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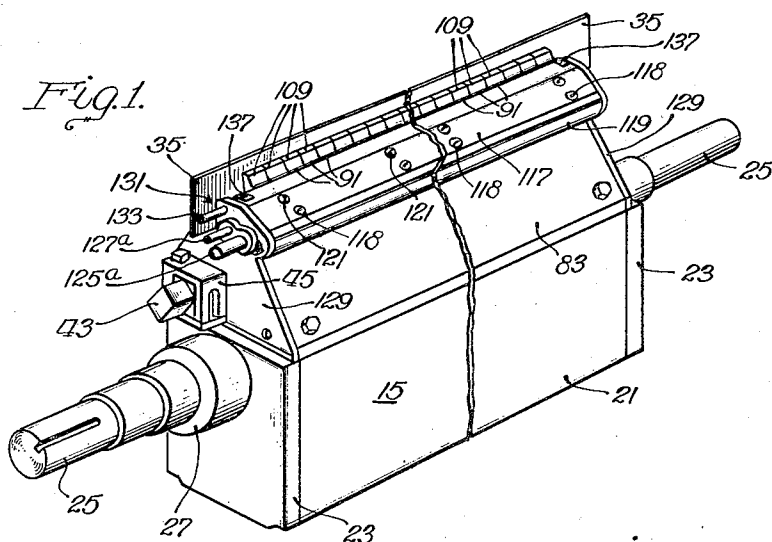
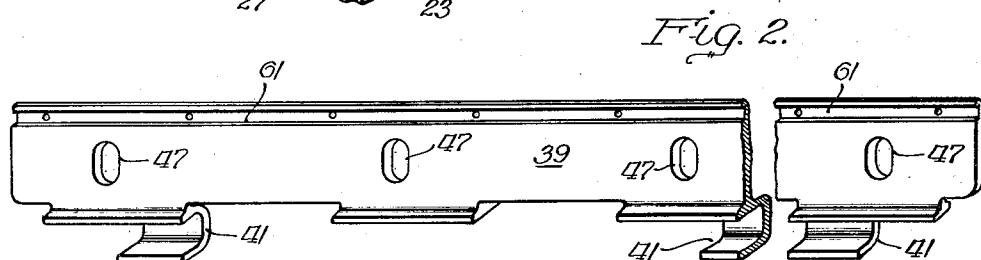
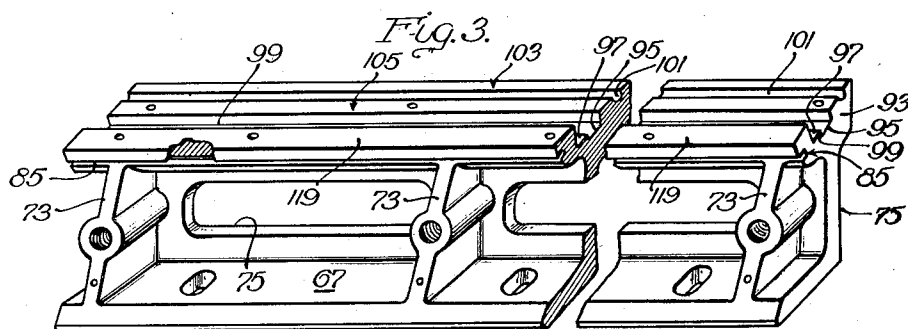
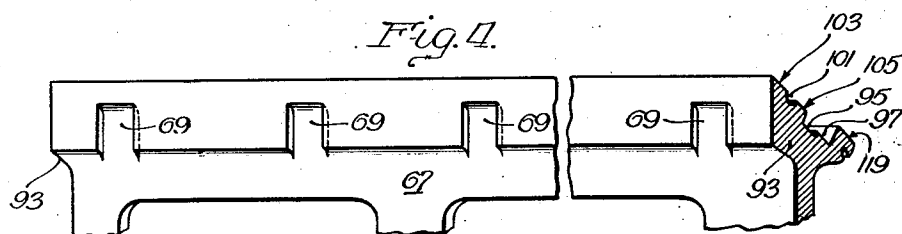
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2,330,889

ROLL DOCTOR

Filed June 28, 1941

6 Sheets-Sheet 1



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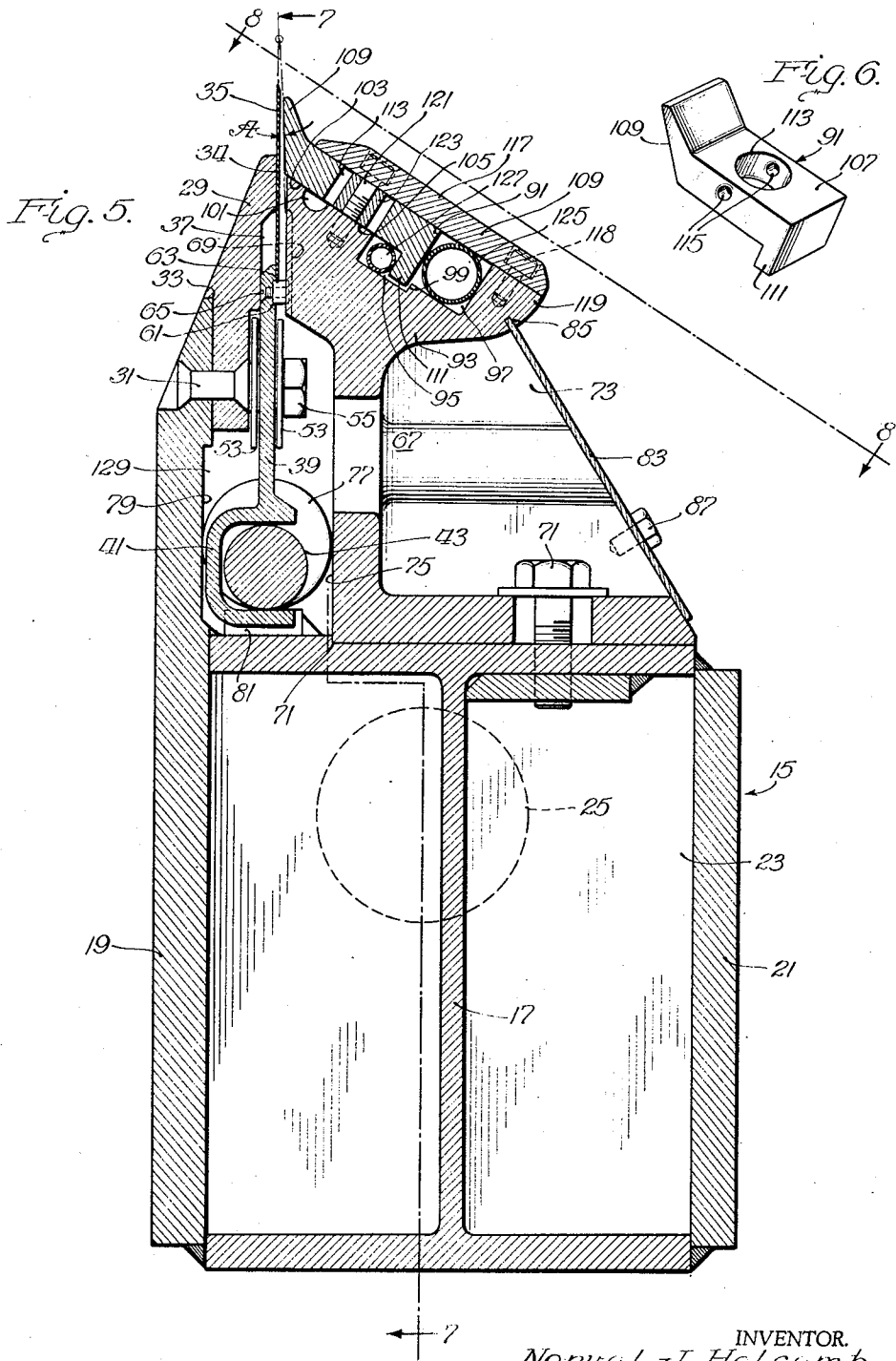
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ROLL DOCTOR

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6 Sheets-Sheet 2



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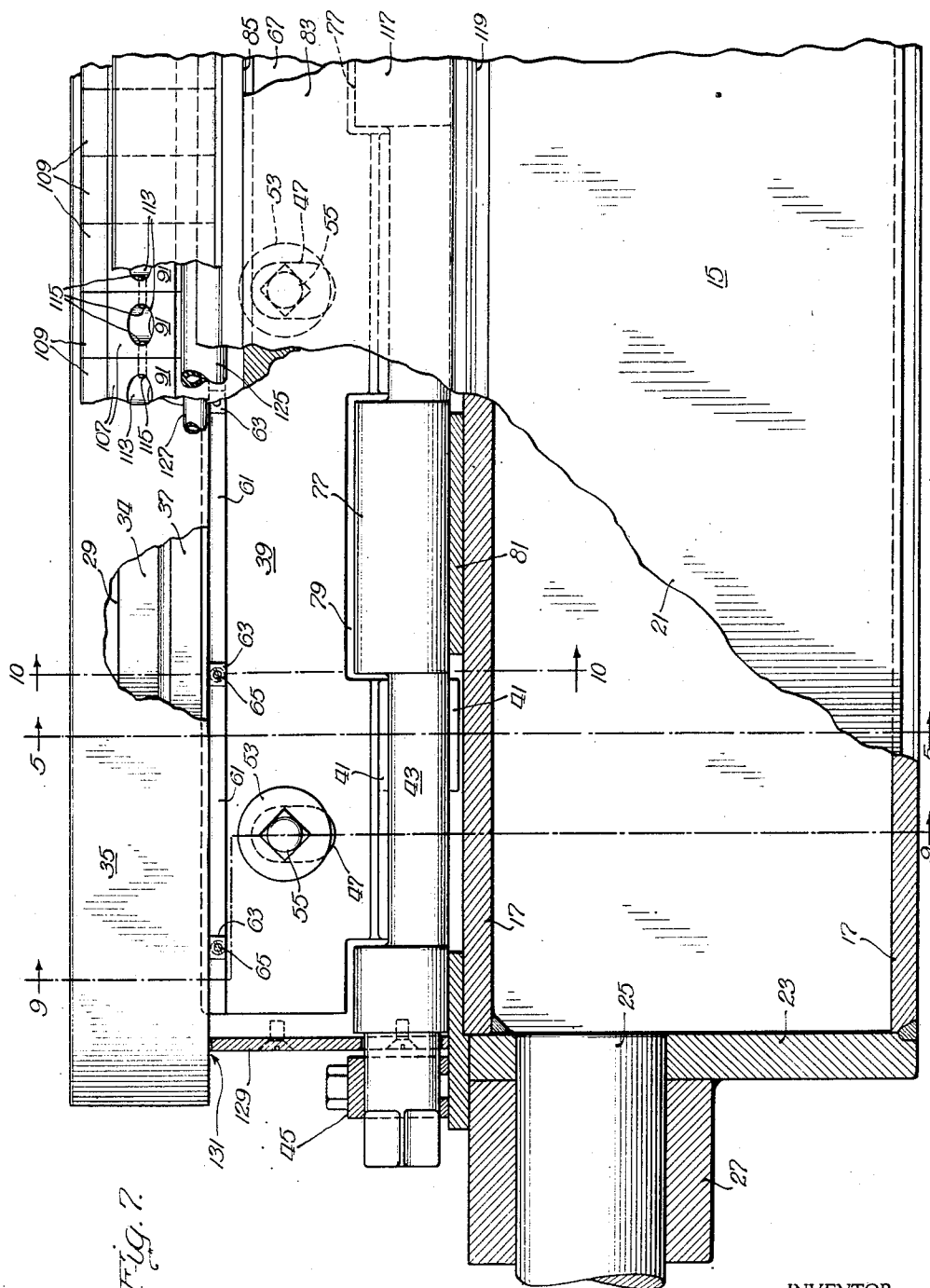
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ROLL DOCTOR

Filed June 28, 1941

6 Sheets-Sheet 3



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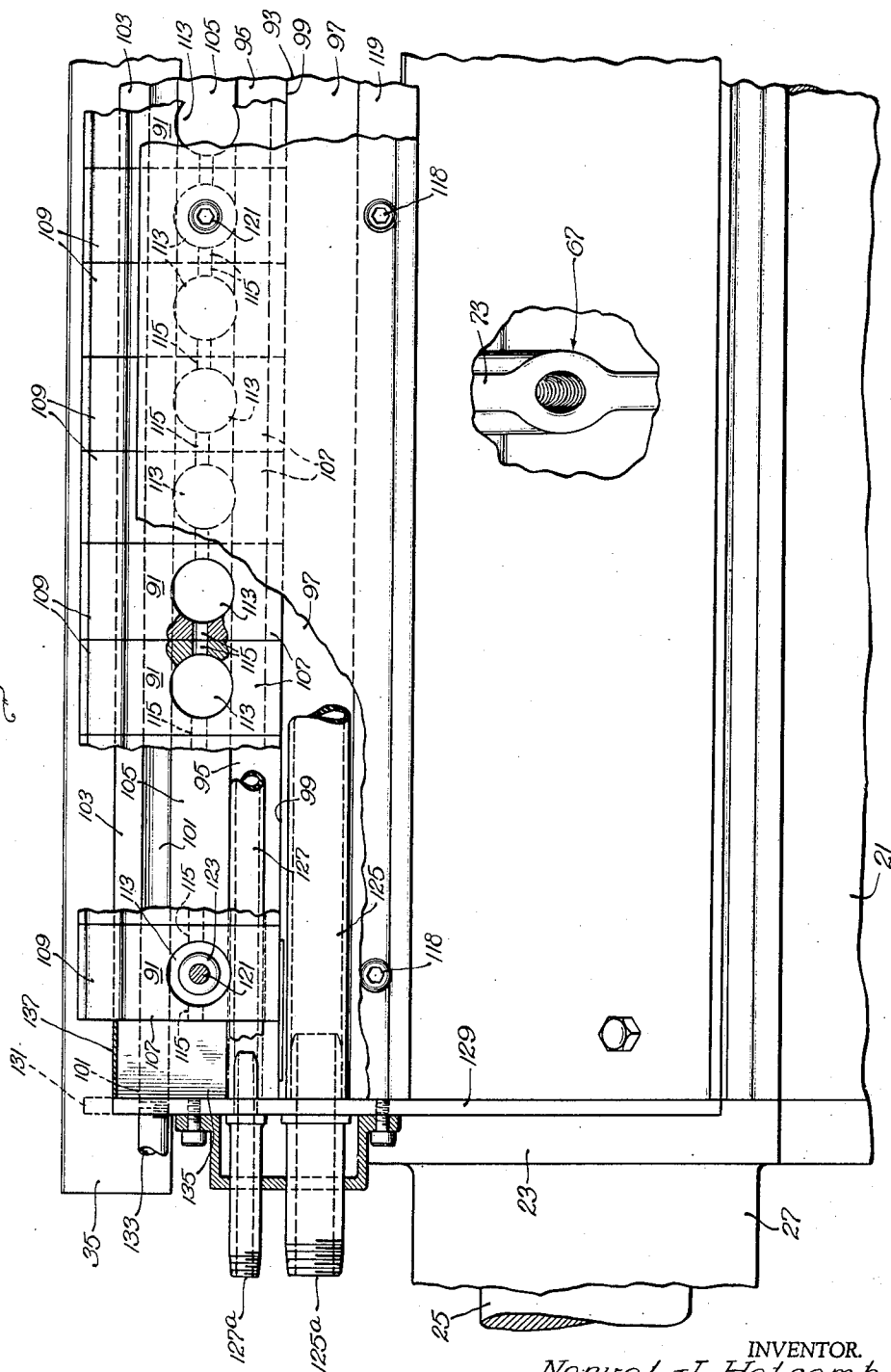
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ROLL DOCTOR

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Fig. 8.



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ROLL DOCTOR

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6 Sheets-Sheet 5

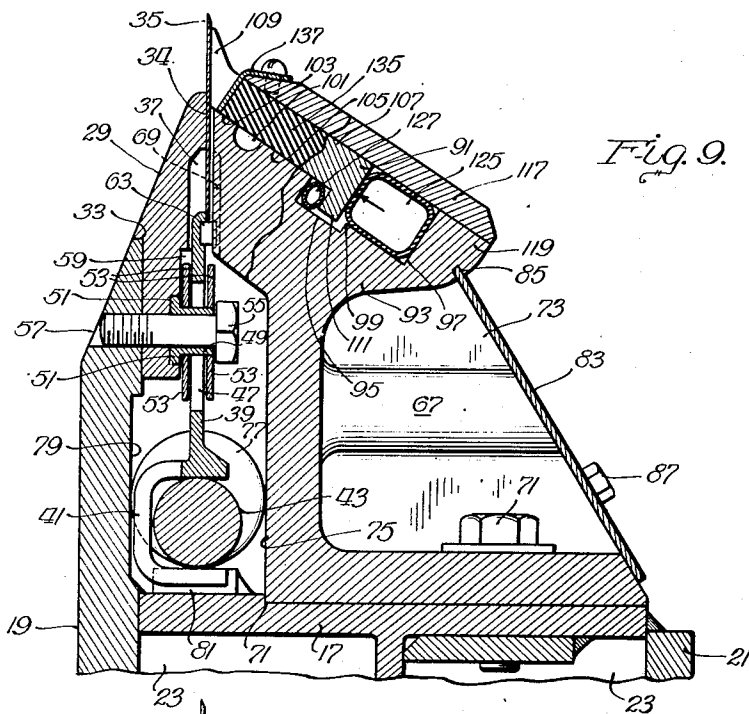


Fig. 9.

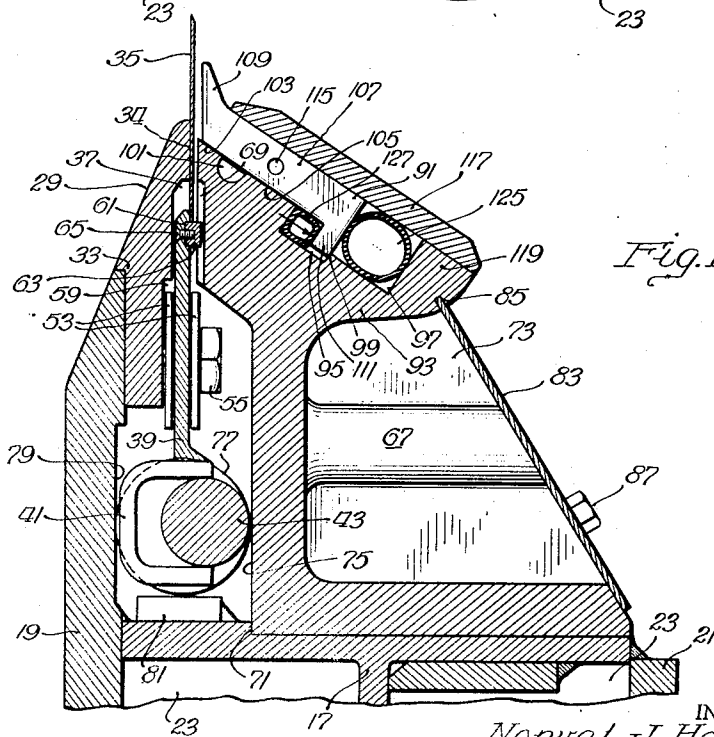


Fig. 10.

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ROLL DOCTOR

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6 Sheets-Sheet 6

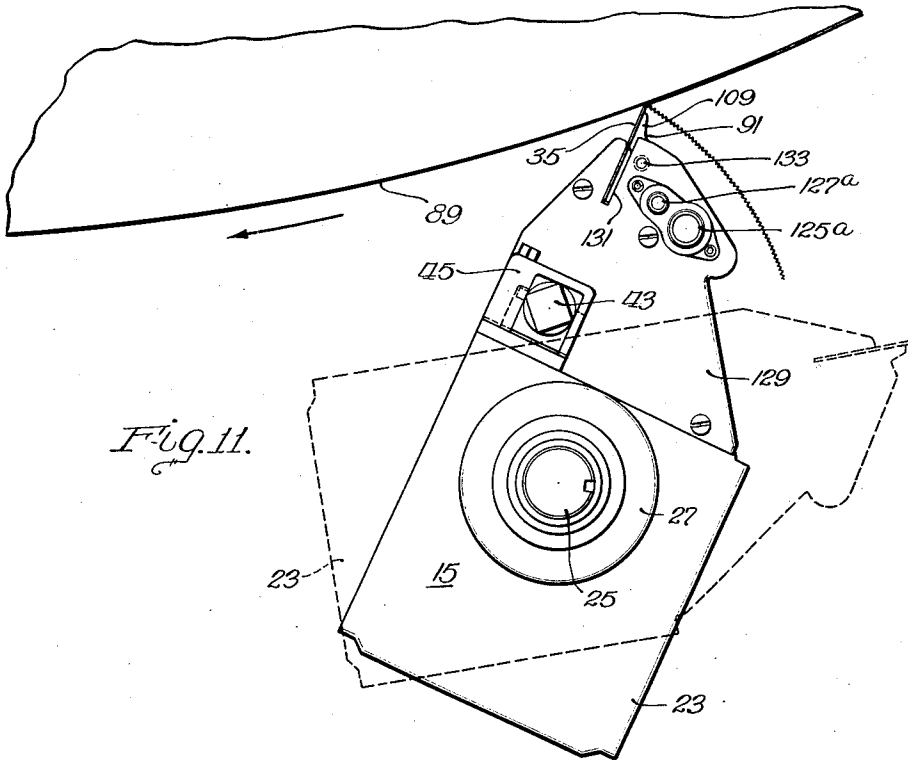


Fig. 11.

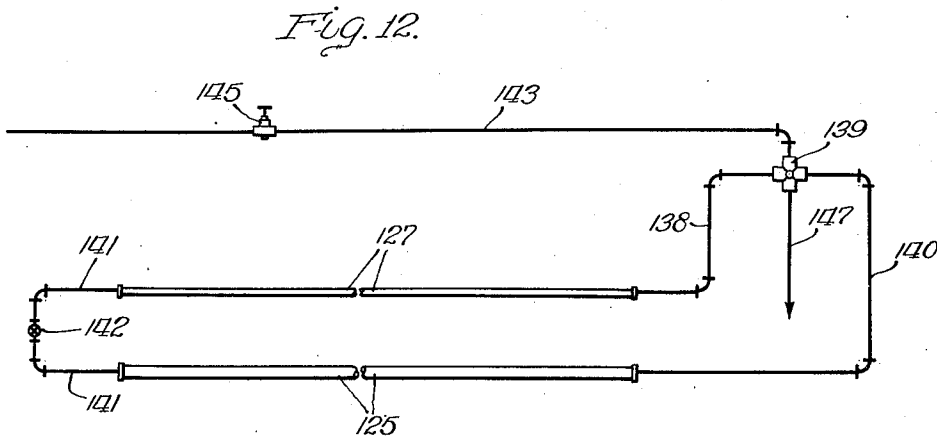


Fig. 12.

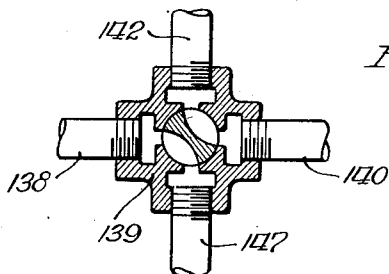


Fig. 13.

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UNITED STATES PATENT OFFICE

2,330,889

ROLL DOCTOR

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Application June 28, 1941, Serial No. 400,207

14 Claims. (Cl. 92-74)

The present invention relates broadly to the art of paper making, and particularly to the roll doctor or scraper apparatus used in connection with paper making machines of the Yankee and other types.

The usual roll doctor apparatus consists, essentially, of a thin, flexible, metallic, scraper blade and a support means for the blade so designed that it holds the edge of the blade in contact with the surface of the roll or drying cylinder with which the apparatus is used. During the operation of the machine the roll doctor serves either to clean the roll or to scrape off and crepe the web or sheet of paper which is carried thereon.

Under modern practices, it is customary to use large paper making machines and to operate those machines at relatively high speeds. For example, Yankee type machines utilizing drying cylinders having a width of 120 inches and a diameter of from 10 to 12 feet, and operating at peripheral speeds in the neighborhood of 2000 ft. per minute have been built, and the tendency of present day designers is toward larger machines with increasing speeds of operation. When cylinders of these large dimensions are utilized, it becomes very difficult to obtain a surface which will remain exactly cylindrical when the cylinder is heated to the relatively high temperature necessary during the operation of the machine. Hence in order to hold the blade in contact with the cylinder surface at all times and secure satisfactory scraping operation of the doctor blade, it is necessary that the apparatus shall include means for resiliently biasing the blade into contact with the surface of the drying cylinder in such manner that the blade will automatically and accurately follow the contour of the cylinder surface. In the art, this biasing means is often spoken of as the blade loading means.

The blade loading means constituting a part of the doctor blade apparatus known prior to the present invention does not accomplish its intended function as satisfactorily as might be desired, and the principal object of the present invention is to provide an improved doctor blade apparatus, and particularly an improved blade loading means, which shall so support and bias the doctor blade that that blade will follow the contour of a drying cylinder or roll at all times regardless of the size or speed of operation of such cylinder or roll, and with just the right amount of pressure.

As will hereinafter appear, this object is accomplished primarily through the provision of an

improved doctor blade apparatus which embodies a novel blade support and blade loading means. The various novel features of this apparatus and the many advantages resulting from its use will be made more apparent by reference to the accompanying drawings and the following description of one particularly satisfactory embodiment of the invention. In the drawings:

Fig. 1 is a perspective view of a roll doctor apparatus embodying the features of the present invention;

Fig. 2 is a perspective view of the doctor blade holder forming a part of the apparatus of Fig. 1;

Fig. 3 is a perspective view of the main supporting member for the blade loading means;

Fig. 4 is a perspective view of the front face of the supporting member illustrated in Fig. 3;

Fig. 5 is an enlarged sectional view of the apparatus taken on the general line 5-5 of Fig. 7;

Fig. 6 is a perspective view of one of the presser fingers forming a part of the apparatus;

Fig. 7 is a fragmentary sectional view, partially in elevation, on the general line 7-7 of Fig. 5;

Fig. 8 is an elevational view partially in section on the general line 8-8 of Fig. 5;

Fig. 9 is a fragmentary sectional view, on the general line 9-9 of Fig. 7, illustrating the operation of the presser fingers. In this figure the presser fingers are in the advanced or blade loading position;

Fig. 10 is a fragmentary sectional view, similar to Fig. 9, showing the presser fingers in the retracted position. This view is taken on the line 10-10 of Fig. 9.

Fig. 11 is a diagrammatic view showing how the doctor blade apparatus illustrated in the other figures of the drawings coacts with the drying cylinder or roll with which it is used;

Fig. 12 is a diagrammatic view illustrating the hydraulic system forming a part of the doctor blade apparatus illustrated in the other figures of the drawings; and

Fig. 13 is a sectional view of the control valve element forming a part of the hydraulic system of Fig. 12.

The embodiment of the invention illustrated in the drawings includes a fabricated, generally box-shaped, frame 15, which serves as the main support for the apparatus. The frame 15 consists of a steel I beam 17 to which are welded, or otherwise attached, suitable rectangularly shaped side plates 19 and 21, preferably of steel. End plates 23 are welded to each end of the structure.

For the purposes of adjustably supporting the

doctor blade apparatus in working position adjacent the drying cylinder or other roll with which it is to be used, as illustrated in Fig. 11, there are provided two stub shafts 25, each of which is fixedly supported in a suitable cylindrical hub 27, welded to one of the end plates 23. The stub shafts 25 are adapted to engage suitable bearings and associated apparatus forming a part of the paper making machine, and since such apparatus is known and is not part of the present invention, it has not been illustrated.

The side plate 19, on the roll or front side of the apparatus projects upwardly from the box-like frame 15 a substantial distance, and a transversely extending, blade support member 29, having a cross sectional outline as illustrated in Figure 5, is integrally attached thereto by means of suitably spaced rivets 31, or equivalent means. The blade support member 29 is preferably made of brass, and it is provided with a shoulder 33 for engaging the upper edge of the side plate 19 to increase the rigidity of the connection therebetween. The front surface of the blade support member 29 is tapered, as illustrated. To provide a proper supporting surface for the doctor blade 35, the portion 34 of the rear surface of the stationary, blade support member 29 which contacts the doctor blade 35 is accurately machined flat, see particularly Fig. 7. The remaining portion of the rear surface is undercut, as illustrated at 37, to provide clearance for the other elements of the apparatus.

To permit transverse adjustment of the doctor blade 35 relative to the surface 34 of the support member 29, the doctor blade 35 is vertically, adjustably, supported in contact with the surface 34 by means of a cam operated blade holder member 39, which is illustrated particularly in Fig. 2. The blade holder member 39 extends lengthwise of the apparatus and is provided with spaced, cam follower portions 41 which engage the cam portions of a cam shaft 43 which is supported in suitable bearings 45 located at either end of the apparatus. The bearings 45 are of adjustable tightness in order that the cam shaft 43 can be locked in any desired position.

The doctor blade holder 39 is guided in its upward and downward movement in response to rotation of the cam shaft 43 by means of a plurality of spaced guide assemblies which slidably engage suitable elongated holes 47 formed in the doctor blade holder. Each of the guide assemblies includes a hollow bushing 49 having a head portion 51 which is adapted to be seated in a counterbored hole 53 (see Fig. 9) in the transverse extending, doctor blade support member 29; two circular washers 53 which engage the side portions of the blade holder, adjacent each of the elongated holes 47, with a sliding fit; and a bolt 55 which extends through the bushing 49 to engage a suitably threaded opening 57 in the upstanding portion of the front plate member 19. The bushings 49 are of sufficient length to prevent the guide washers 53 from being pressed into engagement with the blade holder when the bolts 55 are tightened, and the lower portion of the undercut 37 in the blade support member 29 is deepened, as illustrated at 59, to provide clearance between the front washers and the blade support member.

The doctor blade holder 29 is provided with a longitudinally extending, milled slot 61, and at spaced intervals along the slot 61 a small, square block 63 of steel or other material, of

proper dimensions, is fastened therein by a screw or rivet 65. The upper surface of the blocks 65 define the lower supporting surface for the doctor blade 35, and the frame 67, which serves as the frame for the blade loading means, is provided with suitably spaced undercuts 69 to receive the supporting blocks 63. By virtue of this arrangement, the thin doctor blade 35 is prevented from binding as it is put into place in the machine. This feature is important, because of the fact that the doctor blade must be replaced with a newly sharpened blade at frequent intervals during the daily operation of the machine.

The frame 67 for the blade loading means is illustrated particularly in Figs. 3 and 4, and comprises a generally L-shaped casting which is adapted to be integrally attached to the main box frame 15 by suitably spaced bolts 70, the engaging surfaces being machined and there being a shoulder 71 in the top face of the main frame 15 to accurately position the frame 67 thereon. Strengthening ribs 73 for giving increased rigidity to the L-shaped frame 67 may be provided at regularly spaced intervals therealong. In a structure for use in connection with a drying cylinder having a width sufficient to handle a web about 120 inches wide, the strengthening ribs 73 were located at about 1 foot intervals.

The front surface 75 of the L shaped frame 67 for the blade loading means is machined so as to provide a bearing clearance with the cylindrical sections 77 of the blade adjusting cam shaft 43. A similar clearance is provided between the cylindrical portions 77 of the cam shaft 43 and the adjacent surface 79 of the upwardly projecting side plate 19. This arrangement, in combination with suitably machined and polished pillow blocks 81 located beneath the cylindrical sections 77 of the cam shaft 43, serve to hold that shaft quite rigidly during the operation of the machine. Counterclockwise rotation of the shaft 43 as illustrated in Fig. 10 elevates the blade 35 relative to the other elements of the apparatus. The open side of the L shaped frame 67 for the blade loading means is preferably closed by a flat metal plate 83 which engages a cylindrically extending groove 85 formed in the upper part of the frame member and is held in place by suitable cap screws 87 which engage tapped holes in the frame stiffening ribs 73.

The doctor blade 35 forming a part of the apparatus illustrated in the drawings is of the conventional type and comprises a thin, elongated strip of suitable spring steel or other suitable sheet material (about 22 or 28 gauge is frequently used). It is slid into place from either end of the apparatus, and the edge which contacts the associated roll is usually filed to a sharp bevel. The blade loading means serves to resiliently bias the blade 35 into contact with the surface of the drying cylinder or other roll 89 (Fig. 11) with which the blade is used in such manner that the blade will follow very accurately the unavoidable variations in the contour of that surface.

The blade loading means includes a plurality of presser fingers 91 which are supported side by side, similarly to piano keys, on the upper or bracket portion 93 of the L-shaped frame 67. As will hereinafter appear, the presser members 91 are movable to a retracted position where they do not contact the blade 35, and to an advanced or blade engaging position which latter position is shown in Fig. 9. In apparatus designed for

use with a paper making machine manufacturing a web about 120 inches wide, the fingers 91 have a width of about 1½ inches and a total length of about 3¼ inches. If the fingers are too short there is a tendency to bind.

As shown particularly in Figs. 3 and 5, the bracket portion 93 of the frame 67 is provided with two, rectangularly shaped, longitudinally extending, connecting grooves 95 and 97. The groove 95 is somewhat deeper than the groove 97 to provide a shoulder 99. Toward the front of the bracket portion 93 there is a third, longitudinally extending, groove 101 which, in the illustrated embodiment, is semi-circular in outline. The surfaces 103 and 105, at either side of the groove 101 are machined flat, at an angle of about 60° to the supporting surface 34 for the front of the doctor blade 35.

The presser fingers 91 are preferably of metal, and, as illustrated particularly in Fig. 6, each includes a body 107 having the general outline of a rectangular prism, an integral, flat surfaced, angularly disposed presser portion 109 located at the front end of the finger, and a downwardly projecting portion 111, at the rear end thereof, which is adapted to engage the shoulder 99 when the fingers are in retracted position. When the fingers are in alignment the front surfaces of the presser portions 109 define a flat surface which is inclined slightly to the plane of the blade, the angle A of Fig. 5. Each of the presser fingers 91 is also provided with a vertically extending circular, hole or passageway 113, located centrally of the body portion 107 thereof, and with two smaller holes or passageways 115 extending transversely of the body portion 107 and connecting with the central passageway 109 at opposite sides thereof.

The lower surface of the body portion 107 of each of the presser fingers 91 is machined flat, and in the assembled structure these surfaces of the fingers rest upon the upper surfaces 103 and 105 of the frame bracket portion 93. The fingers 91 are held in this position by a flat, retainer plate 117 which extends longitudinally of the apparatus and overlies all of the fingers. The rear end of the plate member 117 is fastened to the upwardly extending rear portion 119 of the frame bracket 93 by suitable spaced cap screws 118, the surface of that portion being parallel to the surfaces 103 and 105 and raised above those surfaces a distance approximately equal to the thickness of the body portion of the fingers. The front end of the retainer plate 117 is held in position by a plurality of uniformly spaced bolts 121 and cooperating, tubular spacers 123, the spacer 123 being of sufficient length to permit free longitudinal movement of the fingers 91 between the lower surface of the plate 117 and the surfaces 103 and 105 without binding.

As previously stated, the downwardly projecting end portion 111 of each of the presser fingers 91 is adapted to engage the shoulder 99 formed by the intersection of the grooves 95 and 97 to provide a stop for limiting rearward movement of the fingers. The means for moving and resiliently biasing the fingers 91 into contact with the doctor blade 35 comprises an expansible tube 125 located in the rectangularly shaped space defined by the rear faces of the fingers, the bottom and side walls of the groove 97, and the adjacent bottom surface of the retainer plate 117. The tube 125 extends longitudinally of the entire apparatus as illustrated particularly in Figs. 5, 7 and 8. For retracting the fingers, a second

and somewhat smaller expansible tube 127 is disposed in the rectangularly shaped space defined between the side walls of the groove 95 and the adjacent surfaces of the fingers.

The ends of the presser finger and blade supporting structure proper are closed by suitable cover plates 129 which are slotted, as illustrated at 131, to admit the blade. Mounted on the cover plates 129 are suitable tubular connections 125a and 127a to the two longitudinally extending tube members 125 and 127. Also mounted on each of the end cover plates 129 is an air inlet tube 133 which is adapted to communicate with the groove 101 extending beneath the presser fingers 91 adjacent the front end thereof.

During the operation of the apparatus a stream of air under a pressure of from about 10 to 12 pounds per square inch is directed into one of the air inlet tubes 133, the other tube being vented. By virtue of the fact that the groove 101 which connects with the tubes 133 also communicates with the central opening 113 and the two passageways 115 formed in each of the fingers 91, a stream of air is caused to circulate through the interior of the aligned fingers 91 during the operation of the apparatus. This stream of air serves the important functions of keeping dust from collecting between the fingers and of cooling the fingers which, because of their location adjacent the heated surface of the drying cylinder 89, might otherwise be overheated.

To prevent sticking of the presser fingers 91 as a result of sidewise expansion during the operation of the apparatus, a resilient rubber filler or cushion pad 135 is located at either end of the structure between the end cover plate 121 and the first adjacent presser finger. The filler pads 135 are held in place by a suitable retainer clip 137 as illustrated in Fig. 9, and effectively prevent any binding of the fingers.

The hydraulic control system for the expansible tubes 125 and 127 which serve to actuate the presser fingers during the operation of the apparatus is illustrated particularly in Fig. 12. As shown in that figure, the two expansible tubes 125 and 127 are connected in series with each other through suitable piping 138 and 140, a multiple position, control valve 139, which is illustrated particularly in Fig. 13, piping 141 and an adjustable bleed valve 142 in Fig. 12. During the operation of the apparatus, cool water under pressure (about 45 pounds per square inch) is admitted to the inlet side of the control valve 139 through piping 143 and a pressure control valve 145. With the control valve 139 in the finger advancing position shown in Fig. 13, this pressure water is conducted through piping 140 to one end of the larger tube 125 which expands, causing the fingers 91 to advance and thereby resiliently bias the doctor blade 135 into contact with the surface of the drying cylinder or other roll, as illustrated in Fig. 9. The bleed valve 142 in the piping 141 which connects the other end of the larger tube with the adjacent end of the smaller tube 127 permits a small amount of water to flow through the larger tube 125 and into the smaller tube 127. The other end of the smaller tube 127 is connected through the piping 138, the valve 139, and piping 147 to a waste outlet. By this arrangement, a small amount of water is continuously circulated through the tubes 125 and 127 during the operation of the apparatus, and a desirable cooling effect is thereby accomplished. When it is desired to retract the fingers, the control valve 139 is turned 90° from the posi-

tion illustrated in Fig. 13. This relieves the pressure in the larger tube 125 by connecting one end of that tube to the waste pipe 149 through the piping 140, and at the same time applies full pressure to the smaller tube 127 through the piping 143 and 138. The smaller tube is thereby expanded and the fingers are retracted, as illustrated in Fig. 10.

Because of the fact that the pressure is evenly applied to each of the presser fingers 91, the advancing and retracting of those fingers takes place very smoothly and efficiently. This action simplifies the removal of the doctor blade and the replacement of that member with a newly sharpened blade as is frequently done during the operation of the machine. Furthermore, by virtue of the fact that each of the presser fingers 91 is biased in the direction of the doctor blade 35 with substantially equal unit pressure (Pascal's law), each small section of the doctor blade 35 is held in intimate contact with the surface of the drying cylinder or other roll under uniform pressure and despite normal variations in the surface outline. Convenient vertical adjustment of the blade, and automatic cleaning and cooling of the presser fingers is also provided for. Also, the loading force applied to the blade can be readily adjusted by control of the pressure in the hydraulic system.

It will be apparent to those skilled in the art that the principles disclosed in the foregoing may be embodied into other apparatus than the specific embodiment described. Accordingly, it is my desire that the foregoing claims shall be accorded the broadest reasonable construction consistent with the language appearing therein and the prior art.

I claim as my invention:

1. Roll doctor apparatus comprising a flexible doctor blade, support means for said blade, and loading means for resiliently biasing said blade into contact with the roll with which said apparatus is used, said loading means comprising a plurality of separate, presser fingers, disposed side by side and longitudinally movable relative to each other, and means for individually biasing each of said fingers into resilient contact with said blade with a predetermined biasing force.

2. Roll doctor apparatus, comprising a flexible doctor blade, support means for said blade, and loading means for holding said blade into contact with the roll with which said apparatus is used, said loading means comprising a plurality of separate, presser fingers, means supporting said fingers one alongside the other in such manner that said fingers are longitudinally movable relative to each other, and hydraulic means actuable to individually bias each of said fingers into resilient contact with said blade with substantially equal force.

3. Roll doctor apparatus, comprising a flexible doctor blade, support means for said blade, and a blade loading means comprising a plurality of separate, presser fingers, means supporting said fingers one alongside the other in such manner that said fingers are longitudinally movable relative to each other, and means including an expansible tube for resiliently biasing each of said fingers into resilient contact with said blade with substantially equal force.

4. Roll doctor apparatus comprising a flexible doctor blade, support means for said blade, and blade loading means comprising a plurality of presser fingers having a flat, front surface adapted to contact said blade, means supporting said

fingers in side by side relationship in such manner that said fingers are longitudinally movable independently of each other from a retracted position to an operative, blade contacting position, an expansible pressure member actuable to move said presser fingers from said retracted position into said blade contacting position and to resiliently bias each of said fingers into contact with said blade with substantially equal force, and means actuable to move said fingers from said blade contacting position to said retracted position.

5. Roll doctor apparatus comprising a flexible doctor blade, support means for said blade, and means for loading said blade comprising a plurality of presser fingers each of which has a flat, front surface adapted to contact said blade, means supporting said fingers in side by side relationship in such manner that said fingers are longitudinally movable independently of each other from a retracted position to an operative, blade contacting position, means including an expansible pressure member actuable to move said presser fingers from said retracted position to said blade contacting position and to resiliently bias each of said fingers into contact with said blade with substantially equal force, and means including a second expansible pressure member actuable to move said fingers from said blade contacting position to said retracted position.

6. Roll doctor apparatus comprising a flexible doctor blade; support means for said blade including a longitudinally extending, flat surfaced, stationary, blade support member and blade adjusting means actuable to move said blade transversely with reference to said stationary, blade support member; and loading means for holding said blade in contact with the roll with which said apparatus is used, said loading means comprising a plurality of separate, presser fingers, means supporting said fingers in side by side relationship in such manner that said fingers are longitudinally movable independently of each other into and out of contact with said blade, and hydraulic means actuable to move said fingers to said blade contacting position and resiliently bias each of said fingers into contact with said blade with substantially equal force.

7. Roll doctor apparatus comprising a flexible doctor blade; support means for said blade including a longitudinally extending, flat surfaced, stationary, blade support member and blade adjusting means actuable to move said blade transversely with reference to said stationary, blade support member; and loading means for holding said blade in contact with the roll with which said apparatus is used, said loading means comprising a plurality of separate, presser fingers, means supporting said fingers in side by side relationship, with the longitudinal axis of said fingers at an angle of approximately 60° to the plane of said flat surfaced, blade support member, said support means including guide means whereby said fingers are longitudinally movable independently of each other from a retracted position to an operative, blade contacting position, an expansible pressure member actuable to move said presser fingers from said retracted position into said blade contacting position and to resiliently bias each of said fingers into contact with said blade with substantially equal force, and means including a second expansible pressure member actuable to move said fingers from said blade contacting position to said retracted position.

8. Roll doctor apparatus comprising a flexible doctor blade; support means for said blade including a longitudinally extending, flat surfaced, stationary, blade support member, a longitudinally extending, blade holder member disposed adjacent said blade support member, and cam means which coacts with said blade holder member to move said blade transversely with reference to said stationary blade support member; and loading means for holding said blade into contact with the roll with which said apparatus is used, said loading means comprising a plurality of separate, rectangularly shaped, presser fingers, means supporting said fingers in side by side relationship, similar to piano keys, in such manner that said fingers are longitudinally movable independently of each other into and out of engagement with said blade, a resilient expansion block positioned at at least one end of said finger members to permit sidewise expansion and contraction of those members, and hydraulic means actuable to move said fingers to said blade contacting position and to resiliently bias each of said fingers into contact with said blade with substantially equal force.

9. Roll doctor apparatus comprising a flexible doctor blade; support means for said blade including a longitudinally extending, rigid frame, a longitudinally extending, flat surfaced, stationary, blade support member supported upon said frame, a longitudinally extending, blade holder member mounted on said frame, and cam means which coacts with said blade holder member to move said blade transversely with reference to said stationary blade support; and loading means for holding said blade in contact with the roll with which said apparatus is used, said loading means comprising a plurality of separate, presser fingers, means including a secondary frame member mounted on said first mentioned frame for supporting said fingers in side by side relationship, similar to piano keys, in such manner that said fingers are longitudinally movable independently of each other from a retracted position to an operative, blade contacting position, means, including an expansible pressure member supported on said secondary frame, actuable to move said presser fingers from said retracted position to said blade contacting position and to resiliently bias each of said fingers into contact with said blade with substantially equal force, and means, including a second, expansible pressure member also supported upon said secondary frame, actuable to move said fingers from said blade contacting position to said retracted position.

10. Roll doctor apparatus comprising a flexible doctor blade; support means for said blade including a longitudinally extending, rigid frame, a longitudinally extending, flat surfaced, stationary blade support member supported upon said frame, and blade adjusting means actuable to move said blade transversely with reference to said stationary, blade support member; and loading means for holding said blade in contact with the roll with which said apparatus is used, said loading means comprising a plurality of separate, presser fingers, means including a secondary frame member mounted on said first mentioned frame for supporting said fingers in side by side relationship, similar to piano keys, for independent, slidable movement from a retracted position to an operative, blade contacting position, means, including an expansible, longitudinally extending, tube positioned within a slot formed on said

secondary frame and actuable to move said presser fingers from said retracted position to said blade contacting position and to bias each of said fingers into contact with said blade with substantially equal force, means including a second expansible, longitudinally extending tube positioned within a second slot formed in said secondary frame and actuable to move said fingers from said blade contacting position to said retracted position, and resilient means which compensates for sidewise expansion and contraction of said presser fingers.

11. Roll doctor apparatus comprising a flexible doctor blade; support means for said blade; loading means for holding the said blade in contact with the roll with which said apparatus is used, said loading means comprising a plurality of separate, presser fingers disposed side by side and longitudinally movable relative to each other, said fingers being provided with a central cavity and passageways connecting with said cavity which are adapted to communicate with each other when said fingers are in the normal operating position, means for individually biasing each of said fingers into contact with said blade with a predetermined force; and means for causing a flow of pressure air through said communicating passageways and cavities during the operation of said apparatus whereby said fingers are cooled and the accumulation of dust is prevented.

12. Roll doctor apparatus comprising a flexible doctor blade, support means for said blade including a longitudinally extending, flat surfaced, stationary, frame and a longitudinally, extending blade holder member which is actuable to move said blade transversely with reference to said stationary blade support; and loading means for holding said blade in contact with the roll with which said apparatus is used, said loading means comprising a plurality of separate, presser fingers disposed side by side and longitudinally movable relative to each other, said fingers being provided with a central cavity and passageways which communicate with each other when said fingers are in normal operative position, means for individually biasing each of said fingers into contact with said blade with a predetermined biasing force, and means for producing a current of air through said communicating passageways and cavities during the operation of said apparatus whereby said fingers are cooled and the accumulation of dust is prevented.

13. Roll doctor apparatus comprising a flexible doctor blade; support means for said blade including a longitudinally extending, rigid, main frame; loading means for resiliently biasing said blade into contact with the roll with which said apparatus is used, said loading means comprising a plurality of separate presser fingers, means including a secondary frame mounted on said main frame for supporting said fingers in side by side relationship, similar to piano keys, for independent, slidable movement from a retracted position to an operative, blade contacting position, said fingers being provided with centrally disposed cavities and passageways which communicate with each other when said fingers are in said operative position, said secondary frame member being provided with a longitudinally extending groove which underlies said fingers and which connects with said communicating passageways and cavities during the operation of said apparatus, means for individually biasing said fingers into contact with said blade with a predetermined biasing force, and means for introducing

pressure air into said groove and through said groove into said connecting cavities and passageways whereby said fingers are cooled and accumulation of dust is prevented during the operation of said apparatus.

14. Roll doctor apparatus comprising a flexible doctor blade; support means for said blade including a longitudinally extending, rigid, main frame, a longitudinally extending, flat surfaced, stationary, blade support member supported upon said frame, a longitudinally extending, blade holding member mounted on said frame, and blade adjusting means which coacts with said blade holding member to move said blade transversely with reference to said stationary blade support; loading means for resiliently biasing said blade into contact with the roll with which said apparatus is used, said loading means comprising a plurality of separate presser fingers, means including a secondary frame mounted on said first mentioned frame for supporting said fingers in side by side relationship, similar to piano keys, for independent, slidable movement from a retracted position to an operative, blade contacting position, said fingers being provided

with centrally disposed cavities and passageways which communicate with each other when said fingers are in the normal operative position, said secondary frame member being provided with a longitudinally extending groove which connects with said communicating passageways and cavities during the operation of said apparatus, means including an expansible, pressure member supported on said secondary frame and actuable to move said presser fingers from said retracted position to said blade contacting position and to resiliently bias each of said fingers into contact with said blade with substantially equal force, and means including a second expansible pressure member also supported upon said secondary frame actuable to move said fingers from said blade contacting position to said retracted position; and means for introducing pressure air into said groove and through said groove into said connecting cavities and passageways whereby said fingers are cooled and an accumulation of dust is prevented during the operation of said apparatus.

NORVAL J. HOLCOMB.