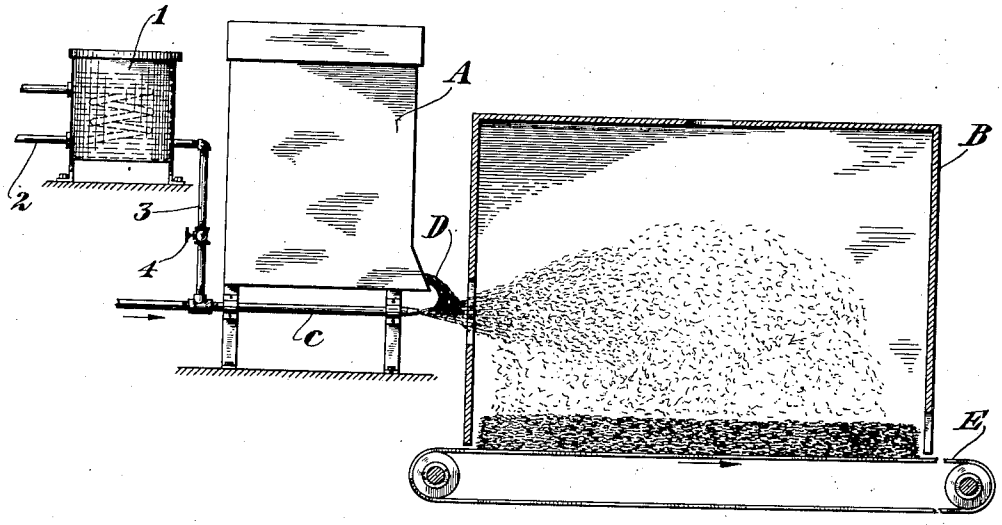
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MOISTURE RESISTANT MINERAL WOOL

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MOISTURE-RESISTANT MINERAL WOOL

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The present invention relates to an improved form of mineral wool adapted for use as a heat-insulating material and other structural purposes.

The primary object of the invention is the provision of a moisture resistant material from mineral wool and an efficient and economical method of producing such a product.

Mineral wool is commonly produced from certain forms of silicate rock or slag, the mineral material being first melted and then a thin stream of the molten material is blown into fibers by means of a jet of steam or air. The fibers thus produced are collected in a settling chamber, and thereafter utilized in various heat-insulating structures such as refrigerator walls, building partitions, and the like. The fibers are commonly used in a loosely assembled form such as a mat or blanket. The fibers are likewise widely used in a comminuted form particularly for insulating the walls of houses. While the fibers of mineral wool remain dry they fill the insulating space and exert a maximum insulating effect, however upon becoming wetted they tend to compact and produce air spaces thru which convective air currents circulate with consequent impairment of the heat insulating effectiveness of the material. The retention of water by the mineral wool is further objectionable for sanitary reasons in cases where the wool is used for insulating the walls of dwelling houses. Water may gain access to the wool either due to leaks thru the protective covering, or by condensation of moisture present in the air which circulates thru the fibers. A method for obviating these disadvantages has been devised according to which the mineral fibers are provided with a thin deposit of a water-repellant material such as zinc stearate.

According to my invention the zinc stearate or the like is applied to the mineral wool fibers, preferably during the blowing operation, in the form of an admixture with a suitable carrier or suspending liquid, as for example, an oleaginous material such as fuel oil or paraffine oil.

Further features and advantages of my invention will be apparent from the following detailed description taken in connection with the accompanying drawing which illustrates diagrammatically a suitable form of apparatus for the practice of the invention.

Referring to the drawing A represents a conventional form of cupola for melting silicate rock suitable for the production of rock wool, B a conventional form of settling chamber for the blown fibers, and C a conduit for the passage of steam or other fluid for disintegrating the molten rock D. The fibers which settle in the chamber B in the form of a mat or blanket of loosely assembled fibers may be conveniently removed by conveyor E. 1 represents a container for the water-proofing solution, as for instance 5 parts zinc stearate dissolved in 95 parts of paraffine oil. The container is preferably provided with a heating means such as steam coil 2 for maintaining the water-proofing material in solution and in a free flowing condition. The temperature for this purpose ordinarily is about 180–200° F. Pipe 3 equipped with valve 4 connects the container 1 to the steam conduit C. In operating this apparatus it is merely necessary to open the valve 4 to feed the requisite amount of waterproofing material to the current of steam passing thru conduit C. A relatively small quantity of water-proofing material when applied as above described suffices to render the fibers water-repellant, for instance, a very satisfactory product may be produced by employing about 1½ gallons of a solution of 5 parts zinc stearate in 95 parts of oil to one ton of fibers. The introduction of the waterproofing solution by means of the steam jet has been found to be particularly advantageous as a particularly thorough and efficient distribution of the solution is obtained thereby, however the solution may be applied to the fibers at any other convenient stage. For example, the solution might be sprayed directly on to the stream of aeriform suspension of blown fibers a short distance from the opening to the settling chamber.

Metallic stearates particularly zinc stearate are especially efficacious for use in any of the above described methods. However, these methods are quite effective for applying various other normally solid water-repellant materials such as aluminum stearate, aluminum palmitate, or other metalic soaps, and other similar insoluble fatty acid compounds having water-repellant characteristics such as stearic acid and palmitic acid. The types and classes of materials mentioned are particularly effective for rendering mineral wool moisture-resistant as a relatively small quantity of the material may be applied so as to form a permanent and effective water-resistant coating. Heretofore liquid material such as oil has been admixed with mineral wool principally for the purpose of settling fine dust-like particles, and such treatments with oil resulted in some incidental water-proofing effect. The oil coatings so formed, however, were not permanent inasmuch

as the coatings although immiscible with water, were readily wetted and hence are not comparable with the solid permanent water-repellent coatings formed on the mineral wool fibers according to my invention which are capable of withstanding even the action of hot water.

As a carrier for the water-repellant material, I prefer an oleaginous material such as ordinary fuel oil or paraffine oil. Obviously various other liquids might be substituted for these liquids which would serve as effective carriers.

In instances where a distinctively colored product is desired, a suitable dye or coloring material such as Victoria blue "B" base admixed with a solution assisting agent such as oleic acid may be admixed with the carrier and water-repellant material.

What I claim is:—

1. Heat-insulating material comprising a loose assemblage of mineral wool fibers having a thin deposit of an oleaginous liquid admixed with a normally solid water-repellant fatty acid compound distributed over the surfaces thereof.

2. Heat-insulating material comprising a loose assemblage of mineral wool fibers having a thin deposit of paraffine oil admixed with a normally solid water-repellant fatty acid compound distributed over the surfaces thereof.

3. The method of preparing heat-insulating material from mineral wool fibers comprising depositing upon mineral wool an admixture of an oleaginous liquid and a normally solid inherently water-repellant fatty acid compound.

4. The method of preparing heat-insulating material from mineral wool produced by blowing molten mineral substances into fibers which comprises admixing with the blown fibers an admixture of an oleaginous liquid and a normally solid inherently water-repellant insoluble metallic soap in a finely divided form.

5. A method for rendering water-resistant mineral wool produced by blowing molten mineral material into fibrous forms with a steam jet, which comprises mixing with said jet an admixture of a normally solid water-repellant insoluble metallic soap and an oleaginous carrier therefor.

6. The method of water-proofing mineral wool prepared by blowing a molten stream of mineral material with a fluid jet which comprises admixing with the fluid jet a mixture of an oleaginous liquid and a normally solid inherently water-repellant fatty acid compound.

7. Material adapted for use as a heat-insulator and the like comprising a loose assemblage of mineral wool fibers having a thin deposit of a mixture of a water-repellant metallic stearate and an oleaginous material distributed over the surfaces of the fibers.

8. Heat-insulating material comprising a loose assemblage of mineral wool fibers having a thin deposit of a mixture of an oleaginous liquid, a normally solid water-repellant metal stearate and a coloring material distributed over the surfaces thereof.

9. The method of preparing heat-insulating material from mineral wool fibers comprising depositing upon the wool a preheated admixture of an oleaginous liquid and a normally solid inherently water-repellant fatty acid compound.

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