Patented Feb. 17, 1953 2,628,937

UNITED STATES PATENT OFFICE

2,628,937

ANTISTATIC TEXTILE TREATING COMPOSITION OF TRIETHANOLAMINE-ALIPHATIC CARBOXYLIC ACID SALTS

Harry Paul, Coventry, England, assignor to Courtaulds Limited, London, England, a British company

No Drawing. Application December 19, 1949, Serial No. 133,950. In Great Britain January 18, 1949

7 Claims. (Cl. 252—8.8)

1

This invention relates to the treatment of artificial staple fibres.

It is well known that certain artificial staple fibres, for example cellulose ester and ether staple fibres, have a tendency to become electrified as a result of rubbing during normal textile operations such as carding, spinning and twisting.

It is known to reduce the tendency of such staple fibres to become electrified during processing by treating them with so-called antistatic compositions and the use of alkylolamines, their soaps or their salts for this purpose has already been proposed. Thus, British specification No. 376,785 describes a process for the treatment of cellulose acetate and the like textile materials comprising applying thereto a preparation consisting of or containing alkylolamines and/or their salts or soaps of aliphatic acids, but containing no fats or fatty oils; in United States patent specifications Nos. 2,067,174 and 2,067,175, the treatment of staple lengths of artificial filaments with like alkylolamine compounds is described. Specific salts or soaps of fatty acids described in the three patent specifications mentioned above are the alkylolamine caprates, laurates, myristates, oleates and stearates. United States patent specification No. 2,081,967 describes the preparation of a lubricating and antistatic finish by emulsifying a mixture of oil, water and such substances of high electrical conductivity as triethanolamine lactate, tartrate, citrate or borate.

The object of the present invention is to provide improved antistatic compositions having high conductivity.

In accordance with the present invention, a method of treating artificial staple fibres to reduce their tendency to become electrified during processing comprises applying to the fibres an aqueous composition in which is dissolved or dispersed an alkylolamine salt of a dibasic acid having the general formula

$$HOOC—(CH_2)_n—COOH$$

in which n is an integer not less than 4. The preferred alkylolamine for use in the invention is triethanolamine. Examples of suitable acids to form the triethanolamine salt are sebacic acid, suberic acid, pimelic acid and adipic acid.

In a preferred form of the present invention the aqueous composition also contains an alkylolamine salt of a fatty acid such as capric acid, lauric acid, oleic acid, stearic acid and other fatty acids the molecule of which contains at least 10 carbon atoms. A suitable mixed composition contains from ½ to 2 parts of the alkylolamine-dibasic acid salt for each part of the fatty acid salt, parts being by weight.

2

The antistatic compositions according to the invention may be applied to the staple fibres by spraying, preferably from an atomiser, in a centrifuge, or by immersing the fibres in the composition and then removing excess liquid for example by centrifuging or by passing the fibres through pressure rollers.

The proportion of the alkylolamine-dibasic acid salt, and of the alkylolamine-fatty acid salt when such is also used, in the antistatic composition according to the invention depends generally on the method by which it is applied; the concentration will normally be selected so that the treated fibres retain about ½ to 1½ per cent of its weight of the alkylolamine-dibasic acid salt. For example, when using the immersion method of applying the composition to cellulose derivative fibres, the composition may contain from ½ to 1½ per cent by weight of the alkylolamine-dibasic acid salt, and the fibres, after the immersion, may then be pressed or centrifuged till they retain approximately their own weight of solution. When the composition is applied either by spraying or by centrifuging to cellulose derivative fibres concentrations of the alkylolamine-dibasic acid salt will in general be higher than 1½ per cent by weight, for example from about 2 to 5 per cent.

The materials which may be treated according to the invention may be any of the staple fibres which are known to be liable to become electrified during processing such as cellulose acetate or other cellulose ester staple fibres, cellulose ether staple fibres, casein and other protein staple fibres and nylon staple fibres.

The present invention is illustrated by the following examples in which parts and percentages are by weight.

Example 1

Cellulose acetate staple fibres were immersed in a bath having the following composition:

	Parts
Triethanolamine sebacate	1
Triethanolamine caprate	1
Water	100

The fibres were then removed from the bath and passed through a mangle so that the fibres retained approximately their own weight of composition.

The fibres obtained were readily carded to form

a sliver with little or no difficulties arising from static electricity.

Example 2

Cellulose acetate staple fibres were sprayed by means of an atomiser with the following composition:

	Parts
Triethanolamine sebacate	5
Triethanolamine caprate	2½
Water	100

The fibres so treated were readily carded to form a sliver without any marked generation of static electricity.

Example 3

Cellulose acetate staple fibres were treated in a centrifuge with the following composition:

	Parts
Triethanolamine suberate	2½
Triethanolamine caprate	5
Water	100

The fibres so treated were readily carded to form a sliver without any marked generation of static electricity.

Example 4

Artificial lactic casein staple fibres were sprayed with the following composition:

	Parts
Triethanolamine sebacate	2
Triethanolamine laurate	2
Water	100

The treated fibres were readily spun into yarns without any marked generation of static electricity.

What I claim is:

1. A method of reducing the tendency of artificial staple fibres to become electrified during processing which comprises applying to the fibres an aqueous composition consisting essentially of (*a*) water, (*b*) a triethanolamine salt of a dibasic acid selected from the group consisting of adipic acid, pimelic acid, suberic acid, and sebacic acid, and (*c*) a triethanolamine salt of at least one fatty acid the molecule of which contains at least 10 carbon atoms, the composition containing from ½ to 2 parts by weight of the triethanolamine-dibasic acid salt (*b*) for each part by weight of the triethanolamine-fatty acid salt (*c*).

2. A method as claimed in claim 1 wherein the dibasic acid salt is triethanolamine sebacate.

3. A method of treating artificial staple fibres for processing which comprises applying to the fibres an aqueous composition consisting essentially of (*a*) water, (*b*) a triethanolamine salt of a dibasic acid selected from the group consisting of adipic acid, pimelic acid, suberic acid, and sebacic acid, and (*c*) a triethanolamine salt of at least one fatty acid the molecule of which contains at least 10 carbon atoms, the composition containing from ½ to 2 parts by weight of the triethanolamine-dibasic acid salt (*b*) for each part by weight of the triethanolamine-fatty acid salt (*c*) whereby the tendency of said fibres to become electrified during the processing is reduced, and thereafter processing said fibres.

4. A treating solution for reducing the tendency of artificial staple fibres to become electrified during processing which comprises an aqueous composition consisting essentially of (*a*) water, (*b*) a triethanolamine salt of a dibasic acid selected from the group consisting of adipic acid, pimelic acid, suberic acid, and sebacic acid, and (*c*) a triethanolamine salt of at least one fatty acid the molecule of which contains at least 10 carbon atoms, the composition containing from ½ to 2 parts by weight of the triethanolamine-dibasic acid salt (*b*) for each part by weight of the triethanolamine-fatty acid salt (*c*).

5. A treating solution as claimed in claim 4 wherein the dibasic acid salt is triethanolamine sebacate.

6. A treating solution as claimed in claim 4 wherein the dibasic acid salt is triethanolamine suberate.

7. A method of reducing the tendency of artificial stable fibres to become electrified during processing, comprising applying to the fibres a composition consisting essentially of (*a*) water (*b*) a triethanolamine salt of a dibasic acid chosen from the group consisting of adipic acid, pimelic acid, suberic acid, and sebacic acid, and (*c*) a triethanolamine salt of at least one fatty acid, the molecule of which contains at least 10 carbon atoms, the composition containing from ½ to 2 parts by weight of the triethanolamine-dibasic acid salt (*b*) for each part by weight of the triethanolamine-fatty acid salt (*c*), from about ½ to about 1½ per cent on the weight of the fibres, of the triethanolamine-dibasic acid salt being retained on the fibres.

H. PAUL.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
2,067,174	Dickie et al.	Jan. 12, 1937
2,067,175	Dickie et al.	Jan. 12, 1937
2,067,219	Whitehead	Jan. 12, 1937
2,067,220	Whitehead	Jan. 12, 1937
2,081,967	Whitehead	June 1, 1937
2,094,608	Kritchevsky	Oct. 5, 1937