March 21, 1961 H. J. SNELSON ET AL 2,975,470

APPARATUS FOR STEAM TREATING FIBROUS PANELS

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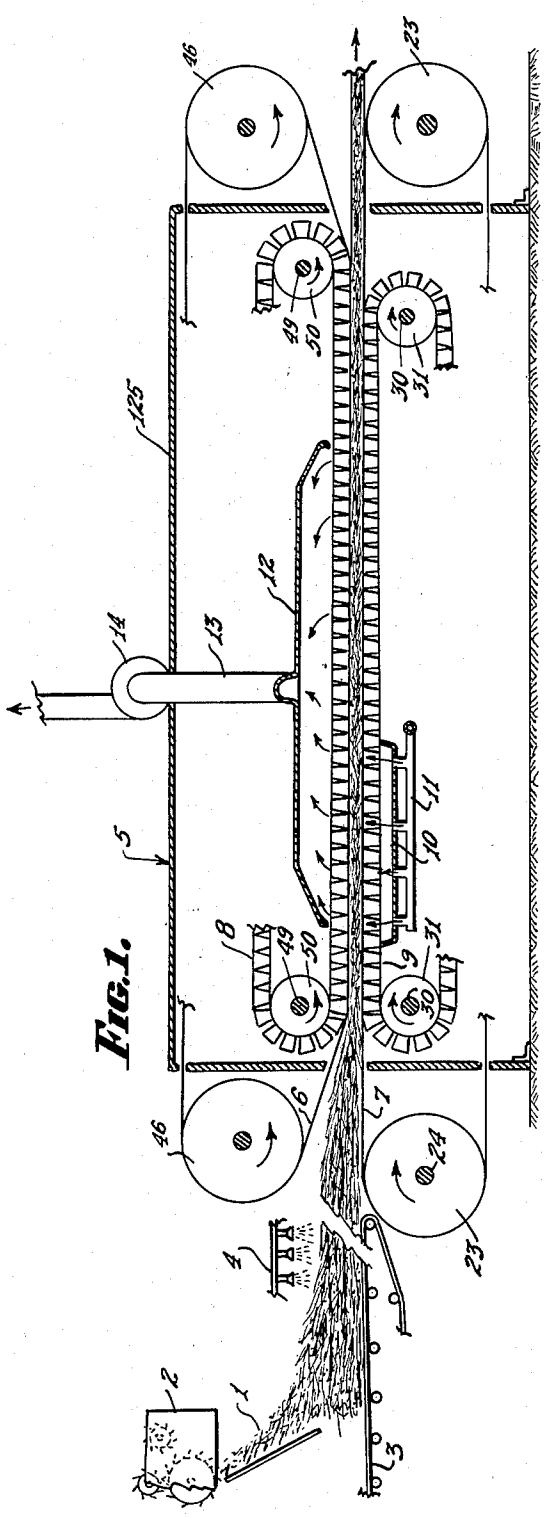


Fig. 1.

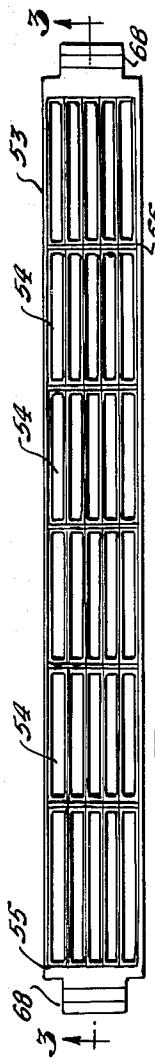


Fig. 2.

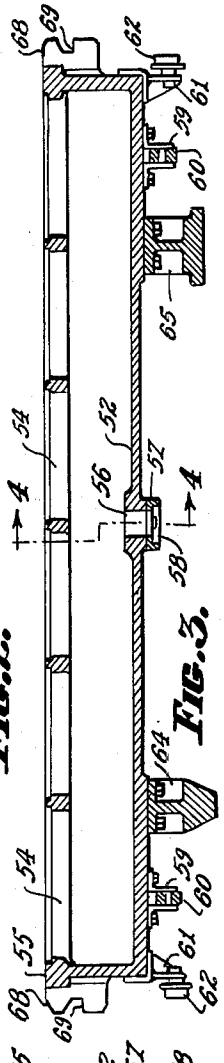


Fig. 3.

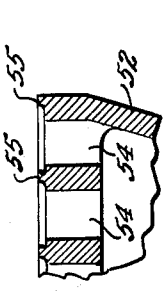


Fig. 5.

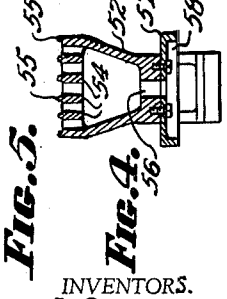


Fig. 4.

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6 Sheets-Sheet 2

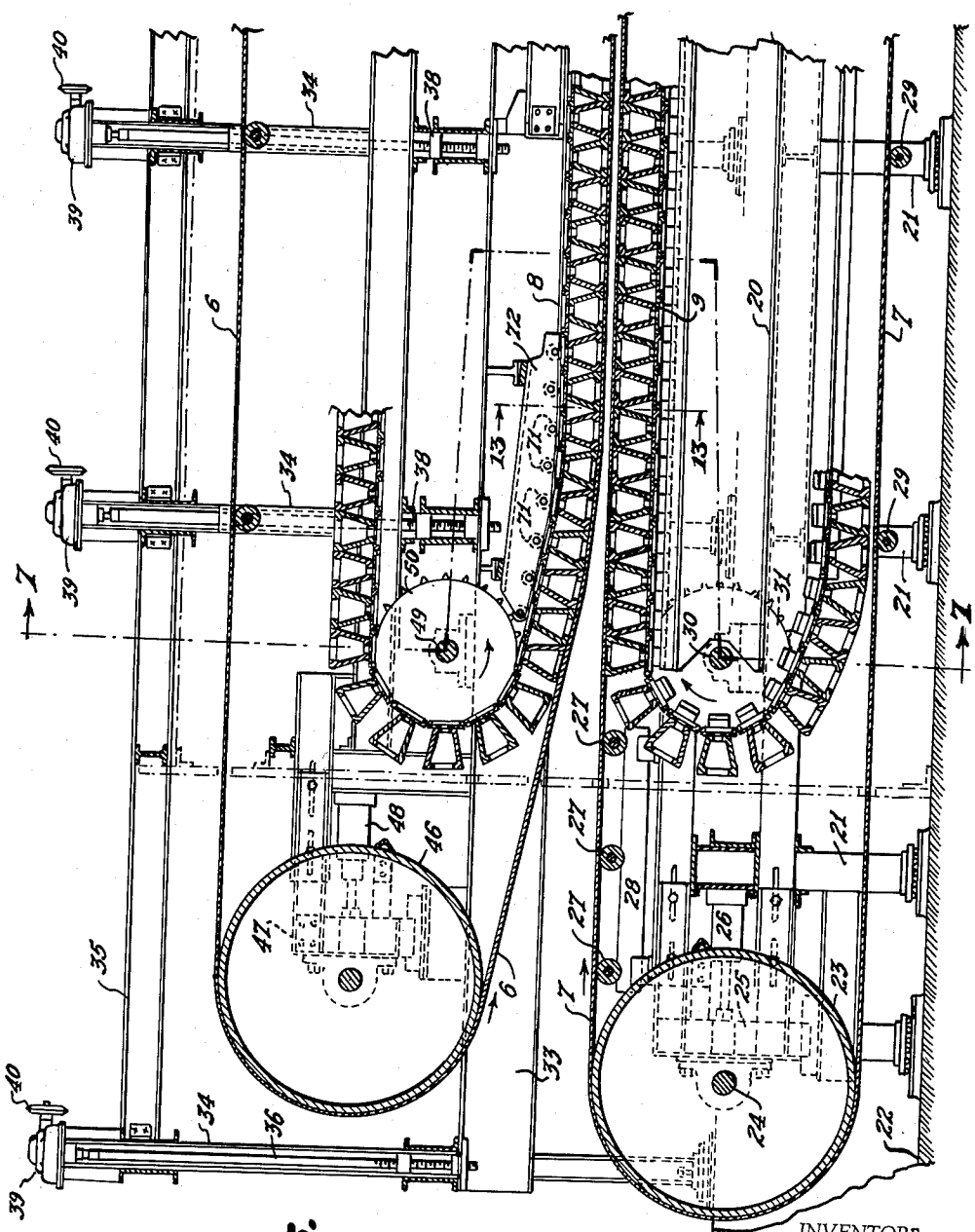


FIG. 6.

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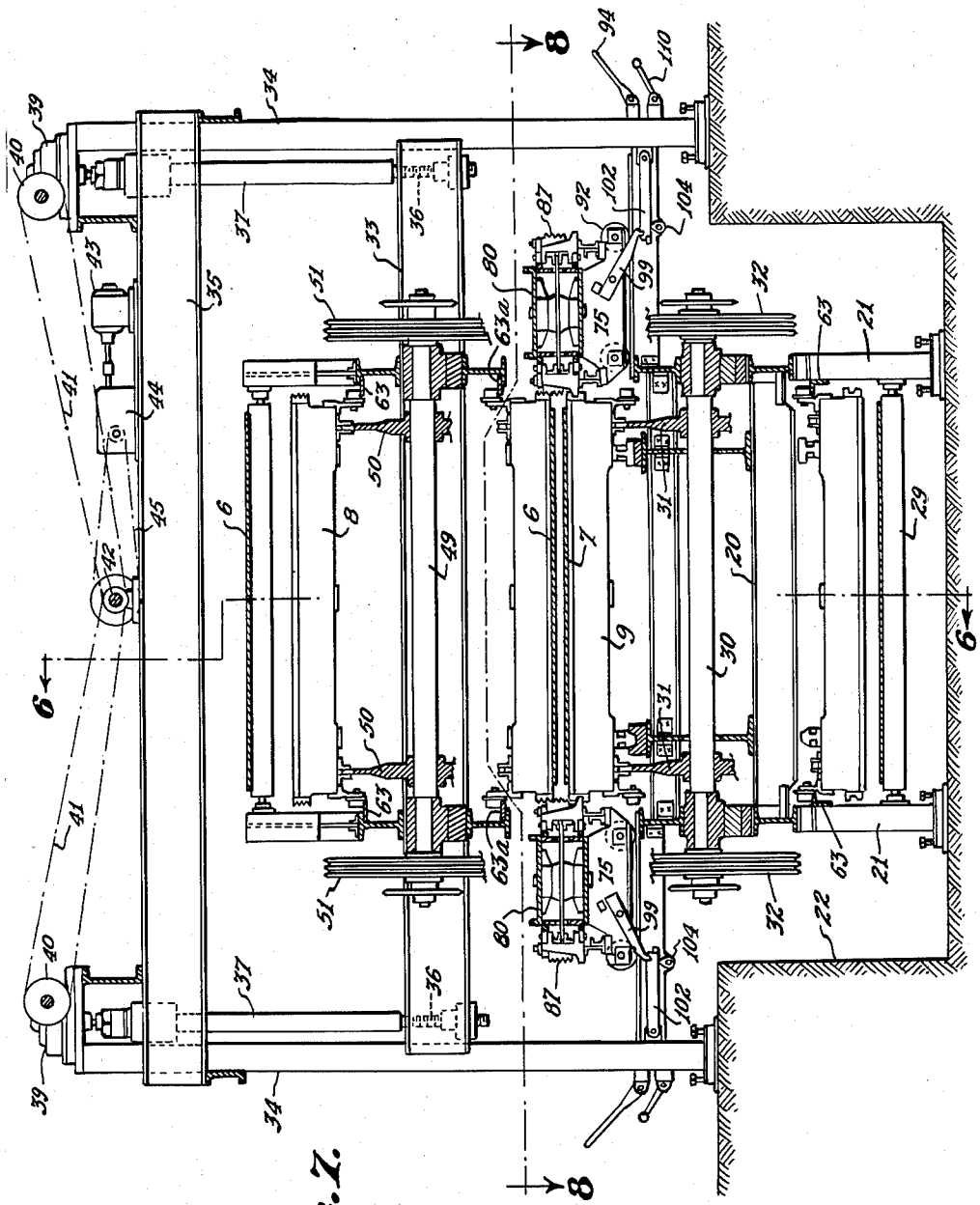


FIG. 7.

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APPARATUS FOR STEAM TREATING FIBROUS PANELS

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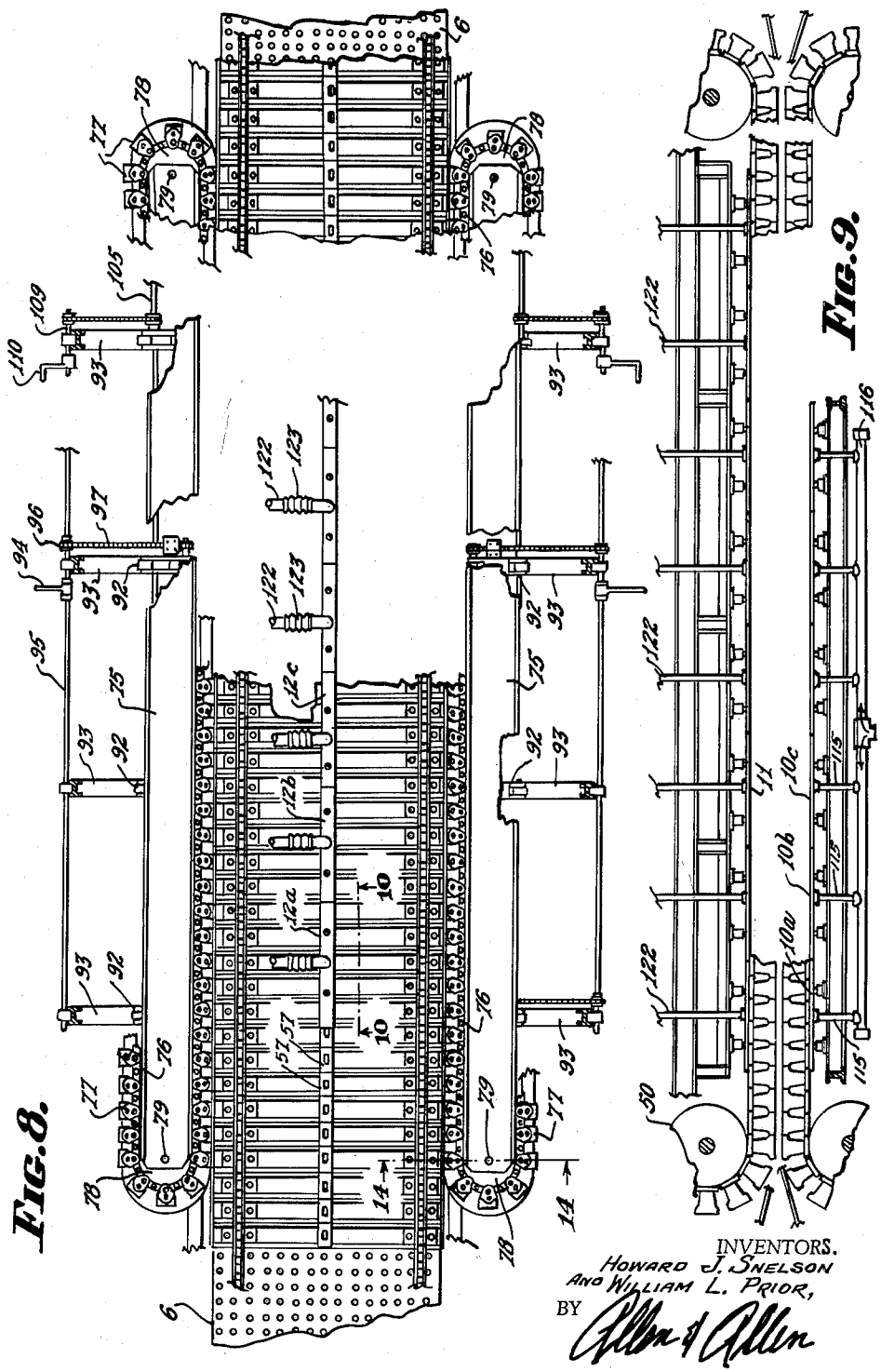


FIG. 8.

FIG. 9.

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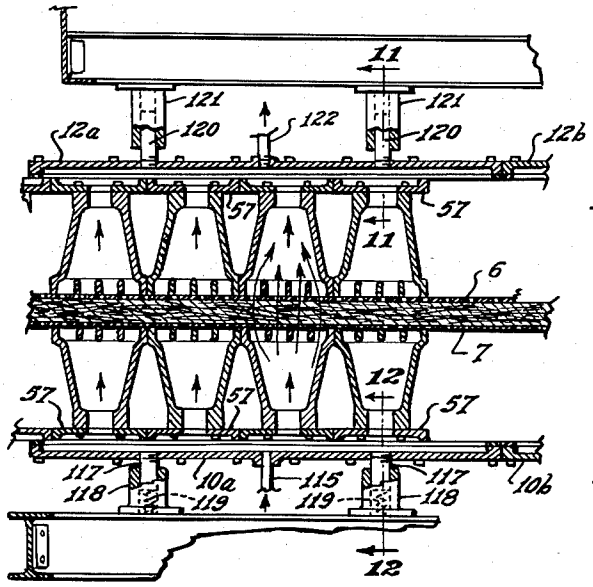


FIG. 10.

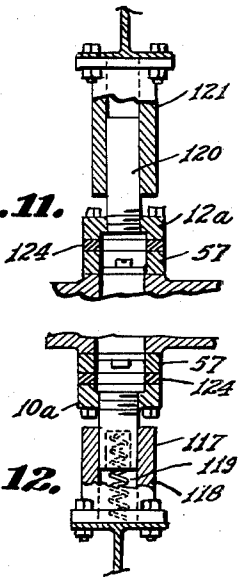


FIG. 11.

FIG. 12.

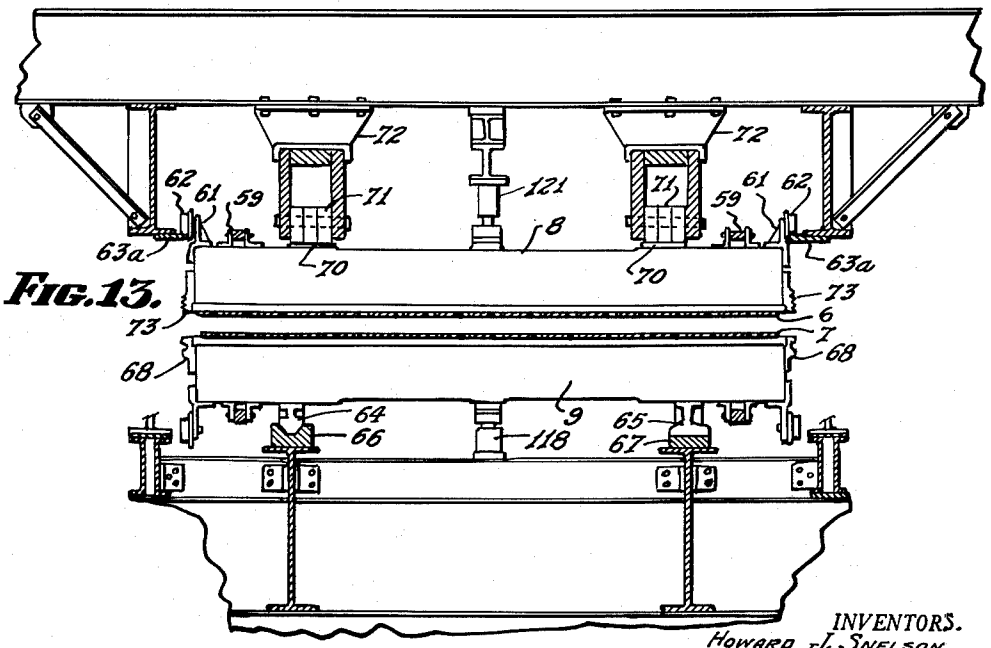


FIG. 13.

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APPARATUS FOR STEAM TREATING FIBROUS PANELS

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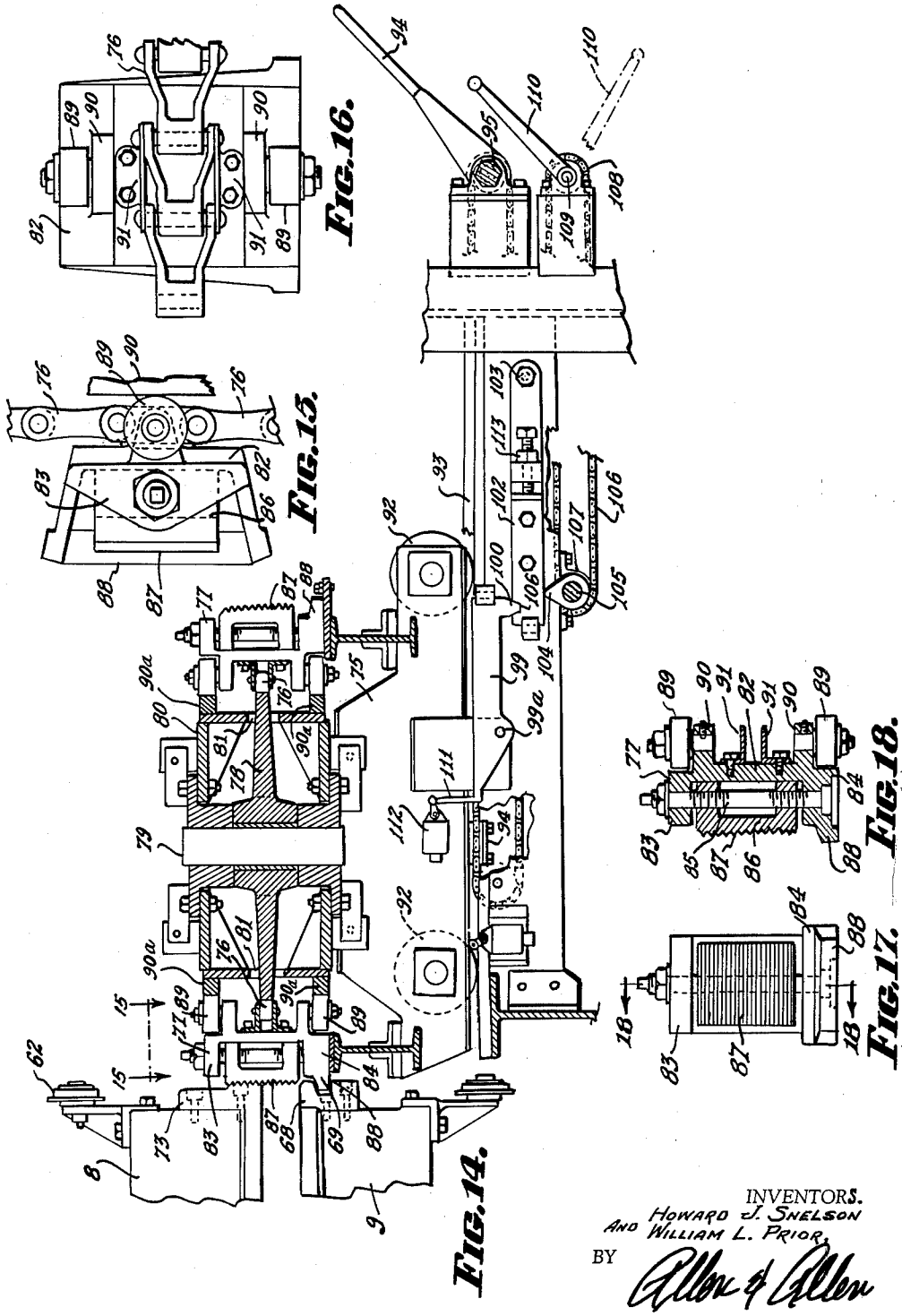


FIG. 16.

FIG. 15.

FIG. 18.

FIG. 17.

FIG. 14.

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2,975,470

APPARATUS FOR STEAM TREATING FIBROUS PANELS

Howard J. Snelson and William L. Prior, Newark, Ohio, assignors to Tectum Corporation, Columbus, Ohio, a corporation of Ohio

Filed Jan. 9, 1958, Ser. No. 707,987

11 Claims. (Cl. 18—4)

This invention relates to the formation of structural building material in the form of fibrous board and more specifically to the provision of apparatus by means of which such board can be formed and processed in a continuous operation.

In particular, our invention is adapted for use in the processing of fibrous board composed of wood wool or excelsior and a magnesium cement binder in accordance with the teachings of our co-pending application Serial No. 692,922, filed on October 28, 1957, entitled "Process for Steam Treating Magnesium Cement Fibrous Panels," now Patent No. 2,944,291. In accordance with the teachings of our co-pending application, we have discovered that magnesium cements, such as magnesium oxysulfate and magnesium oxychloride, can be caused to set under conditions of extreme moisture and that the setting time for such cements can be greatly accelerated by the saturation of the fiber-binder mixture with live steam to the point where the exothermic reaction of the binder takes place and the binder sets within a matter of as little as thirty seconds.

Such processing techniques readily lend themselves to continuous processing wherein the raw materials are assembled, compounded, compressed and the cementitious binder set or cured in a continuous operation. Accordingly, it is a principal object of our invention to provide apparatus by means of which such processing may be carried out in a continuous and a commercially feasible machine operation.

A further object of our invention is the provision of apparatus by means of which the fiber and binder ingredients may be assembled in the form of a continuous mat, compressed and compacted to the desired thickness and density, and the binder ingredient in the mat caused to rapidly set under the application of live steam, thereby producing finished board of predetermined thickness and density.

Still a further object of our invention is the provision of apparatus for the purposes described comprising essentially a press having continuously moving upper and lower platen between which the binder saturated fiber mat is compacted and subjected to a steam treatment while maintained in the compacted condition.

Still a further object of our invention is the provision of a press having various novel features of construction and arrangement of parts which facilitate the operation of the press and allow it to be readily adjusted to permit the processing of board in various thicknesses.

The foregoing, together with other objects of our invention which will appear hereinafter or which will be apparent to the skilled worker in the art upon reading these specifications, we accomplish by that construction and arrangement of parts of which we shall now describe an exemplary embodiment.

Reference is now made to the accompanying drawings wherein:

Figure 1 is a diagrammatic elevational view with parts broken away illustrating the basic components of our apparatus.

Figure 2 is a plan view of one of the flight forming hollow platen members.

Figure 3 is a vertical sectional view taken along the line 3—3 of Figure 2.

Figure 4 is a vertical sectional view taken along the irregular line 4—4 of Figure 3.

Figure 5 is an enlarged fragmentary sectional view of the upper right hand corner of Figure 4.

Figure 6 is a vertical sectional view taken along the line 6—6 of Figure 7 illustrating the entrance or leading end of the press.

Figure 7 is a vertical sectional view taken along the line 7—7 of Figure 6.

Figure 8 is a horizontal sectional view taken along the irregular line 8—8 of Figure 7 with parts broken away illustrating the platen positioning and locking means.

Figure 9 is a fragmentary schematic view with parts broken away illustrating the relative positions of the steam and vacuum manifolds.

Figure 10 is a vertical sectional view taken along the line 10—10 of Figure 8 illustrating the action of a group of the flight forming steam platen.

Figure 11 is an enlarged vertical sectional view taken along the line 11—11 of Figure 10.

Figure 12 is an enlarged fragmentary sectional view taken along the line 2—12 of Figure 10.

Figure 13 is a vertical sectional view taken along the line 13—13 of Figure 6.

Figure 14 is a vertical sectional view taken along the line 14—14 of Figure 8.

Figure 15 is an enlarged sectional view taken along the line 15—15 of Figure 14.

Figure 16 is an elevational view taken from the right hand side of Figure 15.

Figure 17 is a front elevational view of a platen locking element.

Figure 18 is a vertical sectional view taken along the line 18—18 of Figure 17.

Before taking up the detailed description of the various components of our device, reference is first made to Figure 1 of the drawings for a general understanding of its arrangement and mode of operation. As seen therein, the fibers 1 are delivered from a chute or hopper 2 onto a moving conveyor belt 3 where the fibers are formed into a mat and sprayed with binder from a spray-head 4 arranged transversely with respect to the conveyor belt 3. It is to be understood that the apparatus for depositing the fibers on the conveyor belt forms no part of the instant invention, although we prefer to process the fibers in accordance with the teachings of Collins Patent No. 2,744,045, Apparatus and Process for Continuously Feeding and Spraying Wood Wool and Like Materials, which teaches apparatus and procedures for beating and coating the fibers with binder, including such steps as fluffing the initially compacted and bailed fibers, establishing a uniform flow of the fluffed fibers and depositing them in a uniform manner on a conveying means, coating the fiber with the binder material and depositing the coated fibers on the continuously moving delivery conveyor in the form of a mat which is conducted to the press for compacting and curing.

The press in indicated generally at 5 and is composed of upper and lower conveyor belts 6 and 7, respectively, the belts being of foraminous character, formed preferably of stainless steel perforated on ½ inch centers and backed up by upper and lower platens 8 and 9 each composed of a plurality of hollow platen members extending crosswise with respect to the length of the press and linked together for continuous movement in synchronism with the movement of the belts 6 and 7.

The entire upper platen 8 is adjustably mounted so that the distance between the upper and lower platen members may be varied in accordance with the desired thickness of the compressed product. Locking means arranged to travel with the platen are provided to accurately maintain them in the desired spaced relation.

A manifold 10 underlies the upper flight of the lower platen 9, the manifold having elongated openings in its upper surface which communicate with openings in the under surfaces of the hollow platen members making up the platen 9. Live steam is fed through supply conduit 11 into the manifold, the steam passing upwardly from the manifold into the hollow bodies of the platen members. The upper surface of the platen members, i.e., the surfaces in contact with belt 7, are in the form of a grating or grill through which the steam may pass upwardly through the perforations in belt 7 and into the compacted mat. The upper platen 8 is composed of hollow members substantially identical with those making up the lower paten, excepting they are arranged to communicate with an overhead exhaust manifold 12, so that the steam passing through the mat and the upper belt 6 will be evacuated through the platen members of the upper platen and into the exhaust manifold. Preferably, the exhaust manifold will be of a length greater than the length of the steam manifold so that the evacuation of steam and moisture from the mat may continue subsequent to the termination of the actual steam application. The evacuated steam will be exhausted from manifold 12 through exhaust stack 13 having a blower 14.

As the fiber-binder mat moves through the press, the steam will cause the binder to set sufficiently to maintain the thickness established by the press, so that when the mat leaves the press it will not swell or expand, but will remain at the established dimension. Upon the passage of the formed mat from the press, the mat may be passed through one or more drying ovens wherein heated air is circulated to remove additional moisture from the now board-like mat to cause it to thoroughly dry. The mat may be cut into desired panel size as it emerges from the drying oven an dstacked for shipment or storage. The construction and operation of the drying ovens is well known in the art and forms no part of the instant invention.

For a more detailed description of the press, reference is now made to Figures 6 and 7 of the drawings wherein it will be seen that the press has a lower fixed frame 20 mounted on standards 21 which are preferably placed in a pit 22 so as to reduce the overall height of the machine and place the belts 6 and 7 at a convenient working height. At its opposite ends the frame 20 mounts rolls 23 about which the lower belt 7 passes. As previously indicated, the belt 7 is of foraminous character and, preferably, is formed from stainless steel having 3/32 inch openings therein placed on ½ inch centers. Either or both of the rolls 23 may be driven, as from shafts 24 which are operatively connected through suitable drive means to a prime mover (not shown). In the embodiment illustrated, the shafts 24 are mounted on slidable carriages 25 which are movable lengthwise with respect to the path of travel of the belt 7 by means of hydraulic cylinders 26, the cylinders serving to move the rolls 24 outwardly to tighten the belt and inwardly to loosen it. Prior to the time the belt 7 comes into contact with the platen members of lower platen 9, it may be supported on rollers 27 (Figure 6) which are journaled in brackets 28 supported by the fixed frame. Similarly, supporting rollers 29 may be provided extending between the standards 21 to supports the lower flight of the belt 7 as it is returned to the leading end of the machine.

The lower frame 20 also mounts rotatable shafts 30 to which are secured the sprockets 31 which drive the lower platen 9. The shafts 30 are adapted to be driven from sheaves 32 mounted on the ends of the shafts beyond the lower frame, the sheaves in turn being driven from the prime mover in synchronism with the movement of the belt 7.

The upper belt 6 and upper platen 8 of the machine are mounted on an adjustable frame 33 which is suspended from standards 34 spaced lengthwise along opposides of the machine, the standards supporting a fixed upper frame 35. The adjustable frame 33 is suspended by means of threaded shafts 36 which are rotatably mounted in hollow sleeves 37, the sleeves having threaded bearings 38 therein (Figure 6) which permit the shaft to rotate relative to the sleeves. At their upper ends the shafts are connected to gear boxes 39 which, in turn, are driven from sprockets 40. As seen in Figure 7, the sprockets 40 are each connected by an endless chain 41 to a centrally disposed shaft 42 which is driven by a reversable motor 43 acting through gear reduction box 44 and chain 45. It will be understood that the reversable motor 43 may be actuated from a control panel and, depending upon its direction of rotation, will be utilized to either raise or lower the adjustable frame 33 and with it the upper belt 6 and upper platen 8 mounted thereon.

As in the case of the lower foraminous belt 7, the upper belt 6 is supported on rolls 46 mounted on movable carriages 47 and adjustable by means of hydraulic cylinders 48. Similarly, the upper frame rotatably mounts shaft 49 carrying sprockets 50 which driven the upper platen. The shafts 49 are driven from sheaves 51 which, together with the rolls 46, are driven in unison with the sheaves and rolls driving the lower platen and lower belt, respectively. From the foregoing it will be apparent that by raising or lowering the adjustable frame 33, the distance between the adjoining flights of the upper and lower belts may be varied so as to compact the mat being treated to a predetermined thicknss, such as one inch, two inches, three inches or the like.

Referring now to Figures 2 through 5 of the drawings, we have therein illustrated in the construction of the platen members which make up the platens 8 and 9. As seen therein, each of the members comprises a hollow body or steam cavity 52 preferably formed of cast iron. The upper surface 53 is flat and provided with a plurality of openings 54 which may take the form of aligned rows of elongated slots. As best seen in Figure 5, the slots are surrounded by raised portions or lands 55 which are adapted to seat against the under surfaces of the belts 6 and 7 when the platen members are juxtaposed thereto. On their under surfaces, each of the hollow bodies is provided with a centrally disposed port 56 through which steam is adapted to enter the body. The port 56 terminates outwardly in a sliding plate 57 having a recess 58 therein, the plate being adapted to slide along the steam manifold 10 (or the exhaust manifold 12, as the case may be), in a manner to be described more fully hereinafter. Pairs of ears 59 are also secured to the under surface of the bodies adjacent the ends thereof, the pairs of ears each being adapted to engage links of the chains 60 therebetween. The chains 60 are arranged to pass around the sets of sprockets 31 and 50 which drive the platen members. At the end edges of their under surfaces, the members mount brackets 61 to which flanged rollers 62 are rotatably mounted. As best seen in Figure 7, these flanged rollers are adapted to ride along tracks 63 extending lengthwise of the machine which support the platen members as they are returned to the leading end of the machine.

The platen members which make up the lower platen 9 are additionally provided with sliding blocks 64 and 65 which ride in ways 66 and 67 (best seen in Figure 13), supported on the lower fixed frame 20. Preferably, the blocks 64 will be V-shaped and will ride in a V-shaped way, whereas the blocks 55 and way 57 have mating surfaces which are flat. With this arrangement precise alignment of the ways is unnecessary and the blocks will

not tend to bind as they slide therealong. Referring again to Figure 3, the members making up the lower platen are provided at their opposite ends with fittings **68** having horizontally disposed recesses **69** therein for engagement by the platen locking means which will be hereinafter described. The guide blocks and fittings just described are not employed in conjunction with the platen members making up the upper platen **8**. Rather, as seen in Figure 13, the upper platen members are provided with bearing plates **70** which, at the leading end of the machine, are adapted to be contacted by rollers **71**, suspended from brackets **72**, the rollers serving as back-up rollers to prevent the platen members from being laterally displaced as they come into contact with the belt **6**. Thus, as best seen in Figure 6, the roller **71** serves to back-up the lower flight of the upper platen as the platen members pass around the sprockets **50** and make contact with the lower flight of belt **6**. It will be apparent from Figure 6, that if the back-up rollers were not so positioned, the belt **6** would tend to displace the platen members and remove the flanged wheels **62** from the tracks **63**. In place of the fittings **68**, the upper platen members are provided at their ends with serrated or toothed gripping members **73** which, as will be seen hereinafter, coact with the flight locking means now to be described.

In order to maintain a uniform distance between the upper and lower platen throughout the entire length of the machine, we provide locking mechanism which extends along each side of the machine and travels with the coacting flights of the upper and lower platen, the locking mechanism acting to lock each corresponding pair of upper and lower platen members together in predetermined spaced rleation. A primary function of the locking means, together with the lower platen supporting ways **66** and **67**, is to prevent movement of the binder-fiber composition during setting. The binder has a crystalline structure and we have found that movement in the binder during its initial setting materially weakens its structure and greatly decreases the strength of the finished product. Consequently, special locking mechanism is provided to maintain the platen members in fixed position relative to each other as they move through the press, thereby preventing movement in the binder during the critical period.

The general arrangement of the locking mechanism can be best seen in Figure 8, wherein an elongated cariage **75** extends along each side of the press, the carriages each mounting an endless conveyor **76** carrying a multiplicity of locking heads **77** each of which is adapted to engage and travel with one of the upper and one of the lower platen members. At their opposite ends the endless conveyor chains **76** pass around sprockets **78** rotatably mounted on vertical shafts **79** journaled on the carriages. As best seen in Figure 14, the sprockets may be conveniently mounted in hollow rectangular protective housings **80** having openings **81** in the opposite sides thereof through which the periphery of the sprockets project for engagement with the chains **76**.

As best seen in Figures 17 and 18, the locking heads **77** each comprise a vertically disposed body member **82** terminating at its ends in flanges **83** and **84** between which a bolt **85** extends. This bolt receives a locking element **86** having a serrated or toothed face which, when juxtaposed to the end edges of one of the upper platen members, make gripping engagement with the serrated members **73** secured to the end thereof. Similarly, the lowermost flange **84** of each locking head is provided with an elongated projection **88** adapted to enter into the recess **69** of the fitting **68** mounted on each end of the members making up the lower platen. This locking action can be best seen in Figure 14, from which it will be apparent that the locking element **86** and projection **88** serve to secure the corresponding upper and lower platen members in fixed position relative to each other.

The locking heads are maintained in tight engagement with the fittings on the ends of the platen members by means of rollers **89** mounted on lugs **90** projecting rearwardly from the body of each locking head. As seen in Figure 14, the rollers **89** are arranged to contact with back-up rails **90***a* extending lengthwise along the upper and lower side edges of the housings **80**.

The rear surfaces of the locking heads also mount pairs of ears **91** which, as seen in Figure 16, engage the links of chain **76** between them so as to secure each of the locking heads to the chain. From the foregoing it will be apparent that the locking heads will travel along the length of the machine with the platen members as they move along and will be maintained in engagement with the platen members until the heads pass around the sprockets at the far end of the machine, whereupon the heads are returned to the leading end of the machine. It will be understood that at least one sprocket of each carriage will be driven in timed relation to the movement of the upper and lower platen.

In order to clear the locking heads when it is desired to raise or lower the upper platen, the carriages **75** are mounted for movement away from the end edges of the platen members. To this end, the carriages **75** are provided with wheels **92** riding on tracks **93** (see Figures 8 and 14). Outward movement of the carriages is effected by means of a ratchet handle **94** which acts through shaft **95** and sprocket **96** to move chain **97** which is clamped at **98** to the carriage. Thus, the ratchet handle **94** may be used to crank the carriage outwardly for adjustment of the platen, whereupon the carriages may be cranked inwardly into locking position. It may be pointed out that the rollers **62** at the ends of the platen members do not support the platen members when they are locked together. However, a track **63***a* (Figure 13) is arranged to be contacted by the rollers of the upper platen when the carriages have been moved outwardly for adjustment purposes.

In order to prevent accidental outward movement of the carriages while the machine is running and also to prevent the machine from being started when the platens are unlocked, we provide a locking means for retaining the carriages in the innermost position. As shown in Figure 14, the carriages are locked by means of levers **99** pivoted at **99***a* to the carriages. The levers **99** have nose portions **100** which engage in recesses **101** in locking bars **102** pivotally mounted at **103** to the machine frame. The locking bars are maintained with their recesses in engagement with the nose portions **100** by means of cam members **104** mounted on shafts **105** rotatably journaled to the machine frame, the parts being in the position illustrated in Figure 14. A chain **106** passes around a sprocket **107** secured to the shaft **105** and also about a sprocket **108** secured to a shaft **109** mounting crank handle **110**. When the crank handle is moved from its full line position to the position illustrated in dotted lines, the rise of cam **104** will move out of contact with locking bar **102** and the bar will pivot downwardly, thereby releasing the nose of lever **99** and freeing the carriage for movement. The lever **99** will also pivot sufficiently to permit the finger **111** at its opposite end to throw limit switch **112**, which switch is arranged to break a master circuit controlling the prime mover driving the belts and platen. The limit switch will remain in circuit breaking position until such time as the carriage is returned to its innermost position and the locking bar **102** reset by means of crank **110** acting upon cam **104**. Adjustment means **113** may be provided on the locking bar **102** to accurately align the recess **101** with nose **100**.

Figures 8 and 9 illustrate the mounting of the steam manifold **10** and exhaust manifold **11**. As illustrated, the steam manifold **10** is preferably composed of a plurality of sections, such as the sections **10***a*, **10***b*, **10***c*; and similarly the exhaust manifold is composed of a plurality of sections **12***a*, **12***b*, **12***c* joined together in end-

to-end relation. Each of the steam manifold sections is provided with an inlet conduit **115** fed from a steam supply line **116**. The steam manifolds are supported by spring biased posts **117** received in sleeve members **118** mounted on the machine frame, the springs **119** (best seen in Figure 12) serving to resiliently bias the manifold sections into contact with the sliding plates **57** on the platen members. In similar fashion, the exhaust manifold sections are provided with posts **120** received in sleeve members **121** mounted on the upper frame, although in the case of the exhaust manifold sections the springs may be eliminated, the weight of the manifold sections serving to maintain them in contact with the sliding plates **57** of the upper platen members. Vent pipes **122** connect each of the manifold sections to the exhaust stack **13** and blower **14**. Preferably, both the vent pipes **122** and the inlet conduits **115** will incorporate flexible couplings, such as the coupling **123** in Figure 8, to facilitate movement of the manifold sections as they maintain surface contact with the sliding plates **57**. The manifold sections, such as the manifold sections **10***a* and **12***a* seen in Figures 11 and 12, will be provided with wear plates **124** which contact the sliding plates **57**, the wear plates being readily replaceable when they become worn.

The size and range of adjustability of the press will vary depending upon the dimensions of the materials to be handled. In an exemplary embodiment, the length of the press is approximately 60 feet and designed to operate at a speed of up to 40 feet per minute, with normal operating speeds in a range of from 20 to 30 feet per minute. In accordance with the teachings of our aforementioned co-pending application, we have found that the use of moisture laden steam rapidly raises the temperature of the binder ingredient to 212° F., at which point the exothermic reaction of the binder is forced to completion. Consequently, we have found that the steam manifold need not extend the full length of the press but may, in fact, extend through only the first one-third to one-half of the press. The exhaust manifold will, however, preferably extend the full length of the press so that the exhausting of residual steam and moisture in the formed mat may continue subsequent to the steam application and during the initial setting of the binder.

We have also found it advantageous to encase the entire machine in a jacket or other insulated enclosure, such as the inclosure **125** diagrammatically illustrated in Figure 1, through which hot air may be circulated at a temperature of approximately 210–215° F. The purpose of the jacket is to heat the metallic structure of the press and thereby prevent it from sapping the heat generated by the steam. By maintaining the entire machine at a temperature closely approximating the temperature of the steam itself, there will be no appreciable heat loss between the steam and the parts of the press; and this results in obtaining maximum efficiency from the steam utilized to set the binder. If the parts of the machine were cold or relatively cool and were contacted by the live steam, considerable condensation would result and the relatively large quantity of water so formed would have to be removed. Condensation from the upper parts of the machine might very well flow downwardly through the mat to cause erosion or washing of the binder. This danger is eliminated by maintaining the parts in heated condition.

It will be understood, of course, that modifications may be made in our invention without departing from the spirit of it, and consequently we do not intend to be limited as to the scope of the invention excepting as set forth in the claims which follow. In this connection it may be observed that the use of the apparatus herein disclosed is not limited to the use of steam as the curing media. For example, the press disclosed may be used with hot circulating air.

Having, however, described our invention in an exemplary embodiment, what we desire to secure and protect by Letters Patent is:

1. In a press for compacting and steam treating fibrous materials, frame means mounting upper and lower flights each composed of a plurality of continuously moving platen members traveling about spaced apart pairs of sprockets having horizontally disposed axes of rotation, continuously moving belts traveling with said flights of platen members, adjustment means for varying the distance between said upper and lower flights of platen members, continuously moving locking means traveling with said flights of platen members for locking together the ends of corresponding of upper and lower platen members in spaced apart relation as established by said adjustment means, the platen members in at least one of said flights comprising hollow steam jackets each having a perforated face for contact with the belt traveling with the said flight, said last named belt also being perforated, and a steam manifold positioned to be in communication with the hollow jackets of said last named platen members when said upper and lower platen members are locked together by said locking means, whereby steam from said manifold may be introduced into said hollow jackets and passed through the perforated faces thereof and said perforated belt for direct contact with fibrous material compacted between said flights.

2. The device claimed in claim 1 wherein the platen members in both the upper and lower flights comprise hollow jackets each having a perforated face, wherein both of said continuously moving belts are perforated, wherein said steam manifold is in communication with the platen members of one of said flights, and wherein an exhaust manifold is in communication with the platen members of the remaining flight, whereby steam injected into a fibrous material compacted between said flights through the hollow platen members in one of said flights may be evacuated through the hollow platen members in the remaining flight.

3. The device claimed in claim 1 wherein said locking means each comprise an endless series of locking heads each having a serrated face and a projection, said serrated faces being engageable with serrated members mounted on the ends of the platen members making up said upper flight, said projections being engageable in recesses in the ends of the platen members making up said lower flight.

4. The device claimed in claim 3 wherein said locking means are mounted on carriages movable toward and away from the side edges of said flights of platen members, wherein means are provided for locking said carriages in operative position in which said locking heads will engage the ends of said platen members, and means for moving said carriages away from said flights to an inoperative position.

5. The device claimed in claim 4 including drive means for said flights of platen members and said perforated belt, and means effective to render said drive means inoperative upon actuation of said locking means to unlock said carriages for movement away from their operative position.

6. In a press apparatus wherein frame means mount upper and lower flights each composed of a plurality of platen members arranged to travel lengthwise of said press, said platen members being transversely disposed with respect to the direction of travel of said flights, the platen members in at least one of said flights comprising hollow steam jackets each having a perforated face composed of aligned rows of elongated slots, the spaces between said slots defining lands the outermost surfaces of which define a planar surface, continuously moving belts justaposed to said flights, the belt juxtaposed to said hollow platen members having perforations therein in communication with perforated faces of said platen members, means for moving said belts in synchronism with the movement of said flights, and continuously moving locking means traveling with the said upper and lower flights

for locking together the ends of corresponding upper and lower platen members, whereby to secure said platen members together in predetermined spaced apart relationship.

7. The press apparatus claimed in claim 6 including a steam manifold positioned to contact said hollow platen members, openings in the steam jackets of said hollow platen members for communication with said manifold, and means for supplying steam under pressure to said manifold.

8. The apparatus claimed in claim 7 wherein said manifold is formed in movable sections, wherein the openings in said hollow platen members are in the rear surfaces thereof, wherein said openings include plates arranged to make sliding contact with said manifold sections, and wherein said manifold sections are biased toward said sliding plates.

9. In a compacting press wherein frame means mount upper and lower flights each composed of a plurality of platen members arranged to travel lengthwise of said press, said platen members being transversely disposed with respect to the direction of motion of said flights and articulated together in side-by-side relation to form endless compressing surfaces, the platen members in at least one of said flights comprising hollow steam jackets each having an essentially planar face having perforations therein communicating with the hollow interior of said jacket, means for moving the said upper and lower flights of platen members in synchronism, moving locking means traveling with the said upper and ower flights of platen members arranged to lock together the ends of corresponding upper and lower platen members in pre-determined spaced apart relation, and means in communication with said hollow steam jackets for introducing steam therein during a portion at least of the path of travel of said platen members, whereby the steam will be caused to pass through the perforations in the faces of said platen members so as to saturate a mat of material compacted between said flights of platen members.

10. The compacting press claimed in claim 9 including adjustment means for varying the distance between the upper and lower flights of platen members, whereby to vary the thickness of a mat of the material compacted therebetween.

11. The compacting press claimed in claim 9 wherein the means for introducing steam into said hollow steam jackets comprises an elongated manifold extending lengthwise of said press and having an elongated opening therein positioned to contact the rear surfaces of the said hollow platen members, said platen members each having a port therein positioned to communicate with the elongated opening in said steam manifold.

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