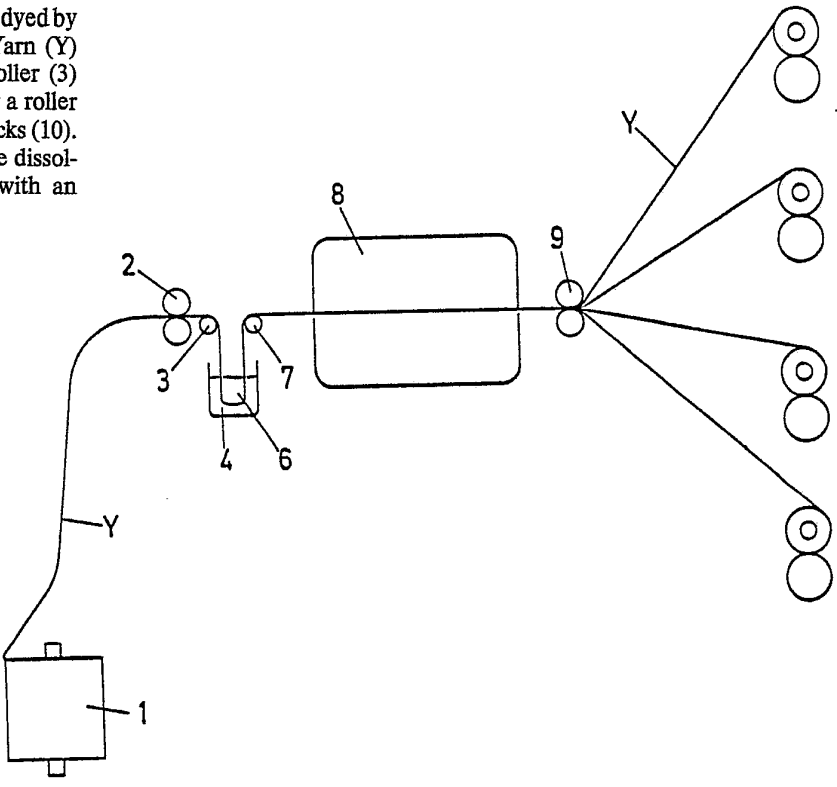




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ³: D06B 19/00	A1	(11) International Publication Number: WO 81/02902 (43) International Publication Date: 15 October 1981 (15.10.81)
(21) International Application Number: PCT/GB81/00049 (22) International Filing Date: 16 March 1981 (16.03.81) (31) Priority Application Number: 8010918 (32) Priority Date: 1 April 1980 (01.04.80) (33) Priority Country: GB (71) Applicant (for all designated States except US): CHAPMAN, FRASER & COMPANY LIMITED [GB/GB]; Manor Silk Mills, Melton Road, Thurmaston, Leicester LE4 8BF (GB). (72) Inventors; and (75) Inventors/Applicants (for US only): FRASER, Thomas, Munro [GB/GB]; Little Farm, Main Street, Great Bowden, Leicestershire (GB). WEBB, Anthony [GB/GB]; 2 Lyncot Road, Leicester (GB). (74) Agent: SERJEANT, Andrew, Charles; Serjeants, 25 The Crescent, King Street, Leicester LE1 6RX (GB).		(81) Designated States: AT (European patent), AU, CH (European patent), DE (European patent), DK, FR (European patent), GB (European patent), JP, NL (European patent), NO, SE (European patent), US. Published <i>With international search report</i>
(54) Title: DYEING YARN PROCESS (57) Abstract Man-made fibre yarns are dyed by applying transfer-printing ink. Yarn (Y) passes from cones (1) over a roller (3) through a trough (4) of ink, over a roller (7) into an oven (8), and onto packs (10). The ink comprises a disperse dye dissolved in water and white spirit with an emulsifying agent. 		

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TITLE: DYEING YARN PROCESSDESCRIPTION

The invention relates to a method of dyeing man-made fibre yarns.

Man-made fibre yarns are generally dyed in a dye liquor at boiling or higher temperature and often elevated pressure. The yarn has to be scoured before treatment, and washed afterwards. Temperature and pressure control involve expensive apparatus, as does effluent treatment and disposal.

The method of the invention comprises applying transfer-printing ink containing a dye to a man-made fibre yarn, and heating to fix the dye and set and dry the yarn. The whole method can be carried out without using any water except to tone the printing ink; scouring, washing or effluent disposal is reduced or can even be omitted. The ink can be applied in the cold under normal atmospheric pressure, the yarn quickly takes up as much ink as it needs, and the remainder can be used on a later occasion. The ink adheres to and coats the yarn, until the heating fixes the dye and immobilizes it in the yarn.

The invention is applicable to the solid dyeing of yarn of man-made fibres, for example of polyester or nylon, in flat, false twist, knit-de-knit, or other textured or bulked form. The printing ink may be of a kind used for the preparation of transfer printing

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paper for the dyeing of fabric of the yarn, that is to say generally containing a disperse dye. It is believed that the the different ink formulation as compared with that used in normal printing paste facilitates the effective use of such ink according to the method of the invention, with only a limited washing or other after treatment and with few pollutants arising in the course of performing the method.

DRAWING

The drawing shows schematically a side view of a machine in which the method of the invention can be performed. In the drawing, a row of cones 1 of polyester yarn (only one of which appears for simplicity), allows yarn Y to pass between a pair of guide rolls 2, over a roller 3 and into a trough 4 of transfer-printing ink containing a dye.

The ink is prepared by stirring 35 parts (by weight) of Solvitose (Registered Trade Mark) into 795 parts of cold water to dissolve it; adding a mixture of 10 parts of Matexil PN-PR (Registered Trade Mark of ICI Ltd) dissolved in 60 parts of hot water of from 60 to 70°C and then cooled; and adding 100 parts of white spirit using high speed mixing until the mixture is thoroughly emulsified. The stirring of air into the emulsion should be avoided as far as possible.

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From 10 to 200 parts by weight of Dispersol (Registered Trade Mark of ICI Ltd) TP liquid dye is added to the emulsion thickening to bring the total up to 1000 parts.

The yarn there passes under a roll 6, over a scraper bar (not shown), over a roller 7 and into an oven 8. The oven 8 is heated so that the yarn reached 220°C , taking into account a take up rate of 120 metres per minute, to fix the dye and set and dry the yarn. On leaving the oven 8, the yarn passes between a pair of guide rolls 9 and is then wound onto a pack 10, a number of which are shown at different height, ready for knitting.

The oven is conveniently constructed in the manner of heating devices used on yarn-setting and texturing equipment. Indeed apparatus for performing the invention can be constructed by producing a trough 4 on existing yarn-setting and texturing equipment. The invention thus provides a dyeing treatment in the course of a yarn-setting and/or texturing treatment.

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Claim

1. A method of dyeing man-made fibre yarn which comprises applying transfer-printing ink containing a dye to a man-made fibre yarn, and heating to fix the dye and set and dry the yarn.

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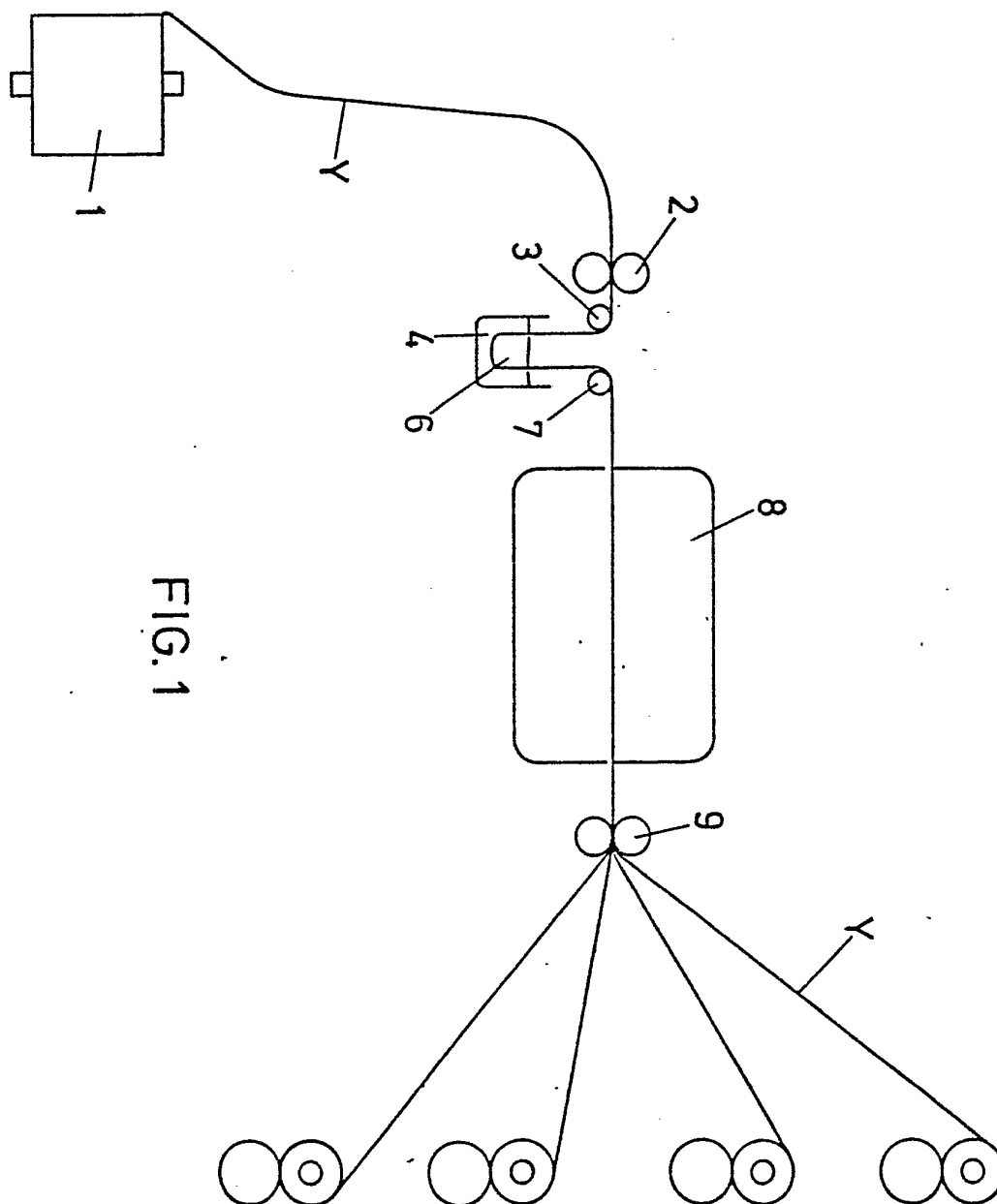
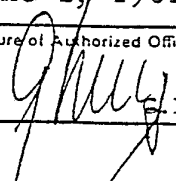
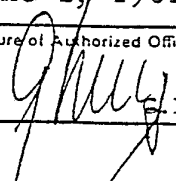
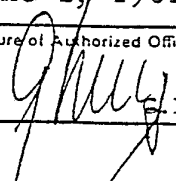


FIG. 1

INTERNATIONAL SEARCH REPORT

International Application No. **PCT/GB 81/00049**

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ³ According to International Patent Classification (IPC) or to both National Classification and IPC Int.Cl.³: D 06 B 19/00														
II. FIELDS SEARCHED Minimum Documentation Searched ⁴ <table style="width: 100%; border: none;"> <tr> <td style="width: 25%; border: none; vertical-align: top;"> Classification System Int.Cl.³ </td> <td style="width: 75%; border: none; vertical-align: top;"> Classification Symbols D 06 B 19/00 </td> </tr> </table> Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵			Classification System Int.Cl.³	Classification Symbols D 06 B 19/00										
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III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; text-align: left;">Category ⁶</th> <th style="width: 60%; text-align: left;">Citation of Document, ¹⁵ with indication, where appropriate, of the relevant passages ¹⁷</th> <th style="width: 30%; text-align: left;">Relevant to Claim No. ¹³</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top;">X</td> <td style="vertical-align: top;">GB, A, 1151317, published May 7, 1969, see the whole document, Vepa ---</td> <td style="text-align: center; vertical-align: top;">1</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">X</td> <td style="vertical-align: top;">GB, A, 1169907, published November 5, 1969, see the whole document, Hoechst ---</td> <td style="text-align: center; vertical-align: top;">1</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">X</td> <td style="vertical-align: top;">GB, A, 1130155, published October 9, 1968, see the whole document, Artos -----</td> <td style="text-align: center; vertical-align: top;">1</td> </tr> </tbody> </table>			Category ⁶	Citation of Document, ¹⁵ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹³	X	GB, A, 1151317, published May 7, 1969, see the whole document, Vepa ---	1	X	GB, A, 1169907, published November 5, 1969, see the whole document, Hoechst ---	1	X	GB, A, 1130155, published October 9, 1968, see the whole document, Artos -----	1
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IV. CERTIFICATION <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> Date of the Actual Completion of the International Search ² May 18, 1981 </td> <td style="width: 50%; border: none; vertical-align: top;"> Date of Mailing of this International Search Report ³ June 2, 1981 </td> </tr> <tr> <td style="border: none; vertical-align: top;"> International Searching Authority ¹ EUROPEAN PATENT OFFICE Branch at The Hague P.O.Box 5818 Patentlaan, 2 2280 HV RIJSWIJK (ZH) The Netherlands </td> <td style="border: none; vertical-align: top;"> Signature of Authorized Officer ²⁰  G.L.M. Kruidenberg </td> </tr> </table>			Date of the Actual Completion of the International Search ² May 18, 1981	Date of Mailing of this International Search Report ³ June 2, 1981	International Searching Authority ¹ EUROPEAN PATENT OFFICE Branch at The Hague P.O.Box 5818 Patentlaan, 2 2280 HV RIJSWIJK (ZH) The Netherlands	Signature of Authorized Officer ²⁰  G.L.M. Kruidenberg								
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