United States Patent

[11] **3,564,308**

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[21] Appl. No. **748,853**
[22] Filed **July 30, 1968**
[45] Patented **Feb. 16, 1971**
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[54] **BURN PREVENTING FORAMINATE MATERIAL ARRANGEMENT ON ELECTRIC MOTORS**
4 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **310/43;** 77/7; 165/135; 310/66; 310/85
[51] **Int. Cl.** **H02k 5/02,** H02k 15/14
[50] **Field of Search** ..... 174/5, 70, 122 (.1), (Inquired), 124 (.1); 219/10.49; 165/135, 136, (Inquired); 263/50; 310/43, 45, 50, 64, 65, 66, 89, 272—3; 313/17, 18, 312, (Inquired), 317, 324; 328/7; 338/208, 259, 268, 277; 2/16, 20; 128/132, 258; 16/116, (.1,1.2); 294/27, 32—34, 1, 131; 145/61(.1, .11, .12, .2); 150/52, (.4); 181/62, 72

[56] **References Cited**

UNITED STATES PATENTS

703,100	6/1902	Wantz	310/50X
1,500,696	7/1924	White	219/531
1,857,639	5/1932	Jancke	219/226
1,986,256	1/1935	Ellis	150/52
2,707,620	5/1955	Snyder	257/136
2,812,900	11/1957	Matthews	230/275
812,797	2/1906	Knudson	200/168
1,538,159	5/1925	Blair	310/64
2,079,369	5/1937	Bradley	174/70X
3,121,813	2/1964	Pratt et al.	310/50
3,205,467	9/1965	Ganci	338/268
3,225,230	12/1965	Maffey	310/50
3,236,300	2/1966	Chave et al.	165/136

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ABSTRACT: Protective material for covering a heated element, such as an electric motor, or machine, or device, or the like, for protecting personnel against burns which might be encountered from engagement with the heated element. The protective material comprises a sheet of material which has relatively low thermal conductivity and which has a multiplicity of apertures therethrough and, which, for example, may be a screen or screenlike material which is positioned in covering engagement with the machine. Because the protective material has a multiplicity of apertures therethrough, the protective material does not significantly affect the dissipation of heat from the machine or device. However, if the protective material is engaged by a persons's hand, only a very small quantity of heat is transferred from the protective material to the person who comes into contact therewith.

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FIG-1

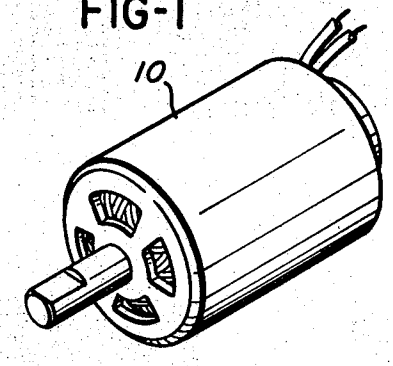


FIG-2

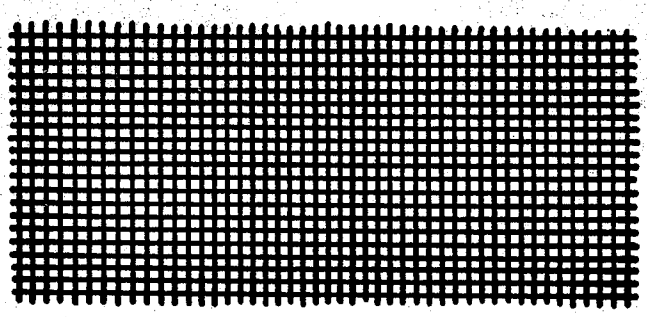


FIG-3

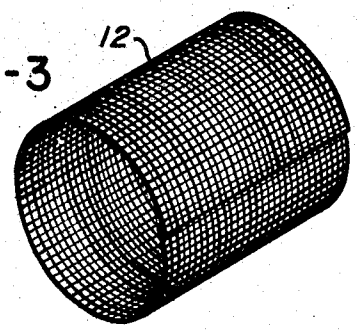
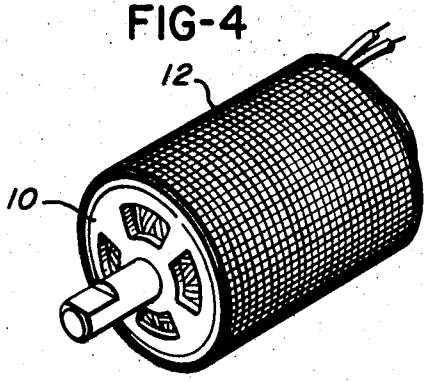


FIG-4



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BURN PREVENTING FORAMINATE MATERIAL ARRANGEMENT ON ELECTRIC MOTORS

BACKGROUND OF THE INVENTION

In numerous types of equipment or apparatus, a machine or device may be positioned among various mechanical members or other elements or devices or other machine members which may sometimes require work thereupon. The machine or device may be one which is heated to a relatively high temperature during use thereof. Thus, if it becomes necessary for a person to work upon the mechanical members immediately following use of the apparatus, the person may come into contact with the hot machine or device and may become burned thereby.

For example, a business type of apparatus such as typewriter apparatus which is electrically operated includes an electric motor which may be disposed in closely spaced relationship among numerous mechanical members. The electric motor is usually one which includes electrical insulation materials which are capable of withstanding temperatures well above the temperature of a person's body. Thus, the electric motor is operated at high temperatures. It sometimes becomes necessary for mechanical members of the typewriter apparatus adjacent the electric motor to be adjusted or repaired. Therefore, it becomes necessary for the person who works upon the mechanical members to have his hands closely adjacent the heated electric motor. If the person's hand should engage the hot motor, a burn of considerable severity may occur.

Therefore, it is an object of this invention to provide means for protection of a person who may work upon portions of apparatus which are adjacent a motor or other machine or device which has a temperature considerably above a person's body temperature.

It is another object of this invention to provide such protective means which does not significantly reduce the capacity of the heated machine to dissipate heat therefrom.

It is another object of this invention to provide such protective means which does not significantly reduce the amount of space in the apparatus within which mechanical members may be disposed.

It is another object of this invention to provide protective material which can be easily and readily applied to any machine, element, device, or member which operates at a relatively high temperature and from which personnel should be protected against burning.

It is another object of this invention to provide such protective means which is relatively low in cost and which may be installed with relative ease.

BRIEF DESCRIPTION OF THE VIEWS OF THE DRAWING

FIG. 1 is a perspective view of a typical electric motor of the type which may be employed as a part of a business apparatus and which may be located in the apparatus in closely spaced relationship among numerous mechanical parts.

FIG. 2 is a plan view, drawn on a much larger scale than FIG. 1, of a portion of suitable protective material which is placed into covering engagement with the electric motor of FIG. 1 for protection of personnel who may work upon mechanical parts disposed adjacent the electric motor.

FIG. 3 is a perspective view, drawn on substantially the same scale as FIG. 1, showing a tube or sleeve of the protective material of FIG. 2 shaped for closely covering the electric motor of FIG. 1.

FIG. 4 is a perspective view, drawn on substantially the same scale as FIGS. 1 and 3, showing the tube or sleeve of protective material of FIG. 3 in covering engagement with the electric motor of FIG. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 shows a machine in the form of an electric motor **10** which is an example of a machine or device to which protective material of this invention may be applied. However, it is to be understood that numerous other types of machines or devices, either electrical or otherwise, may be covered by material of this invention for protection of personnel who may work adjacent the machine. Examples of other types of elements, machines, or devices to which protective material of this invention may be applied are such devices as electrical resistors, electronic tubes, transformers, coils, and any other element or device or machine which operates at a temperature above normal body temperature and which may be disposed among other elements in an apparatus or the like.

A suitable material for use as a protective material in this invention may be any foraminate material which has relatively low thermal conductivity. For example, material referred to as Fiberglas (fibrous glass) or Saran has been found to be very satisfactory as material of this invention. Other materials of the plastics class or materials of other types have also been found to be satisfactory, if they have low thermal conductivity. The foraminate material may be in the form of a screen material such as shown in FIG. 2.

A satisfactory low thermal conductivity material may be generally in the order of 0.010 to 0.020 inches in thickness. However, other thicknesses, somewhat less or somewhat greater have also been found to be satisfactory. The material is preferably of a thickness dimension which does not extend significantly beyond the machine or device which it covers. Screen material having a mesh in the general order of 18 x 14 strands per square inch has been found to be satisfactory. However, screen meshes having more or fewer openings per square inch have also been found to be satisfactory.

The foraminate material may be formed into a tube or sleeve **12** of suitable length and diameter to tightly encompass the motor **10** of FIG. 1. The tube or sleeve **12** is then placed into covering engagement with the motor **10**. The tube or sleeve **12** may be firmly attached to the motor **10** by any suitable means, not shown. The assembly thus appears substantially as shown in FIG. 4.

Instead of preparing a tube or sleeve **12** of the foraminate protective material prior to forcing the sleeve **12** upon the motor **10**, a sheet or strip of the foraminate protective material may be tightly wrapped upon the motor **10**, without substantial overlap.

The motor **10** is then adapted to be positioned within apparatus closely adjacent other elements or members. The motor **10** may become a part of a business apparatus or a part of another type of apparatus. The motor **10** is adapted to operate at a relatively high temperature. Due to the fact that the protective material has a multiplicity of openings therethrough, the ability of the motor **10** to dissipate heat is not significantly affected.

Due to the fact that the foraminate protective material is in firm engagement with the motor **10**, the foraminate material is heated to substantially the same temperature as the motor **10**. However, if when the motor **10** is in a heated condition, it should be necessary for a person to work in the vicinity of the motor **10**, danger of burning of the person does not exist. If the person's hand should engage the foraminate low thermal conductivity material, a small and almost insignificant quantity of heat is transferred from the protective material to the person's hand.

Due to the fact that the foraminate protective material has a low thermal conductivity, heat from the motor **10** does not rapidly flow into the foraminate protective material to replace the small quantity of heat transferred to the person's hand. Thus, even though the person's hand may remain in engagement with the protective material for a few seconds of time, no appreciable quantity of heat flows to the hand. Thus, burning of the hand does not occur, even though the temperature of

the motor **10** may be considerably higher than a person's body temperature.

It is to be understood that protective material of this invention may be applied in covering relationship to other types of machines, devices, or members. The protective material may cover all or a portion of the machine, device, or member.

I claim:

1. In combination with an electric motor which is heated to a temperature above normal body temperature, personnel burn protective material which is in engaging covering relationship with the motor, the protective material being a material which has relatively low thermal conductivity and which has a multiplicity of apertures therethrough and which has small mass per unit of area thereof, the material thus having a small quantity of heat therein per unit area thereof, so that if a person comes into engagement with the protective material, only a small quantity of heat flows from the material to the person and additional heat does not flow readily from the electric motor through the protective material to the person.

2. The combination of claim **1** in which the protective material is a screen material which is approximately 0.013 inches in thickness and is of a mesh approximately 18 x 14 strands per square inch.

3. The combination of claim **1** in which the protective material is a fibrous glass material.

4. The combination of claim **1** in which the protective material is in the form of a sleeve of screen material which engagingly encompasses the electric motor.