June 13, 1944. A. S. NORCROSS 2,351,534

SLASHER SQUEEZE ROLL PRESSURE REGULATOR

Filed Aug. 25, 1941 4 Sheets-Sheet 1

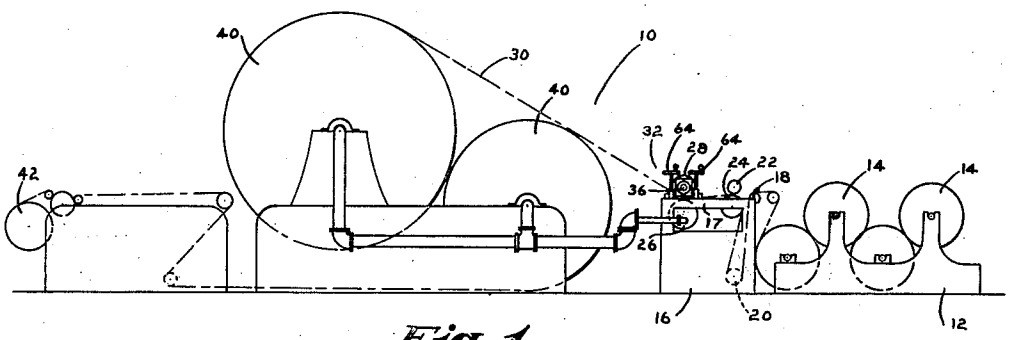


Fig. 1

Fig. 2

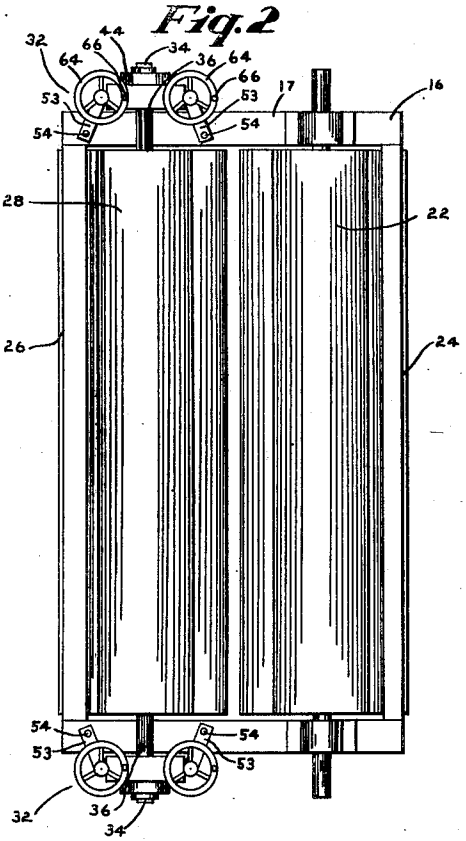
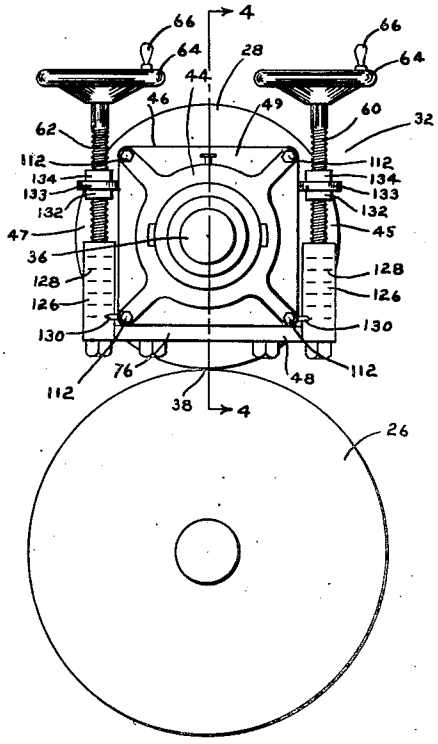


Fig. 3



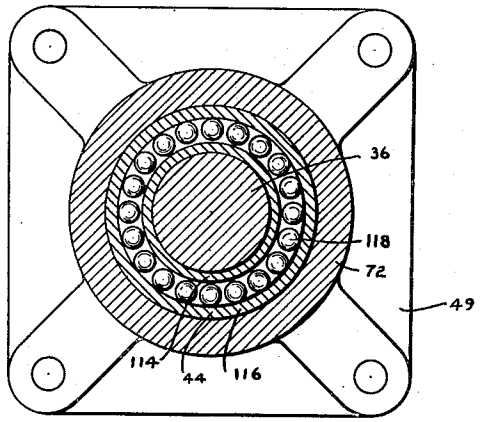
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SLASHER SQUEEZE ROLL PRESSURE REGULATOR

Filed Aug. 25, 1941 4 Sheets-Sheet 2

Fig. 5



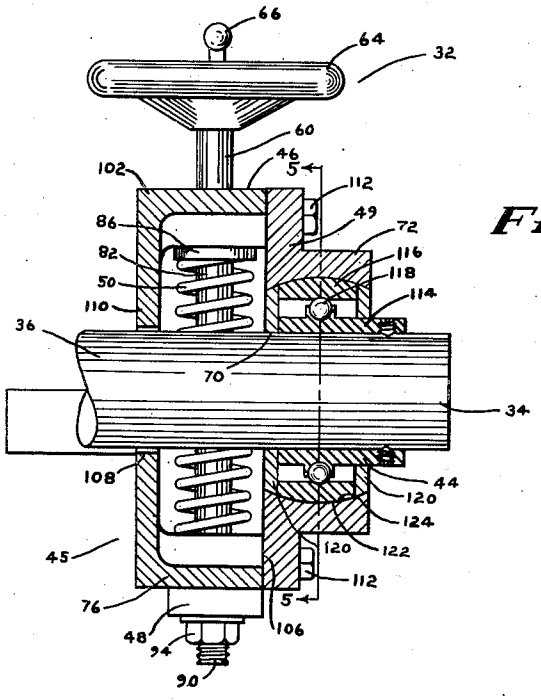


Fig. 4

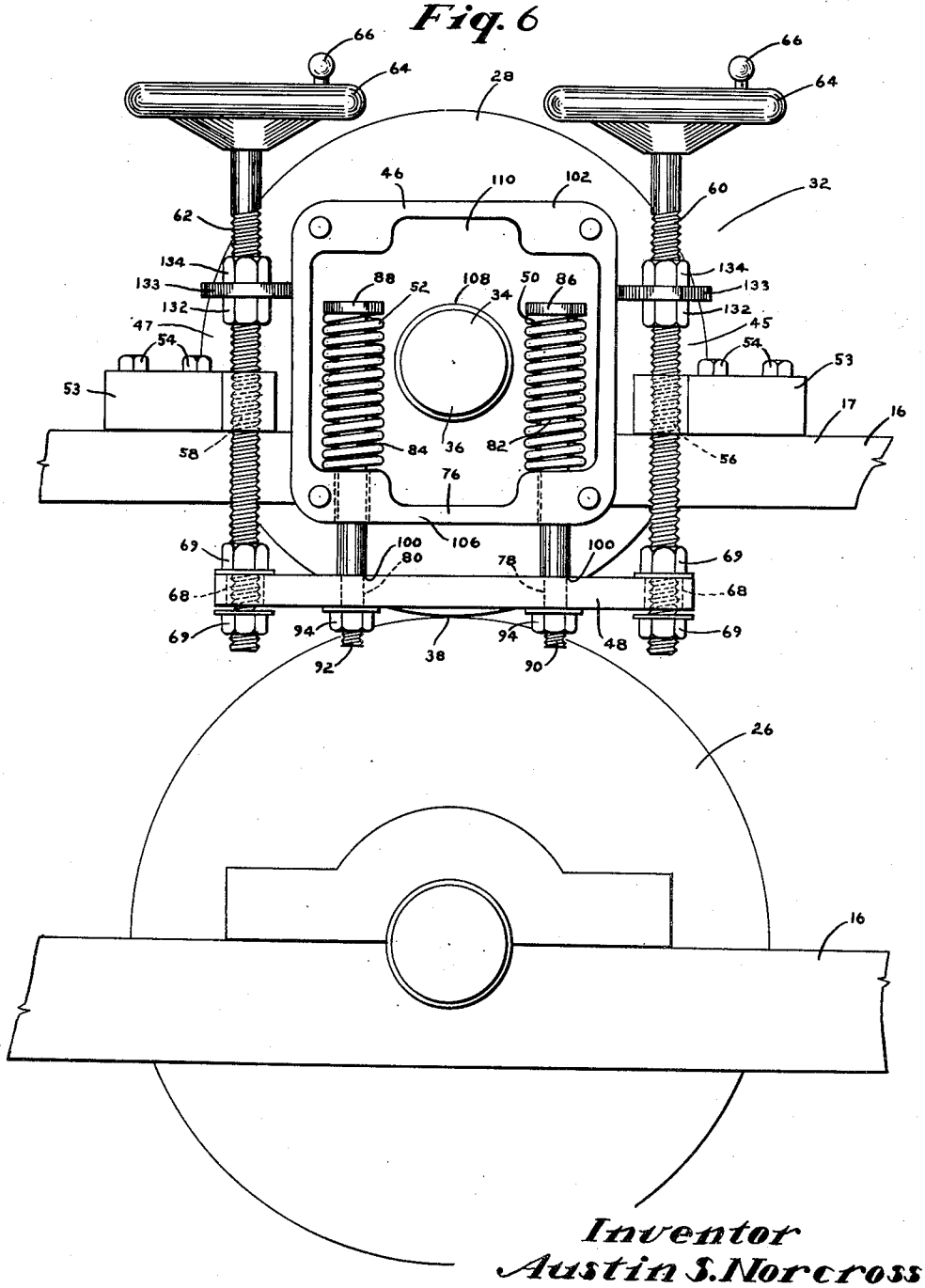
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June 13, 1944. A. S. NORCROSS 2,351,534

SLASHER SQUEEZE ROLL PRESSURE REGULATOR

Filed Aug. 25, 1941 4 Sheets-Sheet 3

Fig. 6



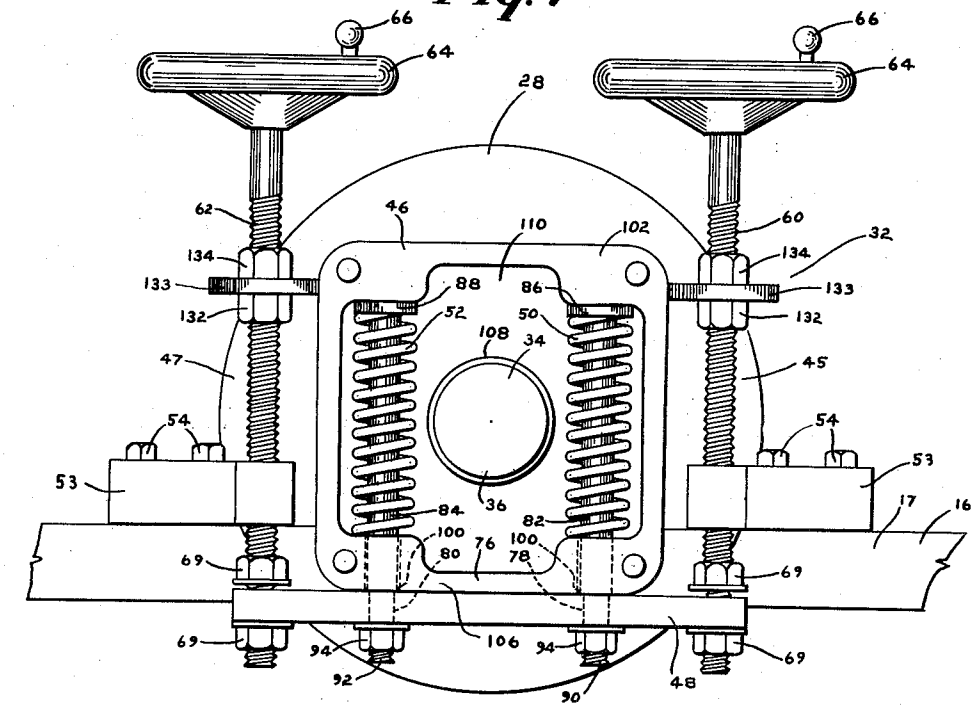
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SLASHER SQUEEZE ROLL PRESSURE REGULATOR

Filed Aug. 25, 1941 4 Sheets-Sheet 4

Fig. 7



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2,351,534

SLASHER SQUEEZE ROLL PRESSURE REGULATOR

Austin S. Norcross, Waban, Mass.

Application August 25, 1941, Serial No. 408,185

15 Claims. (Cl. 28—28)

My invention relates to improvements in supporting devices for the ends of a shaft of a squeeze roll abutting a rotating cooperating roll capable of applying adjustable variable pressure at the nip of said rolls, of lifting said squeeze roll from said lower roll and of retaining the nip between said rolls and the axis of said upper roll in continued alignment with the axis of said other roll. While my improved device may be employed for regulating the pressure exerted by a pair of squeeze rolls of any type, such as wet squeeze or pressure rolls in slashing, dyeing, finishing, paper making, etc. or dry squeeze rolls such as employed in calendering, etc., it is peculiarly designed and adapted for use in a device to be used as an attachment for a warp sizing machine or initially built into such a machine of the type commonly known as a slasher and my invention is primarily adapted to improve sizing conditions in slashers. After the warp has been passed through the size box of such a slasher, it is passed through a pair of squeeze rolls before being dried. In the prior art one squeeze roll has been normally superimposed over the other and the only pressure applied by the squeeze roll has been that furnished by the dead weight of the upper roll which has proved insufficient in practice.

While I am aware that various types of spring devices and weights have also been employed for this purpose usually in conjunction with lever systems, so far as I am aware no device has hitherto been provided which will adjustably vary the pressure applied at the nip between the rolls in a satisfactory manner under all variable conditions of use.

An object of my invention therefore, is to provide a device which will improve the size penetration by applying the correct squeeze roll pressure for the particular sheet being processed, and variations in the slasher itself, such as non-uniform blanket conditions or irregularities in the thickness of the threads.

A further object of my invention is to apply the correct amount of pressure for optimum sizing conditions, in other words to vary the pressure to secure the best type of penetration for the particular warp being sized.

A further object of my invention is to provide an increased slasher speed inasmuch as the correct pressure insures the application of the exact amount of size in the goods and eliminates the carrying forward of excess size, which excess size has often caused the warps to stick to the cylinders, and otherwise slow down the speed of the slasher. The elimination of the unnecessary size obviously reduces the size cost and also decreases the fly in the weave shed.

A further object of my invention is to provide a freely flexible supporting device for the end of a shaft of a squeeze roll, which will readily yield on passage of objects of excessive thickness between the nip, such as large knots in the warp threads, etc., and which will immediately tend to realign itself to again bring the nip in alignment with the axis of the cooperating roll.

In the prior art, most of the devices for varying the pressure included weights operating through a lever system tending to push each end of the adjustable squeeze roll shaft towards the axis of the other roll. With any type of pushing movement any irregularities in the material passing through will tend to push the squeeze roll out of alignment. Inasmuch as I employ a pulling movement, and in my preferred embodiment, a pulling movement both in front and behind, or fore and aft of the nip or shaft ends the net result of these two separate pulls will be at all times to keep the rolls in alignment and the nip between the rolls in alignment with the axis of the lower roll. Due to the fact that I provide an identical supporting device at each end of such a squeeze roll, it is obvious that each end will be similarly kept in alignment with the other end to prevent a disalignment of said rolls due to an excessive adjusting or other movement at one end thereof.

A further object of my invention is to provide a device which will not only resiliently support both ends of a squeeze roll shaft with an equalized spring pull suspension with adjustable variable pressure, but will also by a continued manipulation of the same device lift the adjustable squeeze roll away from its cooperating roll.

A further object of my device is that it will yield to temporarily permit passage of objects of excessive thickness between the rolls, but will immediately resiliently rebound to positively maintain the squeeze rolls in alignment.

A further object of my invention is to provide an indicating device comprising visible scales which always indicate accurately the pressure then applied to each end of the squeeze roll which can be set for the correct pressure for the type of goods being sized or processed as previously determined.

A further object of my invention is to provide a safety device which will positively prevent the pressure applied to the squeeze roll exceeding the safe pressure limit.

These and such other objects of my invention

as may hereinafter appear will be best understood from a description of the accompanying drawings which illustrate an embodiment thereof.

In the drawings, Fig. 1 is a diagrammatic side elevation of a warp sizing machine constructed in accordance with my invention.

Fig. 2 is a plan view of the size box thereof with the warp threads removed.

Fig. 3 is an end elevation of my improved supporting device for supporting an end of the upper squeeze roll shaft in position on the upper squeeze roll.

Fig. 4 is a vertical sectional view taken through my device along the line 4—4 of Fig. 3 in attached position supporting a shaft end.

Fig. 5 is a vertical sectional view taken through a bearing of my improved device along the line 5—5 of Fig. 4.

Fig. 6 is an enlarged end elevation of the parts shown in Fig. 3 with the housing cover plate carrying a shaft end supporting bearing plate and scales removed, showing my improved supporting device with the springs in compressed position and adjusted to apply substantial pressure at the nip of the squeeze rolls adjacent said end.

Fig. 7 is an enlarged side elevation of the parts shown in Fig. 6 with my improved device adjusted to raise the upper squeeze roll away from the lower squeeze or size roll.

In the drawings, wherein like characters of reference generally indicate like parts throughout, 10 generally indicates a warp sizing machine constructed in accordance with my invention. While I have shown my invention applied to a warp sizing machine, it is apparent that certain features thereof may be incorporated in an adjusting device for any type of a squeeze roll pressing against any type of cooperating roll. Said warp sizing machine includes the usual creel 12 for holding the warp supply beams 14, the usual size box 16, including the guide roll 18 mounted thereon, the guide roll 20 in the lower portion of said size box in substantially vertical alignment with the guide roll 18, the initial superimposed squeeze rolls 22 and 24 and the final squeeze rolls 26 and 28. As the pressure exerted by the upper final squeeze roll 28 against the lower final squeeze or size roll 26 considerably determines the penetration of the size in the warp 30 led from the various warp beams 14 and combined before entry into the size box 16, it is to the regulation of such pressure exerted by said final upper squeeze roll 28 against the final lower size roll or squeeze roll 26 that my invention particularly relates.

My invention particularly includes a supporting device 32 for the ends 34 of the shaft 36 of the upper squeeze roll 28 overlying a cooperating rotating lower size roll 26 and capable of applying an adjustable pressure at the nip 38 between said rolls. It is obvious that if desired, my invention may also be employed for supporting each end of the upper squeeze roll 22 in contact with the squeeze roll 24.

The warp after passage through said nip 38 is then suitably dried on the drying cans 40, or in any suitable manner and suitably wound on the loom beam 42. I provide a bearing 44 for each shaft end 36 and adjustable means 45 and 47 fore and aft of each shaft end for resiliently pulling the bearings 44 for the respective shaft ends 36 downwardly towards said other roll 26. Said adjustable means include the spring means 50 and 52 located respectively fore and aft of each shaft end for resiliently pulling down the bearings 44 for the respective shaft ends and the adjusting means 60 and 62 for positively varying the tension exerted by each of said spring means. Said supporting device 32 includes the supporting means, in my preferred embodiment comprising a housing 46 for supporting each bearing 44 and draw-bar means 48 extending longitudinally below each shaft end below each housing 46. The respective spring means 50 and 52 are interposed between a portion of the draw-bar means 48 and a portion of said supporting means 46 fore and aft of each shaft end 36 and I specifically provide said means 60 and 62 for vertically adjustably supporting each end of said draw-bar means on said size box 16 for adjusting the pressure exerted on said nip 38 by each of said spring means 50 and 52, said adjusting means 60 and 62 being also operable to raise the upper squeeze roll 28 from the lower squeeze roll 26 on further actuation thereof on release of tension of said spring means after said draw-bar means abuts said supporting means. I may, if desired, also provide means to indicate relative vertical movement between the ends of said draw-bar means and supporting means to indicate the adjustable pressure applied by said spring means.

Specifically, my invention also includes a freely flexible supporting device 32 for an end 34 of a shaft 36 of a squeeze roll 28 overlying a cooperating rotating lower roll 26, said device being capable of applying an adjustable variable pressure at the nip 38 of said rolls, of lifting said squeeze roll 28 from said lower roll 26 and of retaining said nip in vertical alignment with the axis of said lower roll and where two of said devices are employed on each end of such a squeeze roll, of maintaining the axes of said rolls in vertical alignment. Said device includes the mounting supports or brackets 53 securable in any suitable manner, such as by the bolts 54 shown, to the machine frame, such as the frame 17 of the size box 16. In the embodiment shown, the outer ends of said bracket means 53, which are preferably securable as shown, to the machine frame 17 to project laterally therefrom on each side of a shaft end 34, are provided with the threaded vertical holes 56 and 58 therein. I provide threaded control shafts 60 and 62 having turning handwheels 64 on the upper ends thereof, each provided with a suitable turning handle 66, individually vertically adjustable within said holes 56 and 58 respectively on turning of said handwheels 64. The draw-bar 48 is loosely mounted on and connects the lower ends of said control shafts 60 and 62 together. The lower ends of said shafts may be loosely connected to the ends of said draw-bar in any suitable manner, such as by projecting through suitable holes 68 therein and being secured thereto by the nuts 69 secured on said control shaft at a spaced distance on each side of said draw-bar 48. As stated, my entire device is adapted for loose flexible movement and it is for this reason that the control shafts are loosely connected to the draw-bar. In the preferred embodiment shown, the supporting means 46 for said bearings 44 comprises a freely vertically movable plate 49 of greater height than the diameter of said roll shaft 36 having a central hole 70 for receiving said shaft end and a flange 72 projecting laterally outwardly therefrom around said hole 70. Said plate 49 has a base 76 projecting inwardly from the lower end thereof overlying said draw-bar 48 between said control shafts 60 and 62 having spaced holes 78 and 80 therein fore and aft of said

shaft end 36. I also provide spring supporting rods 82 and 84 projecting upwardly through said holes 78 and 80 on each side of each shaft end 36 having caps 86 and 88 on the upper ends thereof and the lower ends 90 and 92 secured to said draw-bar 48 against upward vertical movement, in the embodiment shown, by having the nuts 94 abutting the lower surface of said draw-bar 48 threaded onto the respective lower ends 90 and 92 of said spring supporting rods and with said draw-bar 48 also abutting an annular shoulder 100 on the lower end of each supporting rod. The helical springs 50 and 52 surround said respective supporting rods 82 and 84 having the upper ends thereof abutting said caps 86 and 88 and the lower ends thereof abutting said base 76 exterior of said spaced holes. To prevent dust, moisture and size from gathering around said springs 50 and 52, said supporting means also includes the housing 46 freely vertically movable with the plate 49 of greater height than the diameter of said roll shaft end 36 overlying said draw-bar 48 between said control shafts 60 and 62 having an open outer end 106, a hole 108 for receiving said roll shaft end 36 in the rear wall 110 thereof, said housing including as its lower wall the base 76 hitherto described. The plate 49, in my preferred embodiment comprises the housing cover 49 detachably securable as by the bolts 112 to the open front end 106 of said housing 46, said plate 49 having the central hole 70 for receiving the shaft end 34 and the annular flange 72 projecting forwardly from said plate around said hole 70. The bearing 44 is mounted within said flange 72, said bearing 44, as stated, supporting said shaft end 34. While any suitable type of a bearing may be used for mounting the shaft end 34 within said annular flange 72, in the preferred embodiment shown, said bearing 44 comprises a ball bearing of standard type comprising the usual inner race 114 surrounding said shaft end 34 and the outer race 116 secured within said flange 72 and the balls 118 mounted in suitable channels in said respective raceways 114 and 116 and if desired, suitable oil seals 120 at each end respectively of said flange 72. In the embodiment shown, the bearing 44 is tiltably mounted within said flange thereby being self-aligning and for this purpose, the outer surface of the outer race-way 116 is transversely concaved as at 122 and the inner surface of the flange 72 correspondingly transversely convexed as at 124.

As stated, I may also provide means to indicate relative vertical movement between the respective ends of said draw-bar 48 and said supporting means 46 to indicate the adjustable pressure supplied by said spring means 50 and 52. In the preferred embodiment shown, said indicating means comprises the indicating scales 126 mounted on each end of said draw-bar 48 to project vertically thereon having the indicating insignia 128 thereon and the pointers 130 projecting longitudinally from each side of the lower end of the supporting means 44, in the embodiment shown, comprising the housing 46 for indicating on said scales 126 the pressure applied by each respective spring 50 and 52 fore and aft of the shaft 36.

I also provide means to limit the downward movement of said control shaft to limit the pressure applied by said springs. In the preferred embodiment, said means comprises the check nuts 132 adjustably mounted on said respective control shafts 60 and 62 having the peripheral guide flanges 133 adapted to abut the end walls of the housing 46 to keep said housing in vertical position and lock nuts 134 on said control shaft for abutting said check nuts 132 for locking them in adjusted position thereon.

As stated hitherto, my improved device may be built into any size slasher box, or any machine employing squeeze rolls, or it may form a supporting device detachably securable to such existing size box or machine.

In use, by counter-clockwise rotation of the control shafts 60 and 62, the upper squeeze roll 28 may be suitably raised as shown in Fig. 7 to permit the warp threads 30 to be threaded between said upper squeeze roll 28 and said size roll 26 after which, the turning handles 64 on the control shafts 60 and 62 may be suitably turned clock-wise until the upper roll 28 abuts the lower roll 26 to provide the nip 38 and further turned clock-wise compressing the respective springs 50 and 52 fore and aft of said shaft end 36 to positively pull the bearing 44 and its supporting means 46 downwardly pulling the roll 28 downwardly against the lower roll 26 with a resilient pulling motion fore and aft of the nip 38. Said control shafts may thus be rotated to compress the springs 50 and 52 the desired amounts to provide the desired adjustable amount of pressure at the nip 38 as indicated by the indicating means 130 and 126 as has been experimentally found desirable previously for similar types of warps. The warp is run through the sizing device as usual. Should there be any irregularities in the blanket or knots in the warp, it is obvious that due to the loose connection 68 between the lower ends of the control shafts 60 and 62 and the draw-bar 48 and the two spring adjustments fore and aft of the shaft end 34 that my improved supporting device will readily yield to permit the passage of any such obstruction through the nip 38 with the resilient springs 50 and 52 causing the device to immediately resiliently rebound after passage of the obstruction therethrough to its original position, the springs 50 and 52 yielding an additional amount for this purpose, such resilient rebound causing the respective rolls 28 and 26 to immediately be brought again into alignment.

It is also obvious that on counter-clockwise rotation of said handwheels 64, the control shafts 60 and 62 may be rotated to lift the draw-bar 48, supporting means 46, bearing 44 and shaft end 34 until the upper squeeze roll 28 is lifted from the lower squeeze roll 26, as shown in Fig. 7 for any desired purpose, such as insertion of the work therethrough, during washing down, during blanket changing and to prevent the upper squeeze roll 28 from marking the warp when the slasher is stopped.

It is apparent therefore that I have provided a novel supporting device for an end of a shaft of a squeeze roll with the advantages described above.

It is understood that my invention is not limited to the specific embodiment shown and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

What I claim is:

1. In a warp sizing machine, a size box, a lower positively driven squeeze roll rigidly rotatably mounted transversely of said size box, an upper squeeze roll above said lower squeeze roll driven by peripheral contact therewith and having a shaft end projecting from each end thereof, a

bearing for each shaft end, supporting means for each bearing, draw-bar means extending longitudinally below each shaft end below each supporting means, spaced spring means interposed between a draw-bar means portion and a supporting means portion fore and aft of each shaft end, means for vertically adjustably mounting each end of each draw-bar means on said size box for adjusting the pressure exerted on the nip of said squeeze rolls by each of said spring means and for raising said upper squeeze roll from the lower squeeze roll after said draw-bar means abuts said supporting means and means to indicate relative vertical movement between the ends of said draw-bar means and supporting means to indicate the adjustable pressure applied by said spring means.

2. In a warp sizing machine, a size box, a lower positively driven squeeze roll rigidly rotatably mounted transversely of said size box, an upper squeeze roll above said lower squeeze roll driven by peripheral contact therewith, and having a shaft end projecting from each end thereof, a bearing for each shaft end, supporting means for each bearing, draw-bar means extending longitudinally below each shaft end below each supporting means, spaced spring means interposed between a draw-bar means portion and a supporting means portion fore and aft of each shaft end, and means for vertically adjustably mounting each end of each draw-bar means on said size box for adjusting the pressure exerted on the nip of said squeeze rolls by each of said spring means and for raising said upper squeeze roll from the lower squeeze roll after said draw-bar means abuts said supporting means.

3. In a warp sizing machine, a size box, a lower positively driven squeeze roll rigidly rotatably mounted transversely of said size box, an upper squeeze roll above said lower squeeze roll driven by peripheral contact therewith and having a shaft end projecting from each end thereof, a bearing for each shaft end, supporting means for each bearing, draw-bar means extending longitudinally below each shaft end, spaced spring means interposed between a draw-bar means portion and a supporting means portion fore and aft of each shaft end, means for vertically adjustably mounting each end of each draw-bar means on said size box for adjusting the pressure exerted on the nip of said squeeze rolls by each of said spring means and means to indicate relative vertical movement between the ends of said draw-bar means and supporting means to indicate the adjustable pressure applied by said spring means.

4. In a warp sizing machine, a size box, a lower positively driven squeeze roll rigidly rotatably mounted transversely of said size box, an upper squeeze roll above said lower squeeze roll driven by peripheral contact therewith, a bearing for each shaft end, supporting means for each bearing, draw-bar means extending longitudinally below each shaft end, spaced spring means interposed between a draw-bar means portion and a supporting means portion fore and aft of each shaft end, and means for vertically adjustably mounting each end of each draw-bar means on said size box for adjusting the pressure exerted on the nip of said squeeze rolls by each of said spring means.

5. A freely flexible supporting device for an end of a shaft of a squeeze roll overlying a cooperating rotating lower roll capable of applying an adjustably variable pressure at the nip of said rolls, of lifting said squeeze roll from said lower roll and retaining said nip in vertical alignment with the axis of said lower roll, comprising bracket means securable to the machine frame to project laterally therefrom on each side of said shaft end having threaded vertical holes therein, threaded control shafts having turning handwheels on the upper ends thereof individually vertically adjustable within said holes on turning of said handwheels, a draw-bar loosely mounted on and connecting the lower ends of said control shafts, having vertically extending scales mounted on each end thereof, a freely vertically movable housing of greater height than the diameter of said roll shaft end overlying said draw-bar between said control shafts having an open outer end, a hole for receiving said roll shaft end in the rear wall thereof and spaced holes in the lower wall thereof fore and aft of said roll shaft end, spring supporting rods projecting upwardly through said holes within said housing on each side of said shaft end having caps on the upper ends thereof and their lower ends secured to said draw-bar against upward vertical movement, helical springs surrounding said supporting rods having the upper ends thereof abutting said caps and the lower ends thereof abutting the lower wall of said housing exterior of said spaced holes, a cover detachably securable to the open front end of said housing having pointers projecting longitudinally from each side of the lower end thereof for indicating on said scales the pressure applied by each spring fore and aft of the shaft end, a central hole for receiving said shaft end and a flange projecting forwardly therefrom aligned with said hole, a bearing tiltably mounted within said flange to be self-aligning supporting said shaft end, check-nuts adjustably mounted on said control shafts to limit the downward movement of the control shafts having peripheral guide flanges adapted to abut said housing end wall to keep said housing in vertical position and lock-nuts on said control shafts for abutting said check-nuts for locking therein in adjusted positions thereon.

6. A freely flexible supporting device for an end of a shaft of a squeeze roll overlying a cooperating rotating lower roll capable of applying an adjustably variable pressure at the nip of said rolls, of lifting said squeeze roll from said lower roll and of retaining said nip in vertical alignment with the axis of said lower roll, comprising bracket means securable to the machine frame to project laterally therefrom on each side of said shaft end having threaded vertical holes therein, threaded control shafts having turning handwheels on the upper ends thereof individually vertically adjustable within said holes on turning of said handwheels, a draw-bar loosely mounted on and connecting the lower ends of said control shafts, a freely vertically movable housing of greater height than the diameter of said roll shaft end overlying said draw-bar between said control shafts having an open outer end, a hole for receiving said roll shaft end in the rear wall thereof and spaced holes in the lower wall thereof fore and aft of said roll shaft end, spring supporting rods projecting upwardly through said holes within said housing on each side of said shaft end having caps on the upper ends thereof and their lower ends secured to said draw-bar against upward vertical movement, helical springs surrounding said supporting rods having the upper ends thereof abutting said caps and the lower ends thereof abutting the lower wall of said housing exterior of said spaced holes,

a cover detachably securable to the open front end of said housing having a central hole for receiving said shaft end and a flange projecting forwardly therefrom aligned with said hole, and a bearing mounted within said flange supporting said shaft end.

7. A freely flexible supporting device for an end of a shaft of a squeeze roll overlying a cooperating rotating lower roll capable of applying an adjustably variable pressure at the nip of said rolls, of lifting said squeeze roll from said lower roll and retaining said nip in vertical alignment with the axis of said lower roll, comprising bracket means securable to the machine frame to project laterally therefrom on each side of said shaft end having threaded vertical holes therein, threaded control shafts having turning handwheels on the upper ends thereof individually vertically adjustable within said holes on turning of said handwheels, a draw-bar loosely mounted on and connecting the lower ends of said control shafts having vertically extending scales mounted on each end thereof, a freely vertically movable plate of greater height than the diameter of said roll shaft having a central hole for receiving said shaft and a flange projecting forwardly therefrom aligned with said hole, and having a base projecting inwardly from the lower end thereof overlying said draw-bar between said control shafts having spaced holes therein fore and aft of said shaft end, spring supporting rods projecting upwardly through said holes on each side of said shaft end having caps on the upper ends thereof and the lower ends secured to said draw-bar against upward vertical movement, helical springs surrounding said supporting rods having the upper ends thereof abutting said caps and the lower ends thereof abutting said base exterior of said spaced holes, a bearing supporting said shaft tiltably mounted within said flange to be self-aligned, pointers projecting longitudinally from each side of the lower ends of said plate for indicating on said scales the pressure applied by each of the springs fore and aft of the shaft end and check-nuts adjustably mounted on said control shafts to limit the downward movement of the control shafts having peripheral guide flanges adapted to abut said plate end walls to keep said plate in vertical position and lock-nuts on said control shafts for abutting said check nuts for locking them in adjusted positions thereon.

8. A freely flexible supporting device for an end of a shaft of a squeeze roll overlying a cooperating rotating lower roll capable of applying an adjustably variable pressure at the nip of said rolls, of lifting said squeeze roll from said lower roll and retaining said nip in vertical alignment with the axis of said lower roll, comprising, bracket means securable to the machine frame to project laterally therefrom on each side of said shaft end having threaded vertical holes therein, threaded control shafts having turning handwheels on the upper ends thereof individually vertically adjustable within said holes on turning of said handwheels, a draw-bar loosely mounted on and connecting the lower ends of said control shafts, a freely vertically movable plate of greater height than the diameter of said roll shaft having a central hole for receiving said shaft and a flange projecting forwardly therefrom aligned with said hole and having a base projecting inwardly from the lower end thereof overlying said draw-bar between said control shafts having spaced holes therein fore and aft of said shaft end, spring supporting rods projecting upwardly through said holes on each side of said shaft end having caps on the upper ends thereof and the lower ends secured to said draw-bar against upward vertical movement, helical springs surrounding said supporting rods having the upper ends thereof abutting said caps and the lower ends thereof abutting said base exterior of said spaced holes, and a bearing supporting said shaft mounted within said flange.

9. A freely flexible supporting device for an end of a shaft of a squeeze roll overlying a cooperating rotating lower roll capable of applying an adjustably variable pressure at the nip of said rolls, of lifting said squeeze roll from said lower roll and retaining said nip in vertical alignment with the axis of said lower roll, comprising, bracket means securable to the machine frame to project laterally therefrom on each side of said shaft end having threaded vertical holes therein, threaded control shafts having turning handwheels on the upper ends thereof individually vertically adjustable within said holes on turning of said handwheels, a draw-bar loosely mounted on and connecting the lower ends of said control shafts having vertically extending scales mounted on each end thereof, a freely vertically movable plate of greater height than the diameter of said roll shaft having a central hole for receiving said shaft and a flange projecting forwardly therefrom aligned with said hole and having a base projecting inwardly from the lower end thereof overlying said draw-bar between said control shafts having spaced holes therein fore and aft of said shaft end, spring supporting rods projecting upwardly through said holes on each side of said shaft end having caps on the upper ends thereof and the lower ends secured to said draw-bar against upward vertical movement, helical springs surrounding said supporting rods having the upper ends thereof abutting said caps and the lower ends thereof abutting said base exterior of said spaced holes, a bearing supporting said shaft mounted within said flange, and pointers projecting longitudinally from each side of the lower ends of said plate for indicating on said scales the pressure applied by each of the springs fore and aft of the shaft end.

10. A freely flexible supporting device for an end of a shaft of a squeeze roll overlying a cooperating rotating lower roll capable of applying an adjustably variable pressure at the nip of said rolls, of lifting said squeeze roll from said lower roll and retaining said nip in vertical alignment with the axis of said lower roll, comprising, bracket means securable to the machine frame to project laterally therefrom on each side of said shaft end having threaded vertical holes therein, threaded control shafts having turning handwheels on the upper ends thereof individually vertically adjustable within said holes on turning of said handwheels, a draw-bar loosely mounted on and connecting the lower ends of said control shafts, a freely vertically movable plate of greater height than the diameter of said roll shaft having a central hole for receiving said shaft and a flange projecting forwardly therefrom aligned with said hole and having a base projecting inwardly from the lower end thereof overlying said draw-bar between said control shafts having spaced holes therein fore and aft of said shaft end, spring supporting rods projecting upwardly through said holes on each side of said shaft end having caps on the upper ends thereof and the lower ends secured to said draw-bar against upward vertical

movement, helical springs surrounding said supporting rods having the upper ends thereof abutting said caps and the lower ends thereof abutting said base exterior of said spaced holes, and a bearing supporting said shaft tiltably mounted within said flange to be self-aligned.

11. A freely flexible supporting device for an end of a shaft of a squeeze roll overlying a cooperating rotating lower roll capable of applying an adjustably variable pressure at the nip of said rolls, of lifting said squeeze roll from said lower roll and retaining said nip in vertical alignment with the axis of said lower roll, comprising, bracket means securable to the machine frame to project laterally therefrom on each side of said shaft end having threaded vertical holes therein, threaded control shafts having turning handwheels on the upper ends thereof individually vertically adjustable within said holes on turning of said handwheels, a draw-bar loosely mounted on and connecting the lower ends of said control shafts, a freely vertically movable plate of greater height than the diameter of said roll shaft having a central hole for receiving said shaft and a flange projecting forwardly therefrom aligned with said hole and having a base projecting inwardly from the lower end thereof overlying said draw-bar between said control shafts having spaced holes therein fore and aft of said shaft end, spring supporting rods projecting upwardly through said holes on each side of said shaft end having caps on the upper ends thereof and the lower ends secured to said draw-bar against upward vertical movement, helical springs surrounding said supporting rods having the upper ends thereof abutting said caps and the lower ends thereof abutting said base exterior of said spaced holes, a bearing supporting said shaft mounted within said flange and check-nuts adjustably mounted on said control shafts to limit the downward movement of the control shafts having peripheral guide flanges adapted to abut said plate end walls to keep said plate in vertical position and lock-nuts on said control shafts for abutting said check-nuts for locking therein in adjusted positions thereon.

12. A freely flexible supporting device for an end of a shaft of a squeeze roll overlying a cooperating rotating lower roll capable of applying an adjustable variable pressure at the nip of said rolls, of lifting said squeeze roll from said lower roll and of retaining said nip in vertical alignment with the axis of said lower roll, comprising, a bearing for said shaft end, supporting means for said bearing, draw-bar means extending longitudinally below said shaft end below said supporting means, spaced spring means interposed between a draw-bar means portion and a supporting means portion fore and aft of each shaft end and means including a portion adapted to be rigidly mounted fore and aft of each shaft end for vertically adjustably supporting each end of said draw-bar means for adjusting the pressure exerted on said nip by each of said spring means and for raising said upper squeeze roll from said lower squeeze roll after said draw-bar means abuts said supporting means and means to indicate relative vertical movement between the ends of said draw-bar means and supporting means to indicate the adjustable pressure applied by said spring means.

13. A freely flexible supporting device for an end of a shaft of a squeeze roll overlying a cooperating rotating lower roll capable of applying an adjustable variable pressure at the nip of said rolls, of lifting said squeeze roll from said lower roll and of retaining said nip in vertical alignment with the axis of said lower roll, comprising, a bearing for said shaft end, supporting means for said bearing, draw-bar means extending longitudinally below said shaft end below said supporting means, spaced spring means interposed between a draw-bar means portion and a supporting means portion fore and aft of each shaft end and means including a portion adapted to be rigidly mounted fore and aft of each shaft end for vertically adjustably supporting each end of said draw-bar means for adjusting the pressure exerted on said nip by each of said spring means and for raising said upper squeeze roll from said lower squeeze roll after said draw-bar means abuts said supporting means.

14. A freely flexible supporting device for an end of a shaft of a squeeze roll overlying a cooperating rotating lower roll capable of applying an adjustable variable pressure at the nip of said rolls, and of retaining said nip in vertical alignment with the axis of said lower roll, comprising, a bearing for said shaft end, supporting means for said bearing, draw-bar means extending longitudinally below said shaft end, spaced spring means interposed between a draw-bar means portion and a supporting means portion fore and aft of each shaft end and means including a portion adapted to be rigidly mounted fore and aft of each shaft end for vertically adjustably supporting each end of said draw-bar means for adjusting the pressure exerted on said nip by each of said spring means and means to indicate relative vertical movement between the ends of said draw-bar means and supporting means to indicate the adjustable pressure applied by said spring means.

15. A freely flexible supporting device for an end of a shaft of a squeeze roll overlying a cooperating rotating lower roll capable of applying an adjustable variable pressure at the nip of said rolls, and of retaining said nip in vertical alignment with the axis of said lower roll, comprising, a bearing for said shaft end, supporting means for said bearing, draw-bar means extending longitudinally below said shaft end, spaced spring means interposed between a draw-bar means portion and a supporting means portion fore and aft of each shaft end and means including a portion adapted to be rigidly mounted fore and aft of each shaft end for vertically adjustably supporting each end of said draw-bar means for adjusting the pressure exerted on said nip by each of said spring means.

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