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HEAT-RESISTANT AIR-COOLED GLOVE

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6 Claims. (Cl. 2-161)

This application relates to a temperature-resistant glove for use in extreme temperature conditions. More specifically, the application relates to an air-cooled heat-resistant glove which may be used under higher temperature conditions than prior art gloves.

In various industrial applications it is often desirable to handle items which have high temperatures. It is the present practice to use a heat-resistant glove which is made of a material which is non-combustible and has a low degree of heat conduction. Unfortunately, with prolonged use of the glove the temperature of the item being handled is eventually conducted through the material to the inside of the glove. At this time the heat-resistant feature of the glove is no longer effective and the glove can no longer be safely used to handle the high-temperature items. Even thickening the material, which makes the glove less flexible, is not effective since this only prolongs for a short period of time the conduction of the heat from the outside to the inside of the glove. Even when the items which are being handled are not of extremely high temperatures, the heat which is conducted to the inside of the glove has a tendency to build up inside the glove. The heat which is conducted to the inside of the glove causes the wearer to perspire and the glove becomes again uncomfortable to wear. Since the prior art heat-resistant gloves eventually have an interior temperature equal to the exterior temperature, the maximum temperature at which the glove can be used for long periods is not much higher than the maximum temperature at which the operator can handle items even without a glove.

It has been suggested to use air as an insulating medium within a heat-resistant glove. However, the air has been incorporated within the glove in a sealed compartment so that even though the air operates to slow the conduction of the heat from the outside to the inside, again it is just a question of time until the heat is eventually conducted to the inside of the glove. The heat-resistant glove of the present invention overcomes the difficulties of the prior art by using circulating air to carry away heat built up within the glove to cool the glove and the hand of the wearer. The invention is adapted to be used with standard compressed air supplies which are found in most industrial plants.

The glove consists of an outer layer of heat-resistant material which is generally impervious to the air and an inner layer of soft, porous material. The air is inserted between the outer layer and the inner layer so that the air is distributed evenly throughout the glove. The even distribution of the air prevents the occurrence of hot spots in the glove. The air is not blown directly on the hand but is diffused through the inner layer to carry with it the heated air from the outer layer. As the air passes over the hand it carries away any moisture which may be built up on the hand of the wearer of the glove. The air is vented to the atmosphere at the back of the glove. Therefore, it is not necessary to have the glove tightly fitting around the wrist and, in fact, it is desirable to have the glove fitting loosely so that the heated air can be expelled rapidly.

The invention will be more clearly understood with reference to the following figures wherein

FIGURES 1 and 1a illustrate a back view and palm view of the glove of the present invention;

FIGURE 2 is a detailed cross section of how the air

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supply hose is fitted between the outer and inner layers of the glove; and

FIGURE 3 is a cross section of the glove at the palm showing the layers of the glove.

In FIGURES 1 and 1a the air-cooled heat-resistant glove 10 includes an outer layer 12 of heat-resistant non-combustible material. For example, the outer layer may be made of asbestos. Also included in the construction of the glove 10 is an inner layer 14 of a soft, porous material. For example, the inner layer may be made of loosely woven cotton. As a further protection against heat, the inside portion of the fingers and the palm of the glove may be covered with leather material 16 such as treated rawhide.

A plastic hose 18 is inserted at the side of the glove 10 between the outer layer 12 and the inner layer 14. The hose 18 extends all the way into the back of the glove and has its opening above the fingers. The hose 18 is held in place by clamps 20 and 22. A clearer understanding of the manner in which the hose is held in position within the glove 10 is shown in FIGURE 2. In FIGURE 2 it can be seen that the outer layer 12 surrounds the hose almost completely, with the clamps 22 extending around the hose and through the outer layer 12. In FIGURES 1 and 1a a threaded nut 24 is shown attached at the end of the hose 18 to provide a place of connection for the supply of air. The air supply comes through a hose 26 which has a complementary female nut 28 to be inserted in the threaded nut 24. It will be appreciated that other means may be used for attaching the hose 26 to the hose 18.

FIGURE 3 illustrates a cross section of the glove through the palm and shows the layer 16 of rawhide, the outer layer 12 of heat-resistant material, an air space and the inner layer 14 of soft, porous material. When the air is supplied through the hose 26 and to the hose 18, it is ejected at the end of the hose 18 at the back of the hand above the fingers into the air space between the inner and outer layers 14 and 12. The air then spreads throughout the glove to carry away heat built up in the outer layer 12 and rawhide 16 and is diffused through the inner layer 14 and over the hand of the operator. The air is then ejected at the top of the glove surrounding the operator's wrist. In this manner a constant circulation of fresh air continuously carries away the heat built up in the glove.

The heat-resistant glove of the present invention has been used for prolonged periods of time under temperature conditions ranging up to 1,000° F. It will be appreciated that if the temperature of the item which is being handled is extremely high, the air which is inserted into the glove may be refrigerated to further cool the glove to a comfortable level. It will also be appreciated that the glove may be used under extreme cold conditions by supplying warm air through the hose 26 to the hose 18.

The invention has been shown and described with reference to a particular embodiment, but it will be appreciated that other adaptations and modifications may be made and the invention, therefore, is only to be limited by the appended claims.

What is claimed is:

1. A ventilated glove assembly for connection to a source of air for protecting the hand of an operator when handling items having temperatures substantially different from a normal range of temperatures, including
 - an outer layer of substantially gas-impervious insulating material conforming to the shape of the hand of the operator,
 - an inner layer of porous material conforming to the shape of the hand of the operator and positioned within the outer layer, and

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- a hose attached to the glove and extending from a position outside of the glove to a position between the inner and outer layers of material for receiving air from the source of air having a temperature to counteract the temperatures of items substantially different from the normal range for circulating air throughout the glove and through the inner layer of porous material to provide a normal temperature within the glove.
2. The ventilated glove assembly of claim 1 wherein the glove is used to handle items having a low temperature and wherein the outer layer is composed of tightly woven asbestos material.
3. The ventilated glove assembly of claim 1 wherein the glove additionally includes a layer of protective material overlaying the palm and fingers of the glove.
4. An air-cooled heat-resistant glove assembly for connection to an air source, including
- an outer layer of substantially gas-impervious heat-resistant material conforming to the shape of a hand,
- an inner layer of porous material conforming to the shape of a hand and with the inner layer of material disposed within the outer layer to form a space between the inner and outer layers of material, and
- an air hose attached to the glove and extending from a position outside of the glove to a position between the inner and outer layers for supplying air from the air source to the space between the inner and outer layers of material for circulating air throughout the glove and through the inner layer of porous material.
5. The air-cooled glove assembly of claim 1 wherein the outer layer is composed of tightly woven asbestos

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material and the inner layer is composed of loosely woven cotton material.

6. A method of constructing and cooling a heat-resistant glove including the steps of
- constructing an outer glove of substantially gas-impervious heat-resistant material,
- constructing an inner glove of porous material,
- inserting the inner glove within the outer glove and having a space between the inner and outer gloves,
- attaching to the glove an air hose extending from without the glove to the space between the inner and outer gloves, and
- supplying air to the air hose to circulate air throughout the space between the inner and outer gloves and through the porous inner glove.

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