US 20060000161A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2006/0000161 A1

Darmer et al. (43) Pub. Date: Jan. 5, 2006

(54) MODULAR SKYLIGHT FRAME AND SYSTEM

(75) Inventors: **Samuel H. Darmer**, Greenwood, SC (US); **Leonard Kenneth Moody**, Greenwood, SC (US); **Eric Brinton**, Greenwood, SC (US)

Correspondence Address:
DORITY & MANNING, P.A.
POST OFFICE BOX 1449
GREENVILLE, SC 29602-1449 (US)

(73) Assignee: **VKR HOLDING A/S**

(21) Appl. No.: **10/860,742**

(22) Filed: **Jun. 3, 2004**

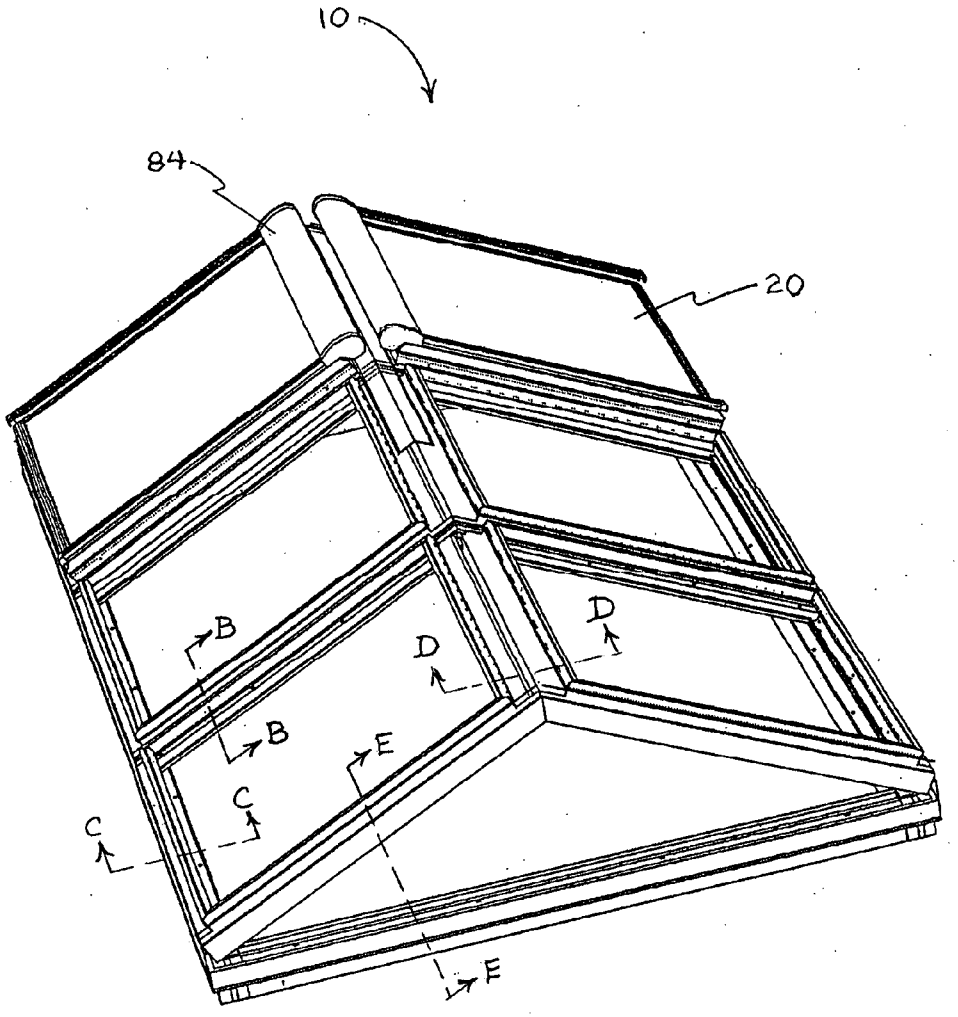
Publication Classification

(51) **Int. Cl.**
E04B 7/18 (2006.01)

(52) **U.S. Cl.** **52/200**

(57) **ABSTRACT**

A pre-assembled skylight frame module and system is provided. A module includes opposed first and second skylight mounts, each including opposed rafters and opposed purlins to define a rectangular aperture between them. The skylight frame module includes an obtuse angle between the two attached first and second skylight mounts. The skylight mounts are adapted for receipt of pre-assembled skylight assemblies. The skylight frame module is configured for side-by-side attachment to adjacent such skylight frame modules, to provide a skylight frame assembly. The skylight system may be adapted to a variety of skylight openings by varying the rafter and purlin lengths and the angle between the connected skylight mounts.



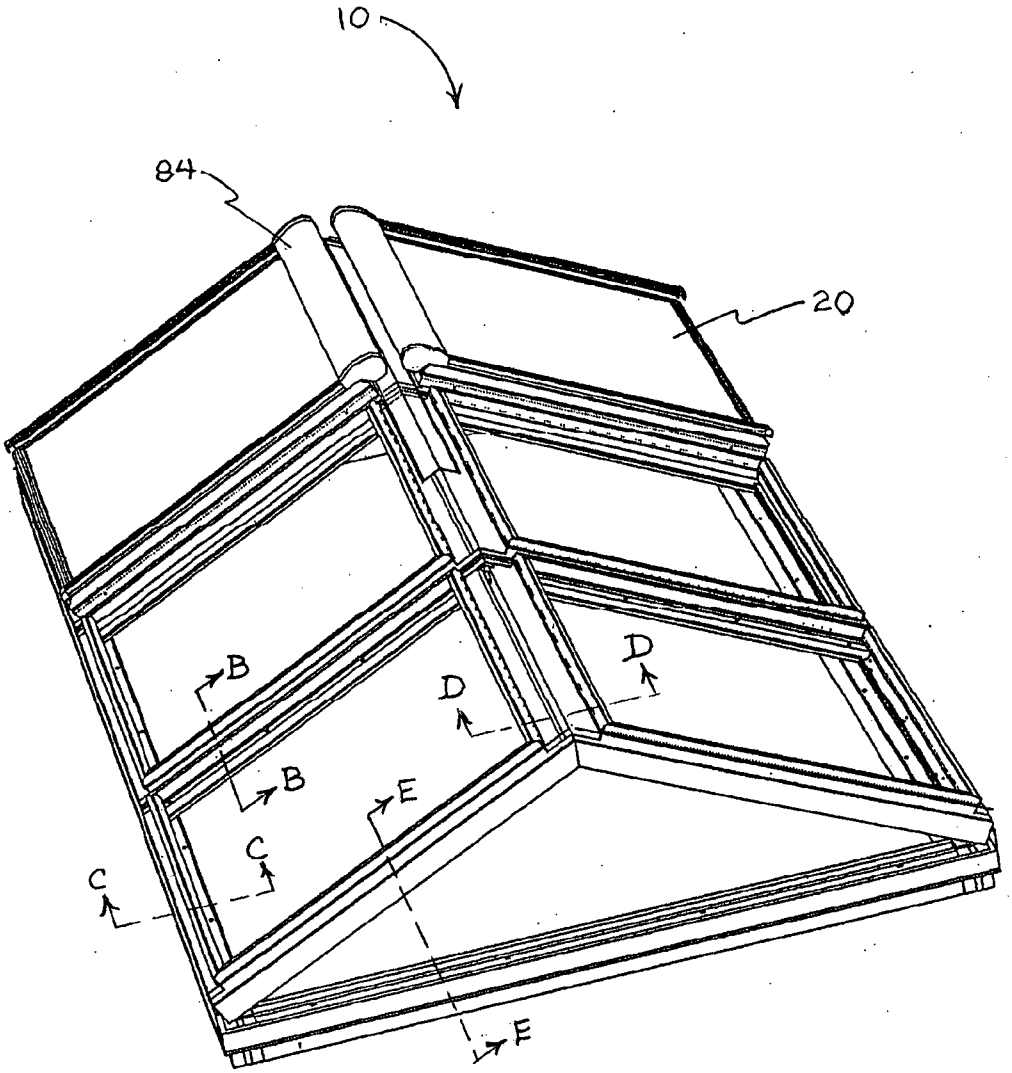


FIG. 1

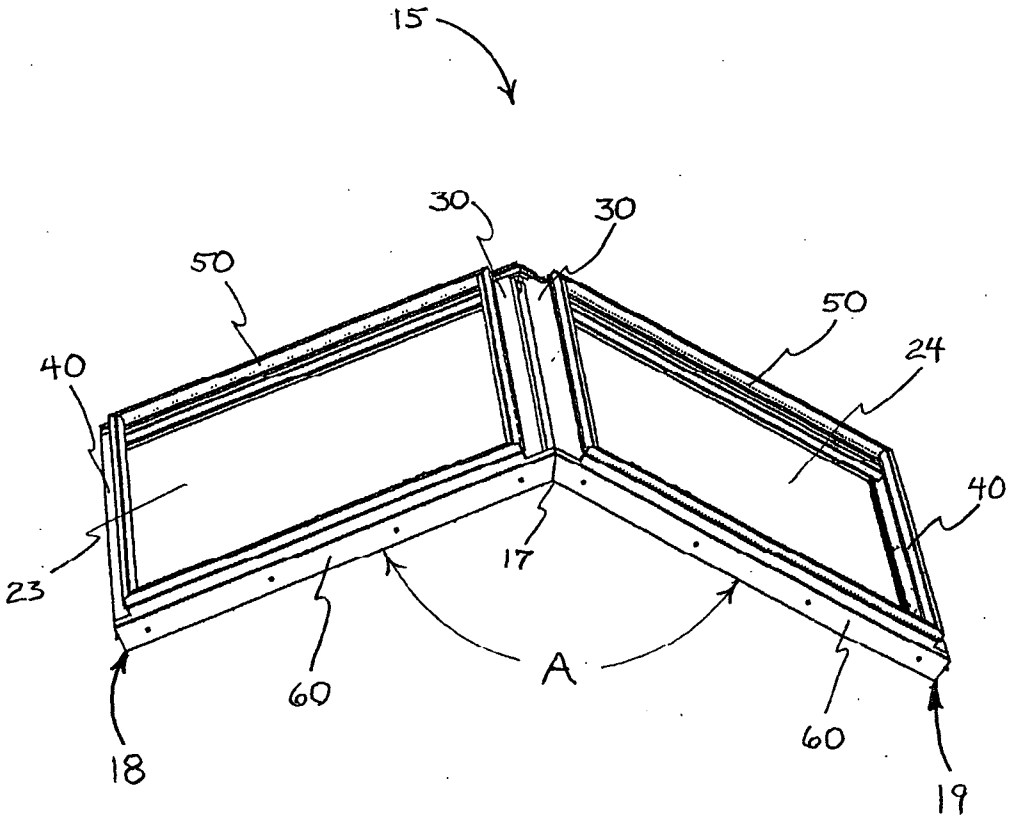


FIG. 2

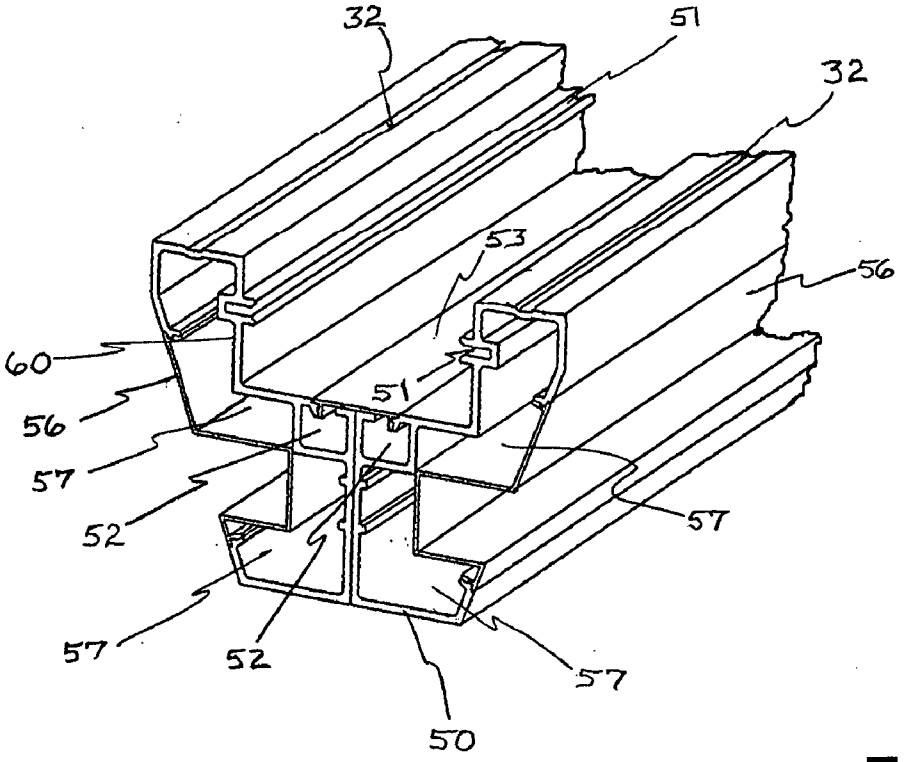


FIG. 3A

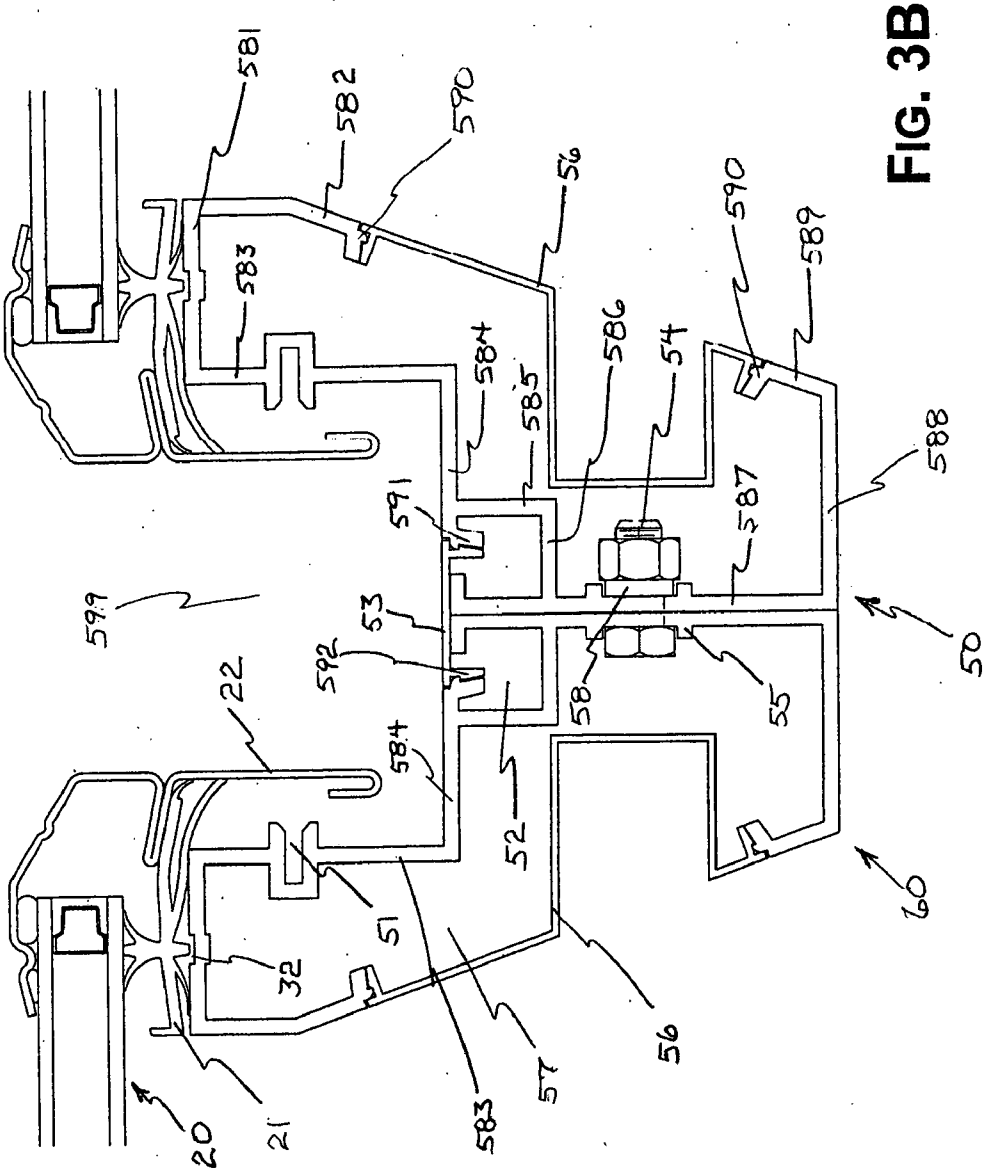

581
582
590
56
590
589
583
584
585
586
54
588
591
587
599
53
592
22
58
55
50
584
52
51
60
32
56
57
583
20
21

FIG. 3B

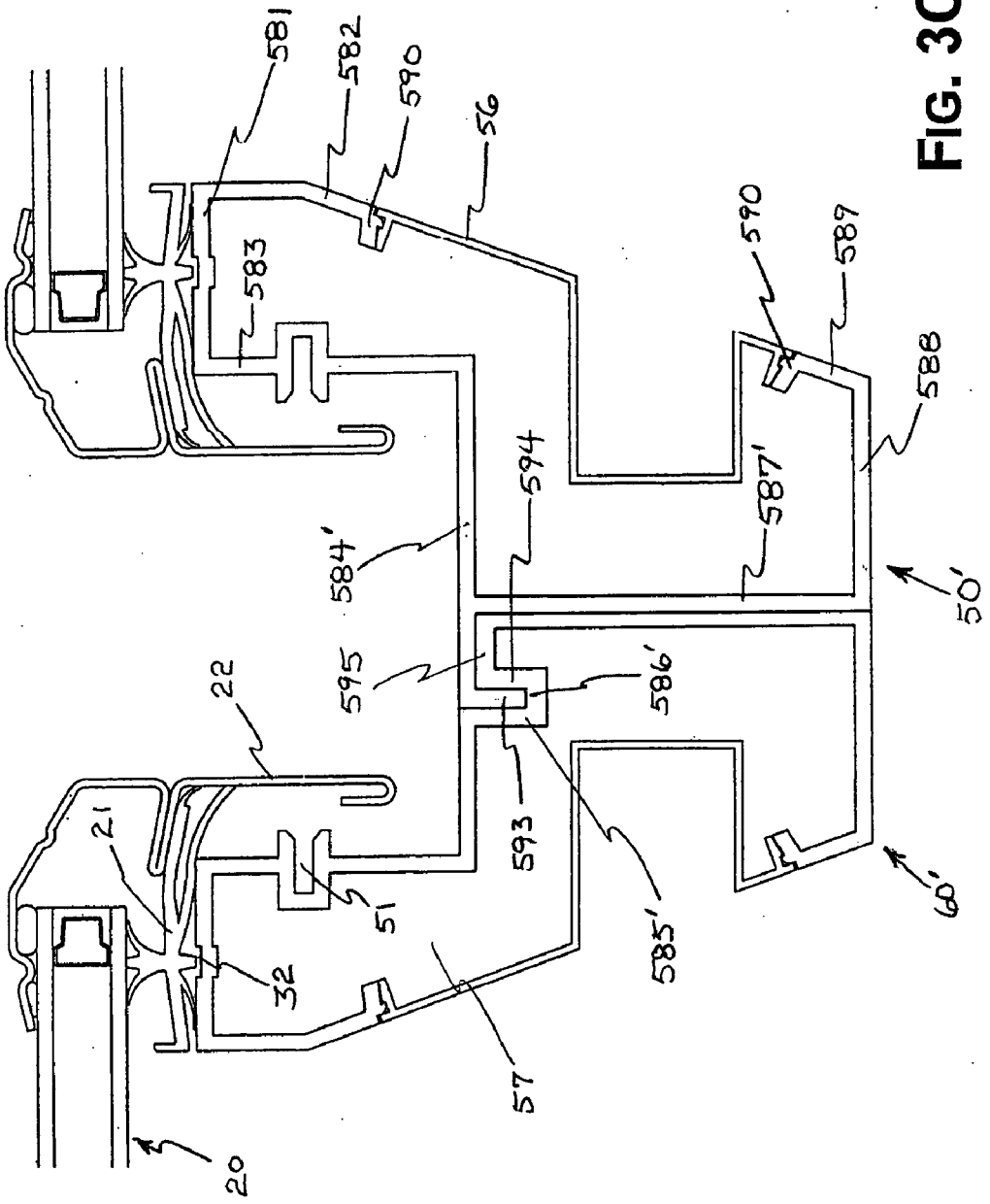

581
582
590
56
583
590
589
588
587'
594
584'
50'
595
586'
22
593
21
51
585'
60'
32
57
20

FIG. 3C

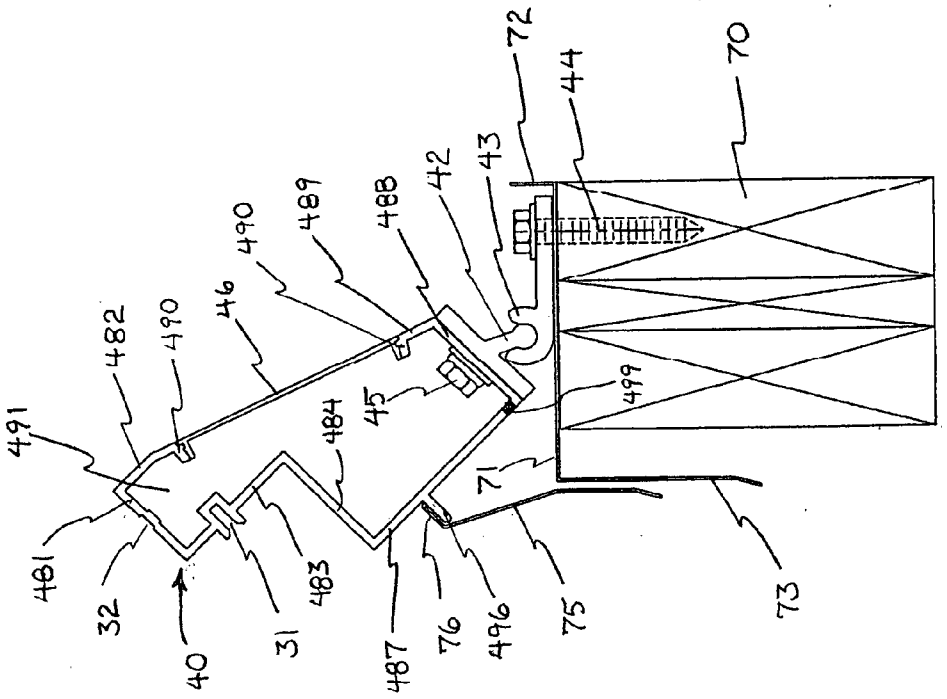
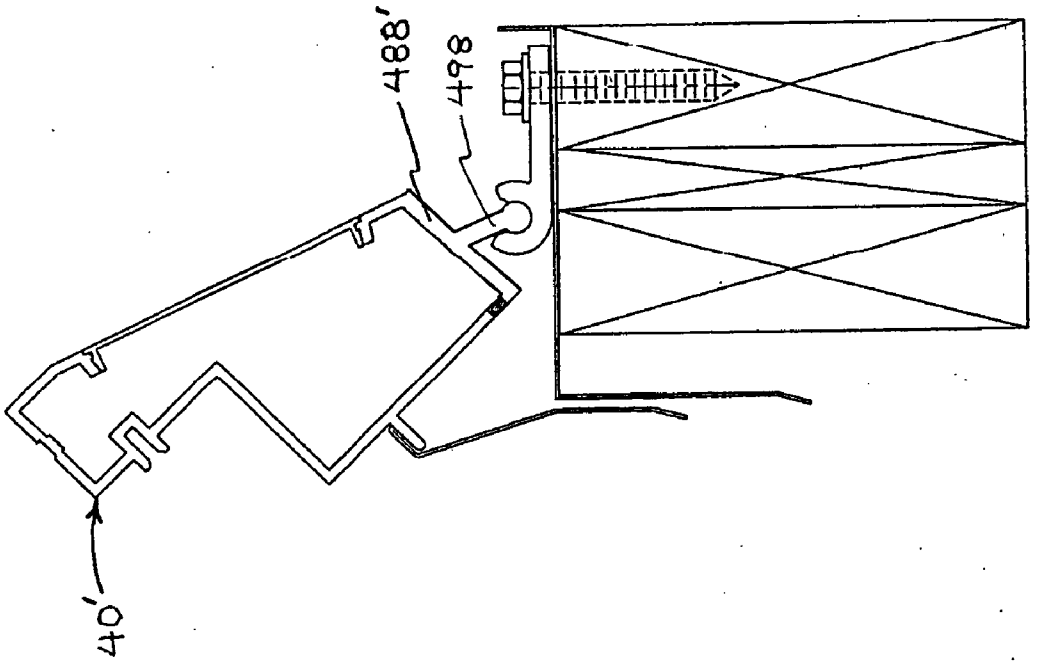

72
44
70
43
42
488
489
490
46
490
482
491
484
45
499
71
481
32
40
31
483
487
76
496
75
73

FIG. 4A

FIG. 4B



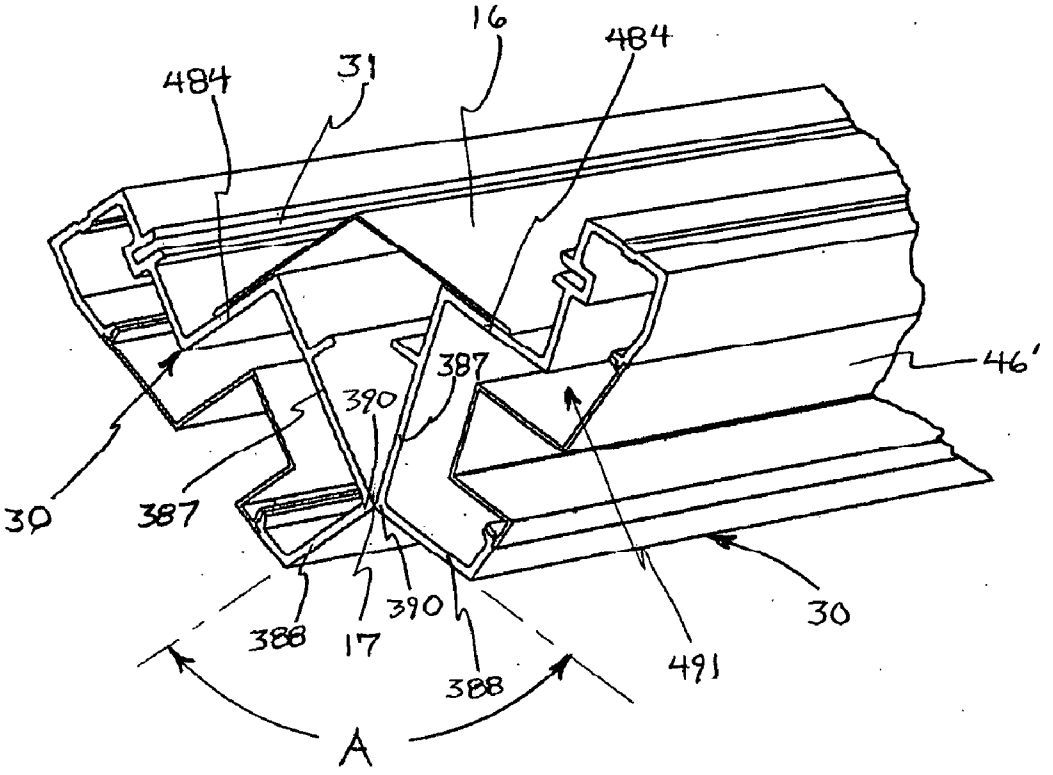


FIG. 5

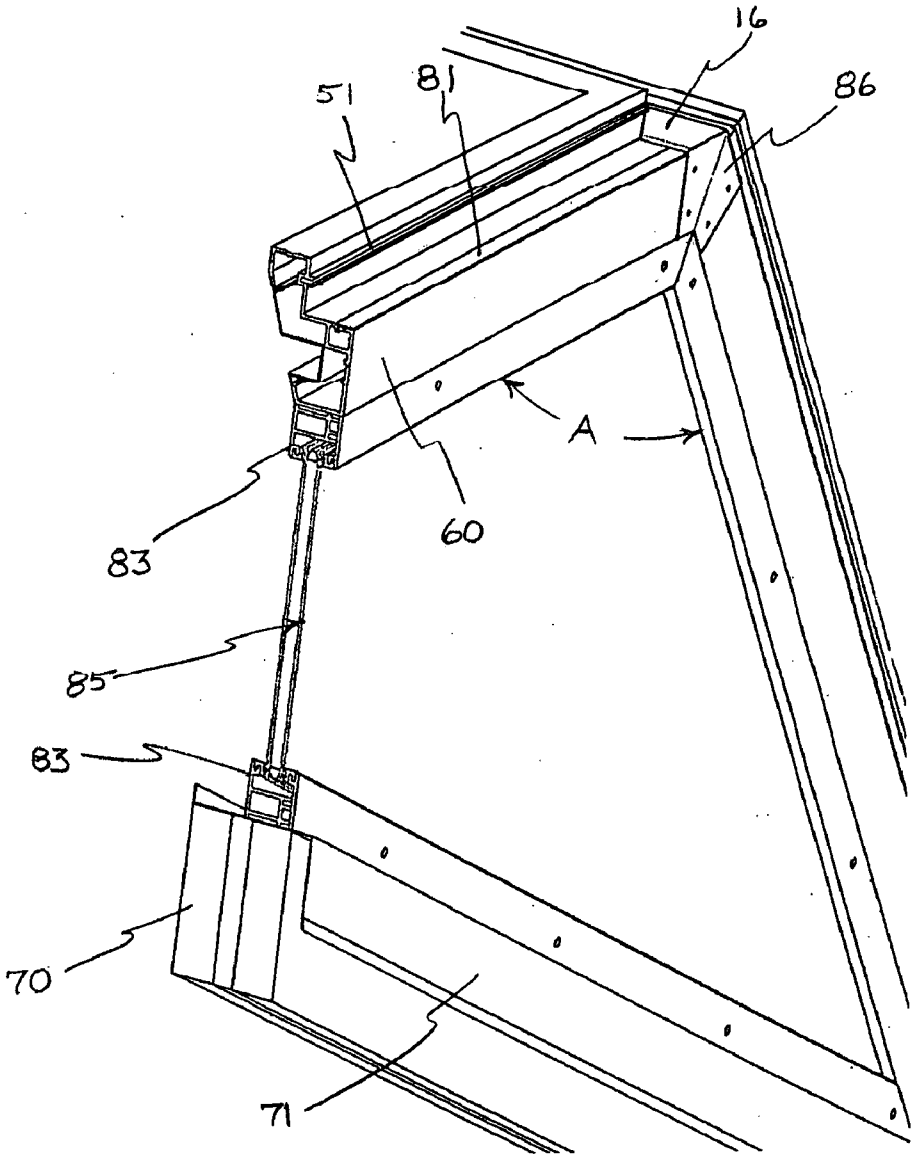


FIG. 6

MODULAR SKYLIGHT FRAME AND SYSTEM

BACKGROUND

[0001] Skylights are useful and popular features in buildings. Allowing natural lighting to the interior of buildings, skylights are used with residences, schools, shopping malls, office buildings, and the like.

[0002] A skylight involves an opening through the roof of a building, above which is constructed a perimeter curb for support of the skylight about the opening upon the roof. Construction of the skylight itself, under existing systems, may involve erection and interconnection of various struts, standards, beams, channels, gutters, and the like above the curb. Thereafter, glazing units may be installed and weatherproofed to the constructed frame assembly. Such weatherproofing might involve wet glazing, often undertaken on the job site by professional glaziers. Alternatively, dry glazing may be used, in which a complicated series of gaskets and seals are installed. Dry glazing is considered inferior by some in the market, in that it requires numerous parts that must be fitted together exactly, it is aesthetically complicated, and it requires increased maintenance. On the other hand, wet glazing on the job site may be problematic, in that professionally-trained glaziers must be located and retained, job quality may be irregular, and later responsibility for leaks or failure may be disputed between various tradesmen or material suppliers.

[0003] Assembly of existing skylight systems is primarily completed on the job site itself. Lacking standardization, various pieces and parts are brought to the site, along with the requisite relatively large number of tools for the assembly. So located, the skylight system is then constructed, piece by piece, over the sometimes large and always dangerous opening in the roof. Moreover, existing gabled skylight systems often produce lateral loading upon the mounting structure, such as the roof curb, which requires more than minimal professional design and engineering considerations. Of course, the tooling costs necessary to produce the various pieces and parts of existing skylight systems is not insignificant, as numerous parts, often of varying configurations, must be manufactured.

[0004] Once assembled, existing skylight systems often suffer from inferior drainage features. As an outside structure, skylight systems are exposed to rain and must shed that rain in an efficient and effective manner, yet existing systems often provide for inefficient or inelegant, and unattractive, drainage systems.

[0005] Transportation of the skylight system to the job site is required. Accordingly, the transportability of the various components comprised by the skylight system is an issue to be considered in design. Furthermore, the skylight system must be moved to the roof of the building for installation, which presents another transportability issue. For example, a system so bulky and cumbersome that a crane is required for lifting the system from a truck to a rooftop is less desirable than a system in which components may be handled manually by workers on site.

[0006] It is also recognized that pre-assembled individual single unit skylight lens assemblies involving a single light aperture, have reached a high level of sophistication, engineering, and reliability. Such units are delivered complete from the factory. Glazing of the light panels has already been completed, under controlled, standardized conditions in a factory by workers with specialized expertise. Installation has been simplified, and performance of these units installed in the field has been superior. Such skylight lens assemblies are available pre-assembled in several standard sizes, such as 2×2 feet, 2×4 feet, 3×3 feet, 4×4 feet, and 4×6 feet. Several models of such skylights include an integrated flashing system, weatherproofing the entire assembly. An example of such a skylight lens assembly is disclosed in application Ser. No. 10/612,386, entitled "Skylight With Sealing Gasket," owned by the same Assignee as the present invention and incorporated herein by reference.

[0007] Accessories, such as awnings, shades, blinds, electrochromic mechanisms, and photovoltaic systems, are available for some single unit skylights. Existing skylight systems may not provide for the inclusion of such accessories, either in allowing for attachment of such systems or providing for structural support of the added weight of such systems, or providing for efficient or aesthetic wiring of electrically powered accessories.

[0008] The present invention relates to improvements upon the known skylight frame systems and provides distinct advantages over the conventional systems and methods.

SUMMARY OF THE INVENTION

[0009] In response to the discussed difficulties and problems, a new skylight frame and system has been discovered.

[0010] Certain aspects of the present invention provide for a pre-assembled skylight frame module, to be installed upon new construction or in retrofitting a newer skylight to an existing structure.

[0011] As used herein, "pre-assembled" is understood to mean a construction that is fabricated and assembled distant from the installation site at which the skylight system is to be mounted.

[0012] According to certain aspects of the present invention, a first skylight mount is provided. The first skylight mount includes opposed first and second rafters and opposed upper and lower purlins, the rafters and purlins interconnected to define a rectangular aperture between them. Likewise, a second skylight mount is provided, it, too, including first and second opposed rafters, and upper and lower opposed purlins, the rafters and purlins interconnected to define a rectangular aperture between them. The first skylight mount is attached to the second skylight mount along the respective upper purlins. Attachment of the first skylight mount to the second skylight mount at the respective upper purlins may define an angle between the first and second skylight mounts ranging from 90 degrees to 180 degrees. Such attachment may be substantially rigid.

[0013] Each of the two skylight mounts of the pre-assembled skylight frame module may be configured for engagement with a pre-assembled skylight lens assembly, of predetermined size, over each of the rectangular apertures of the skylight mounts.

[0014] Other aspects of the present invention also provide that the cross-sectional configuration of the upper and lower

purlins may be substantially the same. Likewise, the cross-sectional configurations of the first and second rafters may be substantially the same.

[0015] The lower purlins may include a hinge member adapted for attachment to a roof curb hinge. The roof curb hinge, so used, may attach the pre-assembled skylight frame module to the roof curb or other mounting structure upon the building roof. In one embodiment, the lower purlins of the skylight mounts may include within their structure a hinge member adapted for attachment to a roof curb hinge.

[0016] The skylight mounts, constructed of the rafters and purlins, may include a top wall configured for abutment with a skylight lens assembly gasket of a pre-assembled skylight lens assembly.

[0017] Adapted for receipt of a pre-assembled skylight lens assembly, the pre-assembled skylight frame modules of the present invention may include a screw receiver for receipt of screw attachment of the pre-assembled skylight assemblies to the skylight mounts.

[0018] Channels within the rafters of the skylight mounts may also be provided. Similarly, the purlins of the skylight mounts may include channels.

[0019] Further, at least one of the skylight frame modules of the present invention may be adapted for attachment of skylight accessories, such as awnings, shades, blinds, electrochromic mechanisms and photovoltaic systems.

[0020] According to certain other aspects of the present invention, a skylight frame system is provided, comprising at least two pre-assembled skylight frame modules. Such pre-assembled skylight frame modules are configured for side-by-side installation, each such module including a first and second skylight mount. Each of the first and second skylight mounts include opposed rafters, an upper purlin and an opposed lower purlins, the rafters and purlins interconnected to define a rectangular aperture between them. Within such skylight frame system, each first and second skylight mounts are attached together at their respective upper purlins. Such attachment may be at an obtuse angle, thereby forming a gable, or may be at 180 degrees. Further, the rafters between the modules are configured for attachment one to the other, for instance at the job site. The attachment of the first skylight mount and the second skylight mount may be substantially rigid, for instance by welding.

[0021] Each of the first and second skylight mounts are adapted for engagement with a pre-assembled skylight lens assembly, of predetermined size, over the rectangular apertures.

[0022] Some of the rafters of the skylight mounts may include within them a secondary gutter, for drainage of water.

[0023] At least one of the lower purlins of one of the skylight mounts of the skylight frame system herein may include a hinge member adapted for attachment to a roof curb hinge. Alternatively, a hinge may be connected with at least one of the lower purlins for hingeable attachment to a roof curb.

[0024] The rafters of the skylight mounts of the within skylight frame system may have substantially the same cross-sectional configuration. Likewise, the purlins may have substantially the same cross-sectional configuration.

[0025] The skylight frame system disclosed herein may include skylight frame modules in which at least one of the rafters is configured to engage with another rafter of an adjacent module upon installation of the module side-by-side, one of the rafters having a male member and the adjacent rafter having a complementary female member configured to engage with the male member.

[0026] The skylight frame system may also include channels within the rafters, or within the purlins, or within both.

[0027] The skylight frame system disclosed herein also may include, with at least one of the skylight frame modules, configuration for attachment of skylight accessories.

[0028] The rafters and purlins of the skylight mounts of the skylight frame modules of the within skylight frame system may include a top wall configured for abutment with a gasket carried by a pre-assembled skylight lens assembly. Similarly, the rafters and purlins may also include a screw receiver for receipt of screw attachment of a pre-assembled skylight system.

[0029] Structural and operational details of preferred designs of the modular skylight frame and system and components embodying the invention and advantages obtained thereby will become apparent from the appended drawings and the detailed description to follow.

BRIEF DESCRIPTION OF THE DRAWINGS

[0030] The aspects described above, as well as other apparent aspects, advantages, and objectives of the present invention are apparent from the detailed description below in combination with the drawings. It should be noted that the appended drawings are not necessarily to scale in all instances, but may have exaggerated dimensions in some respect to illustrate the principles of the invention.

[0031] **FIG. 1** is a perspective, partially disassembled view of a modular skylight system in accordance with certain aspects of the present invention, with two pre-assembled skylight systems installed thereupon along with two accessories;

[0032] **FIG. 2** is a perspective view of a modular skylight frame suitable for use in the system of **FIG. 1**, or alone;

[0033] **FIG. 3A** is a cross-sectional perspective view taken along line B-B in **FIG. 1**;

[0034] **FIG. 3B** is a cross-sectional view of one exemplary embodiment of one aspect of the present invention, taken along line B-B in **FIG. 1**;

[0035] **FIG. 3C** is a cross-sectional view of an alternative exemplary embodiment, taken along line B-B in **FIG. 1**;

[0036] **FIG. 4A** is a cross-sectional view of one embodiment, taken along line C-C in **FIG. 1**;

[0037] **FIG. 4B** is a cross-sectional view of an alternative exemplary embodiment, taken along line C-C in **FIG. 1**;

[0038] **FIG. 5** is a cross-sectional perspective view of an exemplary embodiment, taken along line D-D in **FIG. 1**;

[0039] **FIG. 6** is a cross-sectional perspective view, taken along line E-E in **FIG. 1**.

DETAILED DESCRIPTION

[0040] Reference will now be made in detail to the presently preferred embodiments of the invention, one or more examples of which are illustrated in the drawings. Each example is provided by way of explanation of the invention, and is not meant as a limitation of the invention. For example, features illustrated or described as part of one embodiment may be used on another embodiment to yield a still further embodiment. It is intended that this application includes such modifications and variations as come within the scope and spirit of the invention. Repeat use of reference characters throughout the present specification and appended drawings is intended to represent the same or analogous features or elements of the invention.

[0041] **FIG. 1** shows an exemplary embodiment of a modular skylight frame system in accordance with certain aspects of the present invention. The frame system, generally **10**, is adapted for installation about an opening through a building roof. The frame system **10** may be used with new construction or may be used to retrofit a newer skylight system to an existing building structure. The system depicted in **FIG. 1** illustrates six skylight apertures and, as will be appreciated from the description below, is constructed of three skylight frame modules. For illustration purposes, two lens assemblies **20** are depicted on **FIG. 1**. Likewise, each of the skylight lens assemblies **20** upon system **10** may include an accessory **84**.

[0042] **FIG. 2** illustrates a modular skylight frame **15**. Modular skylight frame **15** includes first skylight mount **18** and second skylight mount **19**. Each of the skylight mounts includes an upper purlin **30** and a lower purlin **40**. Likewise, each of the two skylight mounts includes a left rafter **50** and a right rafter **60**. The rafters and purlins of each skylight mount are interconnected to define rectangular apertures therebetween; aperture **23** is defined within first skylight mount **18** and aperture **24** is defined within second skylight mount **19**.

[0043] As illustrated in **FIG. 2**, upper purlins **30** of the respective skylight mounts **18** and **19** are attached at purlin juncture **17**. Such attachment may be by weldment or by mechanical connection. In the illustrated embodiment, purlin juncture **17** is configured to define angle A between first skylight mount **18** and second skylight mount **19**, thereby forming a gable.

[0044] It will be appreciated that system **10** depicted in **FIG. 1** comprises three skylight frame modules **15**, interconnected side-by-side. Within the scope of this invention, combinations of skylight frame modules **15**, of matching rafter lengths and of either equal or varying purlin lengths, may be used to constitute system **10**. **FIG. 3A**, taken at line B-B in **FIG. 1**, illustrates the attachment of a left rafter **50** of one such skylight module with a right rafter **60** of an adjacent skylight module. As depicted in **FIG. 3A**, left rafter **50** is abutted against right rafter **60**. Left rafter **50** may be attached to right rafter **60** by a variety of means, including bolting, or by male-female interfitting configurations as will be described below with reference to **FIG. 3C**. Still with reference to **FIG. 3A**, rafters **50**, **60** are understood to include rafter grooves **51**. Rafter grooves **51** are adapted for receipt of screw attachment of pre-assembled skylight lens assemblies **20** upon the skylight mounts. Such screws may be passed through the flashing or other mounting structures of the pre-assembled skylight assemblies, and received within rafter grooves **51** for secure attachment of such pre-assembled skylight assemblies to the modular skylight frame system **10**.

[0045] Rafters **50**, **60** may also be understood to include secondary gutters **52**. Secondary gutters **52**, disposed lower than skylights mounted upon rafters **50**, **60**, are configured for receipt of water from above and shedding of such water out of the skylight system **10**. Such water is prevented from entering beneath the skylight assembly **10** by gutter cap **53**, which bridges between the two secondary gutters **52** of rafters **50**, **60**.

[0046] Also depicted in **FIG. 3A** is rafter cap **56**. Rafter cap **56**, in cooperation with rafters **50**, **60**, forms channel **57**. Rafter cap **56** may be installed after wiring, insulation, or the like is passed through channel **57**, thereby concealing such material from view and presenting an aesthetically appealing outer surface, and may be removable for later access to channel **57**. Such wiring may be utilized for accessories **84**, such as awnings, shades, blinds, electrochromic mechanisms, and photovoltaic systems.

[0047] With reference now to **FIG. 3B**, greater detail may be understood as to one embodiment of rafters **50**, **60**. As depicted therein, for example, rafter **50** may include a top wall **581**. Top wall **581** may include a gasket registration notch **32**, adapted for receipt of a skylight gasket **21** of a pre-assembled skylight lens assembly **20**. First wall **581**, in cooperation with such a gasket **21**, allows for a weatherproof seal between rafter **50** and a skylight lens assembly **20**.

[0048] Rafter **50** may also include interior wall **582**. Interior wall **582** is interior to system **10** and lies within the interior space of building upon which system **10** is installed.

[0049] Rafter **50** may also include a third wall **583**, in a preferred embodiment generally perpendicular to first wall **581**, and presented for attachment to a skylight lens assembly **20** mounted thereon. Third wall **583** may include rafter groove **51**, for receipt of screw attachment of skylight lens assembly **20** to rafter **50**.

[0050] Rafter **50** may also include a fourth wall **584**, in a preferred embodiment generally perpendicular to third wall **583**. Fifth wall **585** is connected with fourth wall **584**, in a preferred embodiment generally perpendicularly, and sixth wall **586** is connected to fifth wall **585** generally perpendicularly in a preferred embodiment. Fifth wall **585** and sixth wall **586** form two of the three sides of secondary gutter **52**. Secondary gutter **52** is completed by the upper extension of seventh wall **587**. Eighth wall **588**, in a preferred embodiment, is oriented generally perpendicularly and inwardly from seventh wall **587**. Finally, ninth wall **589** extends from eighth wall **588** to complete the cross-sectional configuration of one embodiment of rafter **50**.

[0051] As illustrated for example in **FIG. 3B**, a rafter cap **56** is depicted attached to rafter **50**. Rafter cap **56** may be configured for snap-fit engagement with rafter cap cleats **590** on interior wall **582** and ninth wall **589**.

[0052] In one embodiment, rafter **50** is attached to rafter **60** with rafter bolt **54**. Rafters **50**, **60** may also include screw bosses **55**, for receipt of the head of rafter bolt **54**. So configured, and with the use of washer **58**, rafter **50** may be attached to rafter **60** with use of only a single wrench, as the head of rafter bolt **54** is kept by a screw boss **55**.

[0053] As illustrated in **FIG. 3B**, attachment together of rafters **50**, **60** define between them a primary gutter **599**. Primary gutter **599** is defined by respective opposing walls **583**, respective fourth walls **584**, and gutter cap **53**.

[0054] With reference to **FIG. 3B**, it will be understood that rainwater falling upon a skylight lens assembly **20** may

be shed off of skylight lens frame **22** toward fourth wall **584**, and shed from system **10** by primary gutter **599**. From there, water is prevented from entering between rafters **50**, **60** by gutter cap **53**. Instead, such water may be allowed to enter secondary gutter **52**, and thereby be shed from the system **10**.

[**0055**] **FIG. 3C** illustrates an alternative embodiment for attachment of adjacent rafters of modules **15**. As depicted therein, left rafter **50'** is attached to right rafter **60'**. Such attachment is provided by receipt of flange **93** within the gutter defined by alternative fifth wall **585'**, alternative sixth wall **586'**, and wall **594**. Alternative seventh wall **587'** is configured to attach directly to alternative fourth wall **584**, eliminating walls **585** and **586** from the alternative embodiment depicted in **FIG. 3B**, to create a hidden standing seam between rafters **50'**, **60'**. Such configuration allows for attachment of left rafter **50'** to right rafter **60'** without use of nuts or other mechanical fasteners. Rainwater falling upon a skylight lens assembly **20** may be shed from skylight lens frame **22** to fourth wall **584'**. Such rainwater would either be shed from the system by fourth wall **584'**, or may enter between walls **585'** and **594**, to be shed from the system.

[**0056**] Comparison of **FIGS. 3B and 3C** illustrate that, in one embodiment of the present invention depicted in **FIG. 3B**, left rafter **50** and right rafter **60** may have cross-sections that are substantially identical. As such, a beam extruded or otherwise fabricated to form a left rafter **50** may be oriented reversely and thus form a right rafter **60**, with the two rafters **50**, **60** thereby attachable one to the other. Alternatively, in the embodiment depicted in **FIG. 3C**, left rafter **50'** differs from right rafter **60'**, requiring a different extrusion or other formative process.

[**0057**] **FIG. 4A** illustrates a cross-sectional view of a purlin **40** attached to a curb **70**. Purlin **40** may include a top wall **481**, including a gasket registration notch **32** for receipt of a skylight lens assembly gasket **21**. Purlin **40** may also include an interior wall **482**, oriented for presentment to the interior of the skylight system **10** upon completion of installation. Lower purlin **40** may also include third wall **483**, disposed from the opposed end of top wall **481**. Third wall **483** may include purlin groove **31**, for receipt of screw attachment of a skylight lens assembly **20**. Oriented away from third wall **483** is fourth wall **484**, in a preferred embodiment at a right outward angle from third wall **483**. Fifth wall **487** is attached to the end of fourth wall **484**, in a preferred embodiment at approximately right angle. Along the length of fifth wall **487** may be included counterflashing flange **496**, for receipt of and attachment to counterflashing **75**. Attached to fifth wall **487** is a bottom wall **488**, and extending from bottom wall **488** is lower wall **489**. Interior wall **482** and bottom wall **489** may include cleats **490**, for snap-fit engagement with purlin cap **46**. As will be observed, lower purlin **40** and purlin cap **46** cooperate to form channel **491**, adapted for receipt and concealment of electrical wiring, insulation, and the like.

[**0058**] Attached to bottom wall **488** may be male hinge piece **42**, which may be attached with hinge bolt **45**. It is to be understood that male hinge-piece **42** may be an elongated member, extending all or part of the length of lower purlin **40**. At installation, male hinge piece **42** is slidably installed within female hinge piece **43**, and female hinge piece **43** may then be bolted or screwed to curb **70**, for example with curb bolt **44**. Disposed between curb **70** and female hinge piece **43** is curb flashing **71**. Curb flashing **71** includes inboard lip **72**, configured to prevent drainage of condensation or water to the interior of a building and instead to prompt drainage of such water outboard of system **10**. Curb flashing **71** may also include outboard flange **73**, for further protection of curb **70** from water draining from curb flashing **71**.

[**0059**] Lower purlin **40** may include a plurality of holes **499**, for drainage of condensation from within system **10**.

[**0060**] **FIG. 4B** illustrates an alternative embodiment of lower purlin **40**, in which male hinge piece **42** is not a separate component to be bolted to lower purlin **40**, but instead male hinge piece **498** is a part of and extends outwardly from alternative bottom wall **488'**.

[**0061**] **FIG. 5** is a cross-sectional view taken at line D-D of **FIG. 1**, showing the attachment of upper purlins **30** of two skylight mounts **18**, **19** in a skylight frame module **15**. As shown therein, two upper purlins **30** are attached at purlin juncture **17**. Purlin juncture **17** is understood to the point of proximity of the respective intersections **390** of walls **387** and bottoms **488** of the upper purlins **30** of skylight mounts **18**, **19**. Such attachment may be by way of mechanical attachment (not shown) or by weldment. In the case of weldment, such weldment may be along the entirety of the lengths of upper purlins **30**, or only a portion or portions of such length.

[**0062**] Also as shown in **FIG. 5**, an alternative purlin cap **46'** is depicted, for comparison with purlin cap **46** depicted in **FIG. 4A**. Between upper purlin **30** and purlin cap **46'** is defined channel **491**.

[**0063**] Purlin juncture **17** is provided to attach upper purlins **30** at angle A.

[**0064**] Also as depicted in **FIG. 5**, top cap **16** is disposed at top walls **484** of the respective upper purlins **30** to prevent intrusion of water to purlin juncture **17**, and may be weatherproofed thereto with caulking, gasketing, or the like. Top cap **16** may be attached by conventional methods.

[**0065**] Comparison of lower purlin **40** in **FIG. 4A** to upper purlins **30** in **FIG. 5** reveals that the same cross-sectional configuration may be used for lower purlins **40** and upper purlins **30**. Alternatively, different cross-sectional configurations may be used, as revealed by comparison of the alternative lower purlin **40'** in **FIG. 4B** to the upper purlins **30** in **FIG. 5**.

[**0066**] **FIG. 6** illustrates the cross-sectional view of an exemplary end glazing panel, to close the ends of the skylight system **10**. As depicted therein, glazing rails **83** may carry glazing panels **85**, and are configured for attachment to right rafter **60** and curb **70**. An alternative end cap seal **81** may be provided for attachment to right rafter **60**, in snap-fit engagement to cleat **591** and glazing rail **83**. Alternatively, solid panels (not shown) may be used to clear the ends of system **10**. Ridge joint end cap **86** may be used in cooperation with top cap **16** to close the end of system **10**.

[**0067**] Consideration of the foregoing description illustrates that system **10** may be adapted for a wide variety of skylight applications. For a skylight opening of a given length and width, only three variables need be considered. First, from the available, standardized pre-assembled skylight systems commercially available, which length and width may be chosen for the intended length and width of skylight opening. Once such selection is made, angle A may be calculated. For example, an opening six and a half feet wide and twenty feet long might result in the selection of standardized, pre-assembled 4×4 foot skylight assemblies.

Angle A may then be calculated to be approximately 93 degrees, and five pre-assembled skylight frame modules could be constructed accordingly. Thereafter, each such module approximately 4×6½ feet in footprint, could be stacked one atop the other, shipped to the site, carried by hand to the skylight opening, and assembled thereon with simple and few tools. Thereafter, ten such 4×4 foot standardized pre-assembled skylight assemblies could be installed upon the constructed skylight frame system. Male hinge piece **42** (**FIG. 4A**) and female hinge piece **43** allow for a broad range of such gable angles A, such as 90° to 180°, and attachment of upper purlins **30** together result in a rigid frame producing minimal lateral stress upon curb **70**.

[**0068**] System **10** provides for superior drainage of rainwater from system **10**. For example, rainwater falling upon top cap **16** would be shed to fourth wall **484** (**FIG. 3B**). Such rainwater may flow from fourth wall **484**, or may flow into secondary gutters **52**. In either event, such rainwater would flow from the rafters **50**, **60** and be disposed outboard of system **10** upon counter flashing lip **76** (**FIG. 4A**) to the roof.

[**0069**] It will also be observed that the skylight mounts **18**, **19** (**FIG. 2**, for example) also are adapted for receipt of accessories. For example, rafters **50**, **60** are structurally rigid to support such systems and are capable of accepting interior shade accessories. The pre-assembled skylight frame modules **15** are also capable of accepting exterior awning accessories and the like. Furthermore, upper purlins **30** and lower purlins **40** are structurally rigid to support hinges and electrical ventilation operators, for opening the skylight lens assemblies **20** for example.

[**0070**] While the invention shown herein is capable of attaining the objects of the invention, it is to be understood that it is the presently preferred embodiments of the present invention and is thus representative of the subject matter that is broadly contemplated. It is to be further understood that the scope of the present invention fully encompasses other embodiments that may become obvious to those skilled in the art. It is intended that the present invention include such modifications and variations as come within the scope of the appended claims and their equivalents, in which reference to an element in the singular is not intended to mean "one and only one" unless explicitly so stated, but rather "one or more."

1. A pre-assembled skylight frame module, comprising:

a first skylight mount, said first skylight mount including a first rafter and an opposed second rafter, an upper purlin defining a purlin length and an opposed lower purlin, said first and second rafters and upper and lower purlins of said first skylight mount interconnected to define a first rectangular aperture therebetween,

a second skylight mount, said second skylight mount including a first rafter and an opposed second rafter, an upper purlin defining a purlin length and an opposed lower purlin, said first and second rafters and upper and lower purlins of said second skylight mount interconnected to define a second rectangular aperture therebetween,

said first skylight mount attached to said second skylight mount along said purlin lengths of respective said upper purlins.

2. The pre-assembled skylight frame module of claim 1, wherein said attachment of said first skylight mount and said second skylight mount defines an obtuse angle between said first and second skylight mounts.

3. The pre-assembled skylight frame module of claim 1, wherein said attachment of said first skylight mount and said second skylight mount is substantially rigid.

4. The pre-assembled skylight frame module of claim 1, wherein each of said first and second skylight mounts is configured for engagement with a pre-assembled skylight lens assembly of predetermined size over said rectangular aperture.

5. The pre-assembled skylight frame module of claim 1, wherein each said upper purlin defines a cross-sectional configuration and said lower purlin defines substantially the same cross-sectional configuration.

6. The pre-assembled skylight frame module of claim 1, wherein each said first rafter defines a cross-sectional configuration and said second rafter defines substantially the same cross-sectional configuration.

7. The pre-assembled skylight frame module of claim 1, wherein at least one of said lower purlins includes a hinge member adapted for attachment to a roof curb hinge.

8. The pre-assembled skylight frame module of claim 1, further including at least one hinge connected with at least one of said lower purlin for hingeable attachment to a roof curb.

9. The pre-assembled skylight frame module of claim 1, wherein said rafters and purlins include a top wall configured for abutment with a skylight lens assembly gasket.

10. The pre-assembled skylight frame module of claim 1, wherein said rafters and purlins include a screw receiver for receipt of screw attachments from a skylight system.

11. The pre-assembled skylight frame module of claim 1, wherein at least one of said rafters defines a channel therein.

12. The pre-assembled skylight frame module of claim 1, wherein at least one of said purlins defines a channel therein.

13. The pre-assembled skylight frame module of claim 1, wherein at least one of said pre-assembled skylight frame modules is adapted for attachment of skylight accessories.

14. A skylight frame system, comprising:

at least two pre-assembled skylight frame modules for side-by-side installation, each said module including:

a first skylight mount, said first skylight mount including opposed rafters, an upper purlin and an opposed lower purlin, said rafters and purlins interconnected to define a rectangular aperture therebetween,

a second skylight mount, said second skylight mount including opposed rafters, an upper purlin and an opposed lower purlin, said rafters and purlins interconnected to define a rectangular aperture therebetween,

said first skylight mount attached to said second skylight mount at respective said upper purlins,

wherein adjacent said rafters between said modules are configured for attachment one to the other.

15. The skylight frame system of claim 14, wherein said attachment of said first skylight mount and said second skylight mount defines an obtuse angle between said first and second skylight mounts.

16. The skylight frame system of claim 14, wherein said attachment of said first skylight mount and said second skylight mount is substantially rigid.

17. The skylight frame system of claim 14, wherein each of said first and second skylight mounts are each adapted for engagement with a pre-assembled skylight lens assembly of predetermined size over said rectangular aperture.

18. The skylight frame system of claim 14, wherein at least one of said rafters defines therein a secondary gutter.

19. The skylight frame system of claim 14, wherein at least one of said lower purlins includes a hinge member adapted for attachment to a roof curb hinge.

20. The skylight frame system of claim 14, further including a hinge connected with at least one said lower purlin for hingeable attachment to a roof curb.

21. The skylight frame system of claim 14, wherein each said first rafter of a said skylight mount defines a cross-sectional configuration and each said second rafter defines substantially the same cross-sectional configuration.

22. The skylight frame system of claim 14, wherein each said upper purlin of a said skylight mount defines a cross-sectional configuration and each said lower purlin defines substantially the same cross-sectional configuration.

23. The skylight frame system of claim 14, wherein each said module includes at least one said rafter disposed for engagement with at least one rafter of an adjacent said module upon said side-by-side installation, one of said rafters of one of said modules including a male member and the adjacent said rafter of the adjacent said module including a female member configured for engagement with said male member.

24. The skylight frame system of claim 14, wherein at least one of said rafters defines a channel therein.

25. The skylight frame system of claim 14, wherein at least one of said purlins defines a channel therein.

26. The skylight frame system of claim 14, wherein said at least one of said pre-assembled skylight frame modules is adapted for attachment of skylight accessories.

27. The skylight frame system of claim 14, wherein said rafters and purlins include a top wall configured for abutment with a gasket carried by a skylight lens assembly.

28. The skylight frame system of claim 14, wherein said rafters and purlins include a screw receiver for receipt of screw attachments from a skylight system.

29. A skylight frame system, comprising:

at least two pre-assembled skylight frame modules for side-by-side installation, each said module including:

a first skylight mount, said first skylight mount including a first rafter and a second rafter parallel to said first rafter, said first skylight mount further including an upper purlin and a lower purlin parallel therebetween and perpendicular to said first and second rafters, said rafters and purlins defining an opening therein of predetermined dimensions,

a second skylight mount, said second skylight mount including a first rafter and a second rafter parallel to said first rafter, said second skylight mount further including an upper purlin and a lower purlin parallel therebetween and perpendicular to said first and second rafters, said rafters and purlins defining an opening therein of predetermined dimensions and an outside perimeter therearound,

respective said upper purlins of said first and second skylight mounts substantially rigidly attached to define a predetermined angle between said first and second skylight mounts,

said first and second skylight mounts each adapted for receipt of a pre-assembled skylight lens assembly of predetermined size over said opening,

said at least two pre-assembled skylight frame modules configured for attachment one to the other.

30. The skylight frame system of claim 29, further including a male hinge member upon at least one of said lower purlins of said skylight mounts adapted for attachment to a receiving hinge member upon a roof curb.

31. The skylight frame system of claim 29, wherein at least one of said lower purlins is attached to a hinge for connection to a roof curb.

32. The skylight frame system of claim 29, wherein said rafters and purlins include a top wall configured for abutment with a gasket carried by a skylight lens assembly.

33. The skylight frame system of claim 29, wherein at least one of said rafters defines a secondary gutter therein.

34. The skylight frame system of claim 29, wherein said rafters and purlins include a screw receiver for receipt of screw attachments from a skylight system.

35. The skylight frame system of claim 29, wherein said rafters and purlins are configured for mechanical engagement with a skylight lens assembly.

36. The skylight frame system of claim 29, wherein each said module includes at least one said rafter disposed for engagement with at least one rafter of an adjacent said module upon said side-by-side installation, one of said rafters of one of said modules including a male member and the adjacent said rafter of the adjacent said module including a female member configured for engagement with said male member.

37. The skylight frame system of claim 29, wherein at least one of said rafters defines a channel therein.

38. The skylight frame system of claim 29, wherein at least one of said purlins defines a channel therein.

39. The skylight frame system of claim 29, wherein said at least one of said pre-assembled skylight frame modules is adapted for attachment of skylight accessories.

40. The skylight frame system of claim 29, further including a top ridge cap over said attachment of said purlins.

41. The skylight frame system of claim 29, wherein each said upper purlin of a said skylight frame mount defines a cross-sectional configuration and each said lower purlin defines substantially the same cross-sectional configuration.

42. The skylight frame system of claim 29, wherein each said first rafter of a said skylight frame mount defines a cross-sectional configuration and each said second rafter defines substantially the same cross-sectional configuration.

* * * * *