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TEXTILE COT

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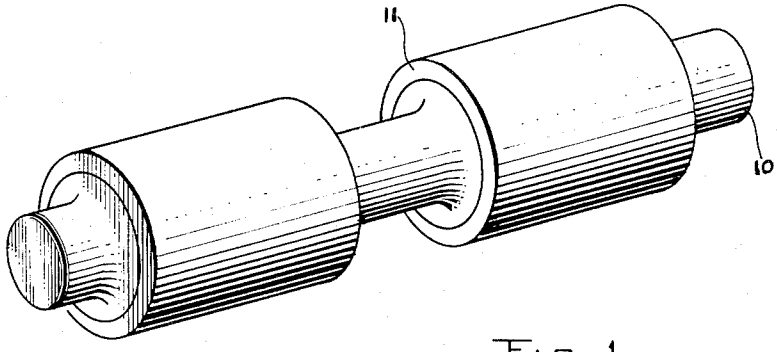



Fig. 1

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# TEXTILE COT

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This invention relates to textile machine units and more particularly to cots or roll covers for spinning rolls.

A textile roller as used in present day drawing, roving and spinning machines, comprises a metal arbor having a sleeve-like roll cover known as a cot, surrounding the arbor. This cover is made of leather, cork composition or certain types of rubber compounds.

In the past, most textile cots were made of leather. These cots proved to be not too satisfactory for use on modern machines, which work at relatively high speeds, due to poor resistance to "lapping-up" and "eyebrowing" and due to their relatively short life. More recently, cots have been made of synthetic materials which show considerably longer life than leather, and also possess better resistance to "lapping-up" and "eyebrowing."

Despite the improved characteristics which have been imparted to textile cots by the use of some of the new types of synthetic rubber, these cots still do not function perfectly under all conditions and for all types of fibers. Some of the newer types of cots, although considerably improved over leather, still exhibit a tendency to "eyebrowing." This condition results from the failure of the cot to carry short fibers or "clearer waste" to the top clearer in order to gather properly. Instead, these short fibers collect at the outside edge of the top clearer and hang down over the roll. This condition is called "eyebrowing" and the mass of fibers which hangs down is called an "eyebrow." As the size of the "eyebrow" increases it will touch the yarn and bunches of short fibers will be pulled into the yarn, thus impairing its quality.

In accordance with the present invention, applicant has discovered a novel type of cot composition which will substantially eliminate the tendency to "eyebrowing" and at the same time exhibit excellent resistance to "lapping-up" as well as long wearing qualities. A further advantage of applicant's novel composition is that the short fibers, which constitute the "clearer waste," although carried to the top clearer are not packed in solidly as is the case with conventional cots, but the waste is in a more or less loose and soft condition which allows the fibers to gradually work back into the yarn in such a manner that these fibers become an integral part of the yarn thus eliminating waste to a substantial extent.

It is therefore an object of the present invention to provide an improved textile roll cover or cot which will substantially eliminate objectionable "eyebrowing," and will at the same time provide excellent wear and resistance to "lapping-up" of the fibers.

Other features and advantages will become more readily apparent in the following description.

The drawing illustrates a typical textile cot in which 10 represents a metal arbor, and 11 represents the roll cover or cot which is mounted upon the arbor. The arbor illustrated is composed of a pair of longitudinally spaced raised portions which support a pair of cots thus forming a pair of longitudinally spaced spinning rolls.



The roll cover or cot 11 is composed of the novel type of composition described below.

Applicant has discovered that by the incorporation of polyvinyl alcohol in a cot composition, the basis of which is an oil-resistant synthetic rubber-like material, "eyebrowing" as described above is substantially eliminated and the cot possesses excellent performance characteristics with respect to endurance and resistance to "lapping-up." Furthermore, such textile cots tend to work the clearer waste back into the goods so that it is worked into the yarn thus eliminating the waste which would otherwise occur. Polyvinyl alcohol is normally obtained as a solid material and is incorporated in the cot compound as a granular material or powder by milling, or otherwise, together with the other compounding ingredients as normally utilized. It has been found that even small proportions of polyvinyl alcohol impart improved characteristics to the composition, while the upper limit which may be used is determined only by the concentration which will seriously affect the physical properties and wearing qualities of the resultant compound. Therefore, the proportions to be used are not critical, and the amount of polyvinyl alcohol incorporated will depend partly on the type of polyvinyl alcohol utilized, i. e., the degree of hydrolysis, and the particular performance characteristics desired of the resultant cot. In general, a preferred range of proportions is from 10 to 100 parts of polyvinyl alcohol for each 100 parts of the synthetic rubber-like material. In order to give optimum results, it is preferred that the resultant stock have a Shore A hardness of 75 to 80. The particle size of the polyvinyl alcohol is not critical, but larger size particles should be avoided in order to insure uniform mixing. Preferably, a particle size is chosen which will pass through a 60 mesh sieve.

As is well known to the art, the polyvinyl alcohol which is referred to herein, is a product obtained by the hydrolysis of polyvinyl acetate. The resultant material is in the form of a solid gel which will vary in physical properties depending on the degree of hydrolysis to which the acetate has been subjected. The various conventional types of polyvinyl alcohol ranging from partially hydrolyzed to substantially completely hydrolyzed types, have been found to function satisfactorily in applicant's composition.

The term "oil-resistant synthetic rubber-like material" as used herein is intended to mean the vulcanizable synthetic elastomers having tensile and resilience properties similar to natural rubber and having the property of greater oil resistance than natural rubber and particularly includes the rubber-like copolymers of conjugated diolefins with acrylonitrile, such as the butadiene acrylonitrile and isoprene acrylonitrile copolymers, and the polyhaloprenes, such as polychloroprene (neoprene).

A typical cot composition for use in the present invention is as follows:

| | Parts by weight |
|---|---|
| Perbunan (74% butadiene 26% acrylonitrile emulsion copolymer) | 100 |
| Plasticizer and tackifier (Bakelite resin) | 10–20 |
| Sulfur | 5 |
| Accelerator (mercaptobenzothiazole or the like) | 1–2 |
| Zinc oxide | 8–12 |
| Clay filler | 15–35 |
| Diphenylguanidine | 0.25 |
| Elvanol 72–51 (polyvinyl alcohol, 98.5–100% hydrolyzed) | 40 |

The above ingredients are incorporated in the rubber by milling and the cot is then formed by extrusion, then wrapped, cured, and ground to size, in the usual manner. In place of perbunan, other suitable oil-resistant synthetic

rubbers, such as neoprene (polychloroprene) or the isoprene-acrylonitrile copolymers, may be used.

Cots formed of the above composition were placed in actual use in spinning frames. Various proportions of polyvinyl alcohol ranging from 10 to 100 parts per 100 parts of rubber were incorporated in compounds of similar composition and evaluated in actual practice. All of the polyvinyl alcohol-containing cots were found to operate with a smooth but not slick surface, even after months of running. The surfaces of the cots were found to be minutely tacky and did not lose their coefficient of friction in use. By comparison with other cots of conventional composition, the new cots were found to eliminate "eyebrowing" over long periods of use. At the same time it was found that these cots would pack clearer waste into the goods so that these normally waste fibers are worked back into the goods, thus eliminating waste. The exact principle of operation of these cots is not known for certain, but it is believed that the polyvinyl alcohol particles tend to swell minutely by absorption of moisture from the atmosphere and then remain in a swollen condition to facilitate drafting. This is a matter of theory however, and is intended to be of an explanatory character only, and not for purposes of limitation of the invention.

I claim:

1. A textile fiber drafting cot having a working surface made of an oil-resistant synthetic rubber-like material as the essential constituent and having intimately incorporated therewith discrete particles of polyvinyl alcohol to effect modification of the drafting properties thereof, the particles which are exposed at the surface of the cot being minutely swollen by the absorption of moisture to provide a fiber-working surface having such swollen particles embedded in the oil-resistant rubber-like material.

2. A cot according to claim 1 wherein the synthetic rubber-like material is a butadiene-acrylonitrile copolymer.

3. A cot according to claim 1 wherein the oil-resistant synthetic rubber-like material is a polychloroprene.



4. A fiber working unit for textile machines having a surface layer containing as an essential constituent an oil-resistant synthetic rubber-like material compounded with about 10 parts to about 100 parts by weight of discrete particles of polyvinyl alcohol per 100 parts by weight of the rubber-like material, the particles which are exposed at the surface of the cot being minutely swollen by the absorption of moisture to provide a fiber-working surface having such swollen particles embedded in the oil-resistant rubber-like material.

5. A textile cot having a working surface made of a butadiene-acrylonitrile copolymer and having intimately incorporated therewith from about 10 parts to about 100 parts by weight of discrete particles of polyvinyl alcohol per 100 parts by weight of the copolymer, the particles which are exposed at the surface of the cot being minutely swollen by the absorption of moisture to provide a fiber-working surface having such swollen particles embedded in the butadiene-acrylonitrile copolymer.

6. A textile cot having a surface layer containing as an essential constituent a butadiene-acrylonitrile copolymer having incorporated therewith about 40 parts by weight of discrete particles of a polyvinyl alcohol per 100 parts by weight of the copolymer, the particles which are exposed at the surface of the cot being minutely swollen by the absorption of moisture to provide a fiber-working surface having such swollen particles embedded in the butadiene-acrylonitrile copolymer.

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