Oct. 11, 1932. M. W. BRUESHABER 1,882,480

INKING ROLLER

Filed Nov. 8, 1929

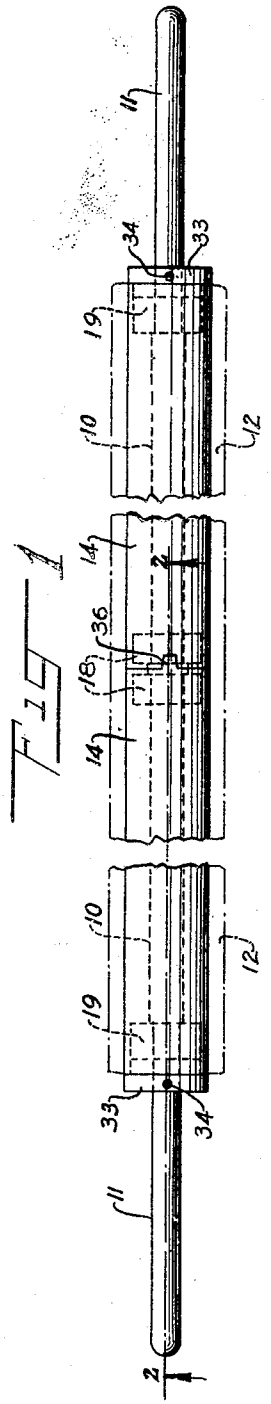


FIG 1

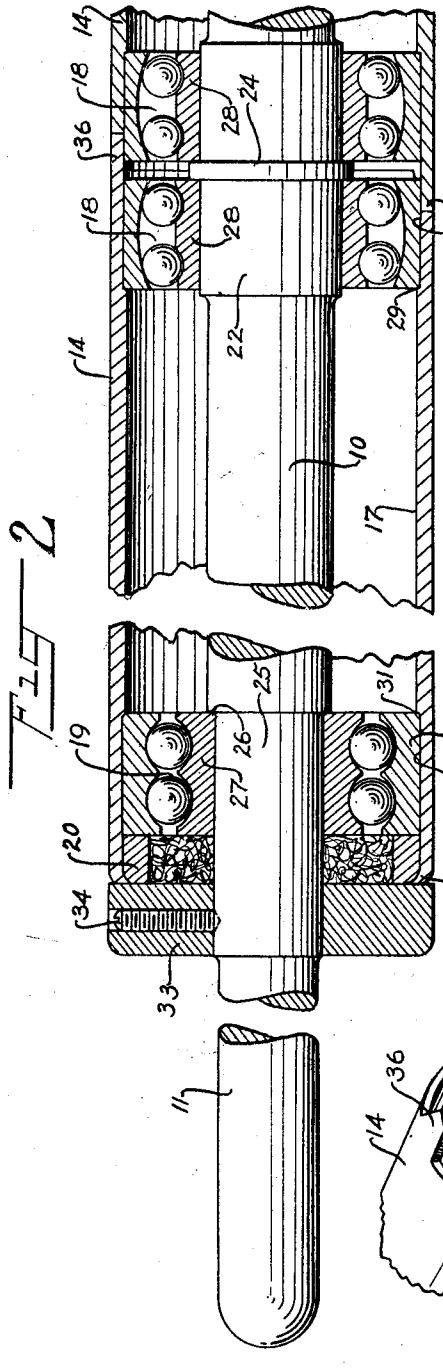


FIG 2

FIG 3

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UNITED STATES PATENT OFFICE

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INKING ROLLER

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The present invention relates to rollers for printing presses and more particularly to an improved inking roller for use in connection with high speed rotary newspaper presses.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawing, referred to herein and constituting a part hereof, illustrates one embodiment of the invention, and together with the description, serves to explain the principles of the invention.

Of the drawing:

Figure 1 is an elevation of the present preferred embodiment of an inking roller in accordance with the present invention.

Figure 2 is a longitudinal section taken on the line 2—2 of Figure 1.

Figure 3 is a fragmentary detailed view showing one part of the inking roller.

In newspaper printing, the presses generally print upon a web of paper four pages wide, and the inking and other rollers for such press must necessarily be relatively long and of small diameter. Under such conditions the rollers are liable to bend throughout their length, and particularly near their central portion, resulting in a non-uniform contact with the plates on the plate cylinders of the printing press, resulting in an uneven inking of the plates on the plate cylinders. Also, by reason of their relatively great length, these rollers are difficult and quite expensive to manufacture, and unless great care is taken in their manufacture, they will not run true and will otherwise interfere with the efficient operation of the press.

The present invention has for its object the provision of a roller particularly adapted for use in connection with printing presses of the type described, which can be manufactured more economically, is not so easily bent and when used as an inking roller will uniformly ink the plates throughout the entire width of the plate cylinders.

The present invention also provides a printing roller which is exceptionally strong, can be easily assembled and disassembled, and is generally more satisfactory than the rollers now commonly employed.

In the present preferred embodiment, and in accordance with the present invention, the roller comprises a shaft surrounded by a pair of relatively thin-walled tubular members of substantially the same diameter, which are rotatably mounted on the shaft and held against axial movement on the shaft and at the same time are held against angular displacement relative to each other. For rotatably mounting the tubular members on the shaft, the tubular members are preferably provided, near their inner and adjacent ends with self-alining ball-bearings, and near their outer ends with anti-thrust ball-bearings which permit the tubular members to rotate on the shaft with substantially no drag on the plates. As embodied, and for preventing substantial bending of the shaft, the shaft preferably gradually increases in size towards its center. Centrally of the shaft there is provided an integral ring which holds the tubular members against axial movement in one direction along the shaft, while collars fixed to the shaft hold the tubular members against axial movement in the other direction. Other means are preferably provided for retaining lubricant within the tubular members to lubricate the bearings.

Other features of the invention will be initially pointed out in connection with the following detailed descriptions of the present preferred embodiment of the invention, and it will be understood that the foregoing general description and the following detailed description are both exemplary and explanatory, but not restrictive of the invention.

Referring now in detail to the present preferred embodiment of the invention, as illustrated by the accompanying drawing, the invention is shown as applied to an inking

roller, which may be covered with a uniform layer of rubber or other composition to receive the ink and transfer it to the plates to be inked. The roller shaft comprises a long, solid round bar 10, preferably of steel, and provided with reduced end portions 11 by which it is mounted in the press, the surface of the composition layer contacting with the plates to be inked. For supporting and retaining the uniform layer of composition 12, there are provided a plurality, and preferably two, relatively long thin-walled tubular members 14, of equal diameter which surround the roller shaft 10, and are rotatably mounted thereon by suitable antifriction bearings. These tubular members are of substantially the same length, and the inner wall of these members is accurately machined as at 15 and 16 for a short distance from each end to render the inner and outer walls of the tubular members concentric. The portion 17 of the inner wall of the tubular members, intermediate the machined ends, need not be finished, and is generally left in substantially its rough state.

The bearings for rotatably supporting the tubular members on the roller shaft preferably comprise a self-alining ball-bearing 18 pressed within the machined portion near one end of each tubular member 14, and a deep groove, anti-thrust ball-bearing 19 pressed within the other machined portion 16 of each tubular member. The anti-thrust bearing 19 is preferably securely held in place by means of ring 20 fitted between it and the end 21 of the tubular member. The self-alining ball-bearings 18 permit the tubular members 14 to rotate freely even when the inner races 28 are not exactly parallel to the outer races, thereby avoiding the necessity for accurate machining of the seats for the outer races. When using self-alining ball-bearings, the seats at the inner and outer ends of the tubular members need not be exactly parallel.

For preventing bending of the roller shaft which would be accompanied by a similar bending of the surface of the roller, the shaft is preferably of gradually greater diameter towards its central portion, and the ball bearings 18 for the inner ends of the tubular members are slipped on and supported by the shaft 10 at the portion 22 of large diameter. This gradually increasing diameter of shaft 10 tends to prevent uneven contact of the roller with the plates, and together with the ball bearings 18, supporting the inner ends of the tubular members, prevents any bending of the tubular members which might occur were the tubular members supported only at points near their outer ends.

Between the ball bearings for the inner ends of the tubular members, there is preferably provided a shoulder 24, which may be integral with the shaft 10, forming a stop to space ball bearings 18 from each other, and preventing either tubular member from being moved too far on the shaft during assembly.

The bearings for the outer ends of the tubular members, are closely fitted on and supported by a reduced portion 25, of the shaft of reduced diameter, and the inner race 27 is held against inward movement by means of the shoulder 26.

For preventing axial movement of the tubular members on the roller shaft, the inner race 28 of the self-alining bearing, held against movement in one direction by shoulder 24, is held against movement in the other direction by shoulder 29. The inner race of the anti-thrust bearing is held against inward movement by shoulder 26, while the outer race 30 is held against axial movement relative to the tubular members by ring 20 and shoulder 31. At the outer ends of the tubular members there is provided a collar 33, of substantially the same diameter as the tubular members and securely fastened to the roller shaft by set screw 34, preventing outward axial movement of the tubular members on the shaft. When properly dimensioned, and as shown in the drawing, the tubular members are held against any substantial axial movement along the shaft.

Means are also provided for preventing relative angular displacement of the several tubular members, and in the present embodiment, the inner end of each tubular member 14 is formed with a projection 36 and a recess 37, diametrically opposed to each other, the projection on each tubular member being adapted to enter and fit within the recess of the other, and thus hold the members against relative displacement.

The assembly of the roller may be easily accomplished by slipping each tubular member, with the bearings already pressed into their proper seats in the inner wall of the tubular members and ends 21 turned in to retain bearings 19, over the corresponding end of the shaft, with the ball bearing having the aperture of largest diameter being in the lead. After the tubular members and bearings have been pushed against each other and the shoulder, the end collars 33 can be secured in place, and the roller may then be covered with a suitable layer 12 of composition if its use as an ink roller is intended.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:—

1. An ink roller for printing presses including in combination a shaft, a plurality of alined hollow members rotatably mounted on the shaft, bearings near the ends of each

tubular member, a shoulder centrally of the shaft for limiting the movement of the hollow members towards the center of the shaft, and means limiting the outward movement of the hollow members.

2. An ink roller for printing presses including in combination a shaft, a pair of alined tubular members rotatably mounted on the shaft, a self-alining bearing for the inner ends of the tubular members and a bearing for the outer ends of the tubular members.

3. An ink roller for printing presses including in combination a shaft, a pair of alined tubular members rotatably mounted on the shaft, a self-alining bearing for the inner ends of the tubular members, and a bearing for the outer ends of the tubular members and means for limiting endwise movement of the tubular members on the shaft.

4. A roller for printing presses including in combination a shaft, a plurality of tubular members surrounding the shaft, antifriction bearings at the inner ends of the tubular members and anti-thrust bearings at the outer ends of the tubular members.

5. A roller for printing presses including in combination a shaft, a plurality of tubular members surrounding the shaft, antifriction bearings at the inner ends of the tubular members and anti-thrust bearings at the outer ends of the tubular members and means for preventing angular displacement of the several tubular members relative to each other.

6. A roller for printing presses including in combination a shaft, a pair of tubular members surrounding the shaft, anti-friction bearings near the inner ends of the tubular members, anti-thrust bearings near the outer ends of the tubular members, means for limiting endwise movement of the tubular members on the shaft and means for preventing angular displacement of the tubular members relative to each other.

7. A roller for printing presses including in combination a shaft, a pair of tubular members surrounding the shaft, self-alining ball bearings near the inner ends of the tubular members, anti-thrust ball-bearings at the outer ends of the tubular members and means for limiting endwise movement of the tubular members on the shaft.

8. A roller for printing presses including in combination, a shaft, a pair of tubular members surrounding the shaft, self-alining ball bearings near the inner ends of the tubular members, anti-thrust ball-bearings at the outer ends of the tubular members and means for limiting endwise movement of the tubular members on the shaft and means preventing angular displacement of the tubular members relative to each other.

9. A roller for printing presses including in combination a centrally enlarged shaft, a pair of tubular members surrounding the shaft, bearings at either end of the tubular members adapted to permit the tubular members to be slipped on the shaft and for rotatably supporting the tubular members on the shaft, and means limiting the endwise movement of the tubular members on the shaft.

10. A roller for printing presses including in combination a shaft, a plurality of axially-alined, hollow, substantially cylindrical members surrounding the shaft, anti-friction bearings at the ends of the cylindrical members for rotatably supporting the cylindrical members on the shaft.

11. A roller for printing presses including in combination a centrally enlarged shaft, a pair of axially-alined, hollow, substantially cylindrical members surrounding the shaft and bearings at the ends of the cylindrical members to permit the cylindrical members to be slipped on the shaft from their respective ends of the shaft and for rotatably supporting the tubular members on the shaft.

In testimony whereof, I have signed my name to this specification.

MARTIN W. BRUESHABER.