

PATENT SPECIFICATION

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International Classification:—B29d. C10g. D04j.

COMPLETE SPECIFICATION

NO DRAWINGS

Improvements in Bituminised Fibrous Sheet Materials

I, CLARENCE HART CAMPBELL, a British Subject, of 46, Coronation Road West, Holland Park, Singapore 9, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:

The present invention relates to improvements in bituminised fibrous materials, such as bituminised felt and bituminised paper or like materials, treated with asphalt, pitch, tar and the like, which are herein referred to by the general term "bituminised fibrous materials".

Such materials as bituminised paper and bituminised felt are well-known for their damp-proofing qualities. Bituminised felt is widely used, in different grades and thicknesses, for covering roofs and as a damp course in building constructions, for example, in which it gives excellent protection against damp.

Bituminised paper likewise is used in packaging as a barrier layer to prevent the ingress of moisture.

These bituminised materials do not, however, possess very good thermal insulating properties, and it is an object of the present invention to provide a bituminised material of superior thermal insulating properties.

Exfoliated vermiculite is an inert mica-ceous material which is produced by heating the natural mineral vermiculite to a temperature of approximately 900°C., at which temperature the natural material expands to some sixteen times its original size. The expanded exfoliated vermiculite has, weight for weight, good heat insulating properties by reason of the minute air cells created in it during heating.

According to the present invention a flex-

ible bituminised fibrous sheet material is characterised by the incorporation therein of a proportion of exfoliated vermiculite.

The exfoliated vermiculite can be incorporated in the actual manufacture of a fibrous material, such as felt, before the application of the bituminous water-proofing material. For example, the actual felt may have up to 50% or more exfoliated vermiculite incorporated in it before the application of the bitumen.

As an alternative the exfoliated vermiculite may be applied to felt or paper after a part or all of the bituminous material has been applied, so as to form a surface layer of exfoliated vermiculite bonded to the base felt or paper and to itself by the bituminous material.

In the manufacture of bituminised wrapping papers a layer of bituminous material is applied between surface sheets of paper, and in accordance with the present invention a proportion of exfoliated vermiculite is incorporated therein to improve the thermal insulating qualities of the paper.

Likewise a layer of exfoliated vermiculite, bound together by bituminous material, can be incorporated between two surface layers of fully prepared bituminised roofing felt or saturated paper.

The insulating material produced by the present invention may be employed both in building and packaging for similar purposes to similar material not having an exfoliated vermiculite content. It is believed that the improved materials provided by the present invention have better acoustic insulating properties and less fire hazard than comparable materials without an exfoliated vermiculite content.

There are two main types of bituminised roofing felt, one being the saturated type, i.e. that in which the felt is only saturated

[Price 3s. 6d.]

with bitumen. Another type is first saturated with an appropriate low melting point bitumen saturant, then coated with a layer of protective bitumen, generally of an oxidised type. This protective coating is next covered with a mineral material to provide a non-sticking surface for packing purposes or to provide a mineral surface protection layer.

10 With the introduction of vermiculite in an exfoliated state, in either one or all the three processes, namely, saturating, coating or the final surfacing,

- 15 a) The thermal insulating value of the finished product is greatly increased.
- b) The fire proofing quality is greatly enhanced as vermiculite has a fusing point of 2,000°F.
- 20 c) The finished product has a high reflecting value for sun radiation.
- d) The vermiculite acts as a dressing agent.

In the manufacture of roofing felt, exfoliated vermiculite is preferably introduced 25 in a finely graded form into low melting point bitumen, i.e. 80-100 penetration, to which up to 20% of natural rubber may be added either as latex or in powdered form. As the raw felt passes through the bitumen 30 saturant a regulated quantity of exfoliated vermiculite is deposited on the felt and is securely embedded amongst the fibres of the felt by a squeegee arrangement, followed by an impress roller.

35 When exfoliated vermiculite is to be introduced in the coating stage, it is intermixed with a coating bitumen. The saturated felt is led through a bath of the coating bitumen and exfoliated vermiculite and 40 is then passed between rollers which are set to a gap that allows a coating of a predetermined thickness to be built on the surfaces of the saturated felt.

In the process of applying this coating 45 compound to either one or both sides of the saturated felt, the vermiculite is deposited in an intimate mixture with the coating material. In this way a second application of vermiculite may be made to felt to which 50 vermiculite has already been applied with the bitumen saturated. This coated felt may then be cooled and rolled. Alternatively, a

final surface of exfoliated vermiculite may be applied.

When only a non-sticking surface is required, the exfoliated vermiculite is reduced to a powder and applied to the bitumen coated surface. When a vermiculite surface of a thicker or heavier nature is required, the gauging of the vermiculite is such as to give a complete surface of the vermiculite.

The vermiculite can thus be introduced into one or all the three stages of manufacture of roofing felt, namely, saturating, coating or surfacing.

1. A flexible bituminised fibrous sheet material, characterised by the incorporation of a proportion of exfoliated vermiculite.

2. A bituminised fibrous sheet material according to claim 1, comprising felt, bitumen and exfoliated vermiculite incorporated in the felt in amounts up to 50% of the weight of the felt.

3. A bituminised fibrous sheet material according to claim 1 or 2, comprising a felt base material saturated with a bitumen saturant having exfoliated vermiculite mixed therewith.

4. A bituminised fibrous sheet material according to claim 1, 2 or 3, comprising a felt base saturated with a bitumen saturant and covered with a bitumen coating layer having exfoliated vermiculite mixed therewith.

5. A bituminised fibrous sheet material according to claim 4, wherein the exfoliated vermiculite is incorporated in a layer of coating bitumen applied to both sides of the saturated felt.

6. A bituminised fibrous sheet material according to any preceding claim, wherein a layer of powdered exfoliated vermiculite is applied to one or both surfaces of bituminised felt material.

7. A method of manufacturing bituminised roofing felts having a proportion of exfoliated vermiculite incorporated substantially as herein described.

STEVENS, LANGNER, PARRY
& ROLLINSON,
Chartered Patent Agents,
Agents for the Applicant.

PROVISIONAL SPECIFICATION

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What I claim is:-

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3. A bituminised fibrous sheet material according to claim 1 or 2, comprising a felt base material saturated with a bitumen saturant having exfoliated vermiculite mixed therewith.

4. A bituminised fibrous sheet material according to claim 1, 2 or 3, comprising a felt base saturated with a bitumen saturant and covered with a bitumen coating layer having exfoliated vermiculite mixed therewith.

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