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(54) **FIRE RESISTANT COVERS FOR ELECTRICAL FITTINGS**

FEUERFESTE ABDECKUNGEN FÜR ELEKTRISCHE GERÄTE

CACHES RESISTANT AU FEU POUR ACCESSOIRES ELECTRIQUES

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(56) References cited:
GB-A- 2 235 710
GB-A- 2 270 936
US-A- 4 210 070

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Description

[0001] 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.

[0002] 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.

[0003] 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.

[0004] GB-A-2270936 discloses a downlighter which comprises a hood of tented pyramidical shape formed from a fire resistant flexible net material and provided with a hole at or near to its apex to allow for the passage of a cable. The hood is not ventilated and is produced from an air pervious material coated with a fire resistant intumescent material. This hood construction suffers from a number of disadvantages, these including those imposed by its shape and lack of ventilation, and the fact that the hole through which cabling can pass permits the passage of smoke and flames in the event of a fire.

[0005] 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.

[0006] 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 an aperture through which a cable can pass, the cover being characterised in that it is shaped to include a top supported by one or more upstanding side walls, and comprises an intumescent gasket including a card which overlies a fibrous sheet impregnated with carbon granules secured to the top of the cover and including a plurality of ventilation 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.

[0007] 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.

[0008] 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.

[0009] 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.

[0010] 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.

[0011] Typically the outside diameter of the cover is 289mm and the height of the cover is typically 145mm.

[0012] 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 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.

[0013] 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 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.

[0014] 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.

[0015] 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.

[0016] It will be appreciated that the foregoing is merely exemplary of fire resistant covers in accordance with the invention and that modifications can readily by 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 an aperture through which a cable can pass and means (9,10) for connecting the cover to adjoining surfaces of the structure in which the electrical fitting is recessed, the cover (1) being characterised in that it is shaped to include a top (2) supported by one or more upstanding side walls (4), an intumescent gasket (5) comprising a card which overlies a fibrous sheet impregnated with carbon granules secured to the top of the cover and including a plurality of ventilation apertures (8) through one of which electrical wiring can pass to an electrical fitting protected by the cover.

2. A cover as claimed in claim 1 further comprising a plurality of fabric pieces (3) 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 (3) extend inwardly from the lower margin(s) of the side wall(s), the connecting means (9,10) cooperating 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 (10) 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 (2) of the cover (1) extends below the intumescent gasket (5) and includes apertures complementary to those of the intumescent gasket.

6. A cover as claimed in any one of claims 1 to 5 wherein the fabric is a fibrous cloth.

7. A cover as claimed in claim 6 wherein the fabric is a glass fibre cloth coated on one or each of its surfaces with liquid based intumescent material.

Patentansprüche

1. Feuerfeste Abdeckung für ein elektrisches Gerät, das vertieft in einen Trägeraufbau eingesetzt ist, wobei die Abdeckung eine aus Gewebe bestehende Haube aufweist, die mit einem auf Flüssigkeit basierenden Schaumbildungsmaterial überzogen oder imprägniert ist und eine Öffnung aufweist, durch die ein Kabel hindurchgeführt werden kann, wobei Mittel (9, 10) vorgesehen sind, um die Abdekkung mit den benachbarten Oberflächen des Aufbaus zu verbinden, in dem das elektrische Gerät eingelassen ist, und wobei die Abdeckung (1) dadurch gekennzeichnet ist, daß sie einen Deckel (2) aufweist, der von einer vorstehenden Seitenwand (4) oder mehreren vorstehenden Seitenwänden (4) getragen wird, wobei eine schaumbildende Flachdichtung (5), bestehend aus einer Karte, über einem Faserstoffblatt angeordnet ist, die mit einem Kohlenstoffgranulat imprägniert ist und auf dem Deckel der Abdeckung festgelegt ist und mehrere Lüftungsöffnungen (8) aufweist, durch die eine elektrische Verdrahtung nach einem elektrischen Gerät hindurchgeführt werden kann, das durch die Abdeckung geschützt wird.

2. Abdeckung nach Anspruch 1, welche außerdem mehrere Gewebestücke (3) aufweist, die am unteren Rand bzw. an den unteren Rändern der Seitenwand bzw. der Seitenwände der Abdeckung befestigt sind.

3. Abdeckung nach Anspruch 2, bei welcher die Gewebestücke (3) sich von dem unteren Rand bzw. den unteren Rändern der Seitenwand bzw. der Seitenwände nach innen erstrecken, wobei Verbindungsstücke (9, 10) mit den Gewebestücken zusammenwirken, um die Abdeckung auf den benachbarten Oberflächen des Aufbaus festzulegen.

4. Abdeckung nach den Ansprüchen 1 oder 2, bei welcher die Verbindungsmittel wenigstens einen Fixierungsstreifen (10) aufweisen, der an der Innenseite der Seitenwand bzw. der Seitenwände der Haube festgelegt und um einen Rand des Trägeraufbaus deformierbar sind, um die Haube mit dem Trägeraufbau zu verbinden.

5. Abdeckung nach einem der Ansprüche 1 bis 4, bei welcher der Deckel (2) der Haube (1) sich unter der schaumbildenden Flachdichtung (5) erstreckt und Löcher aufweist, die komplementär zu den Lüftungslöchern der schaumbildenden Flachdichtung verlaufen.

6. Abdeckung nach einem der Ansprüche 1 bis 5, bei welcher das Gewebe ein Faserstoffgewebe ist.

7. Abdeckung nach Anspruch 6, bei welcher das Gewebe ein Glasfasergewebe ist, das auf einer oder allen Oberflächen mit einem auf Flüssigkeit basierenden schaumbildenden Material überzogen ist.

Revendications

1. Recouvrement ignifuge pour une applique électrique destinée à venir se nicher dans une structure de support, le recouvrement comprenant un couvercle en tissu enduit ou imprégné d'une matière intumescente à base d'un liquide et englobant un orifice à travers lequel peut passer un câble, ainsi que des moyens (9, 10) pour relier le recouvrement à des surfaces adjacentes de la structure dans laquelle est nichée l'applique électrique, le recouvrement (1) étant caractérisé en ce qu'il est configuré pour englober un sommet (2) supporté par une ou plusieurs parois latérales dressées (4), un joint d'étanchéité intumescent (5) comprenant une carte qui recouvre une feuille fibreuse imprégnée avec des granules de carbone fixés au sommet du recouvrement et englobant plusieurs orifices de ventilation (8), le câble électrique étant à même de traverser un de ces orifices en direction d'une applique électrique protégée par le recouvrement.

2. Recouvrement selon la revendication 1, comprenant en outre plusieurs pièces de tissu (3) fixées au (x) rebord(s) inférieur(s) de la ou des parois latérales du recouvrement.

3. Recouvrement selon la revendication 2, dans lequel les pièces de tissu (3) s'étendent vers l'intérieur depuis le ou les rebords inférieurs de la ou des parois latérales, les moyens de liaison (9, 10) coopérant avec les pièces de tissu pour fixer le recouvrement aux surfaces adjacentes de la structure.

4. Recouvrement selon la revendication 1 ou 2, dans lequel les moyens de liaison comprennent au moins une bride de fixation (10) fixée à l'intérieur de la ou des parois latérales du couvercle et aptes à se déformer autour d'un bord de la structure de support pour relier le couvercle à la structure de support.

5. Recouvrement selon l'une quelconque des revendications 1 à 4, dans lequel le sommet (2) du recouvrement (1) s'étend en dessous du joint d'étanchéité intumescent (5) et englobe des orifices complémentaires à ceux du joint d'étanchéité intumescent.

6. Recouvrement selon l'une quelconque des revendications 1 à 5, dans lequel le tissu est une étoffe fibreuse.

7. Recouvrement selon la revendication 6, dans lequel le tissu est une étoffe en fibres de verre enduite sur une ou sur chacune de ses surfaces d'une matière intumescente à base d'un liquide.

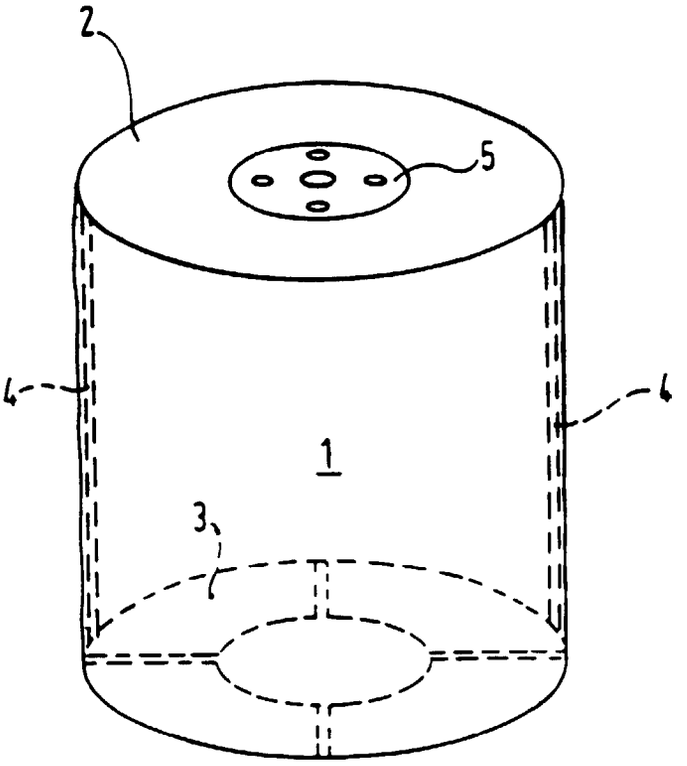

Fig.1.

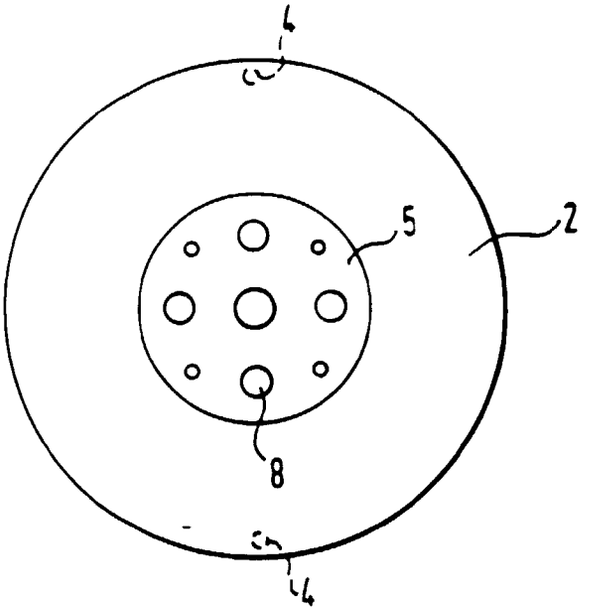

Fig.2.

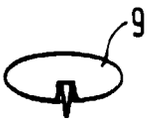

Fig.3.

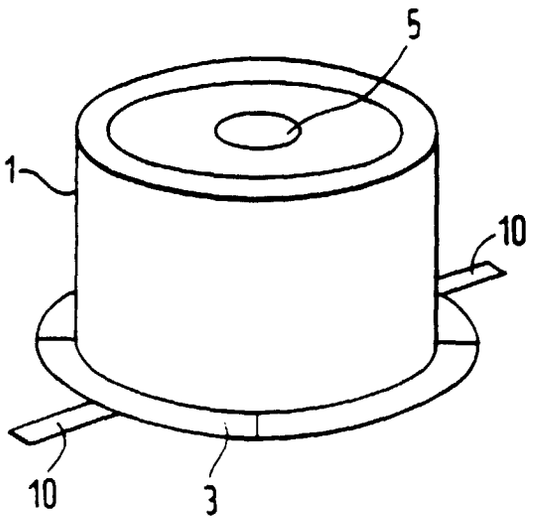

Fig.4.

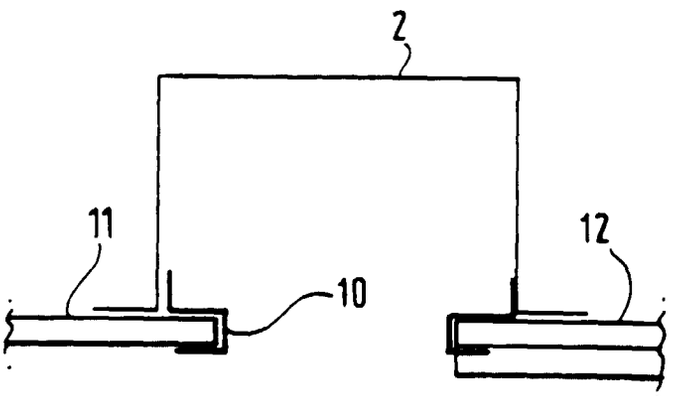

Fig.5.