Jan. 17, 1956 R. J. HIGGINBOTHAM ET AL 2,730,770

CLEARING ROLLS FOR TEXTILE MACHINES

Filed March 11, 1952 2 Sheets-Sheet 1

Fig. 1

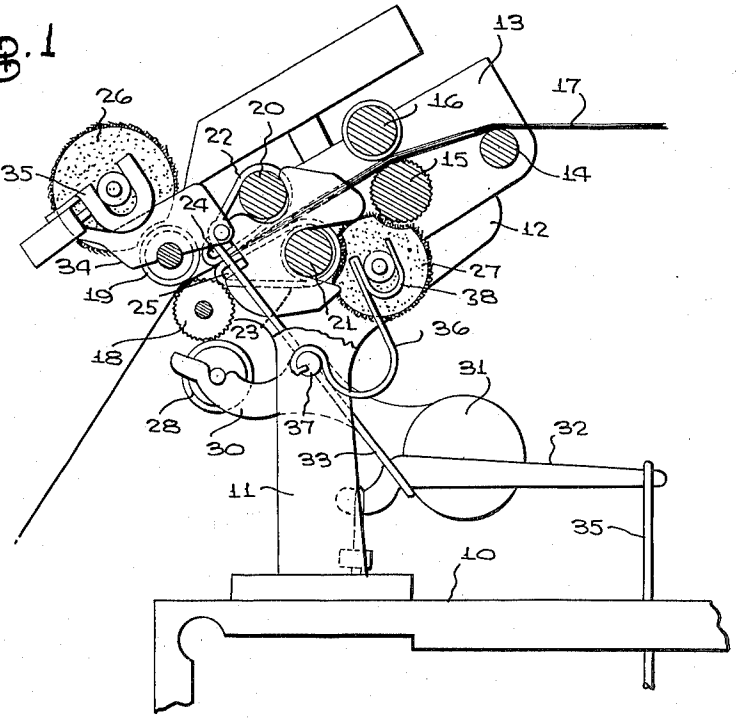


Fig. 2

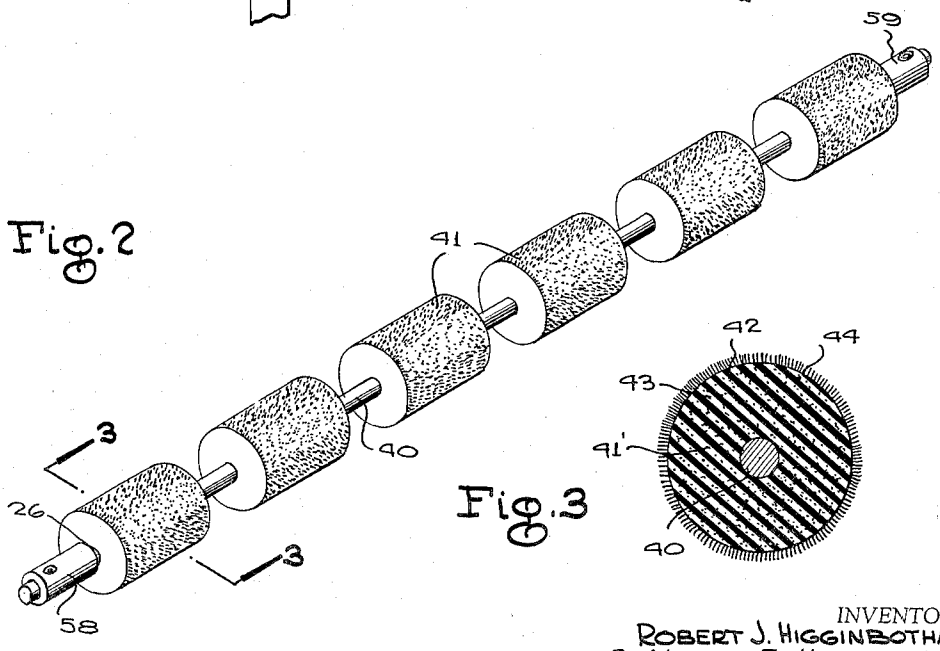


Fig. 3

INVENTORS
ROBERT J. HIGGINBOTHAM
& MARION E. HERNDON, JR

BY
McMorrow, Berman & Davidson
ATTORNEYS

Jan. 17, 1956 R. J. HIGGINBOTHAM ET AL 2,730,770

CLEARING ROLLS FOR TEXTILE MACHINES

Filed March 11, 1952 2 Sheets-Sheet 2

Fig. 4

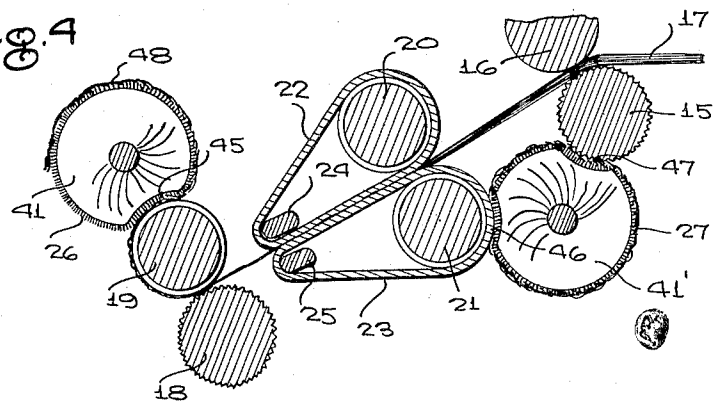


Fig. 5

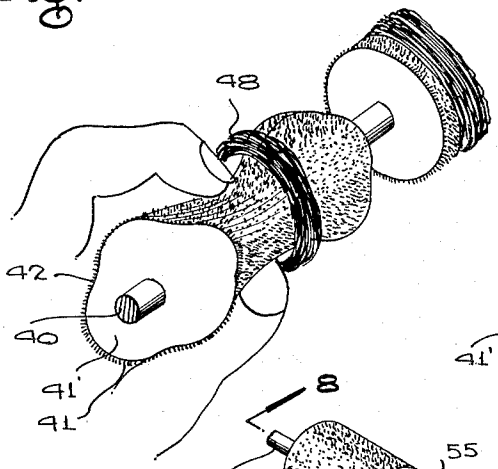


Fig. 6

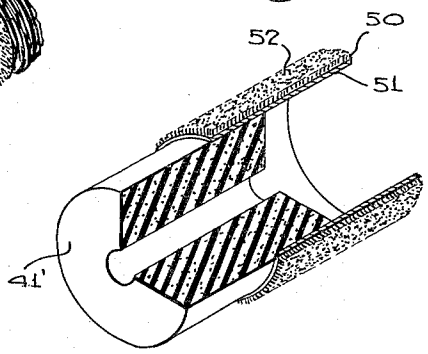


Fig. 7

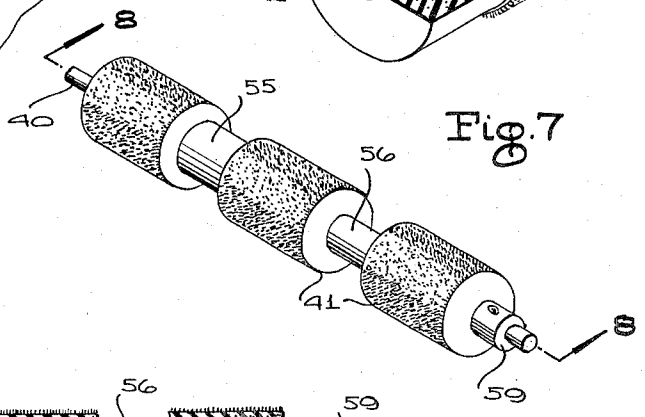
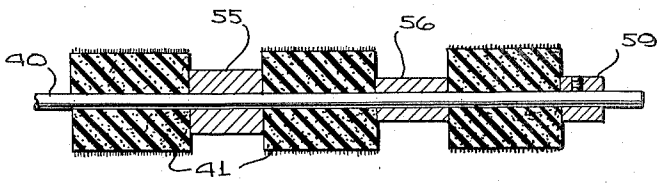


Fig. 8



INVENTORS
ROBERT J. HIGGINBOTHAM
& MARION E. HERNDON, JR.

BY
McMorrow, Berman & Davidson
ATTORNEYS

United States Patent Office 2,730,770 Patented Jan. 17, 1956

2,730,770

CLEARING ROLLS FOR TEXTILE MACHINES

Robert J. Higginbotham and Marion E. Herndon, Jr., Charlotte, N. C.; said Herndon assignor to said Higginbotham

Application March 11, 1952, Serial No. 275,972
1 Claim. (Cl. 19—140)

This invention relates to clearing rolls for textile machines and more particularly to a roll for clearing a drafting, rolling, drawing, spinning, feed or calender roll and maintaining the associated roll in a clean condition.

It is among the objects of the invention to provide an improved clearing roll which includes spaced apart roller bodies all of which are continuously in contact with the associated machine roll regardless of the build up of thread, lint and fibre on one or more of the clearing roll bodies; which contacts the surface of the associated machine roll over an angular extent materially greater than the extent of contact between existing clearing rolls and the associated machine rolls; which includes roll bodies of readily deformable, elastic material; which is easy to clean and readily releases thread and fibre wound thereon; which may have a pile covering flock coated directly onto the surface of the roll bodies of elastic material; which can be mounted in an existing machine in replacement of the existing clearing rolls with no material modification of the machine construction and may be used as both top and bottom clearing rolls in such a machine; which can be adjusted as to weight for different operating conditions; and which is simple and durable in construction, economical to manufacture, easy to install, and effective and efficient in operation.

Other objects and advantages will become apparent from a consideration of the following description and the appended claim in conjunction with the accompanying drawings wherein:

Figure 1 is a somewhat diagrammatic cross sectional view through a drawing machine showing the application of clearing rolls illustrative of the invention to the machine;

Figure 2 is a perspective view of a clearing roll illustrative of the present invention;

Figure 3 is a transverse cross sectional view on the line 3—3 of Figure 2;

Figure 4 is a view similar to Figure 1 diagrammatically illustrating the manner in which the clearing rolls cooperate with the associated machine rolls to maintain the latter in a clean condition;

Figure 5 is a diagrammatic perspective view showing the manner in which a winding of thread or fibre can be removed from the clearing roll;

Figure 6 is a partly sectioned perspective view of a somewhat modified form of clearing roll unit;

Figure 7 is a perspective view of a still further modified form of clearing roll; and

Figure 8 is a longitudinal cross sectional view on the line 8—8 of Figure 7.

With continued reference to the drawings, Figure 1 illustrates the application of the improved clearing rolls of the present invention to a drawing machine, but it is to be understood that these clearing rolls may be applied to various other textile machines without in any way exceeding the scope of the invention.

The machine illustrated in Figure 1 has a base plate 10 and a standard 11 mounted at its lower end on the base plate and extending upwardly therefrom. At its upper end the standard is laterally extended, as indicated at 12, and carries a saddle 13 in which the fiber treating rolls are journaled. The fiber treating rolls illustrated include a guide roll 14 over which the fiber sliver of roving passes to the drawing rolls and include a rear

drafting roll 15 of longitudinally fluted construction, a pressure roll 16 journaled in the saddle 13 in opposition to the rear drafting roll 15, so that the fiber 17 passes between the rolls 15 and 16, and a front drafting roll 18 which turns at a speed somewhat greater than the speed of the rear drafting roll 15, a front pressure roll 19 journaled in the saddle 13 in opposition to the front drafting roll 18 and disposed in opposition to the latter, so that the fiber or roving 17 passes between the rolls 18 and 19, and apron rolls 20 and 21 disposed between the front and rear pressure rolls rotating at a speed somewhat faster than the speed of the rear drafting roll 15, but less than the speed of the front drafting roll 18. Aprons 22 and 23 of flexible material and of tubular shape extend around the rolls 20 and 21 respectively, and around guide bars 24 and 25 disposed between the apron roll 20 and the pressure roll 19 and the apron roll 21 and the drafting roll 18 respectively. The sliver or roving 17 passes between and is engaged by the aprons 22 and 23 and these aprons assist in elongating the sliver or roving passing through the drawing machine, this type of drawing machine being known to the trade as a long draft machine.

Clearing rolls 26, 27 and 28 are journaled on the standard 11 in position such that the clearing roll 26 is disposed parallel to and in engagement with the front pressure roll 19, the clearing roll 27 is disposed parallel to and in engagement with the rear drafting roll 15 and the lower apron 23. The clearing roll 28 is known as a bottom clearing or scavenging roll and may be of the same construction as the clearing rolls 26 and 27, or may be maintained as the original equipment roll of the machine, as may be desired. This bottom clearing roll 28 is journaled at its ends in a bracket 30 at one end of the bracket, the bracket being pivotally mounted intermediate its length on the standard 11 and provided at its other end with a weight 31 which urges the clearing roll 28 upwardly against the under surface of the front drafting roll 18.

A lever arm 32 is connected at one end to the base 10 and is connected intermediate its length to a link 33 with a saddle supported box 34 in which the front pressure roll 19 is journaled. A weight, not illustrated, is suspended from the other end of the lever 32 by a link 35 to pull the front pressure roll 19 downwardly and exert pressure between this roll and the associated front drafting roll 18.

As drawing or drafting machines are old and well known to the art and, as the clearing rolls of the present invention may be installed on various types of textile machines, the drawing machine shown in Figures 1 and 4 is illustrated by way of example only, and a more detailed illustration and description is considered unnecessary for the purposes of the present invention.

Upwardly opening, U-shaped brackets, one of which is indicated at 35, are mounted on the box 34, one at each end of the latter, and receive the ends of the clearing roll 26, so that this roll is supported immediately above the front pressure roll 19 and bears on the front pressure roll with a pressure proportional to the weight of the clearing roll 26. Spring brackets, one of which is indicated at 36, are mounted one at each end of a rod 37 extending through the standard 11 and are provided at their ends remote from the rod 37 with U-shaped formations, as indicated at 38, which receive the ends of the clearing roll 27. These spring brackets 36 hold the clearing roll 27 in engagement with the rear drafting roll 15 and the bottom apron 23 at the location at which the apron passes around the bottom apron roll 21.

As the clearing rolls 26 and 27 may be of identical construction, the roll 26 has been selected for detailed illustration and description.

This clearing roll includes an elongated shaft **40** preferably formed of a suitable resilient material of high structural strength, such as steel, and a plurality of roll bodies **41** coaxially mounted on the shaft **40** at spaced apart locations therealong. The roll bodies **41** are so spaced apart and of such length that one roll body overlies each thread engaging portion of the associated machine shaft and each body is of cylindrical shape and formed of an elastic material, such as expanded rubber. Each of the cylindrical expanded rubber bodies, as indicated at **41'** in Figure 3, is provided with a coaxial bore of a diameter materially smaller than the diameter of the shaft **40**, so that when the bodies are placed on the shaft they will firmly adhere to the shaft by compression of the expanded rubber around the corresponding portion of the shaft and will resist rotational and longitudinal movement relative to the shaft.

In the form of the invention shown in Figures 2 and 3, each of the rubber bodies **41'** is provided on its cylindrical surface with a flock covering **42** of special construction. This covering includes a thin coating **43** of adhesive material applied to the cylindrical surface of the expanded rubber body and textile fibres **44** embedded each at one end in the adhesive coating and extending outwardly from the rubber body in contiguous relationship to each other to provide a pile coating covering the entire cylindrical surface of each roller body. The fibre particles **44** are all of approximately the same length and of a length such as to provide a pile covering having a pile depth in the range between one thirty-second and one-fourth of an inch for best results. These fibres may be of various textile materials, such as rayon, nylon, wool or hair, but preferably have a sufficient resiliency or springiness that they will return to their original position after having been deflected therefrom. They are also all preferably inclined in the same direction relative to the cylindrical surface of the body **41'**, so that they provide a definite scrubbing action in one direction of rotation relative to the associated roller, and are applied to the adhesive coated body **41** by an electrostatic process known to the art.

Figures 4 and 5 show certain advantageous features of the improved clearing rolls. As illustrated in Figure 4, because of the elasticity or resiliency of the expanded rubber bodies **41'** of the roll bodies **41**, the clearing rolls contact an area of the associated machine rolls, such as the machine roll **19** associated with the clearing roll **26**, of an angular extent materially greater than the extent of contact between the machine rolls and the clearing rolls at present in use on textile machines requiring the use of clearing rolls. As indicated at **45**, **46** and **47** in Figure 4, the angular extent of the contact area between the clearing rolls and the associated machine rolls may be as much as 60 degrees, if desired. This gives an effective wiping action between the surface of the clearing roll and the surface of the associated machine roll which enables the pile covering on the clearing roll to remove all of the foreign material from the surface of the machine roll, the angularity or inclination of the fibres of the pile covering assisting in this scrubbing action and the pile covering itself providing a covering which will absorb a large quantity of lint and dust, so that the clearing rolls can operate for an extended period of time without the necessity of being cleaned.

In the operation of the clearing rolls it frequently happens that threads and fibres are wound around the clearing roll bodies, as indicated at **48** in Figure 4. This winding or fouling of the clearing rolls tends to build up and where the clearing rolls are of hard or rigid construction, a fouling on one of the roll bodies will move the remaining roll bodies out of contact with the associated machine roll and discontinue the cleaning action of the clearing roll. With the compressible roll bodies of the present invention, contact between all of the clearing roll bodies and the associated machine roll is maintained regardless of the fouling of one or more of the clearing roll bodies. The compressible nature of the clearing roll bodies also renders such windings or foulings easy to remove from the clearing roll. As is shown in Figure 5, when the compressible clearing roll body is compressed manually, or otherwise, the winding **48** is loosened and can be easily removed from the roll body, even being cut from the roll body, if necessary, without any damage to the clearing roll. The pile nature of the fibre covering of the clearing roll bodies also makes it easy to comb embedded lint and dust from this covering without any damage whatever to the covering or to the surface of the roll body.

In the modified arrangement shown in Figure 6, the roll body **41'** of expanded rubber or other suitable elastic and compressible material is the same as that described above, but a different covering is used. In the modified arrangement, the covering **50** is in the form of a separate sleeve or cot of tubular construction having a fabric backing **51** and a pile **52** woven into and extending from one side of the fabric backing, the depth of the pile being preferably within the range described above. The size of the sleeve or cot **50** is slightly less than the circumferential dimension of the body **41'** when in a fully expanded condition, so that the body has to be slightly compressed in order to insert it into the cot. After the compressed body has been inserted into the cot and allowed to expand, the expansion of the body holds the cot in a tight condition around the body and against movement either rotationally or longitudinally of the body.

As the top clearing roll **26** bears on the associated pressure or drafting roll **19** only by its own weight, it may be desirable, under certain operating conditions, to increase the weight of the clearing roll. This is done by disposing cylindrical spacer sleeves, as indicated at **55** and **56** in Figures 7 and 8, on the shaft **40** between adjacent roll bodies **41**. These spacer sleeves are formed of a heavy material, such as metal, and are given a wall thickness sufficient to provide the desired weight at the corresponding locations along the length of the clearing roll.

Bearing sleeves **58** and **59** are mounted one on each end of the shaft **40** adjacent the outer ends of the end roll bodies **41** to firmly support the clearing rolls in the corresponding U brackets while permitting free rotation of the clearing rolls and limited movement of the clearing rolls toward and away from the corresponding machine rolls incident to the compressible nature of the clearing roll bodies.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claim rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claim are, therefore, intended to be embraced therein.

What is claimed is:

A clearing roll for a textile machine comprising an elongated shaft and roll bodies coaxially mounted on said shaft at spaced apart locations along the latter and each including a cylindrically shaped body of compressible and elastic material and a pile covering on the cylindrical surface of said body, and spacing sleeves of heavy material coaxially mounted on said shaft one between each two adjacent roll bodies to increase the weight of said clearing rolls.

References Cited in the file of this patent

UNITED STATES PATENTS

775,928	Murray	Nov. 29, 1904
1,534,071	Morse	Apr. 21, 1925
2,078,847	Gray	Apr. 27, 1937
2,234,779	Rose	Mar. 11, 1941
2,497,696	Smith	Feb. 14, 1950