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71 Applicant: **ENVIRONMENTAL SEALS LIMITED**
Warcott Lodge, Roman Road, Maydensole,
Dover, Kent(GB)

72 Inventor: **Ward, Derek Alfred**
Warcott Lodge, Roman Road, Maydensole
Dover, Kent(GB)

74 Representative: **Fry, Alan Valentine**
FRY HEATH & CO. St. Georges House 6
Yattendon Road
Horley Surrey RH6 7BS(GB)

54 **Improvements in or relating to intumescent fire seals and their method of manufacture.**

57 An intumescent fire seal for location about a structure such as a door or door frame comprises an elongate flexible strip (4) of plastics material to one surface of which is secured a brush or blade seal (2) which upstands from that surface. A layer of intumescent material (1) is bonded to at least part of the strip surface.

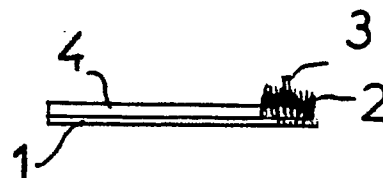


FIG. 2

IMPROVEMENTS IN OR RELATING TO INTUMESCENT FIRE SEALS AND THEIR METHOD OF MANUFACTURE.

This invention relates to intumescent fire seals and to methods of producing the same. The invention also relates to one or more component parts of such fire seals and to combined smoke and fire seals.

Fire seals are conveniently located in or around the edges of doors and door frames to seal the gap therebetween in the event of fire. Hitherto, such fire seals have comprised an intumescent strip encased or partially encased within a rigid or semi-rigid plastics sheath which in use is rebated into a channel set in the door or frame edge. A brush of a nylon material or a neoprene angle blade may be upstanding from the plastics sheath to inhibit the passage of smoke.

Such conventional seals suffer from a number of disadvantages, these including relatively high costs of manufacture and installation, the need for special routing tools during assembly and an inability to flex in a longitudinal sense whereby the seal can only be applied to relatively flat surfaces.

The present invention sets out inter alia to provide an intumescent fire seal which does not suffer from, or at least alleviates, these disadvantages.

In accordance with the present invention in one aspect there is provided an intumescent fire seal which comprises a flexible backing strip of plastics material from one surface of which is an upstanding lengthwise extending elongate brush or blade seal. The brush or blade seal is preferably secured in a permanent manner to the said one surface of the backing strip.

The backing strip may be produced, for example, from polypropylene, polyvinylchloride or nylon. Other materials having the required characteristics of longitudinal flexibility and ability to support and carry the elongate brush or blade seal may be employed. The brush or blade seal may be secured to the backing strip by stitching. However, other permanent means of securing the brush or blade seal to the backing strip may be employed. When a brush seal is used, a polypropylene or like fin may be positioned adjacent to or within the lateral confines of the seal.

The surface of the backing strip from which the brush or blade seal upstands may be coated with an adhesive material. This coating may be applied by a hot melt technique. In this arrangement, the surface of the backing strip so treated may have a roughened texture. The adhesive surface may be protected by a removable strip of paper or the like.

A strip of intumescent material may be applied to the surface of the backing strip from which the

brush or blade seal is upstanding.

In use, the fire seal may be attached to the surface of a structure by means of double sided adhesive tape. Other means of attachment, e.g. pins, staples and the like may, however, be employed.

In another aspect there is provided a component for use in the production of an intumescent fire seal, which component comprises an elongate flexible strip of a plastics material from one surface of which upstands a brush or blade seal, the brush or blade seal being attached to the strip in a permanent manner.

In a further aspect there is provided a component from which an intumescent fire seal is produced which comprises an elongate flexible strip of plastics material from one surface of which upstands a brush or blade seal, this surface of the strip being coated with an adhesive material protected by a removable strip of paper or the like.

In a still further aspect, the present invention provides an intumescent fire seal for location about a surface of a structure such as a door or door frame, the fire seal comprising an elongate flexible strip of plastics material to one surface of which is secured a brush or blade seal which upstands from that surface, the or at least a part of such surface having bonded thereto a layer of intumescent material.

The invention will now be described by way of example only with reference to the accompanying diagrammatic drawings in which:-

Figure 1 is a plan view from above of a fire seal in accordance with the invention; and

Figure 2 is a section taken along line II-II of Figure 1.

The fire seal illustrated in the drawings comprises a backing strip 1 of a plastics material such as polypropylene, polyvinylchloride or nylon from one surface of which is upstanding a dense bristle brush seal 2 of nylon or other suitable material. The brush seal 2 is secured permanently to the backing strip 1 by stitching or other conventional means. As will be seen from the drawings, the brush seal is positioned along one edge of the strip. Alternatively the brush seal may be positioned along either or both edges or may be positioned intermediate these edges.

A fin 3 of a plastics material is positioned within the boundaries of the brush 2 and extends lengthwise therewith. The fin 3 provides a physical barrier to the flow of smoke or other gases.

The upper surface of the backing strip 1 is coated with an adhesive material to enable a strip

of flexible intumescent material 4 to be bonded thereto. The intumescent layer 4 may be applied to the backing strip 1 when the brush seal 2 is attached to the strip, or at some later time. In this latter case, the adhesive coating is protected by, for example, a removable strip of paper or the like. The adhesive coating may be applied by a hot melt technique; to assist bonding, the upper surface of the backing strip may be formed with a roughened texture.

A neoprene angle blade may be employed as an alternative to the brush seal.

Typically, the intumescent strip 4 is based on a mixture of graphite/vermiculite or hydrated sodium silicate, these being two examples only of suitable intumescent materials. The strip may be coated with an epoxy resin to preserve the water content of the material.

Typically, fire seals in accordance with the invention are manufactured in widths of, for example, 10mm, 20mm and 25mm. The thickness of the seal is typically between 0.75mm and 3mm.

In use, fire seals in accordance with the invention can be readily and quickly attached to the edges of a door or door frame by means of double sided adhesive tape. Panel pins or the like may be employed to secure each end of the strip to the door or frame. The fire seal can either be rebated into the edge of the door or door frame or be surface mounted. The seal can readily be shaped around lock areas with a sharp knife or the like. The seal can be overpainted and is not affected adversely by water or chemicals.

Upon a fire occurring, the brush 3 or blade seal acts initially to inhibit the flow of smoke between the door and its frame. As the temperature surrounding the seal rises to, for example, 105°C, the multi-directional intumescent layer is activated and expands to provide a positive pressure of, for example, 14 bar within the gap between the door and its frame to effect a fire, smoke and airtight seal therebetween and to hold the door in position.

It will be appreciated that the intumescent fire seal described is merely exemplary of fire seals in accordance with the invention and that modifications can be made thereto without departing from the true scope of the invention.

Claims

1. An intumescent fire seal for location about a structure such as a door or door frame, the fire seal being characterised in that it comprises an elongate flexible strip (4) of plastics material to one surface of which is secured a brush or blade seal (2) which upstands from that surface, the or at least a part of such surface having bonded thereto a

layer of intumescent material (1).

2. A seal as claimed in Claim 1 characterised in that the brush or blade seal (2) is secured in a permanent manner to the said one surface of the flexible strip (4).

3. A seal as claimed in Claim 1 or Claim 2 characterised in that the flexible strip (4) is produced from polypropylene or polyvinylchloride or nylon.

4. A seal as claimed in any one of Claims 1 to 3 characterised in that the brush or blade seal (2) is secured to the flexible strip (4) by stitching.

5. A seal as claimed in any one of Claims 1 to 4 characterised in that when a brush seal is used, a polypropylene fin (3) is positioned adjacent to or within the lateral confines of the seal (2).

6. A component for use in the production of an intumescent fire seal, which component is characterised in that it comprises an elongate flexible strip (4) of a plastics material from one surface of which upstands a brush or blade seal (2), the brush or blade seal being attached to the strip in a permanent manner.

7. A component from which an intumescent fire seal is produced which is characterised in that it comprises an elongate flexible strip (4) of plastics material from one surface of which upstands a brush or blade seal (2), this surface of the strip being coated with an adhesive material protected by a removable strip of paper or the like.

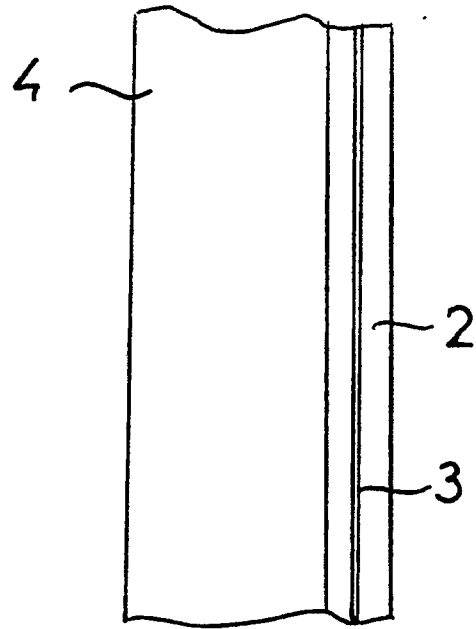


FIG. 1

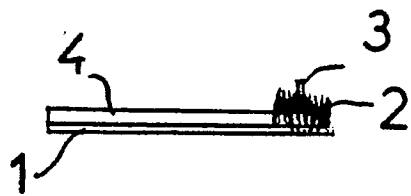


FIG. 2



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 30 6369

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-3 566 541 (G.L. COULTER) * Column 3, line 60 - column 4, line 59; column 7, lines 29-71; figures 1-4, 23, 24 *	1, 2, 6, 7	E 06 B 5/16 E 06 B 7/22
Y	---	3, 5	
Y	DE-A-3 717 206 (H. BAUER) * Column 4, lines 37-54; figures 1-4 *	3	
A	---	1	
Y	GB-A-1 586 362 (THWAITES & GREEN) * Page 2, lines 53-73, 91-105; figures 3, 6, 7 *	5	
A	-----	1, 2, 4	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E 06 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27-08-1990	Examiner KAPPOS A.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons * : member of the same patent family, corresponding document			