Dec. 11, 1934. K. W. HUFFINE 1,984,190

MINERAL FIBER SOUNDPROOF PANEL

Filed July 27, 1928

FIG. 1

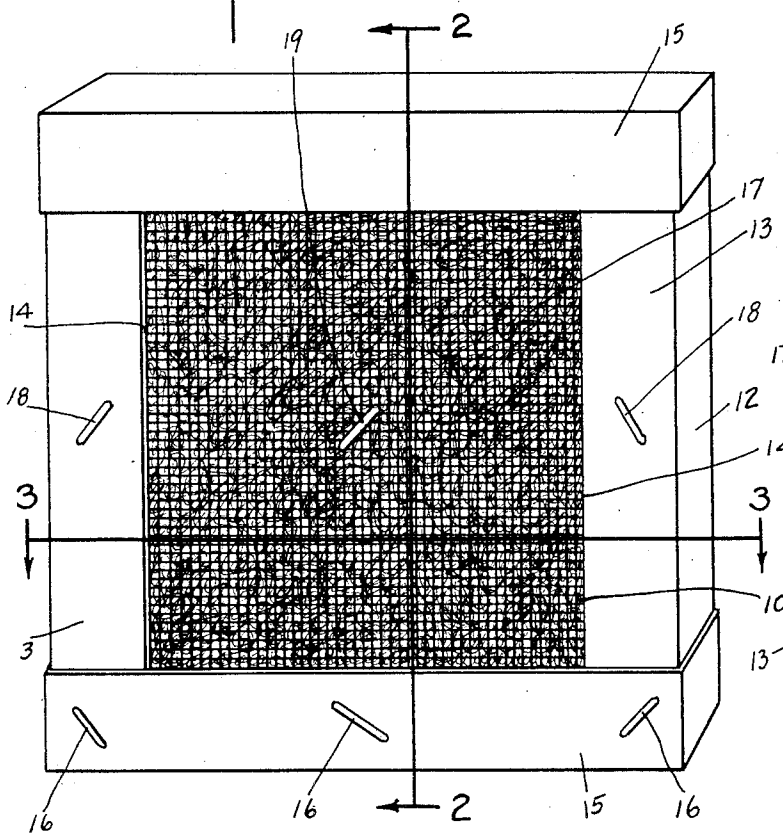


FIG. 2

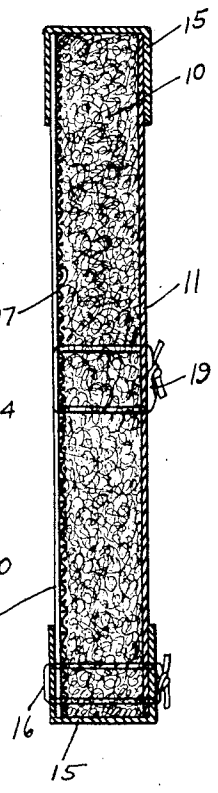


FIG. 3

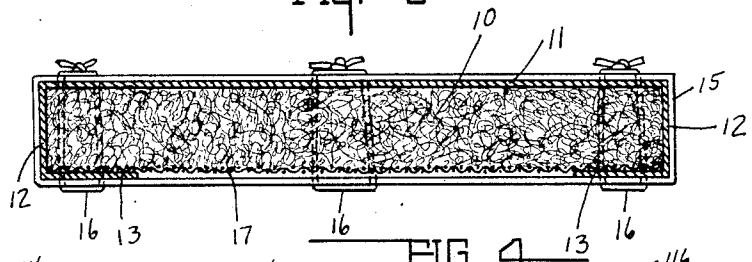
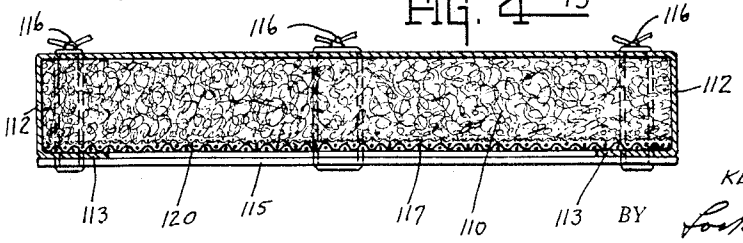


FIG. 4



INVENTOR.
KENNETH W. HUFFINE.
BY Lockwood & Lockwood
Goldsmith & Galt
ATTORNEYS.

Patented Dec. 11, 1934

1,984,190

UNITED STATES PATENT OFFICE

1,984,190

MINERAL FIBER SOUNDPROOF PANEL

Kenneth W. Huffine, Alexandria, Ind., assignor, by mesne assignments, to Banner Rock Corporation, Alexandria, Ind., a corporation of Delaware

Application July 27, 1928, Serial No. 295,672

5 Claims. (Cl. 154—44)

This invention relates to a sound deadening panel.

The chief feature of this invention is to produce a sound deadening material in a form that can be readily handled, transported and applied and which will retain when applied its sound deadening or absorbing qualities.

The chief feature of the invention consists in a pre-assembled unit adapted to accomplish the foregoing object by the use of an open mesh and a mineral fiber associated together in a thin-walled open faced container materially assisting in the formation, transportation, handling and application of the material for use.

The full nature of the invention will be understood from the accompanying drawing and the following description and claims.

In the drawing Fig. 1 is a perspective view of a panel embodying the invention. Fig. 2 is a transverse sectional view through the same, taken on line 2—2 of Fig. 1 and in the direction of the arrows. Fig. 3 is a similar view taken at right angles to Fig. 2 and on line 3—3 of Fig. 1 and in the direction of the arrows. Fig. 4 is a transverse sectional view of a modified and simplified embodiment of the invention.

In the drawing there is illustrated a mass of mineral fiber 10 such as mineral or rock wool which has suitable sound absorbing qualities and which is relatively heat resistant. This mass of fiber is positioned in an open faced container including a back 11, sides 12 and front edges or flaps 13 covering a substantial portion of the face of the sound-absorbing element, adjacent to the periphery thereof, and leaving the opening 14 therebetween. End closures complete the panel container and herein they are cup-like and indicated by the numeral 15, and preferably one is rigidly associated with the container as by staples 16 or the like, but other methods of anchoring may be employed as by gluing with silicate of soda or other adhesives. The other end closure may be secured in a similar manner or may be detachably telescoped as desired, the cup-like formation of said end retaining the ends of the sides and front portions of the container in container formation.

The opening 14 of the container including the mass of fiber 10 is closed by a reticulated or foraminated fiber retaining structure such as a woven wire mesh or screen 17, preferably of rust proof character. This screen may be anchored to the container by the anchorage 18 or by the anchorage 19, or by both. The anchorages 19 comprise suitably a staple construction, of the general character illustrated.

It will be observed that but one face of the container is exposed and open, and that the opening is a very material part of the face that is exposed. Although but one face is shown open in character, the opposite face may be similarly formed. Sound waves which are directed toward the open face engage the screen, are dispersed, pass into the interior of the panel and then are absorbed by the mineral fiber within the container. The screen is non-sound-absorbing, but is sound-permeable and retains the fiber within the container and in operative position and permits the sound waves to have ready access to said fiber for sound deadening purposes. It has also been observed that, when the pad of sound-absorbing material is secured to an imperforate backing support and maintained in position, forming of a space therebetween is prevented and air circulation is minimized.

In Fig. 4 there is illustrated a modified form of the invention, and in this form the entire carton or container is formed from one piece by the ends 115 being extended and completing the panel, the same being secured to the edges 113 and the side 112 by the staple 116. This form of the invention also differs from that shown in Fig. 3 in this wise, the material 110 is not only retained by the coarse screen 117 but there is interposed between the two a fiber retainer 120 which may be cheese cloth or similar material that is relatively yielding and will not detract from the sound absorbing qualities of the panel, or such retainer may consist of a specially processed layer of mineral wool or other material which would have substantially the same result, and as an extension of the aforesaid, the entire body of the wool may be so treated, either in its mechanical production or by the addition of other means such as binders and the like, that the finer particles would adhere to the larger particles and be retained thereby.

By the term "sound-permeable", as used herein, is meant the condition of being adapted to be penetrated readily by air-borne sound waves, as distinguished from the transmission of sound through an air-impermeable member, such, for example, as a sheet of substantially air-impermeable paper.

The above description and specific examples are to be taken as illustrative only. Any variation or departure therefrom which conforms to the spirit of the invention is intended to be included within the scope of the claims.

Panels of this particular character are not only suitable for general sound deadening purposes, but a specific application of the invention is in the household mechanical refrigerator which includes generally an electric motor, compressor, etc. The panel is not only an insulator against the passing of heat but is primarily sound absorbent in that use.

The invention claimed is:

1. A preassembled unit comprising a box-like

container formed of sheet material and having a closed back and channel-shaped edge sections terminating in inwardly extending flanges defining an open face therebetween, a filling of sound-absorbing material within said container, and a sound-permeable membrane interposed between said flanges and sound-absorbing material and extending over the face of the said filling.

2. In a preassembled unit including a sound-absorbing element and adapted to absorb sound incident upon the face of the unit, the improvement comprising imperforate means covering a substantial portion of the face of the sound-absorbing element adjacent to the periphery thereof and sound-permeable means covering the remainder of the face of the said element.

3. A preformed unit adapted to absorb sound and to insulate against the passage of heat, comprising a pad of felted fibers of mineral wool and a container therefor including imperforate back and edge portions adapted to minimize the escape of air and sound therethrough and a face portion comprising a non-sound-absorbing screen adapted to admit incident sound and to distribute heat.

4. A preformed unit adapted to absorb sound and to insulate against the passage of heat, comprising a pad of felted fibers of mineral wool and a support therefor provided with an imperforate back and a sound-permeable face for exposure to the sound to be absorbed, the said imperforate back being secured to the pad, whereby circulation of air through the pad is minimized.

5. A preformed unit adapted to absorb sound and to insulate against the passage of heat, comprising a pad of felted fibers of mineral wool and a container therefor provided with imperforate back and sides and a sound-permeable face for exposure to the sound to be absorbed, the said imperforate back being secured to the pad, whereby circulation of air through the pad is minimized.

KENNETH W. HUFFINE.