March 17, 1931. T. T. POPE 1,796,534

AUTOMATIC CHUCK FOR PAPER ROLLS

Filed May 9, 1927 2 Sheets-Sheet 1

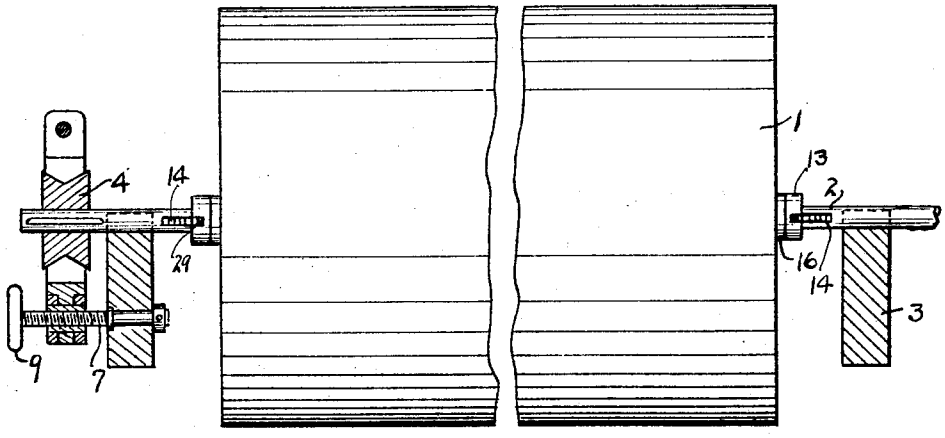


Fig. 1.

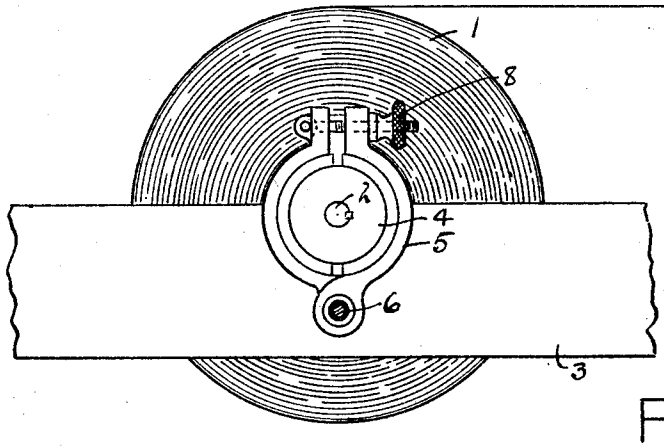


Fig. 2.

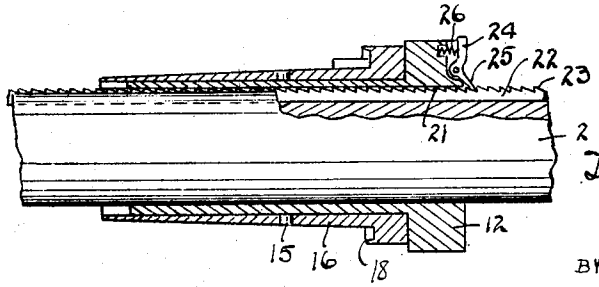


Fig. 7.

Turner T. Pope Inventor

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AUTOMATIC CHUCK FOR PAPER ROLLS

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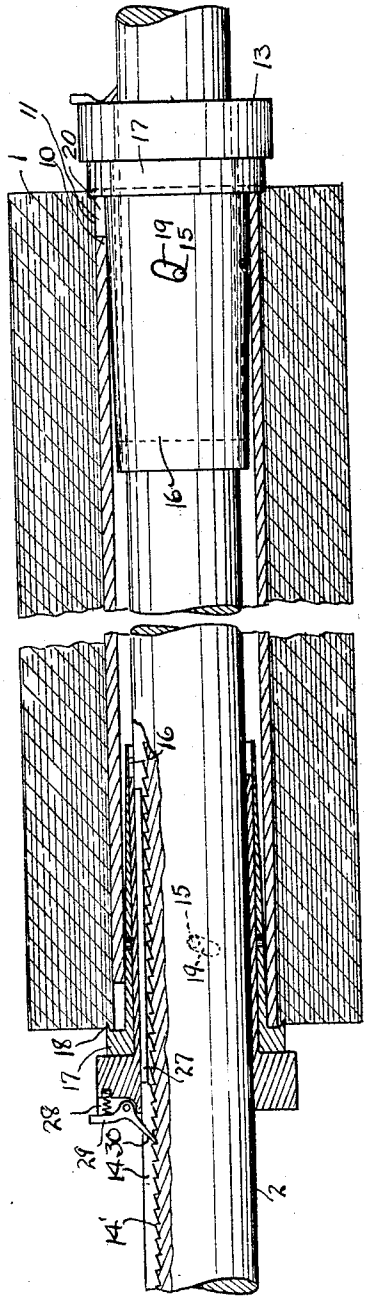


Fig. 3.

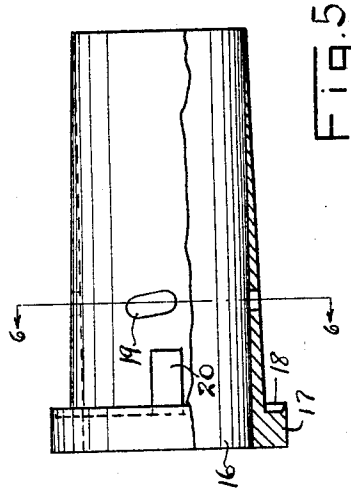


Fig. 5.

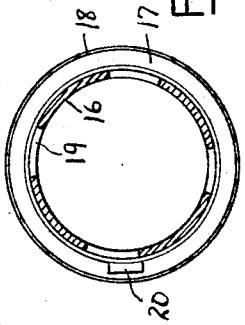


Fig. 6.

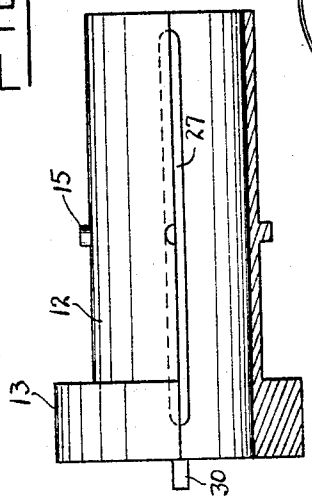


Fig. 4.

Turner T. Pope Inventor

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Patented Mar. 17, 1931

1,796,534

UNITED STATES PATENT OFFICE

TURNER T. POPE, OF HOUSTON, TEXAS, ASSIGNOR OF ONE-HALF TO G. L. MIMS, OF HOUSTON, TEXAS

AUTOMATIC CHUCK FOR PAPER ROLLS

Application filed May 9, 1927. Serial No. 189,846.

My invention relates to chucks for gripping rolls of print paper and the like to the shafts of the press upon which the paper is used.

The chucks employed in securing rolls of paper to the supporting shafts upon the press, must be loosened and removed each time a new roll is mounted on the shaft for use. The chucks now most commonly employed are objectionable from the fact that they come loose easily when in use and allow slippage of the roll on the shaft and cause injury to the core of the roll. Furthermore, the gripping means engages so large a portion of the paper on the core that it is impossible to unreel all of the paper due to the grip of the chuck on the paper. A large quantity of paper is thus wasted at the center of each roll.

It is an object of my invention to provide a chuck which is easily and quickly installed or removed, and which is capable of automatic tightening on the shaft, when desired, by the adjustment of the tension upon the web of paper leaving the roll.

It is a further object to provide a chuck of the character stated which does not engage and mutilate more than a comparatively small portion of the roll of paper.

It is desired that the chuck be capable of ready adjustment for different lengths of rolls of paper and be automatically latched in place on the shaft where desired.

Other objects of the invention residing in the particular construction and arrangement of the parts will be apparent from the more detailed description which follows.

Referring to the drawings herewith, Fig. 1 is a broken side view of a roll of paper mounted upon a shaft in the press, and employing my invention. Fig. 2 is an end view of the same. Fig. 3 is a central vertical section through a roll of paper, showing it in position upon a shaft, my invention being shown both in section and in elevation. Fig. 4 is a view of the chuck mandrel detached partly in elevation and partly in section. Fig. 5 is a similar view of the chuck sleeve. Fig. 6 is a transverse section on the plane 6—6 of Fig. 5. Fig. 7 is a section of a chuck of slightly different construction, but embodying the invention.

Like numerals are employed to designate like parts in all the views.

In Fig. 1 the roll of paper 1 is shown as mounted upon a shaft 2 supported in the frame 3 of the press. At one end, the shaft projects beyond the frame and has thereon a tension device in the nature of a brake. It comprises a grooved drum 4 keyed to the shaft. Fitting about the drum is a clamping band 5 made up of two semi-circular members hinged at 6 to a threaded pin 7. The upper ends of the members are equipped with a tension screw 8 by means of which the pressure of the band may be adjusted upon the drum in an obvious manner. The pin 7 is rotatable through a hand wheel 9 to adjust the position of the drum relative to the frame of the press.

The roll of paper 1 has an inner core 10, ordinarily made of pasteboard, or some similar composition, said core being cylindrical in shape and furnishing a spool upon which the web of paper is wound. The ends of the core have ordinarily a slot or recess 11 therein, which is adapted to receive some means mounted on the shaft to hold the core against rotation on the shaft.

To hold the core and the roll firmly upon the shaft in proper adjusted position, I employ a chuck at each end of the roll adapted to fit within the core and grip the same. The construction of this chuck includes an inner mandrel or sleeve 12 which fits slidably upon the shaft 2 and is approximately cylindrical in shape. It has its outer end formed with a radial flange 13 thereon, said flange having means thereon through which the mandrel may be fixed to the shaft in any desired position.

I contemplate the provision of means to automatically lock the mandrel upon the shaft. In Figs. 1 to 6 inclusive, the shaft 2 is provided with a keyway therein, the lower side of which has teeth 14′ inclined from the ends toward the middle point of the shaft. The mandrel has a short key 27 thereon fitting into said keyway sufficiently to prevent rotation of said mandrel on said shaft.

At the outer side of the flange 13 is a recess 28 in which is pivoted a pawl 29 having a finger 30 engaging said teeth 14' so as to automatically hold said mandrel in locked position.

In Fig. 7 the locking means is modified. In this case there is formed on the inner side of the mandrel a keyway 21 adapted to receive a key 22 in the shaft. This serves to prevent relative rotation of the mandrel on the shaft. The key is formed on its outer face adjacent the mandrel with ratchet teeth 23 inclined inwardly toward the middle of the shaft. To engage with these ratchet teeth a pawl 24 is mounted upon the outer end of the mandrel, said pawl having a finger 25 adapted to engage with the teeth 23 of the key and held resiliently in that position by means of a spring 26. Thus, when the mandrel is forced inwardly on the shaft to engage the core, the ratchet will co-act with the teeth 23 upon the key to prevent its movement outwardly. When the chuck is to be again removed from the roll, the pawl is released from the ratchet upon the key by a force exerted upon the upper arm of the pawl in an obvious manner. The mandrel also has at an approximately central position thereon a plurality of spaced pins or lugs 15, extending radially from the mandrel. Said pins are welded to the mandrel after the outer sleeve 16 has been placed in proper position.

The mandrel forms a seat for a chuck sleeve 16 which fits slidably on the outer cyindrical surface of the mandrel. Said sleeve is tapered from its outer end inwardly and is adapted to be wedged between the mandrel and the inner surface of the core 10. The outer end of the chuck sleeve has a radially extending head 17 which is adapted to contact with the flange 13 upon the mandrel. The inner side of the head 17 has a sharpened flange 18 thereon which extends inwardly a short distance and is adapted to engage about the outer side of the core 10 so as to prevent its undue expansion, due to the gripping of the chuck therein. I have formed the gripping edge 18 slightly larger than the core so as to also engage a few windings of the paper upon the roll, thereby obtaining a firm grip thereon. A key 20 is formed on the sleeve to fit within the slotted opening 11 in the core.

The chuck sleeve 16 has a plurality of openings 19 therein to receive the pins 15 on the mandrel. These openings 19 are inclined in a spiral direction upon the mandrel and the pins 15 fit therein and the sides of the slots or openings provide cam surfaces upon which the pins may slide. When the chuck sleeve is rotated relative to the mandrel in a forward direction, the pin bearing against the side of the slot tends to force the chuck sleeve inwardly against the roll so as to form a more rigid engagement therewith.

In the operation of my device, one of the chucks at one end of the roll is ordinarily set rigidly upon the shaft and is not removed when a new roll is mounted thereon. The opposite chuck is removed, allowing the placing of a new roll of paper upon the shaft and is inserted into position in the end of the roll with the key 20 fitting within the slot or recess 11 in the core, and when the chuck has been forced firmly into position, the mandrel will automatically engage and be latched to the shaft. With reference to Fig. 2, it will be noted that the tension upon the shaft may be varied by the use of the tension screw 8. When the web of paper is being unwound from the roll the pins 15 upon the mandrel will be in the forward side of the slotted openings 19 in the chuck sleeve. If, however, the roll chuck is to be tightened within the core, the tension upon the shaft is increased to slow down the rotation of the shaft and the pull of the web of paper upon the roll will tend to rotate the roll relative to the shaft so as to draw the pins toward the rearward side of the slot and force the chuck sleeve inwardly so as to grip the roll more firmly. This action, as will be noted, is responsive to the tightening of the tension screw 8 at any time so as to assure a firm grip upon the roll.

The advantages of my construction lie in its simple and positive action and the ease with which it may be adjusted to grip the roll. It has a further advantage in that very little of the paper upon the roll will be wasted, due to the action of the chuck. The use of two adjustable chucks, one at each end of the roll, prevents liability of slipping and breaking of the core.

Having thus described the invention, what I claim as new and desired to protect by Letters Patent is:

1. In a press, a shaft, a paper roll thereon having a cylindrical core slotted at its ends, a mandrel on said shaft adapted to fit loosely within the end of said core, a chuck sleeve on said mandrel fitting tightly within said core, a key thereon engaging in said slotted core, a flange on said sleeve having a sharp forwardly extending edge adapted to cut in to said roll, means to tighten said sleeve in said core, and means to fix said mandrel to said shaft.

2. In a press, a shaft, a paper roll thereon, a core in said roll, a mandrel on said shaft within said core, a tapered chuck sleeve on said mandrel, an inwardly extending flange on the periphery of said chuck sleeve to engage about the end of said core, and means connecting said mandrel and sleeve, and responsive to tension on said roll, to tighten said chuck upon the end of said core.

3. In a press, a shaft, a paper roll thereon, a core in said roll, a mandrel on said shaft

within said core, a tapered chuck sleeve on said mandrel, an inwardly extending flange on the periphery of said chuck sleeve to engage about the end of said core, and a radial pin on said mandrel, engaging in a cam slot in said sleeve and arranged to force said sleeve toward said roll when said sleeve is rotated slightly relative to said mandrel.

4. In a press shaft, a paper roll thereon having a cylindrical core slotted at its ends, a mandrel on said shaft adapted to fit loosely within the end of said core, a chuck sleeve slidable on said mandrel and fitting tightly within said core, a key thereon engaging in said slotted core, means securing said sleeve to said mandrel, means to fix said mandrel to said shaft, a flange on said chuck sleeve, and means on said flange to enter the windings of paper adjacent said core.

In testimony whereof I hereunto affix my signature this 5th day of May, A. D. 1927.

TURNER T. POPE.