

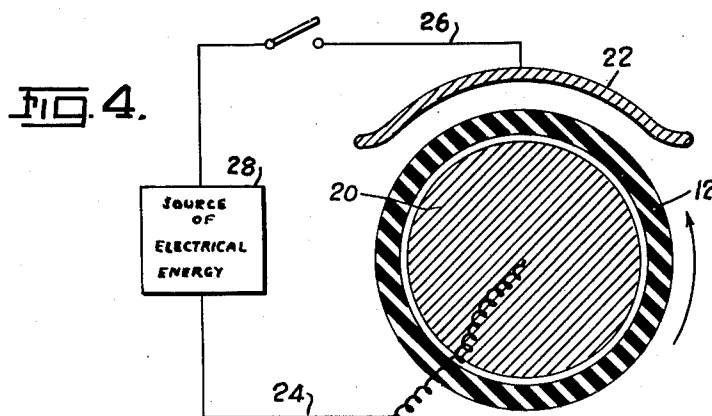
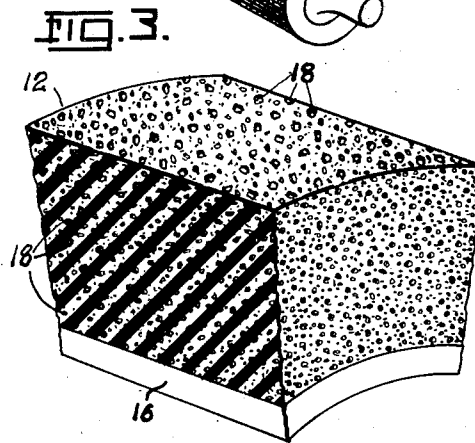
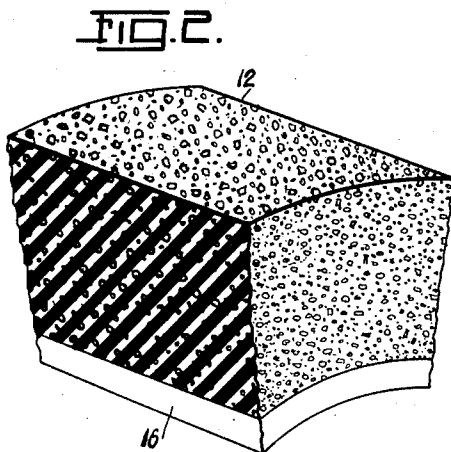
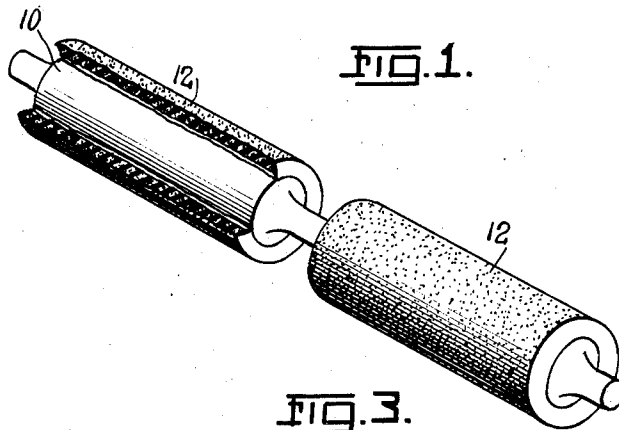
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SPINNING COT

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SPINNING COT

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5 Claims. (Cl. 260—41.5)

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This invention relates to textile machinery.

More particularly, this invention deals with cots for spinning and card room rolls and, while it will be described in connection with the making of a spinning roll cot, it will be readily understood by those skilled in the art that this invention is also adapted for forming cot rolls commonly used in textile working machinery, such as temple rolls, loom take up roll coverings, top spinning rolls, and the like.

The improved spinning roll or cot which is the subject matter of the present invention possesses good drafting characteristics, exhibits low static charge build-up, and has good aging and wear resisting properties. The cot is, likewise, resistant to attacks by oil and abrasive substances and is further characterized by a surface which inhibits "eyebrowing" throughout the life of the cot even when the original surface is worn off through abrasion.

Many attempts to substitute natural rubber compositions in the manufacture of spinning cots have been made but they have proved, largely, unsuccessful because natural rubber is attacked by oil and tends to swell and to develop a gummy surface unsuited for the working of textile fibers. As a result of considerable research, it was discovered that the use of synthetic rubber-like materials comprising butadiene copolymers of acrylic nitriles when compounded with other ingredients and vulcanized produce a cot or roll which can be finished to give a working surface possessing the desirable characteristics of the best leather covered cots. Such cots have excellent fiber drafting properties and exhibit substantially no tendency to collect fiber on the surface thereof. Neither do they exhibit a tendency to groove, or to collect static charges and are substantially unaffected by oils and greases. In addition, cots formed of butadiene-acrylic nitrile copolymer possess substantially greater durability than the best leather cots.

The present invention is concerned principally with improving the operating characteristics of cots, rolls and similarly employed textile machinery auxiliaries made from butadiene-acrylic nitrile copolymer compounds by treating the vulcanized cot or roll in order to create therein minute holes and fissures which tend to enhance the drafting characteristics of the cot or roll.

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without detracting from its resistance to "eyebrowing" or "lapping up."

As a typical example of a spinning cot composition employing butadiene-acrylic nitrile copolymer I submit the following formula:

Example

	Parts by weight
Butadiene-acrylic nitrile copolymer-----	80-125
Dibenzyl ether-----	10-25
Cumarone resin-----	6-12
Zinc oxide-----	4-8
Whiting-----	40-70
Sulfur-----	1-2
Benzothiazyl disulphide-----	0.9-1.5

It has been found further that if the composition of the above example is compounded in its unvulcanized state with a fine granular material it is possible to produce spinning cots and rolls which have even greater resistance to "lapping up" or "eyebrowing." Among the materials which have been suggested as the granular material to be incorporated in such a composition is salt. The salt, as the cot or roll wears down and exposes it to the humid atmosphere of the spinning roll, will deliquesce and melt away and leave the surface of the cot or roll somewhat porous, thus enhancing the fiber drafting characteristics thereof.

However, while it is desirable that the surface of the cot or roll be porous, the deliquescing of the salt also causes the cot or roll to become somewhat gummy and moist which is undesirable.

Another addition product which has been employed is sand, which, however, is abrasive and will damage bearings with which it comes in contact. According to the present invention, the desired physical characteristics resulting from a porous cot or roll surface is obtained without the undesirable features of salt or other granular materials heretofore used. I have found that by incorporating a quantity of particulate cellular material such as ground cork, leather, cellulose sponge or the like, I obtain a dispersion of such particulate material throughout the body of the cot or roll. I then subject the roll to the influence of a high frequency electric field which substantially destroys the particulate product without adversely affecting the cot or roll.

The resulting cot or roll is possessed of a uni-

formly porous surface throughout its life without at any time exhibiting gumminess as is the case when the addition material is salt. The amount of addition material added to the composition of the example may vary considerably and still produce satisfactory results. For instance, to 100 parts by weight of the composition of the example I may add up to 70 parts by weight of addition material, depending upon the bulk and specific gravity of the latter. After the materials are thoroughly mixed, the mixture is molded and vulcanized to form a cot of the desired shape.

It will be understood that the particular amount of butadiene acrylic nitrile copolymer used in the example given may be varied in order to vary the characteristics of the finished cot. But I prefer to use from 30 to 55% by weight of the composition.

The hardness of the cots as measured on the Shore type "A" durometer is preferably within the range of 50 to 95 and may be controlled, as well as the toughness and resiliency of the finished article by suitable additions of carbon black, zinc oxide, clays and other materials well known in the art of compounding material and synthetic rubbers.

While it will be apparent that this invention is not necessarily limited to any specific composition, in order to produce a cot having the highly desirable characteristics hereinbefore set forth, it is advantageous to use a copolymer of butadiene similar to the one given in the example.

This invention will be better understood by reference to the attached drawings, in which:

Figure 1 is a perspective of a top spinning roll or cot;

Figure 2 is an enlarged diagrammatic view of a cross section of the rubber composition including the particulate addition material;

Figure 3 is a view similar to Figure 2 but showing the rubber composition after the particulate material has been reduced or destroyed; and

Figure 4 is a view showing one arrangement for treating the rubber composition in order to reduce or destroy the addition material.

In the drawing, the numeral 10 represents the body of a spinning roller and the numeral 12 represents the vulcanized cover thereon.

In Figure 2 the cover 12 is shown as containing a plurality of particles 14 which are dispersed throughout the body of the said cover. The cover 12 may comprise a section 16 at the inner portion thereof which serves as a tension section thereby adding strength to the roller or cot.

In Figure 3 the addition particles 14 have been reduced or destroyed and the roll cover 12 will be seen to contain a plurality of pores or pits 18. It will be noted that the porosity caused by the pits 18 is substantially continuous throughout the body 12.

In Figure 4 the roll cover 12 is mounted on a mandrel 20 of electrically conductive material and has arranged adjacent the electrode 22. Wires 24 and 26, respectively, connect the mandrel 20 and the electrode 22 with a source of electrical energy indicated at 28.

The source of electrical energy is preferably a high frequency oscillator capable of developing frequencies on the order of one to fifty million cycles per second and voltages on the order of ten to one hundred thousand volts.

After the rubber composition and particulate addition material have been thoroughly mixed, molded and vulcanized, the cot or roll cover is

placed on the mandrel 20 and electrical energy is applied to the mandrel 20 and the electrode 22 from the generator 28. The mandrel 20 is then rotated at suitable speed so that the energy transferred from the electrodes to the particulate material either destroys or reduces the latter. It will be understood that the amount of energy absorbed by the rubber composition itself is not sufficient to cause heating to a harmful extent.

Following the electrical treatment of the cot or roll cover, the surface thereof is ground or buffed to the proper fiber working finish.

The resulting cot surface is dry and smooth to touch but has minute pits or pores therein due to the addition material which has been destroyed by the electrical treatment.

Inasmuch as the addition material was dispersed throughout the body of the cot or roll cover, wear and regrinding of the surface will not destroy the desirable texture thereof.

It will be understood by those skilled in the art that my improved cot or roll covering having porous characteristics may be used in making a great variety of fiber-working machine elements for use in the textile industry. For example, various types of rolls, covers, jackets, aprons and the like used in drafting, conveying, rubbing and fiber-working may be advantageously manufactured using my improved method.

It will also be understood by those skilled in the art that the degree of vulcanization or curing may be so controlled as to produce any specific physical property desired. Also, the amounts of the different ingredients may be varied or have equivalents substituted therefor in order to produce a product of any desired degree of hardness, elasticity and frictional characteristics. In each case, the ingredients are preferably compounded with a copolymer of butadiene and thoroughly mixed with the particulate addition material, molded to the desired shape or form, vulcanized, electrically treated to destroy the addition material and, when necessary, the surface ground, buffed, abraded, or otherwise treated or processed to give it the desirable characteristics.

In addition, it will be understood that while I have set forth certain embodiments of my invention, it is not my intention to have it limited to or circumscribed by the specific details of proportions, procedure and substances herein set forth, in view of the fact that my invention is susceptible to many and varied modifications depending on individual preference and conditions without departing from the spirit of this disclosure and the scope of the appended claims.

I claim:

1. The method of making a textile machine unit for drafting fibers which comprises thoroughly mixing a rubbery acrylic nitrile butadiene copolymer and a particulate organic cellular material, molding the resulting mixture to the shape desired of the unit, vulcanizing said unit, and exposing said vulcanized unit to a high-frequency electric field ranging from one million to fifty million cycles per second and from ten thousand to one hundred thousand volts, whereby said particulate substance is destroyed throughout said unit and minute discrete pores filled with gaseous combustion products of said particles are formed.

2. The method of making a textile machine unit for drafting fibers which comprises thoroughly mixing a rubbery acrylic nitrile butadiene copolymer with fillers, a vulcanizing agent, and a particulate organic cellular material, mold-

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ing the resulting mixture to the shape desired of the unit, vulcanizing said unit, and exposing said vulcanized unit to a high-frequency electric field ranging from one million to fifty million cycles per second and from ten thousand to one hundred thousand volts, whereby said particulate substance is destroyed throughout said unit and minute discrete pores filled with gaseous combustion products of said particles are formed.

3. The method of making a textile machine unit for drafting fibers which comprises thoroughly mixing a rubbery acrylic nitrile butadiene copolymer with fillers, a vulcanizing agent and ground leather, molding the resulting mixture to the shape desired of the unit, vulcanizing said unit, and exposing said vulcanized unit to a high-frequency electric field ranging from one million to fifty million cycles per second and from ten thousand to one hundred thousand volts, whereby said leather is destroyed throughout said unit and minute discrete pores filled with gaseous combustion products of said leather are formed.

4. The method of making a textile machine unit for drafting fibers which comprises thoroughly mixing a rubbery acrylic nitrile butadiene copolymer with filler, a vulcanizing agent and ground cork, molding the resulting mixture to the shape desired of the unit, vulcanizing said unit, and exposing said vulcanized unit to a high-frequency electric field ranging from one million to fifty million cycles per second and from ten thousand to one hundred thousand volts, whereby said cork is destroyed throughout

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said unit and minute discrete pores filled with gaseous combustion products of said cork are formed.

5. The method of making a textile machine unit for drafting fibers which comprises thoroughly mixing a rubbery acrylic nitrile butadiene copolymer, a vulcanizing agent, and a particulate cellulose sponge, molding the resulting mixture to the shape desired of the unit, vulcanizing said unit, and exposing said vulcanized unit to a high-frequency electric field ranging from one million to fifty million cycles per second and from ten thousand to one hundred thousand volts, whereby said particulate substance is destroyed throughout said unit and minute discrete pores filled with gaseous combustion products of said particles are formed.

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