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(54) **SYSTEM AND METHOD HAVING AN IMPROVED SELF MATING BEAM**

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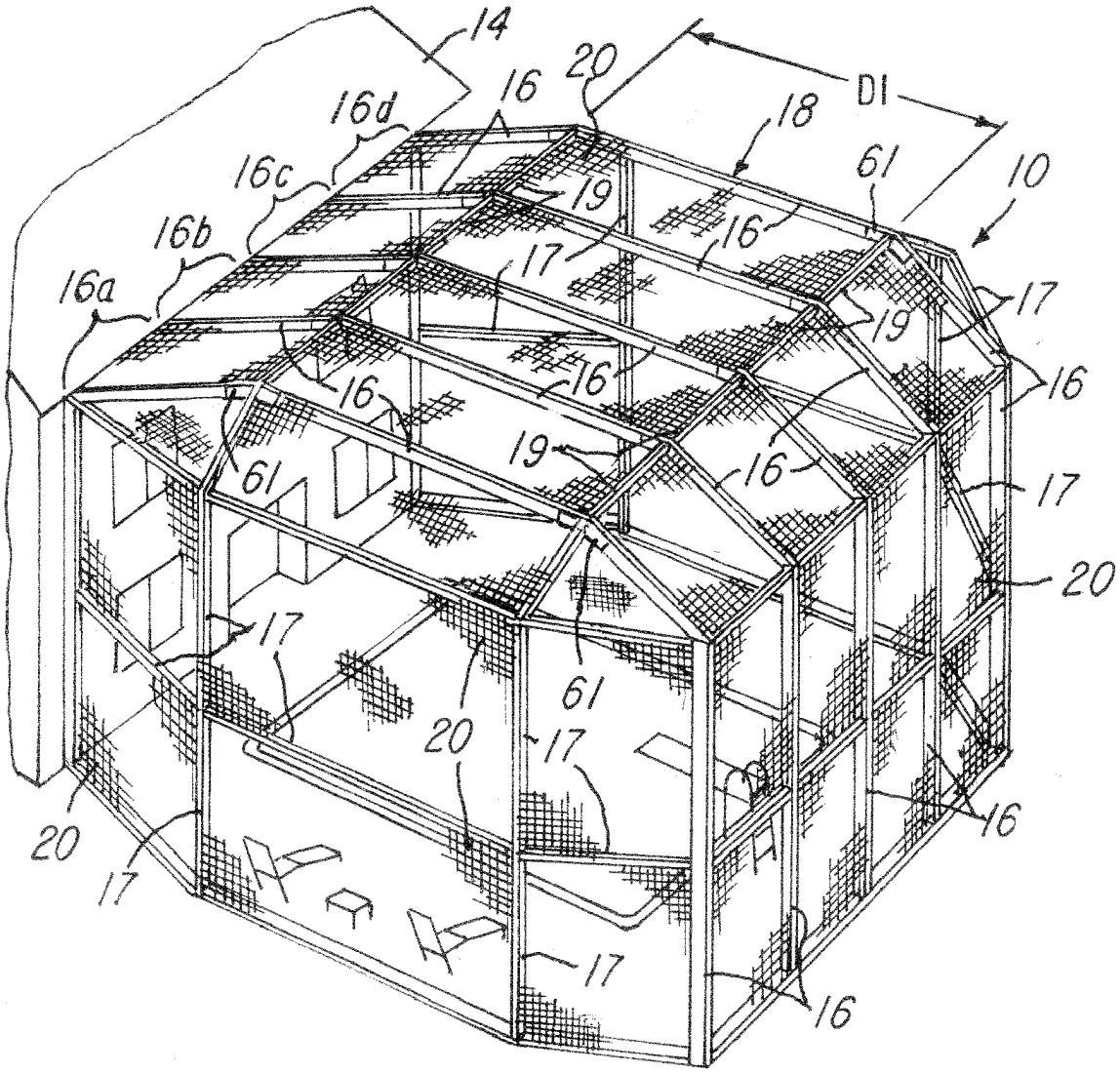
(57) **ABSTRACT**

A system and method for providing a stronger lanai, area or pool enclosure. The system utilizes a beam having an interior channel that provides increased thread receiving surface for receiving one or more fasteners and an interlocking joint for further strengthening the connection between a plurality of beam members that form the beam.



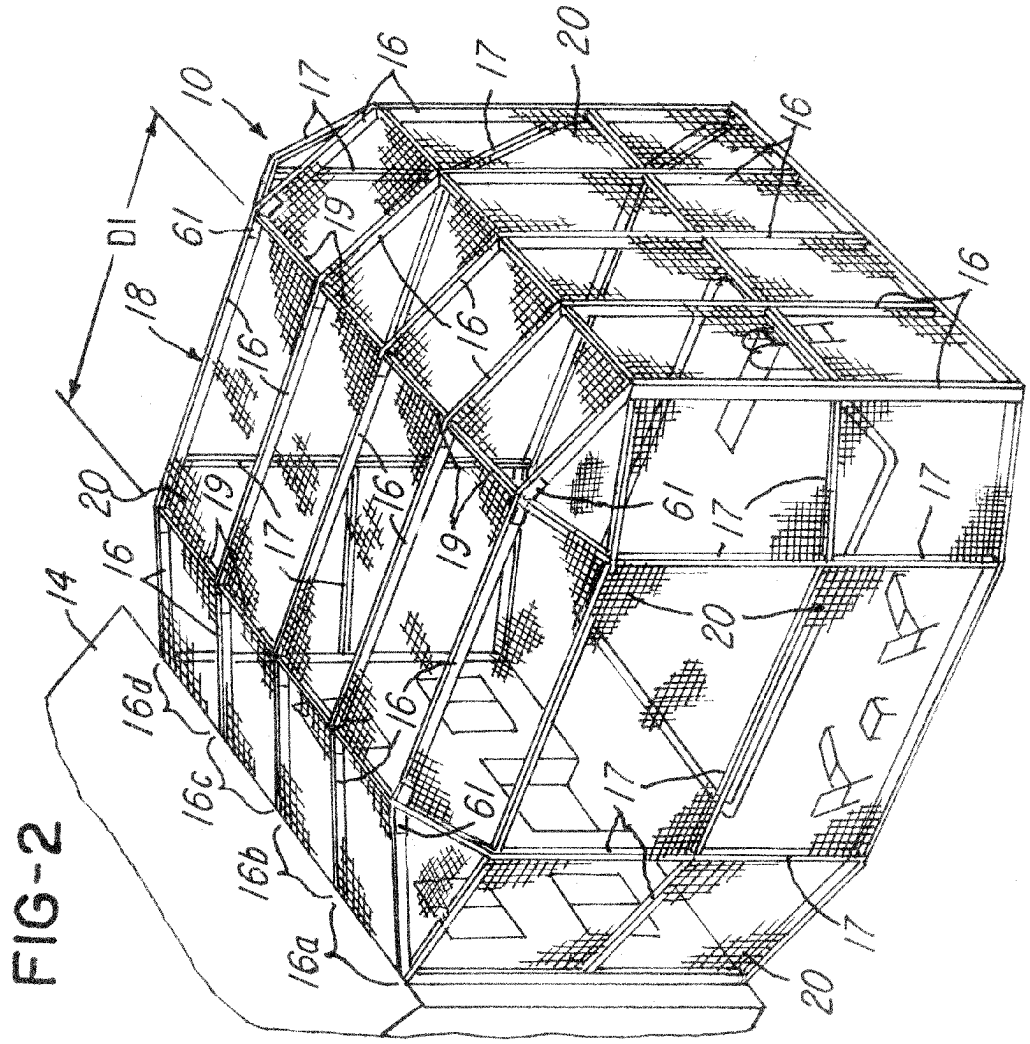


FIG-2

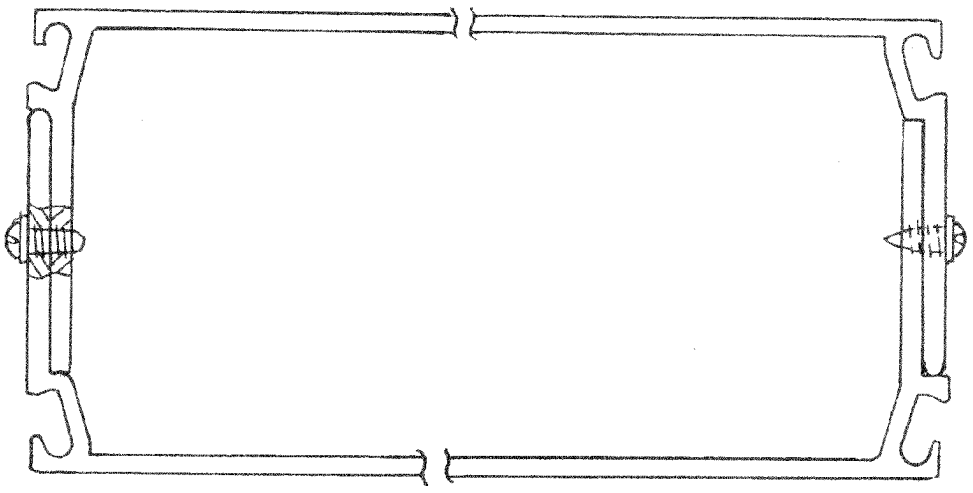
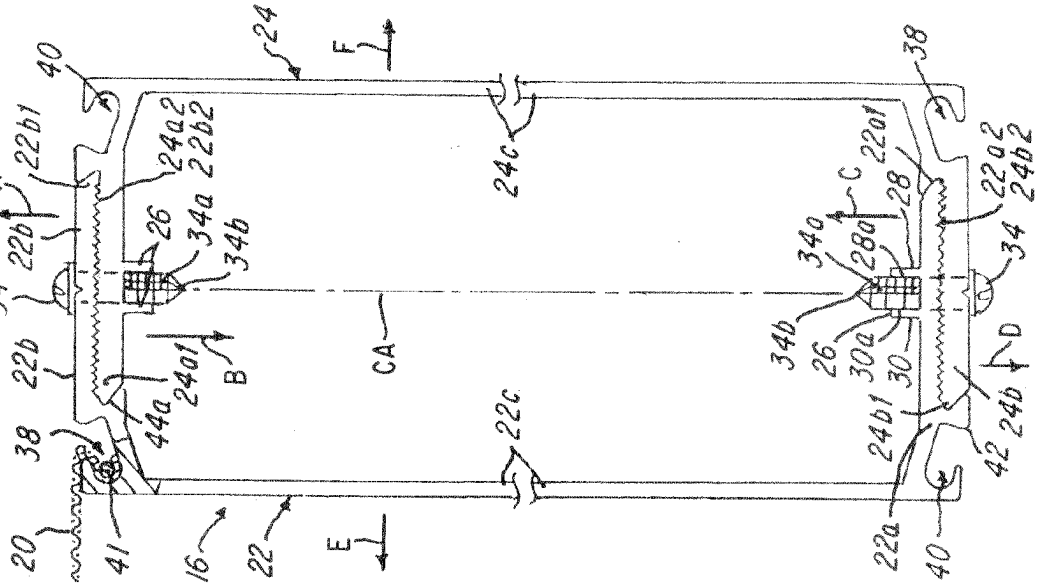


FIG-1
(PRIOR ART)

FIG-4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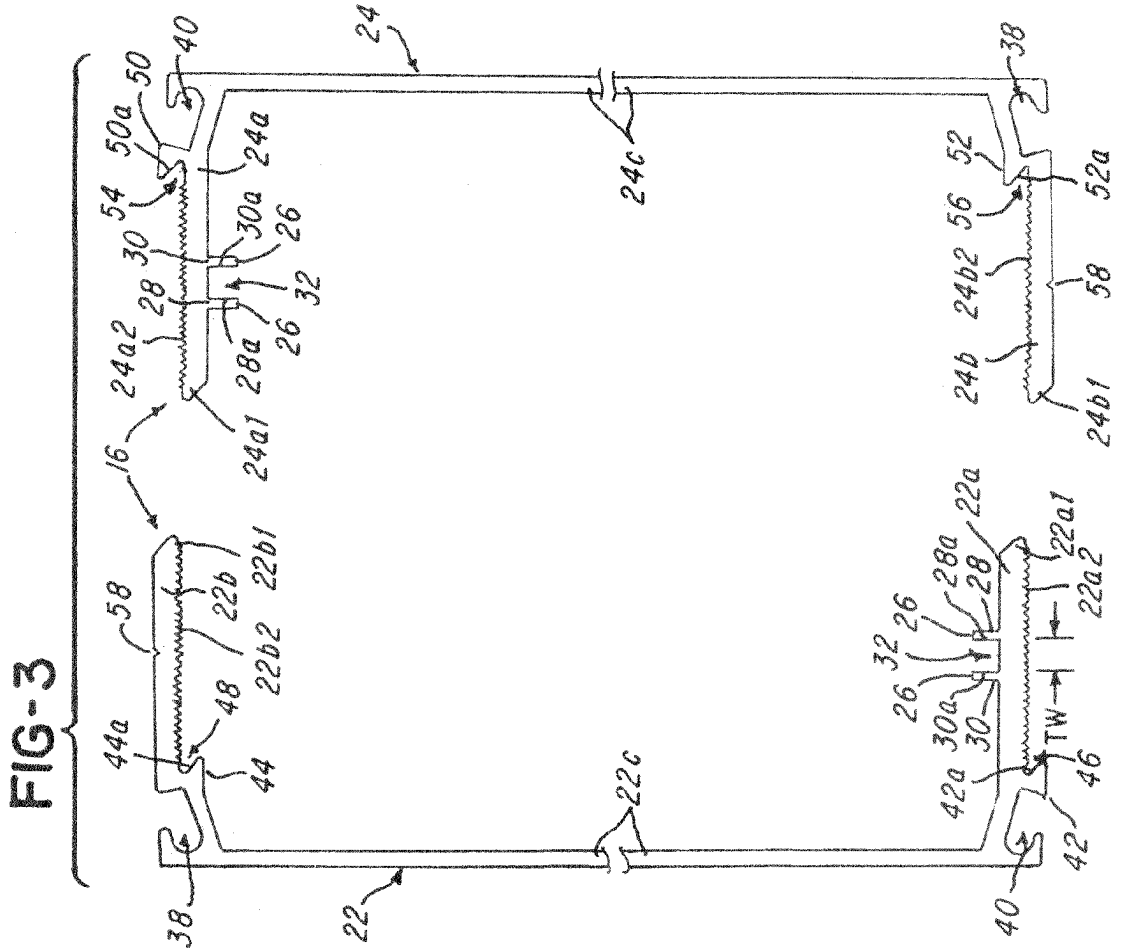
F
40
22b1
A
22b
34
22b
38
20
41
44a
24a2
22b2
34a
34b
26
24a1
B
CA
16
22
E
22c
24c
38
22a1
C
28a
28
34a
34b
26
30a
30
24b1
D
42
24b
22a
40
22a2
24b2

FIG-3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40
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50a
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30
28
24a2
16
24a1
28a
26
32
30a
24a
38
24c
52
52a
56
24b2
58
24b
24b1
58
22
22c
40
42
46
TW
42a
30
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22b1
22b
38

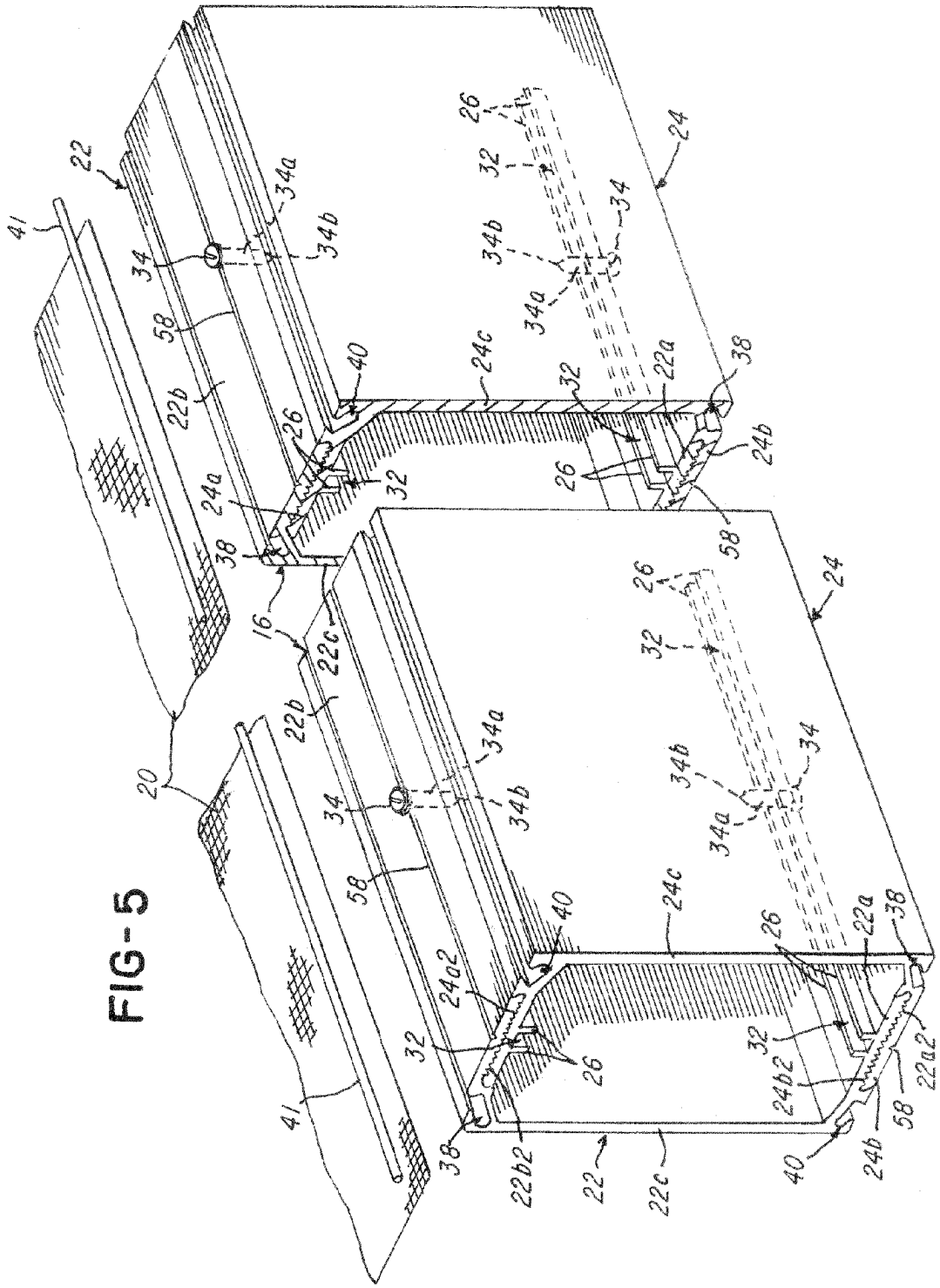

41
22
34a
34b
34
58
22b
40
24c
26
32
34
34b
34a
22a
38
24b
24a
16
22c
20
24
24a2
22b2
22a2
24b2

FIG-5

FIG-6A

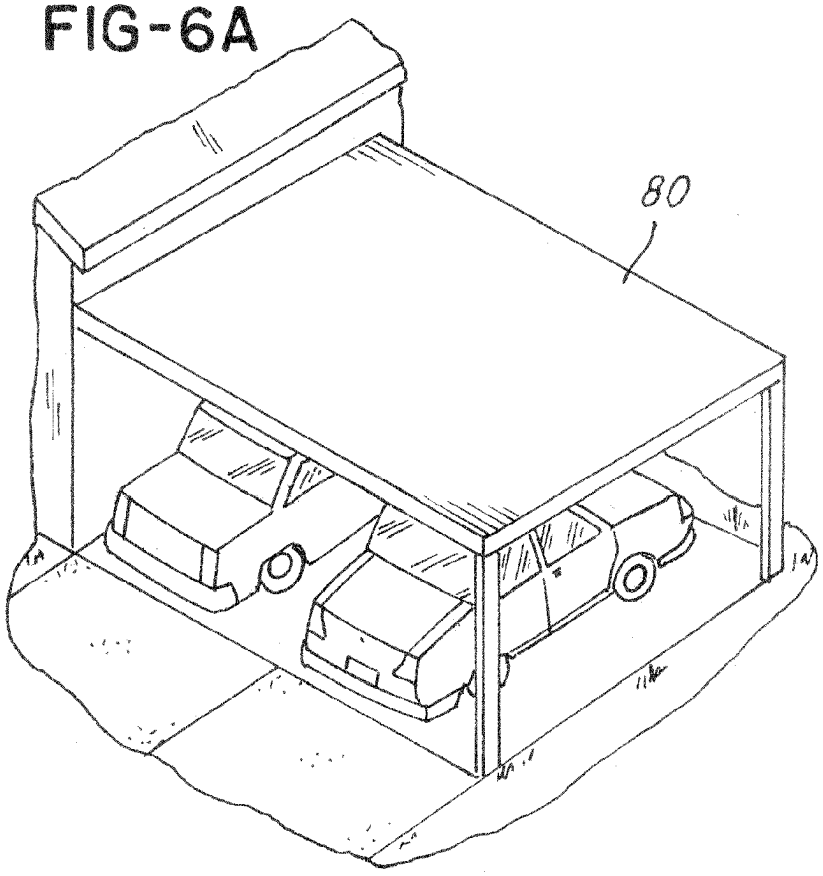
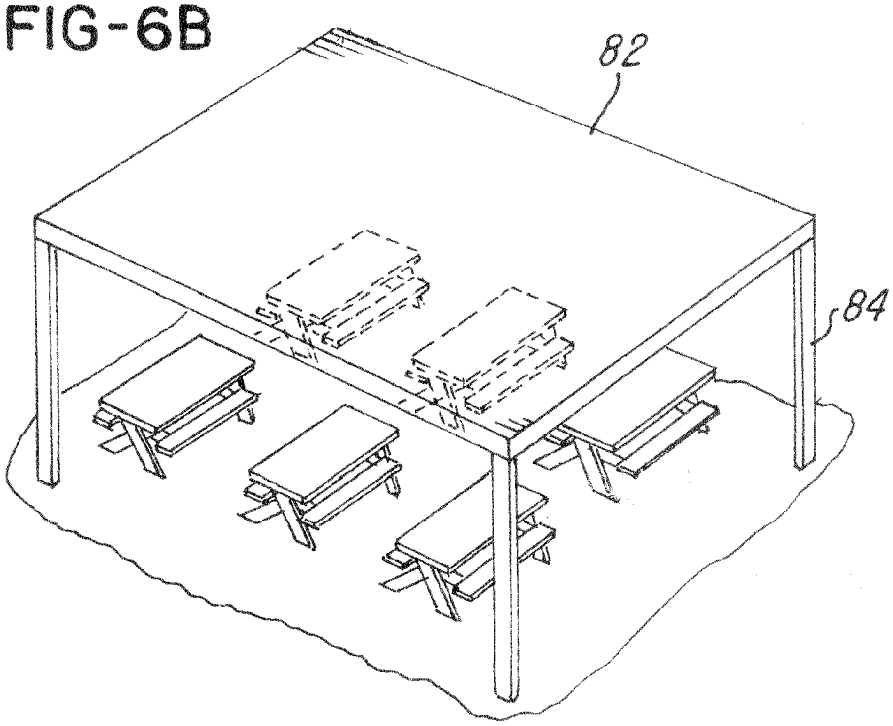


FIG-6B



SYSTEM AND METHOD HAVING AN IMPROVED SELF MATING BEAM

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is a continuation of U.S. patent application Ser. No. 12/015,117 filed Jan. 16, 2008, which is incorporated herein by reference and made a part hereof.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] This invention relates to a lanai system, and more particularly, to a system that utilizes a beam having improved strength and durability.

[0004] 2. Description of the Related Art

[0005] From its infancy stages, the aluminum enclosure industry and patio screen enclosure roof systems were fabricated with a product known as I beams. Although these I beams were structurally sound in nature, there were several recurring application problems with this type of product. For example, the I beams were cumbersome to install, aesthetically unpleasing to the home owner, and sometimes the I beam could not be configured to all applications needed in the industry. The I beam product was ultimately replaced by a product known today as a box beam.

[0006] A typical prior art box beam is shown in FIG. **1** comprising two identical halves A and B. The halves simply overlapped as shown and were stitched or screwed together with a plurality of screws C to make one complete self-mating beam D.

[0007] One problem with the prior art box beams is a high failure rate during strong winds, especially hurricane-force winds. The box beam failed for many reasons, including the fact that the beam web was simply overlapped and laid on top of each other as illustrated in FIG. **1** with nothing to hold them together except the screw C.

[0008] Note that the fasteners only penetrated the thickness of the beams, which meant that the thread-engagement surface for the screws to bite or thread into was the wall thickness of the beam, thereby limiting strength, particularly with thin-walled beams.

[0009] It was also not uncommon that the fastener C would not be placed in the direct center of the beam during installation, but would cause a non-conforming attachment problem in that the securing strength would not be the same along the length of the beam.

[0010] During high winds or hurricane conditions, the webs edge of the historical box beam will deflect, causing and creating failure in the enclosure. Once this deflection occurs, the fasteners start to pull out of the web of the beam resulting in partial or complete enclosure failure or destruction.

[0011] Self-mating beams of the type shown in FIG. **1** are manufactured with the same standards, causing ongoing potential failures, especially as the beams get longer and have to carry heavier loads. Bigger and heavier beams have been created; however, the technology for extruding and installation of these products is the same, resulting in ongoing failures.

[0012] Some homeowners or builders are building larger and more dynamic pool enclosures and lanais with the same historical products, resulting in increased failure rates, especially during high winds in hurricane seasons.

[0013] Unfortunately, as enclosure sizes increase the box beams that were used to make the enclosures had to be made with much thicker and heavier extrusions in order to achieve the span lengths desired. Unfortunately, these extrusions were much more expensive and resulted in increased failure rates and actually resulted in increased costs.

[0014] There is, therefore, a need to provide an improved box beam that overcomes one or more problems of the prior art.

SUMMARY OF THE INVENTION

[0015] One object of the invention is to provide an improved box beam.

[0016] Another object of the invention is to provide a stronger box beam.

[0017] Another object of the invention is to provide a stronger box beam that has an aesthetically pleasing appearance.

[0018] Another object of the invention is to provide a box beam having an interior track that provides more threadable area for receiving one or more fasteners.

[0019] Another object of the invention is to provide a beam having an improved interlocking joint, such as a dovetail joint.

[0020] Another object of the invention is to provide the aforementioned interior track with an interlocking joint.

[0021] Another object of the invention is to provide an indicia, groove, or mark on an outside of the beam that ensures correct and consistent fastener placement during installation.

[0022] In one aspect, one embodiment of the invention comprises a beam for an outdoor enclosure, the beam comprising a first elongated member, a second elongated member, the first and second elongated members being adapted to be coupled together to provide the beam and an interior track on at least one of the first elongated member or the second elongated member, the interior track defining a channel or opening for receiving and supporting at least one fastener for securing the first and second elongated members together.

[0023] In another aspect, another embodiment of the invention comprises a beam comprising a first beam member, a second beam member, each of the first and second beam members comprising a generally U-shape having a first portion, a second portion and a middle portion joining the first and second portions, the first and second beam members being adapted to be coupled together such that the second portions of the first and second beam members overlap the first portions of the second and first beam members, respectively, and an inner surface of the first portion of at least one of the first beam member or second beam member including at least one fastener support at every 16" to 24" intervals for receiving a fastener that is screwed into the beam.

[0024] In still another aspect, another embodiment of the invention comprises a system for enclosing or covering an outdoor area, the system comprising a plurality of beams coupled to provide a frame onto which a screen may be mounted, each of the plurality of beams comprising, a first elongated member, a second elongated member, the first and second elongated members being adapted to be coupled together to provide each beam and an interior track on at least one of the first elongated member or the second elongated member, the interior track defining a channel or opening for receiving and supporting at least one fastener for securing the first and second elongated members together.

[0025] In still another aspect, another embodiment of the invention comprises a method for providing an improved enclosure, comprising the steps of providing a plurality of support members that make up a track comprising an interlocking joint and an interior groove, enabling a user to interlock the support beams together and providing an interior U-shaped integral track for threadably receiving a fastener to further facilitate interlocking the support members together.

[0026] In yet another aspect, another embodiment of the invention comprises a beam for an outdoor enclosure, the beam comprising first and second elongated members, each of the elongated members having a generally U-shaped cross-section including first and second leg portions and an intermediate portion that joins the first and second leg portions, each of the first leg portions having a first acute angled groove on an outer surface of the first leg portions and each of the second leg portions having a second acute angled groove on an inner surface of the second leg portions, the second leg portions of the first and second elongated members overlapping the first leg portions of the second and first elongated members, respectively, with the acute angled grooves of the first and second leg portions of each of the elongated members receiving correspondingly angled outer ends of the second and first leg portions of the other of the elongated members to provide interlocking dovetail joints between the elongated members.

[0027] In still another aspect, another embodiment of the invention comprises a self-mating beam comprising a first elongated member, a second elongated member, and the first and second elongated members being adapted to comprise an interlocking joint when they are mated together.

[0028] The embodiments may also comprise one or more of the features recited in the claims and one or more of the following optional features.

[0029] Each of the second leg portions include an indicia on an exterior surface thereof, which is generally aligned with the interior track on the second or first elongated members, respectively, after the elongated members are coupled together to facilitate screwing the at least one fastener into the interior track.

[0030] Each of the first and second elongated members is a one-piece extruded construction.

[0031] An inner surface of each first portion includes the at least one fastener support for receiving a plurality of fasteners that are screwed into the beam.

[0032] At least one fastener support comprises an interior track that is elongated and that lies in a plane that is generally parallel to a longitudinal axis of the beam.

[0033] The interior track comprises a first track wall and a second track wall that is generally opposed and parallel to the first track wall, the first track wall and the second track wall situated a predetermined distance from the first track wall, the at least one fastener support comprising a threaded shank including at least a portion having a major diameter that is larger than the predetermined distance so that the at least one fastener support becomes threadably received in the track walls when the at least one fastener support is screwed into the beam.

[0034] The interior track is not visible after the first and second elongated members are coupled together.

[0035] The at least one fastener support defines a continuous channel that extends along substantially an entire length of the first and second elongated members.

[0036] The at least one of the first portion or the second portion includes an indicia for facilitating or providing a guide aligning the at least one fastener support with the at least one fastener support.

[0037] The indicia is a groove situated on an outer surface of at least one of the second portions to provide the guide for screwing the fastener into the at least one fastener support.

[0038] The first and second beam members are joined together by an interlocking joint.

[0039] The interlocking joint comprises a dovetail joint.

[0040] The interlocking joint extends along a longitudinal axis and at least a majority of a length of the beam.

[0041] Each of the first and second beam members is generally U-shaped in cross section and the at least one fastener support is integrally formed in an interior surface of the beam.

[0042] The at least one fastener support is not visible when the first and second beam members are secured together.

[0043] The first portion, the second portion and the interior track comprise an integral one-piece extruded construction.

[0044] A system for enclosing or covering an outdoor area comprises a plurality of beams coupled to provide a frame onto which a screen may be mounted, each of the plurality of beams comprising a first elongated member, a second elongated member, the first and second elongated members being adapted to be coupled together to provide each beam and an interior track on at least one of the first elongated member or the second elongated member, the interior track defining a channel or opening for receiving and supporting at least one fastener for securing the first and second elongated members together.

[0045] The interior track comprises a first track wall and a second track wall that is situated a predetermined distance from the first track wall, the at least one fastener comprises a threaded shank including at least a portion having a major diameter that is larger than the predetermined distance so that the at least one fastener becomes threadably received in the interior track when the at least one fastener is screwed into the beam.

[0046] The interior track is not visible after the first and second elongated members are coupled together.

[0047] Each of the first and second elongated members has an interior track integrally formed on an interior surface thereof.

[0048] Each of the interior track extends along substantially an entire length of the first and second elongated members.

[0049] At least one of the first and second elongated members include an indicia groove for facilitating or providing a guide for screwing the at least one fastener in the interior track.

[0050] The first and second elongated members are joined together by an interlocking joint.

[0051] The interlocking joint comprises a dovetail joint.

[0052] The interlocking joint extends an entire length of the first and second elongated members.

[0053] Each of the first and second elongated members, the interior track and the indicia groove are a one-piece extruded construction.

[0054] Each of the acute angled grooves has an included angle of about 45°.

[0055] The plurality of beams are assembled to form a lanai frame or roof frame.

[0056] These and other objects and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0057] FIG. **1** is a view of a prior art box beam;

[0058] FIG. **2** is a view of a patio or pool enclosure in accordance with one embodiment of the invention;

[0059] FIG. **3** is an exploded view of a beam in accordance with one embodiment of the invention showing a first member and a second member that is a mirror image of the first member except that it is inverted;

[0060] FIG. **4** is an assembled view of the first and second members, illustrating the interlocking or dovetailed joint and a plurality of fasteners screwed into an interior channel in the beam;

[0061] FIG. **5** is a sectional view of the beam showing, among other things, an indicia or groove for providing an alignment or guide for screwing the fasteners into the beam, the interior groove, as well as an exploded view of the positioning of a textile or screen relative to a screen receiving channel; and

[0062] FIGS. **6**A and **6**B are illustrations showing use of the beam in one other illustrative application of a covering, such as a car port, illustrating improved spanability of the beam.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0063] Referring now to FIG. **2**, a system **10** is shown in accordance with one embodiment of the invention. The system **10** is ideally suited to encase at least a portion of an area **12**, such as a pool area or patio area adjacent a building or structure, such as a dwelling or house **14**. The system **10** is ideally suited for an outdoor area, but could be used inside a building or structure if desired.

[0064] In the illustration being described, the system **10** comprises a plurality of beams **16**, such as track beams, wall beams, floor beams, roof beams, structural beams or the like and frame members **17** that are coupled together to provide a frame **18** onto which a textile or material, such as a screen **20**, may be affixed by conventional means. The features of the invention can be used with center beams, roof members, wall members, floor beams, side beams, wall beams and the like. The beams **16** may also be used as or in the same manner or environment that any self-mating beam was used in the past, such as a center beam, side beam, roof beam, carrier beam, uprights or posts.

[0065] Referring now to FIGS. **3-5**, it should be understood that it may be desired to provide one or more beams **16** that span long distances D**1** (FIG. **2**), such as distances greater than, for example, 20 feet. One advantage of the invention is that it provides a self-mating beam that can span longer distances D**1** than prior art self-mating beams without the beams warping, deflecting, bending or encountering problems that were encountered in the past. For example, a standard prior art 2" by 6" beam would have little (i.e., only a few feet) or no spanability as a roof member. In contrast, using features of the embodiment being described, a 2" by 6" beam can span a distance D**1** in excess of about 15 or even 20 feet. This enables or facilitates using such beam **16** in place of a much heavier roof beam of the prior art. To achieve such objective, the invention utilizes the beam **16** which will now be described relative to FIGS. **3-5**.

[0066] For ease of illustration and description, a single beam **16** will be described, but it should be understood that the frame **18** may be comprised of one or more of the beams **16**, or the beams **16** may be used with other conventional frame supports and components. The beams **16** may be fabricated or assembled into a truss or structural frame **18** using conventional gussets (not shown for ease of illustration). A 2" by 6" beam **16** may span 15 feet, whereas a 2" by 9" beam **16** might span 45 feet. The beams **16** of the present invention may be used to do jobs that require large span lengths D**1** (FIG. **2**) than what could be done with the same size beam of the past. Thus, the beam **16** enables wider spanability, improved strength and the ability to accommodate greater lengths, yet with less weight. The beam **16** provides improved interlocking of mating halves (described later herein) which in turn, improves spanability of the beam **16**. The improved interlocking joint also enables manufacturing a lighter beam that enables the manufacture and assembly of larger frames **18** that cover larger areas to be screened in or enclosed.

[0067] Each of the beams **16** comprises a first member **22** and a mating overfitted and interlocking second member **24**. The second member **24** is a mirror image of the first member **22**, but inverted relative to the first member **22** as shown. As illustrated in FIGS. **2** and **5**, the beam **16** in the embodiment being described is an integral aluminum extrusion. Notice that each of the first member **22** and second member **24** is elongated and adapted to be interlocked, overfitted and coupled together to provide the beam **16**. In this regard, notice that the first member **22** comprises a first leg portion **22***a*, a second leg portion **22***b* and a joining portion **22***c* that joins the first and second leg portions **22***a* and **22***b* as shown. The second member **24** comprises a first leg portion **24***a*, a second leg portion **24***b* and a joining portion **24***c* that joins the first leg portion **24***a* and the second leg portion **24***b*.

[0068] In the illustration being described, at least one of the first member **22** or second member **24** comprises an interior fastener receiving area, channel or track **26**. The track **26** comprises a first elongated track wall **28** and a second elongated track wall **30** that is generally opposed and parallel to the first elongated track wall **28** as shown. In the illustration being described, the first elongated track wall **28** and second elongated track wall **30** define a channel, spline groove or area **32** for receiving a threaded shank or end of at least one or a plurality of fasteners **34**. The fastener **34** require no special fastener and can be a conventional standard fastener that is conventionally used. The track walls **28** and **30** comprise surfaces **28***a* and **30***a* that provide increased thread-engaging surface area into which the fasteners **34** may be screwed. The first and second elongated track walls **28** and **30** also provide strengthening ribs that extend along the longitudinal length of the beam **16**.

[0069] The interior track **26** is adapted to threadably receive and support the at least one or a plurality of fasteners **34** that are used to secure the first member **22** to second member **24**. In this regard, notice that the track **26** has a dimension TW (FIG. **3**) that is slightly smaller than a major diameter of a threaded shank **34***a* of fastener **34** so that at least a portion of the threaded shank **34***a* of the fastener **34** may threadably engage the surfaces **28***a* and **30***a* of the track or be secured in the track **26** when the fastener **34** is screwed into the beam **16**.

[0070] The first member **22** comprises a plurality of spline grooves or screen receiving areas **38** and **40** for receiving screen **20** and screen support or spline **41** (FIGS. **4** and **5**) for securing the screen **20** therein. In this regard, it should be understood that the screen **20** is wrapped around the screen support or spline **41** and enforced or inserted into the spline groove **32** in a manner conventionally known. In the illustration, the screen support or spline **41** is a thin rubber spline or tubing of the type conventionally known.

[0071] The second member **24** in the illustration being described also comprises an interior track **26** and spline groves **38** and **40**. In the illustration being described, the interior track **26** on the first leg portion **24***a* of the second member **24** is substantially the same as the interior track **26** on the first leg portion **22***a*, and the spline groves **38** and **40** are the same as those on the first member **22**. These parts have been labeled with the same part numbers.

[0072] As mentioned, the first member **22** and second member **24** are interfitted and overlapped so that the first leg portion **22***a* and first leg portion **24***a* are situated in adjacent and engaged relation to the second leg portions **24***b* and **22***b*, respectively, as shown. In this regard, note that ends or surfaces **22***a***1**, **22***b***1**, **24***a***1** and **24***b***1** are tapered, beveled, dovetailed or angled as shown.

[0073] Note that the first member **22** comprises a plurality of integral projections **42** and **44** that define the spline groves **38** and **40** and also define shaped angled or dovetailed receiving areas **46** and **48**, respectively, that are adapted to compliment the shape of the surfaces **22***a***1**, **22***b***1**, **24***a***1** and **24***b***1**. Likewise, the second member **24** comprises the projections **50** and **52** that define similar receiving areas **54** and **56**, respectively. The integral projections **42**, **44**, **50** and **52** comprise angled surfaces **42***a*, **44***a*, **50***a* and **52***a* that cooperate with the surfaces **24***a***1**, **24***b***1**, **22***b***1** and **22***a***1**, respectively, to provide an interlocking or dove-tail joint which facilitates locking the first member **22** and second member **24** together. The angled surfaces **42***a*, **44***a*, **50***a* and **52***a* could be, for example, 45° or any angle, configuration or adaptation that will provide an interlocking joint along the beam to prevent interlocking joint failure. In this regard, notice in FIG. **4** that the interlocking or dovetail joint facilitates preventing the second leg portion **22***b* from separating from the first leg portion **24***a* and the first leg portion **22***a* from separating from the second leg portion **24***b*. Thus, the dovetail or interlocking joint facilitates preventing the second leg portion **22***b* from moving in the direction of arrow A (FIG. **4**), the first leg portion **24***a* from moving in the direction of arrow B, the first leg portion **22***a* from moving in the direction of arrow C and second leg portion **24***b* from moving in the direction of arrow D. It has been found that this interlocking or dovetailed joint provides a very strong connection or coupling of the first member **22** to the second member **24**, and when used in conjunction with the fastener **34** and the interior track **26**, a very rigid and locked connection or coupling is formed. Although not shown, other types of interlocking joints that do not employ the angled surfaces **22***a***1**, **22***b***1**, **24***a***1** and **24***b***1**, but rather, provide other interlocking configurations may also be used to interlock the first member **22** to the second member **24**.

[0074] Advantageously, the rigidity and strength of the connection of the first and second members **22** and **24** enables the beam **16** to span longer lengths using less material. The interlocking joint and interior track extend longitudinally and enable the first member **22** and the second member **24** to be extruded. As mentioned, the strength of the interlocking joint facilitates providing a beam **16** in larger dimensions and lighter weights, without the beam **16** bowing, deflecting, twisting or experiencing the problems of the past during use. For example, a user may be able to replace a 2" by 8" prior art beam with a 2" by 6" beam **16**.

[0075] Notice in FIGS. **3** and **4** that the leg portions **22***a*, **22***b*, **24***a* and **24***b* may comprise serrated surfaces **22***a***2**, **22***b***2**, **24***a***2** and **24***b***2**, respectively, that mate and cooperate to facilitate preventing the first member **22** from moving in the direction of arrow E (FIG. **4**) and the second member **24** from moving in the direction of arrow F in the illustration.

[0076] It is important to note that the leg portions **22***b* and **24***b* comprise an indicia, mark or groove **58**, which in the embodiment being described is generally v-shaped. Notice that when the first member **22** and the second member **24** are overlapped, interlocked or fitted together, the groove **58** becomes generally aligned with a center axis or plane CA (FIG. **4**) of the receiving area **32**. The indicia, mark or groove **58** provides an aligning guide or indicia that the user may use to align the at least one or plurality of fasteners **34** with the channel **32** so that when the at least one or plurality of fasteners **34** are screwed through the second leg portions **22***b* and **24***b*, these screws become threadably received between the track walls **28** and **30**. As mentioned earlier, the track walls **28** and **30** provides more threadable surface area for the at least one or plurality of fasteners **34** to thread into, which further strengthens the fastening of the first member **22** to the second member **24**.

[0077] A method of assembly will now be described relative to FIG. **5**. In general, the first member **22** and the second member **24** are overfitted or interlocked together as shown in FIG. **4**. After the first member **22** and second member **24** are interlocked together, a user may align an end **34***b* of at least one or a plurality of fasteners **34** with the groove **58**. The user then screws each fastener **34** through the groove **58** and thereby secures the first leg portion **22***a* and first leg portion **24***a* to the second leg portions **24***b* and **22***b*, respectively, as illustrated in FIGS. **4** and **5**. The user may screw a plurality of fasteners **34** along the longitudinal length of the groove **58** and beam **16**, as illustrated in FIG. **5**. Notice that in each case, the fastener **34** is threadably received in the interior track **26**. Again, the groove **58** facilitates providing an indicia or guide by which the user can align the fastener **34** with the receiving area **32**. As also mentioned earlier herein, the track walls **28** and **30** of the interior track **26** provides increased thread-engagement surface area for receiving the threaded shank **34***a* of the fastener **34**. The fastener(s) **34** and the interlocking joint provide improved and stronger coupling or interlock between of the first and second members **22** and **24** in turn the beam **16** is stronger than self-mating beams of the past.

[0078] After the first member **22** and second member **24** are secured together in the manner described herein and as shown in FIGS. **4** and **5**, the screen **20** and rubber tubing or screen spline **41** are inserted into the spline groves **38** and **40** in a manner conventionally known. As mentioned earlier, the beams or one or more of the sections **16***a*, **16***b*, **16***c* and **16***d* are typically fabricated or assembled into a complete or partial truss or frame **18** using conventional gussets **61** (FIG. **2**). The frame **18** can then be assembled into sections, such as the sections **16***a*, **16***b*, **16***c* and **16***d*. The sections may then be transported, with or without screen **20**, to a job site. During assembly, one or more sections, such as sections **16***a*, **16***b*, **16***c* or **16***d* (FIG. **6**), may be assembled offsite. Holes or

openings (not shown) are then drilled or provided into the trusses that will receive, for example, 2" by 2" purlings or intermediate members **19** (FIG. **2**) to secure adjacent trusses together. As is known in the art, the sections **16***a*, **16***b*, **16***c* and **16***d* may be transported with the first and second members **22** and **24** fastened together for transportation. At the job site the beams **16** between each section are disassembled, leaving, for example, a first member **22** of the beam **16** with section **16***a* and the second member **24** of beam **16** with section **16***b*. The sections **16***a*, **16***b*, **16***c* and **16***d* may then be individually raised into the air and mounted on the supports, such as walls or supports **17** (FIG. **2**), of the structure or frame **18**.

[0079] Advantageously, the grooves **58** (FIG. **3**) enable the installer to quickly and easily screw the fasteners or screws **34** into the beam **16** and into the interior track **26**. This facilitates quick and easy assembly of the sections together on the job site, especially after the sections are raised in the air. The frame **18** may be constructed off-site or on-site if desired. After the frame **18** and screen **20**, which may be mounted on the frame on-site or off-site, are assembled, frame **18** is then secured or mounted to the structure, such as a wall or roof of a structure, deck, lanai or patio **12**, by conventional means such as screws or fasteners or the like.

[0080] Advantageously, a system and method for providing a strengthened self-mating beam **16** is provided and adapted to provide a beam that can span longer distances. This in turn means that larger lanais and patio covers may be provided. Also, longer and lighter beams may be used without the beams experiencing the problems of the past, such as warping, deflecting, twisting, bending and the like.

[0081] Advantageously, the system and method according to the embodiments described herein enabled the beam **16** to span greater lengths D**1** (FIG. **2**) without the need to utilize more material and thicker wall tolerances in order to accommodate any possible deflection. The interlocking joint alone or in combination with the interior groove and fastener results in a high strength beam that may provide a safer, stronger and more durable enclosure. A stronger interlock between the first and second members **22** and **24** also facilitates enabling the overall beam size, weight, material thickness and the like to be reduced. For example, FIG. **6**A shows another environment for use of the beam **16**, namely a wide spanning car port **80** capable of handling two or more cars without the use of center posts. FIG. **6**B shows another embodiment showing a wide-spanning cover, such as a recreation or picnic area cover **82** supported by the corner posts **84**.

[0082] Thus, it should be apparent that the invention provides means for adapting a self-mating beam to many different environments when large beam span lengths are required and facilitates reducing or eliminating the need for further supports, such as center posts or uprights.

[0083] Other advantages include:

[0084] a continuous interior track **26** that is extruded within the first and second members **22** and **24** that improves fastener engagement;

[0085] the continuous interior track **26** has the interlocking joint that allows and takes on the same characteristics as "tendon" similar of that found in bridge construction;

[0086] the continuous interior track **26** also provides a "double T" creating a rigid connection throughout the entire length of the extrusion, as opposed to a "flat" surface which has little strength;

[0087] all fastener threads of threaded shank **34***a* are engaged in this interior track **26**, which creates a positive moment connection with each fastener **34** that is installed;

[0088] an external mark, indicia or groove on the outside of the web or beam **16** assures correct and consistent fastener **34** placement during installation;

[0089] a 45 degree angle extruded along the spline groove of the web or beam **16**, creating a continuous female locking system to accept the opposing male half; and

[0090] the angle provides a continuous lock down to the at least a portion or the entire length of the beam and locks them together which allows them to take on strength characteristics similar to a "hollow" profile.

[0091] The first or second members **22** and **24** are extruded aluminum and, advantageously, require no additional machining to proved the channel **32**. The alloy used to make the beam **16** could be made from a higher strength alloy, such as 6005 aluminum.

[0092] The beam **16** could also be used with an adhesive system that utilizes an adhesive to bond the beam sides together.

[0093] The beam's **16** strength enables greater spanability without the use of supports as was traditionally needed, such as uprights, posts and the like. This makes the beam **16** advantageously suited for use as an enclosure or in any environment where a traditional interlocking beam was used with supports. For example, in a traditional car port or standalone roof cover, a wide span of self-mating beams was difficult without the use of support posts, such as center posts located underneath the roof. With the embodiment being described, a wider span is enabled without the use of support posts or center posts. This is illustrated in the car port illustrated in FIG. **6**. Notice that no support posts are provided or necessary because of the strength of the interlocking beam **16**.

[0094] While the system and method herein described constitute preferred embodiments of this invention, it is to be understood that the invention is not limited to this precise method and form of apparatus and that changes may be made in either without departing from the scope of the invention, which is defined in the appended claims.

What is claimed is:

1. A beam for an outdoor enclosure, said beam comprising:

a first elongated member;

a second elongated member;

said first and second elongated members being adapted to be coupled together to provide the beam; and

an interior track on at least one of said first elongated member or said second elongated member, said interior track defining a channel or opening for receiving and supporting at least one fastener for securing said first and second elongated members together.

2. The beam as recited in claim **1** wherein said interior track comprises a first track wall and a second track wall that is situated a predetermined distance from said first track wall, said at least one fastener comprises a threaded shank comprising at least a portion having a major diameter that is larger than said predetermined distance so that said at least one fastener becomes threadably received in said interior track when said at least one fastener is screwed into said beam.

3. The beam as recited in claim **1** wherein said interior track is not visible after said first and second elongated members are coupled together.

4. The beam as recited in claim **1** wherein each of said first and second elongated members include an interior track integrally formed on an interior surface thereof.

5. The beam as recited in claim **1** wherein said interior track extends along a longitudinal axis and substantially an entire length of said beam.

6. The beam as recited in claim **1** wherein said interior track defines a continuous channel that extends along substantially an entire length of said beam.

7. The beam as recited in claim **1** wherein at least one of said first and second elongated members include an indicia or groove for facilitating, or providing a guide for screwing said at least one fastener into said interior track.

8. The beam as recited in claim **1** wherein said first and second elongated members are joined together by an interlocking joint.

9. The beam as recited in claim **8** wherein said interlocking joint comprises a dovetail joint.

10. The beam as recited in claim **8** wherein said interlocking joint extends an entire length of said beam.

11. The beam as recited in claim **1** wherein each of said first and second elongated members are generally U-shaped in cross section.

12. The beam as recited in claim **1** wherein each of said first and second elongated members are generally U-shaped in cross section and comprise a first leg portion, a second leg portion and a joining portion that joins said first and second leg portions, each of said first leg portions include an inner track defining a channel that is generally parallel to a longitudinal axis of said beam.

13. The beam as recited in claim **12** wherein each of said second leg portions include an indicia on an exterior surface thereof, which is generally aligned with said interior track on the second or first elongated members, respectively, after said elongated members are coupled together to facilitate screwing said at least one fastener into said interior track.

14. The beam as recited in claim **12** wherein each of said first and second elongated members is a one-piece extruded construction.

15. The beam as recited in claim **1** wherein said beam is assembled to provide a structure for enclosing or covering an outdoor area.

16. A beam comprising:

a first beam member;

a second beam member;

each of said first and second beam members comprising a generally U-shape having a first portion, a second portion and a middle portion joining said first and second portions, said first and second beam members being adapted to be coupled together such that said second portions of said first and second beam members overlap said first portions of said second and first beam members, respectively; and

an inner surface of said first portion of at least one of said first beam member or second beam member including at least one fastener support 16" to 24" intervals for receiving a fastener that is screwed into said beam.

17. A method for providing an improved enclosure, comprising the steps of:

providing a plurality of support members that make up a track comprising an interlocking joint and an interior groove;

enabling a user to interlock the support beams together; and

providing an interior U-shaped integral track for threadably receiving a fastener to further facilitate interlocking the support members together.

18. A beam for an outdoor enclosure, said beam comprising:

first and second elongated members;

each of said elongated members having a generally U-shaped cross-section including first and second leg portions and an intermediate portion that joins said first and second leg portions;

each of said first leg portions having a first acute angled groove on an outer surface of said first leg portions and each of said second leg portions having a second acute angled groove on an inner surface of said second leg portions;

said second leg portions of said first and second elongated members overlapping said first leg portions of said second and first elongated members, respectively, with said first acute angled groove and said second acute angled groove of said first and second leg portions of each of said elongated members receiving correspondingly angled outer ends of said second and first leg portions of the other of said elongated members to provide interlocking dovetail joints between said elongated members.

19. The beam as recited in claim **18** wherein each of said acute angled grooves has an included angle of between about 30° and about 60°.

20. The beam as recited in claim **18** wherein each of said leg portions of said first and second elongated members has teeth in overlapping sides of said leg portions that mesh with each other.

21. The beam as recited in claim **18** wherein said interlocking dovetail joints form channels extending at least a majority of a length of said elongated members containing a bonding adhesive for adhesively bonding said elongated members together.

22. The beam as recited in claim **18** wherein an inner surface of each of said first leg portions has an interior track extending at least a majority of a length of said elongated members for receiving a plurality of longitudinally spaced fasteners that are screwed through said overlapping second and first leg portions, respectively, into said interior track.

23. The beam as recited in claim **22** wherein each said interior track has uniformly spaced apart track walls, and each of said fasteners has a threaded shank portion with a major diameter that is slightly larger than the spacing between said track walls so that said fasteners become threadedly received in said track walls during screwing of said fasteners through said overlapping second and first leg portions, respectively, in substantial alignment with an axial center of each said interior track.

24. The beam as recited in claim **23** wherein an outer surface of each of said second leg portions has indicia in substantial alignment with the axial center of each said interior track to facilitate screwing of said fasteners into said track walls.

25. The beam as recited in claim **23** wherein said indicia is a groove extending at least the majority of the length of said elongated members to provide a guide for screwing said fasteners into said track walls during screwing of said fasteners through said overlapping second and first leg portions, respectively.

26. The beam as recited in claim **22** wherein each of said elongated members is a one piece extrusion.

27. The beam as recited in claim **18** wherein the plurality of said beams are assembled to form a roof over a patio area, car port area or recreation area.

28. A self-mating beam comprising:

a first elongated member;

a second elongated member; and

said first and second elongated members being adapted to comprise an interlocking joint when they are mated together.

29. The self-mating beam as recited in claim **28**, wherein each of said first and second elongated members comprise a groove for receiving at least a portion of said second or first elongated members, respectively, when said first and second elongated members are mounted together, said groove and said at least a portion of said first and second elongated members cooperating to provide said interlocking joint.

30. The self-mating beam as recited in claim **29**, wherein said groove is an angled groove and said at least a portion of said first and second elongated members has an angled surface that is received in said angled grove.

31. The self-mating beam as recited in claim **28**, wherein an interior surface of at least one of said first or second elongated members comprises an interior track for receiving a screw.

32. The self-mating beam as recited in claim **28**, wherein each of said first and second elongated members comprise an interior track that extends substantially along a longitudinal length of said beam.

33. The self-mating beam as recited in claim **28**, wherein each of said first and second elongated members comprise a first leg portion having a first groove, a second leg portion having a second groove and a joining portion for joining said first and second leg portions, said second leg portions of said first and second elongated members overlapping said first leg portions of said second and first elongated members, respectively, with said first groove and said second groove of said first and second leg portions of each of said elongated members receiving portions of said second and first leg portions of the other of said elongated members to provide interlocking joints between said elongated members

34. The self-mating beam as recited in claim **33**, wherein each of said interlocking joints each comprise a dovetail joint.

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