



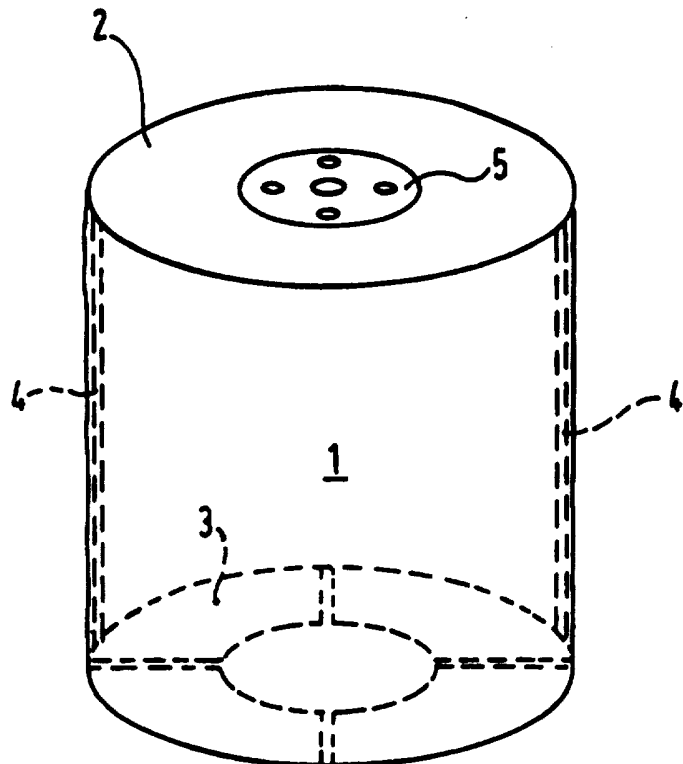
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : E04B 9/00, F21V 25/00</p>	<p>A1</p>	<p>(11) International Publication Number: WO 96/23113 (43) International Publication Date: 1 August 1996 (01.08.96)</p>
<p>(21) International Application Number: PCT/GB95/02598 (22) International Filing Date: 6 November 1995 (06.11.95) (30) Priority Data: 9501391.8 25 January 1995 (25.01.95) GB (71) Applicant (for all designated States except US): ENVIRONMENTAL SEALS LIMITED [GB/GB]; Envirograf House, Barfreton, Nr. Dover, Kent CT15 7JC (GB). (72) Inventor; and (75) Inventor/Applicant (for US only): WARD, Derek, Alfred [GB/GB]; Warcott Lodge, Roman Road, Maydensole, Dover, Kent CT15 5HR (GB). (74) Agents: FRY, Alan, Valentine et al.; Fry Heath & Spence, The Old College, 53 High Street, Horley, Surrey RH6 7BN (GB).</p>	<p>(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i></p>	

(54) Title: FIRE RESISTANT COVERS FOR ELECTRICAL FITTINGS

(57) Abstract

A fire resistant cover for an electrical fitting to be recessed into a supporting structure comprises a fabric hood coated or impregnated with a liquid based intumescent material and includes a top (2) supported by one or more upstanding side walls (1) and a plurality of fabric pieces (3) which extend inwardly from the lower margin of the or each side wall (1). The top (2) of the cover includes a layer (5) of intumescent material which is formed with a plurality of apertures through one of which electrical wiring to the fitting can pass. Complementary apertures are formed in the top of the cover, and means are provided for connecting the inwardly extending material pieces (3) to adjoining surfaces of the structure in which the electrical fitting is recessed.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgystan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Latvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

FIRE RESISTANT COVERS FOR ELECTRICAL FITTINGS

This invention relates to ventilated covers for electrical fittings and more especially but not exclusively to a ventilated cover for a recessed electrical fitting, such as a downlighter set in a plasterboard ceiling, which, in the event of a fire, isolates the fitting from the structure in which it is recessed to maintain the fire resistance thereof.

Light fittings recessed into ceilings are well known. Such light fittings are known as downlighters. The heat generated by such light fittings can be considerable and represents a fire hazard. Also the recess in which such a fitting is mounted can itself provide a path for fire and smoke to a room or area located above that ceiling.

For cosmetic reasons, the aperture which is cut into a plasterboard ceiling to receive a downlighter is kept to a minimum. This restricts the size of ventilated cover

which can be employed, particularly where an existing downlighter is to be fire-proofed. Fire resistant covers for downlighters have previously been proposed but are generally too large to pass through a downlighter recess formed in an existing ceiling. Also, where this is possible, the covers rely upon fixings into the exposed surface of the plasterboard ceiling for securement purposes. This is aesthetically unappealing.

The present invention sets out to provide a ventilated cover for an electrical fitting which eliminates, or at least alleviates, many of the disadvantages present in existing fire resistant covers.

According to the present invention in one aspect, there is provided a fire resistant cover for an electrical fitting to be recessed into a supporting structure, the cover comprising a fabric hood coated or impregnated with a liquid based intumescent material and including a top supported by one or more upstanding side walls, a piece of intumescent material secured to the top of the cover and including a plurality of apertures through one of which electrical wiring can pass to an electrical fitting protected by the cover, and means for connecting the cover to adjoining surfaces of the structure in which the electrical fitting is recessed.

The fabric is preferably a fibrous cloth (e.g. a glass

fibre cloth) which is coated on one or each of its surfaces with liquid based intumescent material. The layer of intumescent material may comprise a suitably shaped piece of card which overlies a similarly shaped piece of intumescent cloth.

In another aspect, the invention provides a fire resistant cover for a downlighter recessed into a suspended ceiling, the cover being produced from a fibrous cloth material coated or impregnated with a liquid based intumescent material and including, in the cover upper surface, apertures around which is provided intumescent material in cloth or sheet form.

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

Figure 1 is a perspective view of a cover in accordance with the invention;

Figure 2 is a plan view from above of the cover shown in Figure 1;

Figure 3 schematically illustrates a fixing for securing the cover to an adjoining ceiling structure; and

Figures 4 and 5 are perspective and sectional views of

an alternative cover in accordance with the invention.

The cover illustrated in Figures 1 and 2 is produced from a fibrous woven cloth (e.g. a glass fibre woven cloth) which has been coated on one or both of its sides with an intumescent paint or other intumescent medium. Preferably the cloth is impregnated with intumescent medium. The cover is generally circular in cross-section and comprises an upstanding side wall 1, a top 2 and floor pieces 3 which extend inwardly from the lower margin of the side wall. Wires 4 are sewn into the fabric of the side walls 1 to assist in holding the cover upright.

Typically the side wall 1 is produced from a length of glass fibre cloth which is sewn together at the strip ends, the top 2 then being secured to the upper margin of the side wall again by sewing. The floor pieces 3 are simply sewn to the lower margin of the side wall and are cut to enable the pieces 3 to lie flat on the adjoining surface of the suspended ceiling.

Typically the outside diameter of the cover is 289mm and the height of the cover is typically 145mm.

The top of the cover has secured to it a circular piece of card 5 which overlies and is bonded to a similarly shaped piece of intumescent material to define an intumescent gasket. This material typically comprises a

fibrous sheet impregnated with an intumescent material such as carbon granules. The gasket comprising the card and intumescent piece may simply be secured to the top of the cover by studs 6 or rivets. The gasket is formed with a central opening 2 through which can pass electrical cabling for the light fitting and four ventilation apertures 8. Similar openings are formed in the top of the cover. Typically the outside diameter of the gasket is 60mm.

As will be appreciated, the opening through which the cover must pass is relatively small. Because of the flexibility of the fabric material from which the cover and the gasket is formed, the hood can simply be squashed or folded to form a narrow tube which can readily pass through even the smallest ceiling opening for location about the margin of the ceiling opening. Before doing so, the electric wire which carries current to the electrical fitting is passed through the central opening 7 formed in the top 2 of the cover. Once sited, the floor pieces 3 of the cover are secured to the upper surface of the ceiling plasterboard using fixing pins 9 such as illustrated in Figure 3. Other simple forms of fixings may be employed. The fixing pins 9 have the advantage that they can be secured in place using finger pressure. Downlighting can then simply be connected to a source of electricity via the appropriate wire and the opening formed in the plasterboard ceiling closed with a lens cover in the normal way.

In use, the heat generated by downlighters recessed into ceilings can represent fire hazards. In the event of such a fire, the intumescent content of the cover and the card layer 5 quickly expands to isolate the fitting entirely from the surrounding structure thereby confining the fire and maintaining the fire resistance of the structure. Covers in accordance with the invention have been subjected to fire testing with no failure of the integrity criterion at the end of four hours testing. Insulation failure occurred after 46 minutes.

The cover illustrated in Figures 4 and 5 differs from that described above by the presence of fixing straps 10 secured to the lower inner surface of the cover which can be deformed as shown in Figure 5 to locate around a sheet of plasterboard 11 (left hand construction of Figure 5) or around and between superimposed sheets of plasterboard 12 (right hand construction of Figure 5). In this embodiment, the floor pieces 3 are folded away from the cover interior and lie in contact with the upper surface of the ceiling plasterboard on which the cover is positioned.

It will be appreciated that the foregoing is merely exemplary of fire resistant covers in accordance with the invention and that modifications can readily be made thereto without departing from the true scope of the invention as set out in the appended claims.

CLAIMS:

1. A fire resistant cover for an electrical fitting to be recessed into a supporting structure, the cover comprising a fabric hood coated or impregnated with a liquid based intumescent material and including a top supported by one or more upstanding side walls, a piece of intumescent material secured to the top of the cover and including a plurality of apertures through one of which electrical wiring can pass to an electrical fitting protected by the cover, and means for connecting the cover to adjoining surfaces of the structure in which the electrical fitting is recessed.
2. A cover as claimed in claim 1 further comprising a plurality of fabric pieces secured to the lower margin(s) of the side wall(s) of the cover.
3. A cover as claimed in claim 2 wherein the fabric pieces extend inwardly from the lower margin(s) of the side wall(s), the connecting means co-operating with the fabric pieces to secure the cover to the adjoining surfaces of the structure.
4. A cover as claimed in claim 1 or claim 2 wherein the connecting means comprises at least one fixing strap secured to the interior of the side wall(s) of the

hood and deformable around an edge of the supporting structure to connect the hood to the supporting structure.

5. A cover as claimed in any one of claims 1 to 4 wherein the top of the cover extends below the piece of intumescent material and includes apertures complementary to those of the piece of intumescent material.
6. A cover as claimed in any one of claims 1 to 5 wherein the piece of intumescent material comprises a sheet of card which overlies a similarly shaped layer of intumescent material.
7. A cover as claimed in claim 6 wherein the intumescent layer comprises a fibrous sheet impregnated with carbon granules.
8. A cover as claimed in any one of the preceding claims wherein the cover top includes a plurality of ventilation apertures.
9. A cover as claimed in any one of claims 1 to 8 wherein the fabric is a fibrous cloth.
10. A cover as claimed in claim 9 wherein the fabric is a glass fibre cloth coated on one or each of its

surfaces with liquid based intumescent material.

11. A cover as claimed in any one of the preceding claims wherein the layer of intumescent material comprises a suitably shaped piece of card which overlies a similarly shaped piece of intumescent cloth.
12. A fire resistant cover for a downlighter recessed into a suspended ceiling, the cover being produced from a fibrous cloth material coated or impregnated with a liquid based intumescent material and including, in the cover upper surface, apertures around which is provided intumescent material in cloth or sheet form.
13. A fire resistant cover substantially as herein described and as described with reference to Figures 1 to 3 or Figures 4 and 5 of the accompanying diagrammatic drawings.

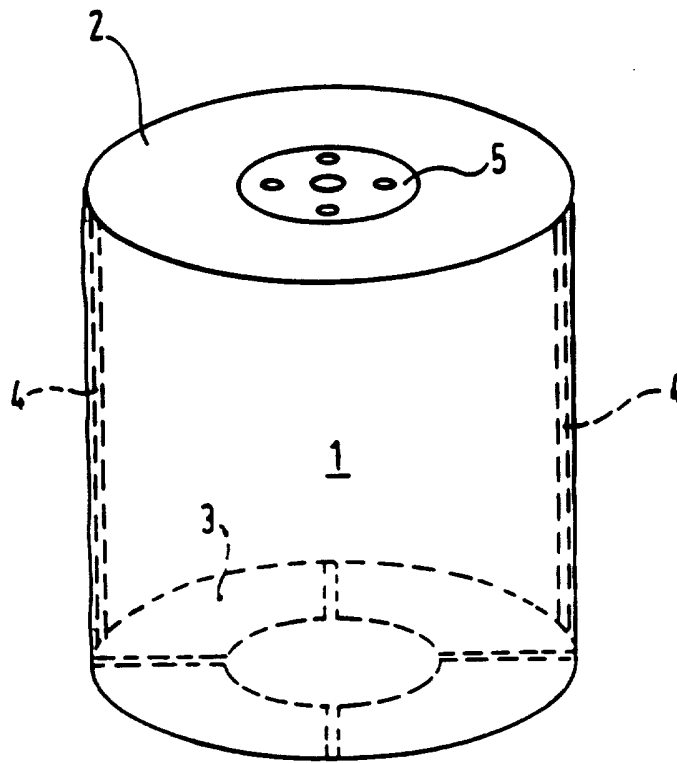


Fig.1.

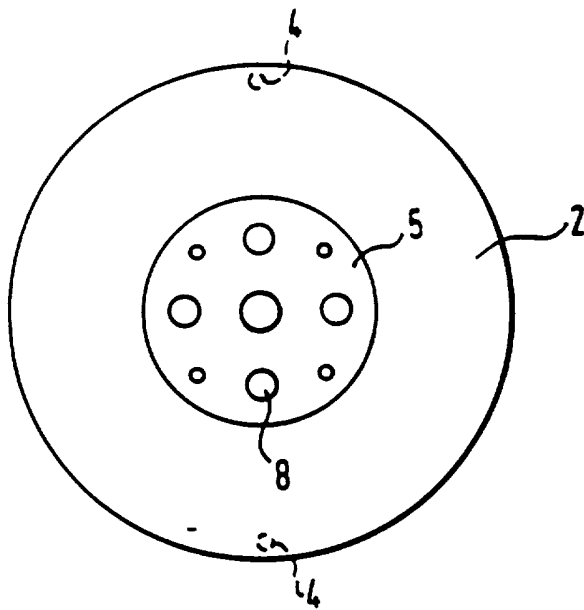


Fig.2.



Fig.3.

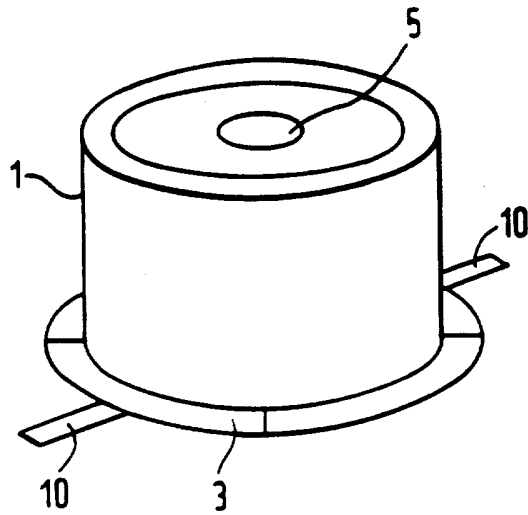


Fig.4.

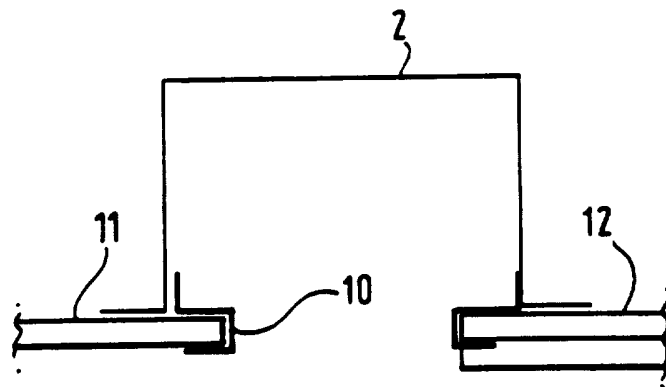


Fig.5.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 95/02598

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 E04B9/00 F21V25/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 F21V E04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB,A,2 270 936 (HAMILTON) 30 March 1994 see page 4, line 1 - page 6, line 13 see claims 1-10; figures 1-7 ---	1-6,8-13
A	GB,A,2 235 710 (WARD) 13 March 1991 see page 5, line 9 - line 26 see figure 1 ---	1,6,10, 11,13
A	US,A,4 210 070 (TATUM ET AL.) 1 July 1980 see column 4, line 49 - column 6, line 4 see figures 1-4 -----	1,8,9, 12,13

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

2 May 1996

Date of mailing of the international search report

10. 05. 96

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+ 31-70) 340-3016

Authorized officer

De Mas, A

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/GB 95/02598

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB-A-2270936	30-03-94	NONE	
GB-A-2235710	13-03-91	NONE	
US-A-4210070	01-07-80	CA-A- 1098276	31-03-81