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Totten et al.

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[54] **LIGHTING TROFFER**

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[51] **Int. Cl.**.....**H05b 33/02**

[58] **Field of Search**.....240/147, 153, 51.11 R

[56] **References Cited**

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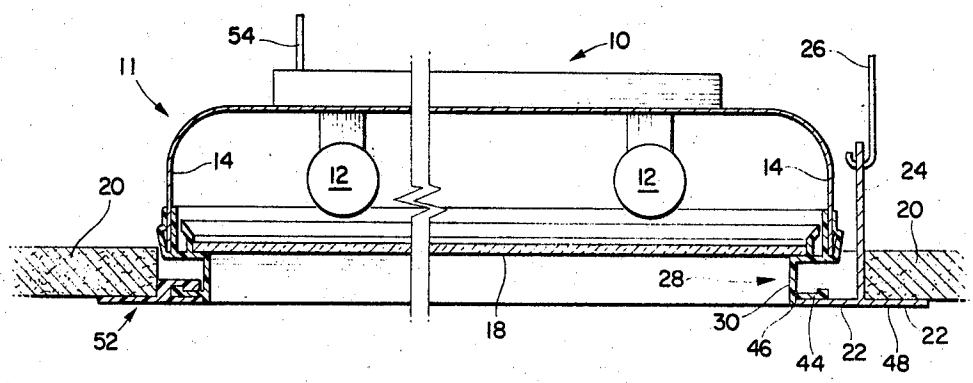
[57] **ABSTRACT**

A troffer for a light fixture for use in a suspended ceiling structure has elongated resilient members secured to its side walls so as to project downwardly therefrom. Each of such elongated resilient members has an upwardly facing seating for supporting a light-transmitting sheet member in the troffer and an outwardly projecting lower flange for supported disposition on an adjacent flange of a conventional T-shaped strut of the ceiling structure, or as an alternate embodiment additional tile support adaptors may be coupled thereto for directly supporting adjacent ceiling tiles or panels.

7 Claims, 3 Drawing Figures



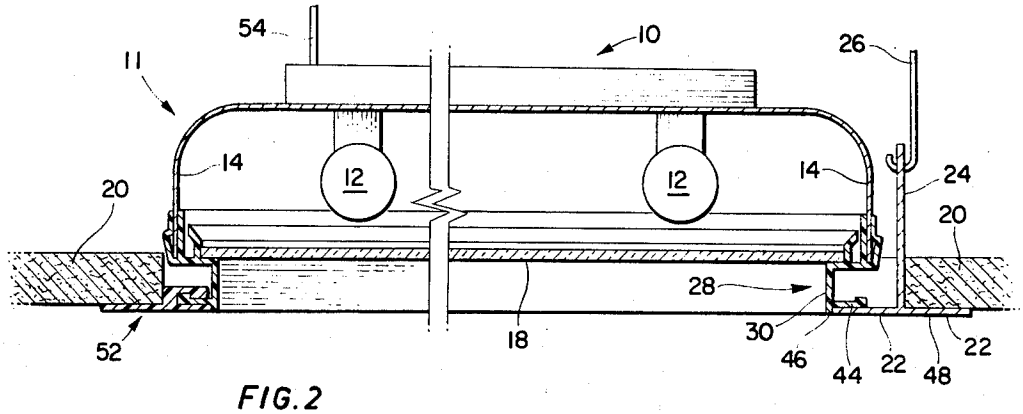


FIG. 2

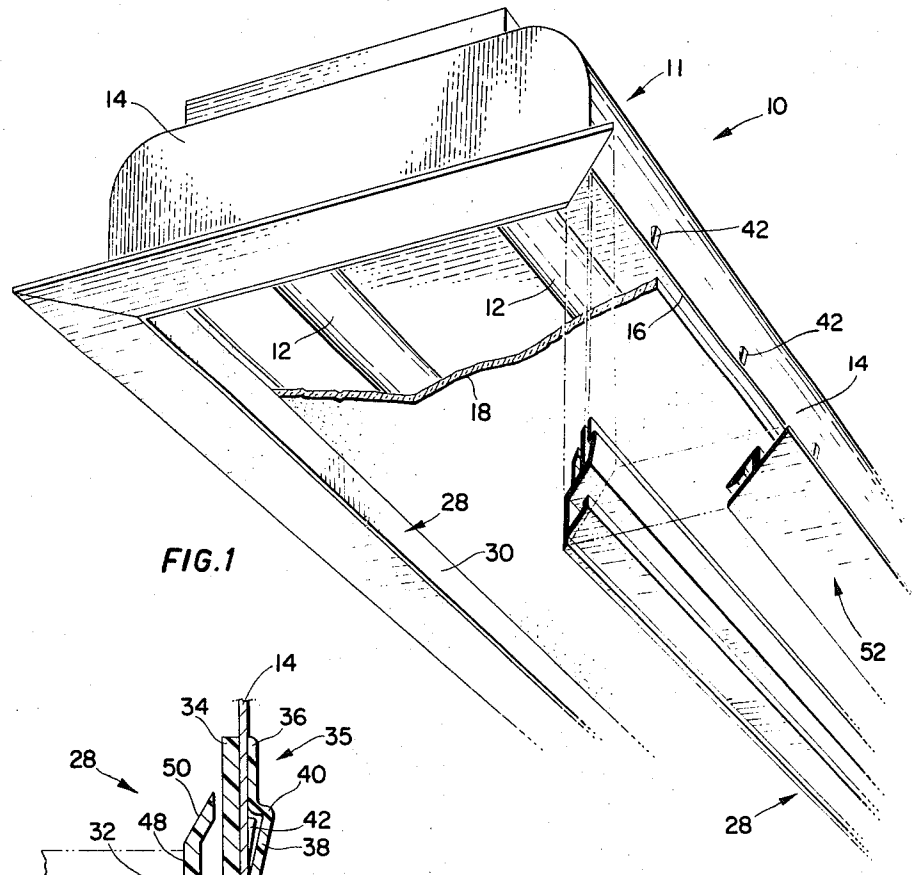


FIG. 1

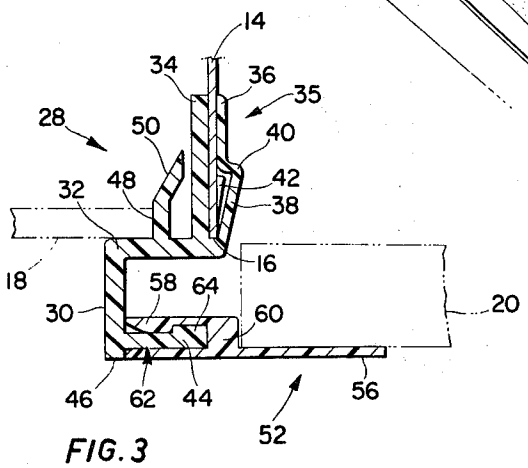


FIG. 3

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LIGHTING TROFFER

The present invention relates to light fixtures for use in suspended ceiling structures and more particularly to a troffer for such a light fixture used in a suspended ceiling structure in which ceiling panels are supported along their edges by the flanges of T-shaped ceiling struts which are in turn supported by hanger members fastened to an overhead structure.

In such suspended ceiling structures, light fixtures having fluorescent tubes are generally used and the housings for such fixtures are known as troffers. Existing troffers are designed so as to be supported by appropriate ones of the existing ceiling struts or "tees" to be independently supported by hanger members secured to an overhead structure. In the latter case, means must then be provided to hold the troffer and the surrounding ceiling panels in their correct relative positions.

It is an object of the present invention to provide a troffer which can be installed easily and and in a suspended ceiling structure both during the initial construction of such a ceiling or subsequently thereto.

Another object of this invention is to provide a troffer which in one form can rest directly on the ceiling struts of the ceiling structure and which can, as required, in another form by the simple attachment thereto of novel adaptor members provide support for the ceiling panels disposed around the troffer.

Yet another object of the invention is to provide a troffer which, if subjected to careless handling before its installation, is less likely to be damaged in a way that will be visible after installation than previous troffers.

Another object of the invention is to provide a troffer of the type described in which a light-transmitting sheet can be correctly positioned in a simple manner.

A further object of the invention is to provide a troffer which, when installed in a ceiling structure, presents an aesthetically pleasing appearance irrespective of whether or not the aforementioned adaptor members are utilized therewith.

Other objects and advantages of the invention will become apparent as the description herein proceeds.

SUMMARY OF THE INVENTION

In its broadest scope, the present invention provides a troffer for use in a ceiling structure of the type which includes ceiling panels with their edges disposed on ceiling struts said troffer comprising a lamp housing with side walls having lower edges defining a light-transmitting, generally planar opening, elongated resilient members having inner walls, being secured to respective ones of said side walls of said lamp housing, and projecting downwardly therefrom around said light-transmitting, generally planar opening, upwardly facing seatings integrally formed with said elongated resilient members, said seatings being adapted to support a light-transmitting sheet in said troffer, and outwardly projecting lower flanges integrally formed with said elongated resilient members and adapted to cooperate with said ceiling structure for joint support of said troffer therewith.

In accordance with another useful feature of this invention, each of the aforementioned elongated resilient members is modified by the addition of a further strip member to support an adjacent ceiling panel when the troffer itself is directly suspended by a hanger member extending upwardly therefrom.

Other features of he invention will be explained with reference to the preferred embodiments thereof as described hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described merely by way of illustration with reference to the accompanying drawings, in which:

FIG. 1 is a fragmentary perspective view from below of a light fixture incorporating one useful embodiment of a troffer in accordance with the invention;

FIG. 2 is a partial vertical sectional view through the light fixture of FIG. 1 showing on the right-hand side of the figure the principal feature of the invention, and on the left hand side of the figure the modification of the invention, and,

FIG. 3 is an enlarged and partial vertical section showing a detail of the feature illustrated in the left hand side of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring first to FIG. 1, there is shown therein a light fixture generally indicated at **10** and including a troffer generally indicated at **11** with fluorescent lighting tubes **12** mounted therein in a conventional manner. Since the tubes **12** and the electrical wiring associated therewith form no part of this invention, they will not be described in further detail herein.

The troffer **11** comprises a rectangular lamp housing having four side walls **14**, three of which can be seen in the drawings and which extend downwardly to lower edges **16** defining a light-transmitting, generally planar opening. A translucent panel or lens **18**, for example, plastic, is supported by the troffer **11** in the planar opening in a manner to be described in greater detail hereinafter.

The light fixture **10** is intended for use in a conventional suspended ceiling structure in which a plurality of ceiling panels **20** are supported by flanges **22** of ceiling struts. In the ceiling structure illustrated, the struts **24** are in the form of inverted T-shaped members as shown in the right-hand side of FIG. 2. Such struts **24** are suitable suspended from the fabric of the building for example by means of wire hangers **26** and are disposed so as to form a rectangular network with the spaces between adjacent struts corresponding dimensionally to an individual ceiling panel **20**.

In the principal embodiment of the invention as illustrated in the right-hand side of FIG. 2, the troffer **11** is adapted to rest on the flanges **22** of the struts in place of a ceiling panel **20**. To this end, an elongated resilient member generally indicated at **28** having an inner wall **30** is secured to the lower edges of the four side walls **14** of the troffer **11** along their full length. The manner in which the elongated resilient member **28** is secured to the troffer **11** will best be understood by reference to FIG. 3 bearing in mind that the construction illustrated in that figure is modified in a manner to be explained in greater detail hereinafter.

With this in mind, it will be seen from FIG. 3 that the inner wall **30** of the elongated resilient member **28** is integrally formed with an outwardly projecting upper

flange 32 which provides a seating for the plastic panel member 18. In proximity to its outer edge, the upper flange 32 is integrally formed with spaced apart upwardly projecting fingers 34 and 35 defining a continuous slit or recess receiving a respective one of the side walls 14 of the lamp housing. In accordance with a particularly useful feature of this invention, the outer one 35 of these fingers comprises integrally formed upper and lower portions 36 and 38 respectively which are interconnected by a downwardly facing lip 40 engaging a plurality of tongues 42 stamped out at intervals along the side walls 14 of the lamp housing. In this manner, the elongated resilient member 28 is easily attached to the side wall 14 by pushing it on and is securely retained thereon. It will be appreciated, however, that other locking or fastening means may be provided for this purpose.

In addition to the upper flange 32, the inner wall 30 of the elongated resilient member 28 is integrally formed with an outwardly projecting lower flange 44 which may, as shown in the right-hand side of FIG. 2, be disposed on the adjacent flange 22 of the ceiling strut 24 shown therein for support thereby. It should be noted also that, in accordance with another useful feature of this invention, the outwardly projecting lower flange 44 is disposed a short distance upwardly of the lower end 46 of the inner wall 30. In this way, the exposed under-surface 48 of the strut 24 is substantially co-planar with the lower end surface 46 of the inner wall 30 to provide an aesthetic appearance and to permit a positive positioning of the light fixture 10 in the ceiling.

Reference will now be made to the manner in which, in accordance with another useful feature of the invention, the plastic panel member 18 is supported and positioned relative to troffer 11. It will be seen from FIGS. 2 and 3 that the edges of this member 18 rest on the upper flanges 32 of the elongated members 28 and that each such edge abuts an upwardly projecting upper flange 32 of a respective one of the members 28. To facilitate insertion of the panel member 18 into the position illustrated, each lip 48 is integrally formed with an upwardly and outwardly projecting upper portion 50. Consequently, when the panel member 18 is obliquely inserted into the troffer 11 from below, it is relatively simple to move member 18 into its correct resting position since, during such positioning operation, the edges of member 18 are guided and centralized by engagement with the upper portions 50 of the lips 48.

The modified structure illustrated in FIGS. 1 and 3 and in the left-hand side of FIG. 2 will now be described. It will be seen that, in this arrangement, the panel-supporting T-strap 24 is not present at that location due to differences in the design of the ceiling and support structure which form no part of the invention and that the adjacent ceiling panel 20 requires to be supported by an adaptor generally indicated as 52 which fastens to the elongated resilient members 28 in a manner now to be explained. The light fixture 10 is itself independently supported by a hanger member 54 (Figure 2) in known manner. The adaptor 52 comprises a full width lower flange 56 and spaced upwardly therefrom an upper flange 58 of about half the width of the lower flange 56. The upper and lower flanges 58 and 56 respectively are integrally formed with an intermediate web 60 which provides an edge abutment for the ceiling panel 20 supported by the adaptor 52 as will best be understood by reference to FIG. 3. The upper and lower flanges 58 and 56 respectively define therebetween an elongated slit recess 62 in which the outwardly projecting lower flange 44 of an elongated resilient member 28 may be secured. To retain the outwardly projecting lower flange 44 within the recess 62, suitable locking means are provided and, in the embodiment illustrated, such locking means comprises an upwardly projecting end shoulder 64 integrally formed with the lower flange 44, a corresponding recess being provided in the undersurface of the upper flange 58 of the adaptor member 52 in proximity to the inner end of the recess 62.

Although FIG. 1 illustrates the use of adaptor members such as adaptor member 52 on all four sides of the light fixture 10 and although FIG. 2 illustrates the use of such an adaptor member on only one longitudinal side of the light fixture 10, it should be understood that the invention is not restricted to the use of any such adaptor members. A light fixture such as fixture 10 may, for example, be supported in the manner described with reference to the right-hand side of FIG. 2 without the use of adaptor members 52. An important advantage resulting from the use of the adaptor members 52 is that a light fixture can be installed in a ceiling structure relatively independantly of the positions of the existing struts 24. Where such struts conveniently positioned or can be positioned to support all four side of the light fixture, the adaptors 52 are not required. On the other hand, struts 24 may not be available due to changes in ceiling design which vary from building to building and in such a case, the light fixture itself can, by the use of the adaptor members 52, be used to support an adjacent edge of a ceiling panel covering the adjoining ceiling space.

A particularly important advantage resulting from the use of the elongated resilient members 28 is that they are more resistant to damage to their visible lower edges from mishandling than the edges of the side walls 14 themselves of the troffer 11. To this end, the members 28 are usefully formed from a suitable resilient plastics material such as polyethylene and can of course be manufactured in any desired color or surface finish. The adaptor members 52 are also usefully formed of such a plastics material. Both the elongated members 28 and the adoptor members 52 are usefully manufactured by extrusion.

In addition, by the use of the invention it becomes possible to reduce the number of different models of troffer, and to apply trim of different colors to suit the requirements of the architect. Thus the same troffer will be suitable for both forms of the invention whereas in prior troffers, two different types were required, greatly increasing manufacturing costs and inventory. Similarly, since the members 28 and adaptors 52 are preferably formed of extruded polyvinyl plastic it is a simple matter to provide different colors, particularly bearing in mind that the only visible portions of the troffers are in fact the members 28, and adaptors 52 if used, and of course the lenses.

As a further alternative, in the case of a plaster ceiling for example, the troffers may be independantly sup-

ported by hangers **54**, and the plaster can be formed up and around the flange **44** of member **28** thereby still further increasing the versatility of the invention.

Other variations are possible within the scope of the invention as defined by the claims appended hereto.

What we claim is:

1. A universal light troffer for use in ceiling structures both with and without suitably located ceiling struts, said troffer comprising;

a lamp housing with side walls having lower edges defining a light-transmitting, generally planar opening;

elongated resilient members having inner walls, being secured to respective ones of said side walls of said lamp housing, and projecting downwardly therefrom around said light-transmitting, generally planar opening;

upwardly facing supporting seatings integrally formed with said elongated resilient members;

lower flanges integrally formed with said elongated resilient members for locating said troffer in a predetermined ceiling location;

continuous spaced apart projecting finger means incorporating an upwardly projecting flange, integrally formed therewith defining a continuous upwardly directed channel therebetween for receiving a portion of a side wall of said lamp housing therein, and,

fastening means being formed integrally with said finger means within said continuous channels for securing said sidewall portion therein.

2. A troffer as claimed in claim **1** in which said upwardly facing supporting seatings are provided by outwardly projecting upper flanges integrally formed with said inner walls of said elongated resilient members upwardly of said lower flanges thereof.

3. A troffer as claimed in claim **2** in which each said outwardly projecting upper flange is integrally formed with an upwardly projecting lip disposed inwardly of said finger means.

4. A troffer as claimed in claim **1** in which said finger means include a downwardly facing lip, and including a plurality of tongues upset from a respective one of said side walls of said lamp housing adapted to interengage with said lip whereby to retain said elongated resilient member in engagement with said portions of said side walls of said lamp housing.

5. A troffer as claimed in claim **1** in which said elongated resilient members are formed of a resilient plastic material.

6. A troffer as claimed in claim **1** including adaptor means attached to respective resilient members generally vertically spaced apart, generally horizontal finger means on a respective adaptor member defining a continuous channel therebetween in which each said lower flange of said elongated resilient members is engaged, and outwardly directed flanges on said adaptor members extending outwardly beyond said finger means thereof to provide seatings.

7. A troffer as claimed in claim **6** in which one of said upper and lower finger means of each said adaptor member and each said outwardly projecting lower flange of said elongated resilient members are formed with cooperating surfaces to retain said outwardly projecting lower flange of said elongated resilient member within said recess of said adaptor member.

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