May 16, 1950 E. M. ROTHERMEL 2,507,869

NONEYEBROWING COT

Original Filed Jan. 6, 1944

FIG. 1

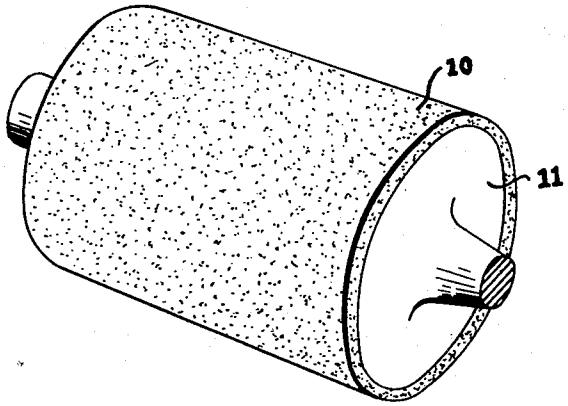
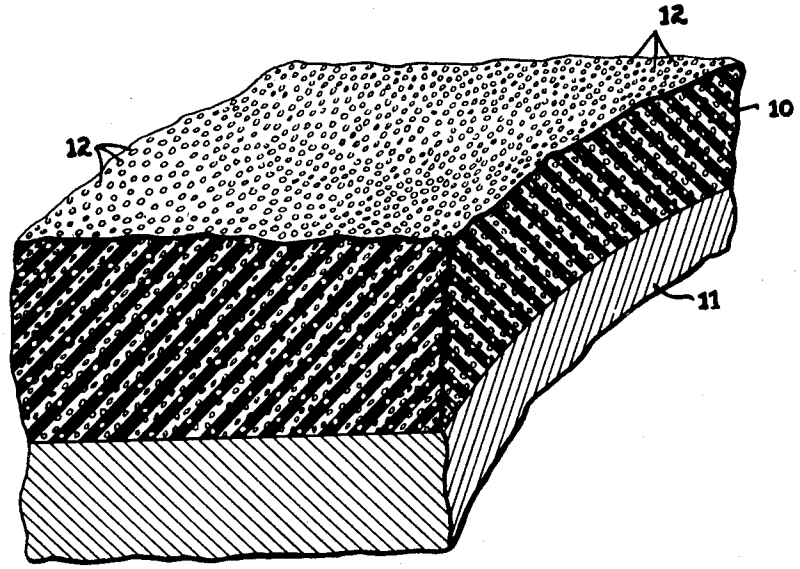


FIG. 2



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2,507,869

NONEYEBROWING COT

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2 Claims. (Cl. 19—143)

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This invention deals with cots for use in textile processing and with a composition of matter suitable for such cots and characterized by its noneyebrowing characteristics.

This application is a division of my prior application Serial No. 517,190, now abandoned.

As is known to those skilled in the art, eyebrowing is an objectionable feature in cots or textile processing and one of the most troublesome and obstinate problems to overcome.

The theory of noneyebrowing is to produce a surface of physical roughness on the cot. This may be done by producing a roughened surface when the cot is manufactured, but such a roughened surface will wear down and ultimately will become smooth. Rebuffing will then become necessary in order to impart to the cot once again the required roughness of surface which is conducive to noneyebrowing.

It has been considered ideal to produce a cot in which the roughened surface initially given to it would be maintained throughout the service life of the cot without requiring rebuffing. To this end, finely divided substances have been incorporated in cots. Such finely divided substances have included salt, sand and similar inorganic substances. As the surface of such cots wear down in use, the small particles of addition substance would be brought to the surface and would eventually fall off the surface of the cot, thus leaving behind a pitted surface which possessed the desirable texture.

Although cots produced with the addition of salt or sand or similar materials have rendered highly satisfactory results, they may be considered as having some drawbacks. For example, salt will deliquesce in the humid atmosphere of textile processing plants, with the result that the surface of the cot will become "gummy" or "sticky." On the other hand, the particles of sand incorporated in such cots are highly abrasive and might cause damage to bearings and other such surfaces as they fall off the surface of the cot.

The present invention, in essence, has for its purpose to produce a cot having the desirable continuous pitted or roughened surface of cots including salt or sand or similar materials without the disadvantages of the latter above mentioned. To this end, there is provided a cot according to the present invention which possesses a structure comprising a multitude of cells which as the cot surface wears down come to the surface and produce a continuous pitted or roughened surface.

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The present invention will be fully understood from the following description taken in connection with the annexed drawing, wherein

Fig. 1 is a diagrammatic view of a cot 10 mounted on a roll 11; and

Fig. 2 illustrates diagrammatically an enlarged portion of the cot 10 mounted on the roll 11.

Referring to Fig. 2 in particular, it will be noted that the cot 10 comprises a plurality of small openings or voids 12. These voids are distributed throughout the body of the cot 10, and as the surface of the cot 10 wears down in use, they come to the surface and produce a highly pitted surface possessing the highly desirable roughness which is conducive to the desirable noneyebrowing characteristic in cots.

According to the present invention, a stock of synthetic rubber composition of the type generally employed in the art for the manufacture of cots is admixed in its unvulcanized condition with a small quantity of a substance which will decompose and form a gas within the range of temperature used in vulcanizing the cot. The quantity of gasifying substance added to the stock of rubber composition will vary according to the nature of the gasifying substance and the type of cells or pores to be produced in the finished cot. From 1 to 5% of such gasifying substance may be employed advantageously in the practice of this invention.

It is required that the mixing of the gasifying substance and the unvulcanized rubber stock be thorough and conducted at low temperatures. The conventional rubber mixing equipment may be employed satisfactorily.

The uncured cots produced with the unvulcanized rubber composition having admixed therewith a gasifying substance may be vulcanized or cured in any size or shape or type desired, both with respect to the voids or cells or with respect to the article itself. For example, a cure of 70 minutes at 300° F. in open steam results in very small voids, while a cure of 90 minutes at 260° F. in open steam results in somewhat larger voids. Lower pressures and temperatures result in still larger voids, but as the temperature and the pressure are reduced the time of curing must be increased.

When the curing medium is hot compressed air, a further difference in structure is obtained in the finished cot. Temperature, pressure and time again may be utilized as factors for varying the structure of the finished cot and the nature of the voids or cells produced therein.

Softer or harder unvulcanized natural rubber or synthetic rubber cot compounds may be in-

corporated with gasifying substances as previously mentioned in such combinations or proportions as might be desired or required to obtain any desirable structure in the finished cot; however, in view of the advantages which may be desired from the use of synthetic rubbers such as Perbunan (acrylic nitrile and butadiene copolymer), I prefer to make use of compounds having a base of Perbunan in the practice of my invention.

By way of illustration and without thereby intending to limit this invention, the following are given as typical examples of cot compounds which may be employed in the practice of the present invention:

Example I

	Parts by weight
Perbunan [1]	100.0
Ground calcium carbonate	50.0
Zinc oxide	2.0
Stearic acid	5.0
Sulphur	2.5
Phenyl-beta-naphthylamine	2.0
Palm oil	3.0
Sodium bicarbonate (gasifying agent)	7.5
Mercaptobenzothiazole	1.5
Diphenyl guanidine	0.5

Example II

	Parts by weight
Perbunan [1]	100.0
Carbon black	50.0
Extra light calcined magnesia	4.0
Zinc oxide	5.0
Phenyl-alpha-naphthylamine	2.0
Diazo-amino-benzene (gasifying agent)	3.5
Medium process oil	7.0
Stearic acid	0.5

Example III

	Parts by weight
Perbunan [1]	100.0
Hydrous aluminum silicate	75.0
Zinc oxide	3.0
Sulphur	2.5
Medium pine tar	7.5
Oleic acid	2.5
Stearic acid	2.5
Adol-alpha-naphthylamine	3.0
Benzothiazyl disulphide	2.0
Ammonium bicarbonate (gasifying agent)	5.0

[1] Perbunan is a copolymer of acrylic nitrile and butadiene.

In addition to the specific gasifying agents mentioned in the above formulations, there are other gasifying substances that may be employed successfully and satisfactorily in the practice of this invention, including the following:

1. Sodium carbonate
2. Ammonium carbonate
3. Mixture of ammonium chloride and sodium nitrite

Those skilled in the art will understand that still other substances may be employed successfully as gasifying agents in the practice of this invention, and that compatible mixtures of the substances set forth hereinbefore and in the examples and of such other substances may also be used successfully in the practice of this invention.

It will be understood that while certain embodiments of the present invention have been described herein, it is not intended thereby to have this invention limited to or circumscribed by the specific details of construction, arrangement of parts, procedures, or proportions herein described or illustrated in the annexed drawing in view of the fact that this invention is susceptible to modifications according to individual preference and conditions without departing from the spirit of this disclosure and the scope of the appended claims.

I claim:

1. In combination, a drafting roll, a cot mounted on said roll and having a fiber contacting layer consisting of a pitted surface and a body of rubber-like material provided with a plurality of gas filled cells substantially uniformly distributed throughout the entire body comprising the layer, whereby, as the layer wears down in use, new cells are presented which form a series of new pitted surfaces successively following each other, said layer being made from a composition of acrylic nitrile-butadiene copolymer and a gasifying agent decomposable at elevated temperatures, and subjected to such temperatures.

2. In combination, a drafting roll, a cot mounted on said roll and having a fiber contacting layer consisting of a pitted surface and a body of rubber-like material provided with a plurality of gas filled cells substantially uniformly distributed throughout the entire body comprising the layer, whereby, as the layer wears down in use, new cells are presented which form a series of new pitted surfaces successively following each other, said layer being made from a composition of acrylic nitrile-butadiene copolymer and a gasifying agent decomposable at elevated temperatures selected from the group consisting of sodium bicarbonate, diazo-amino-benzene, ammonium bicarbonate, sodium carbonate, ammonium carbonate, and a mixture of ammonium chloride and sodium nitrite, and subjected to such temperatures.

EDWARD M. ROTHERMEL.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,563,943	Adams et al.	Dec. 1, 1925
1,988,491	Hazell	Jan. 22, 1935
2,211,429	Daniel et al.	Aug. 13, 1940
2,304,656	Rockoff	Feb. 20, 1941
2,332,514	Holtzclaw	Oct. 26, 1943
2,386,583	Bacon	Oct. 9, 1945