Feb. 1, 1966 TOSHIAKI INUI 3,232,080

CARPET INTERWOVEN WITH HEATING WIRE

Filed Aug. 11, 1964 2 Sheets-Sheet 1

FIG. 1.

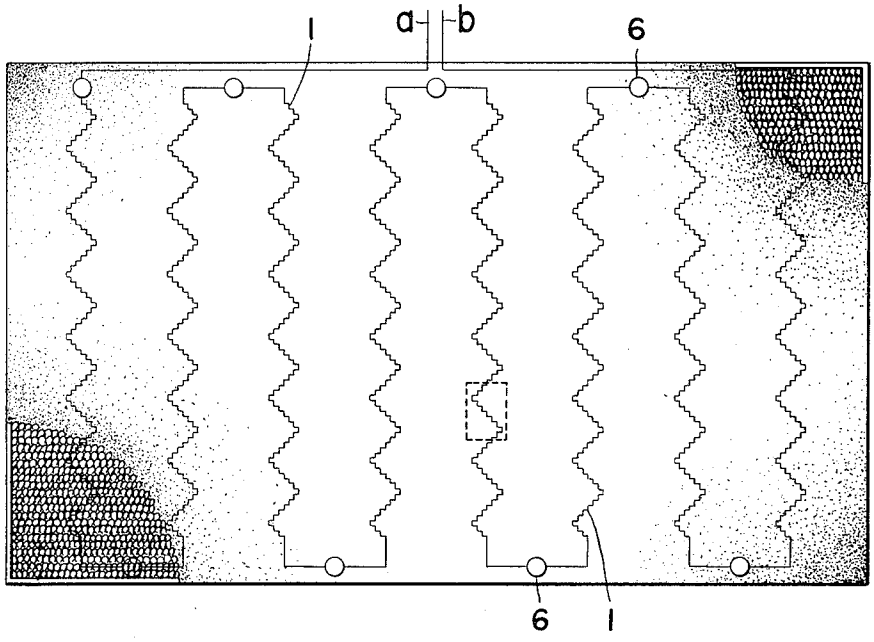
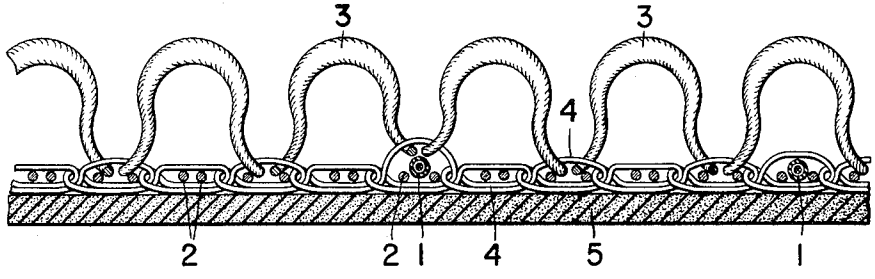


FIG. 2.



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Filed Aug. 11, 1964 2 Sheets-Sheet 2

FIG.3.

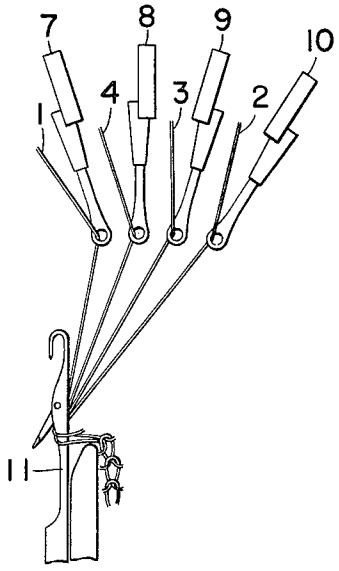
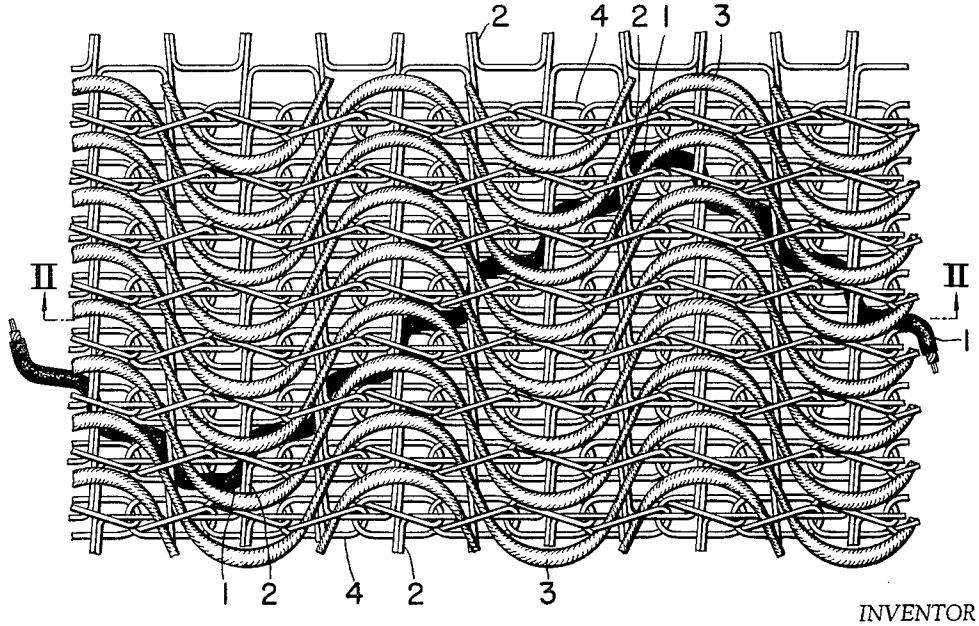


FIG.4.



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CARPET INTERWOVEN WITH HEATING WIRE

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1 Claim. (Cl. 66—192)

This invention relates to a heating carpet into which an electrically insulated heating element is integrally knitted while the carpet is being knitted on a knitting machine, namely, a heating carpet into which an electrically insulated heating element is knitted on several spots along the width of the carpet in such a manner as to have the said heating element held down by the weft of the carpet while the carpet is being knitted; and in which after the carpet has been knitted said heating element is connected in series at both ends to establish a heating wire circuit; and which finally is lined on its back side with sponge rubber.

With the foregoing object in view, the following description will be made with reference to the accompanying drawings, in which a preferred embodiment of the invention is illustrated.

In the drawings:

FIG. 1 is a plan view of a knitted carpet, peeled off in part to show the heating wire knitted in the carpet in accordance with this invention;

FIG. 2 is a large scale fragmentary longitudinal sectional view thereof taken on the line II—II of FIG. 4;

FIG. 3 is a large scale fragmentary elevational view showing a detail of a Raschel knitting machine; and

FIG. 4 is a large scale diagrammatic view of a rectangular segment, surrounded by a broken line in FIG. 1.

Referring now to the drawings, an electrically insulated, such as coated, heating wire **1** to be knitted integrally with a carpet is fed to a prescribed needle **11** in order to insert a required quantity of electrically insulated heating wires at every preset interval along the width of the carpet to be knitted. As shown in FIG. 3 and in FIG. 4, the knitting is carried out by disposing an electrically insulated wire **1** held by a yarn guide **7** between each of the knitting yarns placed in the order of a weft **2** held by a yarn guide **10**, a pile yarn **3** held by a yarn guide **9**, a warp **4** held by a yarn guide **8** and a needle **11**. The electrically insulated heating wire **1** is inserted without making stitches, and if the guide **7** is moved sidewise behind the needle **11**, the electrically insulated heating wire **1**, as shown in FIG. 2, is held down by the weft **2** and inserted, being bound in zigzag fashion over all the length and width of a finished carpet (see FIG. 1). It will be noted from FIG. 1 that the number of wales exceeds the number of individual wires by a factor of at least two, one wire serving a plurality of wales. After a carpet is thus knitted, the insulated heating wire **1** is at each end connected in series to an electric wire that passes through a thermostat **6** and the heating wire **1** on both sides of the carpet is at each end connected to input wires *a* and *b*. Then the carpet is lined on its back side with sponge rubber **5** by means of a suitable adhesive. Said coated electric heating wire **1** is a narrow thin tape-like fine wire around which is coiled an electric insulating yarn and which is further coated with an insulating material such as vinyl resin. A determination is made of the length and thickness of wire needed, and of how many pieces of wire will need to be used so that the carpet may have an adequate heating effect over its entire length and width. In the drawings, by way of exemplification, three pieces of yarn are shown used in the knitting; but several more pieces of yarn may be used for decorating the carpet with patterns.

As described above, the carpet of the invention keeps the heating wire in complete concealment from the surface and the back side thereof, with difference observable in appearance from carpets in general use, but with such an advantage offered as, when the wire is charged with electricity, adequate heat is supplied without any other particular heating apparatuses such as are generally used for heating purposes. It offers another advantage in that sponge rubber lining the back side of the carpet not only increases the user's comfort because of its elasticity, but also insulates electrically and thermally.

What is claimed is:

A warp knitted electrical resistance heating carpet fabric comprising a plurality of electrically insulated heating wires bound into said fabric during the knitting of the carpet on the knitting machine, said insulated heating wires being held by the wefts of said fabric and being in zigzag relation crossing in each direction at least two wales, the number of wales exceeding the number of individual heating wires by a factor of at least two, the ends of said wires being interconnected in series thereby establishing an electric heating circuit, and a sponge rubber layer connected to one side of said knitted carpet fabric and forming an external lining thereon.

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