

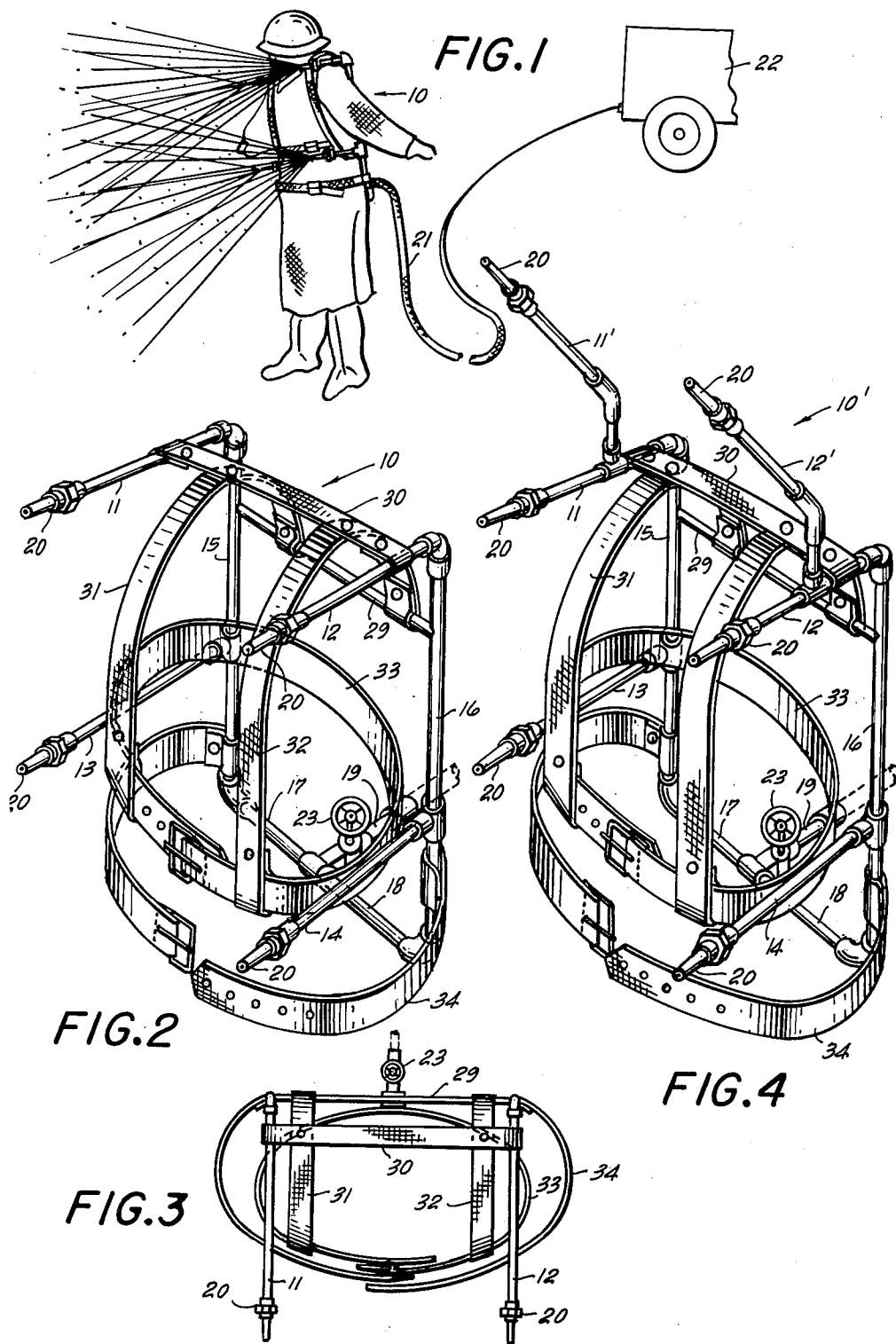
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FIREFIGHTING APPARATUS

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## FIREFIGHTING APPARATUS

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5 Claims. (Cl. 169—1)

This invention relates to a new and improved firefighting apparatus and, in particular, to a portable utility shield adapted to be carried on the body of a fireman for directing a firefighting medium, such as water spray or chemical foam, onto a concentrated fire target area, while at the same time providing a protective shield of water fog or chemical foam about his body.

An important objective of the present invention is to provide a new and improved portable firefighting apparatus which forms a protective shield or mantle of cool, moist air about the body of the fireman while in the midst of a fire and which also allows complete freedom of both of the fireman's arms for handling debris and for rescuing entrapped persons.

Another important objective of the present invention is to provide a new and improved means for portably harnessing a source of highly-pressurized fluid firefighting medium to a fireman in a manner whereby the emergent fluid stream can be directed and maintained on a fire target area in front of the fireman by the movements of the body alone and without use of the arms.

An important and distinctive feature of the portable shield apparatus of the present invention is that, unlike conventional apparatus in the prior art, no substantial portion of the fluid firefighting medium flowing in the delivery line is diverted away from the fire target area in order to form a protective shield of water fog or chemical foam about the body of the fireman.

Another distinctive feature of the present invention is that the delivery line, which connects the portable shield carried on the body of the fireman to the source of the pressurized firefighting medium, also serves as a lifeline for enabling the fireman in an emergency to retreat hastily to safety from the fire area.

The foregoing and other objectives, features, and advantages of the present invention will be more readily understood upon consideration of the following detailed description of the invention, taken in conjunction with the accompanying drawings.

FIG. 1 is a diagrammatic sketch of a fireman utilizing the portable shield apparatus of the present invention.

FIG. 2 is a front perspective view of an illustrative embodiment of the shield apparatus of the present invention which may be advantageously used in fighting automobile fires.

FIG. 3 is a top view of the embodiment shown in FIG. 2.

FIG. 4 is a front perspective view of a modified embodiment of the shield apparatus of the present invention which is especially useful in fighting building fires.

Referring now to the drawings, and FIGS. 1-3 in particular, there is shown an illustrative embodiment of a portable shield apparatus in accordance with the present invention. The shield, indicated generally as 10, is secured to the body of the fireman and is connected through a conduit or hose 21 to a source of pressurized firefighting fluid, such as water or chemical foam, delivered from a pump of a fire truck 22.

The portion of the shield assembly 10 through which the firefighting fluid flows is comprised of a coupling pipe 19 for connection to the delivery line 21, a set of pipes 15-18 formed into the shape of an upright U section, and a rectangular arrangement of horizontally extending pipes 11-14 connected to the U-shaped pipes and projecting respectively from each corner of the rectangle. A standard

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fog nozzle 20 is fitted at the end of each of the four forwardly projecting pipes 11-14, the arrangement of the nozzles being such as to produce a protective shield of fluid spray in front of the fireman as the firefighting medium is directed forwardly onto the fire target area. The shield assembly is preferably equipped with a valve 23 in the coupling line 19 so that the flow of pressurized fluid through the nozzles 20 at the front of the shield can be closed off and regulated to some extent by the wearer.

As may be seen from the figures, the upper pair of pipes 11 and 12 in the rectangular arrangement pass over the shoulders of the wearer, while the lower pair 13 and 14 pass under the arms at about waist level. For securing the shield assembly fixedly to the body of the fireman a suitable torso harness, comprising a horizontal strap 30 attached across the back between the pipes 11 and 12, a pair of vertical shoulder straps 31, 32 connected at the back to a horizontal brace 29 between pipes 15 and 16 and at the front to a chest belt 33, and a waist belt 34, is provided.

As may be best seen from the diagrammatic representation of FIG. 1, the pressurized fluid emergent from the rectangular array of fog nozzles 20 at the termination of the respective pipes 11-14 produces a protective screen of cool moist air in front of the fireman as he walks into the fire, thereby substantially reducing the possibility of smoke or heat asphyxiation and enabling him to advance into the center of the conflagration at a rapid pace. Because of the very high pressurizations which can be satisfactorily and advantageously used with the shield apparatus of the present invention (as high as 750 pounds per square inch), the force of the emergent fluid from the nozzles 20 is sufficiently great to produce a protective screen of substantial dimension in all three planes and thus ensuring the fireman a continuous supply of air for breathing.

As the shield assembly 10 is firmly and rigidly secured to the body by means of the torso harness, the protective screen of fog will always be directed in front of the fireman as he advances and turns into the flames. The construction of the shield and its means of attachment to the body are such that both arms of the wearer are allowed complete freedom of movement, and are thus available for use in handling debris and for removing persons who may be trapped in the flames.

Another advantageous feature of the present invention is that the delivery line 21, which connects the shield apparatus 10 to the source 22 of pressurized firefighting fluid, serves also as a highly dependable lifeline for the fireman. In conventional situations a lifeline is typically provided by tying a rope of hemp or other fiber construction onto the fireman advancing into the flames. However, there is always the possibility present that a rope of such material might be burnt through by the intense heat and flames of the fire, thus leaving the fireman without a means for tracing his way back to safety through blinding smoke and flames. In the present case this possibility is substantially minimized as the flow of fluid through the delivery line greatly increases the resistance of the lifeline to flame and heat. However, in the off-chance that the heat of the flames is so intense that the delivery line 21 begins to burn through, the pressure in the nozzles 20 of the shield 10 will drop off markedly as the fluid spurts through the opening in the lifeline, and thus the fireman will be immediately apprised of the situation and he will have sufficient time to retreat to safety before the escape line burns through and separates.

The embodiment of the invention shown in FIGS. 1-3 may be advantageously used in fighting fires in automobiles and in other small confined areas since the portable shield 10 is of compact design and the structure of the

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apparatus does not substantially project beyond the body contour of the fireman. However, in combating fires in building structures and rooms, the modified shield apparatus 10' shown in FIG. 4 is preferred for use. In the modification 10' the basic shield design shown in the preceding figures is changed to incorporate an additional pair of upwardly-angled pipes 11' and 12' which are coupled respectively to the upper pair of pipes 11 and 12. These additional pipes 11' and 12' are terminated, similar to pipes 11-14, with fog nozzles 20 for directing a portion of the fluid stream upwardly against the ceiling surface as the fireman advances into the structure.

The terms and expressions which have been employed here are used as terms of description and not of limitation, and there is no intention, in the use of such terms and expressions, of excluding equivalents of the features shown and described, or portions thereof, it being recognized that various modifications are possible within the scope of the invention claimed.

What is claimed is:

1. A firefighting apparatus adapted to be carried on the body of a fireman comprising in combination,
  - (a) a harness assembly for fixedly securing said apparatus to the upper torso of a fireman,
  - (b) conduit means including, a connector for coupling to a line source of pressurized firefighting fluid, an upright section, and a plurality of pipes connected to spaced points on said upright section, at least one of said pipes extending horizontally above shoulder level and another extending horizontally at about waist level when said apparatus is attached to the body, and
  - (c) a plurality of fog-forming nozzles each connected to a termination of said plurality of pipes in an arrangement whereby the fluid emergent from said nozzles is directed in a generally forward direction onto a fire target and also forms a protective fog-screen of cool moist air in front of said fireman.
2. The combination as set forth in claim 1 further including means on said apparatus for regulating the flow of said fluid in said conduit means.
3. The combination as set forth in claim 1 wherein said plurality of pipes further includes at least one upwardly-angled and forwardly-directed pipe terminated in a fog-

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forming nozzle for directing a stream of said firefighting fluid against a ceiling surface.

4. A firefighting apparatus comprising in combination,

(a) conduit means including, an upright U-shaped section, a connector at the base of said U-shaped section for coupling to a line source of pressurized firefighting fluid, and an arrangement of four horizontally-extending pipes connected to said U-shaped section at points generally corresponding to respective corners of a vertically-disposed rectangle,

(b) a plurality of fog-forming nozzles each connected to a termination of one of said horizontally-extending pipes,

(c) means for controlling the flow of said fluid in said conduit means, and

(d) a harness assembly for fixedly securing said conduit means to the upper torso of a fireman in a manner whereby said U-shaped section lies vertically along the back, the upper pair of said rectangular arrangement of pipes pass over the respective shoulders, and the lower pair of pipes pass underneath the respective shoulders at about waist level.

5. The combination as set forth in claim 4 wherein said conduit means further includes at least one upwardly-angled and forwardly-directed pipe extending above shoulder level and terminated in a fog-forming nozzle.

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