

[54] **CONTINUOUS, LAMINATED-PLATEN
PRESS FOR PRESSING GLUE-COATED
PRESS CHARGES**

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[21] Appl. No.: **320,874**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 268,674, July 3, 1972, abandoned, Continuation-in-part of Ser. No. 79,839, Oct. 12, 1970, Pat. No. 3,723,230.
[52] U.S. Cl. **156/580; 100/151; 198/162; 425/371**
[51] Int. Cl. **B30b 5/06; B30b 15/06**
[58] Field of Search 156/580, 547; 425/371; 198/162, 165; 100/151, 152, 154, 118

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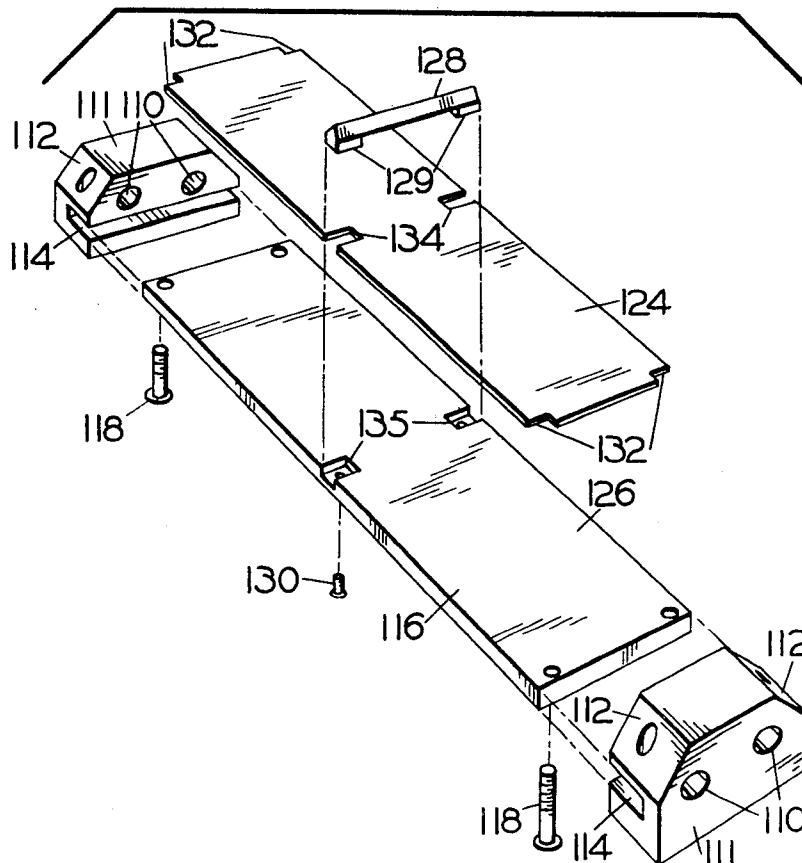
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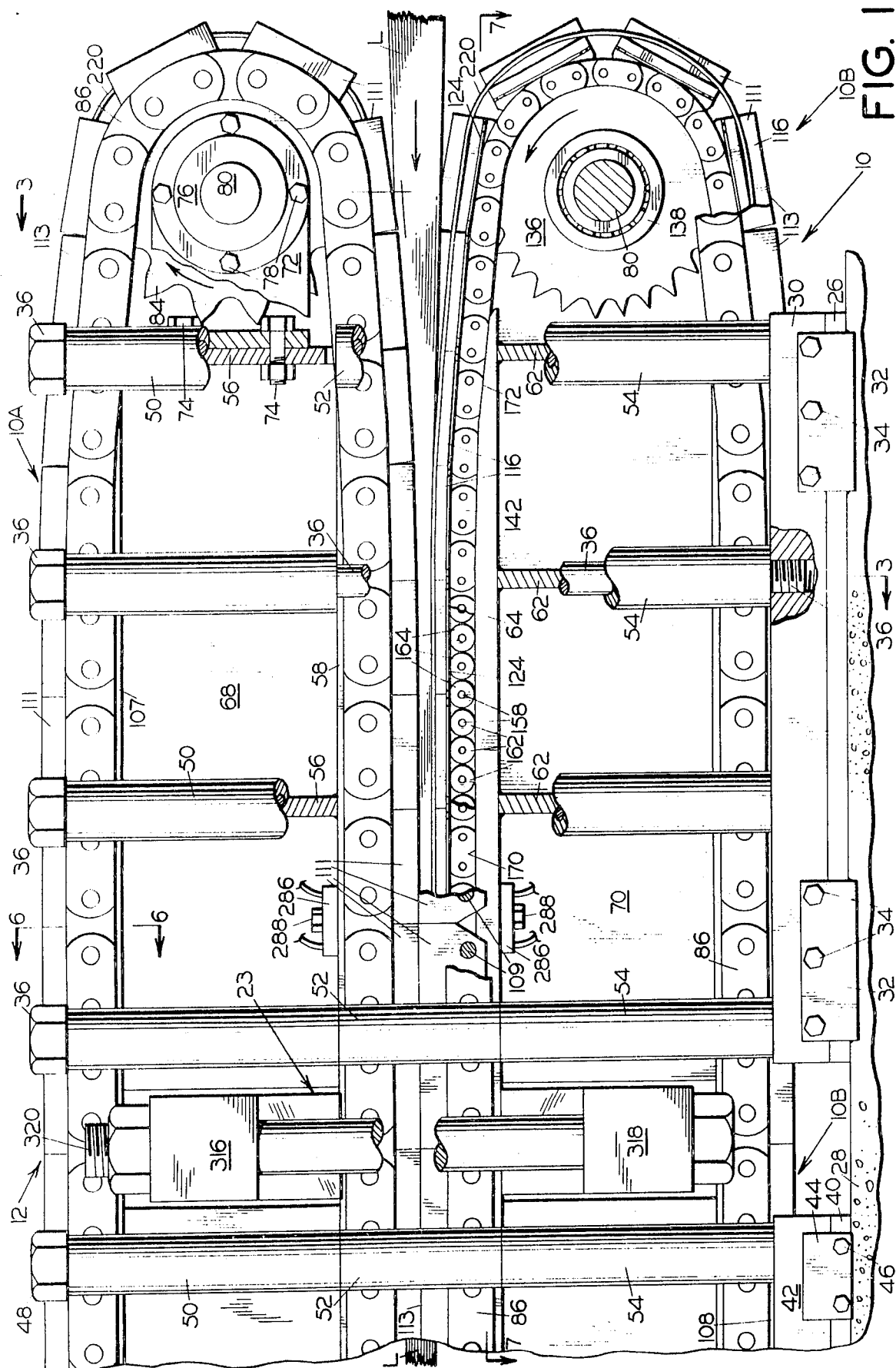
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[57] **ABSTRACT**

A continuous press for pressing glue-coated press charges includes a pair of cooperating press belts each comprising a pair of endless support members transversely mounting a plurality of press platens, with associated underlying anti-friction roller belts. Each press platen is of floating laminar construction. An endless caul belt overlies each press belt, arranged for protective contact with the press charge and preventing mutilation of its surface. A ratchet drive advances the belts in coordinated, step-wise increments determined by measuring means associated with the ratchet drive means and measuring the lineal progress of the work through the press. Side rolls guide the press belts as they travel the length of the press.

5 Claims, 19 Drawing Figures





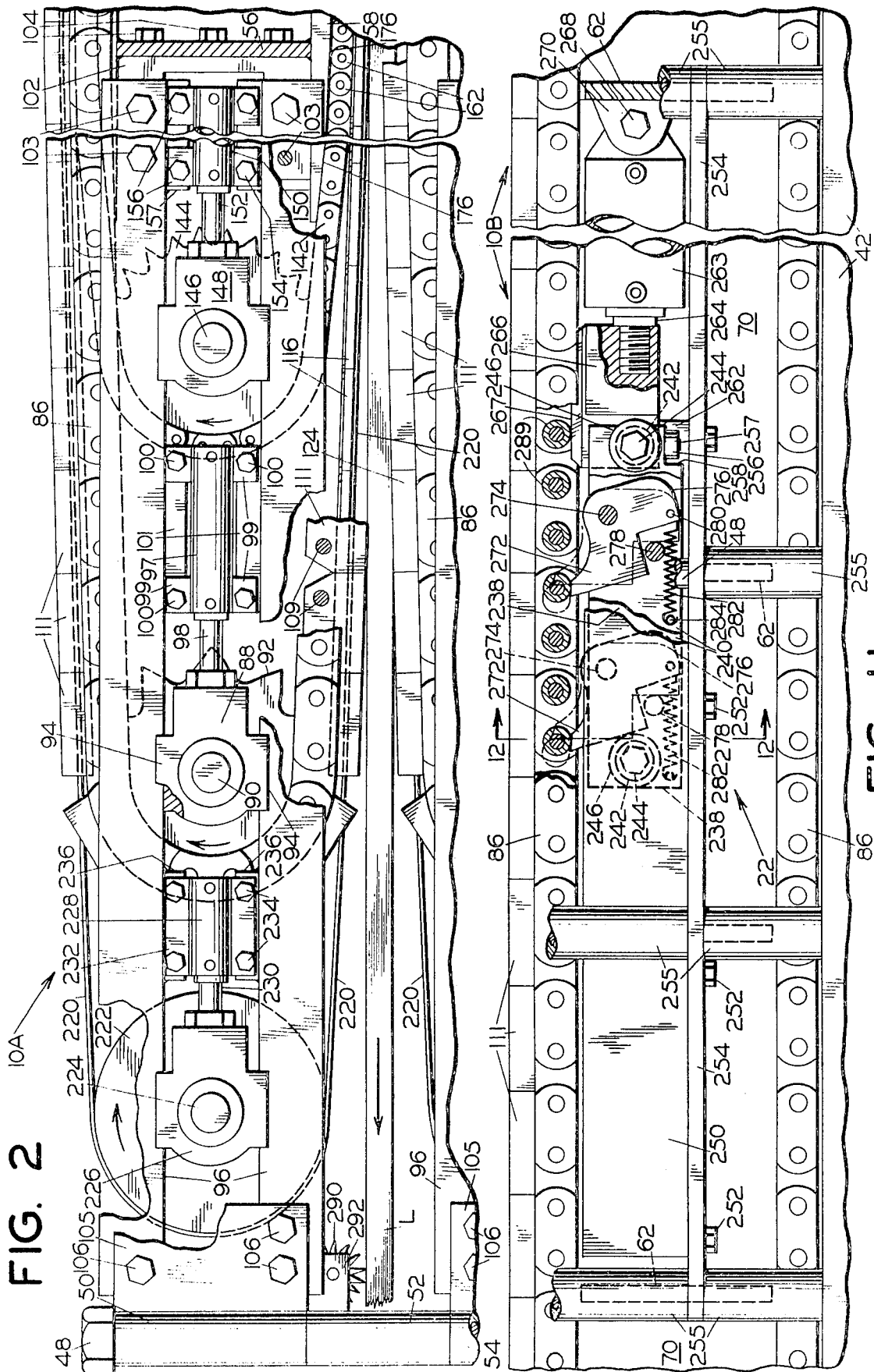
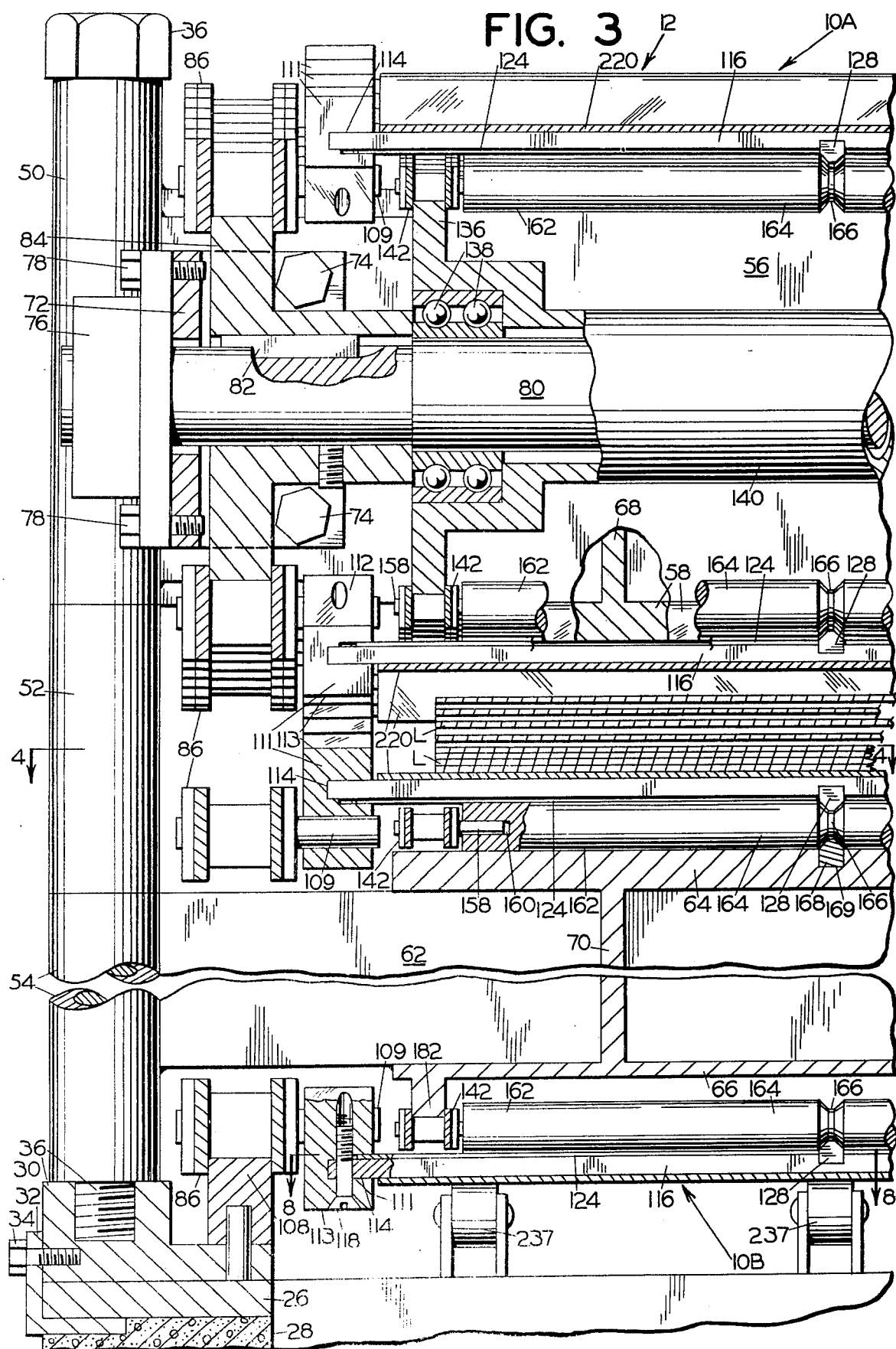


FIG. 3



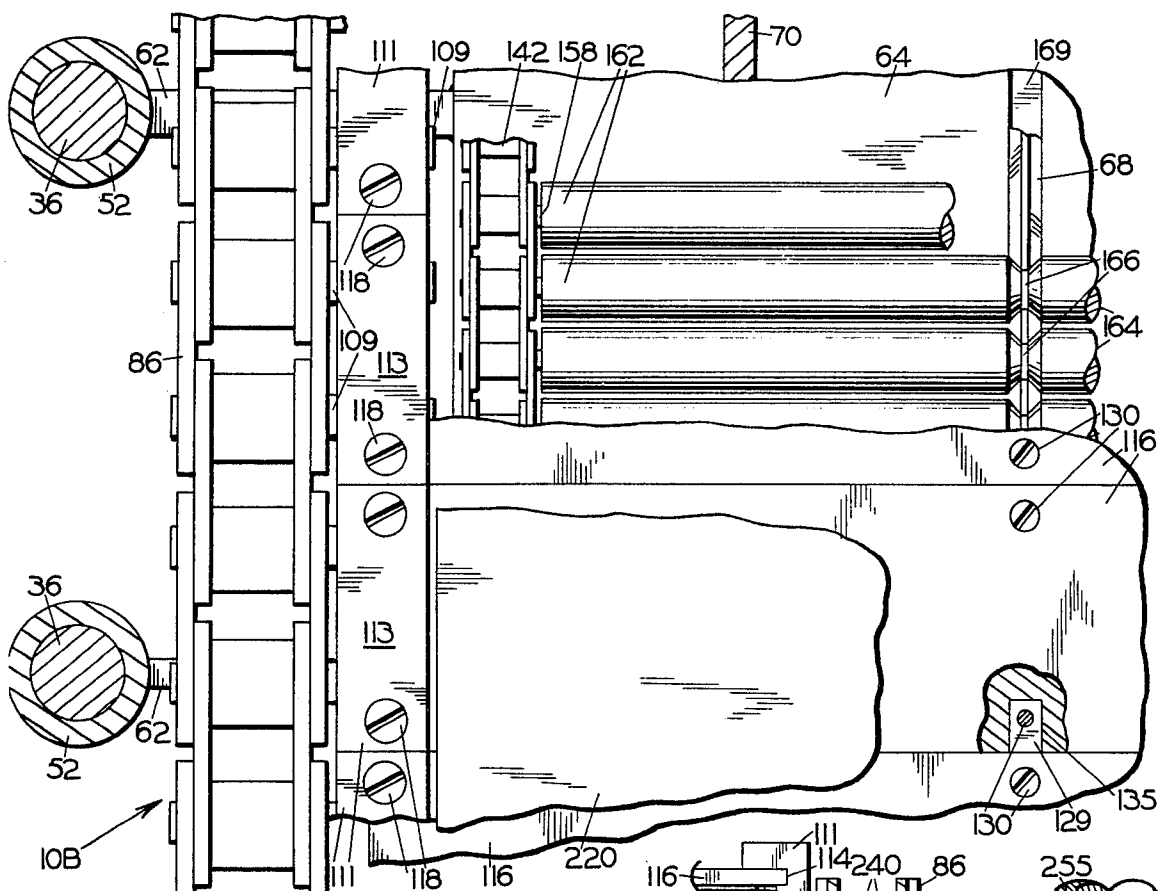


FIG. 4

FIG. 12

FIG. 5

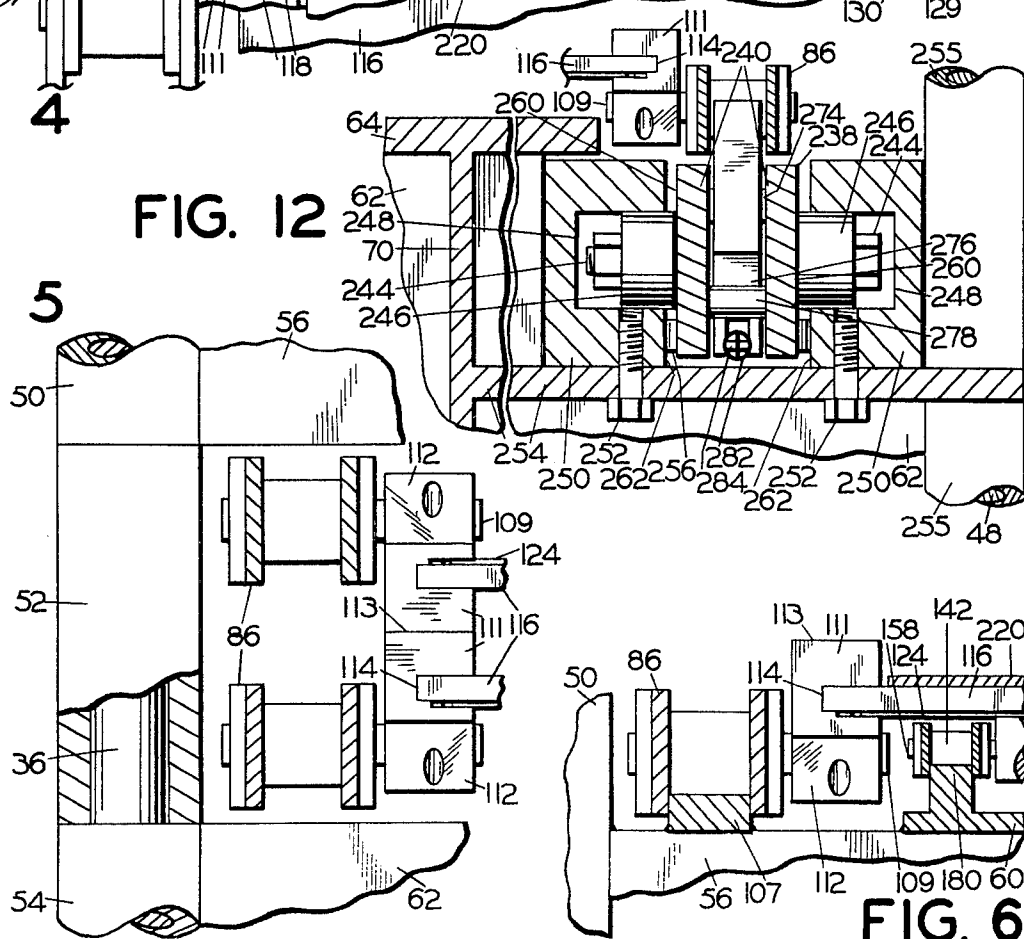


FIG. 6

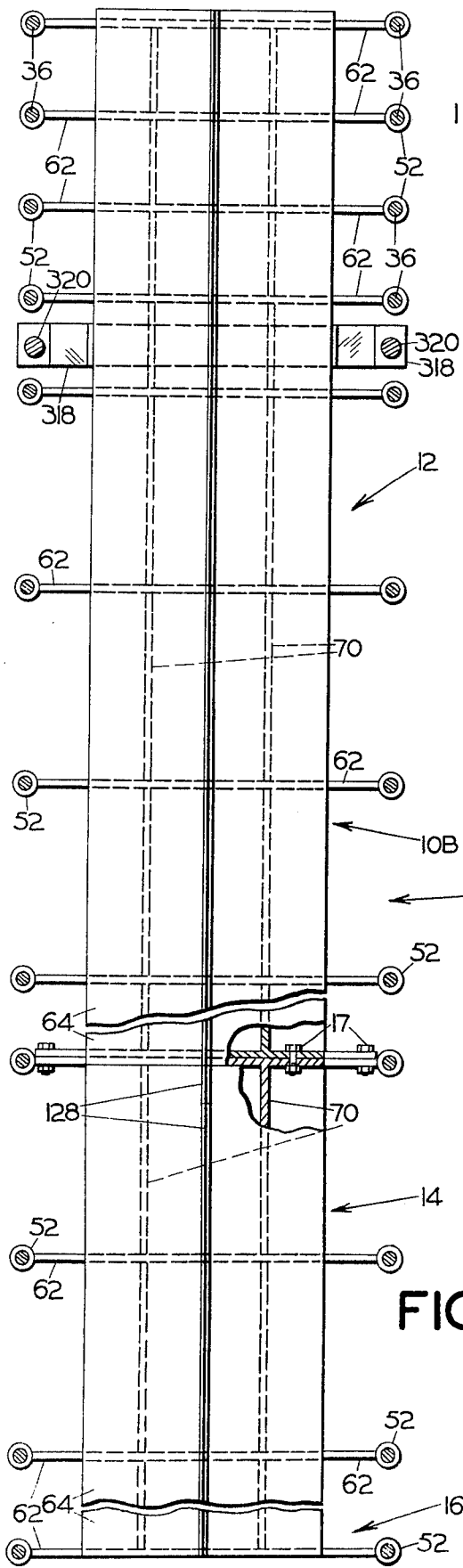


FIG. 7

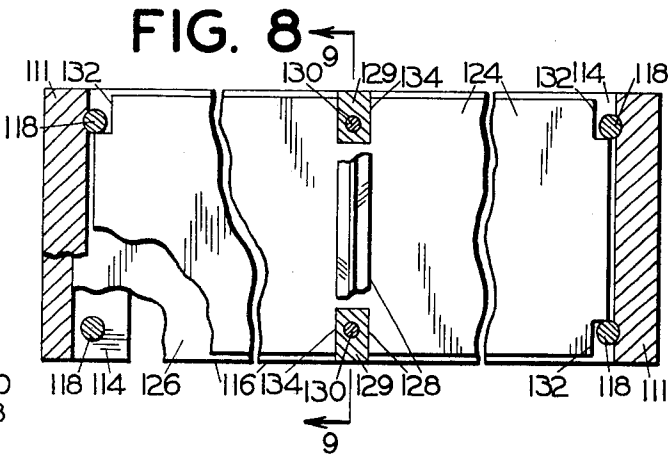


FIG. 8

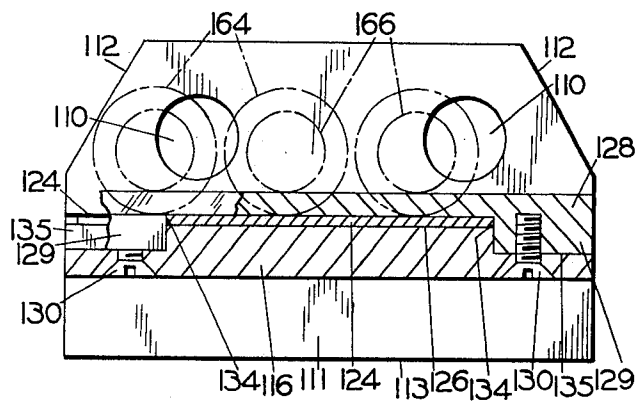


FIG. 9

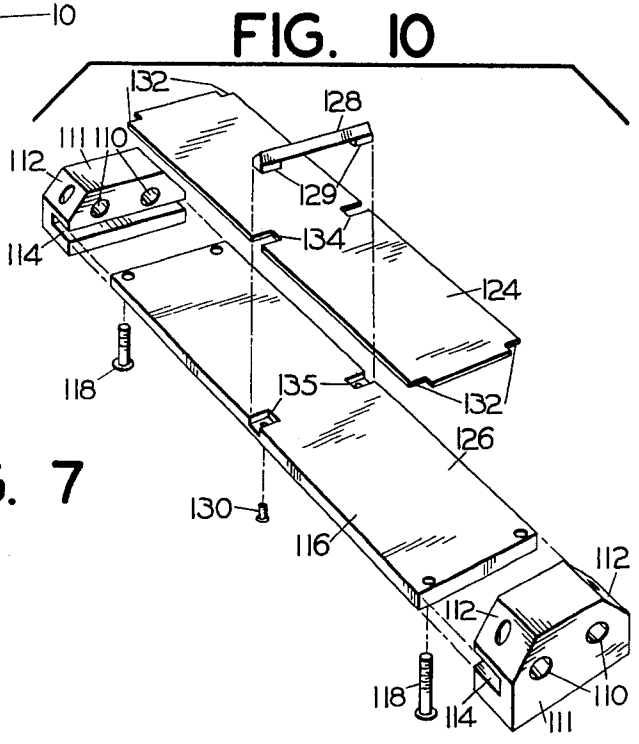
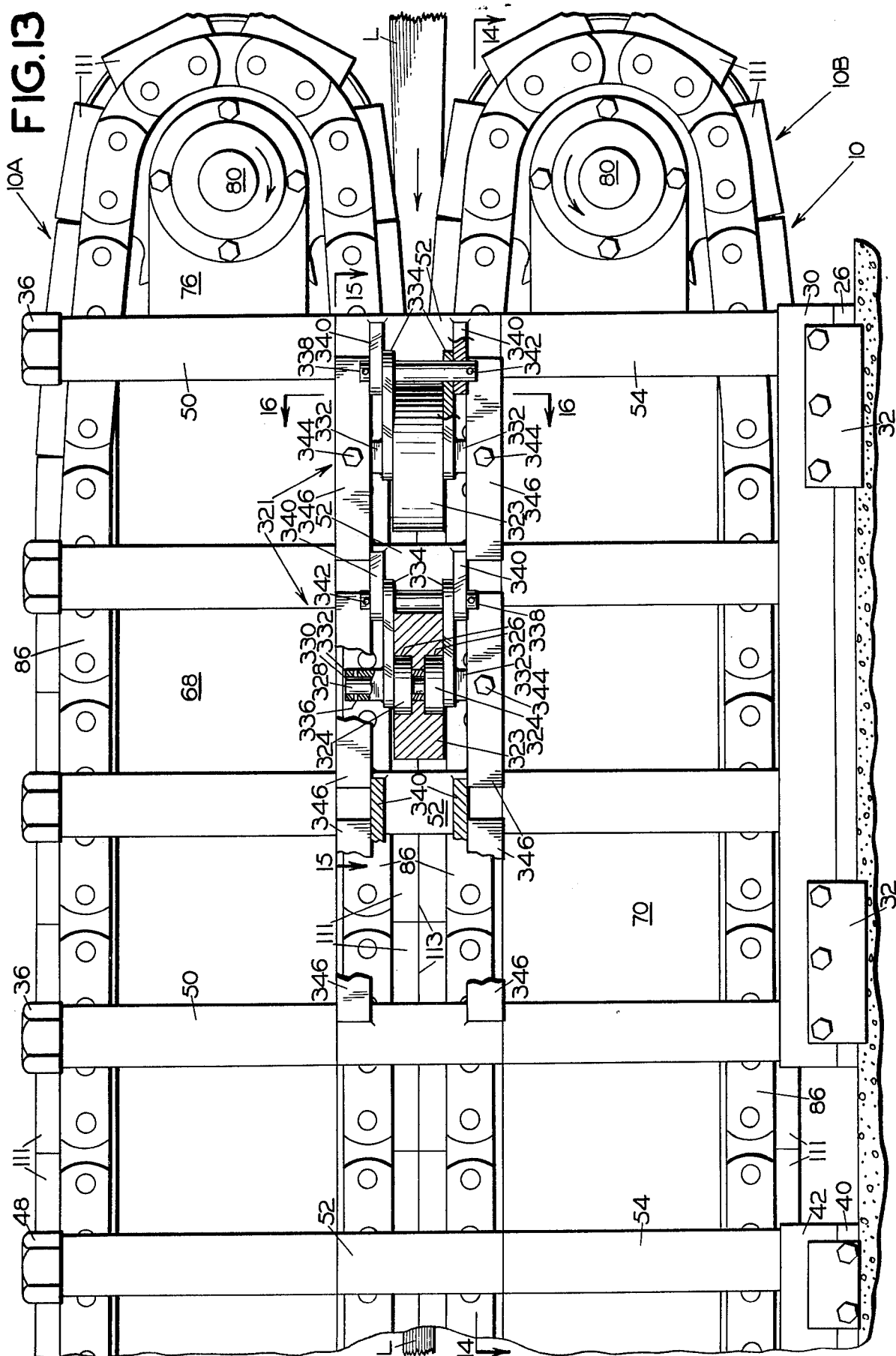


FIG. 10

FIG. 13



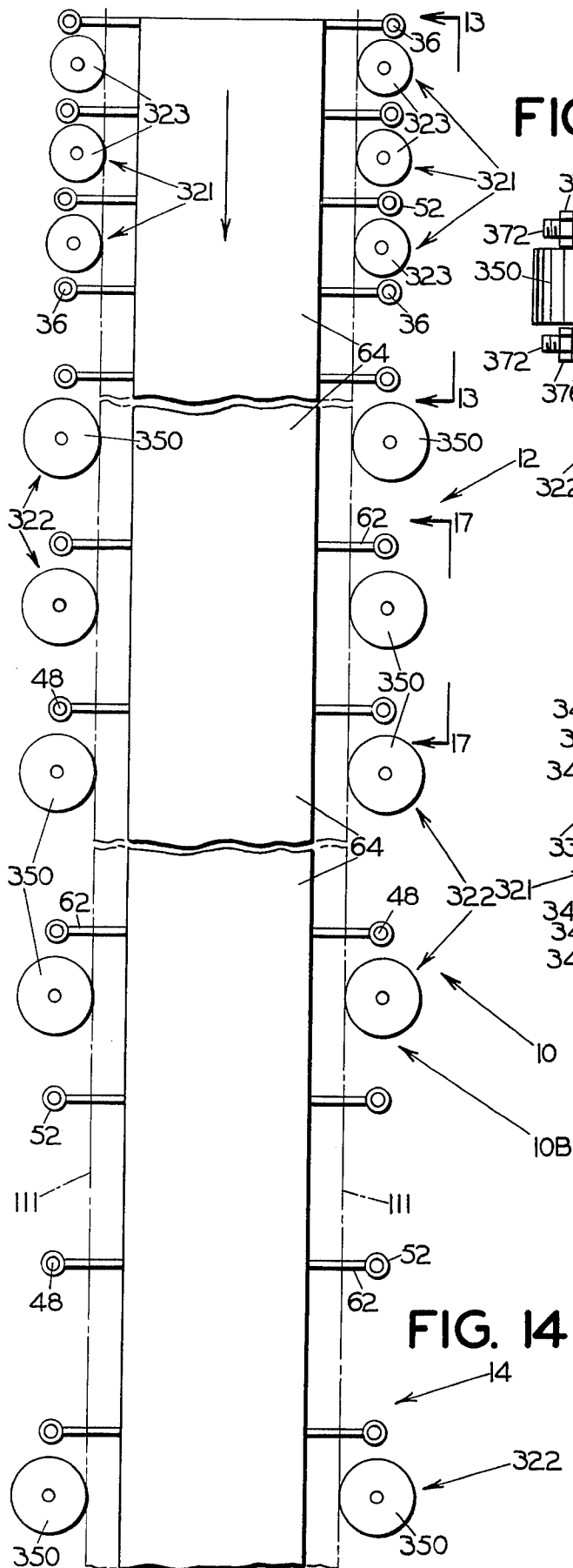


FIG. 19

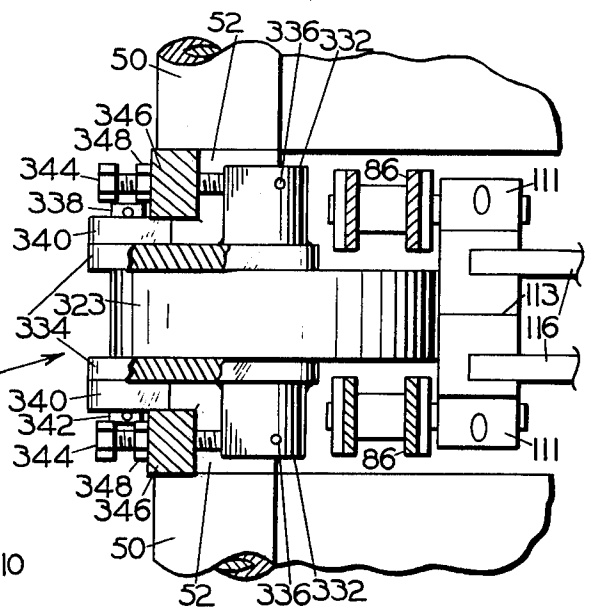
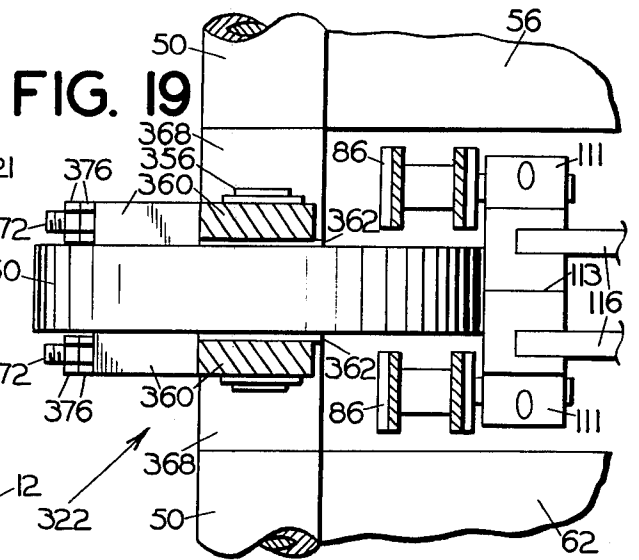


FIG. 17

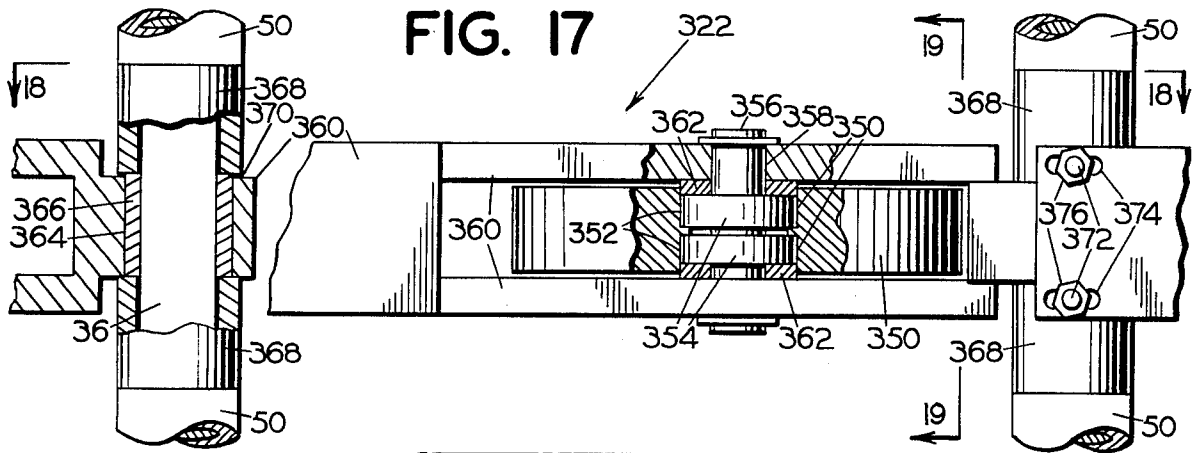


FIG. 18

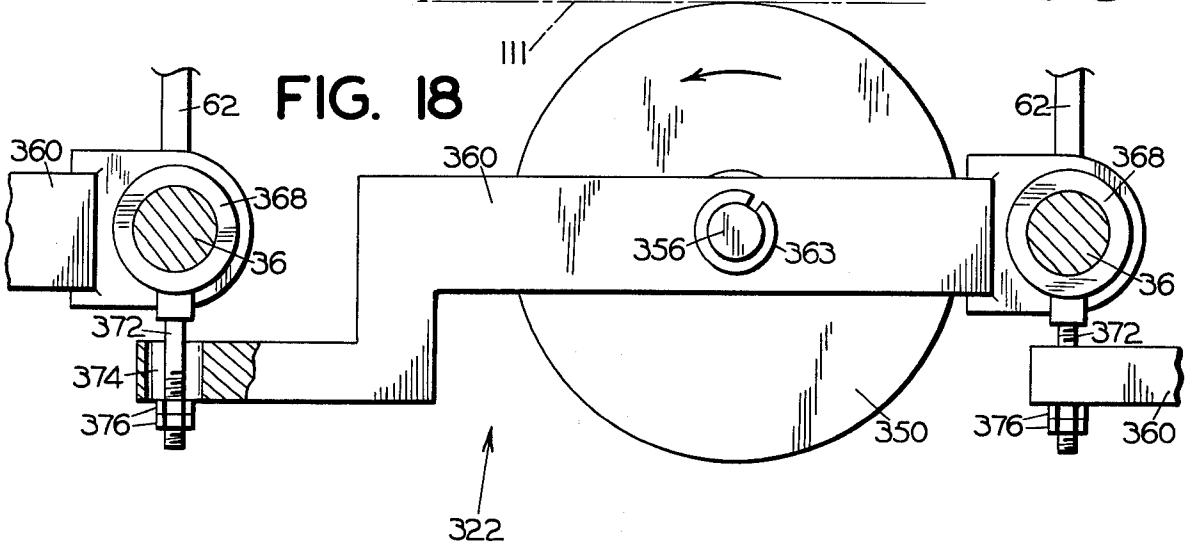
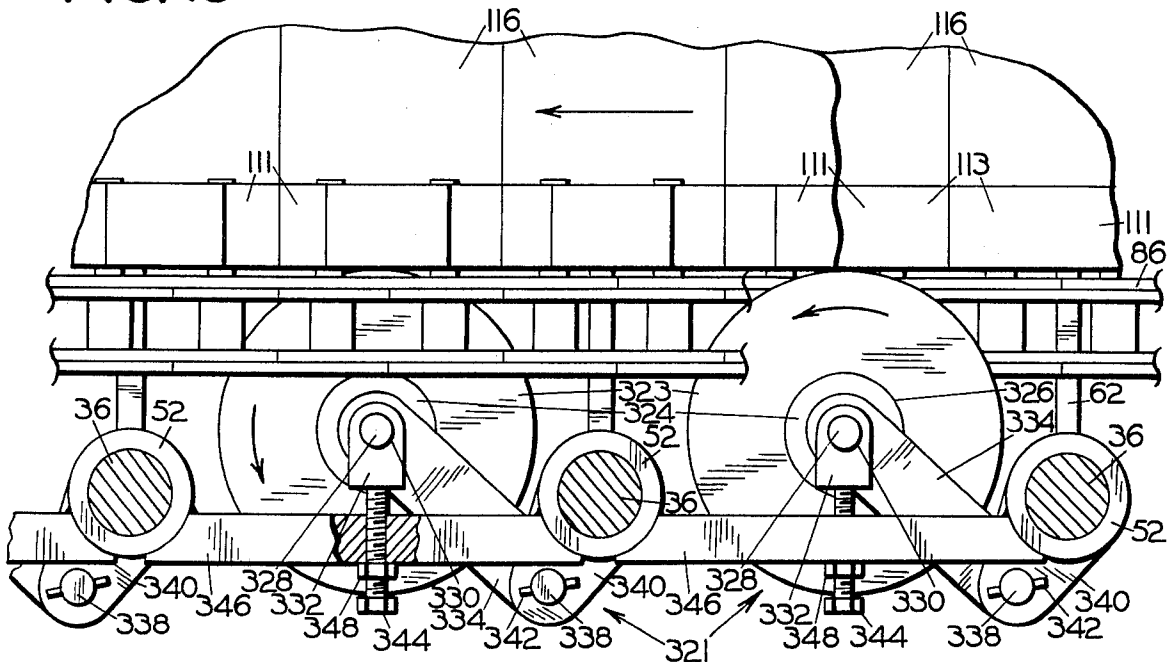


FIG. 15



CONTINUOUS, LAMINATED-PLATEN PRESS FOR PRESSING GLUE-COATED PRESS CHARGES

This application is a continuation-in-part of the patent application of Arthur L. Troutner, Ser. No. 268,674, filed July 3, 1972 for CONTINUOUS, LAMINATED-PLATEN PRESS FOR PRESSING GLUE-COATED PRESS CHARGES, now abandoned the same being a continuation-in-part of the patent application of Arthur L. Troutner, Ser. No. 79,839, filed Oct. 12, 1970 for CONTINUOUS PRESS FOR PRESSING GLUE-COATED, CONSOLIDATABLE PRESS CHARGES, now U.S. Pat. No. 3,723,230

BACKGROUND OF THE INVENTION

This invention relates to continuous presses for pressing glue-coated, consolidatable press charges into a continuous product. It pertains particularly to a continuous press for glueing stacked glue-coated wood laminae into lumber or plywood and is described with particular reference to this application. No limitation thereby is intended, however, for the press is equally suitable for such applications as the consolidation of a mat of glue-coated wood particles into wood composition board.

In the aforesaid patent application of Arthur L. Troutner et al., Ser. No. 79,839, there is described a continuous press comprising essentially a pair of elongated, vertically spaced press beds and a pair of endless press belts positioned between the press beds in substantial alignment therewith.

A pair of endless anti-friction belts are interposed between the press beds and the press belts in substantial alignment and in working contact therewith. Drive means is connected to the press belts for advancing them in the feed direction at a rate predetermined to effect a desired consolidation of the stack of wood laminae or other press charge during setting of the glue. At the same time, the working stretches of the press belts are spaced a distance sufficient to exert a predetermined pressure on the press charge passing in pressure contact between them.

The operation of this assembly leads to the production of a continuous plank or beam of indefinite length and having a width determined by the width of the press.

In the normal construction of such a press, the press beds and press belts comprise massive steel members. The anti-friction belts normally comprise anti-friction roller belts, the rollers also being fabricated from hard steel. Since the rollers of the anti-friction belts point load the press belts, very high pressures are developed at the interface between these two components. The press belts accordingly are subject to cold working by the rollers on which they ride. This action takes place on the roller side only of the press belts. On the opposite side, the components are pressed uniformly against the press bed, which is of softer, flat material so that the unit pressures are lower.

The cold rolling effect causes the press belt components to cup as the cold worked surface expands and the opposite surface does not. The cupped or curved surface in turn undesirably may imprint its contour on the surface of the work passing through the press.

A further disadvantage of the cupping or curving of the press platen surfaces resides in the fact that the press belt elements do not lie flat on the underlying rollers. The curved faces touch only part of the rollers,

thus increasing the roller pressure and magnifying the cold rolling effect. This phenomenon occurs even at low pressure and in thick, hard, structural materials.

Another difficulty inherent in the operation of a press of this class, is that of guiding the work through the press in proper working relation to the parts of the latter. Specifically, the rollers of the anti-friction belts tend to skew as they progress through the press. This causes the associated press belts to shift in the direction of the skew, and thus to misalign the belts with reference to the press charge.

It accordingly is the object of the present invention to provide a continuous press of the class described which is provided with press belts having platens permitting the inevitable cold working of the platens to occur without interfering with their function.

Additional objects of the invention are the provision of a continuous press of the class described fitted with continuous caul plates which further prevent the disfigurement of the surface of the work, with means for guiding the press charge through the press in proper relation to the press parts, and with an incremental drive of the accuracy necessary for the production of a uniform product.

The continuous press of the present invention which achieves the foregoing objectives basically comprises a pair of elongated, vertically spaced press beds associated with a pair of endless press belts positioned between the press beds in substantial alignment. A pair of endless anti-friction roller belts is interposed between the press beds and the press belts in substantial alignment and in working contact therewith. The working stretches of the press belts are spaced apart a distance sufficient to exert a predetermined pressure on a consolidatable press charge passing in pressure contact between them. Drive means connected to the press belts advances them in the feed direction at a rate predetermined to effect desired consolidation of the press charge during setting of the glue.

Each press belt is comprised broadly of a pair of flexible endless support members, such as endless chains, having a plurality of press plates or platens supported transversely between them. Each press plate is of laminar construction. It consists of a relatively thick base plate and an overlying, relatively thin, cover or pressure plate. The cover plate is secured to the base plate in the central areas of both only. The ends of the cover plate are lightly confined and free to expand. In the operation of the press, the cover plate thus accepts the cold working stresses without transmitting them to the base plate, which is in contact with the work. The base plate thus is not subject to a deformation which would be transferred to the press charge.

Further to protect the press charge there is included in the assembly a pair of endless caul belts. One of these is interposed between each press belt and the press charge, thereby preventing marring or scuffing of the surface of the latter. Also, an incremental drive of strictly controlled incremental magnitude is employed to further insure uniformity of the product.

Side guides are provided to guide the press belts, and the press charge, as they move through the press.

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

FIGS. 1 and 2 are fragmentary side elevations of the infeed and outfeed segments of the herein described

press, respectively, with parts broken away for convenience of illustration.

FIG. 3 is a transverse, fragmentary sectional view taken along line 3—3 of FIG. 1.

FIG. 4 is a fragmentary plan view taken along line 4—4 of FIG. 3.

FIG. 5 is a fragmentary sectional view similar to FIG. 3, but showing additional detail.

FIG. 6 is a fragmentary sectional view taken along line 6—6 of FIG. 1.

FIG. 7 is a fragmentary, plan sectional view taken on line 7—7 of FIG. 1.

FIG. 8 is a foreshortened, plan, sectional view taken along line 8—8 of FIG. 3 and illustrating a platen assembly employed in the hereindescribed press.

FIG. 9 is a transverse sectional view taken along line 9—9 of FIG. 8.

FIG. 10 is an exploded perspective view further illustrating the platen assembly.

FIG. 11 is a fragmentary side elevation illustrating the press drive.

FIG. 12 is a fragmentary section taken along line 12—12 of FIG. 11.

FIG. 13 is a fragmentary side elevation of the infeed segment of the press illustrating the leading or forward guide roller locations, parts being broken away for convenience of illustration.

FIG. 14 is a diagrammatic, plan, foreshortened, fragmentary, sectional view taken along line 14—14 of FIG. 13.

FIG. 15 is a fragmentary, plan, sectional view taken along line 15—15 of FIG. 13.

FIG. 16 is a fragmentary sectional view taken along line 16—16 of FIG. 13.

FIG. 17 is a fragmentary elevational view taken along line 17—17 of FIG. 14.

FIG. 18 is a plan fragmentary sectional view taken along line 18—18 of FIG. 17.

FIG. 19 is a fragmentary sectional view taken along line 19—19 of FIG. 17.

THE PRESS CHARGE

As has been indicated above, the presently described press may be applied to the consolidation and gluing of a variety of press materials. It may be applied in general to the continuous pressing of consolidatable press charges comprising matrices the components of which are coated or impregnated with glue. Thus it may be applied to the continuous pressing of felts comprising mineral or woody particles coated with glue, in the manufacture of composition boards.

The press is particularly applicable, however, to the pressing of charges comprising stacked, glue-coated wood laminae in the production of lumber, heavy timbers, and plywood. The laminae advantageously may comprise plywood veneers of any of the various commercial thicknesses.

In the preparation of the stacked laminae, the wood veneers or other sheets first are glue coated by any of the conventional techniques, i.e., by spraying, curtain coating, brushing, or roll coating. Sufficient glue is employed to fill any voids and coat the surfaces. Thermosetting or cold setting glues may be employed. To economize on press length, it is preferred to employ quick setting glues.

The glue-coated laminae are laid up in a stack *L* having a thickness, width, and pattern determined by the

dimensions of the press and the end use to which the pressed product is to be put. Thus the laminae may be stacked uniformly throughout the length of the charge to provide a product of uniform density throughout its length. On the other hand, where products of variable density are desired, the laminae may be stacked non-uniformly to provide areas which, after consolidation in the press, are of greater density than the remaining areas of the pressed product.

DESCRIPTION OF A SPECIFIC EMBODIMENT

However compounded, the press charge is fed automatically or manually into the continuous press of the invention which has for its functions continuously pressing the charge, consolidating it to a predetermined thickness and density, and retaining it in its consolidated condition during setting of the glue. The press basically comprises the press beds, the press belts, the endless cauls, the clamps, and the drive means applied to the belts for advancing the press charge through the press.

Considering these basic components one at a time:

The Press Beds

The press beds with associated structural frame have for their primary functions supporting and backing up the press charge that moves continuously through the press while being subjected to consolidating pressures. Their construction is illustrated particularly in FIGS. 1, 3 and 7.

The design of the framework supporting the press beds is such as to lend flexibility in size and application to the press. Thus the entire press may consist of a single module of thirty or more feet in length. It is a feature of the invention, however, that the frame may be constructed in a plurality of modules to give a finished press having the desired production and capacity.

In the particular embodiment of FIG. 7, the press, indicated generally 10 and consisting of an upper section 10a and a lower section 10b, is divided into an infeed module 12, one or more intermediate modules 14, and an outfeed module 16, all suitably connected as by means of flanged members and bolts 17.

Since heat is applied in the operation of the press, the frame is mounted to permit longitudinal thermal expansion. This is accomplished by anchoring the infeed section of the press while permitting the intermediate modules to slide or float freely longitudinally.

To this end the infeed portion of the press is supported by a frame assembly which consists of anchor plates 16 secured to foundation 28 by the usual means, and further secured to sub-frames 30 by means of angle brackets 32 and bolts 34. A plurality of massive horizontally spaced vertical support bolts 36 are threaded to sub-frames 30.

The central and outfeed end portions of the press are supported by similar design of framework supported by friction plates 40. The latter are anchored to the concrete foundation in a manner similar to anchoring plates 26.

Friction plates 40 slidably support longitudinal sub-frames 42. The latter are guided laterally by a plurality of spaced guides 44. These are secured to friction plates 40 by means of bolts 46.

Evenly spaced, vertically disposed mounting bolts 48 are threaded to sub-frames 42 throughout the remaining length of the press.

All of the frame sub-assemblies have a common design, as will be further described hereinafter, with the exception that bolts 36 supporting the infeed section of the press are spaced relatively close to each other for increased strength.

Bolts 36 and 48 clamp upper sleeves 50, intermediate spacers 52, and lower sleeves 54 to the sub-frames 30 and 42. Bridging between and integral with matching pairs of sleeves 50 are lateral webs 56. At their lower edges these support an upper, centrally disposed, longitudinally extending bed plate 58. At their upper edges they support an upper, centrally disposed longitudinal guide plate 60.

Bridging between and integral with matching pairs of lower sleeves 54 are lateral webs 62. At their upper edges these support the lower, centrally disposed, longitudinal bed plates 64. At their lower edges they support a lower guide plate 66.

A pair of full length upper webs 68 integrate the complete upper frame assembly 10a. Another pair of full length webs 70 integrate the lower frame assembly 10b, FIGS. 1, 3 and 7.

The Press Belts

The press belts have for their function advancing the press charge through the press, consolidating the press charge, and restraining the press charge during setting of the glue. Their construction is illustrated particularly in FIGS. 1, 2 and 3.

The press belts each comprise a pair of endless flexible support members, specifically heavy chains, transversely mounting a plurality of press plates or platens. To support this assembly at the infeed end of the apparatus, there are provided two pairs of bearing mounting brackets 72 bolted to the frame by bolts 74. Two pairs of bearings 76 are mounted to the bearing mounting brackets by means of bolts 78. Journaled within these bearings are a pair of transverse shafts 80. Keyed to the outer portions of the shafts by means of keys 82 are a pair of drive sprockets 84 onto which is trained an endless drive chain 86.

At the outfeed end of the press, FIG. 2, a pair of slidable bearing blocks 88 journal cross shafts 90 which support two pairs of sprockets 92. Each bearing block 88 has formed within its upper and lower extremities a pair of vertically opposed bifurcated portions 94. These register with and are supported by four pairs of rails 96.

To enable tensioning of the drive chains, bearings 88 are attached to tensioning cylinders 97 through rams 98. The cylinders are mounted on integral mounting ears 99 by means of bolts 100 and mounting lugs 101.

At their forward ends, rail pairs 96 are mounted detachably on cross webs 56 and 62 by means of brackets 102 and bolts 103, 104. The rearward portions of rail pairs 96 are detachably mounted to ears 105 which are integrated with upper and lower sleeves 50, 54 respectively by means of bolts 106.

The top links of chains 86 which are located in upper section 10a of the press are supported by tracks 107. These in turn are integral with and supported by webs 56, FIG. 6. The bottom links of chains 86, operating in lower section 10b of the press, are supported by tracks 108, FIG. 3. Tracks 108 are pinned to the inner portion of sub-frames 30.

Continuously located throughout the length of drive chains 86 and forming the chain link hinge pivots are evenly spaced, inwardly disposed hinge pin extensions

109, FIG. 3. Transversely matching pairs of pins 109 are journaled slidably and rotatably within bores 110 of platen support blocks 111. Each platen support block has its inner corners relieved at 112 to provide the necessary clearance when changing the direction of travel at the infeed and output ends of the press.

Inwardly facing slots 114 are formed within platen support blocks 111. These support opposing ends of transverse platens or press plates 116. The platens are detachably secured to the support blocks by a pair of screws 118.

By reference to FIGS. 1, 2 and 4, it will be noted that the arrangement of the platens is such that their adjacent, transverse edges are spaced closely together when the platens are in their horizontal position within the press.

As noted hereinabove, it is one of the features of the present invention that the platen construction is laminar in order to compensate for cold working of one of its surfaces by the roller belt support with which it comes in contact. This construction is apparent from a consideration of FIG. 10.

A relatively thin pressure plate 124 is supported within slots 114 of platen support blocks 111. To permit its working under stresses, it is fastened to the platen in the center portion only. Thus it is mounted to the inner surface 126 of the center portion of platen 116 by means of a bar 128 and screws 130.

Bar 128 serves the purpose of attaching the platen pressure or cover plate to the platen. It also serves the purpose of a slide which tracks in a longitudinal guideway or rail 168 extending centrally the length of the press.

All four corners of cover pressure plate 124 have notches 132 which register with screws 118 and insure a floating arrangement of the cover plate ends. Located at the center of the cover plate are two transversely opposed slots 14. These provide clearance for screws 130. Located at the center of platen 116 are two transversely opposed pockets 135. These receive the projections 129.

The Anti-Friction Press Belts

Means are included in the press assembly for minimizing the friction which otherwise would be present between the moving press belts, above described, and the stationary press beds. The means employed for this purpose comprise endless roller belts interposed between the press beds and press belts. The construction and manner of operation of these roller belts is illustrated particularly in FIGS. 1, 2 and 3.

Shafts 80 additionally support inwardly mounted pairs of idler sprockets 136, rotatably mounted on bearings 138 and integrated by tubes 140. Pairs of endless chains 142 are trained around the idler sprockets traveling the complete length of the press. The chains terminate at tensioning idler sprockets 144 mounted within the outfeed portion of the press, FIG. 2.

Sprockets 144 are mounted rotatably on transverse shafts 146 which have their ends journaled within bearings 148. To enable tensioning of the chains, the rail pairs 96 above described slidably support and guide bearings 148 in the same manner as they slidably support and guide bearings 88.

A pair of tensioning cylinders 150 is attached to bearings 148 by means of rams 152. Cylinders 150 are mounted by integral ears 154 and bolts 156. These are

threadably secured to mounting lugs 157 integral with rails 96.

Chains 142 have elongated hinge pins 158 extending inwardly and similar to hinge pins 108 on chains 86 heretofore mentioned. Pins 158 are journaled within axially centered bores 160 located within each end 162 of transverse pressure rollers 164.

Rollers 164 are made of hard steel and are responsible for the cold rolling action on the platens above described. The rollers have at their mid-point grooves 166 which register with and receive platen rails 128, FIGS. 3 and 9.

Longitudinal primary guide rails 168 are supported centrally in grooves 169 in bed plates 58 and 68. The rails register with and enter grooves 166 of the pressure rollers 128, FIGS. 3 and 4. Slide bars 128 of the platens also register with and enter grooves 166 of the rollers. In this manner the press beds, press belts and anti-friction belts are keyed together in operative relation, preventing lateral displacement of the belts.

It will be noted from FIG. 1 that the upper surface 170 of bed plate 64 generates into a ramp 172 at its forward end. A similar opposed surface is formed at the front portion of bed plate 58. As shown in FIG. 2, the lower surface 174 of bed plate 58 generates into a ramp 176 in its terminal portion. The upper rear surface of bed plate 68 has an opposing similar surface. The front and rear portions of guide plates 60, 66 are similarly formed.

The upper horizontal runs of chains 142 that operate within upper press section 10a are supported and guided by an upwardly extending pair of longitudinal tracks 180. These are integral with guide plates 60, FIG. 6. The bottom horizontal run of chains 142 that operate within lower section 10b or the press are guided by a pair of longitudinal, downwardly extending tracks 182. These are integral with guide plates 66, FIG. 3.

The Endless Cauls

It is a further feature of the instantly described press that not only is the surface of the press charge protected from the defacing action of malformed, cold-rolled press plates, but also from scratching and marring caused by contact with any of the elements of the press. To this end, endless steel caul belts optionally but preferably are interposed between the press charge and the pressing elements.

As is shown in FIGS. 1-4, a pair of endless spring steel belts 220 are located in the upper section 10a and the lower section 10b of the press. At the infeed end, the belts 220 are trained around platens 116.

Rearwardly, they are trained around rollers 222 which are supported by transverse shafts 244. The shafts have their ends journaled within bearing blocks 226 which are slidably mounted between rails 96 in a manner similar to the manner of mounting bearings 88 and 148, previously described. The bottom run of belt 220 located in press section 10b is supported by a plurality of rollers 237.

Pairs of tensioning cylinders 228 are connected to bearings 226 by means of rams 230. Cylinders 228 are demountably secured by integral flanges 232 and bolts 234. The latter are threaded into lugs 236 which in turn are integral with rails 96.

Tensioning cylinders 228, like tensioning cylinders 97, 150 above described, have an independent fluid

supply source which will deliver fluid at a pressure suiting the requirements of the tensioning system.

The Press Belt Drive

The inner horizontal runs of drive chains 86 are driven by one or more sets of four chain driving ratchets indicated generally at 22. These are located transversely in pairs in the upper and lower, and terminal and central sections of the press.

Each drive unit consists of a carriage 238 formed by a pair of plates 240, FIGS. 11 and 12. The plates are positioned in spaced relation by a pair of washers 242. The latter in turn are positioned by a pair of clamping bolts 244 located at both ends of carriage 238.

Bolts 244 also position two pairs of support rollers 246 that extend outwardly from plates 240. The rollers travel within inwardly disposed longitudinally guide-ways 248. These are formed within pairs of tracks 250 detachably mounted by means of bolts 252 to the frame plates 254. The latter are integral with the longitudinal frame web 68 and 70 at their inner portions and supported by clamping bolts 48 and sleeves 255 at their outer portions.

A pair of rollers 256 are journaled onto two stub shafts 257 which are integral with plates 240 and are positioned within relieved portions 258 located on the right hand end of the carriage 238. The peripheries of the rollers extend slightly beyond the outer surfaces 260 of plates 240 and engage the inner surfaces 264 of tracks 250. This effectively guides carriage 238 in the transverse direction.

Carriages 238 are driven by cylinders 263 with rams 264, spreadably secured within a connector guide 266. The latter in turn is secured to the carriage 238 by a bolt 244. It forms part of the connector guide 266. Guide portions 267 extend toward and contact chains 86.

Cylinder 262 is anchored by pin 268 and ears 270 the latter being integral with upper and lower webs 56 and 62 respectively.

Positioned between plates 240 are a pair of chain-roller-engaging ratchet pawls 272. These are mounted rotatably on cross pins 274 secured to plates 240 in the usual manner. Extensions 276 are formed on the cauls and when in chain driving position bear against stop pins 278. The latter are secured to plates 240.

Mounted to the extensions 276 at 280 are tension springs 282 anchored on pins 284 formed on plates 240.

The ratchet drive serves to move the press charge incrementally along the length of the press, on a timed sequence determined by the press loading schedule and arrangement, the glue setting time and other considerations. A problem is presented in maintaining the increments at precisely the right value, particularly in view of the variable stretch of each of the four chains 86, resulting in failure of the pawls to register accurately with the particular chain rollers they seek to engage. Accordingly, a system is employed that will control independently each of the four ratchet units 22 so that it can make an appropriate compensation.

Referring to FIG. 2, a spring loaded, linear, measuring wheel 290 of conventional construction contacts the upper surface of the finished laminate. It is supported by a linear control unit 292 mounted to frame 38 at its outfeed portion. The total design stroke of ram

264 is greater than the incremental stroke that is required.

FIG. 11 illustrates the ram in retracted position while at rest. It also illustrates the ratchet pawl 272 in a typical rest position relative to the chain rollers. When the ram begins its extension, carriage 238 will travel a certain distance until the ratchet pawl contacts the chain roller 289. Subsequent movement of the press charge then will initiate the rotation of linear measuring wheel 290.

When the associated measuring unit 292 determines the desired increment of travel of the press charge, the measuring unit operates to halt the stroke of ram 264 through an associated electric circuit. Thereupon the ram returns to its retracted, at rest position, ready for a new stroke. Consequently, regardless of the position of the pawl relative to chain rollers 289, the laminate travel will start only at the precise movement when pawl 272 initially contacts the roller causing the chain to move simultaneously with the press charge.

As an adjunct of the apparatus, heating means are provided to supply heat in sufficient amount to set the adhesive and/or plasticize the press charge, thereby assisting in the final consolidation of the charge. Suitably disposed and designed heaters are applied to this purpose. In the illustrated form of the invention, a plurality of heaters 286 are secured by bolts 288 to the outer surfaces of bed plates 58 and 68 at strategic locations along the length of the press.

As a further important adjunct of the press, there is provided means for controlling the thickness of the product. Such means comprises one or more substantial clamps indicated generally at 23 positioned in critical locations along the length of the press. Each clamp consists of upper and lower transverse bars 316, 318. These bear respectively against bed plates 58 and 68. They are held together in adjustable relation by the action of a pair of clamping bolts 320. Since they back up the bed plates, they act as effective stops against which the press charge is pressed, thereby determining its final thickness.

FIGS. 13-19 illustrate a form of the invention in which guide means is provided for assisting in the longitudinal guiding of the press belts as they move through the press.

As noted above, a difficulty inherent in the operation of a press of the class described herein is that of guiding the press belts through the press in such a manner as to maintain the work in proper working relation to the press elements. Specifically, the rollers of the anti-friction belts tend to skew as they progress through the press. This causes the associated press belts to shift in the direction of the skew and thus to misalign the belts with reference to the press charge. Because of the great length of the press, and the high pressure developed, this effect may occur to some degree in spite of the fact that the press beds, press belts and anti-friction belts are keyed together in the manner already described.

Accordingly, there are provided in the press of the invention guide means for insuring that the press belts, anti-friction belts and charge will not stray from their predetermined paths through the press. In the illustrated form of the invention, the guide means comprises guide roller assemblies indicated generally at 321, 322 respectively.

As shown particularly in FIGS. 13-16, guide roller assemblies 321 are located in the infeed portion of the

press. Each comprises a hardened steel roller 323 rotatably mounted on a pair of bearings 324. The bearings are journaled within recesses 326 located centrally of the rollers.

A cross shaft 328 is journaled within bearings 324. It has its outer ends pressed into bores 330 located within outwardly extending supporting blocks 332. The latter are integral with a pair of supporting arms 334. Pins 336 secure shaft 328 to blocks 332.

Support arms 334 are mounted for pivotal movement on a cross shaft 338. The latter is journaled in pairs of mounting ears 340. These are integral with spacers 52. Pins 342 retain the cross shaft.

Means are provided for adjusting the position of the rollers relative to the press belts.

Bearing against blocks 332 are the ends of a pair of adjustment bolts 344. These are threaded into a pair of supporting bars 346. The supporting bars in turn are integral with, and bridge, adjacent sleeves 52. Lock nuts 348 retain the bolts.

As shown in FIGS. 14, 17, 18 and 19, guide roll assemblies 322 including hardened steel guide rollers 350 of larger diameter are employed throughout the rest of the length of the press. This is possible because downstream from the infeed portion of the press, where the preliminary alignment occurs, the guide rolls may be spaced farther apart. It is important to use rolls of as large diameter as is practical in order to increase the bearing surface and avoid deformation of the platen parts.

To mount rollers 350, a pair of bearings 354, FIG. 17 is journaled within a bore 352 formed within each roller. Journaled within bearings 354 is a cross shaft 356 which has its ends pressed within bores 358 formed within a bifurcated support arm 360.

A pair of spacing rings 362 are positioned on the shaft and bridge the gap between bearings 354 and arms 360. Clips 363 retain the outer ends of cross shaft 356.

One end of support arm 360 is hinged to the structural bolt member 36, thereby facilitating maintenance and bearing replacement.

For this purpose there is formed a vertical bore 364 through one end of the support arm. A bushing 366 is rotatably mounted within the bore. The bushing is secured to structural bolt member 36 by being clamped between two adjacent sleeves 368.

The vertical dimension of the end of support arm 360 is slightly less than the vertical dimension of bushing 366. This provides a slight clearance 370.

The opposite end of support arm 360 is retained adjustably by means of a pair of studs 372 which are integral with sleeves 368. Studs 372 extend through slots 374 formed within one end of support arm 360. They mount pairs of lock nuts 376 on the outer threaded portions. When rollers 350 are not positioned adjacent one another, as illustrated in the downstream end of FIG. 14, studs 372 are integral with sleeves 52.

The location of the guide roller assemblies in the press is of importance in determining their proper functioning. In the infeed zone, before significant pressures are applied to the press charge, the charge is initially guided and centered by closely spaced, compact, guide roller assemblies 321. Immediately downstream from the infeed zone is a zone where maximum pressures are applied to the press charge, which accordingly is somewhat over-consolidated. Maximum guiding is required

in this zone. Accordingly, there are provided a plurality of guide roller assemblies 322 in closely spaced arrangement.

Downstream from the over-consolidation zone the press pressure becomes progressively less thus requiring progressively fewer guide roller assemblies of the class indicated at 322. Wherever located, the guide roller assemblies 321 and 322 are mounted in opposing pairs to minimize distortional stresses.

During operation of the press the peripheral surfaces of guide rollers 323 of assemblies 321 and guide rollers 350 of assemblies 322 bear against the outer end surfaces of platen support blocks 111, as shown particularly in FIGS. 13 and 19. The arrangement is such that the horizontal center lines of rollers 323 and 350 are substantially aligned with the mating surfaces 113 of platen support blocks 111. A proper working relationship may be maintained by adjustment of bolts 344 and studs 372.

The adjustment of the rollers should be such that those at the infeed end of the press, where heavy pressure has not as yet been applied to the press charge, are in direct contact with platen support blocks 111. On the other hand, in the downstream zones where heavy pressure is applied, a slight but predetermined clearance should be present between the rollers and the platen support blocks. Effective guidance of the press belts thus is obtained at all times, uniformly along their entire length and in spite of the very heavy pressure developed in the press.

OPERATION

The operation of the hereindescribed continuous press is as follows:

At the infeed end of the press a continuously fed, unconsolidated, adhesive coated laminate L is fed to the press manually or, preferably, by an automatic machine that assembles individual wood veneers into an assembly having a predetermined pattern of staggered veneer laps. The outermost lamina does not have adhesive on its outer surface.

The press belts driven by ratchet assemblies 22 drive the press charge through the press in predetermined increments of travel. As the charge passes through the press, it is subjected to great pressure exerted by the platens of the press belts, backed up by the press bed plates and intervening antifriction roller belt.

The cold rolling effect of the rollers of the antifriction belt against the press platens 126 is dissipated by the partially floating cover plates 124 which cover the platen back surfaces and absorb the deforming pressure. They are replaceable upon deformation. Marring of the surface of the work by the press belt components is prevented by the action of the intervening caul belts 220 interposed between the platen faces and the work. Control of the final thickness of the glued laminate is achieved by clamp units 23 incorporating clamp bars 316, 318 which act as stops against which the charge is pressed. The accuracy of the incremental drive is insured by control of the ratchet cylinders by measuring instrument 292. Proper guidance of the press belts, and hence of the press charge, is achieved by the action of guide roll assemblies 321, 322 as they bear against the ends of the individual press platens comprising the belts.

Accordingly, there is discharged from the outfeed end of the press, a consolidated, laminar, continuous lumber product L' which in a typical instance may be three or 4 inches thick, 3 or 4 feet wide, and of indefinite length. This is trimmed and cut to billets of the desired length with an edger and cut-off saw. Thereafter, the billets are reduced further in size to form such products as beams, dimension lumber, cords for trusses, and other lumber items.

Having thus described my invention in preferred embodiments, I claim:

1. In a continuous press for pressing glue-coated press charges and including central longitudinal guide means and a pair of cooperating press belts each comprising a pair of laterally spaced endless support members transversely mounting a plurality of press platens, a laminated press platen comprising:

1. a base plate,
2. means connecting the ends of the base plate to the respective endless support members,
3. a cover plate overlying the working face of the base plate, and
4. fastening means fastening the cover plate to the base plate,
5. the fastening means comprising a transverse bar secured across the central portion of the cover plate and having slide means dimensioned for reception in the guide means.

2. The laminated press platen of claim 1 wherein the cover plate is fastened to the central portion only of the base plate, the cover plate ends being unrestrained.

3. The assembly of claim 1 including a pair of endless caul belts one overlying the plates of each press belt and arranged for protective contact with the press charge.

4. The assembly of claim 1 wherein the endless support members comprise endless chains and including ratchet drive means therefor comprising at least one ratchet positioned for engaging each chain, a variable stroke fluid operated cylinder connected to the ratchet, measuring means engaging the press charge surface for measuring its lineal travel through the press, and cylinder control means interconnecting the measuring means and the cylinder and operative to arrest the cylinder stroke at a distance commensurate with a predetermined lineal travel of the press charge.

5. In a continuous press for pressing glue-coated press charges and including a pair of cooperating press belts each comprising a pair of endless support members transversely mounting a plurality of press platens, a laminated press platen comprising:

1. a pair of end blocks having slots in their opposed inner faces,
2. a base plate with its ends received in the slots,
3. a cover plate overlying the working face of the base plate with its ends received in floating condition in the slots,
4. a bar mounted transversely across the central portion of the cover plate and secured releasably to the base plate,
5. releasable securing means securing the blocks to the ends of the base plate, and
6. releasable securing means securing the blocks to their respective endless support members.

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