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RUB APRON

BACKGROUND OF THE INVENTION

There are numerous rub aprons in present use in the textile industry which are employed in carding or compacting textile fibers and each of such rub aprons is usually supported on relatively movable rotatable rollers which operate to move the rub apron thereabout while providing oscillation of the apron in a direction substantially transverse the direction of movement of the apron for reasons which are well known in the art. However, present aprons are difficult to install on their associated rollers and often elongate in an undesirable manner during such installation. In addition, present aprons do not run true on their associated rollers and tend to slide off thereby causing excessive wear of such aprons and requiring frequent adjustment of such rollers.

SUMMARY

This invention provides a substantially tubular rub apron of simple and economical construction which has substantially inextensible opposed end portions defined by providing inextensible cord means in such end portions and a comparatively extensible central portion which is free of such cord means wherein such portions cooperate to enable the apron to be easily installed on associated rollers as well as assure that the apron may be moved about its rollers in a true manner and substantially without requiring adjustment for the entire life of the apron.

Other details, uses, and advantages of this invention will become apparent as the following description of the embodiment thereof presented in the accompanying drawing proceeds.

BRIEF DESCRIPTION OF THE DRAWING

The accompanying drawing shows a present exemplary embodiment of this invention, in which

FIG. 1 is a perspective view illustrating an exemplary rub apron of this invention installed in position on a pair of rollers; and

FIG. 2 is an enlarged fragmentary cross-sectional view taken substantially on the line 2-2 of FIG. 1.

DESCRIPTION OF ILLUSTRATED EMBODIMENT

Reference is now made to FIG. 1 of the drawing which illustrates one exemplary embodiment of a rub apron 10 of this invention which is supported on a pair of cooperating rollers 11 and 12 having shafts 13 and 14 respectively which may be suitably rotatably mounted on associated supports provided on an associated textile machine such as a carding machine. The rollers 11 and 12 may be relatively adjustable or movable with respect to each other and in this illustration the roller 11 will be considered as having its shaft 13 supported for rotation at a fixed position while the roller 12 will be considered as having its shaft 14 capable of being moved, as indicated by the double arrow adjacent one end of the shaft 14, and rotatably supported at an infinite number of positions whereby the roller 12 may be adjusted relative to the roller 11.

The provision of adjustable roller 12 makes it easier to install the apron 10 on its rollers 11 and 12. Further, the roller 12 may be adjusted with respect to the roller 11 to assure that the rub apron 10 is moved in a true and centered manner without tendency of such apron to slide axially along and off the rollers 11 and 12.

The apron 10 is adapted to be operated with a similar second apron while oscillating the supporting rollers 11 and 12 in a direction substantially transverse the direction of movement of the apron 10 and in manner well known in the art. The apron 10 operates on a substantially flat strip of textile fibers such as indicated at 15 to compact and transform such strip onto an intertwined mass indicated at 16 which has a roughly circular cross-sectional configuration.

The rub apron 10 has a substantially tubular configuration and comprises inner layer means shown as a plurality of two inner layers 17 wherein each layer may be made of a rubber impregnated fabric. The rub apron 10 also has outer layer means shown as a single-outer layer 20 which is made of an elastomeric material such as natural rubber, synthetic rubber, or the like.

The apron 10 also has substantially inextensible means in the form of inextensible cords 21 provided therein substantially between the outer layer 20 and the inner layers 17 to define substantially inextensible opposed end portions 22 of the apron. The central portion of the apron 10 is kept free of the inextensible cords to thereby define a comparatively extensible central portion 23 which is arranged between the innermost inextensible cords 21.

The inextensible end portions 22 assure easy installation and adjustment of the apron 10 on the rollers 11 and 12 with the length of the apron 10 being maintained substantially intact, i.e., the inextensible cords 21 assure that the ends of the apron 10 cannot be stretched so as to provide undesirable elongation of such apron. In addition, the extensible central portion 23 allows resilient stretching or "giving" which promotes self-alignment of the apron 10 as it is moved about its supporting rollers 10 and 11. To assure that the central portion 23 has the desired extensibility the major part of its thickness is comprised of the comparatively elastic outer layer 20 with the lesser portion of such thickness being defined by the inner fabric layers 17.

As previously mentioned, the apron 10 and rollers 11 and 12 are oscillated in a direction transverse the direction of movement of such apron during rotation of the rollers 11 and 12 to provide the necessary rolling and rubbing action and thereby to compact the textile fibers. To prevent the apron 10 from moving axially along the outer surface of the rollers 11 and 12 a plurality of stops shown as stop buttons 24 are provided and fixed in spaced relation against the exposed surface of the fabric layer 17 which defines the inside surface of the apron 10. The stop buttons 24 have cylindrical outer surfaces and are positioned so that their cylindrical surfaces come in contact with the ends of the rollers 11 and 12 to thereby prevent axial movement of the apron 10 with respect to such rollers.

The outer layer 20 of the apron 10 in this example of the invention comprises a single layer having a substantial rectangular central section 25 of uniform thickness with a pair of integral reduced thickness lateral extensions 26 extending outwardly from opposed outer portions of the rectangular section 25. Thus, practically the entire outer surface of the apron 10 is made of an elastomeric material which is particularly adapted to provide compacting of textile fibers in the manner previously mentioned.

The apron 10 also comprises oppositely arranged annular strip means defined by a plurality of rubber impregnated fabric strips 27 and each strip 27 is bonded in position between the innermost layer 17 and an associated lateral extension 26. The annular strips 27 are of rectangular cross-sectional configuration and provide added strength for the rub apron 10.

The apron 10 has a plurality of spaced fasteners or brads 30 provided therein adjacent each side edge portion thereof. Each brad 30 extends through an associated lateral extension 26, associated strips 27 and inner fabric layers 17 to support an associated stop button 24 against the inside surface of the rub apron 10.

The inextensible cords 21 are preferably fiberglass cords which are embedded in the outer layer 20 adjacent both the inner surface thereof and opposed end edges of its rectangular central section 25. The fiberglass cords 21 may comprise a plurality of endless cords which are suitably supported in position; however, in this example of the invention a pair of inextensible fiberglass cords are utilized and embedded in the outer layer 20 with each cord of the pair extending from an associated end edge portion of the apron 10 toward the center thereof in a spirally wound pattern.

The apron 10 is shown as having a pair of inner rubber impregnated fabric layers 17 provided with a single outer layer 20 made of an elastomeric material provided with inextensible cords 21 embedded in the outer layer 20 adjacent opposite end portions thereof. However, it will be appreciated that the outer substantially elastic layer 20 may be comprised of more than one layer and the inner layers 17 may be comprised of a single layer or more than two layers, as desired.

The rubber impregnated fabric layers 17 and the rubber impregnated fabric strips 27 may be made of any suitable fabric such as rayon, nylon, etc. In addition, it will be appreciated that the comparatively inextensible cords 21 may have any desired cross-sectional configuration and may be comprised of either a single strand or a plurality of suitably intertwined strands.

Any suitably substantially inextensible material may be utilized to make the cords; however, as previously mentioned, cords made of fiberglass have been especially successful and are easily bonded in the elastomeric material in a high-strength manner. It has been found that the fiberglass cords assure that the apron 10 can be urged tightly against its associated rollers on a radius corresponding to the radius of each roller 11 and 12. Further, because the fiberglass cords are comparatively unyielding the adjustable roller 12 may be precisely adjusted enabling the apron 10 to run in a centered and aligned manner.

Thus, it is seen that inextensible end portions 22 and extensible central portion 23 cooperate to assure that the apron moves about its rollers 11 and 12 in a centered manner without requiring adjustment of the roller 12 except initially and such adjustment is sufficient to enable true operation of the apron 10 on its rollers 11 and 12 for practically the entire life of such apron.

While a present exemplary embodiment of this invention has been illustrated and described, it will be recognized that this invention may be otherwise variously embodied and practiced by those skilled in the art.

What I claim is:

1. A substantially tubular rubber apron for textile machines adapted to be supported for movement thereof on a pair of spaced rotatable rollers, said apron comprising, inner layer means, outer layer means made of an elastomeric material, and inextensible cords fixed substantially between said layer means and adjacent opposed end edges of said apron to define inextensible opposed end portions and a central portion therebetween, said central portion being defined solely by said layer means and being free of cords to thereby provide a comparatively extensible central portion, said inextensible end

portions assuring easier installation and adjustment of said apron on said rollers with the length of said apron being maintained substantially intact and said extensible central portion allowing self-alignment of said apron on said rollers between its inextensible end portions, said portions cooperating to assure said apron moves about its rollers in a true manner during practically the entire life thereof.

2. An apron as set forth in claim 1 in which said inner layer means comprises a plurality of rubber impregnated fabric layers.

3. An apron as set forth in claim 1 in which said outer layer means comprises a single layer having a substantially rectangular central section of uniform thickness and a pair of integral reduced thickness lateral extensions extending outwardly from opposed outer portions of said rectangular section to define substantially the entire outer surfaces of said apron of said elastomeric material.

4. An apron as set forth in claim 1 in which said inextensible cords are embedded in said outer layer means adjacent the inner surface thereof.

5. An apron as set forth in claim 1 in which said inextensible cords comprise a pair of inextensible fiberglass cords embedded in said outer layers means with each cord of said pair extending from an associated end edge portion of said apron toward the center thereof in a spirally wound pattern, said fiberglass cords being bonded to said elastomeric material in a high-strength manner.

6. An apron as set forth in claim 1 in which said outer layer means comprises a single-outer layer having a substantially rectangular central section of uniform thickness and a pair of integral reduced thickness lateral extensions extending outwardly from opposed outer portions of said rectangular section to define substantially the entire outer surface of said apron of said elastomeric material and further comprising outwardly arranged annular strip means each having a width corresponding to the extent of an associated one of said extensions, each strip means being bonded between said inner layer means and an associated lateral extension to provide said apron with greater strength.

7. An apron as set forth in claim 6 in which said inextensible cords comprise inextensible fiberglass cords embedded in said single-outer layer adjacent both the inner surface and opposed end edges of said rectangular central section.

8. An apron as set forth in claim 7 and further comprising a plurality of stops fixed in spaced relation against the exposed surface of said inner layer means.

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