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MINERAL WOOL

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This invention pertains to thermal insulating materials of the type generally known by the term "mineral wool".

The insulating material commonly employed at present, known as "rock-wool" is made by subjecting a stream of molten rock of lime and magnesium formation to a blast of steam as it is drawn from the cupola or furnace, thereby disintegrating the molten globules and spinning them out into a fibrous wool-like mass. It has also been proposed to treat in the same manner the molten slag or scoria of blast furnaces, which consists of a mixture of calcareous argillaceous silicates, composed chiefly of lime and silica with other ingredients including a trace of iron. This calcium-magnesium silicate having a high lime content is brittle, hard to work with and has a great tendency to become pulverized, thereby losing its insulating properties. Moreover it is somewhat soluble in water which renders it objectionable for many purposes where it is liable to be subjected to moisture.

The object of my invention is to provide a product which is free from the brittleness, characteristic of the mineral wool having a large proportion of calcium and other alkaline earth metals or derivatives, and in which the fibres are pliable and silk-like in texture, the wool being soft and easily handled, fireproof and non-absorbent.

I have discovered that mineral wool blown from molten slag resulting from the reduction or refining of metal bearing materials and having a copper content of at least .15% and up and not more than 5% possesses all of the desirable characteristics above mentioned of pliability and softness of texture, freedom from brittleness, non-absorptive and fireproof but is also far superior to all prior mineral wool products in thermal insulating properties, especially at low or sub-normal temperatures. It is thought that these superior properties of the mineral wool of the present invention may be due to the presence of the softer metals like copper, zinc, lead in the form either as silicates of such metals or as metal silicates admixed with some of such softer metals in an uncombined state, and to the fact that it contains a much lower lime content than prior mineral wools. However, whether or not this theory is correct, it is to be understood that I do not wish to be bound by such theory.

This wool may be made from the slag of copper ore roasting and refining furnaces and the scoria from furnaces refining the residues or scraps from metal manufactures, foundries, etc., containing a certain amount of copper.

Due to the characteristics mentioned this new wool product of my invention is superior to previous mineral wool for all heat insulating purposes, such as the heat insulation of building walls and roofs, lining of refrigerators, filling of fire-proof safes, jacketing of steam pipes, etc.

In addition to its use as a wool as it is blown from the slag, it may be made into blankets by sewing between sheets of paper or other suitable fabric. It can also be fabricated into a superior wall board by combining the wool with any suitable binder, such as fire-clay or water-glass. Wall board made from calcium and magnesium products has the serious disadvantage that it will not provide an adequate anchorage for nails and if several nails are driven in close proximity the board will develop cracks extending from one to the other. Wall board made from my mineral wool furnishes a firm anchorage for nails and will not develop cracks even when nails are driven close together.

I claim:—

1. A mineral wool made from the waste obtained in the reduction and refining of metal bearing materials, and having a copper content of not less than .15% nor substantially more than 5%.

2. A mineral wool made from the silicate waste obtained in the reduction and refining of copper bearing material, and having a copper content of not less than .15% nor substantially more than 5%.

3. A mineral wool consisting of a mixture of silicates of the alkaline earth metals and of copper, the total copper content being not less than .15% nor substantially more than 5%.

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