

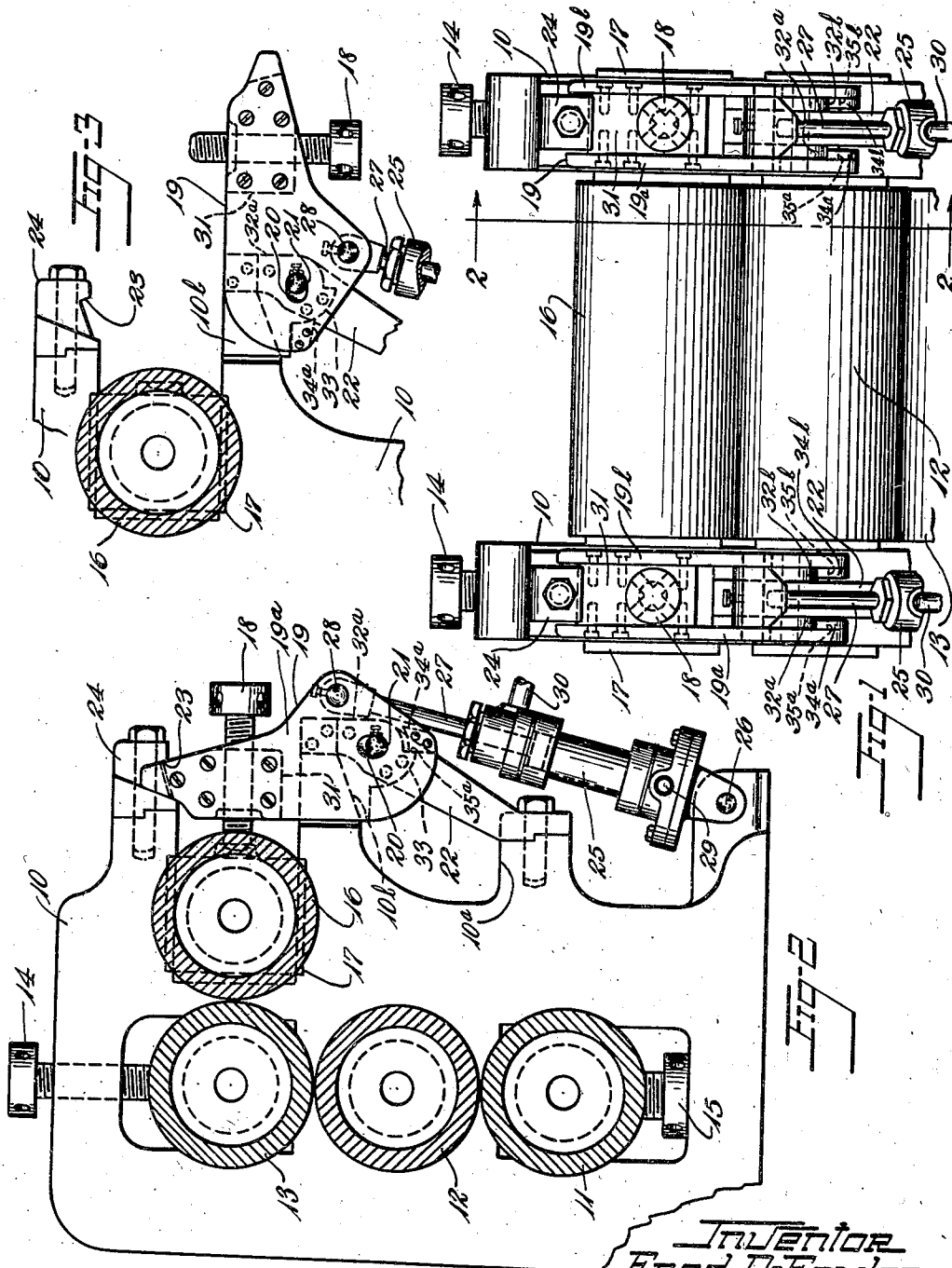
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CHANGE ROLL CALENDER

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CHANGE-ROLL CALENDER

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This invention relates to calenders of the type having rolls which it is desired to change quickly, as for example when it is desired to change the roll pattern in forming parts of rubber footwear.

Heretofore the change-roll, in the case of the four-roll rubber calender, has been mounted on the calendar by means of adjusting screws extending through yokes bolted to the frame. When it has been desired to change the face roll tedious manipulation of the bolts has been required in order to loosen the yoke.

The chief objects of this invention are to provide for speeding up the roll changing operation and for making such operation more convenient, and to provide these results with simplicity of apparatus and adaptability of the apparatus to existing calenders.

These and further objects will be apparent from the following description, reference being had to the accompanying drawing in which:

Fig. 1 is a front elevation of a calender constructed according to and embodying the invention, parts being broken away.

Fig. 2 is a section taken along the line 2—2 of Fig. 1, through the whole calender.

Fig. 3 is a view like Fig. 2, but showing a portion of the apparatus in a different position.

The invention is illustrated as applied to a four-roll calender for making rubber parts such, for example, as parts for rubber footwear. The calender comprising upright frame members 10, 10, at the sides thereof, between which are mounted three calender rolls 11, 12 and 13 in vertical alignment, upper adjusting screws 14, 14 and lower adjusting screws 15, 15 being provided for adjusting the rolls to control the thickness of the calendered stock.

At the front of the calender is mounted a face roll 16, this roll being journaled in journal blocks 17, 17 mounted for horizontal sliding movement in the frame members 10, 10 so that this face roll 16 may be brought into operative adjusted relation with the top roll 13. The roll 16 may be suitably designed to shape the rubber parts and their surfaces as desired.

Adjustment of the roll 16 to and from the roll 13 is effected by means of adjusting screws 18, 18 bearing against sockets in the journal blocks 17, 17, and threadedly mounted in respective yokes 19, 19.

Each of these yokes has an elongated slot 20 for mounting the yoke upon a pintle 21 suitably supported in a bracket 22 secured to the frame element of the calender. The elongated slot 20 provides a lost-motion pivotal connection by

which the yoke is permitted movement in translation in the vertical direction as indicated in Fig. 2, and is permitted to pivot between the vertical position and the horizontal position of Fig. 3. In the vertical and uppermost position of Fig. 2 each yoke is located at its upper end behind a shoulder 23 of a lug 24 secured to the frame.

Movement of each yoke from its upper locked position of Fig. 2 to its lowermost position permitted by the elongated slot 20, and also pivotal movement to and from the position of Fig. 3 is effected by means of a fluid-pressure cylinder 25 pivotally mounted at its lower end at 26 to the frame of the calender and having its piston rod 27 pivoted at 28 to the yoke 19, the pivotal connection 28 being to the right of the pivot 21 of the yoke as seen in Fig. 2. Suitable pressure-fluid and exhaust connections 29 and 30 are provided for the cylinder.

The yokes 19 may be of any suitable construction. In the embodiment illustrated in the drawing each yoke comprises side plates 19a and 19b having an interposed block 31 screwed or bolted in place and retaining the adjusting screw 18. The pivot 28 for the connection to the piston of the operating cylinder comprises a pin extending between the plates with the end of the piston rod 27 journaled upon such pin. Also the elongated opening 20 is duplicated in alignment in both plates of the yoke and the pin 21 carried by the bracket 22 has its end portions in the openings 20 of the said plates of the yoke. At the upper end of each yoke the side plates may overlap the sides of the lug 24, the upper front edge of the block 31 being utilized to seat behind the shoulder 23 for locking the yoke in place.

The brackets 22 are bolted at their lower ends to projections 10a of the frame and at their upper ends to projections 10b of the frame. Adjoining the plates 19a, 19b of the yoke are mounted cam plates 32a and 32b, these cam plates being secured immovably with relation to the frame and having arcuate cam portions 33, 33 approximately concentric with the pin 21. The cam surfaces 33, 33 cooperate with lugs 34a, 34b upon the inner faces of the plates 19a and 19b of the yokes so that when the yokes are rotated they will not be subject to excessive looseness upon the pins 21 as a result of the elongated slots 20. Also, the cam surfaces 33, 33 terminate in shoulders 35a, 35b such that in the upright position of the yokes as shown in Fig. 2 the lugs 34a, 34b may be raised behind such shoulders, and by freeing the lugs 34a, 34b from the cam surfaces 33, 33 permit the yokes to be raised to engage be-

hind the upper shoulders 23, as hereinabove described.

In operation, let it be assumed the parts are in the position of Fig. 2 and that it is desired to change the roll 16. In order to loosen such roll for removal it is necessary only to admit pressure fluid into the upper end of the cylinders 25 to urge the rods 27 downward. This has the result first of drawing the yokes downward to release them from the locks behind shoulders 23, this downward movement being accommodated by the elongated slot 20 at the pivots 21, and the outwardly bevelled form of the shoulders 23 serving to facilitate the loosening of the yoke lock. At the same time the lugs 34a, 34b are freed from the shoulders 35a, 35b so as to coast with the cam surfaces 33, 33.

When the yokes have been dropped clear of the shoulders 23 the continuous downward movement of the piston rods 27 causes a swinging of the yokes about the pivots 21 to the position shown in Fig. 3 wherein the roll 16 and its journal blocks are accessible and free to be removed forwardly from the seats in the calender frame.

Upon insertion of a desired face roll the fluid pressure cylinders are operated to force the piston rods upward which reverses the movement of the yokes hereinbefore described, that is the yokes are first pivoted counterclockwise from the position in Fig. 3 and a continued movement of the piston rods urges the yokes upward as permitted by the elongated slot 20 until the yokes are again engaged behind the shoulders 23, the shoulders 35a, 35b receiving the lugs 34a, 34b to permit the upward movement of the yokes. Adjustment of the screws 18 may then be made to obtain the desired relation of the face roll to the top roll of the calender.

By the construction hereinabove described the face roll 16 is securely held in its adjusted position and yet may be quickly released and freed for removal when a change is desired, and all this may be effected without requiring the manipulation of any attaching bolts.

Variations may be made without departing from the scope of the invention as it is hereinafter claimed.

I claim:

1. A change-roll calender comprising a frame, a roll mounted in said frame, a yoke for retaining said roll in place, said yoke being pivotally mounted by a lost-motion connection to said frame, a shoulder on said frame behind which

the yoke is adapted to be positioned by virtue of the lost-motion connection, and means for swinging the yoke about its pivot and for moving the yoke to and from the position behind said shoulder.

2. A change-roll calender comprising a frame, a roll mounted in said frame, a pair of yokes for retaining said roll in place, said yokes being pivotally mounted by lost-motion connections to said frame, shoulders on said frame behind which the yokes are adapted to be positioned by virtue of the lost-motion connections, and means comprising fluid-pressure cylinders pivotally mounted upon the frame and having pivotal connections with said yokes for swinging the yokes about their pivots and to and from their positions behind said shoulders.

3. A change-roll calender comprising a frame, a roll mounted in said frame, a yoke for retaining said roll in place, said yoke being pivotally mounted by a lost-motion connection to said frame, a shoulder on said frame behind which the yoke is adapted to be positioned by virtue of the lost-motion connection, cam means for resisting linear movement of said yoke during pivotal movement thereof, said cam means permitting movement in translation of said yoke to engage said shoulder, and means for swinging the yoke about its pivot and for moving the yoke to and from the position behind said shoulder.

4. A change-roll apparatus in which a roll-supporting structure has a roll mounted therein, said apparatus comprising a roll-retaining structure movable to a retaining position and in a direction away from such position, said roll-retaining structure being movable also in a second direction, means for holding the retaining structure in the retaining position, and means for moving the retaining structure in said second direction to release it from the holding means to permit movement of the retaining structure in the first said direction away from the retaining position.

5. A change-roll apparatus in which a roll-supporting structure has a roll mounted therein, said apparatus comprising a roll-retaining structure movable to a retaining position and behind a stop on said supporting structure, and means for moving the retaining structure to its retaining position and for moving the retaining structure in a direction releasing it from behind the stop.

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