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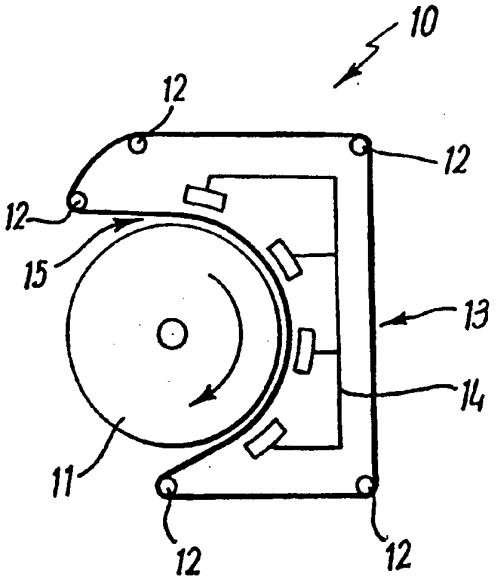
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(54) Title: PAPERMACHINE CLOTHING

(57) Abstract

A method of making a shoe press belt comprises the step of feeding a base cloth (13) over a rotating drum (11) and applying a polymer coating to the base cloth (13), as the base cloth (13) is fed over the rotating drum (11). The polymer coating is impregnated with a fused silica or aramid thixotrope.



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PAPERMACHINE CLOTHING

The present invention relates to papermachine clothing and particularly but not exclusively to shoe press belts.

One form of papermachine clothing comprises a woven or non woven base cloth to which a coating of polymer is applied. In one method of manufacture an endless base cloth is fed around a series of rollers and around a part of a horizontally mounted rotatable drum. As the belt passes around the drum heat-softened polymer is applied into the nip between the belt and the drum.

In this process there is a tendency for the heat softened polymer to slump as it approaches the base of the drum. This is undesirable in that the polymeric layer applied to the belt is of non uniform thickness.

The present invention has been made from a consideration of this problem.

According to a first aspect of the present invention there is provided a method of making papermachine clothing comprising the step of feeding a base cloth over a rotating body and applying a polymer coating to the base cloth as the base cloth is fed over the rotating body, wherein the polymer coating is impregnated with a thixotrope. The thixotrope acts to increase the viscosity of the "fluid" polymer once applied to the base cloth.

Surprisingly the toughness, modulus and abrasion resistance of the papermachine clothing is significantly improved by incorporation of the thixotrope into the polymer coating.

According to a second aspect of the present invention there is provided papermachine clothing comprising a base cloth having a coating of polymer thereon, wherein the polymer is impregnated with a thixotrope.

Aramid fibres such as KEVLAR (RTM) (para-phenylene terephthalamide) are preferred. The fibres are preferably chopped into lengths in the range from 0.8mm to 4.00mm and preferably have a diameter in the order of 12μm. KEVLAR (RTM) is particularly preferred in that the random orientation and physical entanglement of the fibres and fibrils thereof align in the direction of applied shear thus increasing the viscosity of the polymer. Alternatively fused silica may be used as a thixotrope.

The polymer is preferably thermoset. Polyurethane is preferred.

In order that the present invention may be more readily understood a specific embodiment thereof will now be described by way of example only with reference to the single accompanying drawing which shows one apparatus for making papermachine clothing in accordance with the present invention.

Referring to the drawing an apparatus 10 for

making papermachine clothing such as a shoe press belt comprises a horizontally mounted rotatable drum 11 and a plurality of rollers 12 which define a path over which an endless base cloth 13 travels. A series of infra-red heaters 14 are provided adjacent the drum 11 on the side of the base cloth 13 which is remote from the drum 11. A polyurethane coating may be applied to the base cloth 13 by utilising a feed nozzle to project the heat softened polymer into the nip 15 between the base cloth 13 and the top of the drum 11. The polyurethane coating is impregnated with chopped aramid fibres in order to prevent sagging of the polymer on the drum and to improve the abrasion resistance of the belt.

In order to impregnate the polyurethane coating with the chopped aramid fibres the fibres are added in substantially equal amounts to the thermoset precursor material. The aramid containing precursors (e.g. polyol and isocyanate) are mixed immediately prior to applying the impregnated coating to the base cloth. The amount of aramid fibre added is preferably less than 3% by weight.

The strength of a prior art polyurethane coated belt "A" was tested. Similarly the strength of a belt incorporating 0.17% KEVLAR (RTM) was tested. The results are set out below.

	Average Strength (Kg/2.5cm)
'A' Polyurethane (Prior Art)	91.3
'B' Polyurethane + 0.17% Kevlar	94.5

It can be seen that the incorporation of very small amounts of KEVLAR fibres significantly increases the strength of the press belt.

It is to be understood that the above described embodiment is by way of illustration only. Many modifications and variations are possible.

CLAIMS

1. A method of making papermachine clothing comprising the step of feeding a base cloth over a rotating body and applying a polymer coating to the base cloth as the base cloth is fed over the rotating body, wherein the polymer coating is impregnated with a thixotrope.

2. A method of making papermachine clothing as claimed in claim 1, wherein the thixotrope comprises an aramid.

3. A method of making papermachine clothing as claimed in claim 1 or claim 2, wherein the thixotrope comprises aramid fibres.

4. A method of making papermachine clothing as claimed in claim 3, wherein the length of the fibres is in the range from 0.8mm to 4.0mm.

5. A method of making papermachine clothing as claimed in claim 3 or claim 4, wherein the fibres have a diameter of substantially 12μm.

6. A method of making papermachine clothing as claimed in claim 1, wherein the thixotrope comprises fused silica.

7. A method of making papermachine clothing as claimed in any preceding claim, wherein the polymer is a thermosetting polymer.

8. A method as claimed in any preceding claim, wherein the polymer comprises polyurethane.

9. A method of making a shoe press belt using the method of any of claims 1 to 8.

10. Papermachine clothing comprising a base cloth having a polymer coating thereon, wherein the polymer is impregnated

with a thixotrope.

11. Papermachine clothing as claimed in claim 10, wherein the thixotrope comprises an aramid.

12. Papermachine clothing as claimed in claim 10 or claim 11, wherein the thixotrope comprises aramid fibres.

13. Papermachine clothing as claimed in claim 12, wherein the length of the fibres is in the range from 0.08mm to 4.0mm.

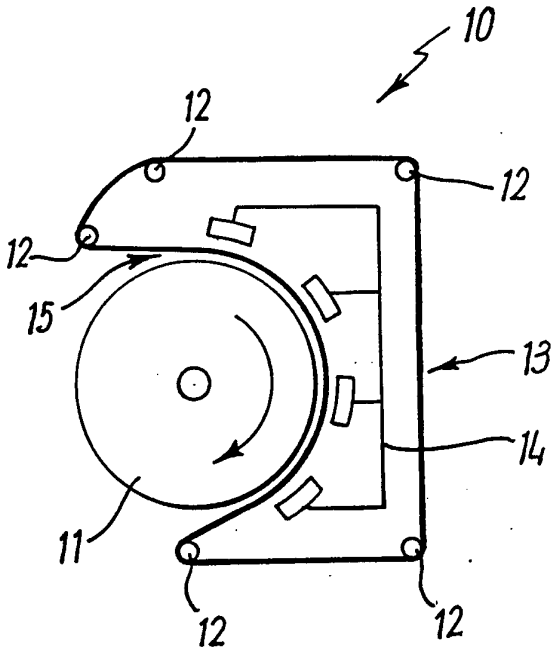
14. Papermachine clothing as claimed in claim 12 or claim 13, wherein the fibres have a diameter of substantially 12μm.

15. Papermachine clothing as claimed in claim 10, wherein the thixotrope comprises fused silica.

16. Papermachine clothing as claimed in any of claims 10 to 15, wherein the polymer is thermoset.

17. Papermachine clothing as claimed in any of claims 10 to 15, wherein the polymer comprises polyurethane.

18. The use of the papermachine clothing of any of claims 10 to 17 as a shoe press belt.


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INTERNATIONAL SEARCH REPORT

Inter nal Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 D21F3/02

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 D21F

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.
A	WO,A,91 00938 (BELOIT) 24 January 1991 ---	
A	EP,A,0 336 876 (BELOIT) 11 October 1989 ---	
A	FR,A,2 543 150 (ALTULOR) 28 September 1984 -----	

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☒ Patent family members are listed in annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter ›nal Application No
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Patent document cited in search report	Publication date	Patent family member(s)		Publication date
WO-A-9100938	24-01-91	US-A-	4944844	31-07-90
		AU-A-	5424990	06-02-91
EP-A-336876	11-10-89	US-A-	4944820	31-07-90
		CA-A-	1319288	22-06-93
		JP-A-	1298292	01-12-89
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FR-A-2543150	28-09-84	NONE		