PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Roof Construction and Device.

We, PARAMOUNT ASPHALTE AND FLOORING COMPANY LIMITED, a company organised under the laws of Great Britain, of 149, Kennington Park Road, London, S.E.11, do hereby declare the invention, for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to ventilating devices for use with roof constructions and in particular to roofs comprising a load bearing surface and an impervious outer covering or coating of waterproof material.

Bitumen felt and asphalt are commonly used to provide impervious coatings on load bearing surfaces such as concrete. These coating materials are used because, when properly applied, the final coating is impervious to water in either liquid or vapour form, and even to air.

Now that more attention is being paid to the heat insulating characteristics of roofs increasing use is being made in roof constructions of heat insulating materials such as foam slag, vermiculite, synthetic boards from waste cellulosic material, and so on, the insulating quality of these materials usually resulting from a multiplicity of air channels or pores distributed throughout the material.

Materials such as foam slag may be used in the construction of the load bearing surface and materials such as vermiculite and synthetic board may be laid on top of a load bearing surface such as, for example, concrete.

It has been noted that impervious coatings of asphalt laid on these materials have a tendency to crack and craze after a short time and we have found that this is due to thermal expansion of air and/or water vapour in the underlying porous material. The expanded gases collect immediately beneath the lower face of the impervious layer and exert a pressure, the effect of which is to lift the layer away from the underlying support. This lifting is periodic, usually occurring during the heat of the day, and results in the asphalt becoming cracked or crazed.

Similarly layers of bitumen felt will be lifted and tend to become torn.

Very little pressure is required to lift the impervious layer, pressures of about two inches water gauge often being sufficient.

To overcome this difficulty ventilator devices have been proposed to allow the air or vapour pressure to escape, these devices consisting of a length of pipe which at its outer end is protected against the weather and at its other end has access to the space between the roof structure and the covering layer to which it is secured.

According to the present invention a roof ventilator for use on roof structures having a surface coating layer of impervious material to protect the same against ingress of weather, comprises a vent pipe which, when in use, is arranged to extend through the surface coating layer to permit free communication between the roof interior and exterior, this vent pipe having at its outer end means to prevent direct ingress of snow and rain and being provided at its inner end with a tent-like metal structure, which structure serves as the means of anchoring the ventilator to the coating layer and as a vapour and air collecting chamber, access to which is through an opening or openings in the sides thereof.

Since any air or water vapour trapped in the roof construction will tend to accumulate beneath the impervious covering at its highest point or line, the pressure relieving ventilators are preferably located at this point or line.

For example, if the roof is cambered from the centre, the pressure relieving means is located at the highest point in the camber and may take the form of an inverted funnel, the upstanding stem of which is provided with an umbrella-like shield and is bent over near its extremity through approximately 180°.

[*Price 3s. 0d.*]

Price 3s.

The invention is illustrated in the accompanying drawings in which Figure 1 is a diagrammatic perspective view of a roof structure fitted with ventilators in accordance with the invention.

Figure 2 is a vertical section on an enlarged scale of an umbrella form of ventilator fitted to the roof.

Figures 3 and 4 are perspective views showing alternative forms of ventilator fittings.

Referring to the drawings, there is shown a flat top roof A, wherein the roof top has its surface covered with a coating of asphalt or other material impervious to water. B is a wall surround.

In present building construction it is usual to construct the load bearing surface of the roof of concrete, as indicated at C in Figure 2, but it will be understood that unless the concrete surface is treated, e.g. by application of a covering of a water impervious material, moisture will find its way through the concrete to the interior of the building.

Increased attention has been paid to thermal insulation of roof structures: most insulating materials contain an appreciable quantity of entrapped air. When such materials are protected with a surface coating of asphalt or similar waterproofing material, the coating functions as a membrane. After a comparatively short length of time it will be noticed that the top layer or coating will tend to crack and craze.

As an example where the concrete layer has applied to it a layer D (see Figure 2), of heat insulating material, e.g. vermiculite or is covered with synthetic board it has been found that the asphalt layer indicated at A in Figure 2 soon becomes crazed.

This cracking and crazing of the asphalt layer is due to thermal expansion of the air and/or water vapour in the underlying porous layer D. Due to the heat of the sun, the moisture or water present in the layer D evaporates and the ~~expanded~~ gases will collect immediately below the impervious layer A of asphalt and exert a pressure as a result of which the layer A will lift and remain in this condition until a temperature drop occurs as at nightfall when it will fall back. Repeated lifting and falling of the asphalt layer produce the cracks which it is the object of the present invention to overcome by fitting ventilators, which permit of free passage of air between opposite sides of the water impervious layer A in order to prevent any build-up of pressure between the load supporting surface C and the covering A of moisture impervious material.

Where the flat roof is sloped with the object to ensuring a fall away for rain water it will be found that pressure will collect at the high spots and accordingly the breathing devices are located at a point or points along the highest parts in the surface of the roof. Figure 1 shows a series of venting devices placed along a central camber line. Each of these devices consist of an inverted funnel formed of metal, thus providing a tent like structure which opens into a vertical pipe K having at its extremity a bent over end L. F is a shield.

In the embodiment shown in Figure 2 the pipe K opens into an inverted funnel M which may vary from 3-9 inches across its widest part or diameter.

The lower edge of the structure M is serrated or notched as at P or similarly shaped to provide a series of communication channels for passage of air to and from the funnel. Also the device is preferably arranged so that the bent-over portion of the stem lies down the direction of the prevailing wind.

In use, the several vent devices during the construction of the roof are placed funnel end downwards on the surface to which the impervious layer is to be applied, and the impervious layer is then applied over the outer surface of the funnel M and up the stem K as far as the umbrella-like shield F. The function of this shield is to prevent the ingress of water between the stem of the funnel and the impervious layer. Similarly the bend in the stem is to prevent water falling down the stem of the funnel.

When the roof construction is complete air or water vapour trapped beneath the impervious layer will exhaust itself to the exterior through the funnel which, in effect, functions as a breather.

In addition a perforated pipe or other collecting channel (not shown) may be laid beneath the highest parts of the impervious layer, one or both ends being led to the base of such a breathing device.

In other cases the roof may slope gradually from one end to the other in which case the breathing means is located at the higher end of the roof.

A suitable breathing device for this purpose is shown in Figures 3 and 4. In the embodiment shown in Figure 3 the stem K, which is similar in structure to that described with reference to Figure 2, opens into a metal plate R which forms one side of a triangular section tent structure, the other two sides of the triangle being completed by metal panels which are cut away at the centre so as to leave end portions, each end portion in the embodiment illustrated forming a right angle bracket R^1 so that it will readily fit and can be fixed in the angle at the base of the wall.

In the embodiment shown in Figure 4 the stem K is carried by one side S of a three piece plate, the other two plates S_1 S_2 forming a tent structure shaped somewhat like the hip end to a pitch roof. The plates may be provided with edge attaching fillets T so that it may be secured to a flat surface and provided with a collecting chamber for air or water vapour.

What we claim is:—

1. A roof ventilator for use on roof structures having a surface coating layer of imper-

The invention is illustrated in the accompanying drawings in which Figure 1 is a diagrammatic perspective view of a roof structure fitted with ventilators in accordance with the invention.

Figure 2 is a vertical section on an enlarged scale of an umbrella form of ventilator fitted to the roof.

Figures 3 and 4 are perspective views showing alternative forms of ventilator fittings.

Referring to the drawings, there is shown a flat top roof A, wherein the roof top has its surface covered with a coating of asphalt or other material impervious to water. B is a wall surround.

In present building construction it is usual to construct the load bearing surface of the roof of concrete, as indicated at C in Figure 2, but it will be understood that unless the concrete surface is treated, e.g. by application of a covering of a water impervious material, moisture will find its way through the concrete to the interior of the building.

Increased attention has been paid to thermal insulation of roof structures: most insulating materials contain an appreciable quantity of entrapped air. When such materials are protected with a surface coating of asphalt or similar waterproofing material, the coating functions as a membrane. After a comparatively short length of time it will be noticed that the top layer or coating will tend to crack and craze.

As an example where the concrete layer has applied to it a layer D (see Figure 2), of heat insulating material, e.g. vermiculite or is covered with synthetic board it has been found that the asphalt layer indicated at A in Figure 2 soon becomes crazed.

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In the embodiment shown in Figure 2 the pipe K opens into an inverted funnel M which may vary from 3-9 inches across its widest part or diameter.

The lower edge of the structure M is serrated or notched as at P or similarly shaped to provide a series of communication channels for passage of air to and from the funnel. Also the device is preferably arranged so that the bent-over portion of the stem lies down the direction of the prevailing wind.

In use, the several vent devices during the construction of the roof are placed funnel end downwards on the surface to which the impervious layer is to be applied, and the impervious layer is then applied over the outer surface of the funnel M and up the stem K as far as the umbrella-like shield F. The function of this shield is to prevent the ingress of water between the stem of the funnel and the impervious layer. Similarly the bend in the stem is to prevent water falling down the stem of the funnel.

When the roof construction is complete air or water vapour trapped beneath the impervious layer will exhaust itself to the exterior through the funnel which, in effect, functions as a breather.

In addition a perforated pipe or other collecting channel (not shown) may be laid beneath the highest parts of the impervious layer, one or both ends being led to the base of such a breathing device.

In other cases the roof may slope gradually from one end to the other in which case the breathing means is located at the higher end of the roof.

A suitable breathing device for this purpose is shown in Figures 3 and 4. In the embodiment shown in Figure 3 the stem K, which is similar in structure to that described with reference to Figure 2, opens into a metal plate R which forms one side of a triangular section tent structure, the other two sides of the triangle being completed by metal panels which are cut away at the centre so as to leave end portions, each end portion in the embodiment illustrated forming a right angle bracket R^1 so that it will readily fit and can be fixed in the angle at the base of the wall.

In the embodiment shown in Figure 4 the stem K is carried by one side S of a three piece plate, the other two plates S_1 S_2 forming a tent structure shaped somewhat like the hip end to a pitch roof. The plates may be provided with edge attaching fillets T so that it may be secured to a flat surface and provided with a collecting chamber for air or water vapour.

What we claim is:—

1. A roof ventilator for use on roof structures having a surface coating layer of imper-

vious material to protect the same against ingress of weather comprising a vent pipe which, in use extends through the surface coating layer to permit free communication between the roof interior and exterior, said vent pipe having at its outer end means to prevent direct ingress of snow and rain and in which its inner end opens into a tent-like metal structure which structure serves as the means of anchoring the ventilator to the coating layer and as an air and moisture collecting chamber, access to which is through an opening or openings in the sides thereof.

2. A roof ventilator as claimed in claim 1 in which the tent-like structure is formed as an inverted funnel and serrations or openings are provided at the edges thereof to facilitate passage of air to and from the interior of the funnel.

3. A roof ventilator as claimed in claim 1 in which the tent-like structure comprises two or three metal plates at an angle to enclose an interior chamber.

4. A roof ventilator having a roof structure as claimed in claim 3, comprising three plates forming a triangular section, which are cut away at the centre.

5. A roof ventilator as claimed in any of claims 1 to 4, wherein that part of the pipe above the funnel or other tent-like structure is provided with a shield to prevent ingress of water between the pipe of the funnel and the impervious coating layer.

6. A ventilator as claimed in any one of claims 1-5 comprising a pipe having a bent over down-turned end.

7. A roof ventilator substantially as described with reference to any one figure of the drawings.

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PROVISIONAL SPECIFICATION

Roof Construction and Device.

We, PARAMOUNT ASPHALTE AND FLOORING COMPANY LIMITED, a Company organised under the Laws of Great Britain, of 149, Kennington Park Road, London, S.E.11, do hereby declare this invention to be described in the following statement:—

This invention relates to roof constructions and in particular to roofs comprising a load bearing surface and an impervious outer covering or coating of waterproof material.

Bitumen felt and asphalt are commonly used to provide impervious coatings on load bearing surfaces such as concrete. These coating materials are used because, when properly applied, the final coating is impervious to water in either liquid or vapour form, and even to air.

Now that more attention is being paid to the heat insulating characteristics of roofs increasing use is being made in roof constructions of heat insulating materials such as foam slag, vermiculite, synthetic boards from waste cellulosic material, etc., the insulating quality of these materials usually resulting from a multiplicity of air channels or pores distributed throughout the material.

Materials such as foam slag may be used in the construction of the load bearing surface and materials such as vermiculite and synthetic board may be laid on top of a load bearing surface such as, for example, concrete.

It has been noted that impervious coatings of asphalt laid on these materials have a tendency to crack and craze after a short time and I have found that this is due to thermal expansion of air and/or water vapour in the underlying porous material. The expanded gases collect immediately beneath the lower face of the impervious layer and exert a pressure, the effect of which is to lift the layer away from the underlying support. This lifting is periodic, usually occurring during the heat of the day, and results in the asphalt becoming cracked or crazed.

Similarly layers of bitumen felt will be lifted and tend to become torn.

Very little pressure is required to lift the impervious layer, pressures of about two inches water gauge often being sufficient.

According to the present invention I provide a roof construction comprising a load bearing surface and an impervious outer covering in which there is provided breathing means for preventing the building up of pressure between the said surface and covering.

Since any air or water vapour trapped in the roof construction will tend to accumulate beneath the impervious covering at its highest point or line, the pressure relieving means is preferably located at this point or line.

For example, if the roof is cambered from the centre, the pressure relieving means is located at the highest point in the camber and may take the form of an inverted funnel, the upstanding stem of which is provided with an umbrella-like shield and is bent over near its extremity through approximately 180°. In use, this device during the construction of the roof is placed funnel end downwards on the surface to which the impervious layer is to be applied, and the impervious layer is then applied over the outer surface of the funnel

and up the stem as far as the umbrella-like shield. The function of this shield is to prevent the ingress of water between the stem of the funnel and the impervious layer. Similarly the bend in the stem is to prevent water falling down the stem of the funnel.

When the roof construction is complete air or water vapour trapped beneath the impervious layer may be exhausted to the exterior through the funnel which, in effect, functions as a breather.

Preferably the lower edge of the inverted funnel is serrated or notched or similarly shaped to provide a series of communication channels for passage of air to and from the funnel. Also the device is preferably arranged so that the bent-over portion of the stem lies down the direction of the prevailing wind.



Such devices, which form part of the present invention, may be arranged along the highest line of the roof or alternatively a perforated pipe or other collecting channel may be laid beneath the highest parts of the impervious layer, one or both ends being led to the base of such a breathing device.

In other cases the roof may slope gradually from one end to the other in which case the breathing means should be provided at the higher end of the roof.

In these cases the breathing means may conveniently be provided in a fillet between the higher edge of the roof and an outer wall. For example, a line of spaced bricks may be laid along the edge of the roof to be coated and a metal strip placed so that it forms along the whole edge a continuous ramp sloping from the roof up onto the bricks. In this way there is formed beneath the metal strip a channel of triangular section extending along the higher edge of the roof. If asphalt is to be used as the impervious coating it is laid to form a continuous layer over the roof, the metal strip and the upper surface of the bricks.

Entrapped air or water vapour will then pass into the channel beneath the metal ramp and between the spaced bricks whence it may pass into a cavity wall or through an air-brick. With this construction the use of traditional skirting and fillet to brickwork is obviated.

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