H. L. HOUGHTON.

TOP ROLLS FOR SPINNING MACHINES.

APPLICATION FILED OCT. 12, 1911.

1,187,993. Patented June 20, 1916.

Fig. 1.

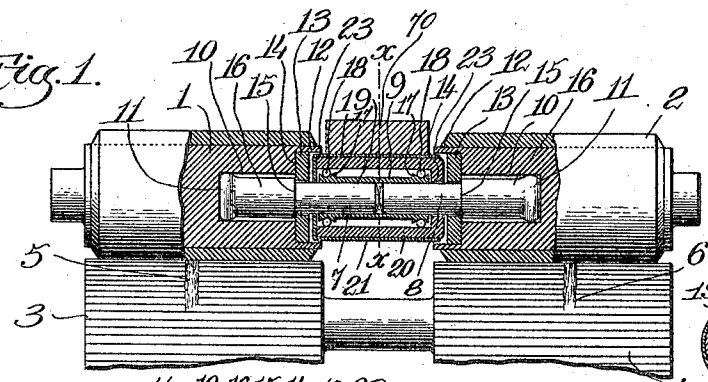


Fig. 2.

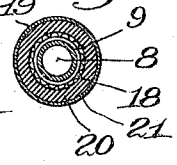


Fig. 3.

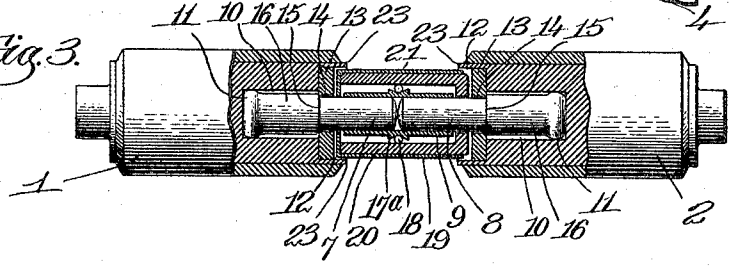


Fig. 4.

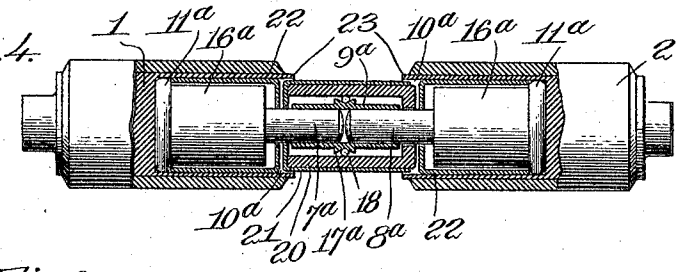


Fig. 6.

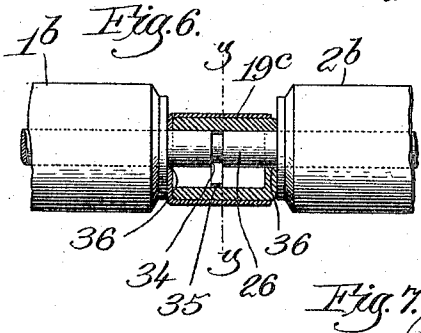


Fig. 5.

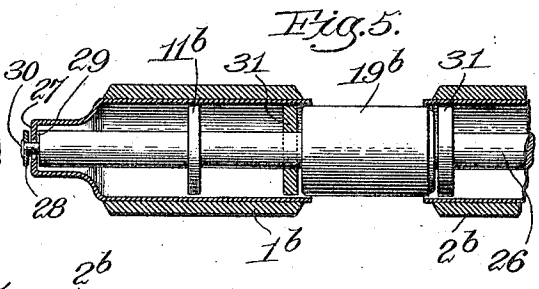
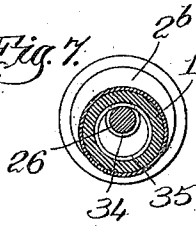


Fig. 7.



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TOP ROLLS FOR SPINNING-MACHINES.

1,187,993. Specification of Letters Patent. Patented June 20, 1916.

Application filed October 12, 1911. Serial No. 654,246.

To all whom it may concern:

Be it known that I, HERBERT L. HOUGHTON, a citizen of the United States, residing at Worcester, county of Worcester, State of Massachusetts, have invented an Improvement in Top Rolls for Spinning-Machines, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

In many types of spinning machines the top rolls are arranged in pairs with the rolls of each pair rigidly connected together by a neck portion on which the top roll saddle rests.

One object of my invention is to provide a novel bearing between the top roll saddle and the neck portion of the top roll by which the friction between these parts is greatly reduced, which bearing is preferably a self-lubricating one; and another object of the invention is to provide a novel construction of top roll in which the individual rolls in any pair are flexibly connected together so that each roll can have a slight angular movement relative to the other roll.

I will first describe some embodiments of my invention which are sufficient to illustrate the principle thereof and will then point out the novel features in the appended claims.

In the drawings, Figure 1 is a sectional view of a pair of top rolls embodying my invention; Fig. 2 is a section on the line *x*—*x*, Fig. 1; Fig. 3 is a sectional view also showing a top roll embodying my invention having a slightly different construction from that shown in Fig. 1; Figs. 4, 5 and 6 show other embodiments of my invention; Fig. 7 is a section on the line *y*—*y*, Fig. 6.

1 and 2 designate the two top rolls of a pair of top rolls, 3 and 4 designate the under rolls on which the top rolls rest, and 5 and 6 designate roving or yarn which is being acted on by the top rolls.

70 shows in section the top roll saddle by means of which the necessary weight is applied to the pair of top rolls 1 and 2.

As stated above one object of my invention is to provide a novel bearing between the top roll saddle and the top rolls by means of which the friction between these parts is greatly reduced. My improved anti-friction bearing comprises a sleeve which surrounds the necked connection between the top rolls and has an anti-friction bearing thereon, and on which the top roll saddle rests. The sleeve on which the top roll saddle rests is shown generally at 19, and as stated above, this has an anti-friction bearing on the necked connection between the two top rolls 1 and 2. The necked connection between said top rolls is in the form of a spindle and this spindle may be either a one-piece spindle or may be made in sections. In the construction shown in Figs. 1 to 4 said spindle or necked connection is made in sections and each top roll has a trunnion or spindle section extending therefrom and the sleeve 19 embraces said spindle sections. These spindle sections are shown at 7 and 8, respectively, and the meeting ends thereof are connected by a sleeve or thimble 9 which has a driving fit over the ends of the spindle sections. The thimble 9 is provided with one or more ball races 17 in which anti-friction balls 18 are received, said balls forming the bearing for the sleeve 19. The sleeve 19 is shown as made of two cup-shaped sections 20 and 21 which telescope over each other and which form within them an imperforate chamber which can be filled with lubricant so that the balls 18 will be working in lubricant.

In Figs. 3 and 4 I have shown an anti-friction bearing in which one series of balls only is used. This construction enables the parts to be readily assembled, for the two cup-shaped sections 20 and 21 can be slipped onto the spindle sections 7 and 8, and then the latter may be forced into the sleeve 9 and at the same time the cup-shaped sections may be telescoped over each other.

The spindle sections 7 and 8 may be secured to the top rolls 1 and 2 in a variety of ways without departing from the invention. In the construction shown in Figs. 1 to 4 these spindle sections are flexibly connected to the top rolls so as to permit each top roll to have a slight angular movement relative to the other. As shown each top roll is provided with the axial recess 10 into which the end of a spindle section is inserted, and each spindle section is provided at its end with a rounded head 11 which fits the bore 10, but which permits a slight rocking movement of the top roll relative to the spindle. Each spindle is shown as having the section 16 of larger diameter which forms an outwardly-facing shoulder 15, and

each top roll is provided at its end with a recess 12 of enlarged diameter in which is fitted a washer 13 that engages the shoulder 15 and prevents the spindle from being withdrawn. The aperture in the washer 13 is preferably larger than the spindle section so as to permit a slight rocking movement. Each top roll is provided with the flange 23 which extends over the end of the sleeve 19 and thus prevents lint from working into the axial recesses in the top rolls. With this construction it will be seen that the top roll saddle has a bearing on the sleeve 9 which surrounds and has anti-friction bearing on the spindle or neck connecting the two top rolls. When the top rolls are in operation the sleeve 19 will remain stationary and because of the anti-friction bearing between it and the top rolls very much less power will be required to operate the top rolls than in the ordinary construction.

In Fig. 4 I have shown another embodiment of my invention wherein the spindle sections are held into the top rolls in a slightly different manner from that shown in Figs. 1 and 3. In this embodiment of my invention the top rolls are each provided with an axial recess 10^a of much larger diameter than that shown in Fig. 1, and the spindle sections 7^a and 8^a are provided with the enlarged heads 11^a which fit the interior of the recesses 10^a and have rocking engagement therewith. Each spindle section is provided with the portion 16^a of enlarged diameter and the spindle sections are held in place by the cup-shaped members 22 which loosely fit over the portions 16^a of the spindle sections, but fit the recesses 10^a with a driving fit, said cup-shaped members having apertures through which the reduced ends of the spindle sections extend. The anti-friction bearing for the top roll saddle shown in Fig. 4 is the same as that shown in Fig. 3. In all the embodiments of my invention mentioned above the spindle is made in two sections, and each section is provided with a rounded head which is situated within an axial bore in the top roll and with which the top roll has a rocking engagement. In each instance said heads are placed at or near the center of the top rolls. Further, in each of the embodiments of the invention thus far described the ends of the shell 19 on which the top roll saddle rests enter and are confined within the recess formed in the top roll, or, in other words, each top roll is provided with the annular flange 23 which extends over the end of the shell 19 and thus prevents lint from working into the recesses in the top rolls.

In Fig. 5 I have illustrated another embodiment of my invention wherein the spindle is made in one piece and the top rolls are hollow from one end to the other. In this embodiment the top rolls are shown at 1^b and 2^b and are in the form of shells which are suitably covered by the leather or other covering. The spindle 26 extends completely through both of the top rolls and is connected to each top roll near its outer end. The outer end of each top roll is closed, as at 27, and each end of the spindle is shown as having a reduced portion 28 that extends through an aperture 29 formed in the end of the top roll, said reduced portion being provided with a head 30 to prevent the spindle from being withdrawn. 31 designates a washer which is driven into the inner end of each top roll and through which the spindle 26 loosely passes. The spindle has thereon a head 11^b which engages the interior of each of the top rolls and forms the support about which the top rolls may rock, said heads 11^b being situated preferably substantially centrally of the top rolls. The anti-friction bearing for the spindle shown in Fig. 5 is similar to that shown in the other figures.

In Fig. 6 I have shown a form of anti-friction bearing which may be substituted for that shown in Fig. 5. In this construction the spindle 26 is provided with the neck portion 34 in which is received a lubricating ring 35. A shell 19^c on which the top roll saddle rests encircles the spindle and the ring 35, the openings 36 in said sleeve through which the spindle passes being eccentrically situated. The sleeve does not rotate because of the friction between it and the top roll saddle, but as the spindle and top rolls rotate the ring 35 will be turned, thus keeping the contacting parts within the shell supplied with lubricant.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. The combination with a pair of top rolls each having a spindle section extending from the end thereof, means connecting said spindle sections, a top roll saddle between said top rolls, a sleeve loosely surrounding the spindle sections and on which the saddle rests, and an anti-friction bearing for said sleeve.

2. The combination with a pair of top rolls each having an axial recess in its end, of a spindle section extending from each recess, means connecting the spindle sections, and a top roll saddle-supporting sleeve loosely surrounding said spindle sections.

3. The combination with a pair of top rolls each having an axial recess in its end, of a spindle section extending from each recess, means connecting the spindle sections, and a top roll saddle-supporting sleeve loosely surrounding said spindle sections, each top roll having a flange 23 extending over the end of the sleeve.

4. The combination with a pair of top rolls, of a spindle section extending from the end of each top roll, a thimble fitted over the ends of the spindle sections and connecting the same, a sleeve for supporting the top roll saddle loosely mounted on said spindle sections, and an anti-friction bearing between said thimble and sleeve.

5. The combination with a pair of top rolls, each having an axial recess extending from its inner end but terminating short of its outer end, of a connecting device extending between said top rolls and provided with heads which are received in said recesses and have a rocking engagement with the walls thereof, said heads being situated substantially centrally of the top rolls.

6. The combination with a pair of top rolls, of a connecting device connecting said top rolls, a ball track associated with said device, anti-friction balls on said track, and a shell inclosing said balls and constituting a lubricant-containing chamber, said shell comprising two cup-shaped members telescoping together.

7. The combination with a pair of top rolls, of a connecting device connecting said top rolls, a ball track associated with said connecting device, anti-friction balls on said track, a shell inclosing said balls, the ends of the top rolls being provided with chambers to receive the ends of the shell.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

HERBERT L. HOUGHTON.

Witnesses:

GEORGE S. TAFT,

LULA HAMBURG.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."