A tubular skylight having an improved one-piece curb/tube improving the ease of manufacture and installation. The one-piece tube/curb having a tube and a flashing integrally molded of plastic. The tube extends above the flashing to support a dome and below the flashing to connect to an adjacent light tube section. The tube preferably includes a reflective inner surface to enhance light conveyance.
TUBULAR SKYLIGHT WITH IMPROVED ONE-PIECE CURB AND TUBE

BACKGROUND OF THE INVENTION

[0001] The present invention relates to skylights and more particularly to tubular skylights, which include a reflective tube extending downwardly from the dome.

[0002] Tubular skylights have acquired increasing popularity as a means of introducing natural light into the interior of a building. These skylights include a curb mounted on the roof of a building, a dome mounted on the curb, and a reflective tube secured within the curb. The reflective tube extends between the curb and a light diffuser within the building’s ceiling. The natural light entering the skylight through the dome reflects downwardly through the tube to the diffuser. The tube in a sense acts as a gigantic optical fiber. Typically both the curb and the tube are fabricated of aluminum.

[0003] The efficiency and type of light reflected from the dome to the diffuser depends in part on the reflective tubing. The manufacturer, shipper, and installer have to be careful not to bend or deform the reflective metal tube or the metal roof flashing. Any deformation may cause degradation in the efficiency of the skylight. A deformation near one of the ends of the tube may impair proper attachment of the tube to either the roof flashing or the diffuser assembly.

[0004] The installation of the tubular skylight can be time consuming. First, great care has to be taken during shipment and installation to prevent any distortion in the metal pieces. Second, the reflective tube must be inserted through a hole in the roof and carefully connected to the curb.

[0005] Another problem is the inability to choose the desired type of light when the skylight is installed. Typically skylights are made as bright as possible by highly polishing the aluminum tubing. If a less harsh light is desired, the only way this can be accomplished is through the installation of a less translucent diffuser.

SUMMARY OF THE INVENTION

[0006] The aforementioned problems are overcome in the present invention wherein a tubular skylight includes a curb having an integral reflective tube section. The integral curb/tube facilitates installation and eliminates the need to attach and seal two components. The curb/tube also reduces the number of pieces and eliminates an attachment point.

[0007] In the preferred embodiment, the tube is molded of plastic and includes a metalized reflective coating on the tube section. When fabricated of plastic, the curb/tube is less likely to be bent or deformed during shipment and installation. A curb/tube without any deformation provides a better seal with the roof and subsequent tube sections.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is a perspective view showing a tubular skylight having the roof flashing of the present invention mounted within a building.

[0009] FIG. 2 is an exploded perspective view of the tubular skylight;

[0010] FIG. 3 is a top plan view of the curb/tube;

[0011] FIG. 4 is a bottom plan view of the curb/tube;

[0012] FIG. 5 is a sectional view of the curb/tube taken along line 5-5 in FIG. 3; and

[0013] FIG. 6 is a sectional view of an alternative embodiment of the curb/tube.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0014] I. Construction

[0015] A tubular skylight constructed in accordance with the preferred embodiment of the invention is illustrated in FIGS. 1 and 2 and generally designated 10. As perhaps most clearly illustrated in FIG. 2, the skylight includes a tube assembly 16 interconnecting a dome assembly 12 and a diffuser assembly 14. The skylight is installed in a building B having a roof R and a ceiling C. More particularly the dome assembly 12 is mounted on a roof R and the diffuser assembly 14 within the ceiling C. The tube assembly 16 channels light between the dome assembly 12 and the diffuser assembly 14. With the exception of the curb/tube 30 (as discussed below), the skylight 10 is generally well known to those skilled in the art.

[0016] The diffuser assembly 14 includes a diffuser plate 74, a trim ring 72 and ceiling screws 76. The trim ring 72 is attached to the ceiling C by the use of the ceiling screws 76. The diffuser plate 74 attaches over the trim ring 72. The diffuser plate 74 can be a prismatic light diffuser, a less translucent light diffuser, or any other style based on personal preference or aesthetic choice.

[0017] The tube assembly 16 interconnects the dome assembly 12 with the diffuser assembly 14. Specifically the tube assembly 16 connects the curb/tube 30 to the trim ring 74. The tube assembly 16 may include one or more tubes of which some may be flexible or angled. Flexible accordion tubes or bent tubes allow the diffuser assembly 14 to be offset from the curb/tube 30. The tube assembly 16 may also come in a variety of lengths to accommodate different heights and locations between the roof R and the ceiling C.

[0018] The dome assembly 12 includes a dome 20, and a curb/tube 30. The dome can have a variety of shapes and may be secured to the curb/tube by dome screws 22, adhesive or any other means.

[0019] The curb/tube 30 is most clearly illustrated in FIGS. 3-5 and includes a flashing 32, an integral tube 36, an outer wall 34 and ribs 48. The flashing 32 rests on the roof R with the outer wall 34 extending upwardly to meet the integral tube 36 that passes through the center of the outer wall 34 and below the flashing 32. The ribs 48 interconnect the integral tube 36 to the housing 34.

[0020] The flashing 32 of the curb/tube 30 may be constructed in almost any shape or size. The flashing may be substantially planar to lie on a flat roof R or in any other shape to fit a variety of roofs such as a tile roof. The flashing 32 is located between the upper and lower ends of the tube 36 so that a substantial portion of the tube 36 is on either side. In the preferred embodiment, as illustrated in FIGS. 1, 2, and 5, the flashing is located about midway along the length of the tube 36. The flashing 32 is attached to the roof R with a fastening means 44 such as screws or nails but other means such as adhesive may be readily used.

[0021] The outer wall 34 includes a top lip 38. The outer wall 34 protrudes upwardly from approximately the center of the flashing 32 to the top lip 38. The outer wall 34 is generally tapered inwardly from the flashing 32 to the top lip
It should be readily apparent that the outer wall 34 does not have to be tapered at all. The top lip 38 may be made in any shape such as a circle, a triangle, or an octagon to match the shape of the dome 20. The dome 20 is sealed to and supported by the top lip 38. As can be seen in FIG. 5, the flashing 32 may be angled in relation to the longitudinal axis of the outer wall 34. This angle may vary to correspond with different slopes of the roof R. For ease of manufacture and inventory, this angle also may be limited to one or a few specified angles.

The ribs 48 are integrally molded with the outer wall 34 and the tube 36 to maintain a proper spacing relationship and rigidity. The ribs 48 generally extend between the tube 36 and the outer wall 34. In the preferred embodiments, these ribs 48 extend from the top lip to approximately the flashing 34. The curb/tube 30 may easily be manufactured without these ribs 48.

The integral tube 36 includes a reflective inner surface 46, an upper end means and a lower end means. In the preferred embodiment, the lower end means is a bottom edge 56 and the upper end means of the integral tube 36 joins the outer wall 34 to form the top lip 38. The integral tube 36 extends downwardly from the top lip 38, through approximately the center of the outer wall 34 and the flashing 32. The integral tube 36 extends beyond the flashing 32 and terminates in the bottom edge 56.

The inner surface 46 may be coated with a reflective coating 46 to efficiently transfer light from the dome 20 downwardly to the diffuser assembly 14. The reflective coating 46 may be made out of a bright metallic finish, a soft opaque white or any shade therebetween depending on the type of light desired. Other coatings may be applied depending on the desired optical effect.

In an alternative embodiment, the curb/tube 30 may be made without the outer wall 34 and the ribs 48, as illustrated in FIG. 6. Instead, the integral tube 36 includes a flashing 34 extending outwardly from the tube 36. In some embodiments, the flashing 34 may also be angled in relation to the longitudinal axis of the tube 36 to correspond to varying roof angles.

II. Manufacture

The curb/tube 30 is generally molded as one piece with an integral tube 36, outer wall 34, flashing 32 and ribs 48. The curb/tube 30 is preferably molded out of a plastic material. The application of the reflective coating 46 to the plastic curb/tube 30 is well known in the art.

III. Installation

The tubular skylight 10 is installed within the building B in the conventional fashion. Holes are cut into the roof R and in the ceiling C. The curb/tube 30 is installed on the roof R with the integral tube 36 extending through and below the roof R. The flashing 32 can be secured to the roof R with the use of fasteners 44 such as screws or nails, although adhesive or any other means may also be used to secure the flashing 32 to the roof R. In the preferred embodiment, the curb/tube 30 includes preformed holes 54 through which the fasteners 44 pass.

The slope of the roof R generally determines the angle between the flashing 32 and the longitudinal axis of the integral tube 36. Preferably this angle is such that the top lip 38 integrally connecting the outer wall 34 and tube 36 provides the best angle for sunlight to enter the dome 20 when the flashing 32 is installed on the roof R. The dome 20 is then mounted and sealed to the top lip 38 and outer wall 34. The integral tube 34 extends beyond the flashing 32 so that the tube assembly 16 may be connected to the bottom edge 56. The tube assembly 16 extends from the bottom edge 56 of the integral first tube section 36 to the trim ring 72 in the ceiling C. [0031] The above description is that of the preferred embodiment of the invention. Various alterations and changes can be made without departing from the spirit and broader aspects of the invention as defined in the appended claims, which are to be interpreted in accordance with the principles of patent law including the doctrine of equivalents.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A one-piece curb/tube for a skylight comprising:
   a tube having an upper and a lower end;
   an outer wall integrally molded with said tube and extending downwardly from said upper end of said tube; and
   a flashing integrally molded with and extending outwardly from said outer wall, said flashing located between said upper and lower ends of said tube, whereby a substantial portion of said tube is located on either side of said flashing.

2. The curb/tube of claim 1 wherein said tube includes an inner surface having a reflective coating.

3. The curb/tube of claim 1 wherein said tube, said flashing and said outer wall are molded as one piece out of plastic.

4. A one-piece curb/tube comprising:
   a tube having an inner reflective surface, said tube connected to an outer wall, said outer wall extending downwardly along said tube; and
   a flange extending outwardly from said outer wall, said tube and said flange being integrally molded out of a non-metallic material.

5. The curb/tube of claim 4 wherein said tube includes a bottom edge extending beyond said flashing.

6. A one-piece curb/tube for a light tube assembly of the type to be installed between a roof and a ceiling to convey sunlight into a building interior, said curb/tube comprising:
   a flashing portion adapted to support said curb/tube on the roof; and
   a tube portion integrally molded with and extending through said flashing portion, said tube portion including an upper end means for supporting a light tube dome, said tube portion further including a lower end means for connecting said tube portion to an adjacent light tube section, said lower end means being located an adequate distance below said flashing portion so that said tube portion extends through the roof when the tube/curb is supported on the roof.

7. The curb/tube of claim 6 wherein said tube portion and said flashing portion are molded as one-piece out of plastic.

8. The curb/tube of claim 6 wherein said tube portion includes an inner surface having a reflective coating.