Dec. 10, 1935. E. H. WELLS, JR 2,023,984

THERMAL INSULATING ARTICLE

Filed Sept. 2, 1933

Fig. 1.

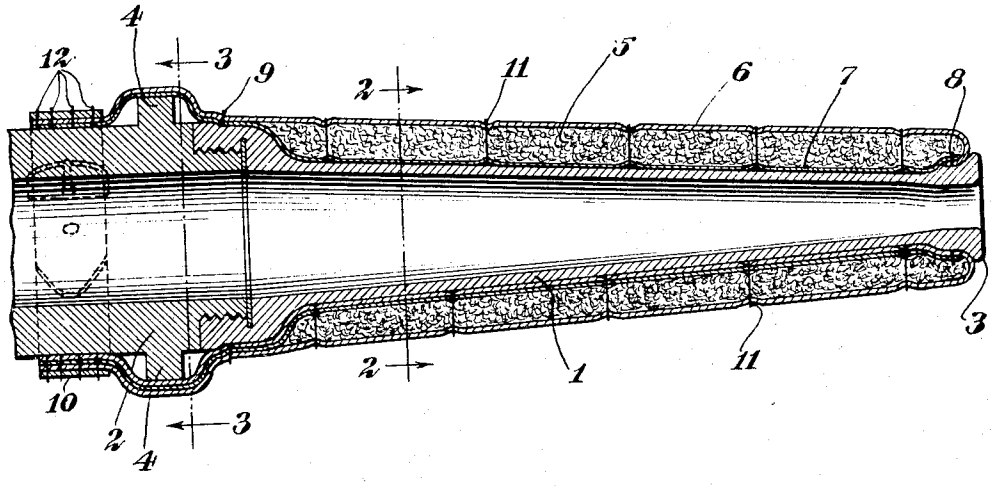


Fig. 2.

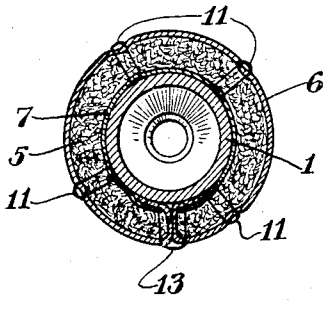
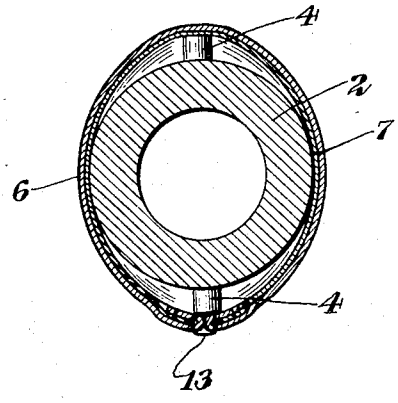


Fig. 3.



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THERMAL INSULATING ARTICLE

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6 Claims. (Cl. 154—44)

This invention relates to thermal insulation and particularly to a tapered tubular article adapted to be engaged snugly over the nozzle of a fire hose and provided with means for preventing wetting of the insulation by water escaping from the nozzle.

There is considerable use of hot water in extinguishing fires. Thus, switch engines are frequently equipped with a hose for spraying water from the boiler upon fires that may occur in railway yards. There has been an obvious need of a satisfactory insulation for the nozzle of the fire hose, to make possible comfortable and safe handling thereof. Heretofore there has been used insulated handles on the nozzle or insulation, in the form of cloth or the like, wrapped around the nozzle. Such insulation may be wetted by water accidently falling thereupon or may become disengaged, at a critical time, and introduce danger of scalding the operator. Neither expedient has been entirely satisfactory.

It is an object of the present invention to provide a nozzle cover overcoming the disadvantages mentioned. A further object is to provide a cover that fits snugly over the nozzle, is protected against being wetted by the fluid being sprayed, and is provided with means at either end for minimizing the entrance of water between the cover and the nozzle. A further object is to provide a cover that extends over irregularities in the nozzle or coupling therefor and reduces the effect of such irregularities in wearing through sections of hose that, when not in use, would otherwise be in contact with the said irregularities. Other objects and advantages will appear from the detailed description that follows and from the appended claims.

The invention is illustrated in the attached drawing in which

Fig. 1 shows a longitudinal sectional view of a nozzle and a part of the coupling attached thereto, with the improved thermal insulating cover in place;

Fig. 2 shows a cross sectional view on line 2—2 of Fig. 1, in the direction of the arrows; and

Fig. 3 shows a cross sectional view on line 3—3 of Fig. 1, in the direction of the arrows.

There is shown a nozzle 1 for conveying hot fluids, suitably the nozzle of a fire hose, and attached thereto a coupling 2. The nozzle and the coupling are of conventional materials, as, for example brass or cast steel. The nozzle is provided with a flared portion 3 at its forward end. The coupling has projections 4, such as lugs, extending from its outer surface and adapted to be engaged by wrenches that are commonly used for engaging or disengaging the coupling, at one end, in the nozzle and, at the other end, in the hose (not shown).

Disposed around the nozzle and extending over the projections 4 is the thermal insulating article of the present invention. This article comprises a fibrous filling 5, that advantageously consists of fire-resistant fibers of low thermal conductance, such as asbestos fibers, enclosed within an approximately tubular case, as, for example, a tapered tubular, double-walled or hollow-walled casing member including the exterior or outer element 6 and the interior element 7 joined together, at one end, as by the stitching 8 and, at the opposite larger end of the tube, by the circumferential stitching 9. Beyond the stitching 9 and extending to the end of the enlarged portion of the covering, the fibrous filling is suitably omitted, to form a thin-walled portion adapted to be drawn over the projections on the coupling and then to be constricted and held securely against the coupling, by means of the strap 10 which encircles the gauntlet at this point and is tightened by means of the buckle 11. The fibrous filling preferably is made repellent to the fluid which is to be sprayed from the nozzle, by the application to the fibers of a coating that is repellent to or has negative capillarity for the fluid. Thus, when the fluid to be sprayed is water, the fibers may be made repellent thereto by a thin coating of a material of negative capillarity for water, as for example, a thin coating of a water-impermeable wax, aluminum stearate, or zinc stearate coated upon the fibers and continuously coalesced thereover.

The casing elements 6 and 7 forming, respectively, the exterior and interior walls of the casing that encloses the fibers, for best results, are formed of a flexible, yieldable, textile fabric, such as cloth woven of asbestos yarn. To prevent the wetting of the fabric by the fluid issuing from the nozzle, when the nozzle is in use, and the subsequent penetration of the fluid into the interior of the insulating covering, the elements 6 and 7, particularly the exterior 6, may be coated with a material that is impermeable or repellent to the fluid. Thus, for a fire nozzle for use with boiling water, the coating may be one of unvulcanized rubber, incompletely polymerized, pliable chloroprene, or other water-insoluble and water-impermeable material of properties resembling those of rubber. This coating material is suitably one that not only makes the exterior impermeable to the liquid being sprayed but also is elastic and

adapts the covering to be stretched, while being drawn over the nozzle, and, finally, to fit snugly therearound. Thus, the smaller end of the tapered tubular cover may be constricted and drawn tightly against the small end of the nozzle, by means of the elastic coating. Since the strap 10 constricts the other end of the covering and holds it tightly against the coupling, the likelihood of fluid entering between the covering and the nozzle is minimized. In such a structure, the fluid-proof coating of the interior casing 7 may be omitted.

To minimize shifting of the fibrous filling material within the casing, the article may be quilted or tufted at intervals as indicated at positions 11. Preferably, quilting means comprising short strands of asbestos yarn or the like of low thermal conductance are inserted completely through the outer and inner casings and through the fibrous filling therebetween and tied in position in a convenient manner.

In one method of making an article of the type described, a sheet of asbestos fabric of suitable width and length to comprise the outer member 6 is laid on a table and a layer of fibrous material adapted to form the filling 5 in the finished article is laid over the fabric. Then a fabric of suitable size and shape to compose the inner casing 7 is laid over the asbestos fibers and is stitched at positions 8, 9, and 12, in a direction that is transverse to the length of the article. It may also be stitched along its side edges to the member 6, suitably a short distance from the side edges of the said member. The structure is then quilted at positions 11. Then the composite is shaped into tapered tubular form, and is stitched lengthwise, at position 13, to hold the abutting longitudinal edges of the fabric together.

After the stitching is done, the article may be dipped in a bath of fluid-proofing material, such as a solution of rubber in a volatile solvent, say, in a socalled "rubber cement". In this manner, the rubber is coated not only over the fabric itself but also over all joints and stitches, to give thorough sealing against the penetration of water. In making this dipping, the ends of the tube may be sealed, if the inside is not to be coated. Or, the coating may be applied by means of a brush. The coating should extend, in any case, a short distance into the small end of the tube as well as over the front (small end) and over the outside or exterior surface. After the coating is made, volatile liquid present in the coating solution is evaporated. It is not desirable to harden the coating composition, as by vulcanization when rubber is used, inasmuch as the flexibility, pliability, and elasticity of unvulcanized rubber are preferred to the properties of vulcanized rubber. Finally, the strap 10 is secured to the end of the gauntlet, as by being stitched thereto as illustrated.

The size of the cover should be such as to require very slight stretching when drawn over the nozzle, in order that the final fit may be tight.

Inasmuch as the lugs or projections 4 on the coupling are ordinarily in contact with the hose, when the hose is stored in spirally wound condition, as is the custom on switch engines, the cover extending over these lugs provides a cushioning effect that protects the hose from being gradually worn through by the lugs. Also, the lugs and the gauntlet drawn thereover and then constricted, as by means of the strap 10, at a position behind the lugs, secure the cover, conveniently, in fixed position with respect to the nozzle and minimize the likelihood of disengagement of the cover from the nozzle during use.

It will be seen that, to minimize wetting, the cover is made somewhat shorter than the nozzle and the front end of the cover is disposed rearwardly with respect to the flare 3 of the nozzle.

The details that have been given are for the purpose of illustration, not restriction, and variations therefrom may be made within the scope of the appended claims.

What I claim is:

1. A thermal insulating cover, adapted for use over a nozzle for conveying hot fluid, comprising a thick, main portion of approximately tubular shape adapted to fit over the nozzle, a layer of thermal insulating fibers constituting a filling in the said main portion, a flexible case enclosing the fibers, an exterior of the case that is impermeable to the fluid to be conveyed, and means for minimizing shifting of fibers within the case.

2. A thermal insulating cover, adapted for use over a nozzle for conveying hot fluid, comprising a thick, main portion of approximately tubular shape adapted to fit over the nozzle, a layer of thermal insulating fibers constituting a filling in the said main portion, a flexible case enclosing the fibers, an exterior of the case that is impermeable to the fluid to be conveyed, a thin-walled portion extending from an end of the main portion, and means securing the thin-walled portion in fixed position with respect to the nozzle to prevent disengagement of the cover from the nozzle.

3. A thermal insulating cover, adapted for use over a nozzle for conveying a hot fluid, comprising a thick, main portion of tapered tubular shape adapted to fit over the nozzle, a layer of thermal insulating fibers constituting a filling in the said main portion, a flexible case enclosing the fibers, an exterior of the case that is impermeable to the fluid to be conveyed, a thin-walled portion extending from an end of the main portion, and means attached to and encircling the said thin-walled portion for securing it in fixed position with respect to the nozzle.

4. An article as described, in claim 1 including a material, adapted to render the case impermeable to the fluid to be conveyed, disposed over all parts of the case enclosing the fibers, whereby penetration of fluid is prevented.

5. An article as described in claim 1 including a material, adapted to render the thermal insulating fibers repellent to the fluid to be conveyed, coated upon the said fibers.

6. A thermal insulating cover, adapted for use over a nozzle for conveying a hot fluid, comprising a thick, main portion of tapered tubular shape adapted to fit over the nozzle, a layer of thermal insulating fibers constituting a filling in the said main portion, a flexible case enclosing the fibers, an exterior of the case that is impermeable to the fluid to be conveyed, a thin-walled portion extending from an end of the main portion, means encircling the said thin-walled portion for securing it in position with respect to the nozzle, and means for drawing the small end of the tapered cover tightly against the small end of the nozzle.

EDWARD H. WELLS, JR.