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(54) **Fabric made of yarn or the like woven with electrolytically treated copper wires and its manufacturing process**

(57) The object is a special fabric made of yarns such as cotton or the like bonded with specially treated copper wires.

This fabric has a pleasing appearance and generates effects, when used in different applications (inner lining for footwear, insoles or any other type of garment or the like), that are highly beneficial for the health thanks to its anti-static, temperature-regulating, anti-

stress and anti-oxidizing features.

The presence of copper fibers also allows to discharge to the ground static electricity that is usually generated by rubbing and prevents or limits growth of molds and microorganisms inside the footwear which also greatly reduces the odors that are generated following perspiration.

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Description

[0001] The object of this industrial invention patent is a special fabric made of yarns such as cotton or the like bonded with specially treated copper wires to create a product with the characteristics and workability of a normal fabric but with several innovative features compared to known fabrics for the reasons that are given below and for its manufacturing process.

[0002] As is well-known there are already fabrics that incorporate metal materials such as gold, silver or the like which are created to achieve special esthetic effects.

[0003] The object and function of this invention, on the contrary, is to create, in addition to a fabric with pleasing esthetic effects, a fabric that offers, thanks to its original composition, effects that are highly beneficial to the health when used in various applications (such as, for example, as the inner lining for footwear or to make insoles or any other garment or the like) thanks to its special anti-static, temperature-regulating, anti-stress and anti-oxidizing features.

[0004] Use of this invention as insoles and/or inner lining for footwear, considering this use as a mere example only, achieves the effect of regulating the body temperature inside the footwear.

[0005] This effect is due to intimate bonding of the yarn, "for example cotton", with the metal copper which is an excellent conductor.

[0006] The presence of copper fibers also allows to discharge to the ground static electricity that is usually generated by rubbing.

[0007] Another characteristic is that the fabric made in this way is protected against mold. As a matter of fact the presence of copper prevents or limits growth of molds and microorganisms inside the footwear which also greatly reduces the odors that are generated following perspiration.

[0008] These and other advantages are achieved by carrying out the invention in question which is characterized, specifically, by the fact that it calls for a fabric made by weaving yarns together with electrolytically treated copper wires, and these copper wires have approximately 50 micron cross sections and are specifically coated with resins and/or plastics, and by the process for making said fabric.

[0009] The invention will be better understood from the following description which is given as a mere example and which in no way constitutes a limit to enactment of the invention.

[0010] The fabric in question is achieved by preparing copper wires that are electrolytically treated at 300,000 Volts and subsequently coated with special epoxy-type resins with dielectric and mechanical properties and/or with plastic that prevents oxidation from contact with the air.

[0011] One characteristic of the product made in this way is what is obtained from weaving together normal

cotton fibers with the copper wire to make a product that, in appearance, is similar to a normal fabric.

[0012] After the copper wire is made as described above it is bonded to a yarn, such as pure cotton in the example in question, and woven together with the yarn itself.

[0013] After weaving the fabric obtained in this way can be dyed to obtain desired color effects and washed to achieve a tighter weave. Washing, in fact, causes the yarn to shrink.

[0014] To achieve optimum performance as described above according to the example in question, the fabric is made 62% in pure cotton and 38% in electrolytic copper. The resistivity of the copper wire is $3 \cdot 10^{10}$ ohms/cm/filament and the gram weight is 200 grams per square meter.

[0015] These percentages are given as a mere example and are not limiting and the fabric designed in this way can be used mainly to create parts of insoles and linings used in footwear in order to achieve the above-described features and can also be advantageously used as a lining or fabric for garments in general and for any other object where thermal regulation is necessary.

[0016] The fabric obtained in this way has all the characteristics that have already been described and also ensures perfect transpiration.

[0017] A technician in this sector may find modifications and variations to what has been described and illustrated, achieving solutions that are to be considered within the scope of the invention, defined by the following claims.

Claims

1. Fabric **characterized by** the fact that it is made by weaving copper wires which have been electrolytically treated and coated with epoxy resins and/or plastic, with yarns.
2. Process for obtaining said fabric **characterized by** the fact that it consists in the preparation of copper wires, which undergo a 300,000 Volt electrolytic process and which are subsequently coated with an epoxy and/or plastic resin material, bonded by weaving the copper wire made in this way with the yarn.
3. Fabric according to claim 2 **characterized by** the fact that the copper wire has a resistivity of $3 \cdot 10^{10}$ ohms/cm/filament and the gram weight is 200 grams per square meter.
4. Fabric **characterized by** the fact that it is made of 62% pure cotton and 38% electrolytic copper wire.
5. Fabric **characterized by** the fact that said yarns are made of 100% pure cotton.

6. Fabric according to the previous claims **characterized by** the fact that the fabric obtained in this way has transpiration, anti-static, temperature-regulating, anti-stress and anti-oxidizing characteristics. 5
7. Fabric **characterized by** the fact that the copper wire can be bonded with any type of yarn, both natural and artificial fibers.
8. Fabric **characterized by** the fact that it is used to make the inner lining of footwear and/or the like. 10
9. Fabric **characterized by** the fact that it is used as a covering for footwear insoles. 15
10. Fabric **characterized by** the fact that it is used as a lining or as a fabric for garments.
11. Fabric **characterized by** the fact that it is used as a lining, covering or fabric for any object where thermal regulation is necessary. 20

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