

(No Model.)

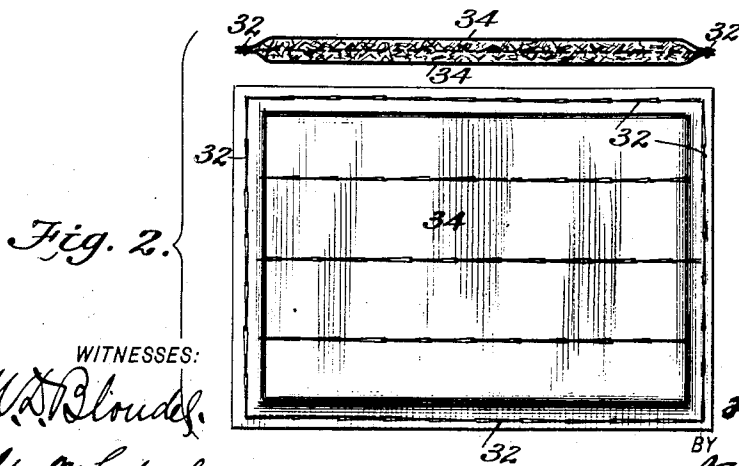
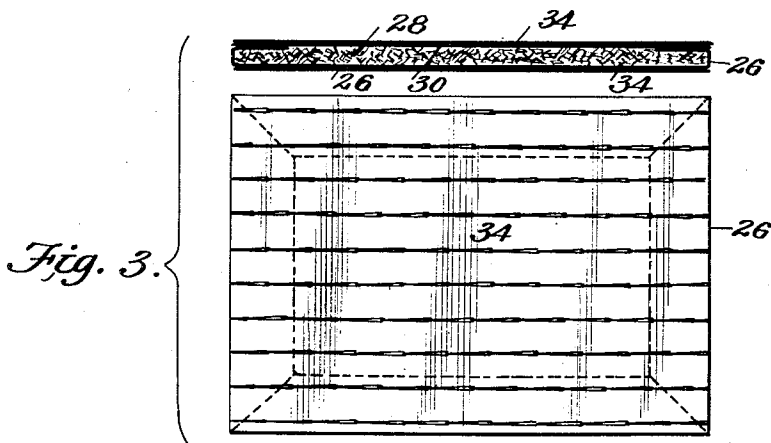
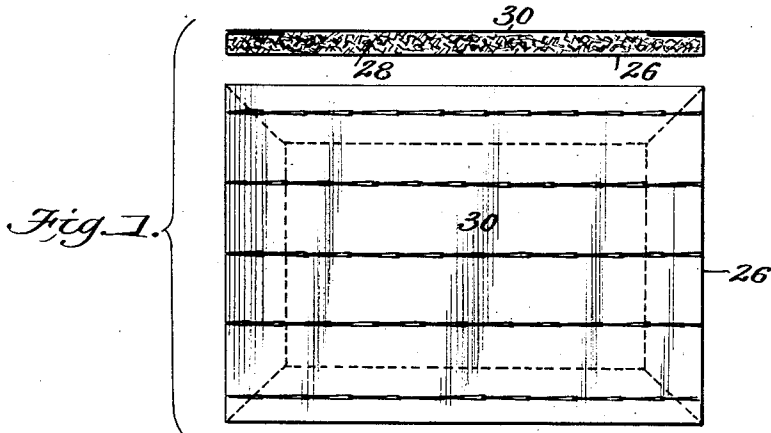
2 Sheets—Sheet 1.

S. CABOT.

SOUND DEADENING AND INCOMBUSTIBLE PACKING FOR BUILDERS' USE.

No. 548,515.

Patented Oct. 22, 1895.



WITNESSES:

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Geo. M. Coopershawer.

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(No Model.)

2 Sheets—Sheet 2.

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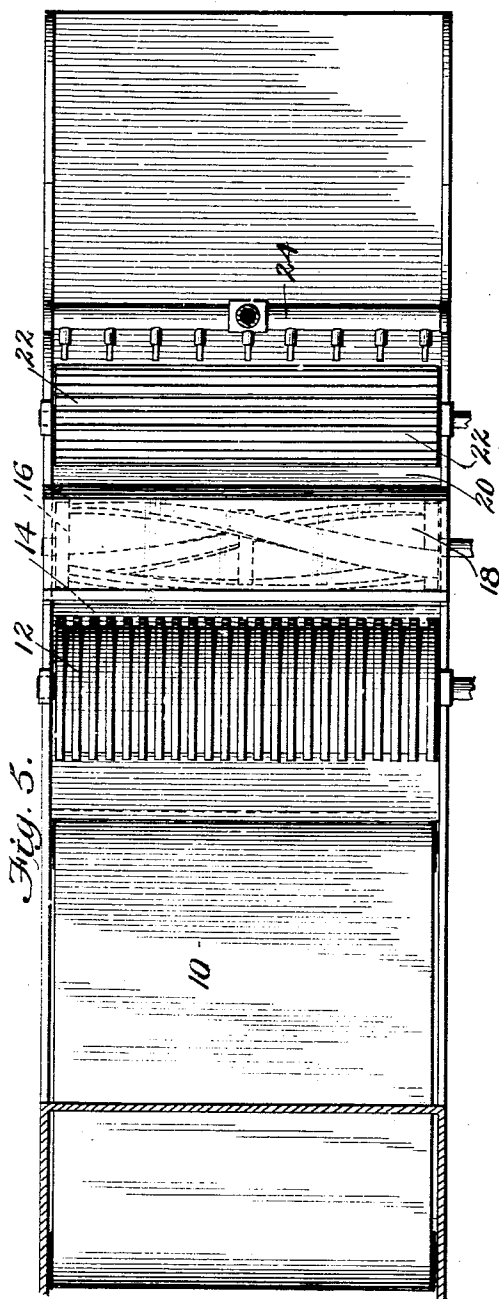


Fig. 5.

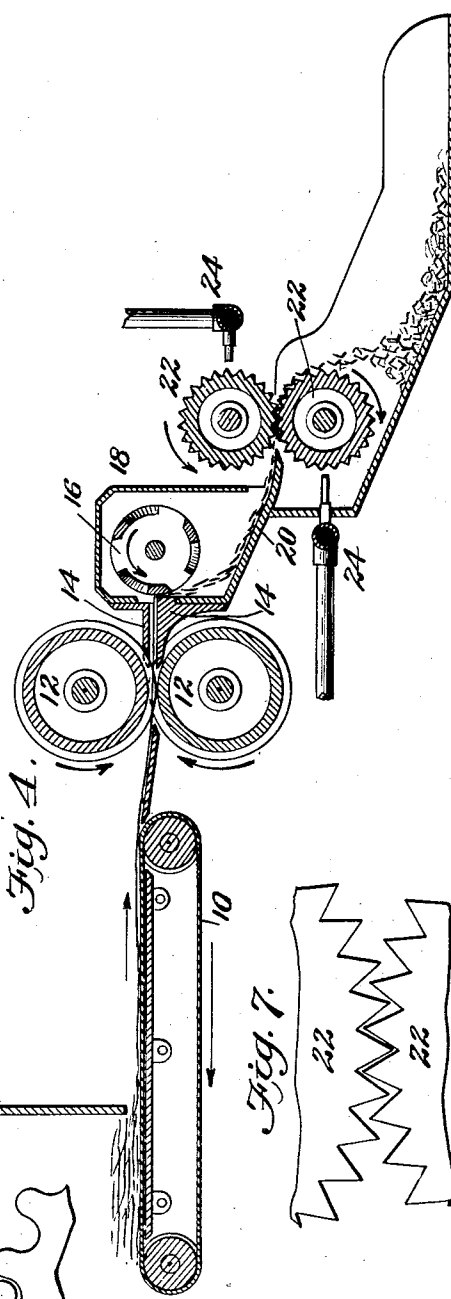


Fig. 4.

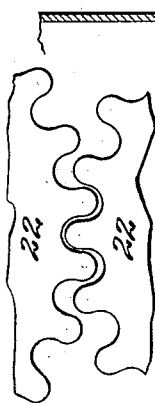


Fig. 6.



Fig. 7.

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UNITED STATES PATENT OFFICE.

SAMUEL CABOT, OF BROOKLINE, MASSACHUSETTS.

SOUND-DEADENING AND INCOMBUSTIBLE PACKING FOR BUILDERS' USE.

SPECIFICATION forming part of Letters Patent No. 548,515, dated October 22, 1895.

Application filed September 13, 1895. Serial No. 562,436. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL CABOT, a citizen of the United States, and a resident of Brookline, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Sound-Deadening and Incombustible Packing for Builders' Use, of which the following is a specification.

This invention is related to the class of manufactured packings used by builders under floors and clapboards and as linings in walls to hinder the transmission of sound from room to room. My invention is designed to accomplish this end efficiently by the interposition of fireproof and non-conducting material adapted to keep a building warm in winter and cool in summer and to lessen the danger from fire.

My sheet packing consists, essentially, of two pieces of paper, preferably of asbestos paper, held or sewed together by wire or thread, and containing between them a layer of comminuted mica prepared for this and like purposes in a new and peculiar way, to be presently described, the bulk of which, in relation to its weight, is very great, and therefore well adapted for the objects in view.

In the drawings forming part of this specification, Figure 1 represents in section and plan a piece of mica packing with single envelope. Fig. 2 is a modification of Fig. 1. Fig. 3 is also a piece of packing shown with double covering. Fig. 4 represents my apparatus used for treating the mica in side elevation, and Fig. 5 shows the same in plan. Figs. 6 and 7 illustrate the contact-surfaces of crimping-rolls with round and with angular flutings.

In the mining of mica and in its manufacture into sheets of definite and uniform sizes for trade purposes there is necessarily a vast amount of waste. The utilization of such waste has been attempted with more or less success for many purposes, notably for electrical insulation and for boiler and steam-pipe coverings. With such objects in view the mica is sometimes ground to powder and in others broken into scales and so applied to the surfaces to be protected from heat emanation or electrical loss, alone or with the admixture of other bodies. I have found that for the purposes I have in view mica in

either of the forms above named lies too dense and compact upon itself and is too heavy and unmanageable in consequence. I overcome these difficulties in the way of the successful application of mica for builders' purposes by treating it in such a manner as to greatly increase its bulk, almost doubling it, and simultaneously increasing by the same amount the total of the air-spaces between the little laminae. This I do by passing it in the form of small scales or plates between two rollers the surfaces of which are grooved or fluted in direction parallel to their axes, and which are so mounted that the two surfaces mesh into each other. When such rollers are held in contact by heavy springs and the cut-up mica is passed between them, each little flake is forced into the depressions in the rollers, whereby it is bent or strained far beyond its elastic limit, so that it retains a curved or crimped set or kink, which effectually hinders the close packing of the mica particles afterward, and increases very greatly the suitability of such mineral material for all uses in which its capacity as a non-conductor of heat or sound is sought, and to such material so treated I have given the name "feathered mica," because of its disintegrated and bulky appearance and lightness.

One of the characteristics of the mineral mica when split into plates is its great elasticity, for a thin sheet of it will return to its flat condition after being bent to the curve of a circle of about two inches in diameter; but as the curve gets smaller the mica will be found to receive a permanent set in being so bent, and when it is very small, as in fluting and crimping rollers, to which reference has been made, its elasticity is virtually destroyed and is characteristic of it no longer.

In Figs. 4 and 5 a mechanical arrangement is shown for the production of the material I employ. These drawings represent the machine in diagrammatic outline only, omitting all non-essential and well-understood devices for properly supporting the several parts, as well as the gearing necessary for driving them. The machine consists of an apron which carries forward and feeds to the slitting-rollers a thin stratum of broken mica in flat pieces of various sizes. This scrap-mica as it passes through the rollers is slit into nar-

row strips, which issue from between the jaws 14. These jaws at their inner extremities have teeth that enter the grooves of the rollers and clear them of wedged material. The rotary cutter 16, consisting of spiral bars of hardened steel driven at a high speed within the housing 18, acts against the lower jaw, which is fixed solidly, and cuts off the mica issuing therefrom in lengths which depend upon the relative speed of the rolls and cutter and the number of bars in the latter. The scales of mica, much disintegrated by this treatment, are next carried on an incline 20 to the crimping-rolls 22. These lay hold of the flakes and bend them with the help of heavy spring-pressure, so as to hinder their lying flat, compact, or dead afterward when packed together, irrespective of the uses to which they may be put. With a view to obtaining the maximum effect from the crimping-rolls I also in some instances heat the same, for which purpose a series of gas-flames 24, issuing against their surfaces, may be used; also strongly-heated air or superheated steam introduced through the axes of the rollers themselves, in a manner well understood, is a satisfactory way of heating them; but when the flutings in these rollers are sufficiently deep the bending or permanent kinking or cockling of the mica can be accomplished without heat. Portions of such rollers with round and with angular flutings are shown in Figs. 6 and 7, to enable an estimate to be formed of their mode of action. I do not wish it understood, however, that the foregoing is the only way of producing permanently bent and cockled mica, but that, as set forth, it is the best way known to me. When the mica has been treated in this manner, it will be found light and feathery in character and well adapted for the use I put it to and for many other uses, such as packing boilers, steam-pipes, safes, and partition-walls, &c.

In Fig. 1 a sheet of packing made with feathered or crimped mica is shown. This consists of a sheet of flexible material (such as paper) 26 of sufficient strength and substance, over which the crimped mica is distributed in a layer of regular thickness 28. The edges of the paper are then folded over, and after another sheet 30 has been laid upon the top the whole is stitched or quilted through by a sewing or stapling machine.

For the production of the best packing I prefer to use asbestos paper wherewith to envelop the mica, and in that case it is sometimes better not to fold the paper over, but to run a row of stitching around the edge outside the layer of mica, as shown in Fig. 2, where the stitching is marked 32.

In Fig. 3 a modified method of inclosing the mica layer is also illustrated, in which the same is first inclosed in a covering of cheap and common paper or of open coarse cloth 26, and this is then reinforced by asbestos paper 34 above and below and stitched through the whole with thread or wire. Cement may also

be used in attaching the asbestos paper. By these means the layer of feathered mica is held in place and an article of manufacture well adapted for builders is produced. If in quilting such sheets the rows of stitches are sufficiently close, there is no danger of the shifting or sagging of the mica while the packing is being handled or afterward when it is nailed in place; but I decrease the necessity for close rows of stitching or stapling by applying to the paper a coat of adhesive material, which holds the crimped mica and lessens greatly the tendency thereof to slip. Many pastes and glues may be employed for this purpose; but soluble sodium silicate (known as "water-glass") is the cement I find best adapted for holding the crimped mica in place. This may be used alone or conjointly with powdered agalite and, like magnesian silicates, in powdered form. Such substances dissolved and suspended in water render common paper or cloth fireproof, and being alkaline in character they adhere closely to asbestos paper and to the mica filaments as well. The application of cement may also be very effectively made in manufacturing packing of the form shown in Fig. 3 by stitching or quilting the layer of feathered mica between common paper sheets, as 26 and 30, and then using a cement to stick the sheets of asbestos 34 on both sides of the sheet-packing, so as thereby to dispense with the stitching through the hole.

The sheet packing made with prepared mica in the manner herein set forth is well adapted for deadening sounds and hindering their transmission through walls and floors, and also preventing the loss of heat from houses during winter or their absorption of heat in hot weather. These advantages are ascribable chiefly to the large air-spaces which my treatment of the mica secures, and in addition to these advantages the sheet packing I have invented and described is quite fireproof itself, offering a great hindrance to the spread of fire and retarding the combustion of the ignitable parts of a building by diminishing the supply of air thereto, and while I have described the best way known to me of producing the permanently crimped or cockled mica and the manufacture of sheet-packing based upon the same I do not limit myself to the precise details set forth, for they may obviously be changed and modified without affecting the principles upon which my invention rests. As regards the crimping and cockling of the mica, for instance, I have found that the rolls 12, which, as shown, cut sharply-defined strips of mica as the material passes between them, may also have the angular edges of their interlocking ribs rounded, so as to bend and tear the mica plates apart and thereby help their disintegration into small laminæ, which such bending specially promotes; but this manner of constructing the rollers gives somewhat less uniformity to the product and the advantageous use of either method is largely de-

terminated by the character of the mica refuse which is to undergo treatment.

In this specification when the term "crimped mica" is used it is intended thereby to express thin pieces of mica to which a bent, curved, or kinked shape has been given, in consequence of which it of necessity lies loose and open when in quantity, with relatively large air-spaces between its particles, which depend, essentially, upon the extent to which the cockling and disintegrating have been carried.

What I claim is—

1. As an article of manufacture an incombustible sheet packing for builders' use, consisting of a stratum of crimped mica inclosed within sheets of flexible material and fastened securely thereto; substantially as described.

2. As an article of manufacture an incombustible sheet packing for builders' use, consisting of a stratum of crimped mica inclosed within sheets of paper and stitched thereto; substantially as described.

3. As an article of manufacture an incombustible sheet packing for builders' use, consisting of a stratum of crimped mica inclosed within sheets of asbestos paper and stitched or cemented thereto; substantially as described.

4. As an article of manufacture an incombustible sheet packing for builders' use, consisting of a stratum of crimped mica inclosed between sheets of paper of any kind coated with an adhesive solution of water-glass cement, and stitched or quilted to said sheets; substantially as described.

5. As an article of manufacture a non-conductor of heat and sound consisting of mica in comminuted form, the individual plates and flakes of which are permanently bent, crimped, or kinked, whereby its bulk in relation to its weight is increased, and increased air spaces established therein; substantially as described.

SAM. CABOT.

Witnesses:

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ELISHA F. MAYO.