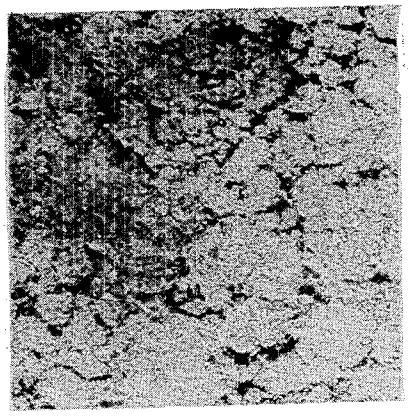
July 18, 1939. W. J. KROPP 2,166,926

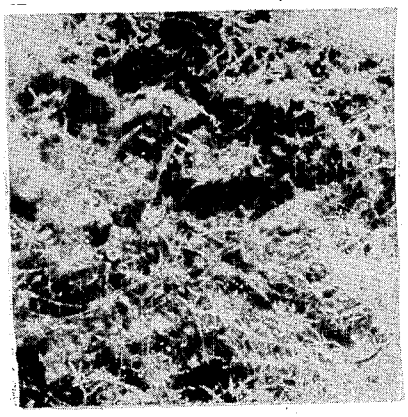
PACKING AND INSULATING MATERIAL

Filed Jan. 9, 1939



NORMAL VIEW

Fig. 1.



MAGNIFIED VIEW

Fig. 2.

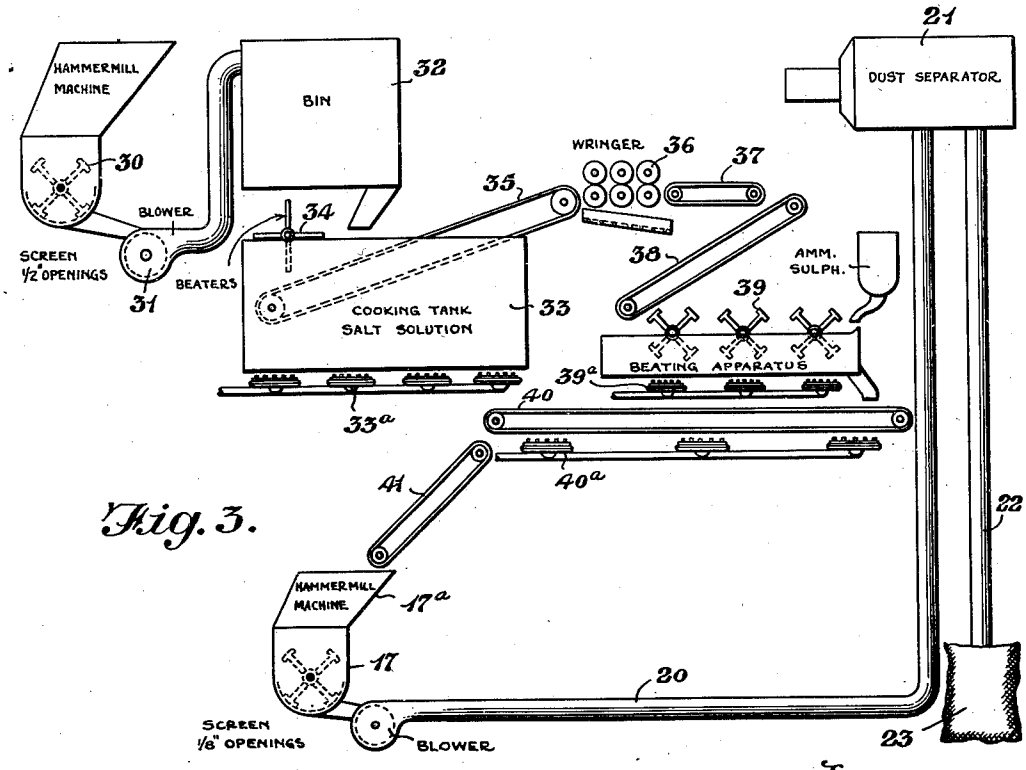


Fig. 3.

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PACKING AND INSULATING MATERIAL

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Application January 9, 1939, Serial No. 250,060

2 Claims. (Cl. 154—44)

This application relates to the article made by the process disclosed in copending application Serial No. 146,503, filed January 4, 1938, which has now matured into Patent No. 2,147,793, which in turn is a continuation in part of application Serial Number 8,877, filed March 1, 1935.

This invention relates to the art of insulation and more particularly a fibrous fluffy insulating material.

Prior to the instant invention it has been proposed that paper be cut or torn into small particles and that a mass of such particles be utilized as insulation material. Such forms of insulation have been relatively inefficient and therefore unsuitable for use in those installations which require insulation of high efficiency. Further, such prior insulations have been relatively difficult to handle, their nature being simply small particles of paper.

It is an object of this invention to provide an insulation of fibrous, loose and fluffy form of high efficiency and low cost.

It is a further object of the invention to provide an insulation which may be fabricated of old newspapers and the like, which will be of fibrous, loose and fluffy form which permits of ready handling such as by pneumatic means; and which is of low cost and high efficiency.

Other objects and the nature and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawing, wherein:

Fig. 1 is a photographic illustration of the insulation as it normally appears to the eye;

Fig. 2 is a photomicrograph of the insulation material as it appears when enlarged several diameters; and,

Fig. 3 is a schematic elevational view of one form of apparatus for making the product of the instant invention.

Referring to the drawing, newspapers, cardboard and the like is first comminuted in a hammer mill 30 provided with a one-half inch wire screen. The comminuted material passing from the hammer mill 30 to the blower 31 generally comprises relatively small pieces of newspaper, cardboard and the like of a size approximating one-half inch or less, the physical identity of the comminuted flaked pieces definitely corresponding to the original material comminuted. This step in the process makes for the saving of time as it is in the nature of a pretreatment which facilitates the subsequent treatments, for example the cooking step, as will be later explained. The blower 31 removes the comminuted product from the hammer mill 30 to a bin 32 from which it is fed to a cooking tank 33 provided with burners 33a. The cooking tank contains a salt solution which may be such as specified in the copending application Ser. No. 146,503. The proportions of the materials within the tank and the temperature therein may be the same as in the said copending application.

Cooking tank 33 may be provided with beaters 34 which force the cooked material through the salt solution after which the treated paper is taken on a conveyor 35 to a wringer 36 which squeezes out a considerable quantity of the moisture from the paper. From the wringer 35 the treated paper passes to the conveyors 37 and 38 to beating apparatus 39 heated by burners 39a. At this time in the process of manufacture dried ammonium sulfate salt may be added to the paper material. This treatment further dries the damp paper. From the beating apparatus 39 the material passes to a steel conveyor belt 40 heated by burners 48 where final drying takes place. A conveyor 41 carries the dried material to a hopper 17a of hammer mill 17 having an one-eighth inch wire screen.

The comminuted product of the hammer mill 17 is of a fibrous nature, the individual fibers of the finally comminuted mass being narrow, fluffy and fuzzy which bear no resemblance to either the raw material from which the final product is made, that is, newspapers, cardboard and the like, nor any resemblance to the comminuted or flaked particles from the hammer mill 30 having a one-half inch screen. These latter particles clearly correspond to the raw materials (newspaper, cardboard and the like), the only difference being that the raw materials are of relatively large sheet size and the initially comminuted product is of relatively small sheet size, that is, one-half inch or slightly less in largest dimension. The completely new physical appearance of the finally comminuted material is due to the critical size of screen utilized in hammer mill 17, that is, the ⅛" size screen which is material in effecting the heterogeneous mass of relatively narrow, fluffy and fuzzy fibers radically differing in appearance and properties from the raw materials used in its production.

From the hammer mill the broken up completely dried salt impregnated fibrous particles are drawn by blower 20 and delivered to dust separator 21 and a permanently fluffy fibrous material having a maximum of heat insulating value is produced. From the dust separator the material is passed through pipe 22 into the sacks

23 as described in the copending application Ser. No. 146,503.

It is to be understood that the product may be produced without the wet fire-proofing steps but that the material so produced will not be as fire resistant.

Insulating material fabricated as above comprises a mass of loose, fluffy and fibrous particles as indicated in the photographic illustrations of Figs. 1 and 2 and the particles are entirely different in configuration from insulation comprising simply small particles of paper. The insulation in accordance with the invention though being fabricated from paper such as old newspapers, cardboard or the like has entirely lost its original characteristic appearance and the particles making up the insulation have assumed a fluffy narrow fibrous form. Not only has the characteristic appearance of the material changed from its natural form as that comminuted in a ½" screen but the mass of fibers of the new insulation coact with each other in a new way to form an insulating mass of heterogeneously interlocked narrow fuzzy particles of definitely superior value insofar as the prevention of thermal heat transfer is concerned.

It will be obvious to those skilled in the art that various changes may be made in this device without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawing and described in the specification but only as indicated in the appended claims, and it is further to be understood that wherever the term paper is used in the said claims, that term is to be defined as including writing paper, newspaper, cardboard and the like.

I claim:

1. Comminuted paper insulation material characterized by a mass of heterogeneously arranged and interlocked slim, fuzzy, fluffy, fiber-like particles of varying length less than one-eighth of an inch and of a generally uniform though irregular transverse cross-sectional area, some of said particles crossing each other along their length with the fuzz on one particle engaging the fuzz on the other, the fiber-like particles being definitely non-flaky and generally elongated.

2. Insulation material as in claim 1 wherein the particles are salt impregnated.

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