C. M. ABBOTT.

INSULATING MATERIAL.

APPLICATION FILED FEB. 11, 1914.

1,126,157.

Patented Jan. 26, 1915.

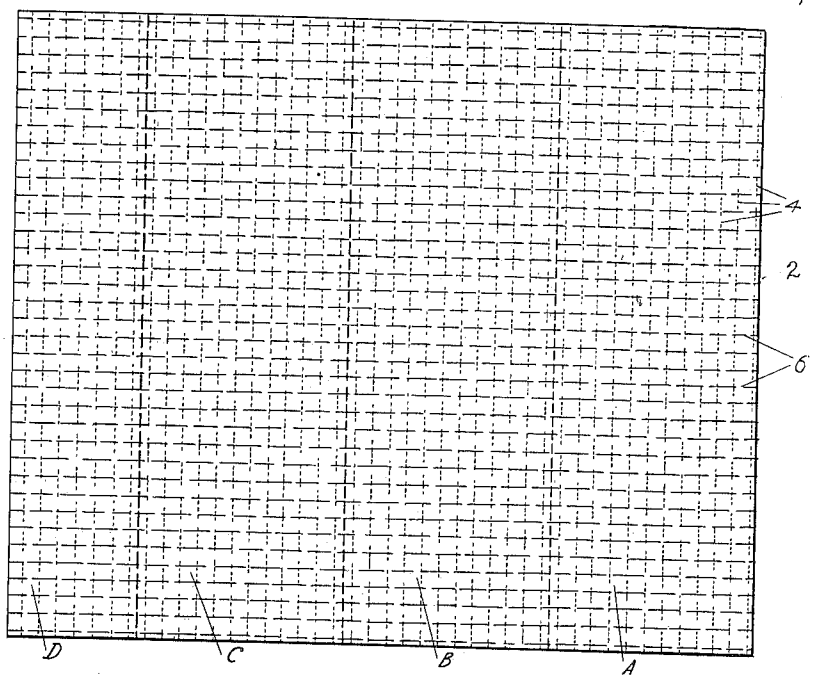


FIG. 1

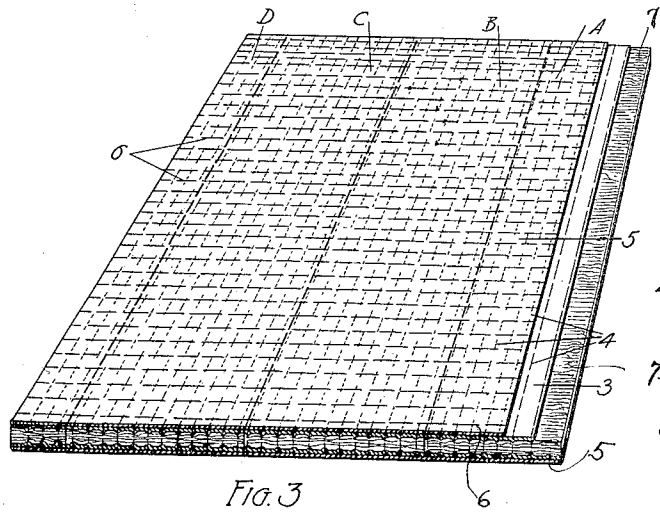


FIG. 3

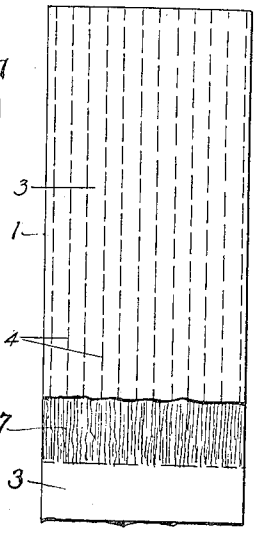


FIG. 2

WITNESSES:

Marion C. Hobbs,

Victoria London

INVENTOR.

Charles M. Abbott.

BY Ellis Spear Jr.

ATTORNEY.

UNITED STATES PATENT OFFICE.

CHARLES M. ABBOTT, OF WATERTOWN, MASSACHUSETTS, ASSIGNOR TO SAMUEL CABOT, INC., OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

INSULATING MATERIAL.

1,126,157. Specification of Letters Patent. Patented Jan. 26, 1915.

Application filed February 11, 1914. Serial No. 818,148.

To all whom it may concern:

Be it known that I, CHARLES M. ABBOTT, a citizen of the United States, residing at Watertown, county of Middlesex, Commonwealth of Massachusetts, have invented certain new and useful Improvements in Insulating Material, of which the following is a specification.

This invention relates to insulating materials and particularly to insulating sheets of large area, and especially to such sheets of considerable breadth. Such sheets are especially adapted for use in refrigerator cars or like structures.

The usual insulating material of the general type involved comprises external layers, usually of paper, and an interposed body of fibrous filling material within which insulating air spaces are formed. The insulating properties are dependent on the confinement of the air in the loosely packed filling which is held between the inclosed covering sheets. Owing to the peculiarities of these materials and the conditions of manufacture, it is a matter of great difficulty to form such strips of material over three feet in width. It is necessary furthermore to have the material held together in proper relative position at all times, and to this end they are usually stitched through and through and generally such stitches are run lengthwise of the strip. In fact, the usual material of this sort can not be handled unless it is so stitched, and must be formed by a continuous operation and stitched as it is formed. The reason for this will be readily understood when it is considered that the covering sheets are usually of paper which is easily broken when separately handled, and the filling material is a loose fibrous material (preferably dried eel grass) which must be fed evenly and uniformly and which if it becomes bunched not only spoils the appearance of the article, but is liable to cause the fracture of the paper, and also materially damages the insulating property at the place where the irregularity occurs.

In addition to the object of providing an insulating material capable of production in greater widths than it has been possible heretofore to manufacture, my invention further contemplates the overcoming of a difficulty which has been long apparent but which has never heretofore been avoided. In such structures as refrigerator cars or places where similar vibration occurs, the filling material is very apt to settle and work down in the strip. In the production of my new insulating material, I have therefore provided for the prevention of this settling tendency and have secured a construction which overcomes the liability of the filler to become displaced. The first of these desired results I secure by forming "breadths" of predetermined length of narrow stock which are successively embodied in the broad insulating sheet which may be carried to any length desired. The second desired result I secure through a system of pockets which are effected by means of cross stitching.

The difficulty involved in the production of the pockets of the insulating material lay in the peculiarity of the filling material employed. The feeding of a fibrous material and particularly such a material as eel grass involves much mechanical difficulty. It has been found to be impossible to handle such a filler as this between sheets of paper except under a uniform and continuous feed as any stopping or starting is apt to break the paper or to dislodge the filler or to disarrange the feed of the filler between the covering sheets. It is also a matter of extreme difficulty to feed the filler in widths over thirty-six inches in width as the spreading of the filler must be done in part at least by hand.

The material therefore has to be formed in a continuous strip by a continuous process and has to be stitched continuously as the strip is formed in order to hold each part so that it can be rolled up and handled as it comes from the machine. The problem of transverse stitching was therefore a difficult one. It was impracticable to stitch across the quilt during its continuous longitudinal motion and produce anything like regular transverse pockets. Applicant's invention has provided a simple solution for all this matter. The "breadths" are prepared in long, continuous strips, formed longitudinally and stitched longitudinally by a continuous operation at the time the strip is formed. Having attained this form the "breadths" may then be handled and strips may be severed at intervals of a length equal to the width desired in the final product. By running these lengths through a second stitching machine crosswise and at the same time applying an upper and lower sheet of heavy paper to the initially formed breadths,

an insulating material of desired width and completely protected is produced. The ultimate product is therefore a strip transversely stitched through two inside sheets and longitudinally stitched through the two outside sheets, with the outer sheets covering the punctures of the inner sheets.

The construction of my material and the manner of producing it will be more fully disclosed in the specification which follows.

Throughout specification and drawings like reference numerals are correspondingly applied and in these drawings: Figure 1 is a partial plan view of an insulating sheet in accordance with my invention, Fig. 2 is a view of the initial breadth forming strip, and Fig. 3 is a view partly cut away to show the interior construction.

I have indicated at 1, Fig. 2, an insulating strip composed of two covering sheets 3 with an interposed filling of insulating material 7. This filler is preferably eel grass. The covering sheets 3 are united through the filler by rows of longitudinal stitches 4. The commercial production of strips of this sort is limited as before stated to widths of about three feet.

With the insulating sheet thus stitched, particularly where it was subjected to a constant vibration, the filling tended to shake down. To head off this longitudinal settling of the fibers, I propose to form pockets completely inclosed by rows of stitches. These pockets prevent both longitudinal and lateral displacement of the fibers.

As above suggested, the problem of stitching the quilt transversely involved much difficulty on account of the nature of the materials. In carrying out my present invention therefore I first cut the longitudinally stitched strip 1 into breadth sections, A, B, C, etc., equal in length to the width desired in the final product 2, Fig. 1. These breadth sections, A, B, C, etc., are successively fed in transverse position between two continuous strips 5, and the whole is longitudinally stitched at regular intervals at 6. The longitudinal stitches 4 are now the transverse stitches and the stitches 6 formed by running the lengths through the second stitching machine appear in the drawings, Fig. 1, as running longitudinally of the sheet. The insulating sheet is now of the desired width and includes a complete system of pockets completely inclosed by rows of stitching. The upper and lower sheets 5 are preferably of relatively heavy waterproof paper, which is applied and stitched through both sheets 3 and the interposed filler 7 by the rows of stitching 6. This second sheet furthermore overcomes the venting of the insulation through the needle punctures. On account of the shifting of the direction of stitching, these punctures do not register so the two sets of covering sheets make a tight seal over the filling.

There may be variations in the proportions, material and method of assembling from the particular insulation herein shown and described, all without departing from the spirit of my invention if within the limits of the appended claims.

What I therefore claim and desire to secure by Letters Patent is:

1. As a new article of manufacture, a body of insulation consisting of internal covering sheets having a filler of eel grass stitched longitudinally and disposed transversely in series between external covering sheets and stitched longitudinally through said external sheets, internal sheets and filler.

2. As a new article of manufacture, a strip comprising a plurality of sections, each consisting of a top and bottom covering sheet having an internal filler of fibrous material, and stitched longitudinally of its length and disposed transversely in series between a second top and bottom covering, the whole being united by longitudinal rows of stitching.

3. As a new article of manufacture, a strip comprising a plurality of sections, each consisting of a top and bottom covering sheet having an internal filler of fibrous material and stitched longitudinally of its length and disposed transversely in series between a second top and bottom covering, the whole being united by longitudinal rows of stitching, said stitching being offset whereby the punctures of the stitching of the first covering strips are covered by the second covering strips.

4. As a new article of manufacture a body of insulation consisting of internal covering sheets having an interposed filler and united by parallel rows of stitching running in one direction, and external covering sheets overlying said inner sheets and covering the stitching thereof, and united thereto by parallel rows of stitching running in a direction transverse to that first mentioned.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES M. ABBOTT.

Witnesses:
VICTORIA LONDEN,
GEO. B. RAWLINGS.