June 27, 1950 J. D. AKERMAN 2,512,990

VENTILATOR SUIT

Filed July 9, 1947

FIG. 1

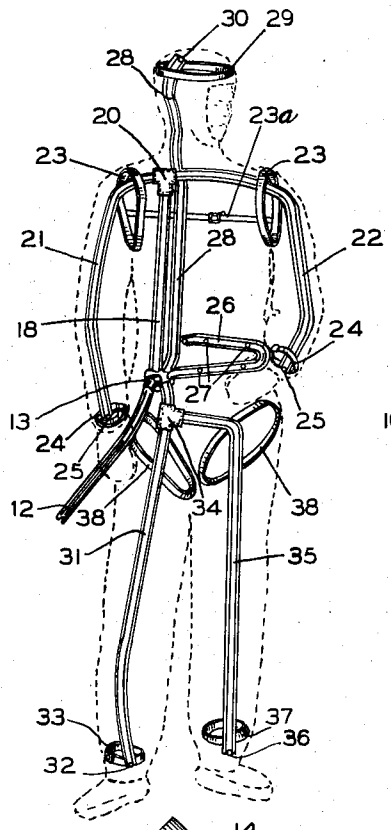


FIG. 7

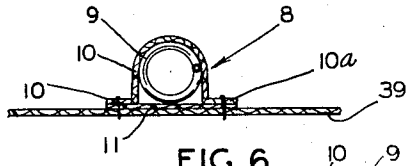


FIG. 6

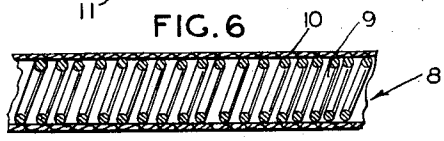


FIG. 5

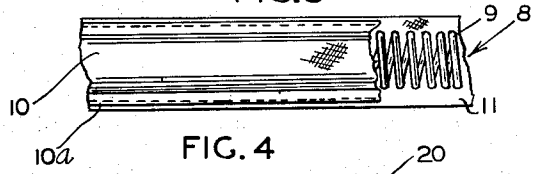


FIG. 4

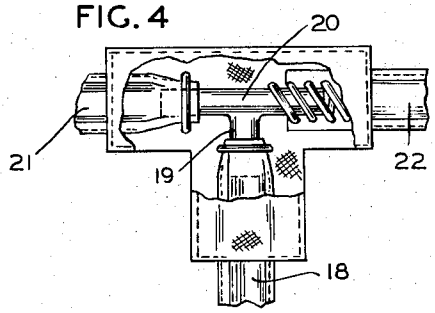


FIG. 2

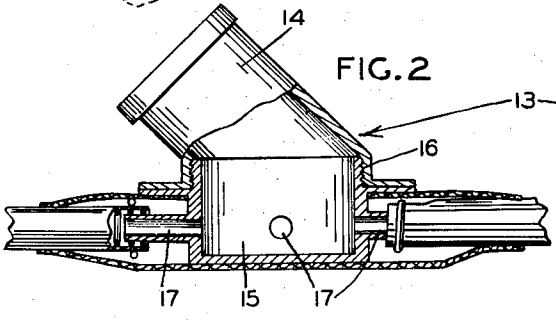
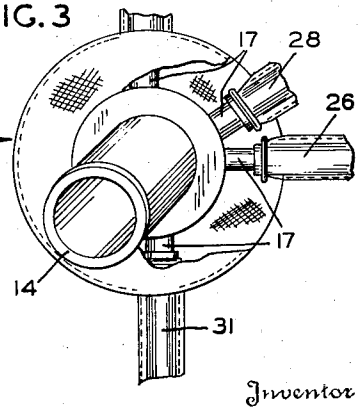


FIG. 3



Inventor

JOHN D. AKERMAN

By Williamson & Williamson

Attorneys

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VENTILATOR SUIT

John D. Akerman, Minneapolis, Minn.

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4 Claims. (Cl. 2—81)

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This invention relates to a ventilating harness for conducting air to various points in the interior of clothing, such as a flying suit which is adapted to cover practically the entire body surface of the wearer.

Many flying suits provide for more or less complete body coverage and in many instances include a helmet structure. They are worn as a protection against the cold at high altitudes. However, before the flyer has left the ground and before he has reached the cooler higher altitudes, the suits are extremely uncomfortable since they are too warm under such circumstances. If a flyer puts on a suit and perspires considerably before he ascends to the cool high altitudes mentioned above, the moisture is likely to chill him when such altitudes are reached.

In addition to suits used for flying, there are other body enclosing garments such as coverall suits worn by miners and people in other occupations where the suit is merely a protection against dust and dirt. In such cases the suits cause the wearers to become overheated with the resulting danger of catching cold in addition to the discomfort of overheating.

It is the general object of the invention to provide a ventilating harness comprising a system of ventilating tube sections connected to an inlet conduit, the several sections of the harness being securable to various parts of the body or to the interior of the suit and wherein ventilating outlets are provided at desirable points to conduct air to and cool various portions of the body of the wearer.

Another object of the invention is to provide ventilating apparatus made up of a system of tubing as mentioned above, wherein the tubing is readily flexible yet non-collapsible so that it will freely conduct air even though the tubing is bent with movement of body parts and it will also resist collapse when any external pressure is applied to it.

The above and other objects and advantages of the invention will more fully appear from the following description, made in connection with the accompanying drawings, wherein like reference characters refer to the same parts throughout the views and in which:

Figure 1 is a perspective view of the apparatus with a figure of a man wearing a body enveloping suit indicated in dotted lines.

Figure 2 is an enlarged side elevational view with portions in section of the connection between the inlet conduit and the branch conduits.

Figure 3 is a view partially in plan, with portions broken away, of the structure shown in Figure 2.

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Figure 4 is a plan view, with portions broken away, of a T branch used in leg and arm portions of the system.

Figure 5 is a fragmentary plan view of a portion of one of the ventilating conduits.

Figure 6 is a longitudinal vertical sectional view through the structure of Figure 5; and

Figure 7 is a transverse sectional view through the conduit and showing it attached by stitching to the inner side of the suit.

In Figures 5 through 7 I have shown a typical ventilating conduit section 8 which includes a helical wire element 9 having a casing thereon made up of a transversely U shaped cover portion 10 and a flat strip 11 which is secured to outwardly extending flanges 10a on the cover portion by adhesive or stitching or both. Obviously another suitable fastening means can be used. A conduit of this structure is readily flexible yet highly resistant to collapse by reason of the helical wire element 9. The fabric making up the cover portions 10 and 11 is preferably resistant to the passage of air through it so that air can be readily conducted to the outer end portions of the several conduit sections to be described below.

In Figure 1 there is shown a complete ventilating harness assembly. It includes an inlet conduit 12 which leads to a branch coupling or connection indicated generally at 13 in Figures 1 through 3. The inlet conduit 12 connects with an inlet branch 14 which communicates with a chamber 15 to which the branch is connected by suitable means, such as threads 16. The chamber 15 is provided with a plurality of side wall outlets 17 and on each of these is secured the end of a conduit section similar to the conduit section 8 shown in Figures 5 through 7. Extending from the chamber 15 is a vertically extended branch or section 18. This section extends upwardly to a branch 19 on a T 20 which lies adjacent the right shoulder of the wearer as indicated in Figure 1. From the other two arms of the T extend a right arm conduit section 21 and a left arm section 22. Said sections 21 and 22 as shown in Figure 1 have shoulder straps or loops 23 connected thereto. These are adapted to receive the upper arm portions of the wearer and to support the conduit sections 21 and 22 from the shoulders.

The lower ends of the conduits 21 and 22 are provided with wrist straps or loops 24 as is clearly shown in Figure 1. At the extreme end of

each conduit 21 and 22 is an outlet opening 25 which preferably is so located that air will flow from the conduits inside of the garment sleeve just above the cuff.

Extending horizontally outwardly from the casing 15 is a branch 26 which is adapted to extend about the waist of the wearer and said conduit may conveniently be provided with a plurality of air outlet apertures 27.

Another branch conduit 28 extends upwardly from the chamber 15 and is provided with a loop or strap 29 at its upper end which is adapted to fit upon the head of the wearer. The conduit 28 has an end air outlet 30 which is located in the inside of a helmet which forms part of a uniform or coverall.

Still another branch conduit 31 extends downwardly from the chamber 15 and it is of such length that it will terminate in the right leg portion of the garment adjacent the angle of the wearer. Its lower end is provided with an air outlet 32 and an ankle strap 33.

In the upper portion of the right leg conduit 31 is a T connection 34 to which is connected a left leg conduit section 35 having a lower air outlet opening 36 and an angle strap 37.

Secured to the upper portions of the leg conduit sections 31 and 35 are thigh straps 38 as shown in Figure 1.

Referring to the shoulder or upper arm straps 23 it will be noted that a cross strap 23*a* may be provided to connect them and prevent them from slipping down the arms of the wearer.

In Figure 7 there is shown another means for attaching air locating the several branch conduits mentioned above. Instead of mounting the conduit sections by means of straps which are adapted to encircle various body parts, the conduit section such as the section 8 of Figure 7 can have its outwardly extending flanges 10*a* sewn to the garment fabric indicated at 39. However, in such a construction the harness or conduit system becomes a portion of the garment unit, whereas in the arrangement of Figure 1 the conduit system is completely separate from the garment.

As pointed out above a ventilating system or conduit harness arrangement such as shown and described can be conveniently utilized to ventilate the entire body of the wearer of a relatively close-fitting coverall type of garment. By placing the air outlets in the conduit branches at various strategic points, not only will the body be cool at this point but the air will circulate generally through the garment. It is of decided advantage, however, to locate the outlets at spaced points to insure complete distribution of air in various extremities of the garment. The several conduits can be made extremely small so that the assembly is not cumbersome but it will still distribute an ample supply of air to accomplish the desired purpose. As pointed out above, the conduit sections are readily flexible but are held against collapsing by reason of the helical wire 9 which will withstand considerable external pressure.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of my invention.

What I claim is:

1. A ventilating system for clothing including an inlet conduit, a plurality of branch conduits connected to said inlet conduit, said branch conduits including a pair of leg sections, a pair of arm sections and a waist encircling section, and said conduits having ventilating outlets at points remote from their connection with said inlet conduit, and said waist section having openings therein at spaced points along its length.

2. A ventilating system for clothing including an inlet conduit, a plurality of branch conduits connected to said inlet conduit, said branch conduits including a pair of leg sections, a pair of arm sections, a waist section and a helmet section, said conduits having ventilating outlets at points remote from their connection with said inlet conduit, and said conduits having shoulder harness means attached thereto for supporting the conduits on a human figure, and said helmet section having a head engaging support thereon.

3. A ventilating system for use inside a body enveloping suit having a trunk portion, legs and arms, comprising inlet conduit, a plurality of branch conduits connected to said inlet conduit and including a pair of leg conduits, each of sufficient length to extend substantially throughout the legs of said garment, a pair of arm conduits of sufficient length which extend substantially throughout the lengths of the arms of said garment, a waist conduit of sufficient length to at least partially extend about the inner waist portion of the garment, said branch conduits having outlets therein at points remote from their connections with said inlet conduit, and said waist conduit having openings therein at spaced points throughout its length.

4. A ventilating system for clothing including an inlet conduit, a plurality of branch conduits connected to said inlet conduit, said branch conduits having ventilating outlets therein at points remote from their connection with said inlet conduit, and each of said branch conduits having a flange extending outwardly therefrom and extending substantially coextensively with the length of the branch and longitudinally thereof and providing means whereby said conduits can be secured to the clothing with which they are associated.

JOHN D. AKERMAN.

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