United States Patent

[11] 3,547,200

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[54] **FOAM DEVICE FOR FOG NOZZLES**
4 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **169/15**
[51] **Int. Cl.** **A62c 35/00**
[50] **Field of Search** 169/5, 15, 14; 239/418, 419.5, 424, 428.5, 434.5, 553.3, 590.3

[56] **References Cited**

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ABSTRACT: An attachment for fog nozzles of the character employed by firemen comprising, a pair of concentric tubes or sleeves disposed in spaced relation, the innermost tube or sleeve being spaced from the outer tube and said innermost sleeve being shaped to form a primary Venturi passage; the spacing between the two tubes constituting a secondary Venturi passage. A coupling for a hose and an attachment for a fog nozzle is located centrally and at the mouth of the innermost tube. The outermost tube has a portion projecting beyond an end of the innermost tube and said portion contains a single frustoconical foraminous screen which has its larger end secured to the forward end of the innermost sleeve. Said screen has a central opening at its forward end that is reinforced by a ring or annulus to constantly maintain an opening of uniform diameter at the forward end of the screen.

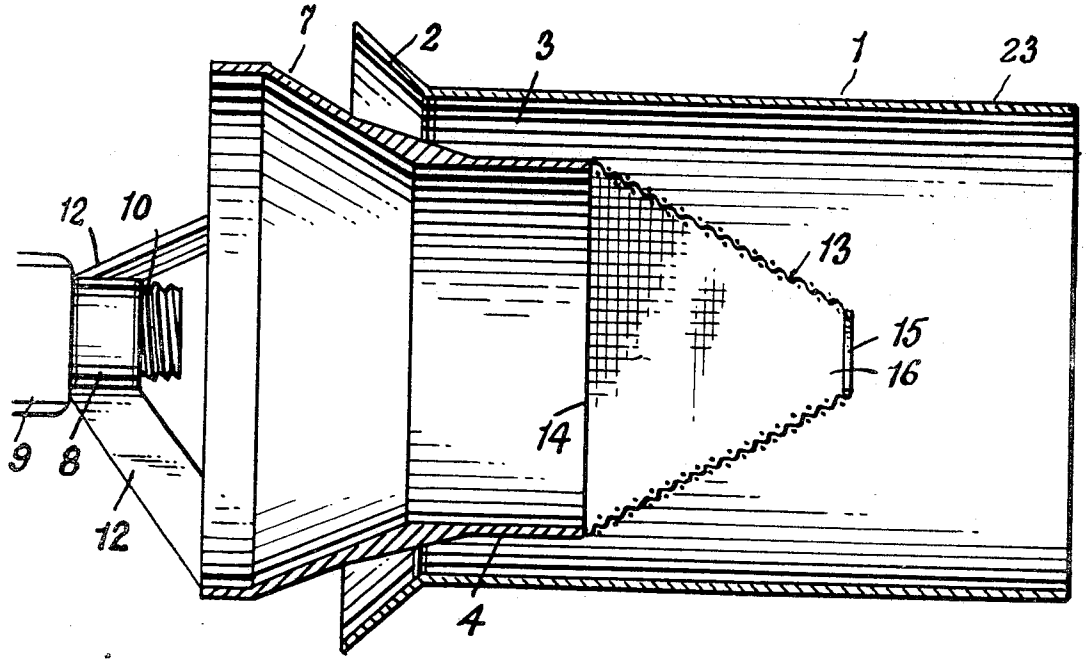

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FIG. 1.

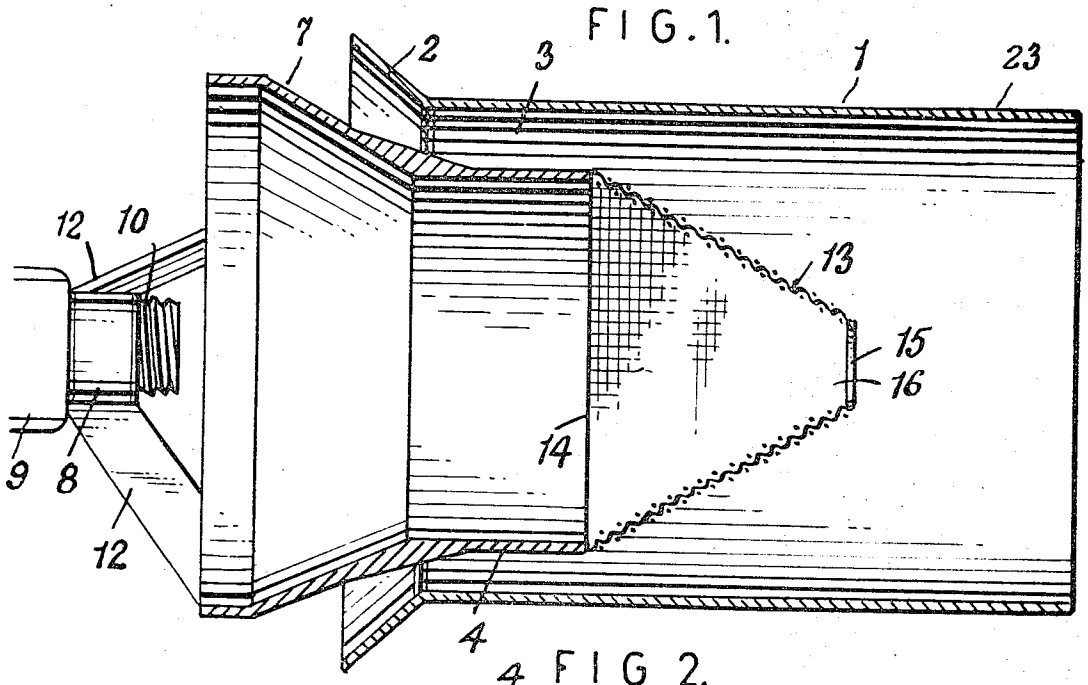


FIG 2.

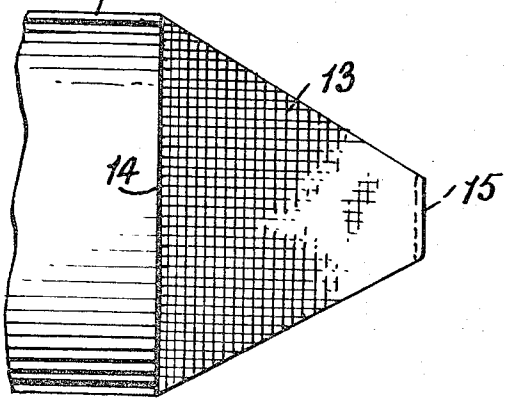
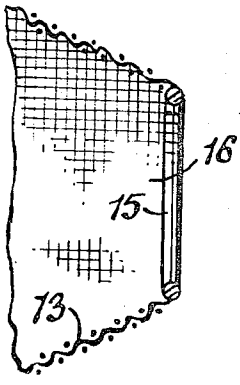


FIG. 3.



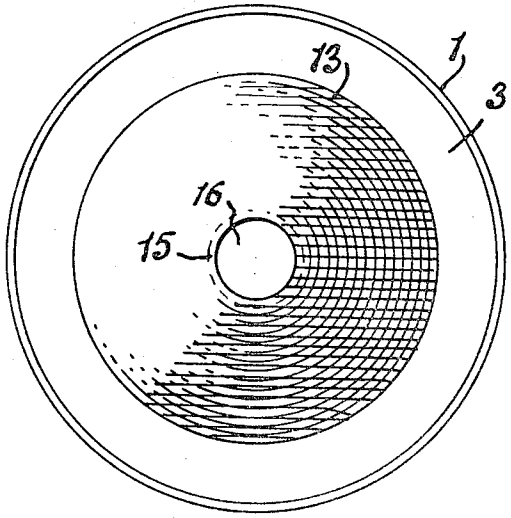


FIG. 4.

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FOAM DEVICE FOR FOG NOZZLES

BACKGROUND OF THE INVENTION

In my copending application Ser. No. 658,714 filed Aug. 7, 1967 now U.S. Pat. No. 3,446,285 is shown a foam device of the general character of that herein described. Such type of foam device, as described in said application, has a plurality of nested frustoconical screens located in an outermost sleeve and forwardly of the front end of an innermost sleeve. It has been found that while such an arrangement produces a very substantial foaming action, the securement of greater reach by the fog is possible by the arrangement and disposition of a single foraminous screen that is secured to and arranged at the forward end of the innermost sleeve. The present invention therefore contemplates an arrangement in which a single frustoconical foraminous sleeve or screen is used and while such an arrangement results in a slight decrease in the foaming action it has been found highly desirable in cases where greater reach of the foam is desired.

DESCRIPTION OF THE INVENTION

The invention relates to fog nozzle attachments for use in connection with fire hoses and has for one of its objects the provision of a device of this character by means of which substantial variations in the outflow of foam or liquid can be had. It is an object of the invention to provide a device of this character which can provide for straight stream operation in addition to ultra high expansion flow and to secure various other flow effects and reach of the flow and where such flow effects are desirable and advantageous under different operating conditions.

With these and other objects to be hereinafter set forth in view, I have devised the arrangement of parts to be described and more particularly pointed out in the claims appended hereto.

In the accompanying drawing, wherein an illustrative embodiment of the invention is disclosed:

FIG. 1 is a longitudinal sectional view of a device constructed according to the invention;

FIG. 2 is an elevational view of the forward end of the innermost sleeve showing the frustoconical screen attached to and projecting forwardly of the sleeve;

FIG. 3 is an enlarged view in section of the front end of the screen, and FIG. 4 is a view of the device as seen from the right end of FIG. 1.

Referring to the drawing, 1 indicates an outer shell or sleeve of tubular form, said shell being provided with a flared end 2 cooperating in the formation of a Venturi passage between it and an inner shell or sleeve shown at 4. This shorter inner sleeve or shell 4 is arranged within and is spaced from the outer shell 1, so that there is an annular spacing 3 between it and the outer shell or sleeve 1. Both of the sleeves 1 and 4 are composed of imperforate material and the outer sleeve may be provided on its exterior with handles or other projections, not shown, by means of which the device can be conveniently handled and used.

The inner sleeve or shell 4 may be supported within the outer shell by brackets or radial braces or other supports which serve to maintain the two sleeves 1 and 4 in their required spaced and concentric relation. The inner sleeve 4 is flared at one end, as shown at 7 thus providing what may be referred to as the "primary Venturi opening" extending through it. The inner sleeve 4 extends beyond the flared end 2 of the outer sleeve and at its opposite end the outer sleeve extends beyond the forward end of the inner sleeve, thus providing a projecting portion 23.

Arranged centrally of the two sleeves or shells 1 and 4 is a hose coupling 8 to one end of which is attached a hose 9 and said coupling is threaded at 10 to receive a conventional fog nozzle. The coupling 8 is supported from the inner shell 4 by means of radial braces shown at 12. An in-line foam eductor is used in connection with the fog nozzle to introduce foam solution into the water stream before it reaches the unit.

Mounted within the outer sleeve 1 and having its larger end secured at the forward end 14 of the inner sleeve 4 is a frustoconical foraminous screen 13. Such screen may be composed of noncorrosive wire mesh and may be of such flexible nature that it will sag or droop when the device is not in use but becomes as shown in FIG. 1 when under the pressure of the water.

At its smaller end or apex the screen is provided with a central opening 16 to the edge of which is secured a stiffening ring 15 to insure the constant maintenance of a uniform central opening at the forward or smaller end of the screen. It will be understood that the size of the interstices in the screen may be varied according to different requirements.

In the operation of the device different effects are obtainable. When the fog nozzle is adjusted for a spreading or flaring action of the fluid emanating from it and which fluid tends to spread upon leaving the inner sleeve or shell 4 to pass through the screen 13 and emerge as foam, a wide spread and short reach of the foam will be had to snuff out an adjacent fire. While the unit is so operating, air will enter through the primary Venturi 4 and air will also enter through the secondary passage 3, the siphoning action of the fluid emanating from the foam nozzle aiding in the securing of this effect. With the flow from the foam nozzle adjusted for wide angle fog (approximately 60° or less) the flow of liquid passing through the primary Venturi passage defined by the sleeve 4 and filling the narrower end thereof causes a lower pressure differential at the wide end of the sleeve 4, causing an inrush of air through the primary Venturi and increases the velocity of the solution and air to enter the secondary Venturi passage 3. The velocity of the solution and air passing through the screen 13 causes a rapid expansion of the foam solution. This expansion and the forward velocity of the mixture through the screen 13 causes a pressure differential at the opening of the second Venturi passage 3, causing more air to flow around the outside of the sleeve 4 and through the screen 13. This added air increases the expansion ratio of the expanded solution flowing through the foam screen.

When longer reach of the foam emanating from the device is required, the operator will adjust his fog nozzle in a manner to narrow the fog pattern in the throat of the sleeve 4, causing a higher flow velocity through the screen 13 at a reduced expansion ratio on the final discharge.

For greater reach of the output from the unit, the operator can alter the fog nozzle pattern to a straight stream. In the operation of the device in this manner, there is considerably less airflow introduced through the screen 13 causing a lower expansion ratio of the discharged stream. The central opening 16 in the screen 13 allows the straight stream to pass directly out of the unit.

There is herein disclosed a foam attachment which can be employed with various settings and adjustments of the conventional fog nozzle, thus giving the fireman or other user more versatility and selection of the different operations, and which is of such efficiency that there is considerable saving of water and foam solution per cubic foot of output and greater safety for the fireman.

Most fire departments are provided with in-line and matching nozzles as standard equipment and can use them in connection with this device at great saving in initial purchase cost.

I claim:

1. A unit for use in connection with a fog nozzle comprising, a pair of sleeves arranged in concentric, spaced relation to thereby provide an annular spacing between them, the spacing constituting a secondary Venturi passage, the innermost of the sleeves forming a primary Venturi passage through it, means for supporting a fog nozzle at the entrance to the innermost sleeve, and a single frustoconical foraminous screen located at the forward end of the innermost sleeve, said single screen having an opening through its apex.

2. A unit for use in connection with a fog nozzle according to claim 1, wherein the screen has its larger end attached to

the forward end of the innermost sleeve and the screen has an annulus encircling its central opening.

3. A unit according to claim 2, wherein the apertured end of the screen is located rearwardly of the forward end of the outermost sleeve and forwardly of the front end of the innermost sleeve.

4. A unit according to claim 1, wherein the screen is attached to the forward end of the innermost sleeve and constitutes a frustoconical foraminous extension thereof and the outer smaller end of the screen is located without the outer sleeve and inwardly of the forward end of said sleeve.