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COATED FABRIC

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(56) Prior Art Documents
US 4429000
US 3788882
US 3619257

(57) Claim

1. The use of a coated fabric in a phase separation process, the said fabric being made by a method comprising the steps of impregnating a cloth with at least one coagulable polymer latex and coagulating the polymer on or in the cloth, wherein the method comprises carrying out the coagulation from a water phase so as to provide a cloth having a porous polymer coating thereon and/or therein and wherein the coagulated polymer is foamed, the foaming occurring simultaneously with or immediately after the coagulation.

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(54) Title: COATED FABRIC

(57) Abstract

A method of making a coated fabric to be used in a phase separation process comprising the steps of impregnating a cloth with at least one coagulable polymer latex and coagulating the polymer on/or in the cloth. The coagulation is carried from a water phase so as to provide a cloth having a porous polymer coating thereon and/or therein.

COATED FABRIC

The present invention relates to coated fabrics, particularly for use in phase separation processes such as papermaking and filtration. The coated fabrics of the invention have particular, but not exclusive, application in the filtration of ingestible materials.

It is known to prepare coated filter fabrics by applying a solution of a polyurethane in DMF (dimethyl formamide) either by immersion in or by coating on one side and then immersing the treated cloth in water. The polyurethane is coagulated and is attached to the fabric as a result.

DMF is a toxic substance. If the filter fabric is to be used in foodstuffs related areas any residual DMF remaining in the filter fabric may end up in the foodstuffs which come near or into contact with the filter fabric. This is obviously undesirable.

The present invention seeks to provide an alternative method of making a coated filter fabric which avoids the use of toxic substances such as DMF.

According to the present invention there is provided the use of a coated fabric in a phase separation process, said fabric being made by a method comprising the steps of impregnating a cloth with at least one coagulable polymer latex and coagulating the polymer on or in the cloth, wherein the method comprises carrying out the coagulation from a water phase so as to provide a cloth having a porous polymer coating thereon and/or therein and wherein the coagulated polymer is foamed, the foaming occurring simultaneously with or

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immediately after the coagulation.

The polymer is preferably coagulated with steam or super-heated steam rather than water.

The polymer used may comprise polyurethane. However, polyurethane is susceptible to hydrolytic degradation. In some instances it is desirable to use polymers having improved resistance to hydrolytic degradation. In such circumstances polymers containing hydrolysis-susceptible linkages such as esters or amide should be avoided. Suitable examples include polyisoprene, polybutadiene, polyvinylidene dichloride, polyvinyl chloride, polychloroprene and particularly styrene-butadiene polymers or mixtures thereof. Fabrics having such polymer coatings surprisingly exhibit vastly improved resistance to hydrolysis, acids/alkalis and oxidation.

The cloth substrate may be woven or nonwoven, but is preferably a needlefelt. The cloth may be made from any suitable material, such as polypropylene.

Foaming may be achieved either by physical means or by using a chemical foaming agent. The foaming agent preferably comprises a low boiling water insoluble halogenated hydrocarbon. The halogenated hydrocarbon preferably has a boiling point in the range of -40°C to 50°C and more preferably in the range from -20° to 30°C. Preferred foaming agents include 1,2-dibromo-1,1,2,2-tetrafluoroethane and trichlorofluoroethane.

The foaming and/or the coagulation of the polymer may be achieved by heating the impregnated coated textile

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AMENDED SHEET

substrate, preferably in the presence of a heat coagulant. Suitable heat coagulants include vinyl alkyl ether and derivatives thereof, polyacetals, polythio ethers, poly(ethylene oxide) and derivatives thereof, and poly(propylene/ethylene oxide) and derivatives thereof. The heat coagulant may be built into the backbone of the polymer. Usually heating to a temperature of about 70°C results solely in coagulation. Heating above this temperature will generally also result in foaming provided a foaming agent is present.

Coagulation may also be achieved by means of adding a suitable electrolyte and/or varying the pH of the polymer latex. For example, with cationic polymers coagulation may occur at an alkaline pH and for anionic polymers coagulation occurs at an acid pH. This may be followed by heating to achieve satisfactory foaming.

The coagulated coatings may be particle-reinforced or fibre-reinforced. The strength of the individual cells in the coagulated cellular polymer network can be improved by the addition of finely-chopped fibres such as RYTON fibres and/or finely dispersed particles such as PTFE particles. These particles and/or fibres should ideally have a chemical inertness, heat stability and acid and/or alkali resistance at least similar to that of the coagulated polymer. The particles and fibres would be incorporated into the polymer emulsion prior to coagulation.

Preferably the filter cloths have a coating thickness in the range from 0.5 to 2.0mm, corresponding to 50 to 250 (preferably 120 to 180) g/m^2 addition by weight of polymer.

The coating may be applied by any coating technique such as knife coating, dip coating, lick coating, screen printing or spraying. Reverse roller techniques may be employed.

The method of the invention may also be used to provide coatings on papermachine clothing such as press felts. The coatings obtained would be tough, smooth and permeable.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. The use of a coated fabric in a phase separation process, the said fabric being made by a method comprising the steps of impregnating a cloth with at least one coagulable polymer latex and coagulating the polymer on or in the cloth, wherein the method comprises carrying out the coagulation from a water phase so as to provide a cloth having a porous polymer coating thereon and/or therein and wherein the coagulated polymer is foamed, the foaming occurring simultaneously with or immediately after the coagulation.

2. The use of a coated fabric as claimed in claim 1, wherein the water phase comprises steam.

3. The use of a coated fabric as claimed in claim 1 or claim 2, wherein the polymer comprises polyurethane.

4. The use of a coated fabric as claimed in claim 1 or claim 2, wherein the polymer comprises any of the following: polyisoprene, polybutadiene, polyvinylidene dichloride, polyvinyl chloride, polychloroprene or styrene-butadiene polymers or mixtures thereof.

5. The use of a coated fabric as claimed in any preceding claim, wherein the cloth is made from polypropylene.

6. The use of a coated fabric as claimed in any preceding claim, wherein the coagulated polymer is foamed by using a chemical foaming agent.

7. The use of a coated fabric as claimed in claim 6, wherein the foaming agent comprises a low boiling water insoluble halogenated hydrocarbon.

8. The use of a coated fabric as claimed in claim 7, wherein the foaming agent has a boiling point in the range from -40°C to 50°C.

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9. The use of a coated fabric as claimed in claim 7 or claim 8, wherein the foaming agent has a boiling point in the range from -20°C to 30°C.

10. The use of a coated fabric as claimed in any of claims 8 to 9, wherein the foaming agent comprises 1,2-dibromo-1,1,2,2-tetrafluoroethane and trichlorofluroethane.

11. The use of a coated fabric as claimed in any preceding claim, wherein the polymer is coagulated by heating the polymer in the presence of a heat coagulant.

12. The use of a coated fabric as claimed in claim 11, wherein the heat coagulant includes any of the following: vinyl alkyl ether and derivatives thereof, polyacetals, polythio ethers, poly(ethylene oxide) and derivatives thereof, and poly(propylene/ethylene oxide) and derivatives thereof.

13. The use of a coated fabric as claimed in any one of claims 1 to 9, wherein the polymer is coagulated by adding an electrolyte to the polymer latex and/or varying the pH of the polymer latex.

14. The use of a coated fabric as claimed in any preceding claim, wherein the thickness of the coating is in the range from 0.5mm to 2.0mm.

15. The use of a coated fabric in a phase separation process, as claimed in any one of claims 1 to 14, substantially as described herein.

Dated this 6th day of March, 1998.

SCAPA GROUP PLC
By its Patent Attorneys
MADDERNS

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 D06N3/14 D06N3/06 D06N3/04 D06N3/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 D06N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,3 619 257 (TOYO RUBBER INDUSTRY) 9 November 1971 see the whole document ---	1-4,6,7, 12
X	US,A,3 788 882 (THOMAS M. NOONE) 29 January 1974 see claims ---	1-4,6
X	US,A,4 429 000 (TORAY INDUSTRIES) 31 January 1984 see claims -----	1,3

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016	Hellemans, W

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INTERNATIONAL SEARCH REPORT

information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US-A-3619257	09-11-71	DE-A-	1779417	07-10-71
US-A-3788882	29-01-74	US-A-	3674547	04-07-72
US-A-4429000	31-01-84	US-A-	4535008	13-08-85
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