Jan. 17, 1961 H. E. ERICKSON ET AL 2,968,389

PREPRESSING AND DIVIDING PARTICLE MATS

Original Filed May 17, 1956 4 Sheets-Sheet 1

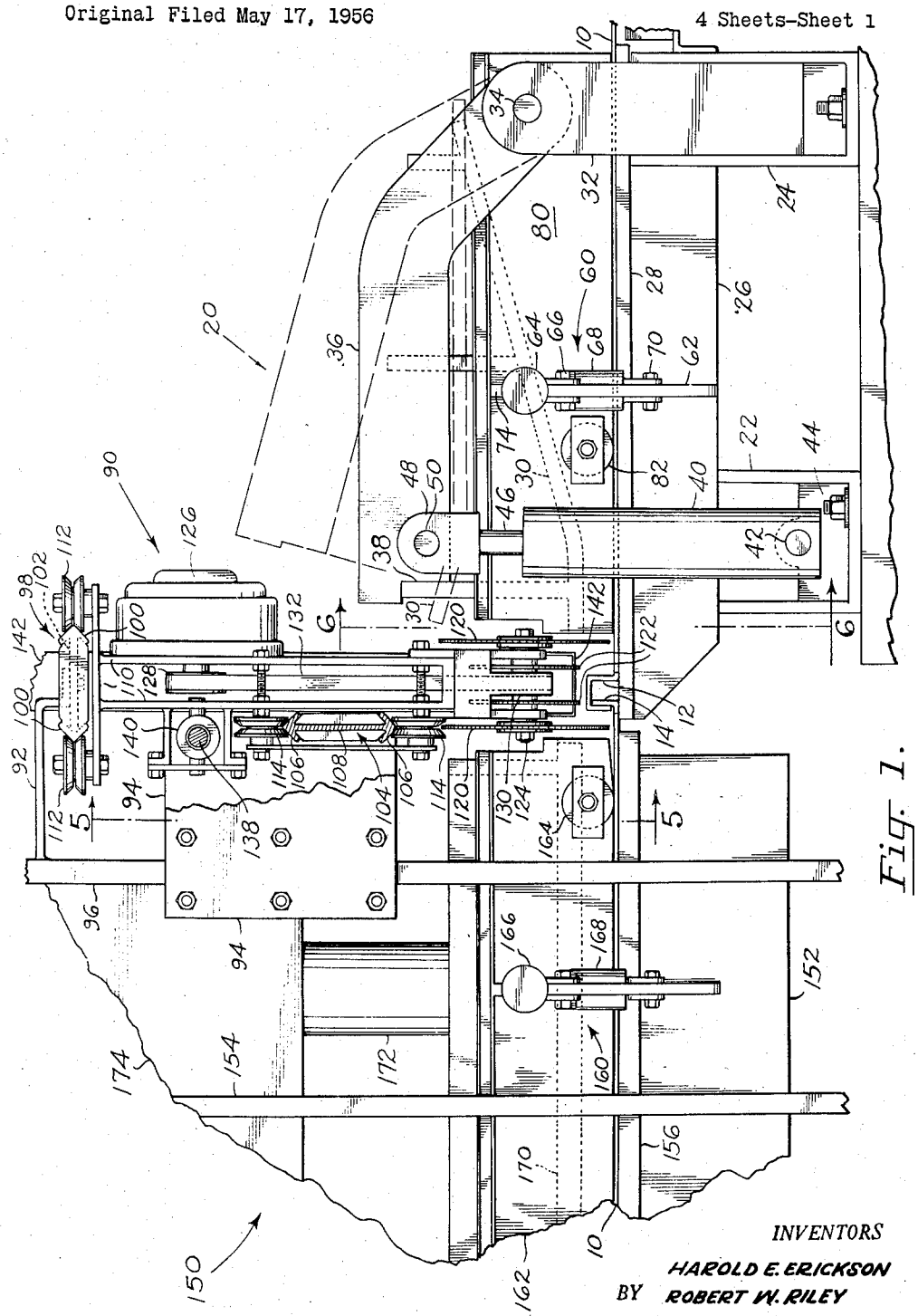


Fig. 1.

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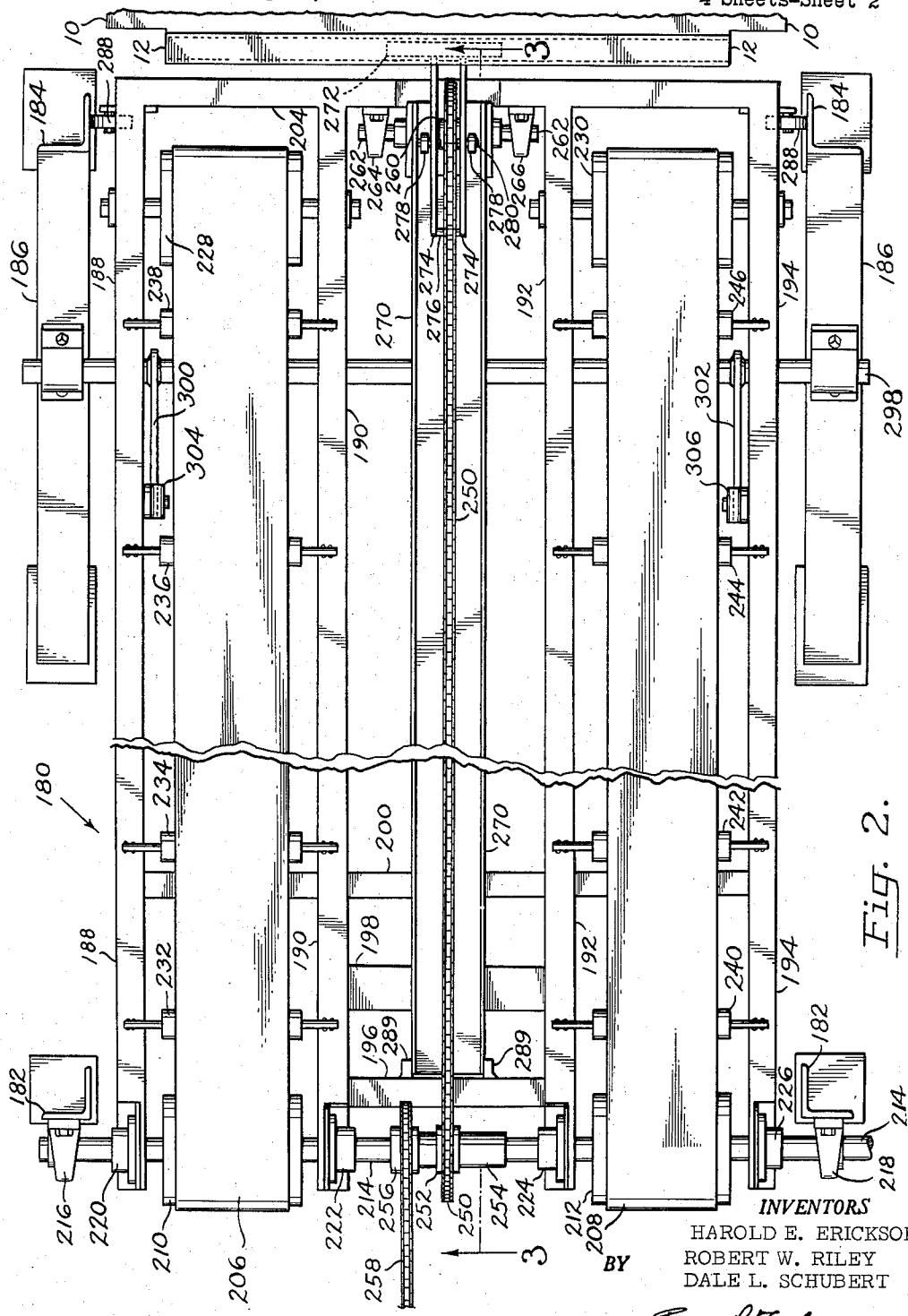


Fig. 2.

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PREPRESSING AND DIVIDING PARTICLE MATS

Original Filed May 17, 1956 4 Sheets-Sheet 3

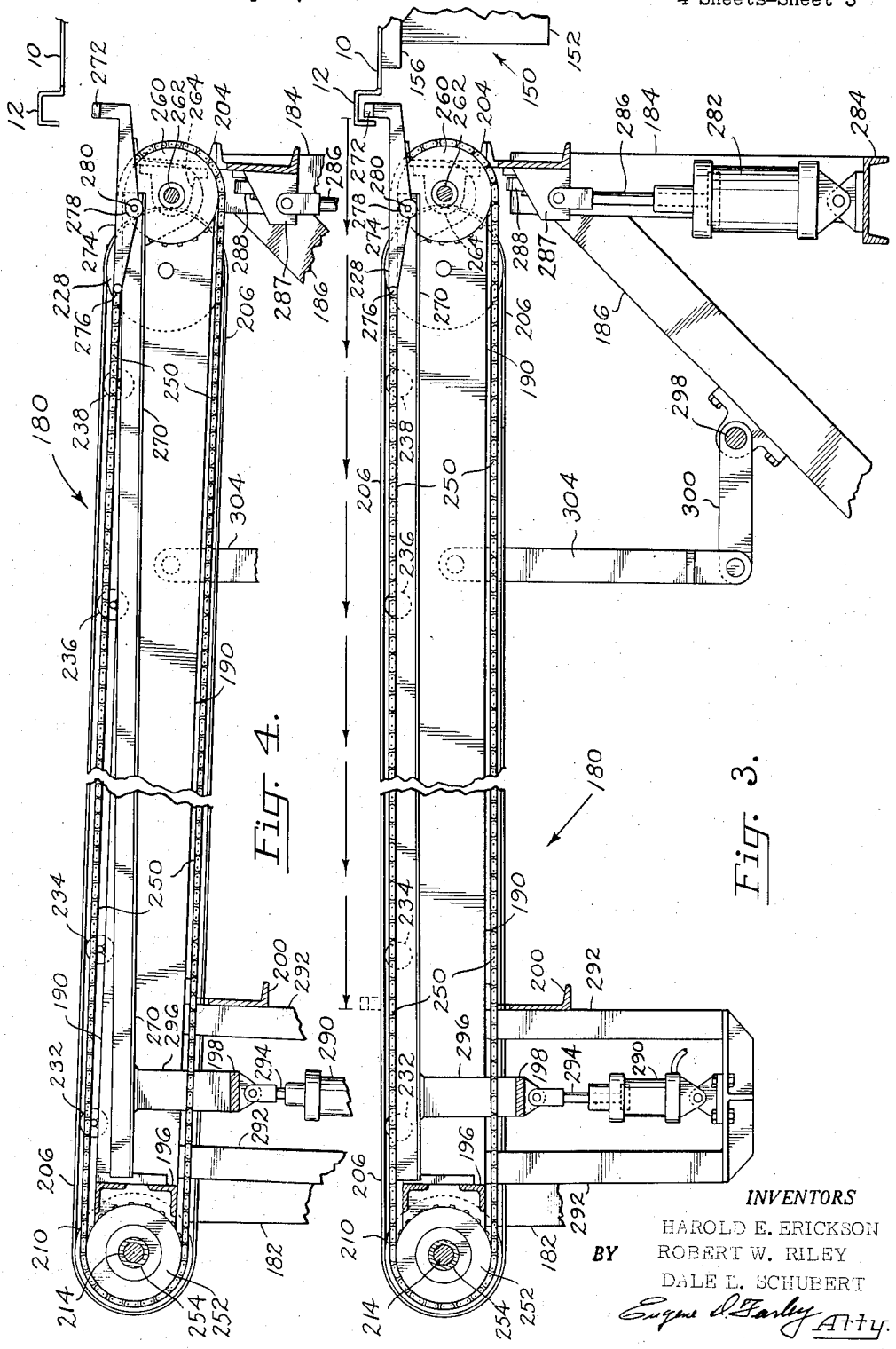


Fig. 4.

Fig. 3.

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PREPRESSING AND DIVIDING PARTICLE MATS

Original Filed May 17, 1956 4 Sheets-Sheet 4

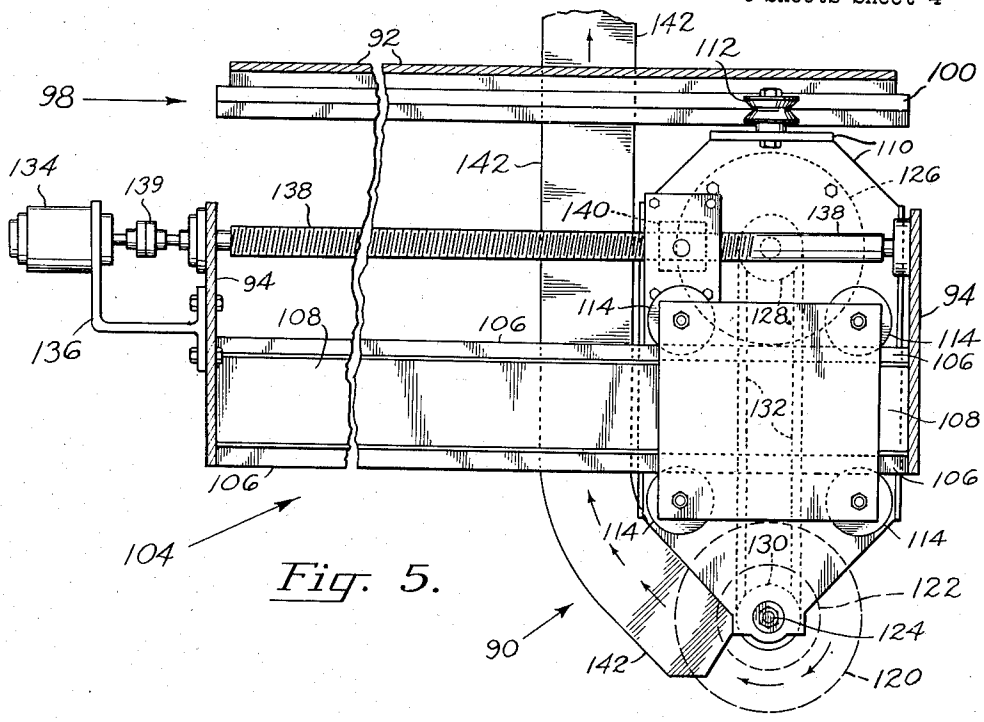


Fig. 5.

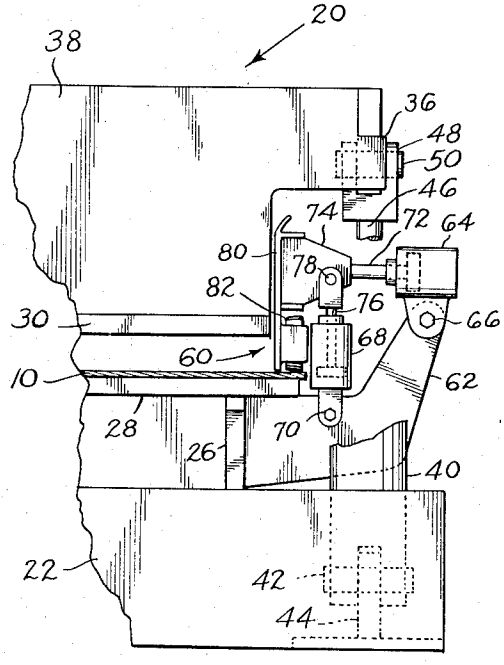


Fig. 6.

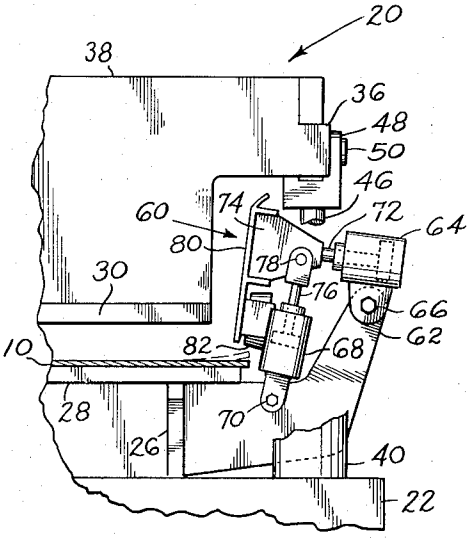


Fig. 7.

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2,968,389

PREPRESSING AND DIVIDING PARTICLE MATS

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Original application May 17, 1956, Ser. No. 585,462. Divided and this application May 3, 1957, Ser. No. 660,733

9 Claims. (Cl. 198—218)

This application is a division of my copending application Serial No. 585,462, filed May 17, 1956, now Patent No. 2,923,968.

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 consequence, 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 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, planning 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** 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 upward 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 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 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 reciprocatable 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, 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 spaced 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 con-

nected 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 **214** 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. A conveyor for a plurality of caul plates releasably interlocked end to end, comprising support means for the caul plates, engaging means for alternately engaging and releasing the leading caul plate, drive means connected to the engaging means for reciprocating the latter between a first station where it engages the leading caul plate and a second station where it releases the same, means for disengaging the leading caul plate from the next following caul plate after the engaging means has reached the second station, and conveyor means for moving the disengaged leading caul plate from the second station.

2. A conveyor for a plurality of caul plates releasably interlocked end to end, comprising a pair of laterally spaced apart driven belts for supporting the caul plates, an endless flexible member mounted between the belts parallel to the latter, caul plate engaging means affixed to the flexible member, first drive means connected to the flexible means for reciprocating the engaging means between a first position and a second position, second drive

means operatively connected to the engaging means for elevating it into engagement with the leading caul plate at the first position of the engaging means, and third drive means operatively connected to the engaging means for lowering the engaging means out of engagement with the leading caul plate at the second position of the engaging means, the second drive means also being operatively connected to the flexible member for lowering the latter and disengaging the leading caul plate from the next following caul plate after the engaging means has reached the second position.

3. A caul plate conveyor comprising a pair of laterally spaced apart driven belts for supporting the caul plate, an endless flexible member mounted between the belts parallel to the latter, caul plate engaging means affixed to the flexible member, first drive means connected to the flexible means for reciprocating the engaging means between a first station and a second station, and second drive means operatively connected to the engaging means for elevating it into engagement with the caul plate at the first station of the engaging means, and third drive means operatively connected to the engaging means for lowering the engaging means out of engagement with the caul plate at the second station of the engaging means.

4. A caul plate conveyor comprising driven belt means for supporting the caul plate, an endless flexible member adjacent and on the track means parallel to the belt means, the belt means and flexible member having infeed and outfeed ends, caul plate engaging means secured pivotally to the flexible member, drive means connected to the flexible member for reciprocating the engaging means between a first station adjacent the infeed end of the flexible member and a second station adjacent the outfeed end of the flexible member, elongated track means for supporting the engaging means during movement between the first and second stations, the engaging means being supported on the track means at the first station in elevated position for engaging a caul plate and at the second station in a lowered position out of engagement with the caul plate.

5. A conveyor for a plurality of caul plates releasably interlocked end to end, comprising driven belt means for supporting the caul plates, an endless flexible member adjacent and parallel to the belt means, the belt means and flexible member having infeed and outfeed ends, caul plate engaging means secured pivotally to the flexible member, drive means connected to the flexible member for reciprocating the engaging means between a first station adjacent the infeed end of the flexible member and a second station adjacent the outfeed end of the flexible member, elongated track means for supporting the engaging means during movement between the first and second stations, first vertically adjustable support means supporting the infeed end of the belt means, flexible member and track means, and second vertically adjustable support means supporting the outfeed end of the track means, the first adjustable support means being operable to elevate the engaging means into engagement with the leading caul plate when the engaging means is at the first station, the second adjustable support means being operable to lower the track means and engaging means at the second station out of engagement with the leading caul plate, the first adjustable support means also being operable to lower the belt means and leading caul plate supported thereon out of engagement with the next following caul plate after the engaging means has reached the second station.

6. A mat conveyor comprising, in combination, a caul plate comprising a substantially flat plate, a substantially inverted U-shaped connecting member on the leading end of the plate, support means for the caul plate, hook means proportioned for releasable engagement with the inverted U-shaped connecting member, drive means connected to the hook means for reciprocating the latter between a first station where it engages the connecting member and a second station where it releases from the connecting member, and conveyor means for moving the caul plate from the second station.

7. A mat conveyor comprising, in combination, a plurality of caul plates each of which comprises a substantially flat plate, a substantially inverted U-shaped connecting member on the leading end of the plate and an upwardly projecting connecting member on the trailing end of the plate, the trailing projecting member of a leading caul plate being adapted to be received in the leading U-shaped connecting member of the next following caul plate, thereby releasably interlocking the caul plates end to end, a conveyor for said caul plates comprising hook means proportioned for releasable engagement with the inverted U-shaped connecting member of the leading caul plate, drive means connected to the hook means for reciprocating the latter between a first station where it engages the inverted U-shaped connecting member of the leading caul plate and a second station where it releases from the same, and means for disengaging the trailing projecting member of the leading caul plate from the leading inverted U-shaped connecting member of the next following caul plate after the hook means has reached the second station.

8. A mat conveyor comprising, in combination, a plurality of caul plates each of which comprises a substantially flate plate, a substantially inverted U-shaped connecting member on the leading end of the plate and an upwardly projecting connecting member on the trailing end of the plate, the trailing projecting member of a leading caul plate being adapted to be received in the leading U-shaped connecting member of the next following caul plate, thereby releasably interlocking the caul plates end to end, a conveyor for said caul plates comprising a pair of laterally spaced apart driven belts for supporting the caul plates, an endless flexible member mounted between the belts parallel to the latter, hook means proportioned for releasable engagement with the inverted U-shaped connecting member of the leading caul plate, the hook means being affixed to the flexible member, first drive means connected to the flexible member for reciprocating the hook means between a first station and a second station, second drive means operatively connected to the hook means for elevating it into engagement with the inverted U-shaped connecting member of the leading caul plate at the first station and for lowering the hook means out of engagement with the inverted U-shaped connecting member of the leading caul plate at the second station, and means for disengaging the trailing projecting member of the leading caul plate from the inverted U-shaped connecting member of the next following caul plate after the hook means has reached the second station.

9. A mat conveyor comprising, in combination, a plurality of caul plates each of which comprises a substantially flat plate, a substantially inverted U-shaped connecting member on the leading end of the plate and an upwardly projecting connecting member on the trailing end of the plate, the trailing projecting member of a leading caul plate being adapted to be received in the leading U-shaped connecting member of the next following caul plate, thereby releasably interlocking the caul plates end to end, driven belt means for supporting the caul plates, an endless flexible member adjacent and parellel to the belt means, the belt means and flexible member having infeed and outfeed ends, hook means proportioned for releasable engagement with the inverted U-shaped connecting member of the leading caul plate, the hook means being secured pivotally to the flexible member, drive means connected to the flexible member for reciprocating the hook means between a first station adjacent the infeed end of the flexible member and a second station adjacent the outfeed end of the flexible member, elongated track means for supporting the hook means during movement between the first and second stations, first vertically adjustable support means supporting the infeed end of the belt means, flexible member and track means, and second vertically adjustable support means supporting the outfeed end of

the track means, the first adjustable support means being operable to elevate the hook means into engagement with the inverted U-shaped connecting member of the leading caul plate when the hook means is at the first station, the second adjustable support means being operable to lower the track means and hook means at the second station out of engagement with the inverted U-shaped connecting member of the leading caul plate, the first adjustable support means also being operable to lower the belt means and leading caul plate supported thereon after the hook means has reached the second station, thereby releasing

the trailing projecting member of the leading caul plate from the leading inverted U-shaped connecting member of the next following caul plate.

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UNITED STATES PATENT OFFICE

CERTIFICATION OF CORRECTION

Patent No. 2,968,389 January 17, 1961

Harold E. Erickson et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 9, line 27, strike out "on the track means" and insert the same after "and" in line 38, same column 9; column 10, line 25, for "flate" read -- flat --.

Signed and sealed this 20th day of June 1961.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents