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(54) **Wrapped radio opaque yarn.**

(57) A radio opaque yarn comprises a bundle of filled polypropylene fibres containing 54% to 80% w/w of barium sulphate, the bundle being bound with up to 20% w/w of substantially unfilled polyester fibres.

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WRAPPED RADIO OPAQUE YARN

This invention relates to radio opaque yarn such as that used in the manufacture of surgical swabs and dressings.

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Radio opaque fibres are disclosed in our European patent application No. 83304777.2. These fibres contain a high proportion of barium sulphate in order to provide the required degree of X-ray opacity. Such highly filled
10 fibres tend to stretch due to fracture of the constituent filaments. Moreover the fractured filaments tend to run causing aggregations which may snarl-up during weaving.

According to the present invention a radio opaque yarn
15 comprises a bundle of filled fibres containing not less than 54% ^W/w of barium sulphate, the bundle being bound with up to 20% ^W/w of substantially unfilled binding fibre.

20 Conventional wrapped yarns contain approximately 50% by weight of binding fibre. The present invention employs a higher proportion of filled fibres. This is important in the production of radio opaque yarns to optimise the opacity of the product. The unfilled, binding fibre
25 may have a higher modulus and tensile strength than the filled fibres, increasing the strength and durability of

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the yarn. Furthermore the binding prevents running of any fractured filled fibres. This particularly facilitates narrow weaving or knitting where control of yarn tension is important. The binding fibres may
5 be monofilament or multifilament.

Preferred yarns in accordance with this invention comprise less than 5% ^w/w of binding fibre.

10 The binding fibre preferably has a diameter of about 0.05 of the diameter of the bundle of filled fibre.

The binding fibre may be wound at a preferred rate of 2 to 8 turns per cm, more preferably 4 to 6 turns per
15 cm, most preferably 4 turns per cm. Yarn having less than 2 turns per cm of wrapping fibre tend to fragment during weaving, whereas yarn having more than 8 turns per cm is brittle and liable to break during cloth processing.

20 The binding fibre preferably comprises a polyester although alternative materials which form fibres having a high modulus and tensile strength may be employed.

25 The filled fibre preferably comprises polypropylene. Polyester fibres have also been found to be applicable. A maximum of 80% ^w/w of barium sulphate has been found to be appropriate although a maximum of 70% ^w/w may be preferred. A coupling agent may be employed, for example
30 an alkanoyl triisostearoyl titanate or other of the coupling agents disclosed in European patent application No. 83304777.2.

One to five binding fibres may be employed although
35 use of a single fibre is preferred because wrapping with a

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plurality of fibres has not been found to confer any additional advantages. The binding fibre may be textured, bulked, crimped or otherwise treated both to impart extensibility to the yarn and to improve the ability of the yarn to withstand wet and dry fabric finishing operations.

The invention is further described by means of examples and not in any limitative sense.

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A bundle of twenty filaments composed of polypropylene (melt flow index = 12, 29.5% ^w/w), barium sulphate (particle size 0.5 μ m, 70% ^w/w) and a coupling agent isopropyl triisostearoyl titanate (0.5% ^w/w) and a pigment

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(Cobalt Blue Med) having a weight of not less than 3000 decitex was wrapped with 4 turns per cm of a flat polyester fibre (24 filament, 74 decitex, no added lubricant). The resultant yarn contained 68% ^w/w of barium sulphate and satisfied both the British

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Pharmacopeia Index test (reference SDM XVII) and the U.S. pharmaceutical X-ray opacity requirements. The yarn was found to have a minimum breaking load greater than 500 cN and a breaking extension not less than 100% but not greater than 300%. The yarn could be woven without difficulty.

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Claims

1. A radio Opaque yarn comprising a bundle of filled fibres containing not less than 54% ^W/w of barium sulphate,
5 characterised in that
the bundle being bound with up to 20% ^W/w of substantially unfilled fibre.
- 10 2. A radio opaque yarn as claimed in claim 1,
characterised in that
the binding fibre comprises less than 5% ^W/w of the yarn.
- 15 3. A radio opaque yarn as claimed in any preceding claim
characterised in that
the diameter of the binding fibre is 0.05 of the diameter of the bundle of filled fibres.
- 20 4. A radio opaque yarn as claimed in any preceding claim,
characterised in that
the yarn comprises 2 to 8 turns per cm of binding fibre.
- 25 5. A radio opaque yarn as claimed in claim 4,
characterised in that
the yarn comprises 4 to 6 turns per cm of binding fibre.
- 30 6. A radio opaque yarn as claimed in any preceding claim,
characterised in that
the binding fibre comprises polyester.
7. A radio opaque yarn as claimed in any preceding claim
characterised in that
the filled fibre comprises polypropylene or polyester.

8. A radio opaque yarn as claimed in claim 8,
characterised in that
the filled fibre comprises 54% to 80% ^W/w of barium
sulphate.

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9. A radio opaque yarn as claimed in claim 8
characterised in that
the filled fibre comprises 54% to 70% ^W/w of barium
sulphate.

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10. A radio opaque yarn as claimed in any of claims
7 to 9
characterised in that
the yarn includes an alkanoyl triisostearoyl titanate
coupling agent.

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EUROPEAN SEARCH REPORT

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Application number

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	GB-A- 839 718 (ROBINSON AND SONS) * Pages 1,2 *	1,8,9	D 02 G 3/44 A 61 F 13/20
A	FR-A-2 125 527 (CODMAN AND SHURTLEFF) * Whole document *	1	
A	FR-A-1 188 629 (VERNON, BRITISH ENKA) * Whole document *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			D 02 G A 61 F A 61 L D 01 F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 08-05-1985	Examiner DEPRUN M.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			