

Aug. 7, 1951

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2,563,115

INSULATING AND JOINT FILLER MATERIAL

Filed Oct. 22, 1949

Fig. 1.

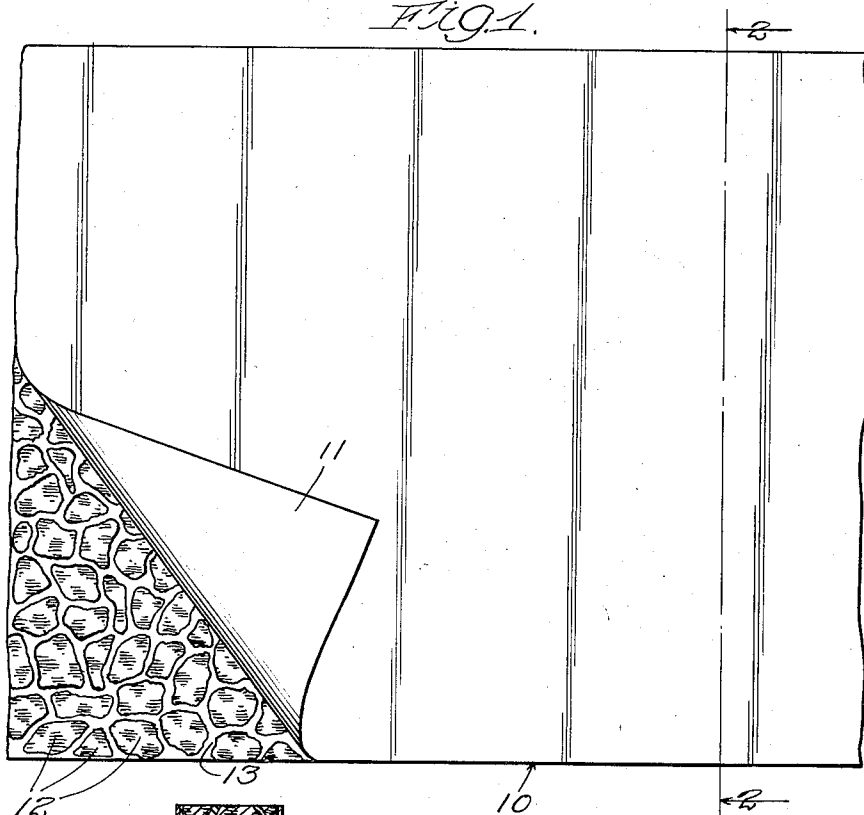
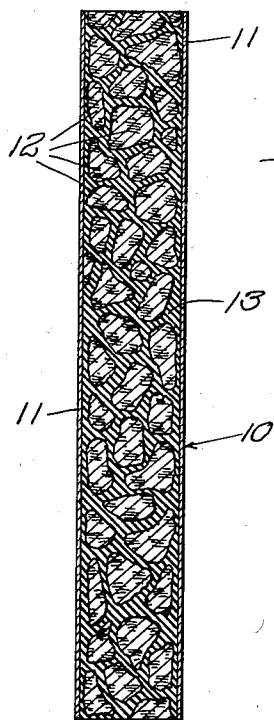


Fig. 2.

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UNITED STATES PATENT OFFICE

2,563,115

INSULATING AND JOINT FILLER MATERIAL

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Application October 22, 1949, Serial No. 123,009

6 Claims. (Cl. 260-750)

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This invention relates to an insulating and joint filler material, and relates particularly to such material comprising an intimate mixture of cork particles and an asphaltic material.

One of the objects of this invention is to provide an insulating and joint filler material comprising, by volume, about 5-9 parts of cork particles substantially all of which have a maximum diameter of about $\frac{1}{8}$ - $\frac{1}{2}$ inch and 3-5 parts of an asphaltic material having a melting point of about 180-250° F.

Another object of the invention is to provide such material wherein substantially all of the cork particles have a maximum diameter between about $\frac{1}{4}$ - $\frac{1}{2}$ inch and the asphaltic material has a melting point between about 200 and 220° F.

A further object of the invention is the provision of such a material wherein the asphaltic material includes up to about 5% by weight of a rubbery material.

A still further object of the invention is the provision of such a material wherein the cork particles have been steam treated so as to have a specific gravity less than that of the untreated cork.

Other objects and advantages of the invention will be apparent in the following description of the invention taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a fragmentary plan view of one embodiment of the invention showing a side cover sheet partially removed;

Fig. 2 is a transverse sectional view taken substantially along line 2-2 of Fig. 1.

The insulating and joint filler material of the invention can be molded in the form of a flat body to the shape shown in the drawings so as to be usable as a joint filler strip in concrete roads and the like. When used as a joint filler strip, the molded strip is ordinarily placed in the joint so as to extend to a point below the top of the joint. The width of the joint is preferably slightly greater than the thickness of the strip. The top portion of the joint above the strip may then be at least partially filled with an adhesive composition which adheres to the sides of the joint to seal the joint and prevent the ingress of water, dirt, sand and other foreign materials. The new composition is particularly useful as a joint filler material as it can be compressed by expansion of the adjacent concrete slabs without substantial extrusion and on contraction of the concrete slabs will recover more than 80% and as much as 92% or more. Thus, the joint filler material always substantially fills the joint

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space below the adhesive material irrespective of the temperature to which the concrete slabs are subjected, and thus irrespective of the amount of expansion or contraction of the slabs with its subsequent effect on the width of the joint.

As the new material may be molded in any form desired and as it has excellent insulating properties and is waterproof, it may also be used in relatively thin sheets as a roof insulating and as a siding material for building structures.

The new insulating and joint filler material comprises an intimate mixture of cork particles and an asphaltic binder material. Substantially all of the cork particles preferably have a maximum diameter between about $\frac{1}{8}$ inch and about $\frac{1}{2}$ inch; in other words, each particle has a maximum transverse dimension between and including these limits. In the preferred construction, substantially all the cork particles have a maximum diameter from $\frac{1}{4}$ to $\frac{1}{2}$ inch. These cork particles are preferably treated with steam, either saturated or supersaturated, to remove at least part of the natural cork resins from the interior of the particles. During the steam treatment some of the resins are driven off, and most of the remainder moves from the interior of the particles to the outer surfaces thereof. This steam treatment reduces the apparent specific gravity of the cork particles over that of the untreated particles. The ordinary untreated particles ordinarily have an apparent specific gravity between about 12.9 and 14.5 pounds per cubic foot. The treatment with steam reduces this specific gravity; thus, in one embodiment of the invention where the specific gravity of the untreated particles was 13.5 pounds per cubic foot, treatment with steam resulted in a specific gravity of 9 pounds per cubic foot, or a 33 $\frac{1}{3}$ % reduction.

The asphaltic material used is preferably an asphalt, or a mixture of asphalts, that has a melting point between 180-250° F., and preferably between 200-220° F. Asphaltic materials, of course, do not have a sharp melting point, but soften and become pourable on increases in temperature. These melting point ranges, as indicated by the standard ball and ring test, are the temperatures at which the asphaltic material is sufficiently fluid to be readily poured. If desired, the asphaltic material can contain up to about 5% rubbery material based on the weight of the asphaltic and rubbery materials. This rubbery material may be either reclaim or crude rubber, or may be any of the well known synthetic rub-

bers such as butadiene-styrene copolymers and butadiene-acrylonitrile polymers. When reclaim rubber is employed, it preferably contains from 30-50% by weight of rubber hydrocarbon. This added rubbery material is not necessary to the invention, but may be used to increase the elasticity of the asphaltic composition.

In making the insulating and joint filler material, preferably only enough asphaltic material is employed to coat each of the cork particles and provide thin layers of material between the cork particles. Preferably, the new insulating and joint filler material contains from 5-9 parts by volume of cork particles and 3-5 parts by volume of the asphaltic material.

The embodiment shown in the drawings illustrates a joint filler strip of the type discussed above. In this embodiment, the filler strip 10 is in the form of a board having substantially parallel sides covered by sheets 11 of felt, paper or the like that have preferably been saturated with asphalt. The body of the board comprises cork particles 12 coated and separated by relatively thin layers of asphaltic material 13. Although in Fig. 1 the outer cork particles are shown exposed for purposes of illustration, these outer cork particles are preferably covered with the asphaltic material as illustrated in Fig. 2. The sheet 10 or slab may be formed in any desired length and width on a web machine or the like and rolled to the desired thickness while the asphaltic material is in a heated condition so that it will be plastic and adherent. The slab may then be cooled and cut into strips of any desired length and width. The side covering sheets 11 are not absolutely necessary, but are employed because of the adhesive nature of the asphaltic material. These sheets, which are preferably impregnated with the asphalt material, readily adhere to the body of the strip.

In preparing the new insulating and joint filler material of this invention, the asphaltic material is heated to or above its melting point so that it was sufficient fluidity to be readily poured and stirred. The heated asphalt and the cork particles are thoroughly mixed together until the cork particles are uniformly distributed and are each coated with the asphalt material. As was pointed out above, the mixture can then be molded in the form of slabs to produce a joint filler strip. The material can also be applied in thin layers to a roof or other supporting structure, if desired. In one embodiment of the invention, 7 parts by volume of cork particles having a maximum diameter of $\frac{1}{4}$ - $\frac{1}{2}$ inch were used with 4 parts by volume of asphalt. Each of the cork particles was covered by the asphalt and all cork particles were separated by thin layers of the asphalt as illustrated in the embodiment shown in the drawings.

The coating of the cork particles with the asphaltic material seals the air cells within the cork. As the cork particles are preferably relatively large, the unit area of surface of the particles is small per unit volume. This together with the sealing of the air cells improves the recovery of the material after it has been compressed. Thus, the new material has a recovery that is between more than 80% and as high as 92%, or greater. This recovery is further enhanced by using steam treated cork particles of the type discussed above so that at least some of the natural cork resins are removed, at least from the interior of the particles, and the apparent specific gravity of the cork particles is

reduced. This steam treatment gives the cork particles a greater resiliency than that exhibited by the untreated particles.

If desired, filler materials such as cotton seed hulls, dicalite, ground corn cobs, bentonite, or the like, or a combination of these or other like materials may be employed. These fillers are preferably absorbent to the asphalt so that the asphaltic material penetrates these materials and does not merely coat them as is true of the cork particles. These filler materials give increased strength to the insulating and joint filler material of this invention and also further reduce any tendency of the asphaltic material to extrude under pressure. In general, this extrusion is avoided so that after pressure is removed the material will return to its original dimensions. When these filler materials are employed, the amount of cork particles used should be reduced correspondingly. In general, these fillers will be used up to a maximum of about 15% by weight of the cork particles.

In preparing the new insulating and joint filler material, the ingredients may be mixed in a steam jacketed mixer of conventional type, with these ingredients including the asphaltic material and being maintained at a temperature above the melting point of the asphalt. The mixing is continued until a uniform mixture is obtained.

Although the new material is useful as an insulating and a joint filler material, it also has many other uses because of its waterproof character and its high degree of recovery after being compressed. As was pointed out above, this recovery is more than 80% and as much as 92% or greater. Thus, the new material may be used as a cushioning under floors of wood or the like, particularly floors such as are used in gymnasiums and that are subjected to impact. When the material is used under such floors, its waterproof character prevents dampness from destroying the wood. The new material also serves as a shock absorber to absorb heavy impacts. As the material has a high degree of recovery, the floors will not sag after long periods of use and will preserve the flooring from damage due to impacts.

As the new material has a large ratio of sealed air cells in the cork particles, it may also be used as an insulation material. Thus, the new material may be molded as pipe coverings or used in flat sheets to insulate refrigeration equipment or the like.

The foregoing detailed description is given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, for some modifications will be obvious to those skilled in the art.

I claim:

1. A preformed insulating and joint filler material having a high recovery and low retained extrusion when compressed and released, comprising, by volume, about 5 to 9 parts of cork particles and about 3 to 5 parts of an asphaltic material having a melting point of about 180° to 250° F., the cork being substantially free of particles below about $\frac{1}{8}$ inch and above about $\frac{1}{2}$ inch in maximum diameter and the asphaltic material being intimately mixed with the cork particles to coat the surfaces thereof without substantial penetration and serve as a binder.

2. The insulating and joint filler material of

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claim 1 wherein the cork particles are between about $\frac{1}{4}$ and $\frac{1}{2}$ inch in maximum diameter.

3. The insulating and joint filler material of claim 1 wherein the asphaltic material contains up to about 5% by weight of the asphaltic material of a rubbery material selected from the class consisting of reclaimed natural rubbers, crude natural rubbers, butadiene-styrene copolymers and butadiene-acrylonitrile copolymers.

4. The insulating and joint filler material of claim 1 wherein the cork particles have been steam treated to a specific gravity less than that of the untreated cork particles.

5. A preformed insulating and joint filler material having a high recovery and low retained extrusion when compressed and released, comprising, by volume, about 5 to 9 parts of cork particles and about 3 to 5 parts of an asphaltic material having a melting point of about 180° to 250° F., the cork particles being substantially free of particles below about $\frac{1}{4}$ inch and above about $\frac{1}{2}$ inch in maximum diameter and having been steam treated to a specific gravity less than that of the untreated cork particles, and the asphaltic material being intimately mixed with

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the cork particles to coat the surfaces thereof without substantial penetration and serve as a binder.

6. The insulating and joint filler material of claim 5 wherein the asphaltic material contains up to about 5% by weight of the asphaltic material of a rubbery material selected from the class consisting of reclaimed natural rubbers, crude natural rubbers, butadiene-styrene copolymers and butadiene-acrylonitrile copolymers.

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REFERENCES CITED

15 The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
20 264,814	Wood -----	Sept. 19, 1882
647,112	Pearson -----	Apr. 10, 1900
1,691,234	Fischer -----	Nov. 13, 1928
1,870,166	Bond -----	Aug. 2, 1932
2,431,384	Fischer -----	Nov. 25, 1947
25 2,454,506	Fischer -----	Nov. 23, 1948