

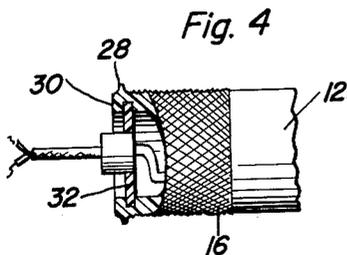
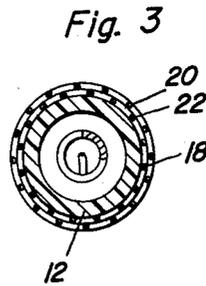
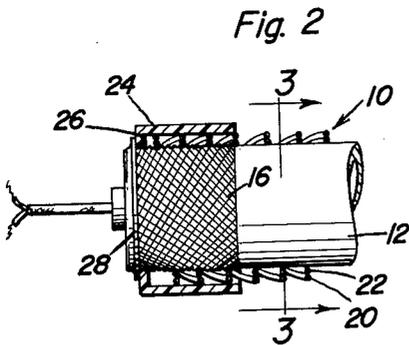
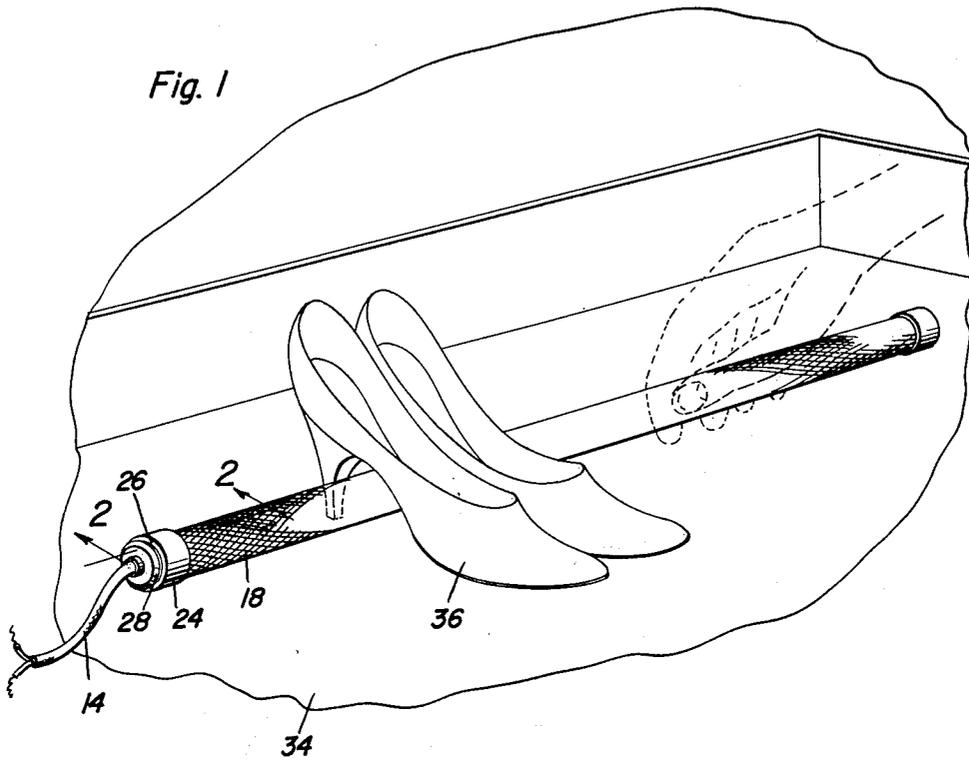
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A. M. FOOTE

3,094,603

ELECTRIC HEATER WITH PROTECTIVE NET

Filed June 16, 1961



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ELECTRIC HEATER WITH PROTECTIVE NET

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4 Claims. (Cl. 219-19)

The present invention generally relates to novel improvements in electric heaters of the elongated tubular type such as that disclosed in prior Patent No. 2,511,910.

The primary object of the present invention is to provide a protective cover in the form of a net made of plastic material which closely surrounds the elongated tubular electric heater to prevent direct contact with the surface of the heater. In the particular heater covered by the above-mentioned patent, the surface temperature of the tubular casing is slightly higher than can be comfortably held in the hand although it will not burn the skin surface nor will it ignite other objects with which it comes into contact. However, certain objects found in closets and the like are sometimes subject to direct contact with a warm surface. For example, patent leather shoes tend to harden and crack when engaged with a hot surface for a prolonged period of time. Therefore, the present invention has for its primary purpose the provision of a protective net having relatively small openings which enables circulation of air over the surface of the heater but prevents direct contact of various objects with the heated surface and also enables the device to be easily picked up and handled without concern or worry about having the hands burned.

A further important object of the present invention is to provide a protective net in accordance with the preceding object which insulates the heated surface from adjacent surrounding articles or surfaces in which the net is constructed of an insulating plastic not subject to deterioration by the application of heat.

Still another feature of the present invention is to provide a protective net in accordance with the preceding objects together with a novel means for securing the net in place on the tubular electric heater.

Yet another object of the present invention is to provide a protective net which is simple in construction, easy to install, effective in operation and generally inexpensive to manufacture.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of the heater employing the protective net of the present invention;

FIGURE 2 is a longitudinal fragmental sectional view of one end of the heater illustrative of the protective cover or net thereon together with the structure for retaining the net in place;

FIGURE 3 is a transverse, sectional view taken substantially upon a plane passing along section line 3-3 of FIGURE 2 illustrating further structural details of the net and the relationship thereof to the tubular heater; and

FIGURE 4 is a side elevational view of the tubular heater with a portion of the end thereof broken away illustrating the construction of the heater.

Referring now specifically to the drawings, the numeral 10 generally designates the construction of the net which encloses the tubular member 12 having an electrical conductor 14 extending longitudinally from one end thereof. The particular details of the tubular heater, the conductor and the heating element interiorly of the tubular

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member 12 form no part of the present invention and are disclosed in the aforementioned patent.

The present invention includes a modification of the exterior surface of the tubular member 12 by providing an annular portion which is knurled at 16 or otherwise roughened for providing a frictional gripping surface to be engaged by the protective net 10. The protective net 10 is constructed of a plastic net 18 having spiral crossed webs 20 and 22 which are secured to each other and which are actually of one piece of material formed into a continuous tubular member in which the crossed threads or strands are spaced from each other thus forming diamond shaped openings. The net is constructed of a plastic material such as Vexar as manufactured by Du Pont or equivalent material which will withstand the surface temperature of the tubular member 12.

For retaining the plastic netting 18 in assembled relation on the tubular member 12, there is provided a cylindrical cap 24 having an intumed end flange 26. The cap 24 encloses the free end of the netting 10 and retains the netting in frictionally gripped relation to the knurled or roughened surface 16 thus locking the plastic covering or net 18 in place.

The protective cap 24 is held in position by a peripheral burr or projection 28 formed on the outer surface of the tubular member 12 when the end thereof is deformed inwardly as at 30 for retaining the end member 32 of the tubular member 12 in place. Thus, the burr 28 serves to prevent the cap 24 from being removed from the end of the protective netting thus assuring that the netting will be held in place. The end cap 24 is also constructed of plastic material and may be provided with a slightly smaller internal diameter than the exterior diameter of the protective net 10 so that the cap 24 will be slightly deformed outwardly when inserted in place thus assuring rigid frictional engagement between the plastic netting 18 and the knurled surface 16 of the tubular member 12. The knurled or roughened surface 16 further serves to hold the protective cap 24 in position and especially preventing further inward movement of the cap onto the tube.

In using the present invention, the tubular member 12 with the protective net 10 thereon may be placed on the floor 34 of a closet or the like or may be mounted on a shoe rack in adjacent relation to shoes 36. This will prevent direct contact of the shoes 36 with the heated exterior surface of the tubular member 12 thereby enabling more flexibility in disposing the shoes in relation to the tubular heater since there need be no concern of any of the shoes coming into contact with the heated surface. This is especially desirable in connection with patent leather shoes which have a tendency of hardening and cracking when disposed in direct contact with heated surfaces. Also, a person will naturally react to release a heated surface when gripped even though the heated surface may not actually burn their hands. Thus, the protective net 10 also serves to eliminate this problem by eliminating direct contact of the hand with the heated surface thereby enabling the device to be easily handled without any necessity of having the electric heater dropped because of the heated surfaces.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In combination with an electric heater including an elongated tubular member having a continuous external

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surface, a protective net enclosing the external surface and including a plurality of spiral crossed strands peripherally spaced from each other to form a plurality of openings for enabling circulation of air over the surface but preventing contact of the surface with articles disposed against the surface of the net, and means anchoring the ends of the net to said tubular member, said means anchoring the net to the tubular member including a peripheral knurled surface area adjacent an end of the tubular member, and a retaining cap encircling the net and securing the net frictionally against the knurled surface.

2. The structure as defined in claim 1 wherein said cap is provided with an internally extending flange, and a burr formed on said tubular member exteriorly of the flange for retaining the flange and cap in place on the tubular member.

3. The structure as defined in claim 2 wherein said cap is constructed of plastic material for biasing the net into gripping engagement with the knurled surface, said net being constructed of plastic material capable of withstanding heat of the surface of the tubular member.

4. In combination with an electric heater including an elongated tubular member having a continuous external

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surface, a protective net completely surrounding and in fitted contact with the external surface and including a plurality of spiral crossed strands peripherally spaced from each other to form a plurality of openings for enabling circulation of air over the surface but preventing contact of the surface with articles disposed against the surface of the net, and retaining caps encircling the net and anchoring the ends of the net to said tubular member.

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