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METHOD AND APPARATUS FOR SPRAYING INSULATION

Lewis W. Eckert, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa., a corporation of Pennsylvania

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U.S. Cl. 239—10 2 Claims

ABSTRACT OF THE DISCLOSURE

A method and apparatus for spraying insulation wherein the dry spray-type fiber insulation is treated with water in a special nozzle structure to assure the application and adherence of the insulation to the equipment surface. The nozzle structure uses a minimum of spray water to eliminate dust and also uses the spray to wet and direct the insulation into position.

BACKGROUND OF THE INVENTION

Field of the invention

The invention is directed to a nozzle structure for the applying and directing of a dry material which is to be sprayed as an insulating coating. Furthermore, the invention is directed to a method of applying dry insulation material to provide dust and secure a thick buildup of insulating material.

Description of the prior art

The application of spray insulation is best exemplified in the building trades. The one major problem that has been encountered with spray insulation is the generation of dust resulting from the unconnected relative fiber particles which comprise the major component of the spray insulation. The dust generated is a hazard to the man using the spray equipment, and the dust is a definite wasted insulation material.

The most commonly used spray insulating nozzle for applying spray insulation is the "external" nozzle, [illegible] the Univer[illegible] Machine Company. This nozzle is called an external nozzle because [illegible] nozzle directs the [illegible] the nozzle exit at the interior of the nozzle. The water is directed to an elevated annular area of the insulating material to wet the material. This external nozzle is used primarily for the application of a volume of spray insulation to a layer [illegible] 6" to 8".

A second nozzle commonly used is the so-called "internal" nozzle. This nozzle is shown in [illegible] Spraying Machine Company. The nozzle has a [illegible] spaced inside the nozzle body. The [illegible] the nozzle to provide a solid curtain of water through which material will pass. The end of the nozzle has a [illegible] to provide control of the spray pattern. This nozzle is used primarily with insulating cement.

A mineral insulation is composed of at least 75% by weight of asbestos or mineral wool with its remaining composition being binders such as clay and cement. An insulating cement has a much larger percentage of the binders, such as clay and cement, and advises short fibers as the remaining component. The insulating cement does provide a small degree of insulation, but is used primarily to provide a smooth finish coat over the fiber insulation and is normally applied only to a ¼" or ⅜" thickness. The fiber insulation is the primary insulator and is normally applied in a thickness of 6" to 8" since the internal nozzle is usually used to apply the insulating cement in a thickness believed to provide a much denser [illegible] which will not deteriorate with the fiber insulation.

The internal nozzle has been used to apply the fiber insulation; however, when used with the fiber insulation, it tends to be discouraged because of globs of [illegible]. When the insulation is applied in this manner, it is better than need still [illegible] to compact it to a greater degree. Consequently, the [illegible] the adhesive [illegible] and the [illegible] 6" to 8".

When [illegible] is used to apply the insulation, there [illegible] dust problem which cannot be controlled [illegible] of the cement to the fiber insulation. [illegible] the internal nozzle with a [illegible] to [illegible] the thickness of the insulating coating that can be [illegible]. The coat that is provided tends to have a [illegible] and unless the nozzle structure [illegible] the [illegible] with the fiber [illegible]. The internal nozzle is [illegible] for applying [illegible] cement. The problem [illegible] the industry [illegible] to overcome a lack of [illegible] ing a rapid [illegible] the desired thickness of [illegible] build up [illegible] the [illegible] the fiber [illegible].

SUMMARY OF THE INVENTION

The [illegible] is directed towards the method and [illegible] for [illegible] spray insulation without a dust problem. Specifically, the invention is directed towards a novel nozzle structure which permits the [illegible] of the fiber [illegible].

The nozzle [illegible] has two water injection areas which cooperate to eliminate the dust problem and permit the proper application of the spray insulation to the desired thickness. Separately from the exit opening of the spray [illegible] is the first water injection area. This [illegible] the spray [illegible] with water to [illegible] the dust. This water is [illegible] to penetrate the fiber insulation [illegible] the fiber [illegible] to [illegible] the dust problem.

The second water area is at the exit of the nozzle and provides a water envelope [illegible] the spray [illegible] exits from the nozzle structure. Additional water may be directed into the stream of spray [illegible] the water injection at the exit [illegible] used primarily to [illegible] the spray insulation and to provide [illegible] the wetness that is necessary to give the spray [illegible] the adhesion necessary to permit the buildup of [illegible].

Both water [illegible] are subject to manual control by the [illegible]. This permits the nozzle to be adjusted with [illegible] amounts of spray insulation which vary to a [illegible] extent. The operator need only adjust the two water [illegible] areas to provide the proper volume between the two, so that dust control and proper application of the spray insulation may be maintained [illegible] the nozzle to carry out its intended functions.

BRIEF DESCRIPTION OF THE DRAWING

FIGURE 1 [illegible] of the nozzle assembly; and
FIGURE 2 [illegible] sectional view of FIGURE 1 along line 2—2.

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METHOD AND APPARATUS FOR APPLYING INSULATION

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Fig. 1

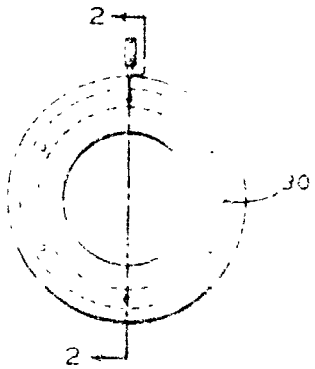
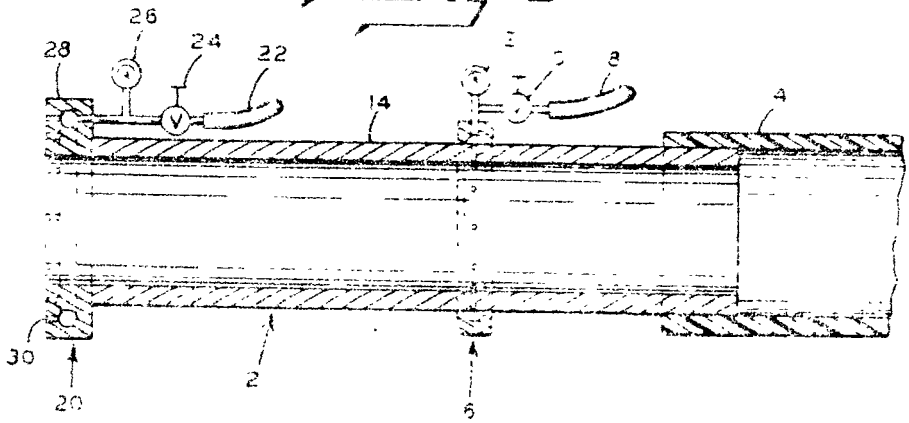


Fig. 2



INVENTOR
LEWIS W. ECKERT

BY Clifford B. Price

ATTORNEY

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGURE 2, the nozzle assembly **2** is connected to a supply hose **4**. The supply hose is connected to the conventional fiber spraying machine which carries the dry fiber insulation to be pneumatically conveyed to and through the nozzle structure to wet the subject matter or area to be coated with the insulating fibers.

The fibers passing through the nozzle are first engaged by a water mist bath generated by the water mist assembly **6**. The assembly consists of a hose **8** which feeds water through a control valve **10**, past a pressure gauge **12** to the nozzle housing **14**. The nozzle housing **14** has a plurality of holes **16** placed around its periphery. A collar **18** is connected to the water supply and distributes the water around the nozzle housing so that it will pass through the holes **16**. The controlled quantity of water passing into the nozzle forms a water vapor through which the dry insulation must pass. The valve and pressure gauge permit a control of the water to provide a effective prewetting of the dry fiber insulation. The water pressure is normally adjusted somewhere in the range of 10 to 50 p.s.i. An operating pressure of 30 p.s.i. has been found to be quite adequate for [illegible] with conventional fiber insulation.

Optimum results are obtained when the internal water mist assembly is placed about 8" from the exit of the nozzle. However, acceptable results can be secured by placing the water mist as near as 2" from the exit of the nozzle and as far as 12" from the exit of the nozzle.

The second water injection assembly **20** is positioned at the end of the nozzle housing **14**. This assembly also has a water supply hose **22** a control valve **24** and pressure gauge **26**. The water passes into a coil **28** which distributes the water around the exit periphery of the nozzle. The water then exits from the collar through apertures **30** which are equally spaced around the periphery of the collar. Normally the apertures **30** direct the water in a direction parallel to the movement of the fiber insulation so that the water forms an envelope around the insulation. It is possible that certain of the apertures **30** may be adjusted to direct the water into the stream of the fiber insulation. This will provide an internal wetting of the fiber insulation, not particularly for dust control, but to provide the fiber insulation with the adhesion necessary to secure a build up of the fiber on the structure being coated. The water injection assembly **20** is used primarily to control the distribution of the fiber insulation and provide the necessary wetting to the fiber insulation so that it will have the adhesion to build up to thicknesses upward of 12". The

assembly **20** [illegible] the water pressure adjusted in a range of 10 to [illegible], but the optimum operating pressure is normally [illegible] with most conventional fiber insulations.

While [illegible] been shown and described as embodied in [illegible] details, it should be understood that this [illegible] for the purpose of illustrating the principles [illegible] and that many modifications and changes [illegible] in the construction of the apparatus [illegible] the true scope of the invention is claimed.

I claim:

1. The method [illegible] fiber insulation comprising the steps [illegible] applying the fiber insulation in a dry moving [illegible] is substantially [illegible] to form a water [illegible] the fiber insulation to eliminate [illegible] the nozzle stream [illegible] water along a parallel path with the [illegible] around the periphery of the discharged [illegible] the insulation [illegible] desired thickness.

2. A nozzle [illegible] and an exit [illegible] mixing and [illegible] through which [illegible] comprising [illegible] and substantially [illegible] plurality of [illegible] the exit [illegible] envelope [illegible] and [illegible] nozzle [illegible] and [illegible]

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M. HENSON WOOD, JR., Primary Examiner

MICHAEL Y. MAR, Assistant Examiner