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(71) Applicant: **van den Hurk, R.A.**
Jagerbal 11
NL-5683 KZ Best(NL)

(72) Inventor: **van den Hurk, R.A.**
Jagerbal 11
NL-5683 KZ Best(NL)

(74) Representative: **Timmermans, Anthonius**
C.Th., Ir.
European Patent Attorneys Octrooibureau
Zuid P.O. Box 2287
NL-5600 CG Eindhoven(NL)

(54) **Isolating fluid-absorbing filling made of polyester/polyacryl.**

(57) Mixture of a fiber-material and a synthetic material whereby the fibers of the former comprise a core surrounded by a porous mantle, the said core being provided with channels, and the synthetic material contains at least one constituent of the family of polyester and polyamide.

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The invention concerns a mixture which is suitable for use as a filling-material for quilts, sleeping bags and pillows.

Usual filling-materials are, for example, of natural origin. One such natural raw material is down, which is, in principle, obtained from all water-fowl; in practice, however, consumption is almost exclusively limited to down from geese and/or duck. Also of natural origin is wool, which is obtained from sheep.

In addition to these substances are filling-materials of mineral origin, which are principally derived from the polyester and polyamide families. The crude synthetic raw material is processed into fibers, which can in turn be converted into a fleece using a carding machine. Such fibers can either be solid or hollow. Hollow fibers are naturally more supple than solid fibers but are nevertheless usually siliconised in order to increase their suppleness.

Even though the known filling-materials, as far as insulating capacity and suppleness are concerned, are suited, in principle, to use as filling-material in quilts, they all lack to some extent the capacity to sufficiently absorb moisture during a relatively short time-interval. As a result, such filling-materials are unsuitable for many applications.

The purpose of the invention is the provision of a filling-mixture which is suitable for use as a filling-material in (among other things) winter gloves, winter boots, insulating sport, leisure and professional wear and is particularly suitable for use as a filling-material in quilts, sleeping bags, underblankets, mattress-covers and pillows. The said filling-material possesses, on the one hand, a sufficient moisture-absorbing and moisture-regulating capacity and, on the other hand, a sufficient suppleness and elasticity.

In addition to a synthetic material containing at least one constituent of the polyester and polyamide families, such a filling-material contains, according to the invention, a fiber-material with composite fibers. These fibers comprise a core which is provided with channels and which is surrounded by a porous mantle.

In selecting filling-materials which may, in principle, be suited to use in quilts (among other things), special attention is paid to the structure of the filling-matter. Natural materials, which consist in practice of a horn-like substance, are naturally provided with a thin layer of fat.

Before application as the filling-material in quilts can occur, a large portion of this fat is first washed away. A certain portion should be retained, however, so as to ensure sufficient suppleness and to prevent the material from becoming brittle. Because of this very fact that a portion of the fat

remains behind in the filling, the absorbing capacity is rendered insufficient to allow application in quilts. Moreover, it transpired that the time required by the natural filling-material to absorb moisture was too long; after extensive testing, it was therefore concluded that natural materials are not suitable for application as filling-materials in a quilt.

As has already been mentioned, it is known that materials from the polyester and polyamide families are utterly lacking in absorbing capacity, especially if they have been siliconised.

It is also known that the human being (in particular) loses up to 500 cc of fluid at night, this being due to changes in the metabolism during sleep and, among other things, regulation of body-temperature. It appeared that the quilt in particular played an important role in controlling the ambience during sleep, but also seemed that the filling-materials known up to now could not contribute sufficiently to this process. On warm summer nights in particular, and especially in countries with a maritime climate and a higher air-humidity, the quilt begins to feel sweaty rather quickly. To make matters worse, this is not the only factor which severely disrupts comfort - as a result of increased temperature, the body is put under extra strain to release still more moisture, which, because of poor (or, indeed, totally absent) exhalation by the quilt, does not effect the desired reduction in body-temperature. The body keeps producing sweat, and yet the desired cooling is not, in general, satisfactorily achieved, especially under the circumstances described above.

It now appears that (mostly synthetic) fiber-materials exist whose fibers comprise a core surrounded by a porous mantle, the core being provided with channels. Fluid is absorbed into the core via capillary action in the channels. Such materials are used as clothing stuffs - in particular for the clothing worn by sportsmen and exercisers.

In practice, however, it appeared that such a fiber-material is totally unsuitable as a filling in, for example, a quilt because its suppleness and elasticity were too low. Despite the fact that the components of the mixture according to the invention, namely the fiber-material and the synthetic material (comprising at least one member of the polyesters and polyamides), each possess properties which, it would seem, exclude either of them from application as a filling-material, it nevertheless appeared that a mixture of the fiber-material and the synthetic material could yield the desired results.

In particular, mixtures characterised by a ratio of fiber-material to synthetic material in the range 40:60 to 20:80 (by volume) were found to be very suitable.

In this manner, it appeared that a filling-material could be realised which had improved insula-

tion properties, these properties being due to the fact that the quantity of air present in the material was not affected by skin-moisture, thus ensuring that the filling-material remained airy to the touch and that the quilt contained a sufficient quantity of fresh air. It eventually transpired that the filling-weight could be reduced, thereby further increasing comfort during sleep. Above all, it appeared that perspired moisture was well absorbed into the mixture and, more importantly, that this absorption occurred quickly. In practice, the filling-mixture was found to lend itself well to washing and drying. Finally, it transpired that, as a result of the less humid ambience in the quilt in particular, the quantity of excrement from the human dust-mite (which has an affinity for such an environment and reproduces rapidly in it) was present in only very minute quantities in the filling-mixture according to the invention. This implies a reduced risk for quite a large group of people who are allergic to this excrement.

For economic reasons and because of functional considerations in attaining the qualities discussed above, the ideal mixture-ratio appeared to be in the region of 30:70.

The synthetic fiber-material can be manufactured from acrylic fibre, preferably from polyacrylonitrile.

For example, the fibre which is now being marketed under the name "Dunova" could be used for this purpose.

In the case of a filling-mixture for quilts, for example, a mixture-ratio of polyester/polyamide and "Dunova" in the range 60:40 to 80:20 is found, in practice, to demonstrate the said properties excellently.

In particular, application of the mixture according to the invention should be sought in situations whereby both a good insulation of body-warmth and a good humidity-regulation are demanded.

Claims

1. Mixture of a fiber-material and a synthetic material whereby the fibers of the former comprise a core surrounded by a porous mantle, the said core being provided with channels, and the synthetic material contains at least one constituent of the family of polyester and polyamide.
2. Mixture according to claim 1 for which the mixture-ratio (by volume) of fiber-material to synthetic material lies in the range 40:60 to 20:80.
3. Mixture according to claim 2 for which the mixture-ratio is around 30:70.
4. Mixture according to one of the claims 1 to 3 (inclusive) in which the fiber-material is synthetic and manufactured from acrylic material.
5. Mixture according to claim 4 in which the fiber-material is made from polyacrylonitrile.
6. Mixture according to claim 4 or 5 in which "Dunova" is the fiber-material.
7. Use of the mixture according to one of the claims 1 to 6 (inclusive) as a filling-material.
8. Use of the filling-material, according to claim 7, in pillows, sleeping bags, quilts, underblankets and mattress-covers.
9. Quilt filling-material which comprises a mixture according to one of the claims 1 to 6 (inclusive).
10. Pillow filling-material which comprises a mixture according to one of the claims 1 to 6 (inclusive).
11. Sleeping bag filling-material which comprises a mixture according to one of the claims 1 to 6 (inclusive).
12. Filling-material for winter gloves, winter boots, insulating sport, leisure and professional wear, which material comprises a mixture according to one of the claims 1 to 6 (inclusive).