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CHOCK FOR MILL ROLL MANDRELS

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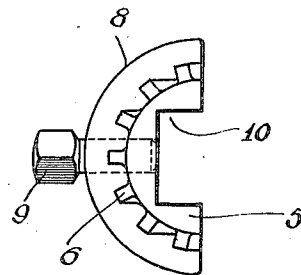
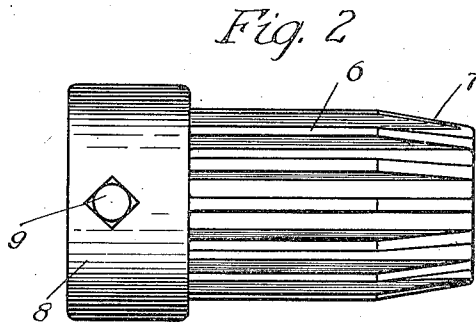
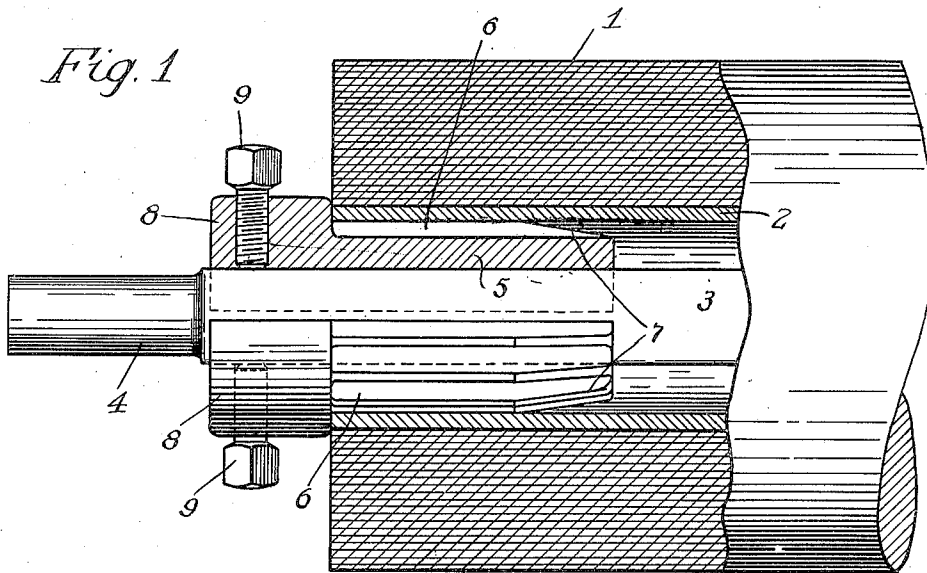


Fig. 3

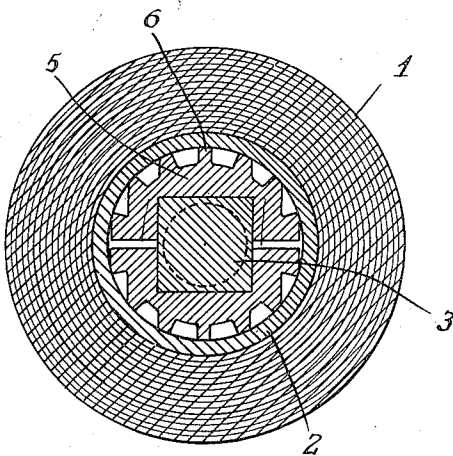


Fig. 4

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CHOCK FOR MILL ROLL MANDRELS

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2 Claims. (Cl. 242—68)

My present invention relates to the paper industry and more particularly to the mounting of mill rolls upon processing machines in which the raw paper web supplied by the mills in rolls is fed to coating, impregnating, printing or other treating machinery. These heavy mill rolls are delivered to the processor wound upon mandrels consisting usually of heavy fiber tubes. On the feed end of the processing machine, these mill rolls of paper are mounted upon a feed shaft with journals turning in suitable bearings to allow the convoluted paper to be drawn off as required. It has heretofore been the general practice to provide a solid integral cone for each end of the roll that is driven into the fiber mandrel or core after first being slipped endwise upon the shaft. Such cone so passed over the end of the shaft is driven into the core tube with a sledge hammer in a direction along the length of the shaft (as the paper rolls are very heavy) resulting not only in the chipping mutilation of the shaft but requiring that accompanying devices, such as clutches, brakes and journal box appurtenances, be first removed in order to so initially slip the cone into position. My present invention has for its object to support and secure a mill roll concentrically on the feed shaft of the machine in an improved manner by means of separate companion chock pieces that together supply the functions of the said cones, which chock pieces, inserted independently by hand, may be pushed with little effort into the ends of the tubular core and later expanded to support it in spaced relation to the shaft but without the necessity of slipping the chock pieces over the ends of the shaft and disturbing the journal bearing structure thereof. In other words, these chock pieces may be applied intermediately from opposite sides without removing the feed shaft from its journal bearings. Furthermore, while, with the prior cone device above mentioned, the periphery of the cone engages the tubular fiber or other core on only one transverse plane of contact, thereby offering only a precarious engagement and tending to rupture the core, my improved chock extends far into the core in substantial parallelism with its cylindrical interior wall and engages and provides support along an extended interior surface. The improvements are directed further toward forming the chock in halves with opposed spreading devices so that it may be expanded into locked position within the core.

To these and other ends, the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully de-

scribed, the novel features being pointed out in the claims at the end of this specification.

In the drawing:

Fig. 1 is a longitudinal central section through a mill roll on a shaft provided with chocks constructed in accordance with and illustrating one embodiment of my invention;

Fig. 2 is a top plan view of one of the chock elements;

Fig. 3 is an inner end view thereof, and

Fig. 4 is a transverse section taken through the roll, mandrel, chock pieces and shaft.

Similar reference numerals throughout the several views indicate the same parts.

Referring more particularly to the drawing, indicates a heavy paper roll wound upon a mandrel consisting of a tubular fiber core 2. Extending centrally through the core is the shaft 3 of the processing machine, of which the mill roll carried thereby constitutes the feed end, said shaft terminating in journals 4 to be supported in suitable journal boxes. The fiber core 2 is usually of about a three inch internal diameter and the shaft 3 is an inch shaft, we will say. I prefer to have the body of the shaft at 3 square in cross section for the purposes of better taking the chocks and the set screws associated therewith. It may be said here that it is past practice to have a flattened side of the shaft for the set screw contact of the solid cones above described as having been heretofore employed.

In the practice of my invention, I slide upon this squared portion 3 of the shaft and in opposition to each other two generally semi-cylindrical chock pieces 5. In each, a truly semi-cylindrical intermediate portion is provided with longitudinal ribs 6 that constitute a body portion concentric with the fiber core tube or mandrel 2. At their inner ends, these portions terminate with a continuation of the ribs in a tapered or introductory wedge portion 7. At their outer ends, they terminate in collar portions 8 of greater diameter than the intermediate or body portions, said collar portions being provided with diametrically opposed set screws 9, such enlargements adapting them to abut against the end of the roll 1 or at least against the end of the mandrel core 2, as clearly shown in Fig. 1. In its inner side, each chock is grooved at 10 to fit half of the shaft 3, in this instance the groove being rectangular in complement to the squared shaft. As appears more clearly in Fig. 4, the grooves 6 have parallel outer sides to facilitate the withdrawal of the chock from the sand of the flask in casting.

In practice, the roll, through its tubular core, is needle threaded loosely upon the shaft 3 and the latter by means of its journals 4 fixed in the journal boxes. The two chocks in opposition to each other are then slid along the squared shaft 3 by means of their channels 10 and their cylindrical portions 5 pushed into the tubular core 2 so that the intermediate cylindrical ribbed portions snugly fit the said tube along an elongated area and the enlargements or collars 8 about the end of the tube. In other words, the two-part chock as a whole preferably initially fits within the core only loosely enough to allow it to be slid into place by hand. The tapered portions 7 facilitate the initial entry of the chock pieces into the tube, as will be understood. For instance, the roll 1 must be raised slightly on the shaft to introduce the top chock piece in Fig. 1, but as soon as the tapered portion 7 thereof has entered the tubular core, the similar portion of the lower chock can easily enter and then the two parts are together pushed home without great effort and without the pounding required in the case of the integral cone shocks first referred to as being old practice. When the collars or enlargements 8 have been pushed against the ends of the core tube 2, as in Fig. 1, the set screws 9 are tightened on the squared shaft.

It is obvious that my divided chock of this invention may be adapted in its inner groove 10 to a cylindrical instead of a square shaft with the usual flattened surfaces for the engagement of the set screws 9 but a square shaft, as shown, locking on all sides with each chock element, greatly relieves the strain on the said set screws. In other words, so far as relative rotation is concerned, the latter need function only to prevent longitudinal movement along the shaft, the tendency to which is slight due to the long and close fitting bearing that the intermediate cylindrical portion 5 of the chocks have with the core 2. In this connection, it is again pointed out that with the integral cone shaped chocks of present practice, the tendency is very great for the roll to spread the chocks at each end of the shaft and loosen and spoil the concentric relationship of the roll with the shaft as well as allowing it to turn independently of the shaft by slipping on the chocks.

As before mentioned, the core tubes or mandrels 2 of the mill roll vary in internal diameter considerably with different manufactures, and the principal feature of this invention is that, after the intermediate portions 5 of the chocks have been slid into position, the opposed set screws have abundant range and power to expand them so that the ribs bite into the core tube along an extended area and absolutely prevent relative movement of the mill roll on the chocks.

I have described this intermediate or body portion 5 as being truly cylindrical. In some instances, however, it is desirable to make the inner end adjacent to the tapered portion 7 slightly larger than the outer portion adjacent to the collar 8. Thus, the two chocks can be slid in on the shaft with dimensions sufficient to give adequate clearance for this operation and then when the

set screws are tightened and the chocks expanded, the desired powerful intimate contact will be made on the interior of the paper core with the semi-cylindrical surfaces still giving a maximum of contact with the inner core walls. In other words, if the body portion of the companion chocks are truly cylindrical and of the same diameter end for end, the tightening of the set screws to clamp them in the core 2 will tend to produce a more tilted engagement and hence a shorter intimate longitudinal contact than if the preliminary tightening of the set screws (which are really jack screws) were to first bring the taper of the combined units to a parallelism and then force them into contact with very little further travel.

In practice, the method of mounting such a mill roll is, while it rests on the floor at the feed end of the machine, to pass the shaft 3 there-through, to slip the chocks neither snugly nor loosely thereon adjacent the journals 4 and then expand them by means of the set screws 9. Then, the shaft and roll, the latter being extremely heavy, are raised by means of suitable tackle and the journals 4 let down into the open journal boxes. It is not absolutely necessary that the collars or set screw enlargements 8 about the ends of the core 2, as the chocks may be expanded with sufficient interior contact to prevent slippage of the roll thereon even if the intermediate cylindrical portion thereof is not entirely within the core 2.

In the old practice, where the integral cones are forcibly driven into the ends of the core 2, it is on this mounting and securing job that the shafts become dented and scarred, whether round or square, to such an extent that they sometimes have to be filed down in order to remove the cone.

I claim as my invention:

1. In a paper roll handling machine, the combination with a supporting shaft, a tubular mandrel thereon and a roll of paper wound upon the mandrel, of a pair of chocks supporting the mandrel upon the shaft at one end, the said chocks consisting of semi-cylindrical tubes, the interior contours of which substantially fit the shaft and the exterior contours of which substantially fit the mandrels, the same being independent of each other so that they can be individually or conjointly inserted into the mandrel from the direction of the end of the shaft, and set screws threaded into the chocks in diametric opposition to each other arranged to react against the shaft to so lift the chocks when tightened that they will tilt upon the shaft and their outer ends will bite into the mandrel as their inner ends react as a fulcrum against the shaft, the said chock units being otherwise independent of each other.

2. A device of the character described in accordance with claim 1 in which the outer peripheries of the chocks are provided with longitudinally extending contacting ribs adapted to bite into the material of the mandrel and prevent relative rotation between such parts.

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