(54) Title: ADJUSTABLE HOUSING FOR INSTALLATION OF A LIGHTING FITTING IN A SUSPENDED CEILING

(57) Abstract: An insulation housing for shielding an electrical fitting when fitted between two adjacent joists (e.g. in a ceiling or wall) comprises two casing components \((P_1, B)\) and \((P_2, B)\) each of which is of a self-supporting substantially rigid material which are connected together in a telescopic manner by means of a bolt \((S)\) sliding within a slot \((T)\). This means that the overall width of the housing can be adjusted to suit different joist spacings. The housing may be attached to the top of two adjacent joists or to the side surfaces of two adjacent joists which face each other.
This invention relates to a new insulation housing for use with electrical fittings, particularly for use with light fittings.

In buildings it is commonplace to provide insulation materials between ceiling joists to reduce heat loss. It is also commonplace to install recessed light fittings which extend between the joists into the space above e.g. into a loft space or the space between floors. Such light fittings generate significant amounts of heat and this is undesirable as there is a fire risk. In addition the fittings are vulnerable to damage e.g. by being stepped on by someone doing building work. Known housings have been of a fixed size and often designed to rest on the ceiling itself, rather than the joists. Others have been designed to be attached to the underside of the joists.

An object of the present invention is to provide a new insulation housing which can be used with a wide range of electrical fittings and joist spacings and which in use is efficient at minimising heat build up and also in preventing damage to the fitting. It may also minimise fire spread, should that occur.

According to one aspect of the present invention, there is provided an insulation housing for shielding an electrical fitting in which the housing comprises a plurality of casing components of a substantially rigid material which are connected together.

In a preferred embodiment, connection means is provided to allow relative lateral adjustment of at least two of the casing components. This may allow for slight inaccuracies in positioning of the housing on the joists. An example of such a connection is two components which slide with respect to each other i.e. telescoping e.g. by means of a bolt on one component for engagement within a multi-toothed slot on the other.

The housing preferably consists of a plurality of casing components which are connected together to comprise a top and one or more sides, preferably of
substantially rectangular or square cross-section with four side walls and open on one face i.e. essentially an open box. The housing is preferably of self-supporting substantially rigid construction of metal or plastic so that the housing does not crush if stepped on by a person or if something falls on it. Usually there would be no need to include an inner layer of lining material e.g. intumescent material.

Whilst individual components of the casing may be formed as single pieces e.g. by moulding, the multi-component nature of the casing means that it cannot consist of a single integral article i.e. it cannot be a single moulded casing. Single component casings have been disclosed in the prior art and have the disadvantages of not allowing for different sized electrical fittings, different joist spacings and fitting tolerances.

In one embodiment, the top of the housing may be reinforced e.g. by one or more strengthening bars. The sides, particularly those to be attached to joists, may be provided with reinforcing means e.g. strengthening ribs.

In one embodiment the housing is provided with means for attachment to the upper surfaces of the ceiling or wall joists i.e. the attachment means is within the floor, roof or wall space. The 'free edges' of two opposite side walls, i.e. the edges remote from the top, preferably are provided with means for attachment to joists e.g. they may have an outwardly extending flange or flanges. By means of these flanges the housing may be attached to the upper surface of two adjacent ceiling joists. In such an embodiment, the two opposite flanged edges are preferably shorter than the other two edges to facilitate fitting the housing across two joists. The multi-component nature of the housing permits some adjustment during assembly and during fitting to the joists.

The housing is particularly applicable for use with a light fitting recessed into a support structure such as a ceiling or wall, especially when the support structure is being constructed.
In a further embodiment of the present invention the housing has a square or trapezoidal cross-section preferably with two open ends and two opposing side walls. At each of the open ends there is preferably provided a means for attachment of the housing between two ceiling joists. The means for attachment may be e.g. flange or flanges. Examples of attachment means comprise L brackets for attachment between ceiling joists by means of nails, bolts or screws. The attachment means may be attached to or integral with the housing. This embodiment may allow fitting of the housing from below the ceiling joists e.g. when there is no easy access from above such as where there is a flat roof with no loft space.

According to another aspect of the present invention, the housing component comprises a plurality of casing components of a substantially rigid material which are connected together by means which allows adjustment of the casing components relative to each other and thereby adjustment of the size of the housing in at least one dimension.

For example, the housing may comprise two casing components which are slidably attached together so that the width of the housing can be adjusted to accommodate different joist spacings. An example of such an attachment means would be one or more bolt and slot arrangements. The relative positions of the casing components would be adjusted by sliding the components together or apart with the (or each) bolt loosely fitted in its slot and then the bolt (or bolts) would be tightened.

It will be appreciated that certain features of the invention which are, for clarity, described in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features of the invention, which are for brevity described in the context of a single embodiment, may also be provided separately or in any suitable combination.

Embodiments of the present invention will now be illustrated with reference to the accompanying drawings in which Figures 1 to 7 show a first embodiment which is not telescopic, Figures 8 to 11 show a second embodiment which is telescopic and Figures 12 to 21 show a third embodiment which is telescopic:
Figure 1 shows a front and perspective front view of a sidewall for a housing; 
Figure 2 shows a top and perspective top view of a top for a housing; 
Figure 3 shows a front and perspective front view of a sidewall for a housing; 
Figure 4 shows an exploded perspective top view of the components of 
  Figures 1 to 3 ready for assembly as a housing; 
Figure 5 shows a perspective top view of the assembled housing of Figure 4; 
Figure 6 shows a top perspective and bottom perspective view of the housing 
  of Figure 5 positioned ready for attachment across joists to protect a 
  light fitting recessed into a ceiling; 
Figure 7 shows a top perspective view of the housing of Figure 5 positioned 
  and attached across joists to protect a light fitting recessed into a 
  ceiling; 
Figure 8 shows a top perspective view of a housing with width adjustment 
  according to a second embodiment of the present invention; 
Figure 9 shows an exploded perspective top view of the components of 
  Figure 8 ready for assembly as a housing; 
Figure 10 shows a perspective top view of the components of 
  Figure 9 assembled as a housing; 
Figure 11 shows a top perspective view of the housing of Figures 9 and 10 
  positioned and attached across joists to protect a light fitting 
  recessed into a ceiling. 
Figure 12 shows a side view of a two piece housing of trapezoidal cross- 
section in its fully extended configuration. 
Figure 13 shows a top view of Figure 12. 
Figure 14 shows an end view of Figure 12. (Other end corresponds). 
Figure 15 shows a perspective view from below of Figure 12. 
Figure 16 shows a perspective view from above of Figure 12. 
Figure 17 shows a side view of the same housing of Figures 12 to 16 but in a 
  fully contracted configuration. 
Figure 18 shows an end view of Figure 17. (Other end corresponds). 
Figure 19 shows a top view of Figure 17. 
Figure 20 shows a perspective view from below of Figure 17. 
Figure 21 shows a perspective view from above of Figure 17.
The list of components for the housings shown in Figures 1 to 21 is as follows:

A - 'L' bracket x 2
B - Side panel x 2
C - Cover panel x 1
D1 - Fixing bolts for side panel (B) x 4
D2 - Fixing bolts for 'L' bracket (A) x 4
E - Adjustment slots with teeth in 'L' bracket (A)
F - Fixing slot in 'L' bracket (A)
G - Strengthening ribs
H - Strengthening bars
I - Wooden joists
J - Ceiling board
K - Downlighter
L - Fixing screws
M - Keyhole slot in side panel (B)
N - Threaded/tapped holes for bolts D1 & D2
P1 - Cover section 1 with adjustable slots (T)
P2 - Cover section 2
S - Adjustable cover fixing bolts
T - Slots allowing adjustment of the P1 and P2 sections
U - Bracket x 4

Embodiments 1 & 2 (Figures 1 to 7 and 8 to 11 respectively) illustrate housings which are particularly useful for attachment on top of ceiling joists (or behind wall joists) e.g. where access permits from above the ceiling (or behind the wall).

Embodiment 3 (Figures 12 to 21) illustrates a housing which is particularly useful for attachment between ceiling (or wall) joists e.g. where access permits from below the ceiling (or in front of the wall). This would be achieved by attachment to the side surfaces of two adjacent joists which face each other.
CLAIMS:

1. An insulation housing for shielding an electrical fitting in which the housing comprises a plurality of casing components of a self-supporting substantially rigid material which are connected together.

2. An insulation housing according to claim 1 in which connection means is provided to allow relative lateral adjustment of at least two of the casing components.

3. An insulation housing according to claim 2 which comprises two components which slide with respect to each other.

4. An insulation housing according to claim 3 in which the two components slide with respect to each other by telescoping.

5. An insulation housing according to any preceding claim in which each casing component comprises a top and two opposite side walls.

6. An insulation housing according to any preceding claim in which each casing component comprises a top and four side walls.

7. An insulation housing according to claim 5 or 6 in which each casing component has a rectangular cross-section.

8. An insulation housing according to claim 5 or 6 in which each casing component has a trapezoidal cross-section.

9. An insulation housing according to any preceding claim in which each casing component is provided with means to permit attachment to the top of a joist.

10. An insulation housing according to any preceding claim in which each casing component is provided with means to permit attachment to the side of a joist.

11. An insulation housing according to claim 9 or 10 in which the means to permit attachment comprises a flange.

12. An insulation housing according to claim 9 or 10 in which the means to permit attachment comprises an 'L' bracket.

13. An insulation housing according to any preceding claim according to claim 1 and substantially as herein described with reference to any one of Figures 1 to 21.

14. An insulation housing according to any preceding claim when attached to the upper surfaces of two joists.
15. An insulation housing according to claim 14 when attached to the upper surfaces of two adjacent joists.

16. An insulation housing according to any preceding claim when attached to the side surfaces of two adjacent joists which face each other.
INTERNATIONAL SEARCH REPORT

A CLASSIFICATION OF SUBJECT MATTER

INV. F21V15/06 F21S8/02 F21V25/00 E04B9/00

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)
F21V F21S 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)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X Further documents are listed in the continuation of Box C

See patent family annex

* Special categories of cited documents

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Date of the actual completion of the international search

8 November 2006

Date of mailing of the international search report

15/11/2006

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Berthomme, Emmanuel
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