US 20120028529A1

(19) **United States**

(12) **Patent Application Publication**

Fenzi

(10) **Pub. No.: US 2012/0028529 A1**

(43) **Pub. Date: Feb. 2, 2012**

(54) **TEXTILE ARTICLE FOR PATIENTS AFFECTED BY A SKIN DISEASE**

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(21) Appl. No.: **13/143,484**

(22) PCT Filed: **Feb. 12, 2010**

(86) PCT No.: **PCT/IB2010/000267**

§ 371 (c)(1),
(2), (4) Date: **Aug. 9, 2011**

(30) **Foreign Application Priority Data**

Feb. 13, 2009 (IT) MI2009A000196

Publication Classification

(51) **Int. Cl.**

A41B 9/00	(2006.01)
D03D 1/00	(2006.01)
A47G 9/02	(2006.01)
D03D 15/00	(2006.01)
D04H 1/00	(2006.01)
D04B 1/16	(2006.01)
D03D 11/00	(2006.01)

(52) **U.S. Cl.** **442/203**; 428/221; 442/301; 442/304; 442/414; 2/400; 5/482

(57) **ABSTRACT**

Textile article, for example a garment, particularly an undergarment, or bed linen, for patients affected by a skin disease, said article comprising at least one textile layer comprising polytetrafluoroethylene (PTFE) fibres, said fibres being present at least at one surface of the textile layer intended to be in contact with the patient's skin. The PTFE fibres make it possible to obtain a very smooth surface, which is not sticky in the least and provides a pleasing sensation of freshness and slipperiness.

TEXTILE ARTICLE FOR PATIENTS AFFECTED BY A SKIN DISEASE

[0001] The present invention relates to a textile article, such as a garment (particularly an undergarment) or bed linen, for patients affected by a skin disease. As known, skin diseases generally arise from an inflammatory reaction of tissues due to various atopic triggering factors, such as chemical products (e.g. solvents or detergents), radiation, microbial infections, parasites, allergic reactions, autoimmune reactions, hereditary factors, etc.

[0002] One of the most common diseases is psoriasis. This is a form of chronic dermatitis characterised by bright red patches covered with abundant whitish scales of extremely variable size, shape and extent. It is often localised to the scalp, extensor surfaces of the limbs (elbows, knees) and the lumbosacral region; it can be widespread and even affect the whole body. Usually it is not life-threatening, but in some cases (pustular and erythrodermic psoriasis) it may be very serious. It affects both sexes equally, with a slight prevalence in males, and may arise at any age, with onset tending to occur in childhood or at a young age. In 5.4% of the cases it is manifestly accompanied by arthritis, which may be severely disabling. It is often a familial disease, with a multigenic hereditary predisposition (at least six genes correlated with it have been identified up to now); for its manifestation, triggering factors shall occur, such as viral or bacterial infections, physical trauma, emotional stress, some drugs such as beta-blockers, non-steroidal anti-inflammatory drugs, lithium salts, interferon, etc.

[0003] Psoriasis is a disease present worldwide, with a prevalence of about 2% in populations of European origin. It is estimated that in Europe around 14.5 million people are affected by this disease. In the USA there are seven million psoriasis sufferers and in Italy approximately 1,250,000.

[0004] Because of its chronic-recurrent nature and its likelihood of becoming a severe and disabling condition, it must be considered a social disease, not only because of its strong individual psychological impact, but also because of its economic relevance for the community.

[0005] The treatment of psoriasis has made great progress in recent years and at present there exist numerous medications which, if skillfully used, can lead to the complete remission thereof. Besides systemic therapies which require the use of various medications, it is also possible to employ local treatments. These provide for the application—after the scales have been removed using unguents containing salicylic acid, urea or propylene glycol—of active principles, which may be traditional ones like cortisone, tars and dithranol, or more modern substances, such as calcipotriol, tacalcitol or tazarotene.

[0006] In psoriasis there exists the so-called Koebner phenomenon, or isomorphic response, whereby new psoriasis lesions appear on skin that has been traumatised or irritated. It is thus important that the clothing worn by psoriasis patients be well tolerated by the skin and not cause trauma, irritation or allergic reactions.

[0007] There exist other skin diseases which present analogous symptoms and problems. One of the most widespread is atopic dermatitis. This is an inflammatory reaction of the skin caused by hyper-reactivity of immune system mast cells to a given allergenic substance, or even due to congenital difficulties in synthesizing gamma-linolenic fatty acid. It is known that various factors can exacerbate the disease, e.g. contact with irritating textile fibres (such as wool), the use of aggressive detergents and various climatic factors. Moreover, the disease is often accompanied by a skin superinfection, caused in particular by *Staphylococcus aureus*. In addition to treating patients with creams and emollients, it has been proposed that patients wear fabrics having antimicrobial properties, due, for example, to the presence of silver filaments, whose antiseptic properties are well known (see, for example, the article by Haug S. et al entitled "Coated Textiles in the Treatment of Atopic Dermatitis", *Curr. Probl. Dermatol. Basel, Karger,* 2006, vol. 33., pp. 144-151). The Applicant posed himself the problem of devising textile articles, such as garments, in particular under-garments, or bed linens, which are especially suitable for patients affected by the aforesaid skin diseases, in particular psoriasis or atopic dermatitis, and which can prevent the disease and related symptoms from worsening because of continuous rubbing of the skin against the textiles it comes into contact with, providing patients with a sensation of relief and thus helping them to improve their quality of life and social relationships, which can be compromised due to the psychological sensation of "inadequacy" that afflicts this category of patients. Moreover, such textile articles must be capable of minimising the undesirable effects deriving from contact with emollients, and particularly unguents, commonly employed in this type of skin disease. In fact, the textile articles must be able to be used in combination with such treatments without any damage, in particular without any unattractive streaks or stains showing on the outside of the articles themselves.

[0008] The Applicant has now found that it is possible to obtain such results by producing textile articles, such as garments, particularly under-garments, or bed linens, which include at least one textile layer comprising polytetrafluoroethylene (PTFE) fibres, said fibres being mainly present on the surface of the textile layer intended to be in contact with the patient's skin. The PTFE fibres make it possible to obtain a very smooth surface, which is not sticky at all, providing a pleasing sensation of freshness and slipperiness. Using such fibres it is moreover possible to obtain exceptional properties of water and oil repellence, fire-resistant properties, good breathability, lightness and ease of laundering.

[0009] In a first aspect, the present invention therefore relates to a textile article, such as a garment, particularly an under-garment, or bed linen, for patients affected by a skin disease, said article comprising at least one textile layer comprising polytetrafluoroethylene (PTFE) fibres, said fibres being present at least at one surface of the textile layer intended to be in contact with the patient's skin.

[0010] According to another aspect, the present invention relates to a textile article comprising at least one textile layer comprising polytetrafluoroethylene (PTFE) fibres for alleviating symptoms and/or improving disease course in a patient affected by a skin disease, said fibres being present at least at one surface of the textile layer intended to be in contact with the patient's skin.

[0011] Preferably, the textile article according to the present invention is intended for a patient affected by psoriasis or by atopic dermatitis.

[0012] The particular characteristics of water and oil repellence of PTFE fibres make it possible to achieve a barrier effect against the outward migration of the oily substances present in the unguents and emollients commonly used to treat the disease, substances which, unlike common oint-

ments, remain on the patient's skin for a long time before being absorbed by the dermis. Said barrier effect is not achievable with common textile materials based on cotton and/or wool.

[0013] As regards the PTFE fibres, these are products commercially available for special industrial and medical applications. One example is the product Profilen™ sold by Lenzing AG.

[0014] The density of such fibres is selected based on the specific article to be produced and may preferably range from 200 to 1000 dtex.

[0015] Preferably, the PTFE fibres are in the form of continuous fibre yarns. Alternatively, discontinuous fibre yarns, intimately commingled with other fibres, such as cotton or wool, can be used. In this case the amount of PTFE fibres is preferably not lower than 20% by weight of the whole yarn.

[0016] As regards the textile layer that includes the PTFE fibres, this can be an actual fabric having a warp-weft structure, or a knitted fabric. The type of weave can vary greatly according to the specific textile article to be produced, e.g. flat, double face, satin (e.g. crowsfoot satin weave), twill or derived twill, etc. As regards the knitted structure, this is preferably a blocked knit.

[0017] The textile layer may be formed by 100% PTFE fibres, or the PTFE fibres can be combined with fibre of a different type, either natural (preferably cotton) or artificial (preferably cellulosic), or synthetic (preferably polyesters or polyamides).

[0018] In order to obtain the desired beneficial effect on the patient's condition, the surface of the textile layer intended to be in contact with the patient's skin is mainly formed by PTFE fibres. The percentage of PTFE fibres present at said surface is approximately between 60% and 100%, more preferably between 70% and 100%.

[0019] If the PTFE fibre is combined with other fibre, use is preferably made of a weaving such as to obtain a fabric wherein the PTFE fibre is mainly present at the internal face, while the other fibre (e.g. cotton) is mainly present at the exterior.

[0020] As regards the articles that may be produced according to the present invention, these are preferably under-garments, such as shirts, T-shirts or socks, or garments in general, such as gloves, hats, shirts, trousers, skirts. As regards bed linen, this may consist, for example, of pillowcases and sheets.

1. Textile article for patients affected by a skin disease, said article comprising at least one textile layer comprising polytetrafluoroethylene (PTFE) fibres, said fibres being present at least at one surface of the textile layer intended to be in contact with the patient's skin.

2. Article according to claim **1**, wherein said skin disease is psoriasis or atopic dermatitis.

3. Article according to claim **1**, said article being selected from: garments, particularly under-garments; bed linen.

4. Article according to claim **1**, wherein the PTFE fibres are in the form of continuous fibre yarns.

5. Article according to claim **1**, wherein the PTFE fibres are in the form of discontinuous fibre yarns, intimately commingled with other fibres, such as cotton or wool, wherein the amount of PTFE fibres is preferably not lower than 20% by weight of the whole yarn.

6. Article according to claim **1**, wherein said at least one textile layer is a fabric having a warp-weft structure.

7. Article according to claim **1**, wherein said at least one textile layer is a knitted fabric.

8. Article according to claim **1**, wherein said at least one textile layer is formed by 100% PTFE fibres.

9. Article according to claim **1**, wherein in said at least one textile layer the PTFE fibres are combined with fibre of a different type, either natural (e.g. cotton) or artificial (e.g. cellulosic), or synthetic (e.g. polyesters or polyamides).

10. Article according to claim **9**, wherein said at least one textile layer has a warp-weft structure having a weaving such as to obtain a double face fabric wherein the PTFE fibre is mainly present at the internal face, while the other fibre is mainly present at the exterior.

11. Article according to claim **1**, wherein, at the surface of the textile layer intended to be in contact with the patient's skin, the percentage of PTFE fibres is comprised from 60% to 100%, more preferably from 70 to 100%.

12. A textile article comprising at least one textile layer comprising polytetrafluoroethylene (PTFE) fibres to alleviate symptoms and/or improve disease course in a patient affected by a skin disease, said fibres being present at least at one surface of the textile layer intended to be in contact with the patient's skin.

13. Article according to claim **12**, wherein said skin disease is psoriasis or atopic dermatitis.

14. Article according to claim **12**, wherein said textile article comprises at least one of:

(a) said article being selected from: garments, particularly under-garments; bed linen,

(b) wherein the PTFE fibres are in the form of continuous fibre yarns,

(c) wherein the PTFE fibres are in the form of discontinuous fibre yarns, intimately commingled with other fibres, such as cotton or wool, wherein the amount of PTFE fibres is preferably not lower than 20% by weight of the whole yarn,

(d) wherein said at least one textile layer is a fabric having a warp-weft structure,

(e) wherein said at least one textile layer is a knitted fabric,

(f) wherein said at least one textile layer is formed by 100% PTFE fibres,

(g) wherein in said at least one textile layer the PTFE fibres are combined with fibre of a different type, either natural (e.g. cotton), or artificial (e.g. cellulosic), or synthetic (e.g. polyesters or polyamides), and

(h) wherein, at the surface of the textile layer intended to be in contact with the patient's skin, the percentage of PTFE fibres is comprised from 60% to 100%, more preferably from 70 to 100%.

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