thus one of the ends may be formed with a connecting member 12 which assumes substantially the configuration of an inverted U. The other end is provided with a connecting member 14 in the form of an angular projection of the plate. This projection may be inserted in the U-shaped connecting member to releasably interlock adjacent caul plates in the manner indicated. As a consequence there is formed a continuous train of caul plates by which the continuous mat is supported and conveyed through the various units of the apparatus.

The edge prepress

The first of these units is the edge prepress indicated generally at 20. This unit has for its general purpose the prepressing of the leading edge of the continuous mat to prevent its disintegration and make it easier to guide the mat through the remaining units of the assembly.

The edge prepress is supported on a base comprising a U-shaped forward support member 22 and a U-shaped rearward support member 24. These support a pair of spaced horizontal structural members 26 which in turn support the lower platen 28 across which caul plates 10 are drawn.

To support the upper platen 30 which cooperates with lower platen 28 in prepressing the leading edge of the continuous mat, there are provided a pair of spaced standards 32 at the rearward end of the unit. Hinged to the upper ends of these standards by means of pins 34 are a pair of spaced arms 36, the forward ends of which are interconnected by web member 38.

Cylinders 40, which preferably are hydraulically operated, are pivotally mounted through pins 42 to plates 44 which bridge the space between the parallel segments of U-shaped support member 22.

The piston rods 46 of cylinders 40 are connected to clevises 48 which, together with pins 50 pivotally connect the ends of the piston rods to the ends of arms 36. Accordingly, reciprocation of piston rods 46 causes angular movement of arms 36, and of the platen supported thereby, between the solid and dotted outline positions of Fig. 1.

The configuration of upper platen 30 is such as to result in consolidation of the forward end of the mat only. Thus when it is in its lowered or operative position, the forward portion of the platen is flat and substantially parallel to caul plate 10. This portion of the platen is of rather restricted width since its action is intended to be localized at the leading edge, prepressing of the body of the mat being reserved for a subsequent unit of the assembly. The remaining section of platen 30 angles upwardly in the indicated manner so that it forms an inclined upper surface at the leading portion of the mat, further facilitating the guiding or threading of the mat through the subsequent units of the apparatus, and preventing fracturing of the mat by establishing a thickness gradient.

Means also are provided for restraining the mat during the prepressing operation so that sharply defined square edges are obtained. The deckle assembly employed for this purpose is indicated generally at 60, there being one such assembly on each side of the edge prepress.

Each deckle assembly is mounted on an arm 62 which extends laterally outwardly and upwardly from structural member 26. At the extremity of the arm a

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fluid operated cylinder 64 is pivotally mounted by means of pin 66. Intermediate the ends of the arm is a fluid operated cylinder 68, pivotally mounted by means of pin 70.

The piston rod 72 of cylinder 64 is rigidly connected to plate 74. The piston rod 76 of cylinder 68 is pivotally connected to the same plate through pin 78. Plate 74 in turn is rigid to deckle 80 which extends the full length of the edge prepress unit. Accordingly there is formed a mat-pressing region defined by platen 28 and deckles 80 into which the mat is conveyed with the deckles retracted to prevent binding, and in which it is pressed with the deckles advanced to square the mat edges.

Passage of the mat through the prepress unit is facilitated, even though caul plates 10 on which it is transported are warped and twisted, by the action of a plurality of spaced apart rollers 82 mounted on the lower outside margins of the deckle plates. These rollers engage the longitudinal margins of the caul plates and press them downwardly, guiding the caul plates beneath the deckle plates and into the subsequent units of the apparatus where clearance is restricted. They also help hold the caul plates flat during prepressing.

The traveling saw

This unit of the presently described apparatus has for its function dividing the continuous mat into sections of a size suitable for consolidation into the final board product. The division is effectuated by cutting away the mat transversely while it is restrained, using cutting means designed to cut square, uniform end edges.

The mat dividing means employed comprises a traveling saw, the construction of which is illustrated in Figs. 1 and 5. This unit, indicated generally at 90, is suspended above the train of caul plates 10 and is supported, for example, by means of a top plate 92 and a pair of spaced apart side plates 94 all of which may be fastened to vertical beams 96. These structural members support a pair of tracks which mount the saw assembly for reciprocation transversely of the mat.

The upper track 98, which is disposed horizontally and may comprise a pair of angle irons 100 interconnected by transverse plates 102, is supported by plate 92. The second track 104, which is disposed vertically and may comprise a pair of angle irons 106 interconnected by a vertical plate 108, is supported by plates 94. Both of these tracks are connected to and support a saw frame 110 upon which are rotatably mounted a first set of grooved wheels 112, which engage horizontal track 98, and a second set of grooved wheels 114, which engage vertical track 104. In this manner the frame is stabilized both vertically and horizontally while still being permitted to reciprocate freely across the mat.

Frame 110 mounts means for cutting away the mat and hence for dividing it into sections as indicated above. In the illustrated embodiment the cutting away means comprises a cutting head which includes a pair of spaced saw blades 120 mounted on the outside of the head and provided with relatively fine cutting teeth so that a sharply defined mat edge will be formed. It also may include a pair of spaced saw blades 122 which are located between the outer blades and which may have relatively coarse, wide teeth for disintegrating and plowing out the portion of the mat between blades 120.

All four blades may be keyed to a common shaft 124 which is rotatably mounted on frame 110 and which is connected to a suitable power means. The power unit may comprise, for example, a rotary motor 126 having on its shaft a pulley 128 which drives a pulley 130 on shaft 124 through the interconnecting belt 132.

Suitable drive means also are provided for driving the cutting head back and forth across the mat on tracks 98, 104. This drive may comprise a reversible motor 134 mounted on a bracket 136 which is connected to one

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of plates 94. Motor 134, in turn, is coupled through coupling 139 to a screw 138 journaled between plates 94. This screw engages a nut 140 on frame 110. Hence operation of motor 134 drives the cutting head assembly across the mat in a direction determined by the direction of rotation of screw 138.

As the cutting head makes its traverse, outer saws 120 divide the mat by sharply defined cuts while inner saws 122 disintegrate the material between the two outer saws. All four saws coact on the cutting traverse to dislodge the material and discharge it into a following vacuum conduit 142, which also is mounted on frame 110, and which conveys the dislodged material back to the bin used for charging the mat forming apparatus.

It is to be noted particularly that saws 120, 122 operate on an unconsolidated portion of the mat lying between regions of mat consolidation. Also, they make their traverse while caul plates 10 which support the mat are securely held down by the prepressing units. Accordingly they can approach the upper surface of the caul plates very closely and make a clean cut through almost the entire thickness of the mat.

The mat prepress

The next unit of the herein described assembly is the mat prepress, indicated generally at 150 in Fig. 1. As opposed to edge prepress 20, which has for its function the prepressing of the leading edge only of the continuous mat, mat prepress 150 has for its function prepressing to a uniform density the mat section cut off by traveling saw assembly 90.

It comprises a base 152 to which are attached spaced vertical beams 96, 154. A lower platen 156 which supports caul plates 10 is mounted on the base. A deckle assembly indicated generally at 160 and corresponding to deckle assembly 60 of edge prepress unit 20 is mounted on each side of the prepress. As in the case of the deckle assembly 60, assembly 160 includes deckle plate 162 and spaced rollers 164.

It is moved by cooperating, fluid operated cylinders 166, 168, between an advanced position, wherein it contacts the side edges of the mat in the prepress, and a retracted position, wherein it is removed therefrom both vertically and horizontally. The application and operation of these cylinders is similar to that described above with reference to cylinders 64, 68 of deckle plate assembly 60.

Cooperating with lower stationary platen 156 is a vertically reciprocable upper platen 170. It is reciprocated by means of piston rods 172 driven by a fluid operated cylinder (not illustrated) but contained in housing 174.

Accordingly a mat segment cut off by unit 90 may be prepressed to a desired density and thickness by means of platen 170. During prepressing the caul plates 10 on which the segment rests are held down flat, even though warped by the platen and the side edges of the mat are retained and squared by the face surfaces of the deckle plates. After raising the platen and retracting the deckles, the prepressed mat sections are ready for transfer to the press loader which injects them into the press for consolidating them to their final density and thickness.

The mat conveyor

The mat is conveyed through the various units of the presently described apparatus and transferred to the press loader by a train of caul plates 10 releasably interconnected end to end and driven by a drive unit indicated generally at 180 in Figs. 2, 3 and 4. This unit is supported by forward vertical posts 182 and rearward vertical posts 184 reinforced by brackets 186. Posts 182 support a framework including a plurality of spaced longitudinal frame members 188—194, and a plurality of interconnecting, spaced, transverse frame members 196—204. This framework carries a pair of spaced,

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parallel, longitudinal drive belts 206, 208 which are of sufficient length to underlie one caul plate at a time.

The forward ends of belts 206, 208 are mounted on drive pulleys 210, 212 respectively. The pulleys are keyed to a shaft 214 journaled in bearings 216, 218 on posts 182. This shaft carries a plurality of bearings 220—226 which pivotally mount longitudinal frame members 188—194, respectively. Shaft 214 is coupled to a motor for driving the upper stretches of belts 206, 208 in a forward direction.

The rearward ends of belts 206, 208 are mounted respectively on idler pulleys 228, 230. The first of these pulleys is journaled between longitudinal frame members 188, 190; the second between longitudinal frame members 192, 194. The upper stretch of belt 206 is supported by a plurality of spacer idler rollers 232—238. Correspondingly, the upper stretch of belt 208 is supported by a plurality of spaced idler rollers 240—246.

Means also are included in conveying assembly 180 for drawing the entire caul plate train through the herein described apparatus; for placing the leading caul plate with its superimposed mat on belts 206, 208; and for uncoupling the leading caul plate from the remaining caul plates of the train, preliminary to transferring it to the press loader. The means employed for these purposes is illustrated in Figs. 2, 3 and 4.

The forward section of an endless chain 250 engages a drive sprocket 252 keyed to a sleeve 254 which rotates freely about shaft 214. Sleeve 254 carries another sprocket 256 engaged by a chain 258. The latter chain in turn is connected to a reversible motor, not shown.

The rearward end of drive chain 250 engages an idler sprocket 260 keyed to a shaft 262 which is journaled in bearings 264, 266 bolted to transverse frame member 204.

A track 270 for a caul engaging hook 272 extends beneath chain 250. Hook 272 is dimensioned to be received in the U-shaped end sections of the caul plates. It is affixed to a pair of spaced arms 274, the forward ends of which are connected to chain 250 by means of pin 276.

Hook 272 and arms 274 are supported by a pair of rollers 278 rotatably mounted on a common shaft 280. These rollers travel in track 270.

Accordingly, as the upper stretch of chain 250 is driven forwardly by the motor connected to drive chain 258, the hook assembly is drawn forwardly a distance indicated by the arrows in Fig. 3, which corresponds to the length of one of the caul plates. Then, assuming that the hook is in engagement with the forward end of the leading caul plate, the entire caul plate train will be drawn through the apparatus by this increment.

For engaging and disengaging hook 272 from the caul plates there is provided an assembly, the construction of which is evident from Figs. 3 and 4. This assembly raises and lowers the respective ends of chain 250 so that hook 272 carried thereby may be alternately raised and lowered into and out of engagement with the caul plates.

Accordingly, the forward end of the frame unit supporting both belts 206, 208 and chain 250 is supported by and pivotally mounted upon shaft 214 through bearings 220—226. The rear end of the frame unit is supported by a fluid operated cylinder 282 pivotally mounted on a transverse frame member 284. The piston rod 286 of this cylinder is connected pivotally to a bracket 287 on transverse frame member 204. Hence as piston rod 286 is extended and retracted, the rearward portion of the entire frame unit which carries chain 250 and hook 272, is elevated and lowered between the positions indicated in Figs. 3 and 4 respectively shaft 214 at the forward end of the unit acting as a pivot point. This movement is facilitated by mounting on the unit a plurality of wheels 288 which rotate in a vertical plane and track on posts 184.

The rearward end of track 270 is pivotally mounted on

shaft 262. Its forward end may be raised and lowered between guides 289 by an assembly including cylinder 290 which is pivotally connected to a U-shaped frame 292 depending from transverse frame members 196, 200. The piston rod 294 of this cylinder is connected pivotally to a link 296 which in turn is welded to track 270. Accordingly, as piston rod 294 is extended and retracted between the positions of Figs. 3 and 4, the forward end of track 270 is raised and lowered, shaft 262 serving as a pivot point.

It thus will be apparent that when hook 272 is at the rearward end of the unit and cylinder 282 is extended, the hook will engage the connecting segment 12 of caul plate 10. However, when the hook has been advanced to the forward portion of the unit and piston rod 294 of cylinder 290 retracted, then the hook will drop downwardly, arms 274 which support it pivoting about pin 276, until it is out of engagement with the connecting segment of the caul plate.

To prevent twisting of the unit during its raising and lowering, a torsion rod 298 is mounted on braces 186. The torsion rod is connected to the movable frame by means of forked links 300, 302 which are pivoted in turn to links 304, 306. The latter in turn are pivotally connected to frame members 188, 194 and stabilize the unit.

Operation

The operation of the herein described combination prepress and traveling saw unit is as follows. A continuous mat of lignocellulose or other particles is formed on a train of caul plates 10 which are releasably interlocked by means of projections 14 and U-shaped sections 12 on their respective ends. The train with its superimposed mat is advanced stepwise through the apparatus, advancing one caul plate length at a time.

After each such advancement, movement of the caul plate train and the operation of the mat forming apparatus are arrested pending prepressing and division of the mat. These operations are effectuated by the edge prepress indicated generally at 20 in the drawings, by the traveling saw indicated generally at 90 and by the mat prepress indicated generally at 150.

After the leading edge of the mat has been prepressed in unit 20 the mat is drawn forwardly until it extends completely through all three of the above mentioned units. Next deckle assemblies 60, 160 are advanced. Movable platen 170 of the mat prepress unit and movable platen 30 of the edge prepress then are closed. This prepresses to the desired thickness the entire segment of the mat in prepress unit 150. It prepresses the leading edge only of the mat segment in prepress 20, and forms an inclined leading surface corresponding to the contour of the platen.

During prepressing, the mat is restrained by both platens, and its side edges are confined by deckle units 60, 160.

Next the traveling saw assembly which includes the spaced saw blades 120, 122 traverses the unconsolidated mat segment which overlies the joint between adjacent caul plates. This divides the mat, disintegrates the unconsolidated mat segment, and discharges the disintegrated material into a vacuum conduit 142 where it is returned to the mat forming apparatus. Since the caul plates are held down securely, the saws can approach them very closely so that a sharply defined cut is made.

After the saw has made its traverse and returned to its starting position the platens are raised and deckles 60, 160 are moved upwardly and sidewardly by the action of cylinders 64, 68 in the case of deckle assembly 60, and of cylinders 166, 168 in the case of deckle assembly 160. This permits free advancement of the mat without binding.

The mat next is advanced by one caul length. This brings the mat segment which has been prepressed in unit

150 onto conveyor 180 (Figs. 2-4). It also advances the continuous mat, the leading edge of which has been prepressed by unit 20, into mat prepress 150, the prepressed inclined leading edge entering the unit smoothly and without being damaged, thereby retaining its sharp definition. Thereafter the operation is continued in stepwise manner, the prepressed mat on conveyor 180 being transferred to a press loader, which is not illustrated; the prepressed mat from the mat prepress 150 being transferred to conveyor 180 and the continuous mat having its forward edge prepressed in edge prepress 20 being transferred to mat prepress 150.

Stepwise advancement of the mat throughout the unit is made possible by a drive illustrated in Figs. 2-4. The rearward end of a frame pivoting about shaft 262 and carrying conveyor belts 206, 208 and chain 250 is alternately raised and lowered by a cylinder 282. Chain 250 drives a hook 272 carried by arms 274 which pivot about pin 276 on the chain. The arms are supported by wheels 278 riding in a track 270.

Elevation of piston rod 286 of cylinder 282 brings hook 272 into engagement with the U-shaped connector 12 on the leading caul plate 10. Chain 250 then advances the hook, and hence the caul plate train, to the advanced position indicated by the arrows of Fig. 3. Thereupon the forward end of track 270 is lowered by the action of cylinder 290, so that hook 272 is released from engagement with the caul plate, and the rearward end of the frame unit is lowered by the action of cylinder 282 so that the trailing end of the leading caul plate is disengaged from the next succeeding caul plate.

Belts 206, 208 then are actuated, delivering the disengaged caul plate and prepressed mat onto a press loader. Track 270 then may be elevated and hook 272 returned to its starting position where it is elevated by the action of cylinder 282 to its position of engagement with the next succeeding caul plate. In this manner a stepwise progression of the plates through the apparatus is obtained.

Accordingly it will be apparent that by the present invention we have provided an integrated efficient unit for prepressing a dry or moist formed mat, for dividing it into sections, and for conveying it into a press loader. The apparatus is characterized by the formation of mat sections which have sharply defined square edges on all four sides. This in turn leads to the production of a final consolidated product of uniform density which need be trimmed but very little if at all, thereby avoiding waste of material.

Since the action of the prepress is that of a platen rather than that of rollers, the component particles of the prepressed mat are not oriented. This improves the strength of the final product. Also, the tendency of the mat to disintegrate into particles which may lodge under the caul plates in the press is reduced to a minimum.

It is to be understood that the form of our invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of the parts may be resorted to without departing from the spirit of our invention or the scope of the subjoined claims.

Having thus described our invention, we claim:

1. The method of handling particle mats preliminary to consolidating them which comprises forming a continuous unconsolidated mat, prepressing the leading transverse edge portion of the continuous mat, advancing the mat, prepressing a leading segment of the mat including the prepressed leading transverse edge portion, prepressing a leading transverse edge portion of the following mat a spaced distance from the trailing end of the leading segment, and while prepressing said leading segment and spaced following transverse edge portion cutting away the unconsolidated mat in the space therebetween, thereby dividing the mat transversely and forming a separated prepressed leading mat section and a

residual continuous mat having a prepressed leading transverse edge portion.

2. The method of claim 1 including confining the side edges of the continuous mat during the prepressing operation and releasing the side edges of the mat during advancement thereof.

3. Mat prepressing and dividing apparatus comprising in combination conveyor means for conveying a continuous particle mat past a plurality of stations and including a train of releasably interconnected caul plates on which the mat is supported, mat prepress means placed at one of such stations for prepressing the leading mat segment of the continuous mat supported by the leading caul plate, mat edge prepress means placed at another of such stations for prepressing a following mat segment a spaced distance from the trailing end of said leading segment, said following mat segment being supported by the next adjacent caul plate, mat dividing means placed at a third of such stations for cutting away the unconsolidated mat segment overlying the connected ends of adjacent caul plates intermediate the prepressed leading segment and the leading transverse edge of the following segment, and deckle means for retaining the side edges of the mat while prepressing the same, thereby forming a separated prepressed leading mat section having uniform, square side edges supported by one of the caul plates and a residual continuous mat having a prepressed leading transverse edge and supported by the remaining caul plates.

4. Mat prepressing apparatus comprising, in combination, conveyor means for conveying a plurality of mat supporting caul plates in end to end relation past a plurality of stations, mat prepress means placed at a first of such stations for prepressing a mat supported on the leading caul plate, mat edge prepress means placed at a second of such stations a spaced distance rearwardly of the rear end of the mat prepress means for prepressing the leading transverse edge portion of the mat supported on the next following caul plate, mat trimming means placed at a third of such stations between the first and

second stations for cutting away the unconsolidated mat between the trailing transverse edge of the leading mat and the leading transverse edge of the next following mat while said mats are being prepressed at the first and second stations.

5. Mat prepressing and dividing apparatus comprising in combination conveyor means for conveying a continuous particle mat past a plurality of stations and including a train of caul plates on which the mat is supported, mat prepress means placed at one of such stations for prepressing the leading mat segment of the continuous mat supported by the leading caul plate, mat edge prepress means placed at another of such stations for prepressing a leading transverse edge of the following mat segment a spaced distance from the trailing end of said leading segment, said following mat segment being supported by the next adjacent caul plate, mat dividing means placed at a third of such stations for cutting away the unconsolidated mat segment overlying the adjacent ends of adjacent caul plates intermediate the prepressed leading segment and the leading transverse edge of the following segment, thereby forming a separated prepressed leading mat section and a residual continuous mat having a prepressed leading transverse edge and supported by the remaining caul plates.

References Cited in the file of this patent

UNITED STATES PATENTS

540,053	Hebbard	May 28, 1895
565,061	Wilson et al.	Aug. 4, 1896
1,170,053	Droitcour	Feb. 1, 1916
1,550,236	Barber	Aug. 18, 1925
1,742,410	Millington	Jan. 7, 1930
2,231,254	Cleveland	Feb. 11, 1941
2,497,488	Cashwell	Feb. 14, 1950
2,582,449	Millar et al.	Jan. 15, 1952
2,614,589	Coats et al.	Oct. 21, 1952
2,648,262	Croston et al.	Aug. 11, 1953
2,689,975	Leng	Sept. 28, 1954
2,700,177	Mottet	Jan. 25, 1955