Aug. 27, 1963 H. G. BELL ETAL 3,101,479

APPARATUS AND SYSTEM FOR THE CONTINUOUS PRODUCTION OF HOGSHEADS AND THE LIKE

Filed June 1, 1956 3 Sheets-Sheet 1

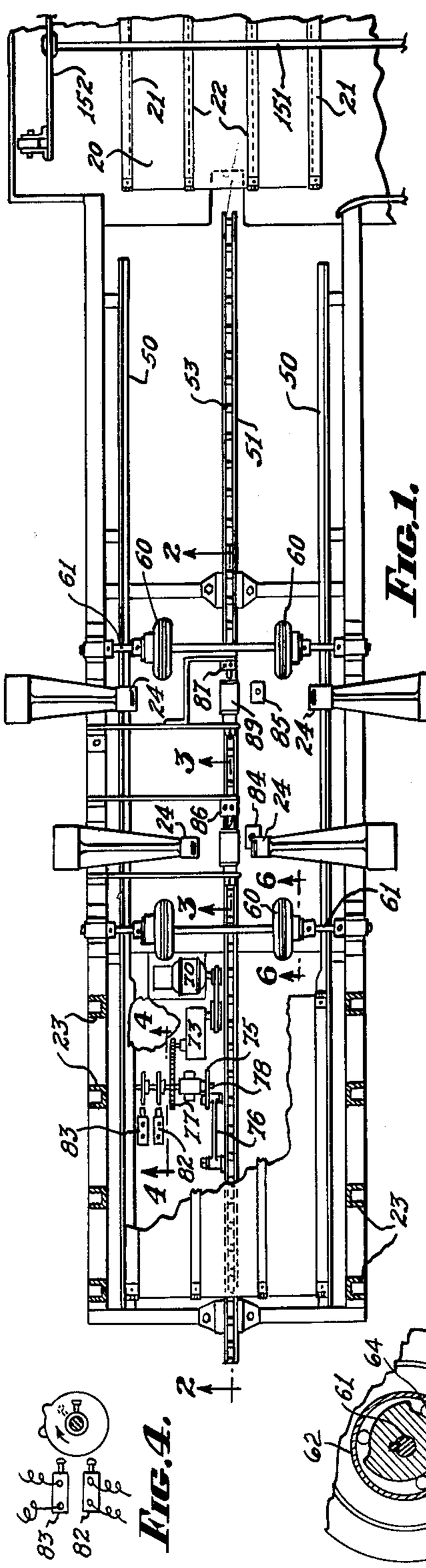

FIG. 1.

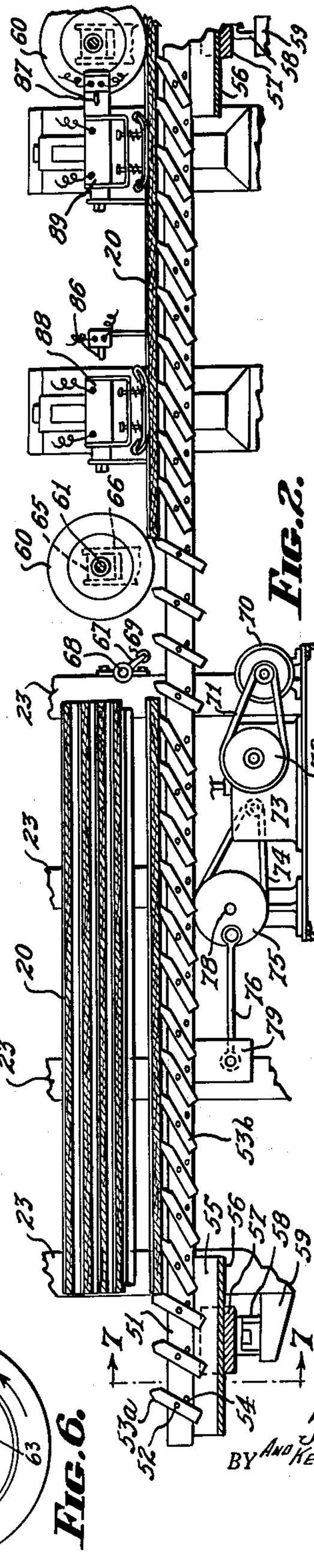

FIG. 2.

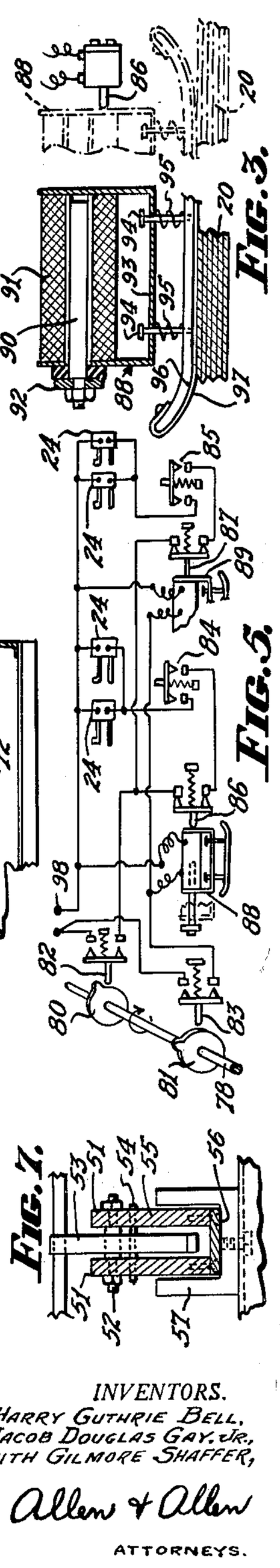

FIG. 3.

FIG. 5.

FIG. 4.

FIG. 6.

FIG. 7.

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APPARATUS AND SYSTEM FOR THE CONTINUOUS PRODUCTION OF HOGSHEADS AND THE LIKE

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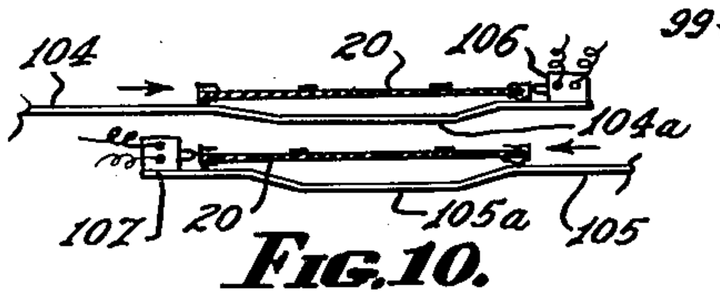

FIG. 10.

FIG. 8.

FIG. 13.

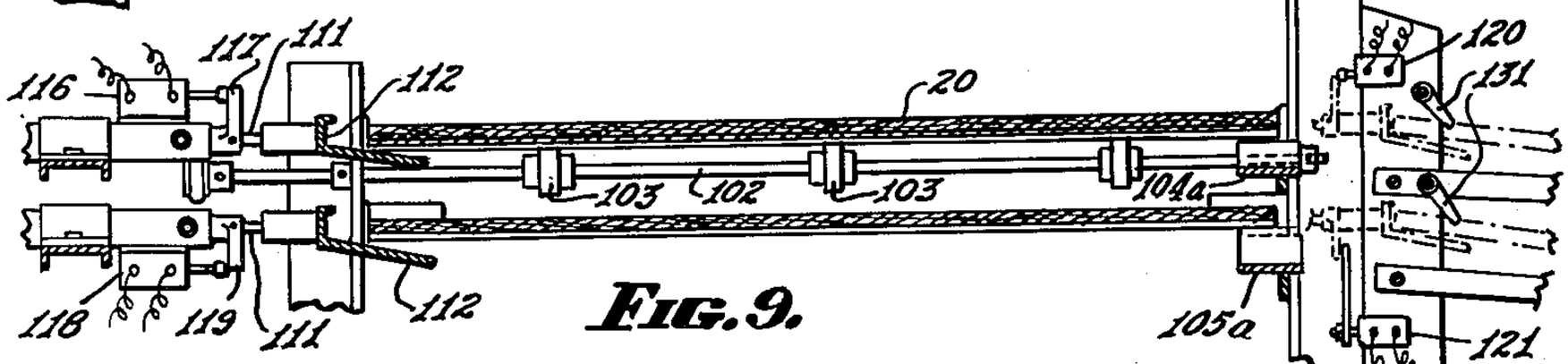

FIG. 9.

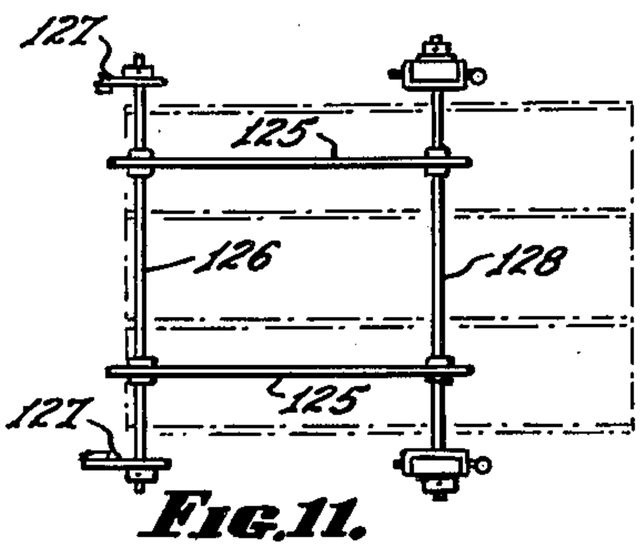

FIG. 11.

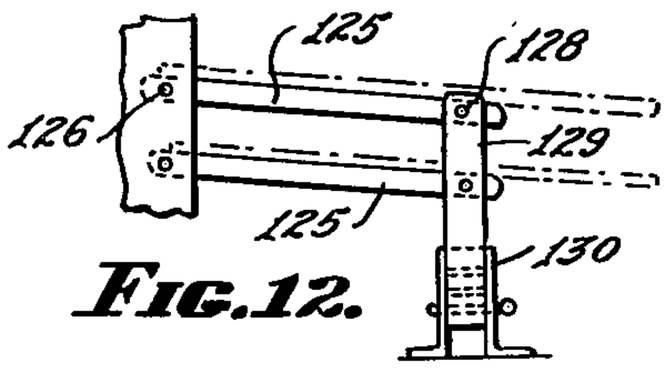

FIG. 12.

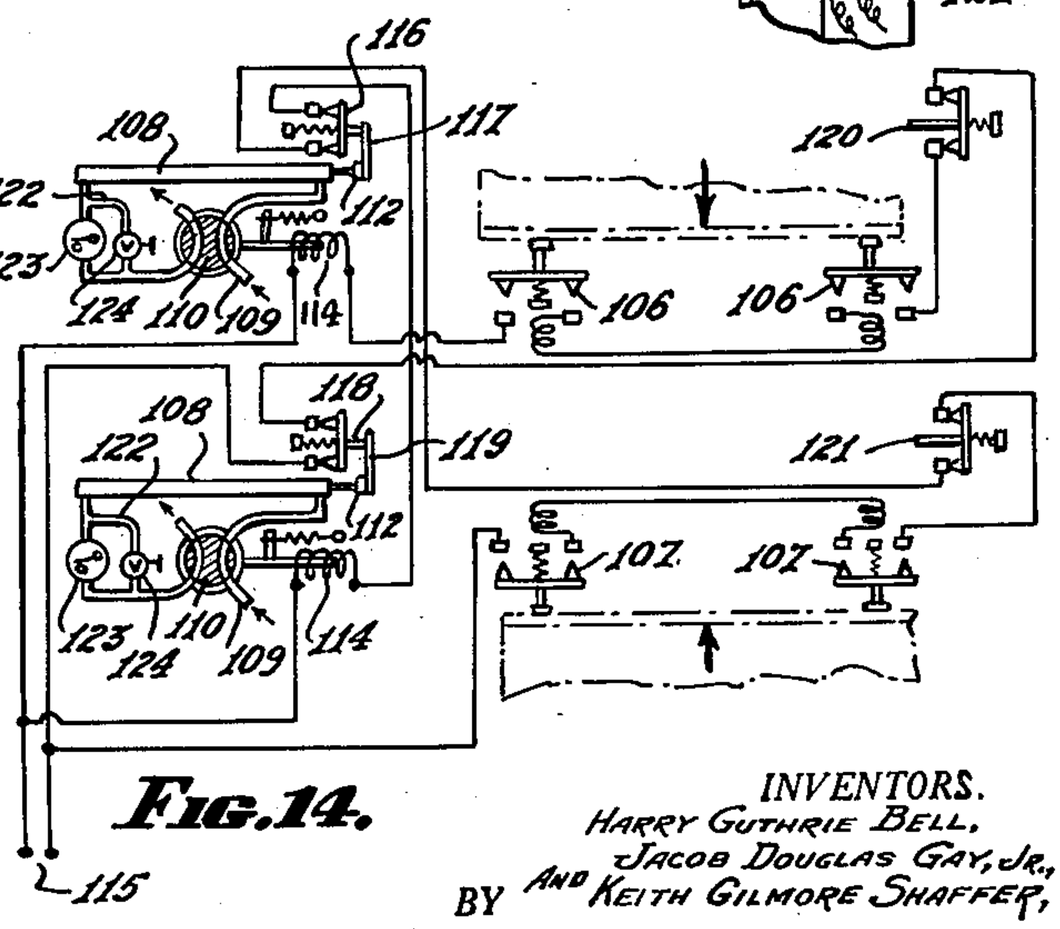

FIG. 14.

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APPARATUS AND SYSTEM FOR THE CONTINUOUS PRODUCTION OF HOGSHEADS AND THE LIKE

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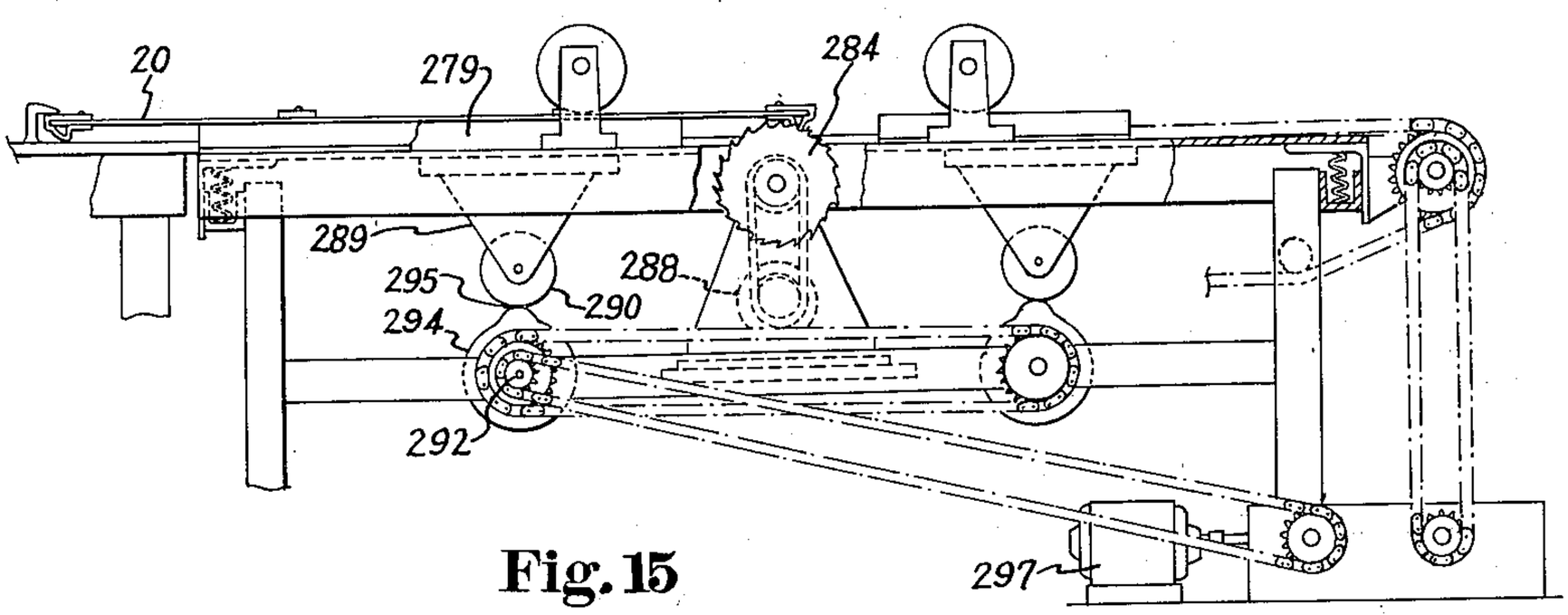

Fig. 15

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Patented Aug. 27, 1963

3,101,479

APPARATUS AND SYSTEM FOR THE CONTINUOUS PRODUCTION OF HOGSHEADS AND THE LIKE

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Filed June 1, 1956, Ser. No. 588,726
2 Claims. (Cl. 1—125)

This application is closely related to our co-pending application filed November 1, 1955, bearing Serial No. 544,258, and entitled Apparatus and Method for the Continuous Production of Hogsheads and the Like. The instant invention resides in improved apparatus and systems for producing these articles.

An important object of our invention is to provide an arrangement in which hogshead panels are moved in step by step fashion so that each panel is stopped during actual actuation of the stapling mechanism or other means used for securing the metal hoops and hoops-and-liners to the wood panel sections.

A further object of our invention is to provide an arrangement including a plurality of panel stapling means, a saw station for each such panel stapling means and common means for receiving the finished panels from each of the saw stations.

Other objects and advantages of our invention will become apparent to those skilled in the art from the following description and with reference to the accompanying drawings, in which drawings like numerals are employed to designate like parts and in which:

FIGURE 1 is a plan view, with parts broken away, showing the means for moving hogshead panels and stapling the hoops and hoops-and-liners thereto,

FIGURE 2 is an enlarged section taken on the line 2—2 of FIGURE 1,

FIGURE 3 is an enlarged section taken on the line 3—3 of FIGURE 1,

FIGURE 4 is an enlarged section taken on the line 4—4 of FIGURE 1,

FIGURE 5 is a diagrammatic view showing the general wiring arrangement and control means for the modification of FIGURE 1,

FIGURE 6 is an enlarged section on the line 6—6 of FIGURE 1,

FIGURE 7 is a section on the line 7—7 of FIGURE 2,

FIGURE 8 is a fragmentary plan view of a system for receiving hogshead panels from a pair of sawing stations and moving them alternately so that they might be handled from a single station,

FIGURE 9 is an enlarged section taken on the line 9—9 of FIGURE 8,

FIGURE 10 is a section taken on the line 10—10 of FIGURE 8,

FIGURE 11 is a fragmentary plan view of means for receiving the panels from the saw tables,

FIGURE 12 is a side elevation of the apparatus shown in FIGURE 11,

FIGURE 13 is a perspective and diagrammatic view of means for receiving the panels from a pair of saw stations and accumulating them on a common conveyor,

FIGURE 14 is a diagrammatic view showing the control arrangement for the general means by which panels are taken from a pair of saw tables and accumulated at a single station alternately, and

FIGURE 15 is a side view, with parts broken away, showing an exemplary saw table employed in the apparatus.

In the description to follow it will be understood that we have shown our invention as applied to the handling of hogsheads but that the invention is capable of handling

many other suitable articles. The hogshead section which the apparatus of this invention will handle comprises one or more pieces of plywood having a hoop-and-liner temporarily secured along opposite edges of the section. A pair of hoops will be temporarily secured to the section between and parallel to the hoops-and-liners. In FIGURE 1 the hogshead section or panel is indicated at 20, the hoops-and-liners at 21 and the hoops at 22.

The plywood piece or pieces, as the case may be, with the hoops-and-liners 21 and hoops 22 temporarily secured thereto will be placed by means not shown within a feed mechanism comprised of a plurality of upstanding members 23. The frame members 23 are arranged with other mechanism so as to hold a stack of horizontally disposed panels 20 just above the conveyor means for moving the lowermost panel from beneath those remaining in the stack. One by one panels will drop from the stack to a position on such conveyor means. This arrangement is shown in detail in our copending application and does not constitute a principal part of the instant invention. Suffice it to say that the members 23 generally stand for a feed mechanism capable of maintaining a stack of panels 20 in such a way that periodically one such panel may leave the stack and be received on conveyor mechanism to be described in detail shortly.

The panels 20 will be moved from the feed mechanism 23 and passed through mechanism which will permanently staple or otherwise secure the hoops-and-liners 21 and hoops 22 to the plywood pieces. Following this the panels 20 will be moved through a sawing station which forms lines of cut at right angles to the hoops and hoops-and-liners. These lines of cut define the staves of the hogshead. From the sawing station the panels will be received by a common means which will direct such panels to a place of discharge. A finished hogshead may then be obtained simply by manipulating the panel 20 to form a cylinder, the ends of the hoops-and-liners 21 and hoops 22 being provided with latch or catch means by which the panel may be maintained in cylindrical form. A hogshead bottom may then be inserted and the hogshead filled with tobacco or other similar products after which the hogshead head may be put in place and the product will thus be packaged and ready for shipping purposes.

Referring now to FIGURES 1 through 7 there is shown an arrangement by which hogshead panels or the like are moved from feed mechanism generally indicated by the frame members 23. One of the chief differences incorporated in this arrangement, as distinguished from that of our aforementioned co-pending application, is that the panels are moved in step by step fashion so that the panel is stopped during actual actuation of the stapling mechanism. This arrangement is more positive in action in that the stapling mechanism does not have to do anything more than just set the staple, that is, it does not have to restrain movement of the panel since the panel has already been brought to a stop. At the same time the panel is actually moved more quickly from the feed mechanism to the means by which it is brought to the sawing table.

The panels 20 will be let down from the stack members 23 by the feed mechanism and controls heretofore mentioned. These panels will come to rest on support members 50. If desired a plate could be used rather than the pair of elongated bars 50 so long as a channel were provided for the reciprocating pusher bar to be described below.

The just mentioned pusher bar comprises a pair of vertical plates 51 which are held in spaced relationship by a plurality of shouldered bolts 52. There is a pusher member 53 mounted for swinging movement on each of the shouldered bolts 52, such members 53 being between the plates 51. There are pins 54 located between the mem-

bers 51 so as normally to maintain the swinging members 53 in the position indicated at 53*a* in FIGURE 2 at the left-hand end thereof, the members 53 tending by gravity towards a vertical position. These pins 54 are so located as to permit a fair amount of clockwise movement from the position indicated at 53*a* but so as to resist any counterclockwise movement from such position, such pins interrupting the gravity influenced effort of the members 53 to reach a vertical position.

At each end of the vertical plates 51, as best shown in FIGURES 2 and 7, there are depending extensions 55. A plate 56 is bolted to the lower edge of the extensions 55. A U-shaped bearing block 57 is suitably mounted on a member 58 fixed to a bracket 59 extending from the framework of the mechanism. The plate 56 rests on the bottom of the block 57 while the plate extensions 55 are received between the upstanding legs of the U-shaped block 57. The arrangement just described is repeated at each end of the pusher mechanism. In this manner the pusher mechanism is supported between the support bars 50 for reciprocation.

When a panel 20 is permitted to drop from the feed stack members 23 onto the support bars 50 it will engage a plurality of the swinging pusher members 53. These members will each be forced to the position indicated at 53*b* in FIGURE 2. Those members 53 not contacted by a panel 20 will remain in the upstanding position indicated at 53*a* in this FIGURE 2. Upon forward movement of the pusher bar as defined by the plates 51, such movement being to the right as viewed in FIGURE 2, it will be apparent that a finger 53*a* will engage the rear or left hand edge of the panel 20 whereupon to move such panel with the pusher bar. When such pusher bar is next moved to the left as viewed in FIGURE 2 one of the members 53 will be moved out of contact with the panel 20 whereupon it will swing by gravity to a position as represented by the member 53*a* so that upon movement of the pusher bar 51 again to the right this just released member 53*a* will contact the panel 20. It will thus be apparent that the panel 20 is moved to the right along with similar movement of the pusher bar 51 but that upon movement of the pusher bar 51 to the left the panel 20 will remain stationary. Additional means to insure this are provided and will be described below.

In order to insure that return movement of the pusher bar 57 will not bring with it a panel 20 due to its contact with a plurality of the members 53, a pair of large rubber tired wheels 60 is provided at a pair of stations. Each pair of wheels 60 is mounted on a common shaft 61. The wheels 60 are arranged so that they may rotate in the direction of forward movement of the pusher bar 51 but not in the return movement thereof. This is accomplished by conventional means comprising a hub 62, a cam plate 63 pinned to the shaft 61 and a plurality of bearing members 64. It will be apparent from FIGURE 6 that the wheel 60 may rotate in the direction of the arrow since the members 64 will move to a place of clearance with respect to the cam member 63. Reverse movement of the wheel 60, however, is not possible since the members 64 would then wedge between the hub 62 and cam 63.

To each end of the shaft 61 there is pinned a rectangular block 65. Each of these blocks is free to move vertically in bracket members 66. This arrangement permits the shaft 61 and wheels 60 to move vertically so as to allow for variations in the panel thicknesses which pass therebeneath. The weight of the wheels 60 is sufficient to give necessary hold-down pressure.

Additional means for insuring that the panels 20 will not move back upon return movement of the pusher bar 51 are also provided and especially designed to contact the forward part of the panel 20 right after its initial movement. Such means comprise a plurality of fingers 67 mounted on a shaft 68 extending across the machine frame. The ends of these fingers may have some kind of

friction material mounted thereon. It will be apparent that as the panel 20 contacts these fingers upon forward movement of the pusher bar 51 the fingers are free to rotate in a counterclockwise direction. When, however, the pusher bar 51 returns the engagement of the friction surfaces 69 will prevent corresponding movement of the panel 20 as might otherwise occur due to the frictional contact between such panel and the plurality of members 53. After a few movements of the panel 20 it will then be engaged beneath the wheels 60 and the bulk of the anti-slip function will be accomplished by these wheels. The arrangement of the fingers 67 is desirable since it is difficult to get the large wheels 60 close enough to the panels 20 to be sure that such panels will be engaged upon initial movement as caused by reciprocation of the pusher bar 51.

The means for reciprocating the pusher bar 51 will now be described. As perhaps best seen in FIGURES 1 and 2 there is a motor 70 mounted on a suitable support beneath the bars 50. A pulley belt 71 extends from the motor 70 and engages a member 72 comprising a part of a speed reduction unit 73. Another belt 74 extends from the speed reducing unit 73 and engages a sprocket 77 fixed on a shaft 78. A disc 75, to which there is pivotally fixed a pitman arm 76, is fixed on the shaft 78. The other end of the member 76 is pivotally connected to a depending bracket fixed to the pusher bar mechanism 51 as indicated at 79. It will be apparent to those skilled in the art that rotation of the disc 75 will cause, through the pitman connection 76, reciprocation of the pusher bar mechanism 51.

There is a pair of cam wheels mounted on the shaft 78, one such wheel having a cam surface 80 and the other a cam surface 81. These cam surfaces are arranged to contact periodically switches 82 and 83 respectively as will be described below.

In the arrangement of this invention the stapling heads 24 are actuated only when the panel 20 is at rest, or in other words, only during the return movement of the pusher bar mechanism 51. Should for some reason a member 53 not engage properly behind a panel 20 so that upon next forward movement of the mechanism 51 such panel was not moved, it is desirable that the stapling mechanism not be actuated again so as to drive one staple upon a previously driven staple since this will cause damage to the stapling mechanism. Accordingly means are provided so that the stapling heads 24 cannot be actuated unless there has been interventing movement of a panel 20. One of the cam surfaces just above described controls this as will be further described shortly.

The control circuit for the stapling heads 24 includes a pair of switches 84 and 85 which must be actuated before the stapling heads 24 will operate. These switches 84 and 85 are actuated simply by the weight of the panel 20 as it moves along the support bars 50. The switch 84 prevents any operation of the first pair of stapling heads 24 until such time as the panel 20 is brought into proper position. The switch 85 prevents operation of the second pair of stapling heads 24 until the panel has moved sufficiently to come therebeneath. It will be observed as before that the first pair of stapling heads 24 serves to fasten the hoops 22 to the panel 20 while the second pair of heads 24 serves to fasten the hoops-and-liners 21 to the panel 20.

The means for preventing the stapling heads from driving one staple on top of another should a panel 20 not be moved by the pusher mechanism 51 includes a pair of switches 86 and 87 in the control circuit. A drag shoe 88 is provided for the first pair of stapling heads 24 and switch 86 while a similar drag shoe 89 is provided for the second pair of stapling heads 24 and switch 87. The construction of such drag shoe is perhaps best shown in FIGURE 3.

As shown in FIGURE 3 the drag shoe 88, for example, is really a solenoid having a fixed bar 90 and a movable sleeve 91. The bar 90 is fixed on a suitable frame mem-

ber 92 mounted in the machinery. Fixed to the movable sleeve 91 is a member 93 having a pair of slidable studs 94. A spring 95 surrounds each stud 94 and is located between the bottom of the member 93 and the shoe member 96. The bottom of the shoe member 96 may have a friction material 97 fastened thereto.

If a panel 20 is properly engaged by a swinging pusher member 53 forward movement of the pusher bar mechanism 51 will result in the shoe 88, for example, being moved so as to engage the switch 86, see the dotted line portion of FIGURE 3. Such movement of the shoe 88 will occur because of the frictional engagement of the shoe carried substance 97 with the panel 20 and the light resilient action of the springs 95. When the shoe 88 engages the switch 86 actuation of the stapling heads is possible. If the shoe 88 does not contact the switch 86 the stapling heads may not be actuated.

The general operation of the shoe mechanism and control circuit is such that after the shoe 88 has been moved into contact with the switch 86, the first pair of stapling heads 24 is actuated when the cam surface 80 contacts the switch 82. Immediately after this the cam surface 81 will actuate the switch 83. Closing of the switch 83 actuates the solenoid 90—91 so that the shoe 88, for example is returned to the position of the solid lines in FIGURE 3, in other words its contact with the switch 86 is broken. It will thus be obvious that for the stapling heads 24 to be actuated again the panel 20 will have to move and take with it the shoe 88. If for some reason the panel 20 does not move the shoe 88 will not move and the switch 86 will not be closed with the result that the stapling heads won't be actuated in the same place twice.

Referring now to FIGURE 5 the control circuit heretofore mentioned will be described. It will be understood that the circuit includes a satisfactory source of electric power as generally indicated at 98. For the purposes of this description it will also be understood that a panel 20 has been moved into such position that it contacts the switches 84 and 85. It will also be understood that the drag shoes 88 and 89 have been brought into contact with switches 86 and 87 respectively. As the shaft 78 is rotated by the motor 70 through the speed reduction unit 73 not only the disc 75 and pitman 76 will be actuated to reciprocate the pusher bar mechanism 51 but also the cam wheels bearing the cam surfaces 80 and 81 will be rotated.

When the cam surface 80 closes the switch 82 the first pair of stapling heads 24 will be actuated since the switch 84 is closed by weight of the panel 20 and since the switch 86 is closed by contact with the drag shoe 88. Immediately after this the cam surface 81, due to its position on the shaft 78 will close the switch 83 thus energizing the solenoid for the drag shoe 88. Upon this solenoid being so actuated the drag shoe 88 will be withdrawn from contact with the shoe 86.

In similar manner and while the foregoing was happening the second pair of stapling heads 24 will also have been actuated upon closing of the switch 82 since the switch 85 is closed by weight of the panel 20 and the switch 87 closed by contact with the drag shoe 89. Again, upon contact of the cam surface 81 with the switch 83 the solenoid for the drag shoe 89 will be actuated so that this shoe is also withdrawn from contact with the switch 87.

Continued rotation of the shaft 78 will cause the pusher mechanism 51, through the pitman 76, to return or move to the left as viewed in FIGURE 2. Still further rotation of the shaft 78 will cause the pusher mechanism 51 to move forward or to the right as viewed in FIGURE 2. If a member 53 has engaged properly behind the panel 20 such panel will be moved forward a given increment. This movement of the panel will again cause the drags 88 and 89 to contact the switches 86 and 87 so that further contact between the cam surfaces 80 and 82 and the cam surfaces 81 and 83 will repeat the movements above described. On the other hand, should for some reason or other the member 53 not engage behind the panel 20 so that the panel 20 does not move forward upon forward movement of the pusher bar mechanism 51, the stapling heads 24 will not be actuated again since the drag shoes 88 and 89 will not have been moved into contact with the switches 86 and 87 respectively. In this manner it is insured that the stapling heads 24 will not endeavor to drive one staple upon another thus avoiding damage.

In FIGURE 8 there is shown an arrangement for taking panels 20 after they leave a saw station. In the arrangement of FIGURE 8 it is contemplated that there will be a pair of saw stations. The purpose of the mechanism of FIGURE 8 is to receive panels from either or both of the saw stations and bring them to a common exit point.

In FIGURE 8 the conveyor chains for moving the panels 20 through the saw stations are indicated at 161. Each of these saw stations will be understood to be like that shown and described in detail in our co-pending application Serial No. 544,258. To this end there will be means for rotating saw blades which will cut through the plywood pieces of the panel. Additional means will be provided to raise the panel 20 as the hoops-and-liners and hoops successively pass over the saw blades so that lines of cut are placed clear through the plywood pieces between the metal bands comprising the hoops-and-liners and hoops while such pieces will be grooved only in the wood area beneath such bands.

A saw station is indicated in FIGURE 15. A saw blade is designated at 284 and may be driven by a motor 288. The panels 20 are supported on a table 279. Cam members 294 are fixed on shafts 292 which may be driven by a motor 297 through suitable gearing as diagrammatically illustrated. Cam projections 295 form a part of the cam members 294. The table 279 has brackets 289 carrying rollers 290 which are arranged by the cam means 294–295. By this arrangement the table, and panel carried thereon, may be raised and lowered as required for grooving and cutting the panels in the manner just indicated.

A shaft 203 is also illustrated. In the arrangement of FIGURE 8 the shaft 203 is extended so as to receive a sprocket 99 about which there is placed a belt 100. This belt 100 also engages a sprocket 101 on a shaft 102. A plurality of belts 103 are driven by the shaft 102. When the conveyor chains 161 bring a panel 20 over the shaft 203 from the respective saw stations the belts 103 as driven by the shaft 101 will continue the movement of such panel. This panel will be moved along support members 104 provided at either side of the mechanism. These members 104 are shown at the upper part of the FIGURE 8. Corresponding members 105 are provided for the additional mechanism bringing the panel 20 as moved by other belts 103. As best seen in FIGURE 10 the members 104 and 105 are at different levels.

At the end of the members 104 there is provided a pair of limit members and switches 106. Similar limit members and switches 107 are provided at the ends of the members 105. One set of belts 103 will move a panel 20 along the members 104 until such panel contacts both of the switches 106, which switches will prevent further movement in this direction. The other set of belts 103 will move a similar panel from another saw station along the members 105 until such other panel strikes the switches 107 whereby its further movement in this direction is prevented. When these panels have been so moved one will lie above the other as shown in FIGURE 10. As also shown in FIGURE 10 the member 104 is bent downwardly near its switch bearing end as indicated at 104*a* while the member 105 is similarly constructed as shown at 105*a*. The portions 104*a* and 105*a* are less than the width of the panel 20 so that such panel when brought against its limit switch will bridge these bent portions of the support members 104 and 105 respectively. The purpose of this construction will be explained shortly.

Located at one side and centrally of the mechanism represented by the sets of belts **103** is an elongated cylinder **108** which receives pressure from a source, not shown, through the conduit **109** and valve **110**. Within the cylinder **108** is a piston having a rod **111** extending from the cylinder and to which there is fixed a pusher shoe **112**. As perhaps best seen in FIGURES 9 and 14 it will be understood that there are a pair of these cylinders **108** and related mechanism, one above the other.

The arrangement of the mechanism is such that when panels **20** are on their respective supports **104** and **105** the pistons within the cylinders **108** will be actuated alternately so as to push one panel and then the other from the supports onto the receiving station generally indicated at **113**. It will be apparent that the purpose of the portions **104***a* and **105***a* is to permit the pusher shoes **112** to engage a panel **20** and move it laterally from the supports **104** and **105**.

The arrangement of the mechanism is such that the cylinders and their related mechanism generally indicated at **108** cannot be actuated simultaneously. This arrangement is perhaps best seen in FIGURE 14. Each of the valves **110** is controlled by a solenoid **114**. The solenoid **114** for the upper cylinder **108** is in a circuit including the switches **106** mounted on the ends of the support members **104**. The solenoid **114** for the lower cylinder **108** is in a circuit which includes the switches **107** mounted on the ends of the support members **105**. Both circuits include a suitable and common source of electricity as indicated at **115**.

There is a switch **116** for the upper cylinder **108** and there is a contact member **117** on the upper piston rod **111** for engaging this switch. A similar switch **118** is provided for the lower cylinder **108** and a similar contact member **119** is carried on the lower piston **111**. The normal positions of the valves **110** at such times that the solenoids **114** are not actuated are such that pressure from the conduits **109** is led to the right hand ends of the cylinders **108** as observed in FIGURE 14. This will cause the pistons to be at their left hand positions in the cylinders **108** with the result that the switches **116** and **118** will be closed by contact with the members **117** and **119** respectively. In addition to the switches mentioned there is also a switch **120** in the circuit including the switches **106** and a switch **121** in the circuit including the switches **107**.

When a panel **20** is moved by the upper set of belts **103** until it lies against the switches **106** at the ends of the support members **104** these switches **106** will thereby be closed. Upon closing of both of the switches **106** there will be a circuit completed through the upper solenoid **114** provided the piston rod **111** for the lower cylinder is in its left hand position so that the member **119** will be maintaining the switch **118** closed. Actuation of the upper solenoid **114** in the manner just described results in the valve **110** being turned so as to direct fluid pressure into the left hand end of upper cylinder **108** so as to drive the piston rod **111** and pusher shoe **112** to the right as viewed in FIGURE 14. As the pusher shoe **112** so moves the member **117** will permit the switch **116** to open. The switch **116** is in a circuit including the lower solenoid **114**. Thus, so long as the piston rod **111** is in any position other than that where the member **117** contacts the switch **116** it is impossible to drive the lower pusher shoe **112** to engage a panel **20** since it will be impossible to actuate the lower solenoid **114** with the upper switch **116** open.

Continued movement to the right of the upper pusher **112** will bring the member **117** into contact with the switch **120**. By this time the panel **20** will have been shoved to the receiving station indicated at **113**. In this connection it will be understood that a holding circuit is provided for the switches **106** so that both switches will remain closed until the panel **20** has been moved to the station **113** and the switch **120** opened by contact with the member **117**. Upon this switch **120** thus being opened the circuit through the upper solenoid **114** will

be broken whereupon the valve **110** will return under spring pressure to its normal position. In its normal position fluid pressure will be directed into the right hand end of the cylinder **108** with the result that the piston rod **111** and pusher shoe **112** will return to its home position wherein the member **117** closes the switch **116**. As the pusher shoe **112** starts its return the switches **120** will again close under spring pressure but by this time the switches **106** will be open so that the solenoid **114** is not again actuated until another panel strikes the switches **106**.

With the upper pusher **112** now in the position as indicated in full lines in FIGURE 14 it will be apparent that should a panel **20** be brought by the lower set of belts **103** to a position such that this panel will close the switches **107** located on the ends of the lower support bars **105**, the lower cylinder mechanism **108** will be actuated to push the panel to the receiving area **113**. When the switches **107** are closed by a panel **20** the lower solenoid **114** will be actuated provided the switch **116** is closed. Again this arrangement prevents simultaneous actuation of the pair of cylinders **118**. Closing of the circuit including the lower solenoid **114** will move the valve **110** so as to admit fluid within the lower cylinder **108** to push the pusher shoe to the right as viewed in FIGURE 14. When so moved the member **119** will come out of engagement with the switch **118** thus opening the solenoid circuit for the upper cylinder **108** whereby to prevent the simultaneous actuation of these cylinder members as just mentioned. Continued movement of the pusher shoe **112** will result in the lower panel **20** being moved to the receiving station **113** whereupon the member **119** will open the switch **121** thus breaking the circuit through the lower solenoid **114** so that the valve **110** will return to its normal position as shown and the pusher shoe **112** be brought back to its starting position wherein the member **119** closes the switch **118**.

There is provided for each of the cylinder arrangements **108** a mechanism illustrated by the conduit **122**, check valve **123** and needle valve **124**. This mechanism provides for a relatively slow return of the pusher shoe **112** so as to give sufficient time for additional panels **20** to be brought into position. The speed of return may be regulated by adjustment of the needle valve **124**. Although the arrangement described illustrates a relatively fast movement of the pusher shoe against a panel **20** with a relatively slow return it will be apparent that this could be reversed so as to produce a slow push with a fast return.

As shown in FIGURES 8, 11 and 12 the receiving station **113** may comprise a pair of support bars **125** on which the panels **20** are shoved by the pusher mechanism **112**. These bars are illustrated as pivoted to a shaft **126** mounted in brackets **127** extending from the machine. The other ends of such bars are connected to a shaft **128** mounted in a pair of vertically slidable members **129** acting in sockets **130**. A set of bars and shafts **125** is provided for the upper and lower panel receiving mechanisms. With this arrangement operators may simply remove the panels **20** as they are received on the upper and lower sets of support bars **125**. In order to prevent the panel **20** from moving back upon return of the pusher shoes **112** stripper mechanism **131** is provided. A plurality of these pivoted figures **131** will permit movement of the panel to the right as viewed in FIGURE 9 but not to the left as is understood in the art.

The receiving station **113** may, instead of the bars **125**, comprise an endless conveyor **132**. In this arrangement it will be obvious that the panels **20** are simply received alternately as pushed by the various members **112**. The conveyor may take these panels to any desired position. This arrangement is shown in FIGURE 13.

Although the mechanism has been described for alternately pushing panels from the upper members **104** and the lower members **105** it will be apparent that the mecha-

nism will operate even though only one of the saw stations is in use. So long as the elements are in the position shown in FIGURE 14, either, but not both together, of the cylinder arrangements **108** may be actuated simply by the closing of one or the other of the sets of switches **106** and **107**. Thus successive periodic actuation of either the switches **106** or **107** is possible although it is contemplated that first the switch **106** and then the switch **107** will be actuated.

Operation

From the foregoing it will be observed that the apparatus and system we have provided enables hogsheads and the like to be assembled in a continuous manner. Stacks of hogsheads **20** with the hoops-and-liners **21** and hoops **22** temporarily fastened in place are from time to time placed within the initial receiving means generally indicated and defined by the plurality of frame members **23** as shown in FIGURES 1 and 2. As earlier explained the hogsheads of such a stack are so maintained by these members **23** that periodically the lowermost panel of the stack will be dropped onto the conveyor means for moving such panel through the mechanism for permanently securing the hoops-and-liners and hoops to the plywood pieces. The means for periodically dropping a panel **20** onto the members **53** carried on the bar **51** is shown and described in detail in our aforementioned co-pending application Serial No. 544,258.

As the bar **51** is reciprocated the members **53** will engage behind a panel **20** and move it step by step beneath the stapling heads **24** which are actuated during the rest periods in the movement of the panel and the hoops-and-liners and hoops thereby permanently secured. Various hold-down means are employed to insure positive and correct operation. In addition the means **60** and **69** prevent rearward movement of the panel **20** upon return reciprocation of the bar **51** and members **53**.

After the hogshead panel leaves the stapling head it is moved into a position to be engaged by the rake **152** on the end of the rod **151** whereby the panel may be moved at right angles to its initial path of travel. The rake and rod just mentioned are actuated in the manner shown in detail in the aforementioned co-pending application.

The reciprocating rake **152** will move the panel **20** onto the conveyor chains **161** which will lead the panel through the saw station. As above explained and as shown and described in detail in our said co-pending application, the saw station is so arranged as to cut through the panel in the area between the metal bands defining the hoops-and-liners and hoops while just grooving the panel in the wood areas immediately beneath the bands.

Assuming a pair of initial receiving, stapling, cross conveyor and saw means, the panels are then alternately led from the respective saw means to a common receiving means as shown and described in detail in connection with FIGURE 8. In this manner a succession of completed hogshead panels may be brought to the final receiving means **113**.

It will be understood that although we have described our invention as embodied in certain specific structures, it is realized that changes may be made without departing from the scope and spirit of this invention. It will be further understood that the specific structures shown are exemplary only and we do not intend to be limited to such structures except insofar as they are specifically set forth in the subjoined claims.

Having thus described our invention, what we claim as

new and what we desire to protect by United States Letters Patent is:

1. A system for assembling hogsheads which comprises: a first feeding station, a first stapling section for stapling the hoops and hoops-and-liners to the hogshead panels, first conveyor means to move panels from said first feeding station through said first stapling section, first saw means to form staves in said panels, and first additional means to receive panels from said conveyor means and convey them through said first saw means; a second feeding station, a second stapling section for stapling hoops and hoops-and-liners to other hogshead panels, second conveyor means to move said other panels from said second feeding station through said second stapling section, second saw means to form staves in said other panels, and second additional means to receive said other panels from said second conveyor means and convey them through said second saw means; upper support means to receive panels from said first saw means, lower support means to receive said other panels from said second saw means, said support means being positioned one above the other, a receiving station common to both support means, and means to push the panels from said support means one by one onto said receiving station; said push means comprising a pair of elongated cylinders, a piston rod reciprocable in each said cylinder, valve means for each said cylinder whereby to direct fluid pressure to either end thereof, a shoe on each said rod, said upper and lower support means having depressed areas to permit said shoes to pass over whereby to engage panels supported on the undepressed portions of said support means; and a control circuit including each of said valve means and so arranged that the valve means cannot be manipulated to cause simultaneous pushing movement of said shoes.

2. The system of claim 1 in which said control circuit includes a solenoid for each of said valve means, each of said valve means normally directing fluid into its cylinder so as to maintain its said shoe in non-push position, first switch means for each said cylinder, each said first switch means being closed when said shoes are in non-push position, the solenoid for one valve means including a connection to the first switch means for the other cylinder and vice versa, a second switch means for each of said cylinders, each said second switch means being normally closed and in direct connection with the solenoid valve means for its respective cylinder, a first panel contacted switch between one solenoid and its respective second switch and second panel contacted switch between the other solenoid and its respective second switch, whereby when said first panel contacted switch is closed by a panel bearing against it a circuit is closed through a solenoid (provided the first switch means for the other cylinder is closed) to move the respective valve means from its normal position so as to move a said shoe from its non-push position to its push position wherein it will actuate its respective second switch to break the circuit through said solenoid and permit said valve means to return to normal and cause said shoe to return to non-push position, whereupon further closing of either panel contacted switch will result in a similar actuation of a shoe.

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