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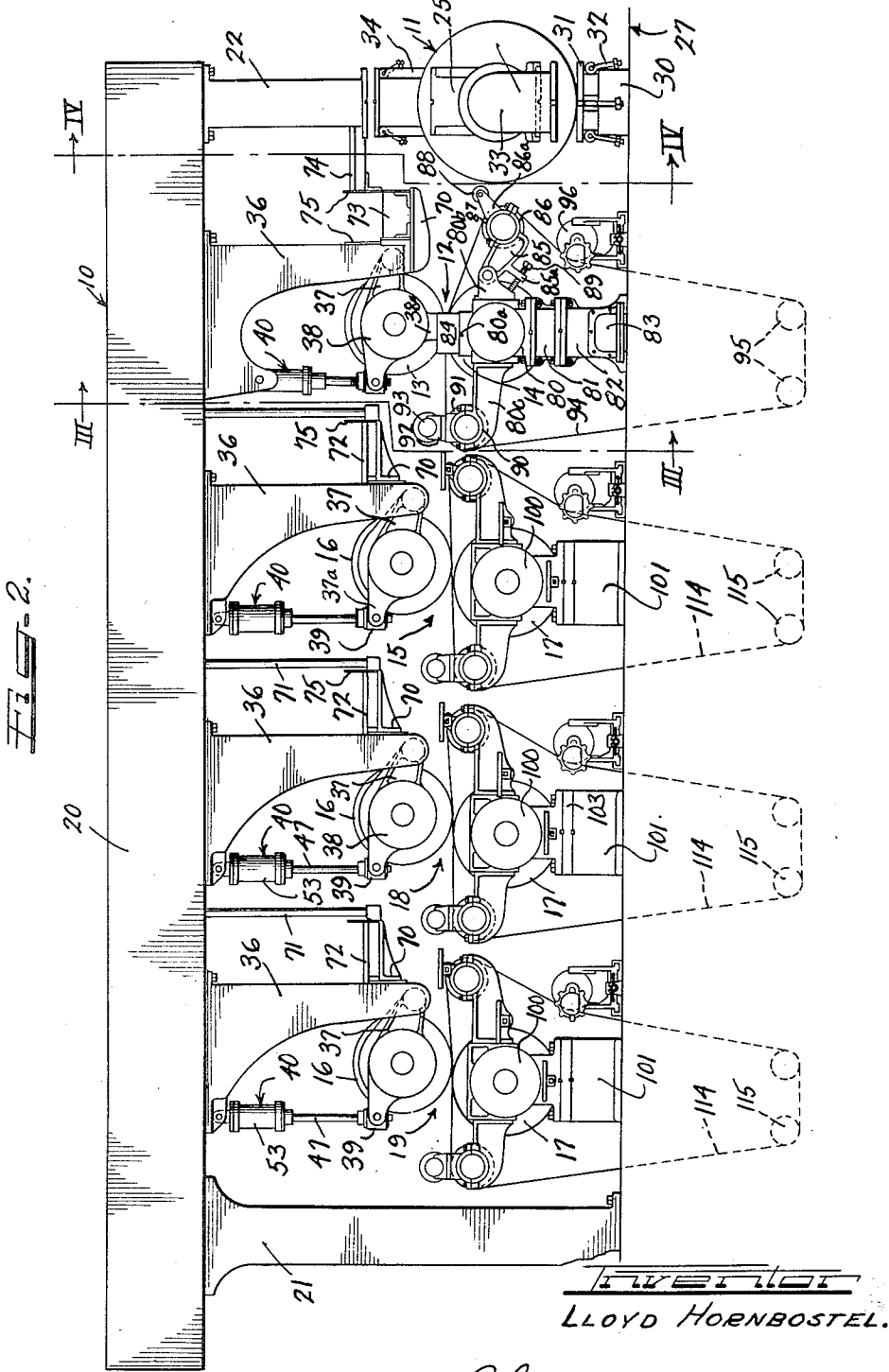
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PAPER MAKING MACHINE

Filed Nov. 30, 1942

9 Sheets-Sheet 2



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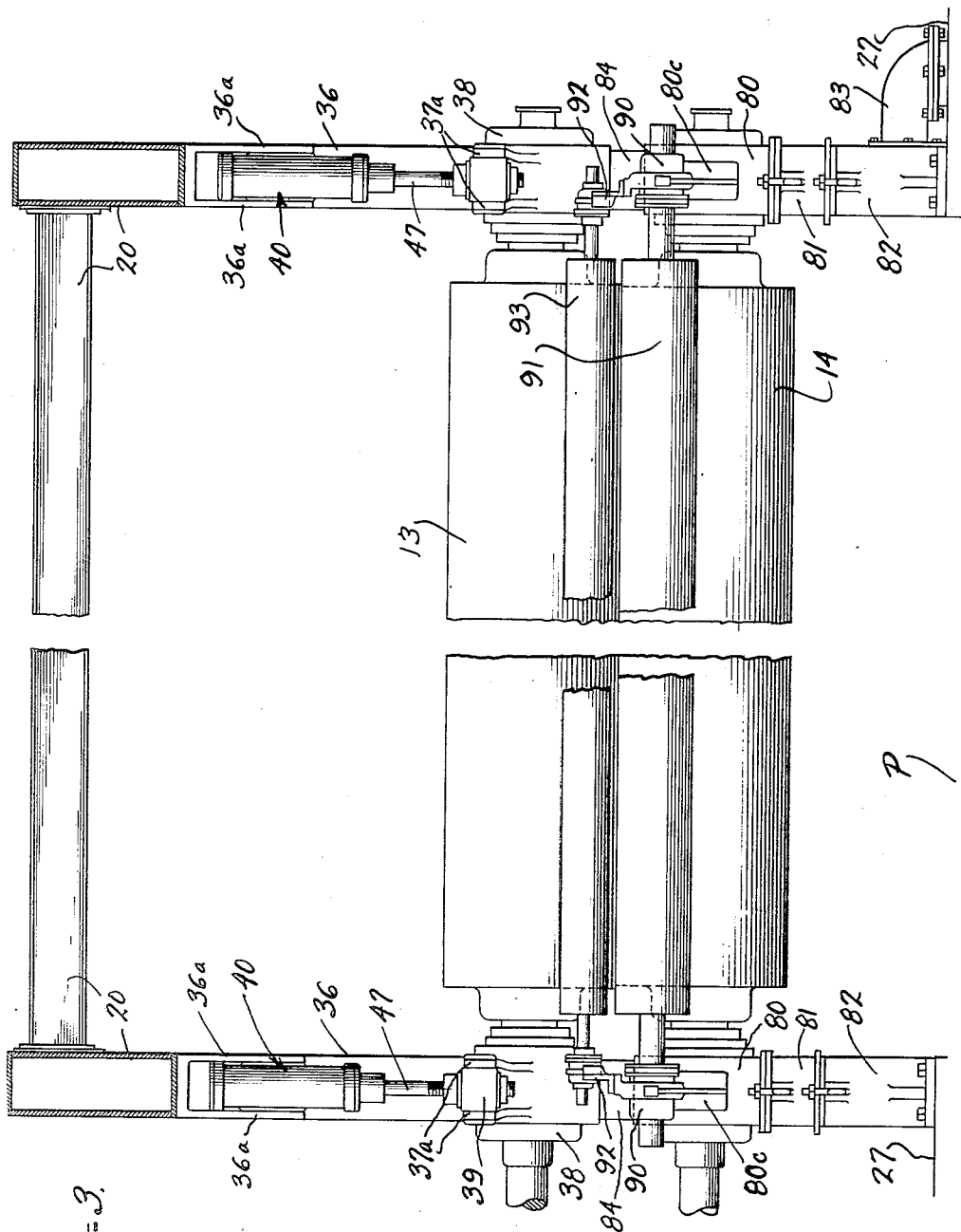


Fig. 3.

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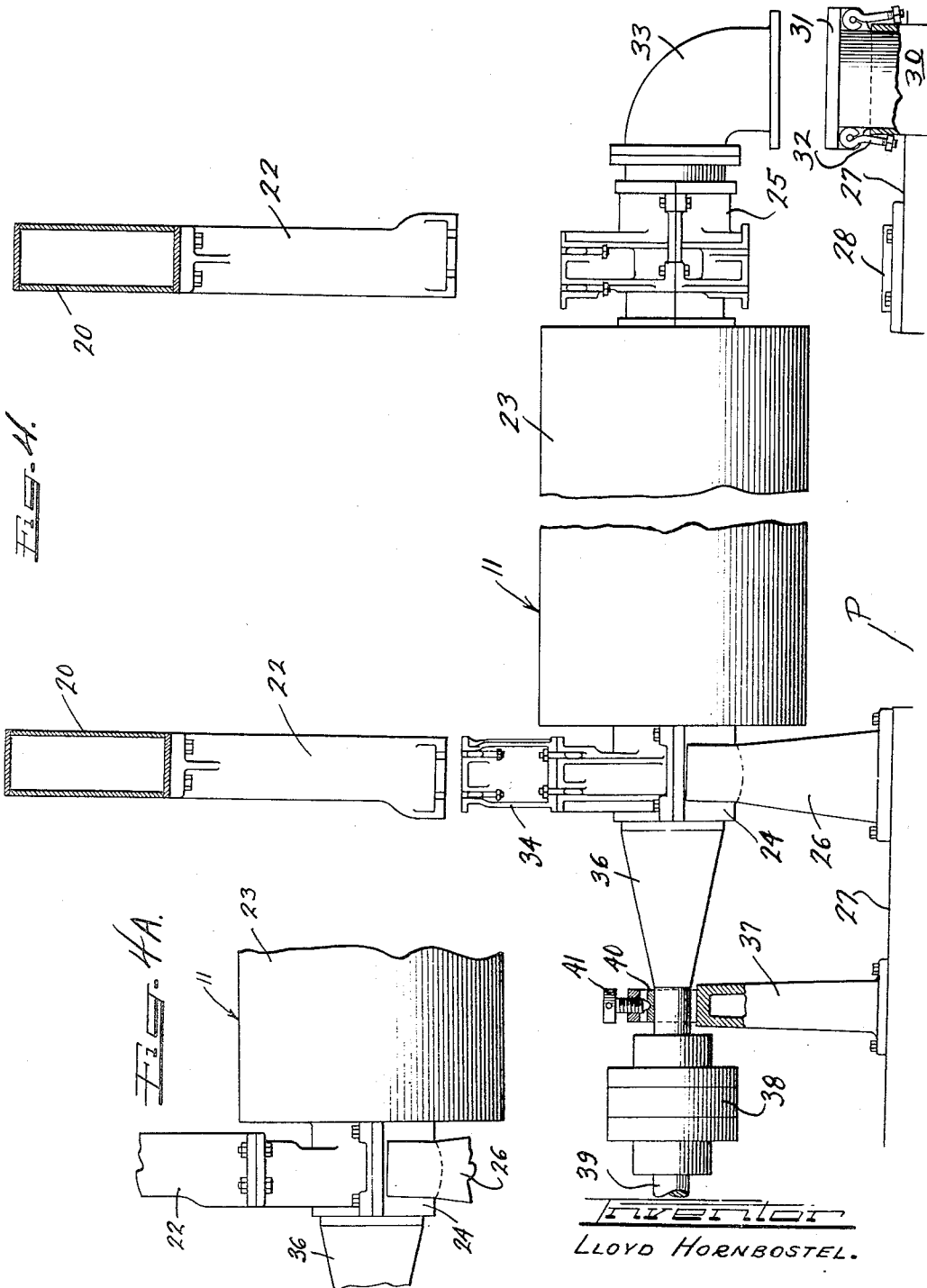
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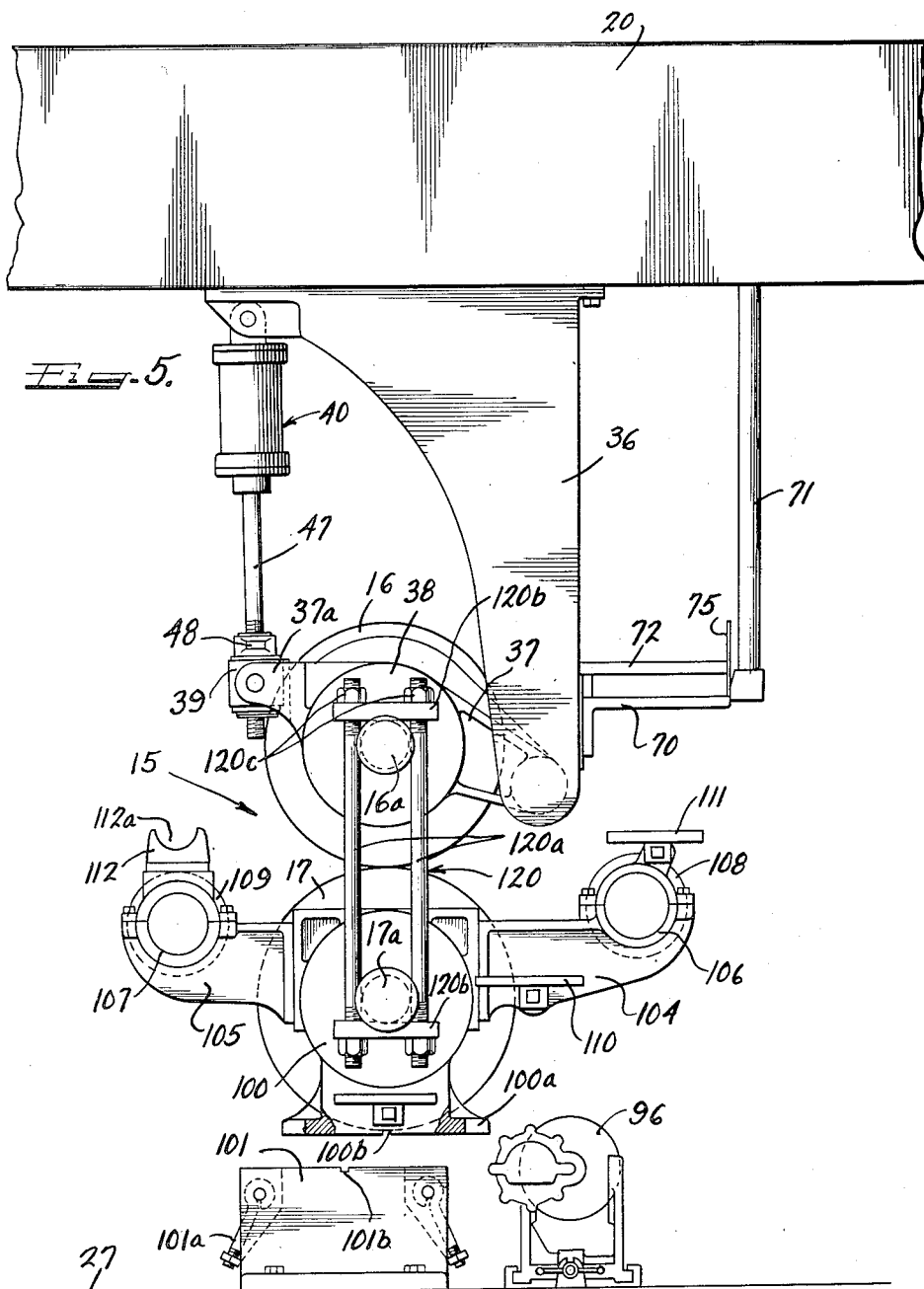
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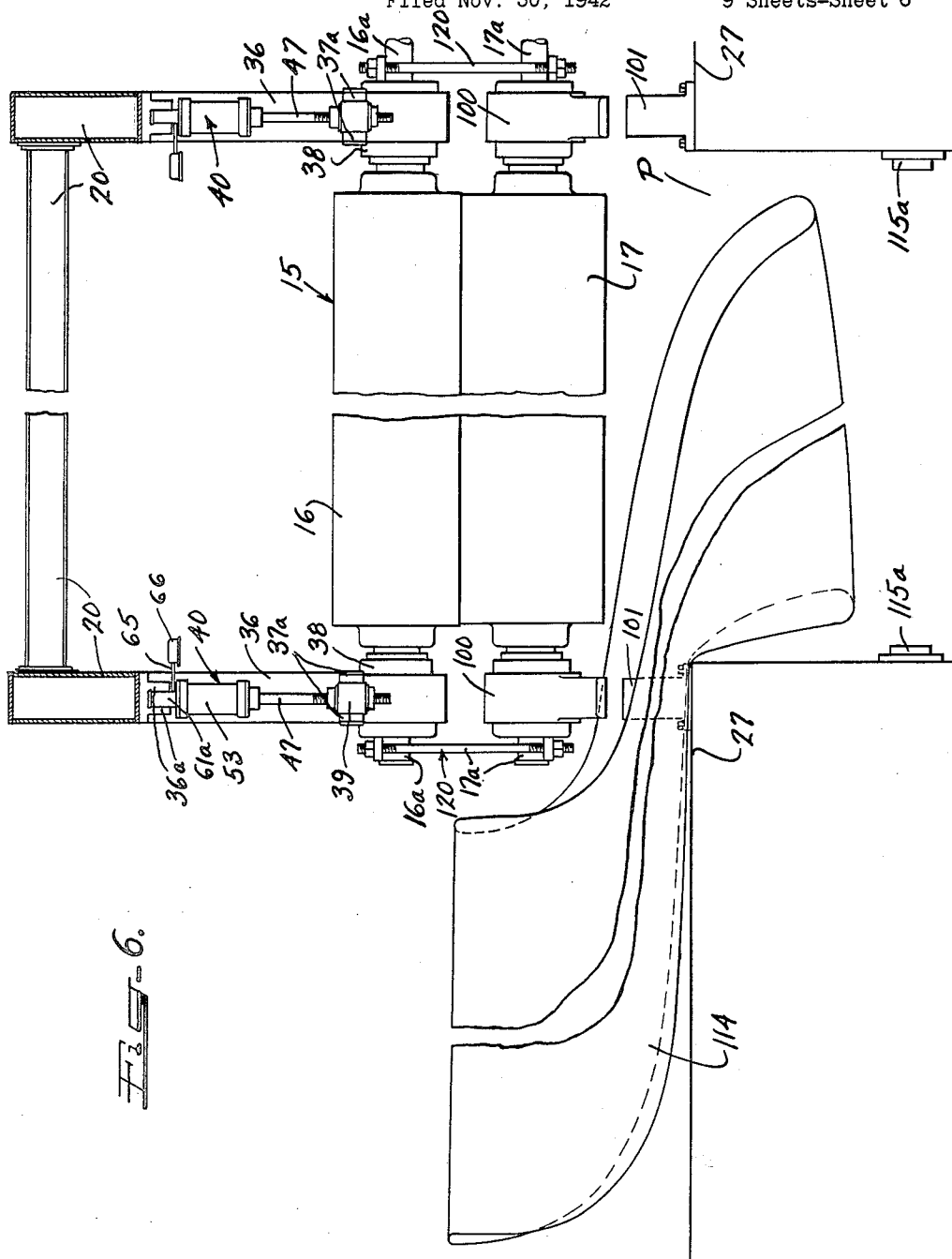
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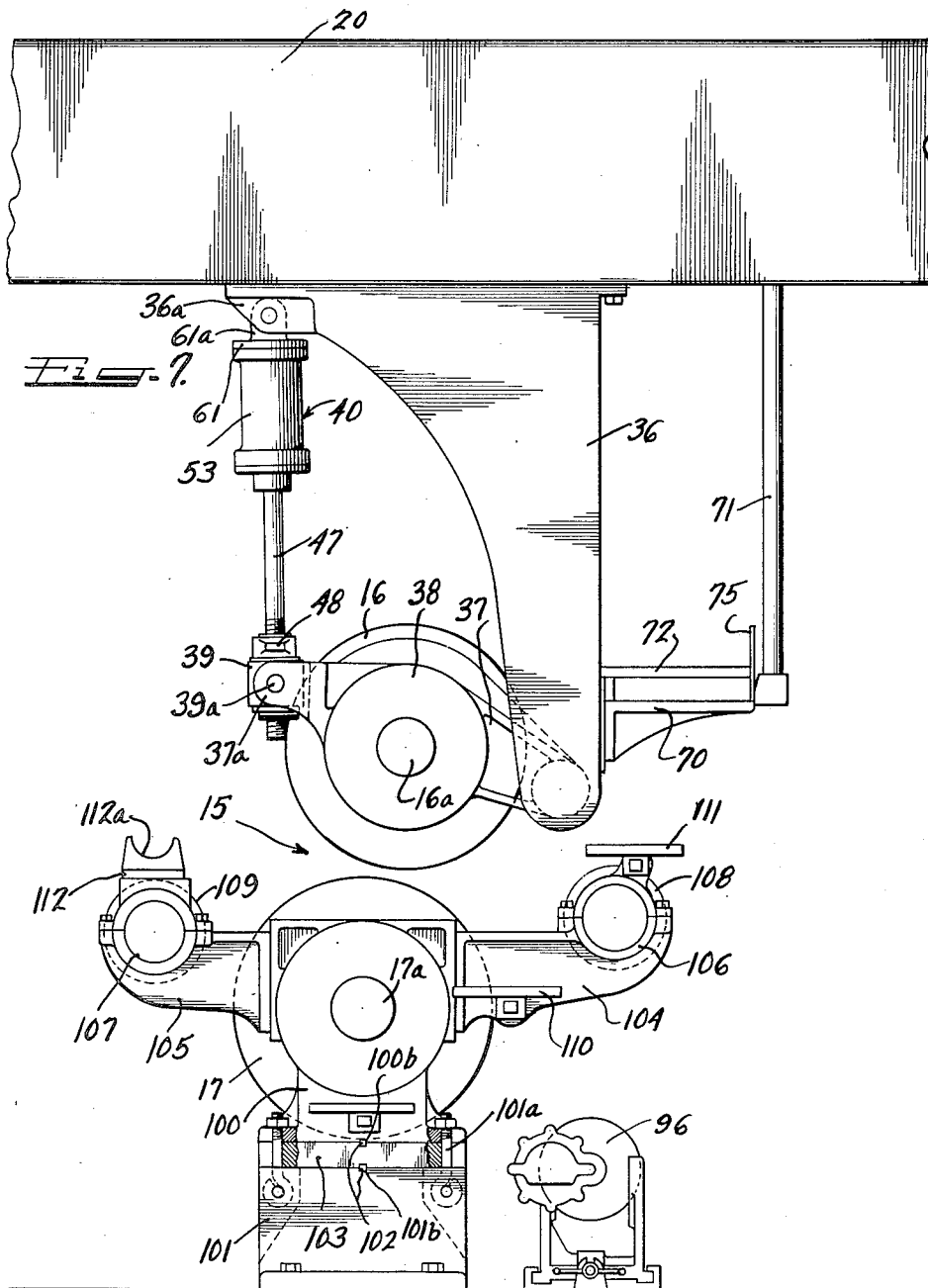
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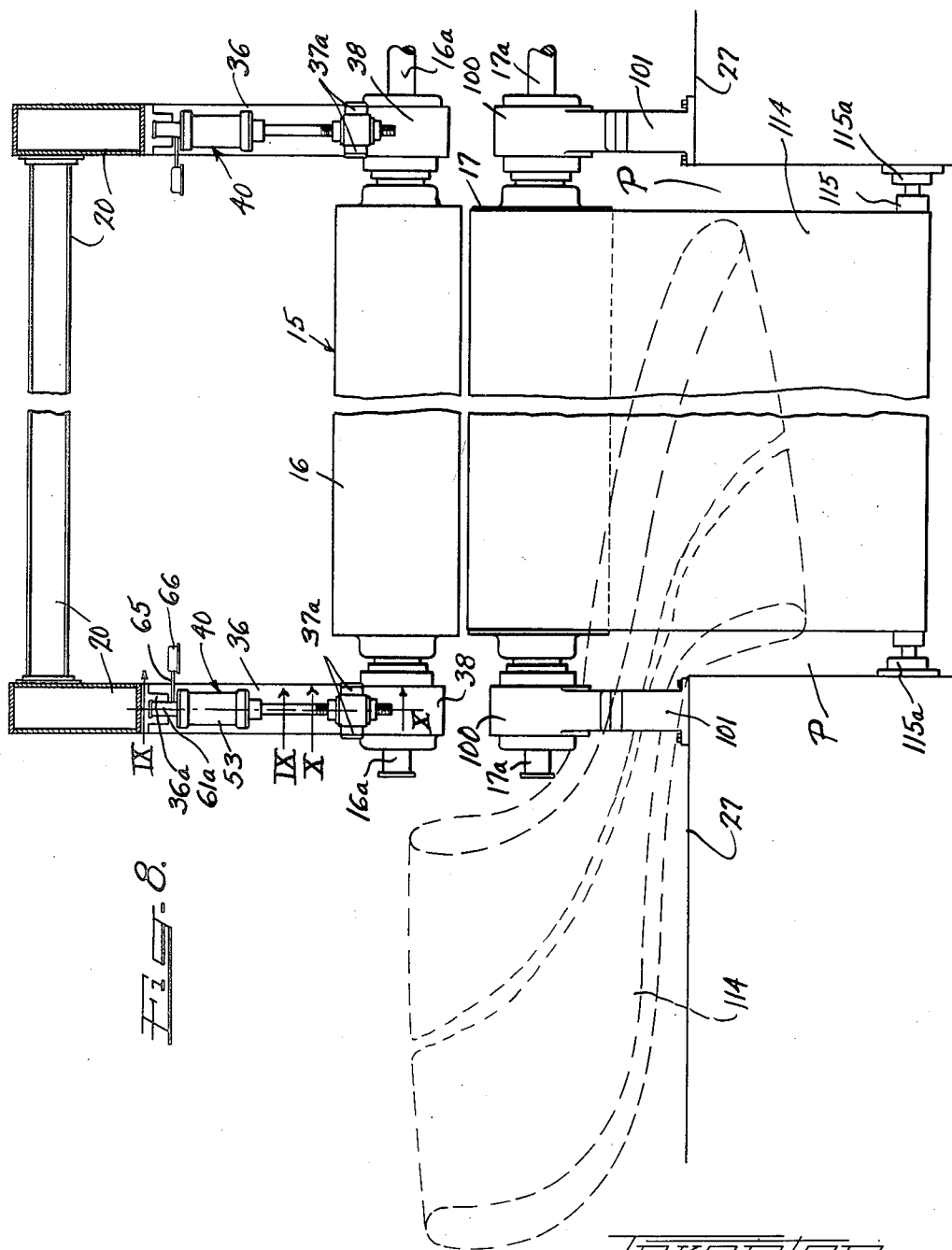


Fig. 8.

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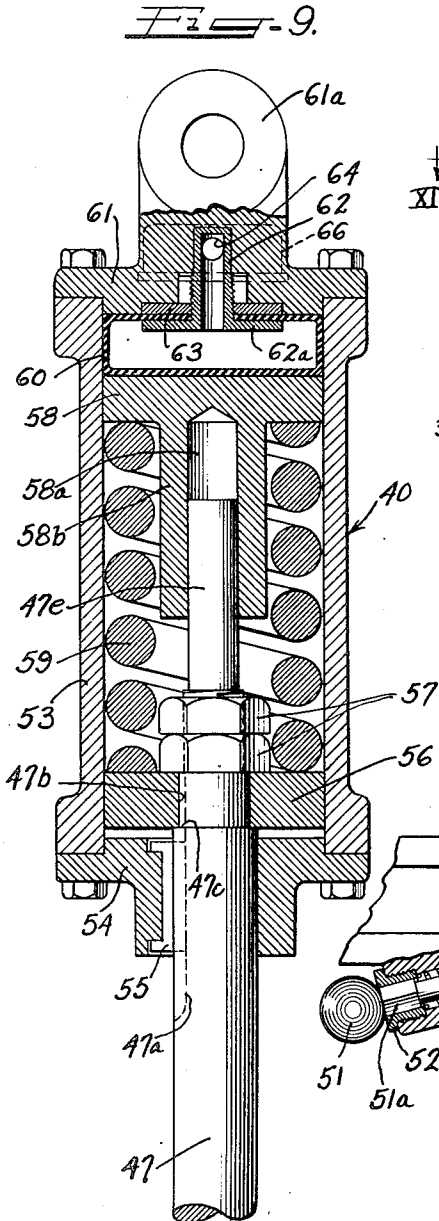
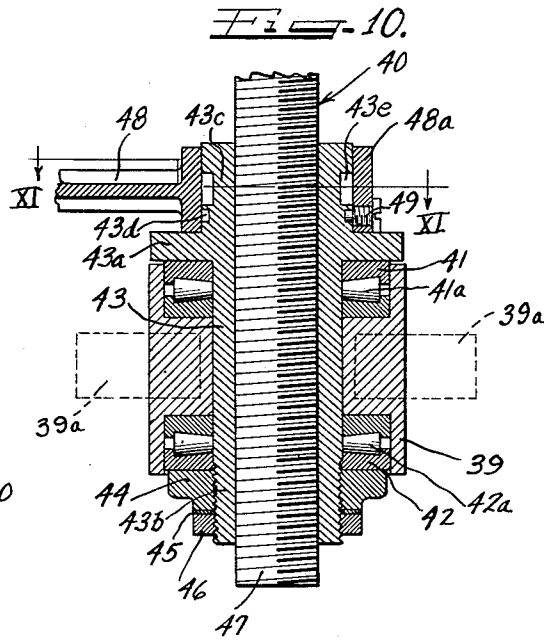
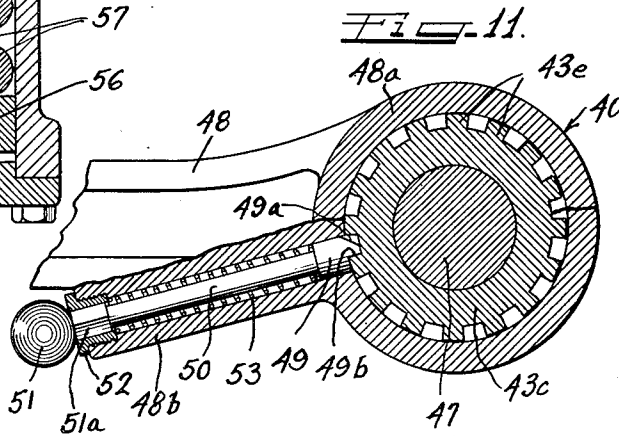
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UNITED STATES PATENT OFFICE

2,367,778

PAPERMAKING MACHINE

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Application November 30, 1942, Serial No. 467,343

16 Claims. (Cl. 92—49)

This invention relates to improvements in the water-removing sections of paper making machines and other analogous deliquefying machines.

More specifically, this invention relates to a press section and couch roll assembly for a paper making machine or the like wherein a series of upper press rolls are suspended from an overhead framework which is supported at one end by uprights on the couch roll framework while the lower press rolls are supported on bottom supports so that no cross-frames or other obstructions pass in front of a sheet of paper as it advances through the section.

A feature of the invention includes the supporting of the overhead framework on uprights carried by the couch roll framework together with an arrangement whereby the load on these uprights can be relieved by raising the top framework to make possible removal of upright sections on the front side of the couch roll assembly whereby the couch roll can be supported in cantilever fashion for a wire-changing operation.

Another feature of this invention involves an arrangement of at least one press in the press section to effect a raising of the overhead framework of the section for the wire changing operation.

Another feature of the invention includes the suspension of pressure-applying devices for the top press rolls from the overhead framework which devices can be reversely operated to raise the lower press rolls off of their bottom supports for press felt changing operations.

Press sections for paper making machines and analogous deliquefying machines have heretofore included a series of side frames providing bearings for the press rolls. These side frames create obstructions which make it quite difficult for an operator to follow the paper through all of the presses and render the threading of the leading edge of the paper through the press section a very difficult and hazardous operation. The present invention now eliminates all obstructions at the sides of the press section by suspending all of the upper press rolls from an overhead framework and by mounting the lower press rolls on bottom supports which do not extend across the plane of the paper. No columns, rods, or other pieces of equipment whatsoever cross the run of the paper from the time it leaves the couch roll until it is out of the press section. With this arrangement, the operator can walk along the front side of the paper machine and readily, without danger, guide the leading end

of the sheet of paper from one press to another.

The press section of this invention is very compact, eliminates lengthy draws of paper between the presses, and includes a couch roll assembly for supporting one end of the overhead framework. One of the presses, preferably the first press is equipped with abutment members on the bearing housings thereof which are adapted to receive blocks therebetween so that the pressure devices for the top press roll of this press can be operated to raise the overhead framework to carry the load of one end of this framework on the bottom supports for this first press. If desired only the front bearing housings of this press need be equipped with abutment members and only one block need be inserted to raise the front side only of the overhead framework. This framework is sufficiently flexible so that it may be cocked to have the front side only raised. The uprights or the front side upright only normally supporting the overhead framework from the couch roll assembly are thus relieved of their loads and removable sections are provided on these uprights permitting the couch roll to be cantilevered for a wire-changing operation.

Each of the bearing housing or axles of the press rolls are adapted to receive links, connecting yokes, or the like structure so that the bottom press rolls of each press can be suspended from the top press rolls to raise the bottom rolls off of their bottom supports and make possible an easy replacement of press roll felts.

It is, then, an object of this invention to provide a water-removing section of a deliquefying machine including upper and lower rolls wherein the upper rolls are suspended from an overhead framework while the bottom rolls are mounted on bottom supports with no frames or other obstructions crossing between the upper and lower rolls.

A further object of this invention is to provide a compact press roll section for a paper making machine wherein only short draws of paper are necessary between the presses.

A further object of this invention is to provide a press roll section for a paper making machine wherein all of the top press rolls are suspended from a top frame, which frame, in turn, is supported by a couch roll framework.

A still further object of this invention is to provide a press section and couch roll assembly which, by manipulation of a press, can relieve the load on the couch framework to make possible a cantilever supporting of the couch roll for re-

placement of a forming wire on the paper making machine.

A still further object of this invention is to provide a water-removing section for a paper making machine including upper and lower rolls wherein the lower rolls can be suspended from the upper rolls for felt changing operations.

Another object of this invention is to provide a press roll assembly including upper and lower press rolls wherein pressure between the rolls is controlled by devices which do not extend across the plane of material passing through the press.

Another object of this invention is to provide a press for a paper making machine wherein a lower press roll is supported on bottom supports terminating below the run of the paper and wherein an upper press roll is suspended from an overhead framework on supports which terminate above the run of the paper together with pressure-applying devices likewise suspended from the overhead framework and terminating above the run of the paper.

Other and further objects of this invention will be apparent to those skilled in the art from the following detailed description of the annexed sheets of drawings which, by way of preferred example, illustrate one embodiment of the invention.

On the drawings:

Figure 1 is a fragmentary side elevational view of a paper making machine showing the couch roll and press section assembly of this invention in operative paper making position.

Figure 2 is a view similar to Figure 1 but illustrating the assembly in position for a wire-changing operation.

Figure 3 is a broken transverse cross-sectional view, on a larger scale, and with parts in elevation, taken along the line III—III of Figure 2.

Figure 4 is a broken transverse cross-sectional view, on a larger scale and with parts in elevation, taken along the line IV—IV of Figure 2.

Figure 4a is a fragmentary elevational view of a portion of the rear side support structure for the couch roll end of the overhead frame according to an alternate arrangement wherein the overhead frame is only raised at the front side for wire change.

Figure 5 is a fragmentary side elevational view of one of the plain presses in the press section shown in Figures 1 and 2 illustrating the manner in which the upper press roll can support the lower press rail for a felt-changing operation.

Figure 6 is a transverse cross-sectional view of the suspended press shown in Figure 5 illustrating the manner in which a new felt can be mounted around the front bearing of the suspended lower roll.

Figure 7 is a fragmentary side elevational view of the press shown in Figure 5 but illustrating the bottom press roll supported on its bottom supports and the top press roll separated from the bottom press roll to position the assembly for completion of the felt-replacement operation.

Figure 8 is a transverse cross-sectional view, with parts in elevation, illustrating the completion of the felt-changing operation with the press in the position shown in Figure 7.

Figure 9 is an enlarged vertical cross-sectional view, with parts in elevation, of one of the pressure-applying devices taken along the line IX—IX of Figure 8.

Figure 10 is an enlarged fragmentary vertical cross-sectional view, with parts in elevation, of

another portion of the pressure-applying device taken along the line X—X of Figure 8.

Figure 11 is a horizontal cross-sectional view, with parts in elevation, taken along the line XI—XI of Figure 10.

As shown on the drawings:

In Figures 1 and 2 the reference numeral 10 designates generally a couch roll and press section assembly according to this invention including a couch roll assembly 11, a first suction press 12 composed of a plain top press roll 13 and a bottom suction press roll 14, a first plain press 15 composed of a plain top roll 16 and a plain bottom roll 17, a third plain press 18 likewise is composed of plain top and bottom rolls 16 and 17, and a third plain press 19 also composed of plain top and bottom rolls 16 and 17. It should be understood that, while one suction press 12, and three plain presses 15, 18 and 19 have been illustrated, this invention includes any combination of plain and suction presses, or any number of plain presses alone as well as any number of suction presses alone.

The couch roll assembly and press section 10 of this invention includes an overhead framework 20 composed of longitudinal and transverse horizontal beams as shown in Figures 1 to 4. This overhead framework is supported at the end thereof remote from the couch roll assembly 11 on floor-mounted uprights such as 21. The other end of the overhead framework 20 is supported on uprights 22 normally carried by the framework for the couch roll assembly 11.

As shown in Figure 4, the couch roll assembly 11 is of the cantilever type including a suction couch roll 23 mounted on rear bearings 24 and front bearings 25. The rear bearings 24 are carried by a pedestal 26 secured to the flooring or base 27 on the rear side of the pit P. The flooring or base 27 on the front side of the pit P supports a base mounting 28 which, as shown in Figure 1, carries a removable block 29 for supporting the front bearing 25. A suction conduit 30 can extend through the flooring 27 and has a telescoped connecting portion 31 with swing bolts 32 adapted to be secured to an elbow pipe 33 for connecting the interior of the suction couch 23 with a source of vacuum. As is evident from Figures 1 and 4, the supporting block 29 is removable when the load on the front bearing 25 is removed therefrom as will hereinafter be more fully explained and the swing bolts 32 are detachable from the elbow pipe 33 to permit the section 31 to be telescoped into the pipe 30 and open up a gap between the pipe sections.

The upper portions of the bearings 24 and 25 also carries swing bolts for securing thereon removable blocks 34 and 35 as shown in Figures 1 to 3. The upper ends of these blocks 34 and 35 carry swing bolts for attachment to the lower ends of the pedestals 22.

The couch roll assembly 11, as shown in Figure 4, includes a rearwardly extending drive portion 36 which extends through a mounting 37 and can be coupled by means of a coupling 38 to a drive shaft 39. The mounting 37 includes a vertically shiftable bearing 40 controlled by a pin 41. When the weight of the overhead framework 20 is removed from the couch roll bearings 24 and 25 the pin 41 can be manipulated to raise the front end of the couch roll assembly for supporting the couch roll in cantilever position whereby the front blocks are readily removable and the suction conduits readily opened to permit re-

placement of the paper machine forming wire F. W. (Figure 1).

In normal operation of the paper machine, however, the weight of the framework 20 is borne at one end on the uprights 21 and is borne on the other end through the uprights 22, removable blocks 34 and 35, bearings 24 and 25, support 26, block 29, and support 28. Thus the framework for the couch roll assembly 11 normally supports one end of the overhead framework for the press section but this support is so constructed and arranged that the couch roll can be mounted in cantilever fashion for a wire changing operation whenever the load of the overhead framework is relieved from the couch roll framework.

The uprights 22 are bolted or otherwise affixed to the couch roll end of the overhead framework 20 so that these uprights will always move with the framework.

In the alternative arrangement shown in Figure 4a, the rear side upright 22 is longer than the front side upright and extends down onto the rear bearing 24 of the couch assembly, no block 34 being used. In this arrangement the weight of the rear side of the overhead frame 20 is always carried by the couch and the frame 20 is raised on its front side only for the wire change. As shown in Figures 1, 2, 3, 5, 6, 7 and 8, the overhead framework 20 carries, between the pedestals 21 and 22, a pair of depending frames or supports 36 for each press 12, 15, 18 and 19. Each frame 36 pivotally supports at its lower end one end of an arm 37. The arm 37 carries bearing housings 38 for the top rolls 13 and 16 of each press. These top rolls are thus rotatably mounted between arms 37 which arms, in turn, are pivotally mounted at one end on overhead frame carried supports 36.

The ends of the arms 37 which are not pivoted to the supports 36 are preferably bifurcated or yoked as at 37a (Figures 3, 6 and 8) and receive therebetween the blocks 39 of pressure-applying devices 40. As shown in Figures 1, 2, 6 and 8, a pressure-applying device 40 is pivotally suspended from the upper portion of each support 36 so that each arm 37 is controlled by a device 40.

The device 40 is best illustrated in Figures 9 to 11 as including the block 39 with side pins 39a adapted to seat in pivot holes of a yoke end 37a of the arm 37. Bearings 41 and 42 are respectively seated in recesses in the top and bottom of the block 39. These bearings preferably have tapered rollers 41a and 42a respectively.

A sleeve member 43 projects through the block 39 and has an integral collar 43a covering the top bearing 41. The lower end 43b of the sleeve 43 projects beyond the bottom of the block 39 and the projecting portion is threaded to receive a nut 44 for abutting the bottom of the lower bearing 42. A lock washer 45 and lock nut 46 can also be disposed around the threaded portion of the sleeve to lock the nut 44 in position. The sleeve is internally threaded and receives in threaded relation therewith a threaded rod 47.

The sleeve 43 has a neck portion 43c above the collar 43a receiving therearound the eye end 48a of an operating arm 48. This operating arm is swingable around the neck portion and is held thereon by means of a pin 49 seating into an annular groove 43d around the neck portion as best shown in Figure 10.

The neck portion 43c has a ring of vertical teeth 43e therearound adapted to be acted on by a spring-pressed dog 49 on the end of a plung-

er rod 50 which is carried in a boss portion 48b of the operating arm 48.

The rod 50 can conveniently have a ball-operating handle 51 with a square neck portion 51a seatable in the square aperture of a nipple 52 which is threaded into the end of the boss 48b. A spring 53 can be held under compression between the nipple 52 and the dog 49 so as to force the dog inwardly into the space between the teeth 43e of the sleeve.

The dog 49 has a beveled leading end portion 49a adapted to ratchet over the teeth 43e in one direction together with a tooth-abutting shoulder 49b opposite the beveled portion 49a to lock against an adjacent tooth 43e. In this manner the arm 48 can be reciprocated to effect rotation of the sleeve 43 in one direction relative to the block 39. The ball knob 51 can then be manually grasped to retract the dog 49 from engagement with a tooth 43e and to remove the square neck 51a from the nipple 52. When thus retracted, the ball knob can be rotated 180° and released to seat the square neck 51a back into the nipple 52. In this position, however, the beveled edge 49a of the dog 49 will be reversed and reciprocation of the arm 48 will effect rotation of the sleeve in the opposite direction. A reversible ratchet arrangement is thus provided.

As shown in Figures 1, 2, 6 and 7, the rod 47 of each pressure-operating device 40 extends upwardly from the block 39 into a cylinder 53. As best shown in Figure 9, the cylinder 53 has a bottom cap 54 bolted thereon which carries a key 55 slidable in a keyway 47a in the rod 47. This key and keyway prevent rotation of the rod.

The rod 47 projects into the interior of the cylinder 53 and has a reduced portion 47b receiving a piston 56 therearound. A shoulder 47c is provided at the base of the reduced portion 47b to bottom the piston 56. The reduced portion 47b can be threaded to receive nuts 57 thereon for securing the piston to the rod.

A still further reduced portion 47e is provided on the rod 47 projecting centrally of the chamber defined by the cylinder 53 above the threaded portion receiving the nuts 57. This portion 47e is slidable in the bore 58a of a shank 58b on a second piston 58. The piston 58 is slidably mounted in the cylinder 53.

A coiled spring 59 is held under compression between the pistons 56 and 58 in the cylinder 53 and urges the rod 47 and its pilot portion 47e away from the piston 58 by acting through the piston 56. A fluid-tight bladder or sack 60 is mounted in the cylinder 53 above the piston 58. This sack or bladder 60 is held in the cylinder by means of a top cap 61 having a mounting ear 61a thereon through which a pivot pin can be passed to suspend the cylinder from its supporting member 36.

The cap 61 is recessed to receive a stem member 62 which passes into the sack 60 and has a head 62a adapted to engage a wall of the sack. A nut 63 is threaded on the stem 62 to clamp the bladder between the head 62a and nut so as to seal the aperture through which the stem extends into the bladder.

The interior of the stem 62 communicates with a bore 64 in the end cap 61. This bore 64 of the end cap receives a tube 65 as shown in Figure 8 leading to a pressure indicating gauge 66.

The sack or bladder is filled with pressure-transmitting fluid such as oil or glycerin so that, whenever the piston 58 compresses the bladder or sack, fluid pressure will act on the gauge 66 to

give a visual indication of the pressure developed in the sack. The sack is preferably made of rubber, a flexible synthetic plastic, leather or the like.

Since the rod 47 is keyed against rotation, and since the cylinder 50 is held against rotation by naving the ear 61a on its top cap pivoted between fingers 36a on its support 36, a rotation of the sleeve 43 by reciprocation of the operating arm 48 will raise or lower the sleeve to carry the block 39 therewith. The block 39, however, will not rotate since it is mounted on the bearings 41 and 42 and locked against rotation on the pins 39a between the yoke 37a on the end of the arm 37. As a result of manipulation of these pressure devices 40, therefore, the arms 37 will be raised and lowered about their pivot points to raise and lower the top roll 13 or 16 of each press. Whenever the top press roll of a press is lowered into pressure engagement with its cooperating bottom roll 14 or 17, the exact degree of pressure in the nip between the rolls can be carefully controlled and measured since the spring 59 in each pressure device will be compressed in accordance with the degree of pressure built up between the rolls. This compressing pressure will be transmitted to the sack 60 and the fluid therein will indicate the pressure in the gauge 66. As a result of this construction, therefore, the nip pressure in each press can be carefully controlled and is at all times known. Both ends of each top press roll can be regulated so as to maintain a uniform nip pressure across the entire length of the nip.

As shown in Figures 1, 2, 5 and 7, the support members 36 can have horizontal beams or brackets 70 mounted near their lower ends projecting laterally therefrom. Rods or pipes 71 depend from the top framework 20 and are secured at their lower ends to the ends of the brackets or beams 70. Cat walks 72 can be built up on top of this supporting structure provided by the beams and rods 70 and 71 permitting the operators to inspect the presses during operation and to make adjustments.

The suction press 12 can have the free end of the beam 70 carry a step 73 which is secured to a catwalk 74 carried by the pedestals 22. Hand rails 75 can be provided if desired adjacent the catwalks.

As shown in Figures 1 and 2, the suction roll 14 of the suction press 12 has the end bearing housings 80 thereof mounted on removable blocks 81 which blocks in turn are removably mounted on floor-carried base pedestals 82. The removable blocks 81 are secured to the bearing housings 80 and pedestals 82 respectively by means of swing bolts.

The front side of the suction roll has a hollow bearing housing, a hollow removable block, and a hollow base pedestal the interiors of which are connected to a source of suction through a conduit 83. In this manner the interior of the suction roll is evacuated through the suction passages connecting the suction conduits with the interior of the suction gland in the roll (not shown).

The bearing housings 80 have abutment portions 80a built on the top thereof adapted to receive removable blocks 84 (Figures 2 and 3). The bearing housings 38 on the cooperating top press roll 13 of the suction press 12 likewise have abutments 38a projecting downwardly therefrom to rest on top of the removable blocks 84. When the press section is in operative paper making position, as shown in Figure 1, the blocks 84 are, of course,

removed. However, when it is desired to change the forming wire F. W. on the couch roll 23, the blocks 84 are placed on the abutments 80a of the bearing housing 80 and the pressure devices controlling the top roll 13 are operated to bring the abutments 38a of the top roll bearing housing 38 into engagement with the blocks 84. The swing bolts connecting the pedestals 22 with the blocks 34 and 35 are released and the pressure devices 40 are actuated so as to raise the overhead framework 20 as shown in Figure 2 for relieving the load on the blocks 34 and 35. These blocks can then be removed as described above in connection with Figure 4 and the couch roll assembly can be placed in cantilever mounted position for the wire-changing operation.

If the rear side couch support arrangement of Figure 4a is used the rear bearing housings 38 and 80 of the suction press 12 need not have the abutment portions 38a and 80a and the rear block 84 is not used since the front block 84 alone is sufficient to support the front side of the overhead frame 20 during the wire change. In this arrangement the rear side of the overhead frame is not raised but the inherent flexibility of the structure will prevent cocking sufficiently to relieve the load on the front side of the couch so that it may be cantilevered.

The bearing housing 80 for the suction roll 14 also have laterally projecting arms 80b and 80c respectively, as shown in Figures 1 and 2. The arms 80b pivotally support arms 85 of bearing housing 86 which carry a felt guide roll 87. These bearing housings 86 also carry additional arms 86a which rotatably support a paper roll 88 for receiving the web W from the couch roll 23 to guide it to the first press 12.

The arms 85 have depending fingers 85a receiving bolts 89 therethrough which bolts are adapted to abut against the arms 80b for controlling the level of the felt guide roll 87 and roll 88.

The arms 80c on the bearing housing 80 project toward the first plain press 15 and have bearing housing 90 on the ends thereof rotatably supporting a felt guide roll 91. These bearing housings 90 additionally carry upright arms 92 which rotatably support a paper roll 93. An endless felt 84 is trained in an open loop around the guide rolls 87 and 91 over the suction press roll 14. One or more bottom guide or tensioning rolls 95 is provided in the basement or pit under the flooring, 27. An external felt guide roll 96 is also mounted on the floor 27 to act on the outside of the felt loop before the felt reaches the guide roll 87. This roll 96 can be provided with a felt centering attachment to cause the felt to run true.

As shown in Figure 1, the web W is received from the couch roll 23 by the roll 88 and passes under this roll onto the felt 94 on which it is guided through the nip of the suction press 12. The web is then stripped from the felt 94 and passes over the paper roll 93 to the felt of the first plain press 15. The paper roll 93 functions to support the web as it passes from one press to another while keeping the web off of the felts as much as possible.

The bottom roll 17 of the plain presses 15, 18 and 19 are of identical construction and only one will be described.

As shown in Figures 1, 2, and 5 to 8, the plain presses, such as the first plain press 15, has the bottom roll 17 thereof equipped with bearing housings 100 on the ends thereof, which bearing housings are supported by floor mounted ped-

estals or stands 101. As shown in Figures 6 and 8, the pedestals 101 are mounted on the flooring 27 adjacent each side of the pit P.

As shown in Figures 5 and 7, the pedestals 101 are equipped with swing bolts 101a which are adapted to be seated in slots 100a in the bases of the bearing housing 100 to mount the bearing housings on the pedestals. Keyways 100b and 101b can be provided in the mating surfaces of the bearing housings 100 and pedestals 101 to receive keys 102 for holding the bearing housings in proper alignment on the pedestals. If desired, and as shown in Figures 1, 2 and 7, the pedestals 101 can have plates 103 mounted thereon and equipped with keyways in both the top and bottom surfaces thereof so as to register with the keyways 101b and 100b and receive the keys such as 102 and to be held in proper alignment between the bearing housing bases and the pedestals. These plates 103 are then completely removable from between the pedestals and bearing housing bases as indicated in Figure 5 for a felt-changing operation. However, the plates 103 could be dispensed with and the pedestals 101 could directly receive the bearing housings 100 thereon.

The bearing housings 100 each have laterally projecting arms 104 and 105 providing bearing supports 106 and 107 on their ends for felt guide rolls 108 and 109. The arm 104 can also have a step 110 mounted thereon at a level beneath the roll 108 while a second step 111 can be mounted on the bearing 106 to facilitate access to the catwalk 72.

The bearing housings 107 have upwardly projecting arms 112 which are recessed as at 112a to receive the axles or bearings on the axles of a paper roll 113, as shown in Figures 1 and 2. The roll 113 functions the same as the roll 93 to support the web as it passes from press to press while keeping it off the felts.

As also shown in Figures 1 and 2, an endless felt 114 is provided for each plain press 15, 18 and 19 and is guided around the felt guide rolls 108 and 109 and around bottom guide rolls 115 mounted in the pit P beneath the floor level 27.

External guide rolls 96 described in connection with the suction press 12 are also provided to coact with the felts 114 for guiding the same onto the first inside guide rolls 108. These external guides 96 can be equipped with felt centering devices to cause the felt to run true.

As best illustrated in Figures 5 to 8, the axles 16a and 17a on both the upper and lower press rolls 16 and 17 can extend through the bearing housings 38 and 100 respectively on both the front and rear ends thereof or the front bearing housings 38 and 100 can have nubbin-like extensions thereon.

When it is desired to place a felt on a press such as the press 15 the swing bolts 101a are released from clamping engagement with the bearings 100 and with the interposed plates 103 and are swung down to an out of the way position in the pedestals 101 as shown in Figure 5. The pressure devices 40 are then operated to lower the top press roll 16 onto the bottom press roll 17. Slings 120, which can be conveniently composed of a pair of rods 120a threaded on their ends and receiving cross bars 120b over their threaded ends together with nuts 120c threaded onto the rods holding the cross bars thereon, are placed over the axles 16a and 17a projecting from both the front and rear bearing housings 38 and 100. The pressure devices 40

are then operated by manipulation of their actuating handles 48 after positioning the latching dog as explained hereinabove in connection with Figures 9 to 11, for raising the entire bottom roll assembly off of the pedestals 101 as shown in Figures 5 and 6. The plates 103 are then removed from between the pedestals and bottom roll bearing housings if the plate construction is used or, alternatively, the bottom roll assemblies can be raised sufficiently to open up a gap between the bottom roll bearing housings and the supporting pedestals.

The paper roll 113 on the press assembly is removed from its mounting 112a as illustrated in Figure 5, and the bottom guide rolls 115 are removed from their mountings 115a in the pit P as illustrated in Figure 6.

The felt 114, as illustrated in Figure 6, is usually furnished in bundle form similar to a blanket which bundle is opened up in the aisle provided by the flooring 27 adjacent the front side of the paper machine.

The leading end of the felt is opened to form an open loop which is fed through the gap provided between the supporting pedestal 101 and the front bearing 100 for the bottom roll assembly as shown in Figure 6, to position the leading end of the felt in the pit P. The sides of the loop are positioned on opposite sides of this pedestal 101.

With the felt in this partially opened up position, the plates 103 are remounted on the pedestals 101 and the pressure devices 40 are actuated to lower the bottom roll assembly back onto the plates or directly onto the pedestals as illustrated in Figure 8.

The swing bolts are next swung into position to mount the bottom roll assembly in fixed position back onto the supporting pedestals 101 and the slings 120 are removed from the axles 16a and 17a.

The pressure devices are then again actuated to raise the top roll 16 off of the bottom roll 17 as shown in Figure 8 and open up a gap between these rolls. The portion of the felt bundle which remains in the aisle can then be opened up into a loop as shown in dotted lines in Figure 8. This opened up loop is then slid onto the bottom press roll 17 through the gap between the rolls 16 and 17.

The bottom guide rolls 115 are then remounted on their supports 115a in the pit P and the felt is tensioned into operative position as shown in Figures 1 and 2.

While the felt changing operation has only been described in connection with the plain press 15, it is, of course, to be understood that this same operation is involved in the changing of felts for all of the other plain presses and for the suction presses as well. The suction press 12 is equipped with axles or extensions adapted to receive slings such as 120 to permit a raising of the bottom suction roll 14 by the upper roll 13. The blocks 81 of this suction roll as shown in Figure 3 are removable to provide a gap through which the new felt can be inserted.

From the above descriptions it will be understood that this invention not only provides a compact dewatering section for a paper making machine which is free from obstructions passing the plane or run of the paper through the section, but is also arranged and constructed so that suspended top roll assemblies can be utilized to raise the entire section for permitting a couch roll structure to be mounted in cantilever

position for a wire changing operation as well as for lifting the bottom roll assemblies for felt changing operations.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. A water removing section for a paper machine comprising a cantilever type couch roll assembly, end frames supporting said assembly, a top frame, front and rear side supporting uprights carried by said top frame adapted to be mounted on said end frames of the assembly, upper rolls suspended from said top frame, lower rolls cooperating with said upper rolls, bottom supports for said lower rolls, and means for thrusting upper roll structure against lower roll structure for raising said top frame to relieve the load on said front side upright whereby the couch roll assembly can be supported in cantilever position without carrying the load of the top frame on the front side thereof.

2. A roll section adapted for a paper making machine comprising an elongated top frame, uprights supporting one end of said top frame, a roll assembly supporting the other end of said top frame, a plurality of upper roll structures suspended from said top frame, a plurality of cooperating lower roll structures under said top frame, including supports extending upwardly to levels beneath the lower levels of the upper rolls, means suspended from the top frame urging the upper rolls into pressure relation with their cooperating lower rolls whereby material passed between the upper and lower rolls is pressed while laterally unobstructed, and said means suspended from the top frame being effective for pressing an upper roll structure on a lower roll structure to raise said top frame to relieve the load on the roll assembly at one end thereof.

3. A press section and couch roll assembly for a paper making machine comprising a top frame, a couch roll structure supporting one end of said top frame, an upper press roll structure suspended for vertical movement from said top frame, a lower press roll structure adapted to cooperate with said upper press roll, supports for said lower press roll structure terminating in spaced relation from the upper press roll structure, and means for vertically moving said upper press roll structure to thrust against said supports for raising the top frame to relieve the load on the couch roll assembly.

4. A press section and couch roll assembly for a paper making machine comprising a couch roll, bearing housings on the ends of said couch roll, bottom supports for said bearing housings, the bottom support for the bearing housing on the front side of said couch roll being removable, uprights removably mounted on said bearing housings, a top frame supported on said uprights, a top press roll structure suspended from said top frame, means for vertically moving said top press roll structure, a bottom press roll adapted to cooperate with the top press roll, bottom supports for said bottom press roll, and means insertible between said bottom supports and said top roll structure whereby said top roll structure can be thrust against said means to raise the top frame for lifting the uprights away from

the couch roll bearing housings, and means for supporting the couch roll in cantilever position whereby the removable support for the front couch roll bearing housing can be removed.

5. A couch roll assembly and press section for a paper making machine comprising a couch roll frame, uprights detachably carried by said frame, a top frame supported on said uprights, a plurality of top press rolls suspended from said top frame, means swingably mounting said top press rolls, bottom press rolls cooperating with said top press rolls, floor mounted frames for supporting said bottom press rolls, the bottom roll, said structure and the top roll structure terminating in spaced relation to provide an unobstructed path for paper passing between the press rolls, means for raising said top frame to lift the uprights off of the couch roll frame, means for detachably connecting the top and bottom press rolls, and means for swinging said top press rolls to lift the bottom press rolls off of their floor mounted frames.

6. A press section for a paper making machine comprising an elongated substantially horizontal overhead frame, floor mounted uprights supporting one end of said frame, a couch roll frame supporting the other end of said overhead frame, a plurality of top press rolls suspended from said overhead frame in the space between said uprights, movable supports for said top press rolls, a plurality of floor mounted roll supports, bottom press rolls carried by said floor supports under the top frame between the uprights, said floor supports terminating beneath the top press rolls to provide an unobstructed path in the plane of a web of paper passed between the press rolls, and individual means suspended from the overhead frame acting on the movable supports for the top press rolls to control the pressures in the nips between the top and bottom press rolls, said individual means including means adjacent the couch roll frame effective to coast with the floor supports for raising the top frame to relieve the load on the couch roll frame.

7. A couch roll assembly and press section for a paper machine comprising a cantilever type couch roll having a front side frame with a removable section and a cantilever type rear side frame, uprights carried by the couch roll frames, an elongated top frame supported at one end by said uprights, a plurality of pairs of supports depending in spaced vertical relation from said top frame, arms pivoted to the lower ends of said supports, top press rolls between said arms and rotatably supported on said arms, arm-actuating devices suspended from said top frame, a plurality of pairs of floor-mounted roll supports under said top frame pairs of supports, bottom press rolls between said floor-mounted supports and rotatably supported thereby, means for operating said arm-actuating devices to control the pressures in the nips between cooperating top and bottom press rolls, blocks insertible between the arms and floor-mounted supports of at least one cooperating top and bottom press roll to thrust the arms against the floor-mounted supports for raising the uprights off of the couch roll frame whereby the removable front side frame section thereof can be removed for a wire-changing operation, and detachable slings for connecting cooperating top and bottom press rolls whereby said devices may be actuated to raise the arms and lift the bottom press rolls together with the top press rolls for raising the

bottom press rolls off of their floor-mounted supports.

8. A couch roll assembly and press section for a paper-making machine comprising front and rear couch roll side frames, a couch roll therebetween rotatably carried thereby, said front side frame having a removable section, said rear side frame having a cantilever support attachment, removable frame sections on top of said front and rear side frames, uprights mounted on said removable frame sections, a top frame supported on said uprights and secured thereto, a pair of spaced opposed supports depending from said top frame, arms swingably mounted on the lower ends of said supports, bearing housings on said arms, a top press roll between said arms rotatably mounted in said bearing housings, a pair of jacks pivotally connecting the free ends of said arms with said supports, said bearing housings on said arms having abutment surfaces thereon, front and rear bottom press roll supports beneath said top frame suspended supports, said bottom roll supports having detachable upper and lower sections, bearing housings on said upper sections, a bottom press roll between said supports rotatably mounted in said bearing housings, abutment surfaces on said bearing housings, removable blocks insertable between the abutment surfaces on the top and bottom roll bearing housings, means for operating said jacks to thrust the abutment surfaces on the top roll bearing housings against said blocks for raising the top frame to carry the uprights off of the removable couch roll frame sections whereby said sections can be taken out of position for a wire-changing operation, and means for suspending the upper sections of the bottom roll supports and the bottom roll from said arms whereby said jacks can also be operated to raise the bottom press roll to open up a gap between the bottom roll support sections.

9. A couch roll and press section assembly for a paper making machine comprising an elongated horizontal top frame, floor mounted uprights supporting one end of said top frame, a couch roll frame supporting the other end of said top frame, a plurality of top press roll structures suspended from said top frame in the space under the frame between the couch roll frame and the uprights, a floor mounted bottom press roll structure for each top press roll, instrumentalities for temporarily carrying the couch roll frame supported end of the top frame on a floor-mounted bottom press roll structure, and instrumentalities for temporarily carrying the bottom press roll structures from the top frame.

10. A suction press assembly comprising floor-mounted front and rear side frames, a suction roll rotatably mounted on said frames, said front side frame being hollow to define a suction passage to said suction roll, said front side frame having a removable section, a top frame, uprights supporting said top frame in spaced lateral relation from said suction roll to provide free unobstructed access to the suction roll, a top press roll suspended from said top frame, means carried by said top frame for positively pressing the top press roll against the suction roll and adapted to coact with the floor mounted side frames to raise the top frame for relieving load on the uprights, and means for temporarily suspending the suction roll from the top press roll to be raised therewith by said means carried by the top frame for relieving the load on the front side frame for the suction roll whereby said remov-

able section of the frame can be temporarily removed for insertion of a new felt.

11. A press section and couch roll assembly for a paper machine comprising a horizontal top frame, a couch roll frame supporting one end of said top frame, and a vertically movable press roll suspended from said top frame adapted to lift the top frame to relieve the load on the couch roll frame for a wire-changing operation.

12. The method of changing the forming wire on a paper making machine including a cantilever type couch roll and a press section having top press rolls supported by front and rear side frames of the couch roll and floor-mounted bottom press rolls which comprises transferring the load of the top press rolls from the front side couch roll frame onto a floor-mounting for a bottom press roll, and removing portions of the front couch roll frame to support the couch roll in cantilever position for opening up a gap on the front side of the couch roll for free passage of a new wire.

13. The method of mounting a forming wire and a press felt on a paper making machine including a press section having a top frame carrying the top press roll partially supported on a couch roll frame and the cooperating bottom press roll mounted on floor supports which comprises thrusting a top roll against the floor supports for raising the top frame to relieve the load on the couch roll frame, supporting the couch roll in cantilever position, slipping a forming wire over the couch roll, lowering the top frame back onto the couch roll frame, suspending the bottom roll from the top roll, raising the assembly to lift the bottom roll off its supports, and inserting a felt through the space between the floor and the thus lifted bottom roll.

14. A press section for a paper making machine comprising a top frame, uprights supporting said top frame, one of said uprights having a removable section, a plurality of top press roll structures suspended from the top frame between the uprights, a floor-mounted bottom press roll structure for each top press roll structure, devices carried by the top frame for positively raising and lowering the top press roll structures including a device adjacent the upright having the removable section adapted to coact with the floor-mounted bottom press roll structure adjacent said upright to transfer the load on the top frame from said upright to said floor-mounted structure whereby said removable section can be removed, and said top and bottom roll structures being unobstructed across the plane of a paper web passed between the top and bottom rolls.

15. A press section for a paper making machine comprising an elongated top frame, uprights supporting said top frame at the ends thereof, supports depending from said top frame between said uprights, top press roll structures movable on said supports, bottom press roll structures mounted under said top frame between said uprights, jacks carried by said top frame for positively raising and lowering the top press roll structures, lateral arms on the bottom press roll structures, felt guide rolls on the arms, removable slings for connecting top and bottom roll structures, said jacks adapted to raise the sling-connected structures for felt-changing operations, and said top and bottom roll structures being unobstructed during pressing operations

across the plane of a paper web passing between the top and bottom rolls.

16. A press section for a paper making machine comprising a top frame, uprights supporting said top frame, a plurality of top press roll structures suspended from the top frame between the uprights, a floor-mounted bottom press roll structure for each top press roll structure, devices carried by the top frame for positively raising and lowering the top press roll structures and adapted to coact with the floor-mounted bottom press roll structure adjacent said upright to transfer the load on the top frame from an upright to said floor-mounted structure and said top and bottom roll structures being unobstructed across the plane of a paper web passed between the top and bottom rolls.

17. A press section for a paper making machine comprising a top frame, uprights supporting the

ends of said frame, said top frame and uprights defining a space with unobstructed open sides, a plurality of upper press roll structures in said space suspended from said top frame, a plurality of cooperating lower press roll structures in said space including supports terminating in spaced relation beneath the upper rolls whereby the paper is adapted to pass between the cooperating upper and lower rolls without passing behind any obstructions extending between the rolls, and means suspended from said top frame to selectively force the upper rolls into pressure relation with their cooperating lower rolls and raise the upper rolls away from said cooperating lower rolls, said means adapted to urge a top roll structure against the bottom roll structure to raise the top frame for relieving the load on uprights at one end of the frame.

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