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Gross

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[54] **KNITTED ANTI-STATIC AND FLAME-RETARDANT BLANKET**

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[73] Assignee: **Fairhope Fabrics, Inc.**, Fall River, Mass.

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[52] **U.S. Cl.** ..... **5/334 R**, 66/192, 66/202, 297/DIG. 5

[51] **Int. Cl.** **A47c 23/00**

[58] **Field of Search** ..... 66/192, 193, 195, 202; 3/333, 334 R, 335, 336; 297/DIG. 5

[56] **References Cited**

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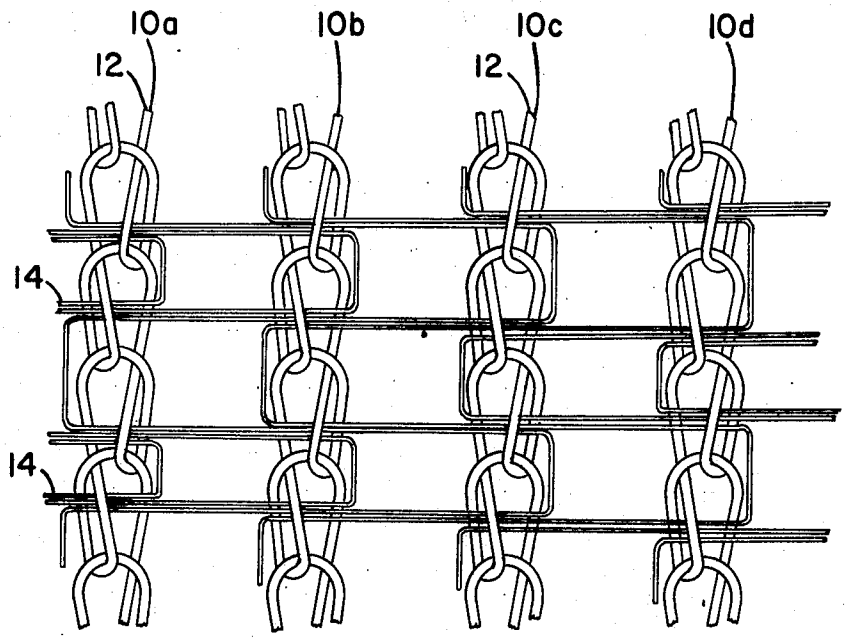
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[57] **ABSTRACT**

A knitted thermal blanket constituted of a material which is made of a combination of flame retardent synthetic yarns and flame retardent synthetic yarns containing a selected percentage of metal fibers that is selectively placed throughout the material either in the warp, the filling, or in both. The flame retardent synthetic yarn and metal combination is attained by spinning the synthetic fiber and metal fibers into a yarn and this yarn in the proper percentage needed is introduced into the fabric. The fabric is knitted in a manner whereby additional ties and knots hold the metal tighter and this prevents loss of the same during repeated washings of the material.

8 Claims, 2 Drawing Figures



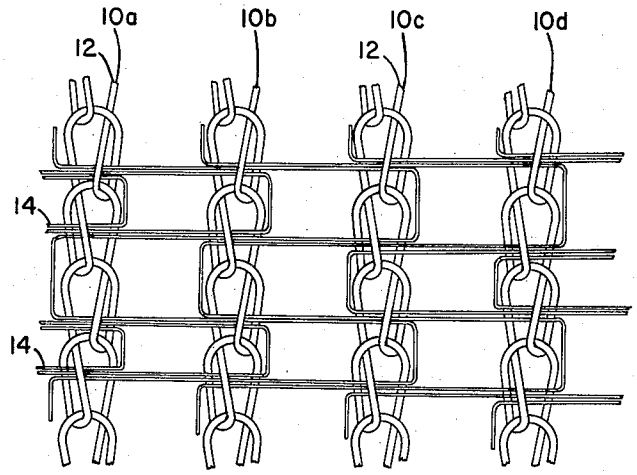

10a
10b
10c
10d
12
12
14
14

Fig. 1

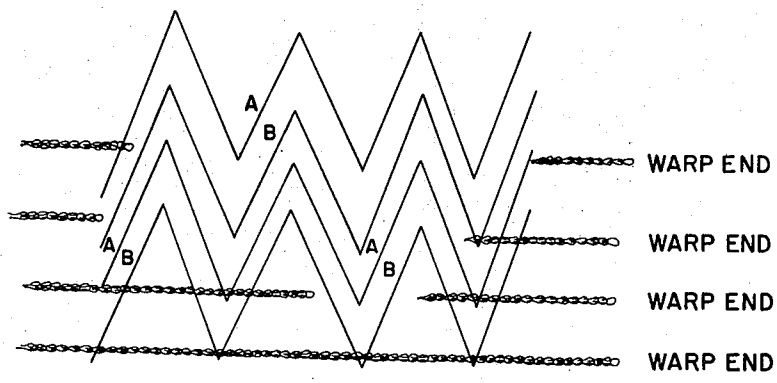

A
B
A
B
A
B
WARP END
WARP END
WARP END
WARP END

Fig. 1A

KNITTED ANTI-STATIC AND FLAME-RETARDANT BLANKET

The present invention relates to a knitted thermal blanket of a highly flame retardent synthetic yarn in which a yarn containing fine metal fibers are blended into the fabric in a manner in which the metal fibers are retained therein, even after repeated washings, thus the present fabric shows a high degree of static control.

It is an object of the present invention to provide a knitted thermal blanket which has a combination of non-flammability and low static propensity.

Another object of the present invention is to provide a flame retardent, and anti-static mesh blanket which is knitted in a manner to ensure that there is no distortion of the mesh which would affect the wearability of the blanket.

The invention will now be more fully described with reference to the accompanying drawings wherein:

FIG. 1 is a top plan view of the blanket fabricated in accordance with the teachings of the present invention, and

FIG. 1A is a diagrammatic view showing the wrap ends and disclosing the path of travel of the filling between the warp ends.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The blanket constructed according to the teachings of the present invention is similar in some respects to my co-pending U.S. Pat. application Ser. No. 234,044 filed Mar. 13, 1972 entitled "Flame Retardent Blanket Having Anti-Static Properties". In this regard, the synthetic yarn **10** may take the form of flame retardent Verel staple, flame retardent Dynel staple, or any other flame retardent synthetic staple. Verel is a registered trademark of Tennessee Eastman Company and is a modified acrylic staple having between 35 and 85 percent acrylonitrile while Dynel is a registered trademark of Union Carbide Chemicals Company and is a mod-acrylic fiber. It should be noted that because of the excellent insulating properties of man-made synthetic yarn, such as Verel and Dynel, the electro-static charges built up in the fabric and are not permitted to dissipate, as is the case with natural fabrics. Therefore, the use of flame retardent synthetic yarns causes a serious problem of excessive build up of static electricity. In order to overcome this latter problem, it has been discovered that the placing of a certain proportion of extremely fine long metal fibers such as stainless steel throughout the blanket fabric causes the static charge to be dissipated.

As seen in the drawing, the Verel warp ends **10***a*, **10***c*, **10***e*, and **10***g* of the knitted thermal blanket show the use of extremely fine metal fibers **12**, such as stainless steel. The metal fibers **12** each of a thickness of approximately 6–12 microns are blanded with a flame retardent Verel and spun into yarn. The resultant yarn is then placed in selected warps, such as, for example, every third warp end, i.e., **10***a*, **10***c*, **10***f*, etc. Moreover, if it is desired, for example, to have a three ply yarn two ends of plain Verel are twisted with the blended Verel yarn of flame retardent Verel having the metal fibers therein. It should be understood that the principal of the present invention may be achieved by placing the metal fibers in each warp end, every other warp end, every third warp end, etc. Moreover, it is to be understood that the present invention contemplates the placing of the metal fibers **12** in the filling material **14** or weft, and not in any warp ends at all. Furthermore, it should be noted that the present knitted thermal blanket can be made in which part of the metal fibers **12** is in the warp yarn ends and the other part of the fibers **12** is located in the filling. It is also within the scope of the present invention to use yarn blended with metal in the fabric alone and without plying it with a selected synthetic yarn. But in any event, the metallic fibers present in the knitted thermal blanket must be so distributed in the knitted thermal blanket fabric in order to render the knitted thermal blanket conductive throughout. It may also be desirable to place an excess amount of metal in the fabric in order to compensate for small amounts of the metal fibers that may be separated from the fabric after continued washings.

The amount of metal fibers in the knitted thermal blanket, that is, the steel itself, has been calculated by weight with respect to the knitted thermal blanket, and the amount is preferably 0.23 percent. However, under certain circumstances, due to use in varying atmospheres, the amount of the metal fibers by weight may be more or less than the above amount but would be within the range of 0.10 to 2 percent by weight.

As seen in the drawing, the warp ends **10***a*, **10***c*, etc., are for example, constituted of a synthetic staple, such as 8/2 ply Verel yarn and metal fibers **12** of a predetermined weight are twisted with the selected Verel yarn ends which may be every warp end, every second warp end, every third warp end, etc.

As seen in FIG. 1A, the filling travels over three needles therefore forming two filling ends A and B between each pair of needles or warp ends. It should be noted that there are two filling devices operating in opposite directions, thus resulting in four filling ends between each pair of warp ends.

It should be observed that the present thermal blanket is of a knitted construction, such as a chain stitch. This knitted construction is desirable because with soft synthetic yarn, such as Verel, there is a certain amount of slippage at the corners of the mesh resulting in a distortion of the mesh and reduces the wearability of a woven blanket. However, in the present knitted construction, each corner of the mesh is individually locked by the knitting process and distortion is minimal.

The present knitted thermal blanket preferably has the yarn containing the metal fibers knit in the warp with a knitted stitch as shown in the drawing. Thus, additional ties and knots as a result of the knitting of the yarn hold the metal in the fabric much tighter thereby materially reducing the loss of this metal during continued washing of the knitted thermal blanket. Furthermore, the knitted thermal blanket is so constructed that when the yarn containing the metal fibers **12** is in every third, or in every second, or in every warp end, each row of the layed in filling **14** touches a metal-contained warp end.

It should be noted that the metal fibers **12** are so fine that they blend easily with man-made fibers on conventional textile apparatus, and they cannot be seen or felt. The achievement resulting from the present invention is extremely desirable in our technological age, since both the risk of fire and explosion remains a clear and present danger in hospitals and nursing homes, as well

as the problem of disruption of sensitive electronic equipment by static build up.

The present invention additionally contemplates the use of a flame-retardent synthetic fiber, such as Verel and Dynel, blended with other yarns, such as cotton. However, it is to be understood that the amount of flame-retardent synthetic fiber in the blend should be sufficient to render the blanket substantially fire proof.

What is claimed is:

1. A knitted anti-static thermal blanket comprising a combination of flame retardent synthetic yarn staple fiber, and a blended yarn containing a synthetic fiber and a plurality of metal fibers so distributed in said fabric to render the same conductive throughout and to dissipate any electric charge therein, said metal fibers having a weight relative to said knitted thermal blanket of approximately 0.10 to 2 percent whereby said knitted thermal blanket has both flame retardent and anti-static properties, said blanket being so knitted that said metal fibers are firmly held therein and during repeated washings of said blanket the loss of metal fibers therein is materially reduced.

2. A knitted thermal blanket as claimed in claim **1** wherein the warp ends are knitted in a chain stitch which functions to lock the corners and having additional ties and knots whereby said additional ties and knots in said knitted thermal blanket hold said metal fibers therein.

3. A knitted thermal blanket as claimed in claim **2** wherein two plain warp ends of synthetic yarn staple fiber are twisted in at least one yarn end to form a multi-ply yarn.

4. A knitted thermal blanket as claimed in claim **1** wherein said yarn containing said metal fibers is inserted in the filling material.

5. A knitted thermal blanket as claimed in claim **1** wherein a portion of said yarn containing said metal fibers is twisted with at least one end of said synthetic yarn to form the warp and the other portion of said yarn containing said metal fibers is inserted in the filling material.

6. A knitted thermal blanket as claimed in claim **1** wherein each row of the layed in filling touches said blended yarn containing said metal fibers.

7. A knitted thermal blanket as claimed in claim **1** wherein said synthetic fiber is blended with another yarn.

8. A knitted thermal blanket as claimed in claim **7** wherein said other yarn is cotton.

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