United States Patent

[11] **3,597,585**

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[54] **TUBE MAT**
10 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **219/201,** 219/528, 219/529, 219/546, 219/549
[51] **Int. Cl.** **H05b 1/00**
[50] **Field of Search** 219/201, 528, 529, 545, 546, 549

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ABSTRACT: A mat made of a ropelike member coiled in a flat plane. The rope has incorporated therein a resistance heating wire which is supplied with electricity in order to heat the mat.

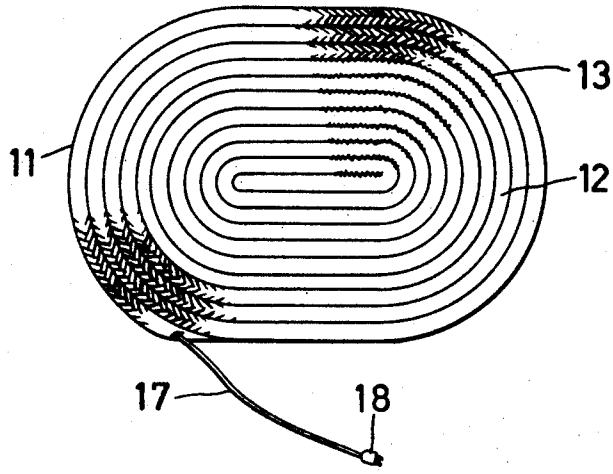


Fig. 1.

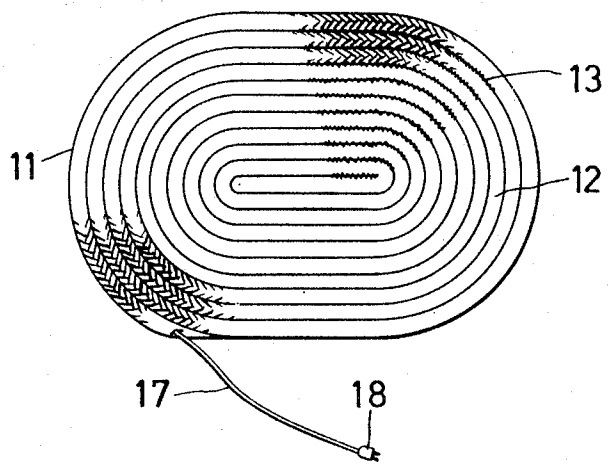


Fig. 2.

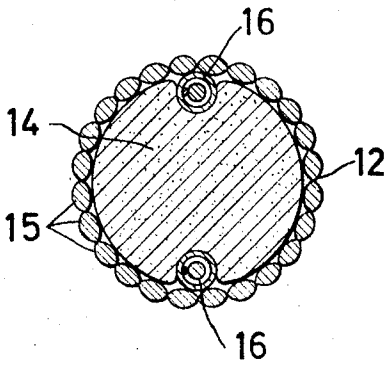


Fig. 3.

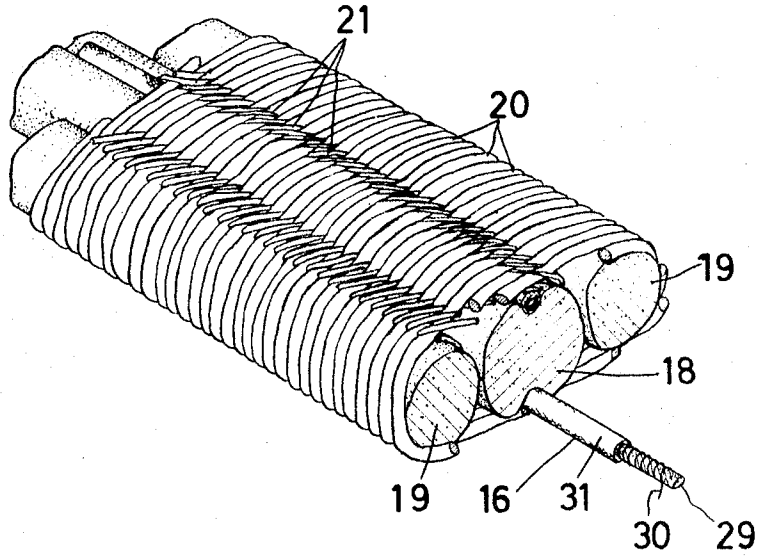


Fig. 4.

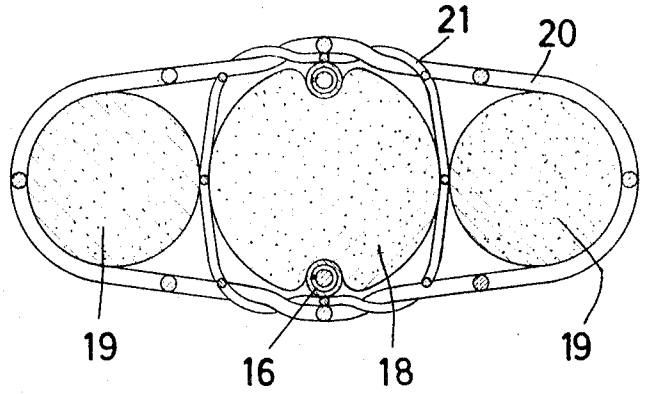


Fig. 5.

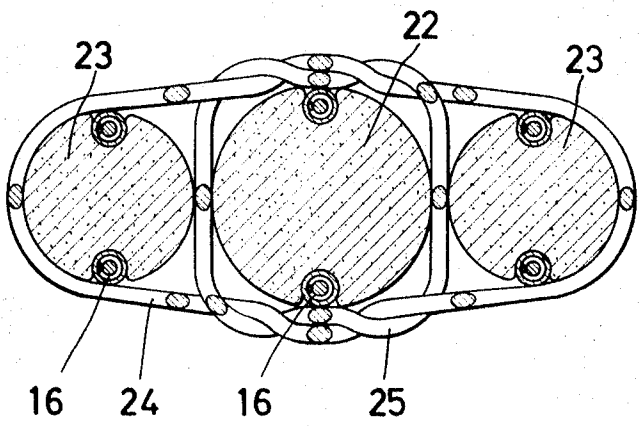
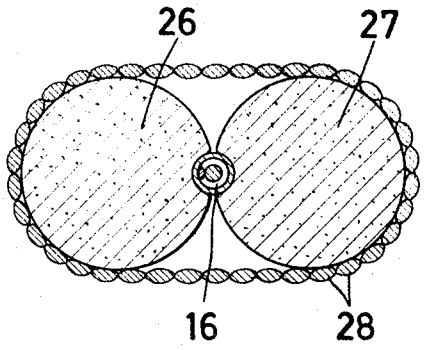


Fig. 6.



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TUBE MAT

This invention relates to a thermogenetic tube mat in which heating wire is inserted.

The conventional tube mat has been used for the purpose of preventing the soles from being brought in direct contact with the cold floor, or as a foot-wiper, etc. The object of the invention consists in positively warming the feet by heating the tube mat itself, the invention therefore being a very useful one enabling keeping the feet warm which are liable to grow cold particularly in the cold season.

The invention has the foregoing object, and the details thereof will be described hereinunder with reference to the annexed drawing, of which:

FIG. 1 is a plan view showing an embodiment of the invention;

FIG. 2 is an enlarged cross-sectional view of a rope which constitutes the foregoing embodiment;

FIG. 3 is a fragmentary perspective view showing another embodiment of the rope which constitutes a tube mat according to the invention;

FIG. 4 is an enlarged cross-sectional view of FIG. 3;

FIGS. 5 and 6 are enlarged cross-sectional views showing other embodiments of the rope constituting a tube mat according to the invention.

In the invention a tube or rope type mat is formed by using a generally tubular material or rope wherein there is inserted heating wire which is heated by selectively connecting to an electric current.

In FIG. 1 the numeral 11 designates a tube mat which is formed by helically coiling a tube mat rope 12 in planar form, the adjoining parts thereof being bound together by zigzag stitches 13, just as is the case with the conventionally known tube mat.

The said rope 12 comprises a core member 14 consisting of appropriate fiber, a plurality of thick ornamental strings 15 being dextrorsely and sinistrarsally wound thereonto and so intertwined together as to form a braid, and wherein heating wire 16 is inserted between the core member 14 and the ornamental strings 15 thus braided. In the form of FIG. 2, the heating wire 16 is inserted both along the upper and the lower parts of the core member 14. If a tube mat 11 is formed making use of a rope 12 and having such heating wire 16 inserted therewith, and a cord 17 connected with the heating wire 16 is linked to the power source for the electric light or the like, the heating wire is heated by the electric current supplied. The tube mat 11 can be kept moderately heated by automatically controlling the temperature making use of a thermostat (not shown) which may be provided at an appropriate part of the tube mat 11.

In the embodiment illustrated in FIGS. 3 and 4, on each side of a thick central core member 18, a slightly thinner core member 19 is laid, with a plurality of thick ornamental strings 20 being wound dextrorsely round the three core members 18, 19, 19, and further having a plurality of slightly thinner ornamental strings 21 wound sinistrorsally round the outside of the central core member 18 and simultaneously intertwined with the ornamental strings 20, thereby forming a broad and flat rope. A heating wire 16 is inserted between the upper part of the central core member 18 and the ornamental strings 20, 21 as well as between the lower part of said member 18 and said strings 20, 21. The foregoing rope is formed into a planar tube mat as shown in FIG. 1.

Furthermore, the embodiment shown in FIG. 5 is similar to that shown in FIGS. 3 and 4 in the respect that a slightly thinner core member 23 is disposed along each side of the thick central core member 22, but wherein the ornamental strings 24 which are wound round the outside of the three core members 22, 23, 23 are intertwined with the ornamental strings 25 which are wound around the central core member 22. In this case, however, the ornamental strings 24 and 25 are of the same gauge or identical thickness, and moreover the heating wire 16 is inserted between the upper part of each core member 23 and the ornamental strings 24, 25 as well as between the lower part of each said member 23 and said strings 24, 25.

In FIG. 6 a plurality of ornamental strings 28 are wound in opposite directions round the outside of two core members 26, 27 of the identical thickness, said strings being intertwined with each other so as to form a braid. In this case, the heating wire 16 is sandwiched between the right and the left core members 26, 27.

Various types are conceivable for the distribution of the heating wire, but the essential requisites are that the electric heating wire should be prevented from being in direct contact with the human body and should be sufficiently flexible. With this object in view, as the embodiment illustrated in FIG. 3 shows, slender and flexible electric heating wire 30 is helically wound on to the outside of a core string 29 consisting of material which is strong, heat-resisting, insulating and flexible, the outside thereof being covered with a protective tube 31 produced by knitting heat-resisting, insulating and flexible thread.

The inserting parts of the heating wire are not limited to those indicated in the drawing; for instance, the heating wire may be inserted along both sides of the core member 14 of the rope indicated in FIG. 2, or between the core members 18, 19 or between the core members 22, 23 in FIG. 5, or along the upper and the lower parts of the core members 26, 27 in FIG. 6, or the like.

Furthermore, the types of the rope are not limited to those illustrated, many other types being also embodiable. As to the type of the tube mat too, it is needless to mention that the type is not limited to the one shown in FIG. 1.

Since this invention provides a tube mat which is electrically heated by inserting heating wire thereinto, cold feet are comfortably warmed even in the cold season by utilizing the tube mat spread upon the cold floor.

What I claim is:

1. In a flexible rug or carpet of the tubular of spiral rope type wherein succeeding convolutions of the spiralling rope are conventionally bound together in planar form as by a series of zigzag stitches interconnecting adjacent edges of the rope member, the improvement of heating means in conjunction therewith comprising a flexible rope from which the rug is made and having a center core member surrounded by a plurality of ornamental strings or threads wound therearound to form an enveloping outer covering; and having an insulated flexible resistance heating wire disposed longitudinally and coextensively between said core member and ornamental threads along at least one side of said core, and means adapted to connect it with a power source.

2. A flexible heated rug of the type defined in claim 1 wherein said heating wire is inserted along two preferably diametrically opposed sides of the core member of the rope and between said core and ornamental threads.

3. A flexible heated rug of the type defined in claim 1 wherein the flexible rope from which the rug is formed comprises a plurality of at least two core members disposed in a flat side-by-side manner and having said ornamental threads enveloping both core members.

4. A flexible heated rug of the type defined in claim 1 wherein the flexible rope from which the rug is formed comprises a plurality of at least two core members disposed in a flat side-by-side manner and having said ornamental threads enveloping both core members and further having an electrical heating wire interposed between said two core members.

5. A flexible heated rug of the type defined in claim 1 wherein the flexible rope from which the rug is formed comprises a plurality of at least two core members disposed in a flat side-by-side manner and having said ornamental threads enveloping both core members and further having said electrical heating wire interposed between adjacent edges of each of said two core members.

6. A flexible heated rug of the type defined in claim **1** wherein the flexible rope comprises a plurality of three core members disposed in a generally flat planar side-by-side relation and having said ornamental threads enveloping all of said core members.

7. A heated rug as defined in claim **6** wherein additional decorative threads are interwoven around the central core member and interconnected with those enveloping all three core members.

8. A heated rug as defined in claim **6** wherein the central of the three core members is of a larger size or gauge than said other two core members.

9. A heated rug as defined in claim **6** wherein a plurality of said electrical heating wires are disposed longitudinally along at least one side of each core member.

10. A heated rug as defined in claim **6** wherein a plurality of said electrical heating wires are disposed longitudinally along two opposed sides of each of said three core members.