Nov. 12, 1940. J. A. TORRI 2,221,499

SOUND-DEADENING COMPOSITION

Filed Nov. 8, 1937

Fig. 1.

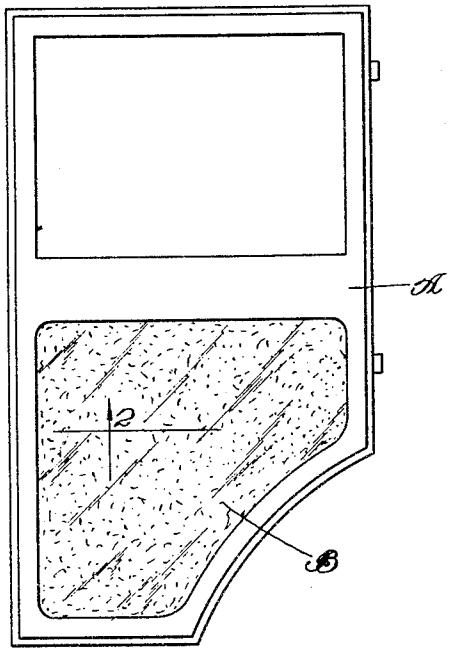
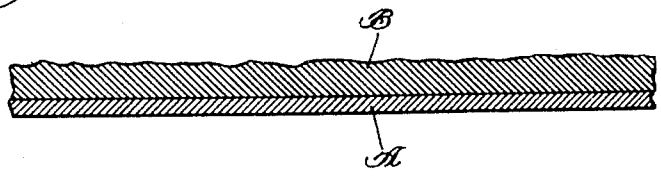


Fig. 2.



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Patented Nov. 12, 1940

2,221,499

UNITED STATES PATENT OFFICE

2,221,499

SOUND-DEADENING COMPOSITION

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Application November 8, 1937, Serial No. 173,460

7 Claims. (Cl. 106—31)

This invention relates to sound-deadening compositions adapted for use in connection with fabricated sheet metal structures, and the like.

The primary object of the invention is to provide an improved, inexpensive sound-deadening or dampening composition which can be applied directly to the metallic structure to be insulated and serve as a lining itself, or used as an adhesive to secure ordinary sound insulating pads to the structure.

The improved composition may be made of such consistency that it may be applied by means of a brush, spray gun, or trowel. It may be applied as a coating to the under-side of fenders and the like, to prevent wear and deaden the sound resulting from impacts of small articles thrown against the structure. While the invention is intended primarily for use in vehicle bodies, it will be readily understood that it may be equally useful in other structures where it is desired to deaden or dampen sounds resulting from impact, sympathetic vibration, or the like.

Heretofore, compositions for this purpose have employed asphalt materials loaded with light porous materials such as cork, charcoal, rubber, paper, wood, vegetable fibers, corn husks, asbestos fibers, and the like. The present invention constitutes a distinct departure from such practice and it is found that greatly improved results are obtained by using material of opposite characteristics from those heretofore used. In the present invention, I prefer to use fillers of high specific gravity such as sand, silica, and barytes, or metallic fillers such as filings and diminuted turnings of iron, lead or other metals. I have discovered that the essential constituent of a sound-deadening composition is a dense, heavy, inert, non-absorbing filler suitably incorporated in a binder. The coating after being applied to the sheet metal structure is dense, tough, non-porous, non-fibrous, compact, and fire-proof. It looks different and feels different from the ordinary sound-deadening compositions heretofore used and produces greatly improved results at a reduced cost.

The present application is a continuation in part of my application Serial No. 142,716, filed May 14, 1937, Sound-deadening composition.

The invention is illustrated in a preferred embodiment in the accompanying drawing, in which:

Figure 1 is a plan view of an automobile door structure provided with a lining of the sound-deadening composition; and Fig. 2 is a broken sectional view, taken as indicated at line 2 of Fig. 1.

In the embodiment illustrated, A designates a sheet metal panel to which is directly attached a sound-deadening composition B. The panel is shown as an ordinary door member but it will be understood that the composition may be applied to the side walls, top wall, or floor of the car for the same effect. Preferably, the composition is applied so as to be from $\frac{1}{16}$ to $\frac{3}{16}$ of an inch in thickness. Of course, the coatings may be thicker, if desired, and will produce improved results but due to the increase in weight of the structure, it is preferred to stay within the limits mentioned in automobile structures.

As stated above there are many dense, heavy, inert materials which are adapted to serve as a suitable loading to mix with an asphalt binder but sand is generally preferred due to its low cost, high specific gravity and other well-known characteristics.

A suitable asphalt emulsion can be prepared in an emulsifying machine by using 50 parts of Mexican asphalt (melting at 105° F.), and heating the material to from 290° to 300° F. 3 parts of clay may be dissolved in 47 parts of water heated to about 90° and this is added to the asphalt and the material emulsified in well-known manner. The asphalt emulsion is very stable and can be mixed with the sand loading at ordinary room temperature without difficulty. An excellent formula utilizing asphalt emulsion is as follows:

	Parts by weight
Asphalt emulsion	55
Silica sand	45

Practically any clean sand may be used but preferably should not be coarser than that which would pass through a 20 mesh screen. Preferably, the grains are much smaller. The reason for this is that when the material is sprayed on to the under-side of roofs, or the like, it is more difficult to make the composition stick if the granules are large, because there is a tendency for them to bounce off. Of course, after the material is applied and has a chance to set, the size of the granules is of little importance. The larger size granules (20 mesh) are more adapted for use in installations where the material is applied by troweling, for example, on the floor of a car.

The above composition may be air dried or may immediately be subjected to baking temperatures up to 300° F., as are commonly encountered in paint drying ovens. Only about 25% of the composition evaporates and this leaves 75% as the effective sound-deadening material.

This is a relatively high percentage of permanent and effective sound-deadening material as will be readily understood by those skilled in the art.

Another formula is particularly useful where the composition is used as an adhesive for cementing various types of insulating pads to fabricated sheet steel for the purpose of sound-deadening. A preferred composition is as follows:

	Parts by weight
Emulsified asphalt	75
Sand	25

It is possible to change this ratio of emulsion to sand to as high as 55 parts of asphalt to 45% sand and still have a very effective adhesive. It has been found that the incorporation of silica sand or other such materials, appreciably improves the sound-deadening qualities of said adhesive without materially detracting from the adhesive qualities of cement. Careful tests of samples utilizing this adhesive show remarkably improved sound-deadening qualities over samples utilizing the ordinary adhesive heretofore utilized.

As stated above, the various compositions may be applied by means of a spray gun and it is found that they will flow satisfactorily from the gun under pressure of 90 pounds per square inch and may be atomized at the nozzle with a pressure of 60 pounds per square inch.

The asphalt emulsions, described above, are given but one emulsifying treatment and the agitator in the emulsifier is driven at a speed of about 100 r. p. m. The asphalt leaves the emulsifier at a temperature of about 145° F. and is permitted to air cool.

Recent tests have shown that homogenizing the asphalt to a further degree will lower its viscosity so that 15 parts of asphalt may be used satisfactorily with up to 85% of sand. It is preferred, commercially, to use about 67% of sand, however, with 33% of the improved emulsified asphalt which is emulsified as follows. Two emulsifiers are used having agitators operating at about 1750 r. p. m. The first emulsifier is provided with a water cooler utilizing available cooling water. After the asphalt passes through the first emulsifier it goes through a cooler which reduces its temperature to the neighborhood of 70° to 90° F. and then passes into the second emulsifier which may also be water cooled and will deliver the homogenized asphalt at a temperature of 80° to 100° F. This homogenized asphalt is quite stable and may be stored until ready for use with a heavy, inert material such as sand. As mentioned above, the extra homogenizing step lowers the viscosity of the asphalt and it has the appearance of a thin paint. The sound-deadening composition is then formed by the addition of a very large percentage of sand and it has been found that such a composition can best be installed by troweling.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

I claim:

1. A fluid adhesive sound-deadening composition adapted to be applied to a panel surface and to become self-sustaining thereon comprising a mixture of an emulsion of water and asphalt together with sand, said sand comprising from 25% to 85% by weight of the composition.

2. A fluid adhesive sound-deadening composition adapted to be applied to a panel surface and to become self-sustaining thereon comprising a stable mixture of an emulsion of water and asphalt together with sand, said sand comprising from 45% to 85% by weight of the composition and being substantially uniformly distributed throughout the mixture.

3. A fluid adhesive sound-deadening composition adapted to be applied to a panel surface and to become self-sustaining thereon comprising a stable mixture of approximately 33 parts of a homogenized emulsion of water and asphalt together with 67 parts of sand, said sand being substantially uniformly distributed throughout the mixture.

4. A fluid adhesive sound-deadening composition, adapted to be applied to a normally vibratory panel and to become self-sustaining thereon at temperatures up to 300° F., comprising a mixture of an emulsion of asphalt having a softening point in the order of 105° F. and water, together with sand, said sand comprising between 45% and 85% by weight of the composition.

5. A fluid adhesive sound-deadening composition, adapted to be applied to a normally vibratory panel and to become self-sustaining thereon at temperatures up to 300° F., comprising a stable mixture of an emulsion of approximately equal parts of low softening point asphalt and water with a very small quantity of colloidal clay together with sand, said sand comprising from 45% to 85% by weight of the composition and being substantially uniformly distributed throughout the mixture.

6. A fluid adhesive sound-deadening composition, adapted to be applied to a normally vibratory panel and to become self-sustaining thereon at temperatures up to 300° F., comprising a stable mixture of a homogenized emulsion of approximately 50 parts of low softening point asphalt, 47 parts of water, and 3 parts of colloidal clay together with sand, said sand comprising from 45% to 85% by weight of the composition and being substantially uniformly distributed throughout the mixture.

7. A fluid adhesive sound-deadening composition adapted to be applied to a normally vibratory panel and to become self-sustaining thereon comprising a mixture of an emulsion of water, asphalt and colloidal clay together with sand, said sand comprising from 45% to 85% by weight of the composition.

JOSEPH A. TORRI.

CERTIFICATE OF CORRECTION.

3

Patent No. 2,221,499. November 12, 1940.

JOSEPH A. TORRI.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, line 35, for "100" read --1100--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 10th day of December, A. D. 1940.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)

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