Oct. 27, 1959 W. NAEGELI 2,909,811

TOP DRAWING-ROLLS ON SPINNING MACHINES

Original Filed Sept. 24, 1948

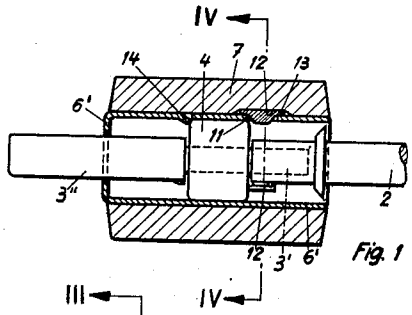

Fig. 1

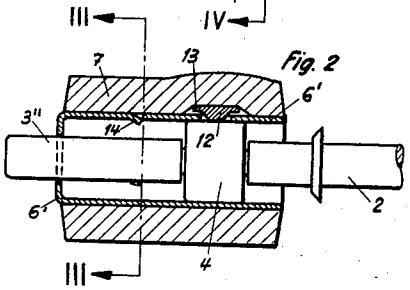

Fig. 2

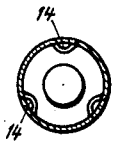

Fig. 3

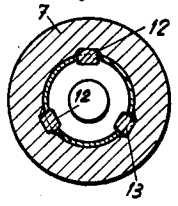

Fig. 4

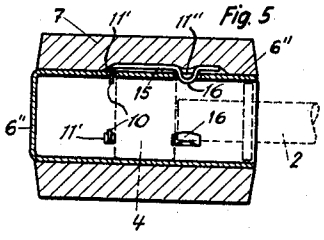

Fig. 5

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United States Patent Office 2,909,811 Patented Oct. 27, 1959

2,909,811

TOP DRAWING-ROLLS ON SPINNING MACHINES

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Original application September 24, 1948, Serial No. 51,090, now Patent No. 2,700,191, dated January 25, 1955. Divided and this application August 20, 1954, Serial No. 454,243

Claims priority, application Switzerland June 15, 1948

6 Claims. (Cl. 19—142)

My present invention relates to improvements in top drawing-rolls on spinning machines, running in antifriction-bearings.

The present application is a division of my copending application Serial No. 51,090, filed September 24, 1948, which matured into Patent No. 2,700,191 on January 25, 1955.

The rolls to which the present invention refers usually comprise an axle carrying antifriction-bearings at both ends, which bearings support sleeves having an elastic covering of cloth and leather, rubber or of some other material of similar properties. Such covering is subject to wear.

The yarn causes corrugations, wrinkles or other unevenness on the surface of the covering, so that the latter must be reground from time to time. The antifriction-bearings of the sleeves must be periodically checked. The sleeves and their covering, therefore, must be demounted from time to time from their axle journals. Such demounting has to be done readily and easily and without impairing the hold of the sleeve on the bearing.

It has been proposed to circumferentially groove the middle of the sleeve so as to produce axial or thrust stops for the bearings.

When, in operation, one top roll is winding yarn—in such latter prior-art adaptation—the antifriction-bearing of the other top roll is set askew and the sleeve will readily lose its axial hold. It then wanders off in a lateral direction, and the covering will be damaged. Such loose sleeves readily drop on the floor upon demounting the top-roll pair from the draw-head. Such inconvenience increases the work of attendance, results in loss of time, and, eventually, in serious interruptions of operation. Further, due to the relatively large clearance or play between the sleeve mount and the antifriction-bearing, there results a substantial lateral wear of the annular sleeve groove so that the latter eventually has to be replaced. Conventional sleeves, having a circumferential groove at midlength, are expensive to manufacture and require very accurate machining.

In order to eliminate the aforedescribed drawbacks, disadvantages and inconveniences, the top roll sleeve on which the covering is secured is securely held in place, according to the present invention, on the outer race of the antifriction bearing by a radial pressure action produced by utilizing the elasticity of the top-roll material. The pressure action is advantageously derived from the resilience of the sleeve covering, but also may be derived from resilient parts or portions of the sleeve, e.g. from resilient longitudinal webs provided on the latter.

Various forms of the present invention are shown, by way of example, in the accompanying drawing, in which

Figs. 1 and 2 show in longitudinal section one roll of a pair of top rolls in normal operating position and during mounting onto the antifriction bearing, respectively;

Fig. 3 is a sectional view on line III—III of Fig. 2 with the elastic cover removed;

Fig. 4 is a sectional view on line IV—IV of Fig. 1;

Fig. 5 is a longitudinal sectional view of a modified top roll according to the invention.

In the embodiment of the invention illustrated in Figs. 1 to 4, the sleeve 6' is provided with circumferentially spaced longitudinal slots or apertures 11, each of which receives a holding or locking member 12 provided with axial projections 13. The members 12 are urged radially inward by the radial or concentric pressure action of an elastic covering 7 and form, as shown in Fig. 1, axial or thrust stops for one side of a bearing body 4, the member 12 moving radially outward upon introducing the bearing 4 into the sleeve 6'. Inwardly projecting lugs 14, stamped from the wall of the sleeve 6', are provided on the other side of the bearing 4 for positively limiting axial movement of the bearing in the sleeve.

When mounting the elastic covering 7 on the sleeve 6' the members 12 may be held in place by a cuff which is pushed away by the covering 7 as it is pushed or pulled onto the sleeve 6'. This is not illustrated because the present invention does not relate to a method of manufacturing top drawing rolls but to a new structure of the cylindrical portion of the top drawing roll which structure facilitates mounting of the cylindrical portion on and demounting from a bearing.

Flexibility of the top roll is attained by using a bearing 4 which is mounted on a pin 3' and which affords some slack or, when using bearings 4 which are practically free of slack, by increasing the clearance between the sleeve 6' and the bearing 4.

In the embodiment illustrated in Figs. 1 to 4, the pin 3' is provided at the end of a shaft 3'' projecting through an aperture in the otherwise closed end of sleeve 6'. Pin 3' has an end portion fitting tightly into an axial bore in the end of shaft 2.

In the embodiment shown in Fig. 5, narrow laminal elements 15 are inserted in apertures 11' and 11'' in a sleeve 6''. One end portion (10) of the elements 15 is bent radially inward extending through apertures 11', and a semicircular boss extending through apertures 11'' is formed by an arcuate portion 16 positioned between the ends of each element. Of the two projections thus formed on each element 15 the portion or projection 10 serves as an axial stop for the antifriction bearing 4 which is shown by dash lines. The righthand projection, represented by the boss 16, is urged temporarily radially outward when pushing the bearing 4 into sleeve 6''.

The boss 16 exerts a clenching pressure on the bearing when the latter reaches its operative position within the sleeve in which position the bearing abuts against the stop means 10.

In the described forms of the top rolls, the resiliency of the covering 7 on the sleeve is utilized. Cloth, leather, cork, rubber and synthetically produced substances having similar properties are particularly suitable materials for the covering.

Top rolls in accordance with the present invention are distinguished by an extremely simple manipulation in cleaning. They are carried faultlessly by the antifriction bearing, so that the pressure roll in operation will not wander off. A certain play is maintained for the pressure roller with respect to the stationary axle 2, which is desirable for spinning. A special advantage is the fact that any sliding friction between stationary and rotating parts is avoided. The completely encased antifriction bearing affords a maximum reliability of operation. Since no bearing grease contacts the sealing elements, no dust will settle thereon and the points of sealing remain always clean. Any dust which somehow has passed through the sealings will be deposited in the space between the bearing and the sealing element, without detriment to the bearing.

The top-roll construction according to the present invention is of simple and cheap manufacture. These top rolls may be used to equal advantage, at any rate without any appreciable difference, both for top-roll axles guided at midpoint or at their ends.

What is claimed is:

1. A top roll for spinning machines, comprising a shaft, a bearing on said shaft, a thin walled sleeve member removably fitted around said bearing, inwardly projecting circumferentially spaced portions in said sleeve member for limiting movement of said bearing in said sleeve member in one axial direction, circumferentially spaced apertures in said sleeve member, said apertures being axially spaced from said inwardly projecting portions, a locking means separate from said sleeve member and positioned at each aperture and having a portion extending through said aperture into the interior of said sleeve member for preventing movement of said bearing in said sleeve member in the other axial direction, and resilient means stretched around said sleeve member and yieldingly pressing said locking means radially inwardly through the respective apertures and affording pushing of said locking means outwardly through said apertures when said bearing is pushed into said sleeve member to abut against said inwardly projecting portions in said sleeve member.

2. A top roll for spinning machines, comprising a shaft, a bearing on said shaft, a thin walled sleeve member removably fitted around said bearing, pairs of axially spaced apertures in said sleeve member, the apertures of different pairs being circumferentially spaced and arranged in two planes at a right angle to the longitudinal axis of said sleeve member, narrow laminal members disposed adjacent to the outside of said sleeve member and individually having an end portion bent radially inwardly of said sleeve member and extending through one aperture of one pair, and having a radially inwardly arcuate portion extending radially inwardly through the other aperture of one pair, said end portions being adapted to limit movement of said bearing in one axial direction and said arcuate portion being adapted to impede movement of said bearing in the other axial direction, and resilient means stretched around said sleeve member and yieldingly pressing said laminal members onto said sleeve member and their inwardly bent portions through said apertures and affording pushing of said arcuate portions outwardly through their apertures when said bearing is pushed into said sleeve member to abut against said bent end portions.

3. A top drawing roll for drawing heads of spinning frames and the like, comprising an axle, an antifriction bearing mounted thereon, cylindrical sleeve means slidably fitted on said bearing and including a sleeve member having apertures, individual holding means forming parts separate from said sleeve member and being individually radially movably disposed in said apertures and having a portion adapted to project from said apertures inwardly of said sleeve member, and an elastic covering disposed around said sleeve member and engaging said holding means and affording radial outward movement of the latter when said bearing is moved in and out of said sleeve member and forcing said holding means inwardly of the sleeve member when said bearing is in normal operating position.

4. In combination with a top drawing roll as defined in claim 3, stop means integral with and inwardly protruding from said sleeve means for limiting axial movement of said bearing in said sleeve means.

5. A top drawing roll as defined in claim 3 including stop means integral with said holding means and inwardly projecting from said sleeve member for limiting axial movement of said bearing in one direction.

6. A top roll assembly for textile machines comprising a thin-walled sleeve, a bearing adapted to be axially slipped into and out of said sleeve, an elastic covering on said sleeve, said sleeve and covering forming a unitary body, a locking means forming a part independent of and within said unitary body and normally extending radially inwardly from said body and projecting into the path of the bearing when the latter is removed from said sleeve, said locking means being engaged by said elastic covering affording pushing of said locking means out of the path of the bearing when the latter is pushed into said sleeve and exerting a clenching pressure on the bearing when the latter reaches its operative position within the sleeve.

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