THE JOINT EXAMINATION BOARD

PAPER P4

AMENDMENT OF SPECIFICATIONS FOR UNITED KINGDOM PATENT APPLICATIONS IN PROSECUTION, REVOCATION PROCEEDINGS OR OTHERWISE

14th NOVEMBER, 1996

10.00 A.M. - 1.00 P.M.

Please read the following instructions carefully. This is a **THREE HOUR** paper.

1. In the appropriate boxes at the top of each sheet please enter the designation of the paper, the question number, and your Examination number. Write on one side of the paper only using **BLACK** ink. You must **NOT** staple pages together. You must **NOT** state your name anywhere in the answers.

2. **NO** printed matter or other written material may be taken into the examination room.

3. Answers **MUST** be legible. If the examiners cannot read a candidate's answer no marks will be awarded.

20 PAGES INCLUDING THIS FRONT SHEET

INSTRUCTIONS TO CANDIDATES

In this paper, you should assume that a United Kingdom patent application comprising the attached specification has been filed and that the UK Patent Office has issued the attached Official Letter. You have reported the Official Letter to your client and have received instructions for response in the form of the attached letter.

Your task is to prepare the following:

1. A draft letter to the UK Patent Office in response to the Official Letter including amended claims if appropriate. (Please note that for the purposes of this examination you are **not** required to propose any amendments to the description of the patent application.)

2. A memorandum consisting of notes to provide the basis of advice and comment to your client. These notes should be restricted to patent matters; you are **not** required to consider any other matters such as copyright or design protection.

You should accept the facts given in the paper and base your answer on those facts. In particular, you should **not** make use of any special knowledge that you may have of the subject matter concerned, and you must assume that the prior art referred to is in fact exhaustive. Where only extracts of documents are presented, you should assume that those extracts contain all relevant material.

If your advice to your client includes a suggestion that one or more divisional applications should be filed, you should draft independent claim(s) for the or each divisional and your memorandum should indicate your grounds for believing the filing of such a divisional application to be advisable. You should **not**, repeat **not**, draft a description for a divisional application, or any dependent claims.

LETTER FROM CLIENT

"Thank you for your recent letter enclosing the Official Letter from the Patent Office and the patents referred to by the examiner.

"We are very concerned at the objections which have been raised, since both our AIRFLOW rafter vents (which you will recall is the name we give to the rigid version for new-builds) and the FLEXIVENT (the variable width vent for refurbishment projects) are now selling extremely well and we are sure that it is only the existence of the patent application which is stopping most of our competitors from copying the designs. Quite apart from sales to the professional/trade sector, we are now breaking into the DIY market and are also exporting large quantities of ventilators. We are sure our competitors will wish to do the same, and it is therefore most important to us that you rebut the examiner's objections as comprehensively as possible.

"We have taken a close look at the points made by the examiner, but feel that it is really up to you to decide whether they have any merit. As far as we can see, the product described in the US patent he refers to is nothing like our vent. It seems to be primarily a sort of insulating block, whereas our vent has no thermal insulation properties. In fact, the aluminium version of our vent would be a good thermal conductor! We also note that the blocks described in the US patent do not seem to be fixed in place. Presumably they can get away with this because the blocks rest on the floor of the roof space. Our vents (especially the AIRFLOW version) need to be fixed and the fixing flanges which we provide (with or without pre-formed fixing holes) are an important feature. The resilience of the FLEXIVENT does enable it to be used without nails or screws sometimes, but even with this product the fixing flanges are important.

"The other patent just shows the well known soffit vent which I think you actually mentioned in our patent application.

"Neither of the patents show the "fly-screen" (the mesh) which we also described in our application. Most of the AIRFLOW vents we sell have this feature. The success of this version of our product is probably attributable to our realisation that, while the use of roof ventilators is essential, it does lead to an increased danger of insect infestation (wasps etc). Architects are now starting to require the fly-screen version for many applications and this is leading to higher sales. In fact, now that they are known to solve the problem of infestation we think it is only a matter of time before building regulations specify the use of fly-screens in many situations.

"Our vents are quite unlike those unearthed by the examiner (or indeed anything else we have ever seen) and so it seems to us that the examiner's objections should not be too problematical. We would therefore like you prepare a suitable response for us to review before you send it to the Patent Office. We are particularly keen to progress matters as quickly as possible since we have reason to believe that one of our competitors, Venture Vents, is about to launch a competing product like our FLEXIVENT very soon. One of our reps managed to get hold of a promotional leaflet (Document A) which describes this product and I enclose a copy for your information. You will see that the vent in question is very similar to the FLEXIVENT. It is made by vacuum-forming a sheet of thin plastics material. Naturally we would like to be able to put a stop to sales of this product.

"We hope that the above information is helpful. We look forward to hearing from you in the near future."

OFFICIAL LETTER

Application No: GB 9412345.6
Applicant : Innovative Roofing Systems Ltd

Examiner : H. Hogg
Date of report : 16 July 1996

Latest date for reply : 16 January 1997

Patents Act 1977
Examination Report under Section 18(3)

Basis of the examination

My examination is based on the specification as filed.

Novelty

It appears, as a result of a search under Section 17, that your application does not comply with the requirements of Section 1(1)(a) in that the invention, so far as claimed in Claims 1-4 of the application, is not new having regard to the matter contained in the patent specifications or other documents cited below:-

US 4612999

GB 2012012

PATENT APPLICATION No 9412345.6

Filed July 1994 (no priority claimed)

Title - Improvements in roof ventilation

This invention relates to the ventilation of the roof space of a building.

It is common in roof structures for high levels of insulation to be used in order to reduce heat losses from the building. However, this increases the necessity to provide good ventilation of the roof structure in order to prevent condensation of moisture in the interior. Condensation within the roof structure is undesirable since it can lead to rotting of roof timbers or damage to the insulation material.

It is particularly important to provide adequate eaves-to-eaves ventilation, i.e. an adequate ventilation path from the point at which the roof timbers meet the supporting walls at one side of the building to the corresponding point on the other side of the building. Various forms of ventilator have been devised for this purpose. Eaves constructions commonly comprise fascia and soffit boards fixed to the ends of the roof rafters, and it is known to fit ventilators to these boards. Such ventilators typically consist of elongate apertured strips which are fixed to the edges of the soffit or fascia board, or moulded ventilators which are set into openings formed in the boards for the purpose.

A disadvantage of known forms of roof ventilator are that they are relatively difficult and/or time-consuming to install, and also may be visible (and unsightly) from the exterior of the building. These problems may be particularly significant where the ventilators are fitted to existing buildings (rather than in new-build situations). Also, known forms of soffit and fascia ventilator are only suitable for use in buildings having eaves constructions with soffit and/or fascia boards.

We have now devised an improved form of roof ventilation system which overcomes or substantially mitigates the disadvantages associated with the prior art.

According to one aspect of the invention, a roof space ventilation system comprises

a roof space defined by a floor and a roof ceiling supported by roof rafters,

an insulating material which lines the floor;

eaves located at opposite sides of the roof space to permit atmospheric air to enter and leave the roof space, and

a ventilator for providing a flow of air into and out of the roof space,

wherein the ventilator is located between an adjacent pair of roof rafters adjacent the eaves and comprises a ventilator body having formed therein a plurality of channels disposed, in use, substantially parallel to said rafters.

The ventilation system according to the invention is advantageous in that the channels provide a ventilation path between the roof space and the external environment, the ventilator body acting as a spacer between any insulation material laid on the floor of the roof space and the underside of the roof itself. The ventilator may be fitted to adjacent rafters simply and rapidly, either during construction of a new building or to an existing construction.

In one preferred embodiment of the ventilation system according to the invention, the ventilator body is resiliently compressible transverse to the longitudinal axis of the channels. This is useful particularly in cases in which the ventilator is installed in existing buildings, since buildings of different ages may have rafters with somewhat different separations.

The resilience of the ventilator body may be created by forming the body from a sheet of resilient material, eg a light gauge metal, most preferably aluminium, and folding the sheet to form channels of V- or U-section. The ventilator body may then be compressed, concertina-fashion, and inserted between the rafters. When released the ventilator body then expands and bears against the rafters.

In other embodiments, the ventilator body is a rigid body and the channels are enclosed channels formed within the body. The channels may, for example, be bores of circular or other cross-section, or may be defined by partitions within the body such that the channels are of square or other box section. In a particularly preferred embodiment, the ventilator body comprises a pair of plates spaced apart by partitions arranged in zig-zag fashion.

Rigid ventilators of these types are particularly useful in new-build situations for which the rafter separation is normally the standard distance now specified in building regulations. Thus, the ventilator may be produced in one standard size. Furthermore, it is common for the interior of a roof to be lined with sarking felt or a similar material. Such material can sag and could at least partially block open channels in the ventilator body.

The ventilator body is preferably provided with means for fixing to the rafters. Such means most preferably takes the form of flanges through which mechanical fixings such as nails or screws may be driven. Pre-formed openings may be provided in the flanges.

Embodiments of the invention will now be described in greater detail, by way of illustration only, with reference to the accompanying drawings, in which

Figure 1 is a perspective view of a first embodiment of a roof ventilation system according to the invention;

Figure 2 is a perspective view of a ventilator used in the ventilation system of Figure 1, prior to installation;

Figure 3 illustrates the sequence of operations involved in installing the ventilator of Figure 2;

Figure 4 shows a perspective view of a second embodiment of a roof ventilator; and

Figure 5 shows a view similar to Figure 4 of a third embodiment of a roof ventilator.

Referring first to Figures 1 and 2, a first embodiment of a roof ventilator according to the invention (generally designated 1) is formed from a sheet of aluminium. The sheet is folded to form a plurality (in the example illustrated, eleven) channels 2. Terminal lateral portions of the sheet constitute fixing flanges 3. The sheet is secured to a pair of adjacent roof rafters 4 by suitable fixings (not shown), eg nails or screws, driven through the flanges 3. The material from which the ventilator 1 is formed is of sufficiently light gauge that the fixings may be driven directly

through it. Alternatively, fixing holes may be pre-formed in the flanges 3.

The ventilator 1 is installed such that the channels 2 abut the underside of the roof 5. The ventilator 1 thus acts as a spacer between the roof 5 and insulation material 6 laid on the floor of the roof space and extending up to the eaves (ie into the corner at which the roof rafters 4 meet the supporting brickwork).

As can be seen from Figures 2 and 3a, the ventilator 1 is pre-formed in somewhat expanded form. The ventilator 1 is resiliently compressible transverse to the longitudinal direction of the channels 2, and may therefore be compressed (as shown in Figure 3b) to suit the spacing of the rafters 4. The ventilator 1 is pressed, in the compressed state, into the space between the rafters 4 until it abuts the underside of the roof, and then released. The compressed ventilator 1 then expands laterally until the flanges 3 abut the rafters 4. The resilience of the ventilator 1 then holds it in position until it is secured by means of the fixings. Indeed, the resilience of the ventilator 1 may be sufficient to hold it in place sufficiently securely that the use of further mechanical fixings may be dispensed with.

The compressibility of the ventilator 1 thus enables it to be fitted between rafters having various different separations.

Turning now to Figure 4, a second embodiment of a roof ventilator according to the invention is generally designated 11. The ventilator 11 comprises two flat walls 12,13 spaced apart by a plurality of inclined partitions 14 arranged generally in the form of a zig-zag so as to define a plurality of channels 15 which are triangular in transversal cross-section. The upper wall 12 has a pair of lateral flanges 16 by which the ventilator 11 may be supported between, and fixed to, an adjacent pair of roof rafters.

The ventilator 11 is formed in plastics material by direct extrusion according to a conventional technique.

In use, the ventilator 11 is fitted between a pair of adjacent roof rafters, the ventilator 11 being

supported by the flanges 16. Fixings, eg nails or screws, may be driven through the flanges 16 into the joists to fix the ventilator 11 in position. Alternatively, fixing holes may be pre-formed in the flanges 16. The ventilator 11 exhibits a high degree of rigidity and, like the first embodiment described above, acts as a spacer between the underside of the roof and insulation laid on the floor of the roof space.

Finally, Figure 5 shows a modified version of the ventilator of Figure 4. This embodiment is generally designated 21 and differs from the previous embodiment in that a mesh or gauze 22 is fitted across the one end of the ventilator 21. The mesh or gauze 22 may also be of plastics material and is preferably fitted to the ventilator 21 after extrusion, eg by means of adhesive or a welding technique. The mesh or gauze 22 is sufficiently fine to prevent ingress into the roof space of insects or other vermin. The ingress of insects into a roof space is undesirable, particularly in the case of insects, eg wasps, which build nests. The use of roof ventilators having a ventilation channel by which the interior of the roof space communicates with the exterior is necessary for the reasons given above but has the inevitable consequence that they provide easy access for insects and other vermin to the roof space from outside.

Claims

1. A roof space ventilation system comprising

a roof space defined by a floor and a roof ceiling supported by roof rafters,

an insulating material which lines the floor;

eaves located at opposite sides of the roof space to permit atmospheric air to enter and leave the roof space, and

a ventilator for providing a flow of air into and out of the roof space,

wherein the ventilator is located between an adjacent pair of roof rafters adjacent the eaves and comprises a ventilator body having formed therein a plurality of channels disposed, in use, substantially parallel to said rafters.

2. A roof ventilation system as claimed in Claim 1, wherein the ventilator body is provided with means for fixing the ventilator to the adjacent roof rafters.

3. A roof ventilation system as claimed in Claim 2, wherein the means for fixing comprises flanges through which fixings may be driven into the roof rafters.

4. A roof ventilation system as claimed in Claim 3, wherein the flanges are provided with pre-formed openings for the fixings.

5. A roof ventilation system as claimed in any one of the preceding claims, wherein the ventilator body is formed from a folded sheet of aluminium so as to be compressible transverse to the longitudinal direction of the channels.

6. A roof ventilation system as claimed in any preceding claim wherein the channels are partially closed by a mesh.

7. A roof ventilation system substantially as hereinbefore described and as illustrated in Figure 1.

Fig. 1

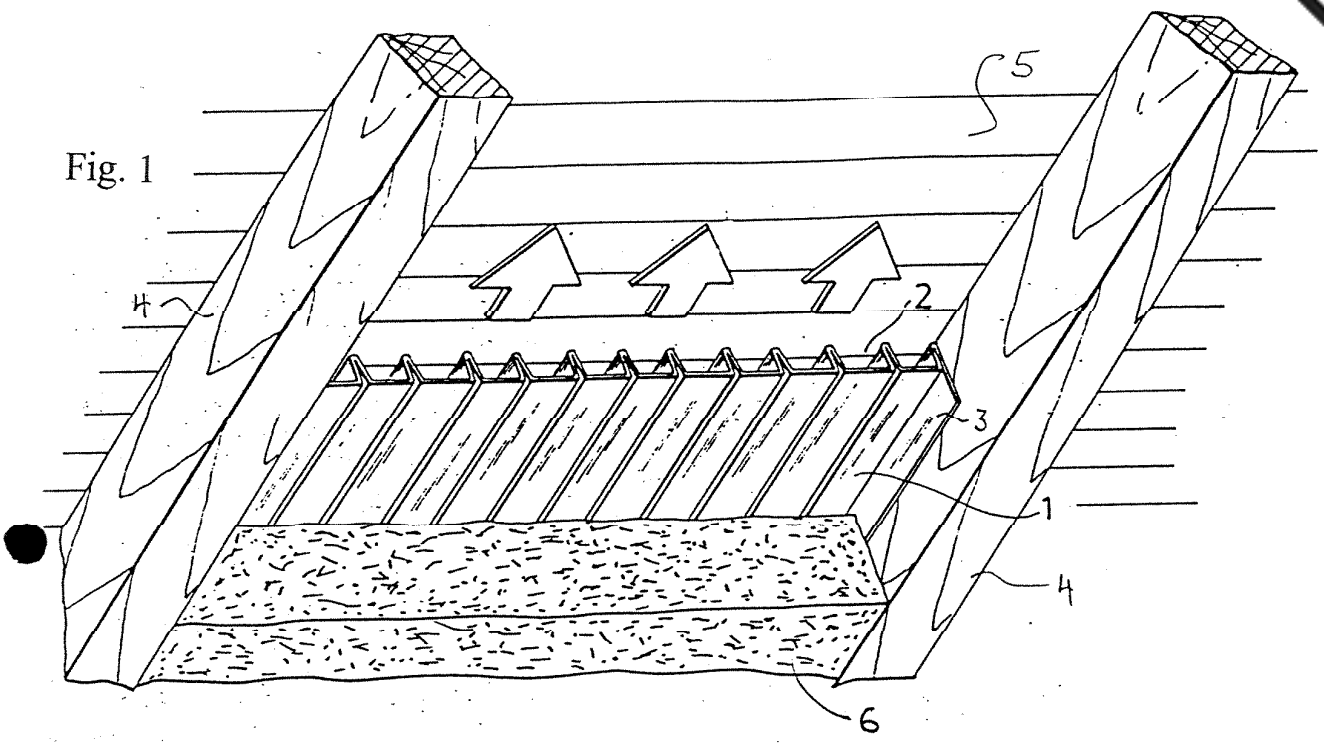
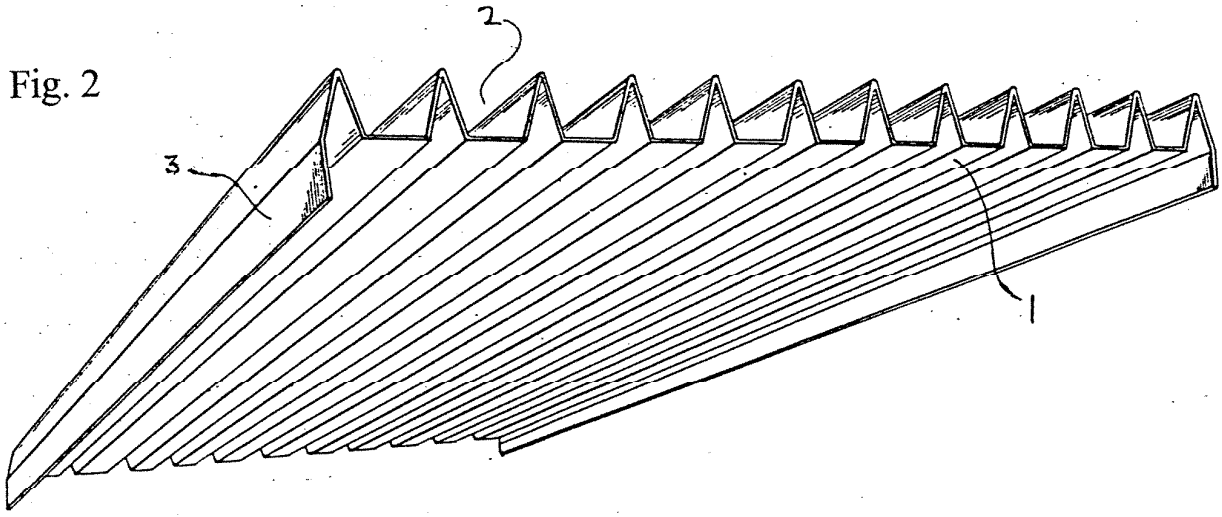
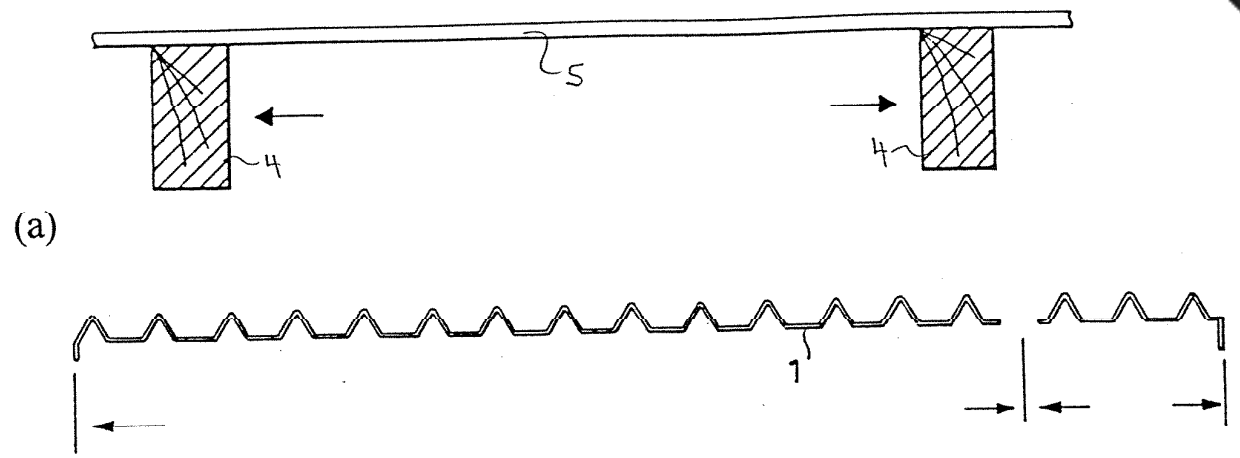
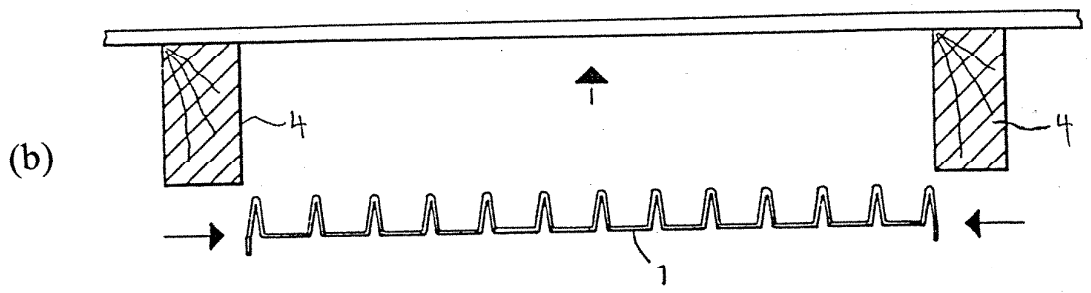


Fig. 2







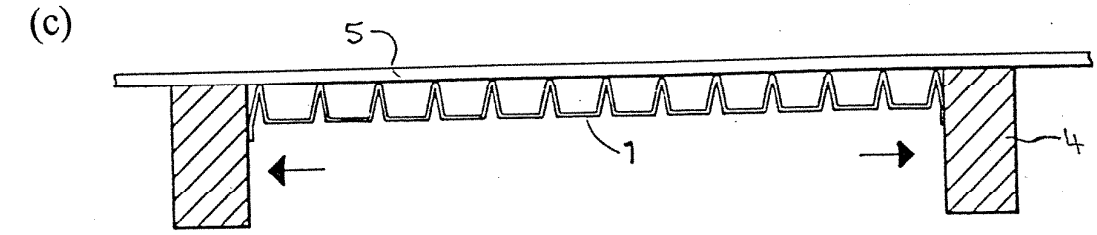


Fig. 3

Fig. 4

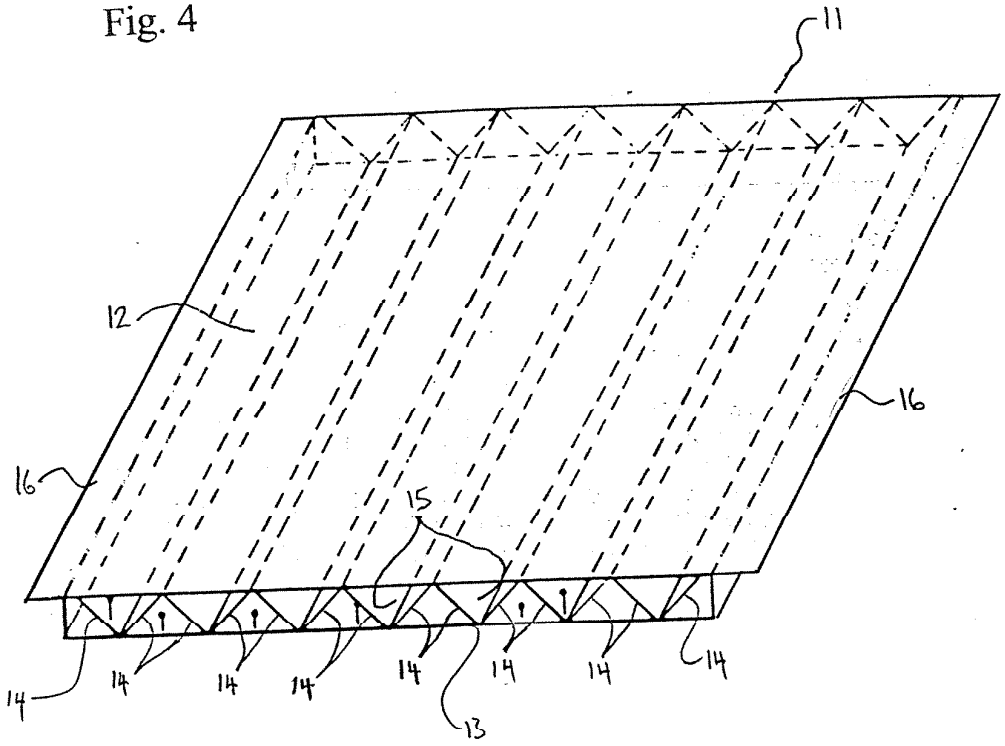
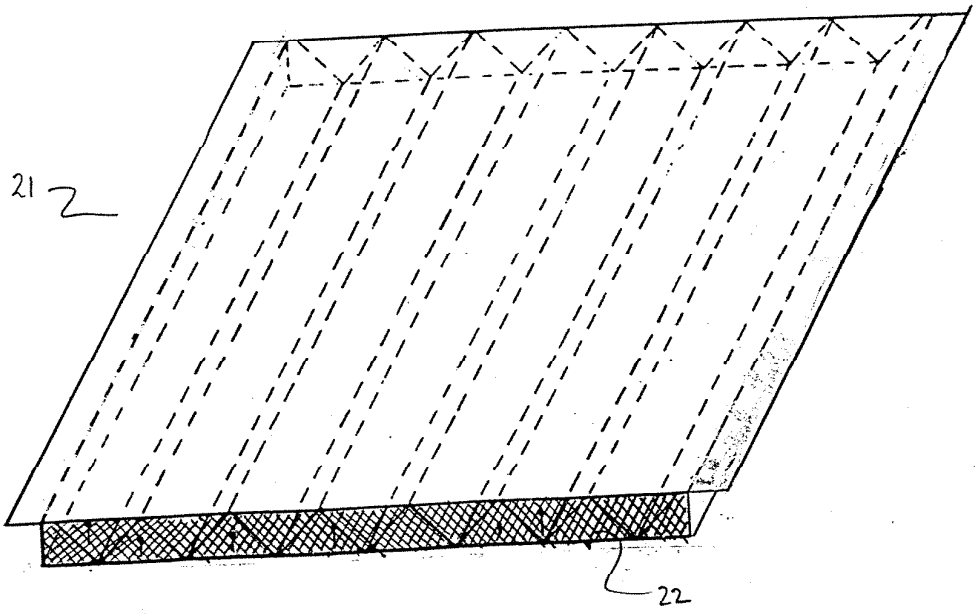


Fig. 5



US Patent 4,612,999

(Issued August 3, 1976)

(Extracts)

ROOF CONSTRUCTION WITH INLET AND OUTLET VENTING MEANS

SUMMARY OF THE INVENTION

The invention relates to an improved ventilated roof construction for eliminating the thermal gradient on the underside of the roof deck while also providing adequate insulation in the area of the ceiling adjacent the top plate of the exterior wall. In accordance with the invention, an insulating member is positioned between adjacent rafters of the roof, and the insulating member includes a lower surface that rests on the ceiling and an inclined upper surface which bears against the undersurface of the roof deck. The upper surface of the insulating member is formed with a series of grooves or recesses that in combination with the roof deck define air passages for the flow of air along the undersurface of the roof deck from the facia to the ridge.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a roof construction incorporating the ventilating system of the invention;

FIG. 2 is a side elevation of the structure shown in FIG. 1.

DESCRIPTION OF PREFERRED EMBODIMENT

FIGS. 1 and 2 illustrate a typical building construction which includes an exterior wall 1, a ceiling 2 and a roof 3.

The wall 1 is composed of a series of vertical studs 4 and a top plate 5 is connected to the upper ends of the studs. Outer sheathing 6 is applied to the outer surfaces of the studs and a layer of siding 7 can be applied to the sheathing 6. Sheets of plaster board 8 or the like are attached to

the inner surface of the studs 4 and insulation, not shown, can be applied between the studs.

The ceiling 2 is composed of a series of parallel ceiling joists 9 which rest on the top plate 5. A layer of plaster board 10, or the like, is attached to the undersurface of the joists 9.

The roof 3 includes a series of rafters 11, with each rafter having a notch or heel cut 12 which rests on the upper plate 5 adjacent the respective ceiling joist 9. The rafters support a roof deck 13 which is composed of a layer of sheathing or plywood 14 covered with an outer layer of shingles 15.

A facia 16 is secured to the outer ends of the rafters 11 and includes an outer member 17 and an inner member 18 which are spaced apart by spacers 19. The spaces between the spacers 19 provide inlet passages 20 for air. A soffit 22 extends between the ends of the rafters 11 and the wall 1.

Air which enters the attic area beneath the roof deck 13 through the inlet passages 20 is discharged through an outlet 23 at the ridge of the roof.

Insulating material 24 in the form of blown insulation or insulating batts is located between the ceiling joists 9 and rests on the plaster board 10.

According to the invention, a series of rigid insulating members 25 are positioned between adjacent rafters and rest on the ceiling 2. Each insulating member 25 is provided with a lower surface 26 which rests on the ceiling plaster board 10 and an upper inclined surface 27 which bears against the underside of the roof deck 13. Grooves or flutes 28 are provided in the upper deck surface 27 and in combination with the roof deck, provide channels or passages for air passing along the undersurface of the roof deck from the air inlet 20 to the outlet 23.

The insulating members 25 are formed of bonded fibrous material, such as glass fibres, cellulose fibres or mineral fibres, and the like.

To position the insulating members 25 between the rafters 11, the outer end of each insulating member is provided with a downwardly extending lip or flange 29, which bears against the outer surface of the top plate 5, as shown in FIG. 2. In addition, the side of each insulating member 25 is provided with a notch 30 to accommodate the ceiling joist 9.

With the construction shown in FIGS. 1 and 2, air enters the passages 20 in the facia 16 and passes upwardly along the underside of the roof deck 13, through the grooves or flutes 28 in the insulating members 25. Thus, the insulating members 25 ensure that the critical and restricted vertical space between top plate 5 and roof deck 13 is maintained open to the flow of air, and yet the insulating members 25 provide positive insulation for the area of the ceiling 2 adjacent the exterior wall.

Fig. 1

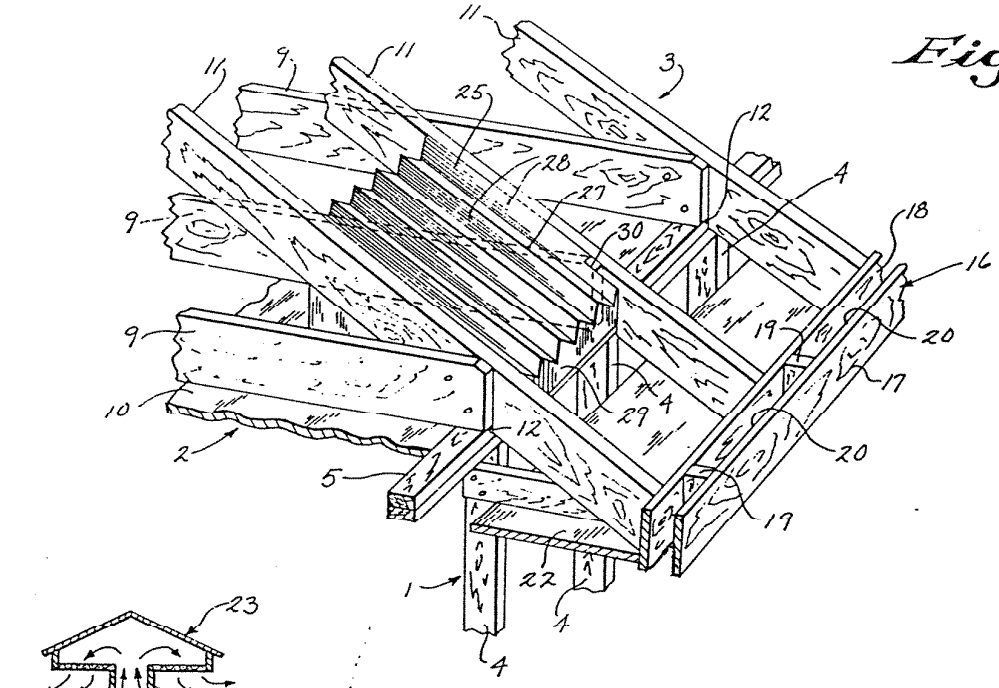
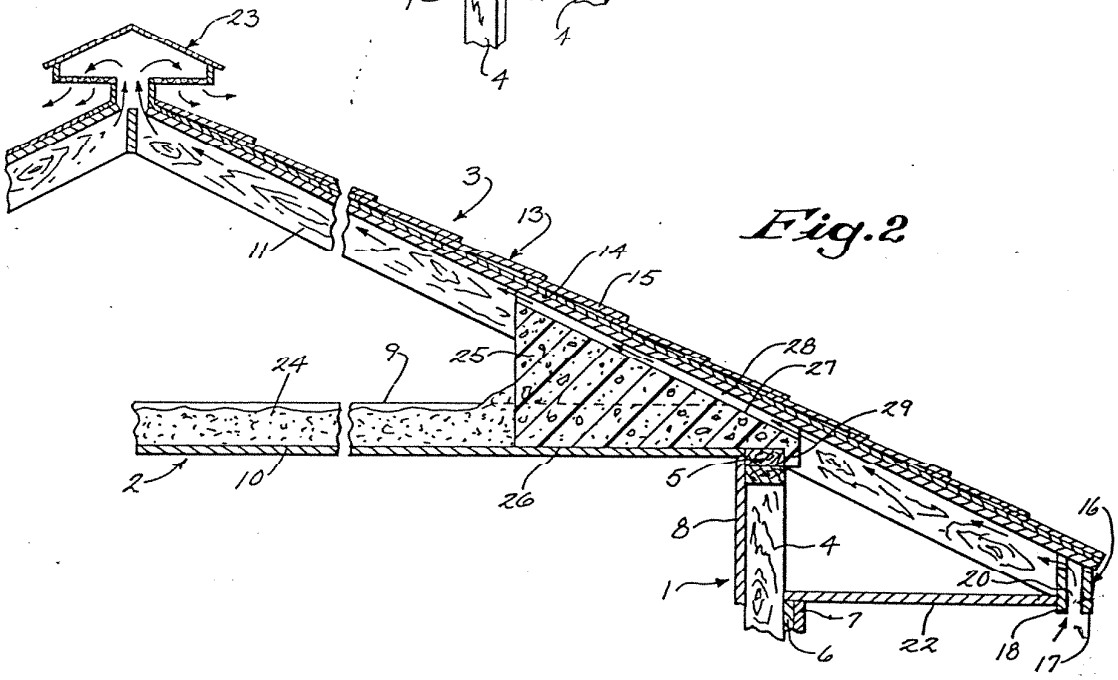


Fig. 2



GB Patent Application 2012012

(Published 1979)

(Extracts)

Roof Space Ventilator

This invention relates to a roof space ventilator.

The continuing awareness, within the building industry, of the energy crisis has led to an increasing use of high levels of insulation in houses, and particularly in roof spaces.

The use of high levels of insulation in roof spaces has two principal effects. Firstly the temperature of the roof becomes cooler, and secondly ventilation of the roof space through the eaves of the house is impeded.

Consequently it is essential to ensure that an adequate ventilation path is maintained for atmospheric air through the eaves into and out of the roof space.

****

Reference is now made to the accompanying drawings in which·

Figure 1 is a perspective view of a roof space ventilator according to the invention; and

Figure 2 is a cross-section showing the ventilator of Figure 1 in position in a roof.

In Figure 1 a ventilator generally designated 1 comprises an elongate strip 2 provided with apertures 3 along its length. The apertures measure approximately 3cm x 1.5cm. A channel formation 4 is provided on one side of the elongate strip 2 and a flange 5 is provided on the other side. The flange 5 has fixing holes 6 to facilitate the attachment of the ventilator 1 to a roof structure.

The ventilator 1 is formed by plastics extrusion followed by punching of the apertures 3 and fixing holes 6 in separate operations.

Figure 3 shows the ventilator 1 positioned at the eaves of a roof structure. The ventilator 1 is located between a facia board 20 and a soffit board 21. The facia board 20 is connected to a rafter end 24 and the soffit board 21 is connected to brickwork 22 of the house. The soffit board 21 fits into the channel formation 4, and the facia board 20 is attached to the flange 5 by passing screws 23 through holes 6.

The air flow path into the roof structure is indicated by the arrows A.

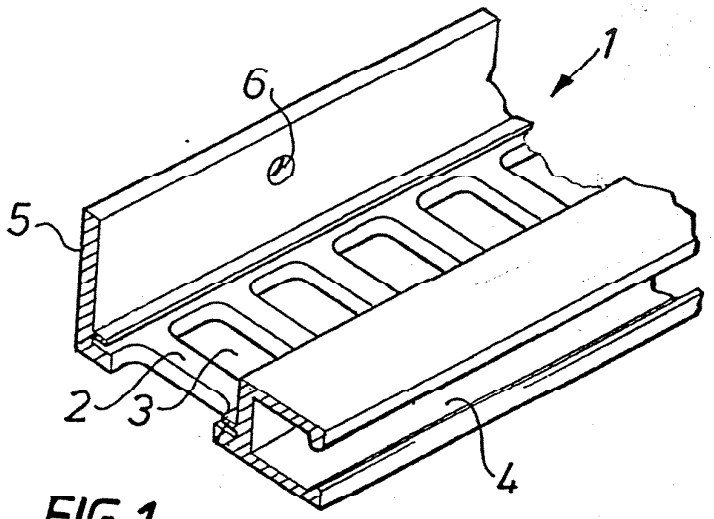


FIG. 1

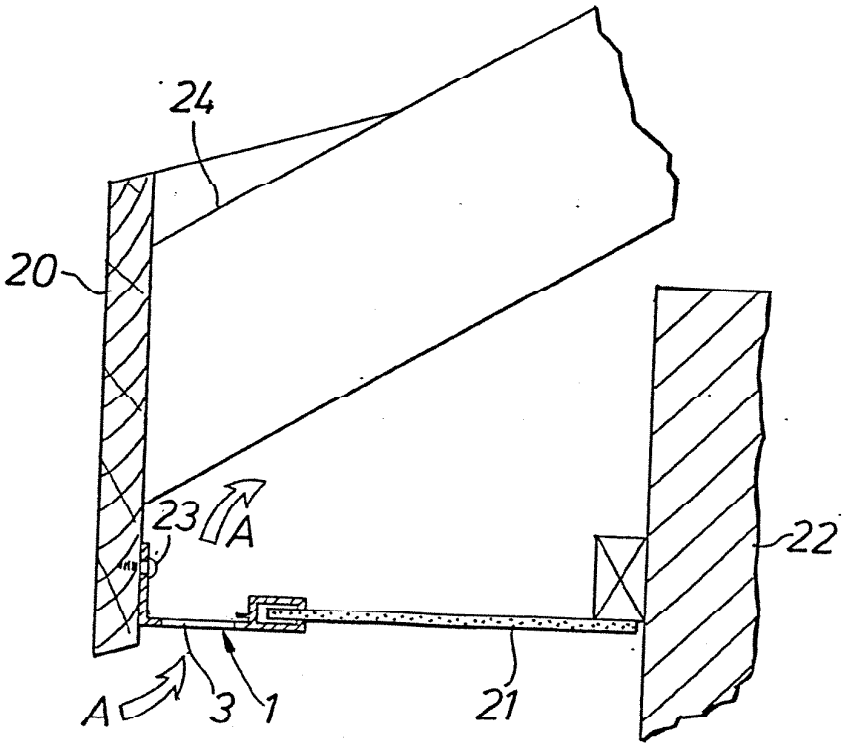


FIG. 2

Document A

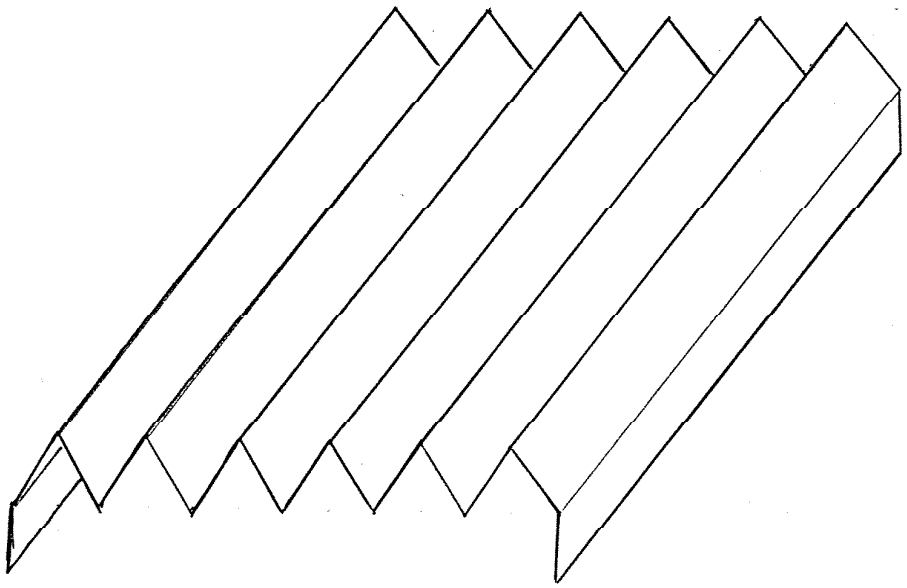
Venture Vents Limited

New Product Information

About to be released!

The Venture Vents FLEXIFLOW™ rafter vent.

- Enables safe insulation of existing roof structures.
- Simple to fit - ideal for the DIY worker
- Simple and quickly fitted to rafters (only a few nails required)
- Adapts to differing rafter separations
- Lightweight plastic construction, stacks for easy storage



July 1996