

Jan. 7, 1958

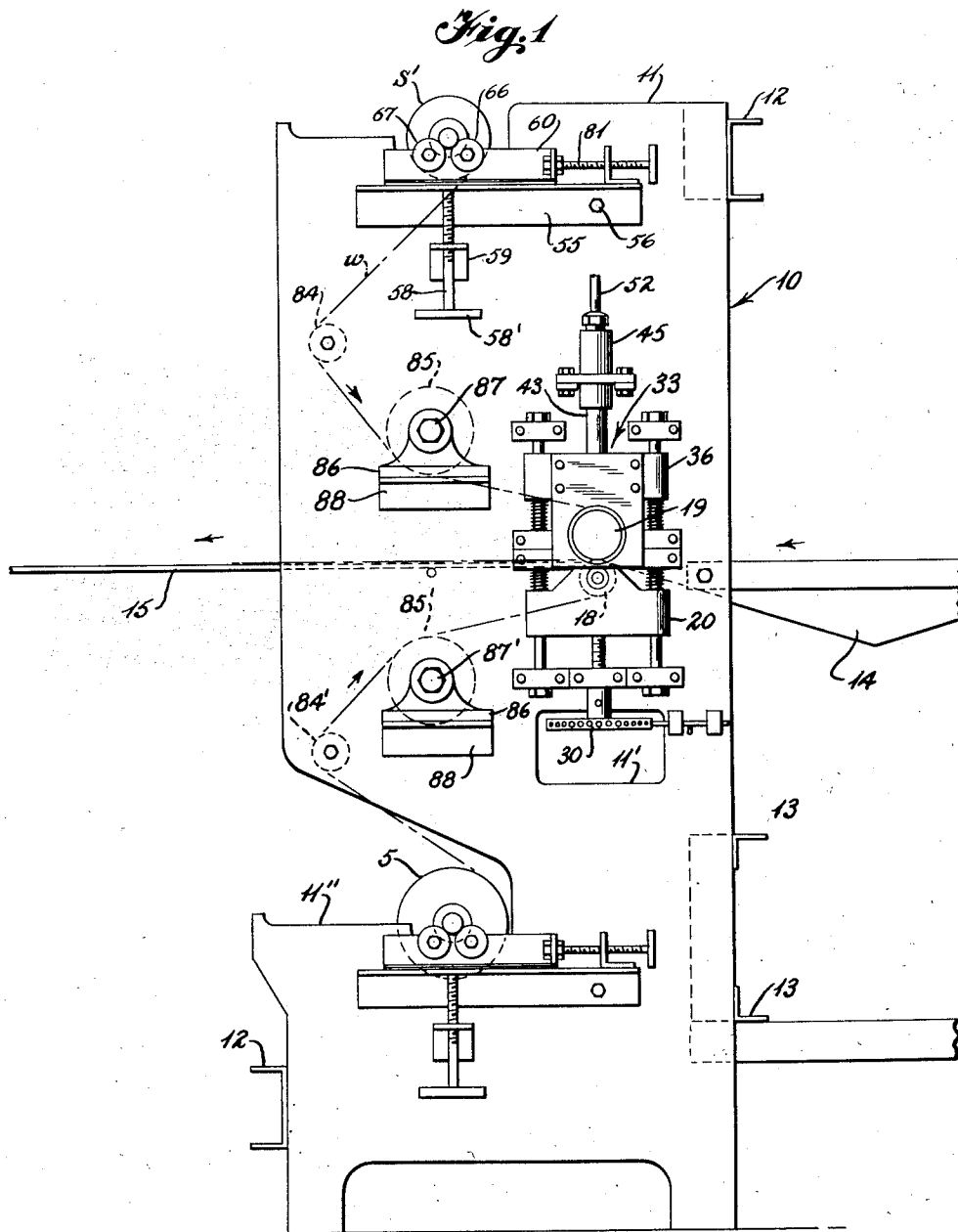
F. X. AMBROSE

2,818,904

PRESS FOR WEBS

Filed Aug. 8, 1955

4 Sheets-Sheet 1



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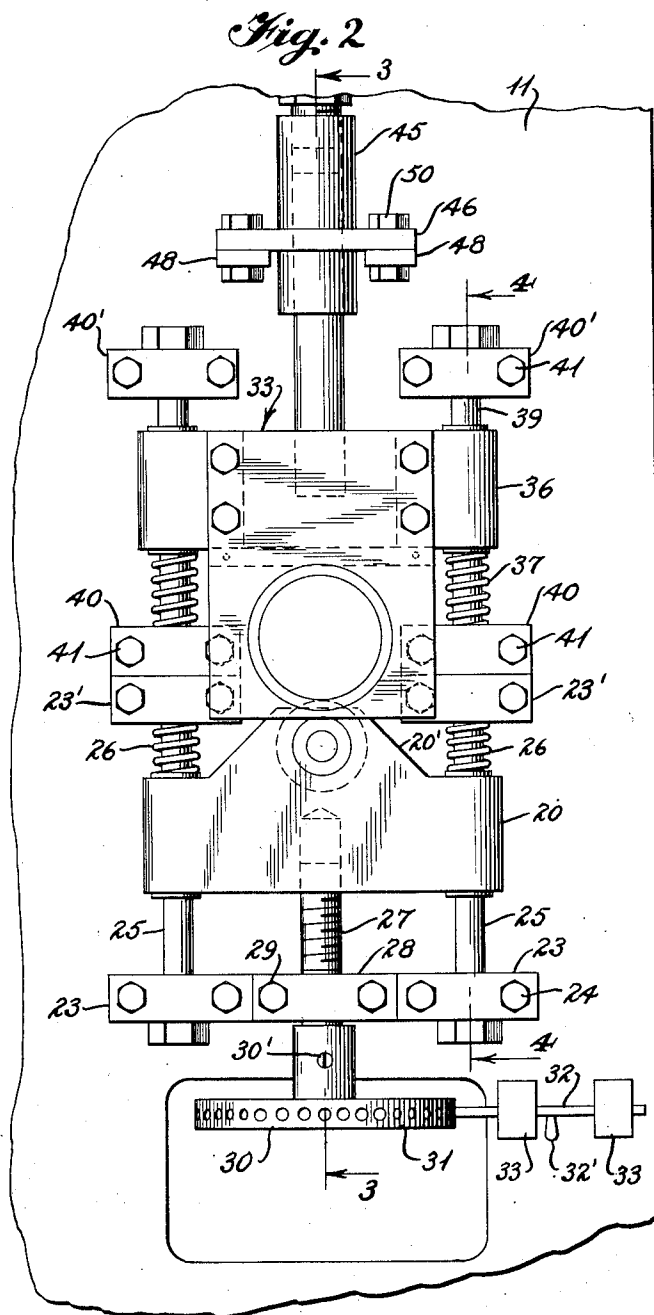
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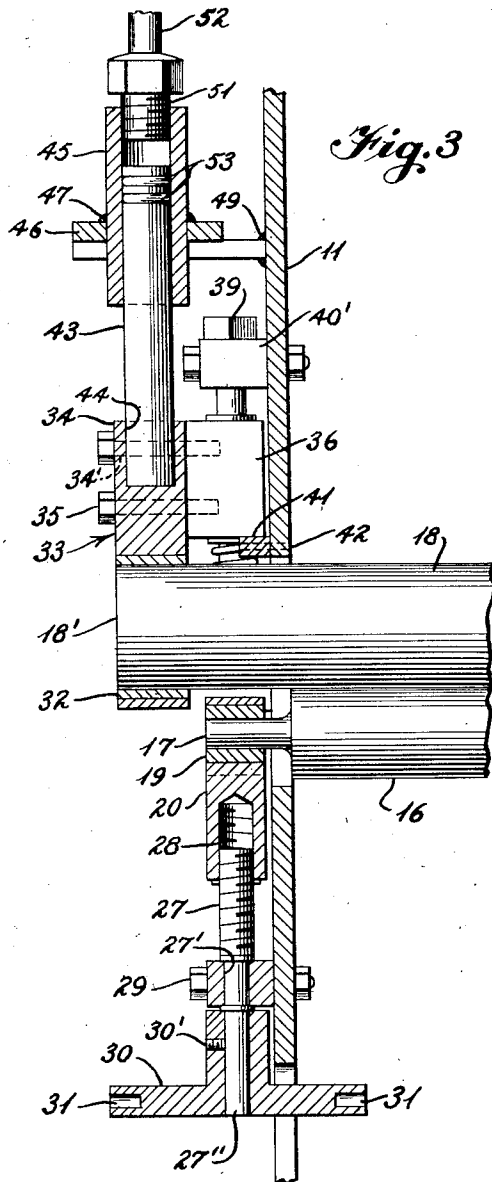


Fig. 3

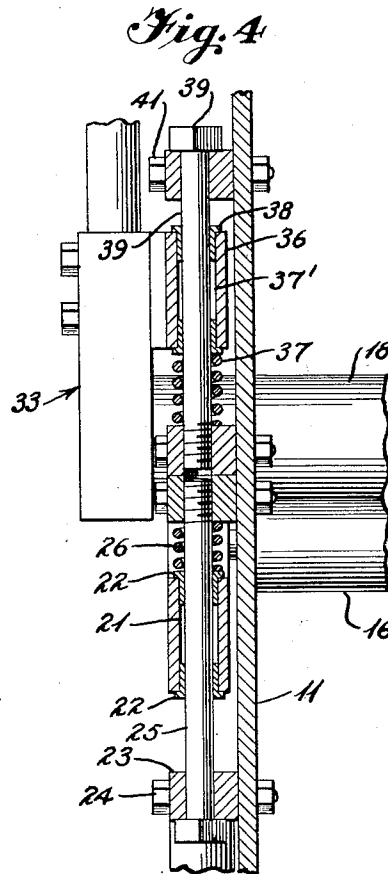


Fig. 4

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Fig. 5

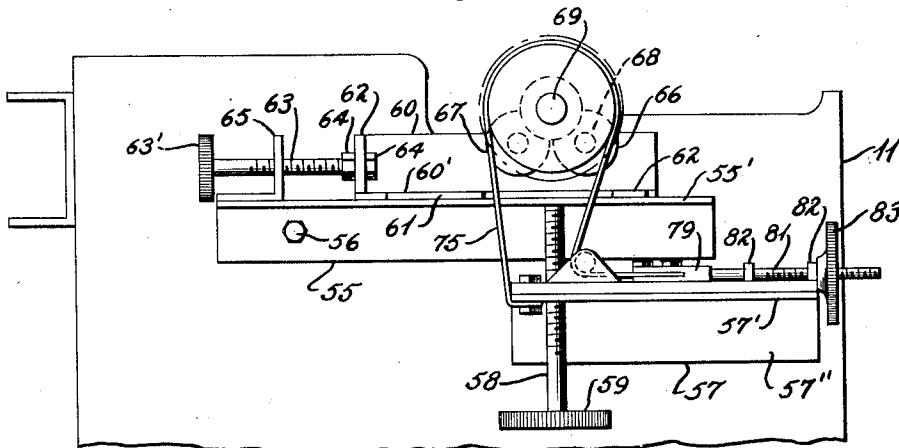


Fig. 6

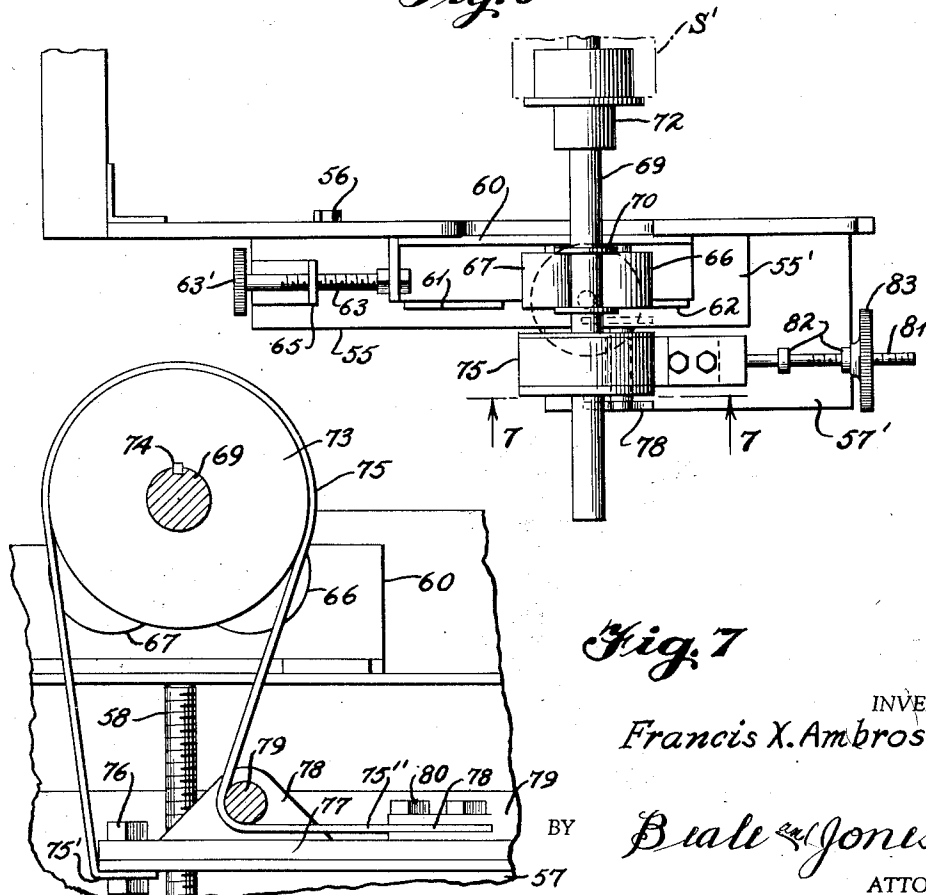


Fig. 7

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2,818,904

PRESS FOR WEBS

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14 Claims. (Cl. 154—1)

This invention is directed to improvements in roll type web presses.

In carrying out the manufacture of fiber glass sheeting, relatively large rectilinear mats of fiber glass are passed through an impregnating bath of suitable resin and assembled between two in-running webs of "cellophane" stock and then passed between a pair of press or impregnating rollers having pressure applied thereto such that the whole laminated structure is pressed together or squeezed under controlled conditions. In applying the pressure to the fiber glass mat sandwiched between the "cellophane" web, the resin carried by the fiber mat is pressed out and squeezed into intimate contact with the fibers making up the mat. It is important to control the feed-in of the in-running "cellophane" webs and to control the pressure acting on the squeeze rolls between which the laminated assembly of webs and mat passes.

It is an object of my invention to provide a press of two in-running cooperating rolls with resilient and pressure controlled mounting at the ends of the rolls.

Another object of my invention is to provide in an impregnating roller press for assembling webs, a web supply having means for stretching and expanding the web before it passes between the rollers.

A further object of my invention is to provide a guided support for the end of a lower roll in a press with means for vertically positioning the roll and a movable support means for an upper roll cooperating with the lower roll such that controlled pressure may be applied to the upper roll.

A further object of my invention is to provide vertical guide mountings for supporting the housing supporting the bearings of a pair of squeeze rollers.

A still further object of my invention is to provide in a web assembly press a mounting for the web supply spool such that the web may be fed under tensioning over a bearing bar and expander roller to a position between a pair of press rolls.

Still further objects and the entire scope of applicability of the present invention will become apparent from the detailed description given hereinafter; it should be understood, however, that the detailed description and specific example is given by way of illustration only, and, while indicating the preferred embodiment of the invention, is not given by way of limitation, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

For a more complete understanding of the nature and scope of my invention, reference may be had to the specification, claims, and drawings in which:

Fig. 1 is a side elevation of the press assembly;

Fig. 2 is an enlarged side elevation of the mounting for the ends of the press rolls;

Fig. 3 is a vertical elevation along line 3—3 of Fig. 2 showing the mounting for the ends of the rolls;

Fig. 4 is a vertical sectional view along line 4—4 of

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Fig. 2 showing the vertical guides for the end bearings of the rolls of the press;

Fig. 5 is an enlarged side elevation of the web roll support and tension control;

Fig. 6 is a fragmentary top plan view of the web roll support shown in Fig. 5; and

Fig. 7 is an enlarged fragmentary side elevation along line 7—7 showing the tensioning means for the spool of web stock.

Throughout the various figures and written description like reference numerals refer to similar parts.

The press assembly is generally indicated at 10 and comprises two vertically disposed spaced-apart end frames 11—11, one only of which is shown in Fig. 1. These end frames 11 are suitably interconnected by transverse channel members 12—12 and angle bars 13—13. A press of this type handles webs of over 5 feet in width and thus it is essential that the cooperating press rolls be adequately supported and yet be movable toward each other for pressure adjustment. In use the press 10 receives a glass fiber mat from impregnating zone 14 and assembles it between two in-running webs fed in between press rolls 18 and 19 as will be described.

The assembled mat and webs leave the press 10 and pass over a table generally indicated at 15.

Reference to Fig. 3 shows the lower roll 16 formed with reduced diameter end trunnions 17. The diameter of roll 16 is 2 inches while the upper roll 18 is 2½ inches and extends out beyond the trunnions 17 of the lower roll. Trunnion 17 is supported by a bearing piece 19 housed in a bearing support 20. Reference to Fig. 2 shows bearing support 20 as being of elongated shape and having a centrally extending upper portion 20' which is apertured to receive the bearing bushing 19. Toward either end of the bearing support 20 there are formed therein vertical apertures 21, see Fig. 4, which receive at their upper and lower ends bushings 22—22. In alignment with the apertures 21 and thereabove and therebelow are pillow blocks 23 which are secured to the outer face of frame 11 by means of bolts 24. The upper ones 23' of these pillow blocks have threaded apertures to receive the upper threaded end of guide bolts 25 which pass through the apertures 21 in the ends of the housing support member 20. Received over the upper ends of the bolts 25 are compression springs 26 which are positioned intermediate the upper pillow blocks 23' and the upper bushing 22 at each end of the bearing support 20. Compression springs 26 urge the bearing support 20 downward and the bearing support member 20 is supported on a threaded stud 27 which is threadedly received in threaded aperture 28, see Fig. 3, which extends vertically into the lower portion of bearing housing member 20. Stud 27 has a reduced neck 27' and a lower end 27''. Neck 27' is received in a pillow block 28 secured to frame plate 11 by means of bolts 29. The lower end of stud 27 has secured thereto as at 27'' a hand wheel 30 as by means of setscrew 30' so that threaded stud 27 may be rotated and in turn bearing housing member 20 is moved vertically up and down on the guide bolts 25 and against the compression springs 26. Lock means are provided for the hand wheel 30. The lock means for wheel 30 comprises a plurality of spaced-apart apertures at 31 extending in a radial manner in the periphery thereof so as to receive a slide bolt 32 supported for horizontal sliding movement in bearing blocks 33—33 and movable by means of the traverse hand grasp portion 32'. This same type of bearing support is provided at the other end of lower roll 16 and attached to the corresponding vertical end frame member 11 at that end. The mounting for the end of the upper roll 18 will now be described. Upper roll 18 is about 2½ inches

in diameter and is larger than lower roll 16. It extends at each end beyond the end of the journal 17 of the lower roll as at 18' where it receives a bearing bushing 32 which is carried in an upper bearing support member generally indicated at 33. Upper bearing support member 33 comprises an outer rectangular-like block piece 34 having a lower portion which houses the bearing 32 while the upper portion thereof has vertically spaced-apart apertures at either side as at 34', see Fig. 3, which receive capscrews 35 that secure the outer bearing support member 34 to the inner member 36. Inner bearing support member 36 has vertically spaced-apart apertures 37' therein, see Fig. 4, which receive bushings 38 at the ends thereof that serve as bearings for vertical guide bolts 39. The lower ends of the vertical guide bolts 39 are threaded and are received within threaded apertures in pillow block members 40 secured to the outer face of frame 11 by means of bolts 41. The upper pillow block members 40'—40' are merely apertured to receive the upper ends of the guide bolts 39. Positioned on the lower ends of the guide bolts 39 and intermediate the lower pillow blocks 40 and the bearing support member 36 are compression springs 37 which serve to yieldingly support the upper roll 18. Reference to Fig. 3 shows a lower stop member 41 secured below the block portions 36 to the frame member 11 as by means of rivets or screws 42. This stop member 41 limits the downward movement of the bearing support 33 for the upper roll 18. The two pairs of guide bolts 25 and 39 guide the rolls 16 and 18 respectively, in true up and down movement.

Movement of the upper roll 18 in a downward pressing direction against roll 16 is controlled hydraulically as will be described. A piston member 43 is received in a vertical manner in a recess 44 provided in the central upper portion of outer member 34 of the upper bearing support member 33. The upper end of piston 43 is received within a cylinder 45 which is disposed in a vertical manner and held within a horizontally disposed flange 46 by means of bracket 48 welded as at 47 to frame 11.

Brackets 48 are apertured and receive bolts 50 which secure the flange 46 thereto. The upper end of cylinder 45 is threaded and receives the hydraulic fitting 51 having a hydraulic pressure line 52 attached thereto. The upper end of piston 43 has a pair of spaced apart grooves which house O-rings 53 so as to provide pressure seals between piston and cylinder. Thus, upon application of pressure in the hydraulic line 52 pressure is applied to the interior of cylinder 45, piston 43 rigidly attached to upper bearing support member 33 is moved downwardly so as to move roll 18 toward lower roll 16 and apply pressure therebetween the rolls and to the work passing therebetween. It will be observed in Fig. 1 that frame 11 has a cutout portion 11' therein to receive the hand wheel 39 and that at its lower portion has a V-like cutout portion at 11' extending into its left-hand face so that the lower supply roll or spool S may be inserted and removed.

The mounting for the "cellophane" or the like enrobing web material for the mats is housed on spools S and S'. The lower and upper spools, S and S', respectively, will now be described. The mounting for each of these spools is the same and thus the upper mounting for the upper spool S' will only be described. Attached to each end of the outer face of frame member 11 in a pivoted manner are angle iron members 55 as by means of pivot bolt 56 adjacent one end of members 55. This mounting structure for supporting spool S' is shown in Figs. 5, 6, and 7. A second angle iron member 57 is positioned in spaced relation below angle iron member 55 and it has an upper web portion 57' of substantial width as shown in Fig. 6, compared to the vertical flange 57'' of the angle iron member 57. Angle iron member 57 is rigidly attached as by welding to the frame 11. A threaded stud 58 having a hand wheel 58' at the lower

end thereof is threadedly received by a threaded aperture in an angle iron bracket 59 welded to frame 11, see Fig. 1, so that the stud 58 rests against the lower surface of horizontal flange 55' of angle iron member 55. Thus, by screwing the stud 58 up or down the angle member 55 is pivoted up or down about its pivot pin 56 and thereby raised and lowered. Slidably mounted on the upper surface of angle iron 55 is a third angle iron member 60 having its flange 60' resting against the flange 55' of angle iron member 55 for sliding movement. The third angle iron member 60 is restrained for lengthwise movement on the top of flange 55' of angle iron member 55 by blocks 61 and 62 attached to the angle iron member 55 as by welding. Secured to one end of the third angle iron member 60 is a transversely extending flange 62 which is apertured to receive a threaded stud 63 that is secured thereto by nuts 64. Threaded stud 63 is threadedly received within a small angle iron member 65 attached to the pivot end of angle iron 55. Stud 63 has a hand wheel 63' at the outer end thereof and the angle iron member 60 may be slidably moved along angle iron 55 and locked in place. A pair of spaced-apart rollers 66 and 67 are secured to the angle iron member 60 by means of pins 68, see Fig. 5. These rollers 66 and 67 support a one-inch diameter shaft 69 that supports the upper spool S' of "cellophane" or enrobing stock. Shaft 69 has a pair of flanges 70—71 secured thereto at either end in spaced relation at the ends of roll 66 and 67 so as to hold the shaft 69 from moving lengthwise. A suitable spool support fitting 72 is secured to shaft 69. By means of the threaded studs 58 and 63, the supports for the ends of shaft 69 and the spool S' of web stock may be adjustably positioned. Tension is applied to the spool S' and the shaft 69 as will now be described.

Reference to Fig. 3 shows a pulley 73 rigidly attached to the shaft 69 as by means of a key 74. Passing over this pulley 73 is a flexible belt 75 which has one end 75' secured by bolt 76 to angle iron member 57. Bolt 76 also passes through an apertured end of a plate 77 having a pair of upstanding spaced-apart lugs 78—78 secured thereto which support the ends of a circular shaft 79 over which the movable end of flexible belt 75 is led. Movable end 75'' of belt 75 is attached to a slotted end 78 of a slide block 79 by means of capscrews 80. Rigidly attached to block 79 is a threaded stud 81 which extends outwardly beyond the right-hand end of flange top plate 57' and passes through a pair of apertured lugs 82 welded in spaced relation apart on the top surface of angle iron 57. A threaded nut 83 is received over the end of the threaded stud 81 and by adjusting the same, tension is placed on the flexible belt 75 since block 79 slides on the top flange 57'.

It will be observed in Figs. 5 and 6 that the shaft 69 supporting the spool S' may be adjusted upwardly by pivoting angle iron 55 and transversely of frame 11 by sliding member 60. Tension may be applied to the flexible belt 75 passing over pulley 73 rigidly attached to shaft 69 so as to apply drag on the spool S' and thus tension may be applied to the web led therefrom.

Reference to Fig. 1 shows the web w led from spool S' over a fixed bearing bar 84 which extends between the end frame members 11—11 in a position, see Fig. 1, to the left of a vertical plane passing through the spool S' and thus on the opposite side to such a vertical plane as is positioned the pair of press rolls 18 and 19. Bar 84 is covered with dielectric material such as "Teflon" which is molded thereon so as to prevent static electricity being induced in the web w. Positioned intermediate the rolls 18 and 19 and the supply spool S' is an expanding roller 85 which is about 4½ inches in diameter and over which the web w is led in its reach to the upper surface of the upper roll 19 over which it is led so as to enter the press rolls from the right-hand side as viewed in Fig. 1. Expander roller 85 is mounted on a bearing bracket 86 by means of a pivot screw 87. Bearing

bracket 86 is attached to the end frame 11 as by means of an angle iron 88. The web from the lower spool S is likewise led over a similar fixed bearing bar 84' and an expander roller 85'. This lower web is fed over the lower portion of lower roll 18 into the nip from the right so that the assembled impregnated mat of fiber glass (not shown) is sandwiched between the two in-running webs of "cellophane" and squeezed by means of the pressure rolls 18 and 19 so as to disperse the resinous material throughout the fiber mat.

In operation the assembled lamination of impregnated mat between the two web sheets is pulled to the left as viewed in Fig. 1 over the spanning plate or table 15. The spools S and S' carrying the web supplies are mounted so that the web may be fed with no wrinkles therein as it is introduced between the press rolls 18 and 19. The bearing bars 84—84' and the expander rolls 85—85' over which the webs are led stretch and smooth out the web so that it is under a uniform condition as it is fed between rolls 18 and 19 to enrobe the glass fiber mat sandwiched therebetween. The rolls 18 and 19 are adjustably supported in a manner that permits proper leveling and uniform pressure application between the roll which is essential in providing a uniform sheet of fiber glass of uniform thickness and density.

What is claimed as the invention is:

1. A press for continuously pressing together material sandwiched between two in-running webs comprising a pair of upright end frames, a horizontally disposed lower roll; means for mounting the lower roll comprising, an end bearing assembly at each end of the roll, a pair of vertically extending spaced apart guide members attached to each frame and in guiding engagement with each of said bearing assemblies, biasing means on said spaced apart guides urging said bearing assembly downward and adjustable support means attached to the frame and in supporting engagement with said bearing assembly for moving the bearing assembly and the lower roll up and down while said biasing means urges the bearing assembly downward; an upper horizontally disposed roll for pressing engagement with said lower roll to press together the webs and the material sandwiched therebetween; means for mounting the upper roll comprising, an end bearing assembly at each end of the upper roll, a pair of vertically extending spaced apart guide members attached to each of said frames and in guiding engagement with each of said bearing assemblies for the upper roll, biasing means associated with said vertically extending spaced apart guide members and urging said bearing assemblies for the upper roll upward; means for supporting the ends of an upper and a lower spool of web stock, each of said spool support means being attached to said frame members and comprising a base member pivotally attached to said frame members, a secondary member slidably mounted on said base member, a pair of rollers mounted on said slide member and adapted to rollingly support the end of each spool; means for applying a resistance to the rolling movement of each spool; guide means over which said web from the spool is led to between said rolls; and fluid pressure means associated with each of said upper bearing assemblies for applying pressure thereto to urge said upper roll towards said lower roll to apply pressure to the webs and material passing between said rolls.

2. A press according to claim 1 wherein said means for applying a resistance to the rolling movement of each spool comprises a flexible band attached to said frame and passing over an end of said spool for frictional engagement therewith and means for applying a tension to the other end of said flexible band.

3. A press according to claim 2 wherein said end bearing assemblies for supporting the ends of said rolls comprise a bearing sleeve directly supporting the end of the roll and a support member for the bearing sleeve,

said support member having guiding engagement with said spaced apart guides.

4. A press according to claim 2 wherein said vertically extending guide members for each bearing support member are bolts and include apertured block members attached to said frame for supporting said bolts, said block members for each guide bolt for the lower bearing support member being spaced apart vertically with the upper block member being threaded to receive said bolt while the block members for each guide member are vertically spaced apart with the lower such member being threaded to receive the upper guide bolt supported thereby.

5. A press according to claim 3 wherein the upper roll is longer than the lower roll and projects beyond each end of the lower roll, said bearing support member for the upper roll comprising a first member guidingly supported by its vertical guide members and said biasing means and a second member attached to said first member outwardly thereof and having a depending portion supporting the bearing sleeve attached to and supporting each end of the upper roll.

6. A press according to claim 5 wherein said fluid pressure means associated with each bearing assembly for the ends of the upper roll is attached to said second member of the upper bearing support member.

7. A press according to claim 6 including stop means attached to said frame to limit the downward movement of each upper bearing support member.

8. A press according to claim 7 wherein said lower roll has a reduced portion at each end forming a journal for supporting engagement with the bearing at each end of the lower roll and wherein said upper roll has its journal portion at each end substantially the same size as the balance of the roll.

9. A press according to claim 8 wherein said bearing support for the lower roll has a vertically disposed threaded aperture therein, said adjustable support means for the bearing support member for the lower roll comprises a vertically disposed shaft having a reduced collar formed thereon, a support attached to the frame within which said shaft is supported at said reduced portion, said shaft having its upper end threaded and received in said threaded aperture and control means attached to said shaft for rotating same so as to adjustably position said bearing support along its spaced apart guide members.

10. A press according to claim 9 including lock means for holding said control means for said vertical shaft in a set position.

11. A press according to claim 2 wherein said guide means over which said web from its spool is led between said rolls comprises a non-rotating bearing bar having a dielectric covering thereon and an expander roll over which said web rolls, said bearing bar being disposed in spaced relation from said spool and on the opposite side of a vertical plane passing through said expander rolls and said spool from which said press rolls are spaced and said expander roller being disposed vertically intermediate said bearing bar and said press rolls.

12. A press for continuously pressing together material sandwiched between two in-running webs comprising a pair of upright end frames, a horizontally disposed lower roll, means for mounting the lower roll comprising an end bearing assembly at each end of the roll and a pair of vertically extending spaced apart guide members attached to each frame and in guiding engagement with each of said bearing assemblies, biasing means on said spaced apart guides urging said bearing assembly downward and adjustable support means attached to the frame and in supporting engagement with said bearing assembly for moving the bearing assembly and the lower roll up and down while said biasing means urges the bearing assembly downward; and upper horizontally disposed roll for pressing engagement with said lower roll to press together the webs and the material sandwiched therebetween; means for mounting the upper roll comprising an

end bearing assembly at each end of the upper roll, a pair of vertically extending support guide members attached to each of said frames and in guiding engagement with each of said bearing assemblies for the upper roll; biasing means associated with said vertically extending spaced apart guide members and urging said bearing assemblies for the upper roll upward; means for supporting the upper ends of an upper and lower spool of web stock, each of said spool support means being attached to said frame members and comprising a base member pivotally attached to said frame members, a secondary member slidably mounted on said base member, a pair of rollers mounted on said slide member and adapted to rollingly support the end of each spool; means for applying resistance to the rolling movement of each spool; guide means over which said web from the spool is led to between said roll; and fluid pressure means associated with each of said upper bearing assemblies for applying pressure thereto to urge said upper roll toward said lower roll to apply pressure to the web and material passing between said rolls, said fluid pressure means comprising a cylinder mounted on each of said upright end frames, each of said cylinders having a closed upper end and an open lower end, said closed upper end having an outlet to a pressure source, said open lower end receiving a plunger reciprocal within said cylinder and extending down out of said cylinder, said lower end of said piston being secured to said upper bearing.

13. A press for continuously pressing together materials sandwiched between two in-running webs comprising a pair of upright end frames; a horizontally disposed lower roll; means for mounting the lower roll comprising an end bearing assembly at each end of the roll, a pair of vertically extending spaced apart guide members attached to each frame and in guiding engagement with each of said bearing assemblies, biasing means on said spaced apart guides urging said bearing assembly downward and adjustable support means attached to the frame in supporting engagement with said bearing assembly for moving the bearing assembly and the lower roll up and down while said biasing means urges the bearing assembly downward, said bearing support for the lower roll having a vertically disposed threaded aperture therein, said adjustable support means for the bearing support member for the lower roll comprising a vertically disposed shaft having a reduced collar formed thereon, a support attached to the frame within which said shaft having its upper end threaded and received in said threaded aperture, and a handwheel attached to said shaft for rotating same so as to adjustably position said bearing support along spaced apart guide members; an upper horizontally disposed roll for pressing engagement with said lower roll to press together the webs and the material sandwiched therebetween; means for mounting the upper roll comprising an end bearing assembly at each end of the upper roll, a pair of vertically extending spaced apart guide members attached to each of said frames and in guiding engagement with each of said bearing assemblies for the upper roll, biasing means associated with said vertically extending spaced apart guide members and urging said bearing assemblies for the upper roll upward; means for supporting the ends of an upper and lower spool of web stock, each of said spool support means being attached to said frame members and comprising a base member pivotally attached to said frame members, a secondary member slidably mounted on said base member, a pair of rollers mounted on said slide member and adapted to rollingly support the end of each spool; means for applying a resistance to the rolling movement of each spool; guide means over which said web from the spool is led to between said rolls; and fluid pressure means associated with each said upper bearing

assembly for applying pressure thereto to urge said upper roll toward said lower roll to apply pressure to the webs and material passing between said rolls.

14. A press for continuously pressing together materials sandwiched between two in-running webs comprising a pair of upright end frames; a horizontally disposed lower roll; means for mounting the lower roll comprising an end bearing assembly at each end of the roll, a pair of vertically extending spaced apart guide members attached to each frame and in guiding engagement with each of said bearing assemblies, biasing means on said spaced apart guides urging said bearing assembly downward and adjustable support means attached to the frame and in supporting engagement with said bearing assembly for moving the bearing assembly and the lower roll up and down while said biasing means urges the bearing assembly downward, said bearing support for the lower roll having a vertically disposed threaded aperture therein, said adjustable support means for the bearing support member for the lower roll comprising a vertically disposed shaft having a reduced collar formed thereon, a support attached to the frame within which said shaft is supported at said reduced portion, said shaft for rotating same so as to adjustably position said bearing support along spaced apart guide members; lock means for holding said control means for said vertical shaft in a set position, said lock means comprising, said control means attached to said shaft comprising a wheel, said lock means comprising a plurality of evenly spaced holes about the periphery of said wheel and a rod reciprocally mounted on said end frame to extend into a selected one of said holes on the periphery of said wheel; an upper horizontally disposed roll for pressing engagement with said lower roll to press together the webs and the material sandwiched therebetween; means for mounting the upper roll comprising an end bearing assembly at each end of the upper roll, a pair of vertically extending spaced apart guide members attached to each of said frames and in guiding engagement with each of said bearing assemblies for the upper roll, biasing means associated with said vertically extending spaced apart guide members and urging said bearing assemblies for the upper roll upward; means for supporting the ends of an upper and lower spool of web stock, each of said spool support means being attached to said frame members and comprising a base member pivotally attached to said frame members, a secondary member slidably mounted on said base member, a pair of rollers mounted on said slide member and adapted to rollingly support the end of each spool; means for applying a resistance to the rolling movement of each spool; guide means over which said web from the spool is led to between said rolls; and fluid pressure means associated with each said upper bearing assembly for applying pressure thereto to urge said upper roll toward said lower roll to apply pressure to the webs and material passing between said rolls.

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