US 20170022698A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2017/0022698 A1**

(43) **Pub. Date: Jan. 26, 2017**

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(54) **HEXAGONAL BUILDING ASSEMBLY**

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(21) Appl. No.: **15/218,914**

(22) Filed: **Jul. 25, 2016**

Related U.S. Application Data

(60) Provisional application No. 62/196,827, filed on Jul. 24, 2015.

Publication Classification

(51) **Int. Cl.**

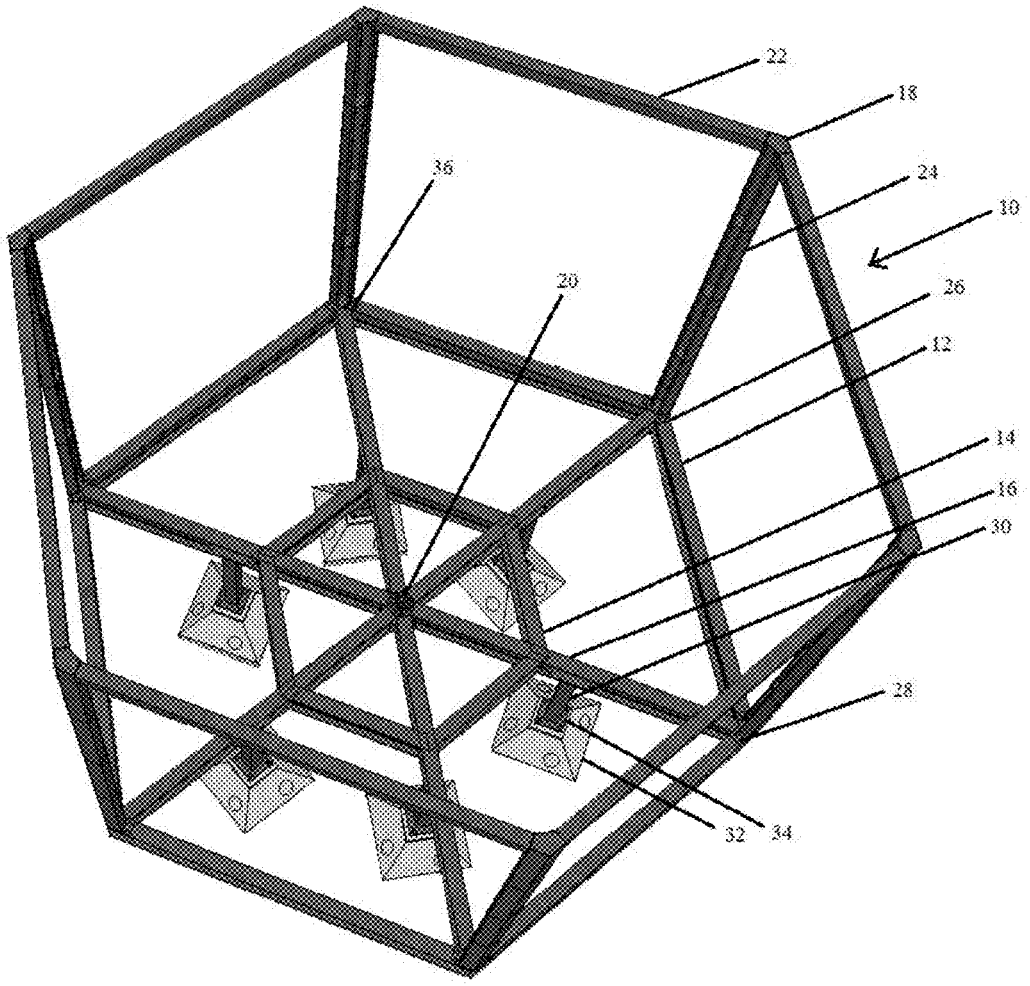
E04B 1/19	(2006.01)
E04B 2/58	(2006.01)
E04H 9/14	(2006.01)
E04B 1/24	(2006.01)

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

CPC . ***E04B 1/19*** (2013.01); ***E04B 1/24*** (2013.01); ***E04B 2/58*** (2013.01); ***E04H 9/145*** (2013.01); *E04B 2001/1975* (2013.01); *E04B 2001/1993* (2013.01); *E04B 2001/0092* (2013.01)

(57) **ABSTRACT**

A polyhedral building module may be connected along its sides to manufacture free form buildings or structures. A multiplicity of individual polyhedral building modules may be manufactured remotely and shipped to a building site where they can be attached to one another and the building constructed. Ideally, the polyhedral building modules may be attached to each other using hand tools. Upright members or columns provide support for a roof structure. The building module may be raised off of the ground by brace members attached to the underside of the building module's floor structure.



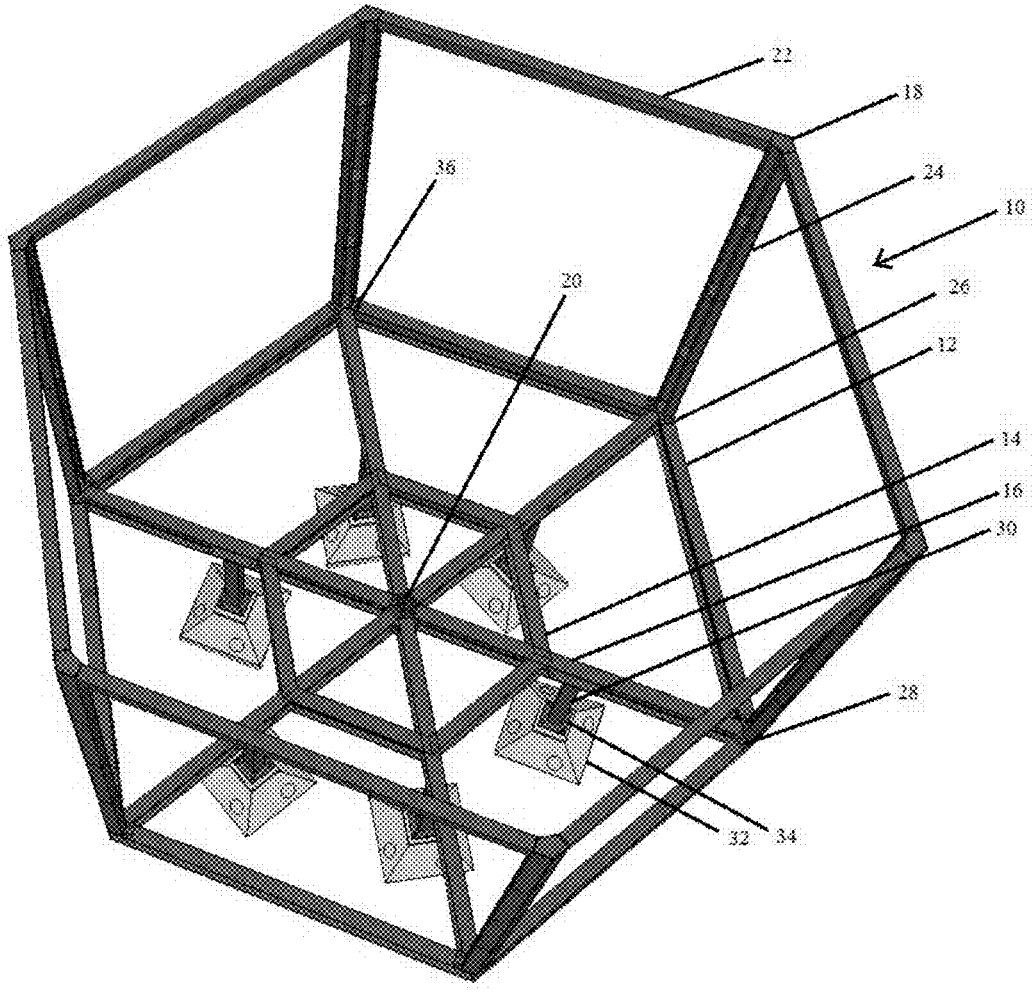


FIG. 1

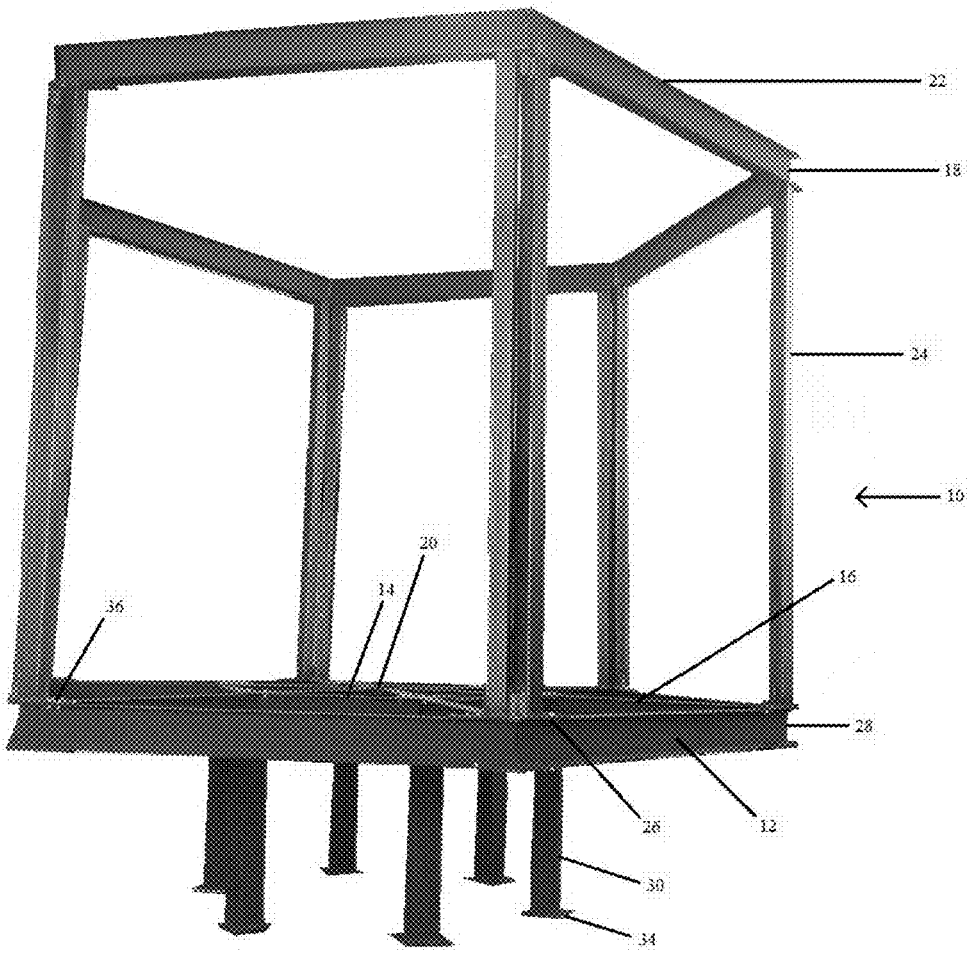


FIG. 2

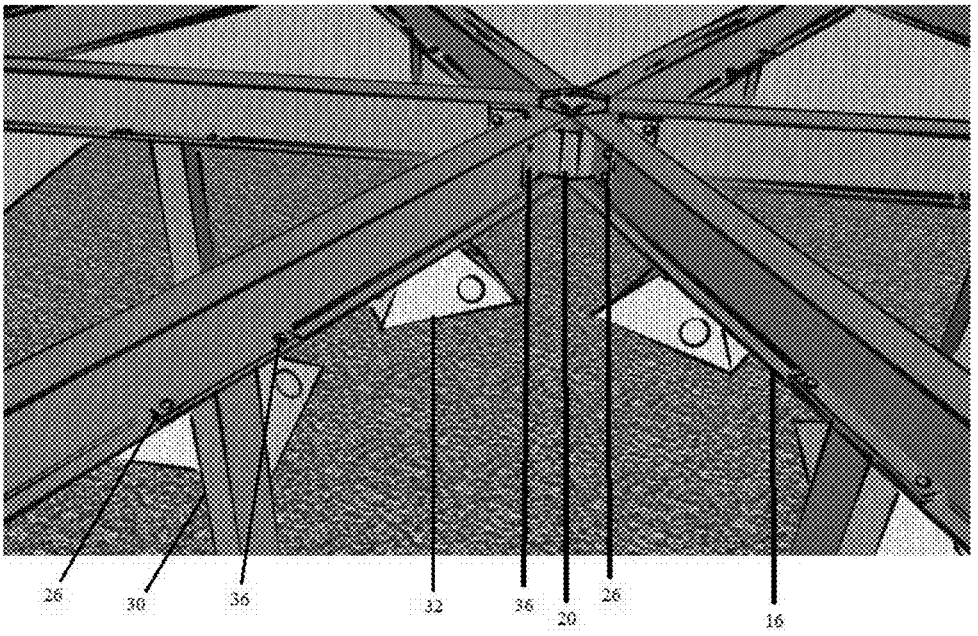


FIG. 3

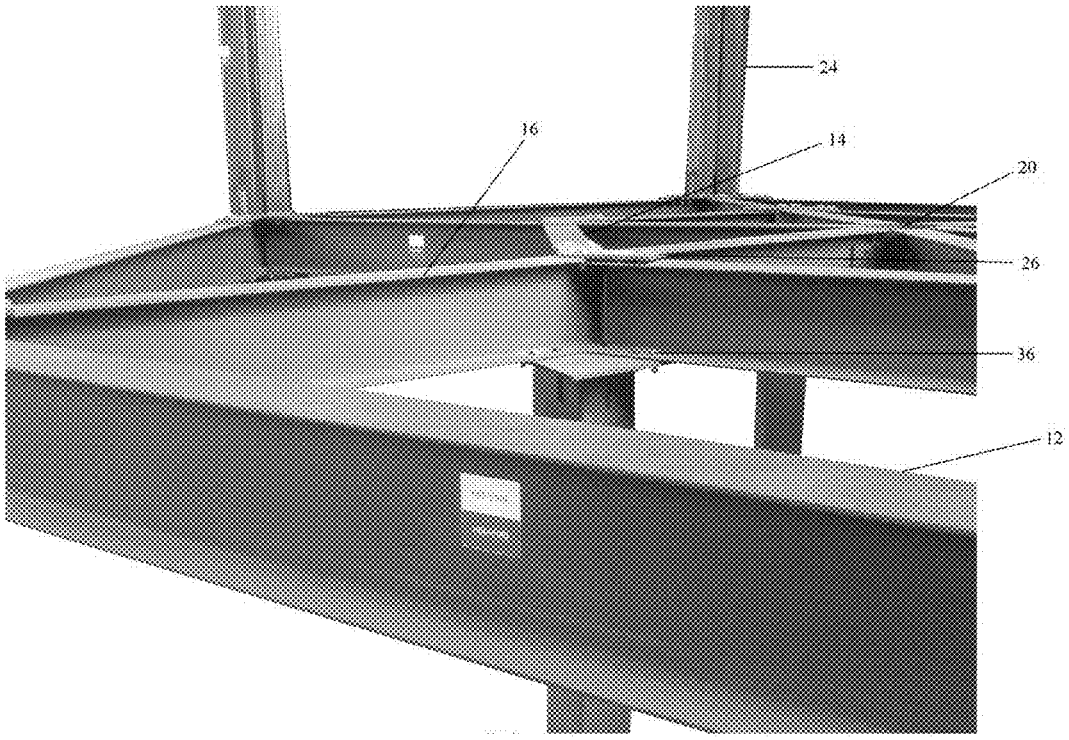


FIG. 4

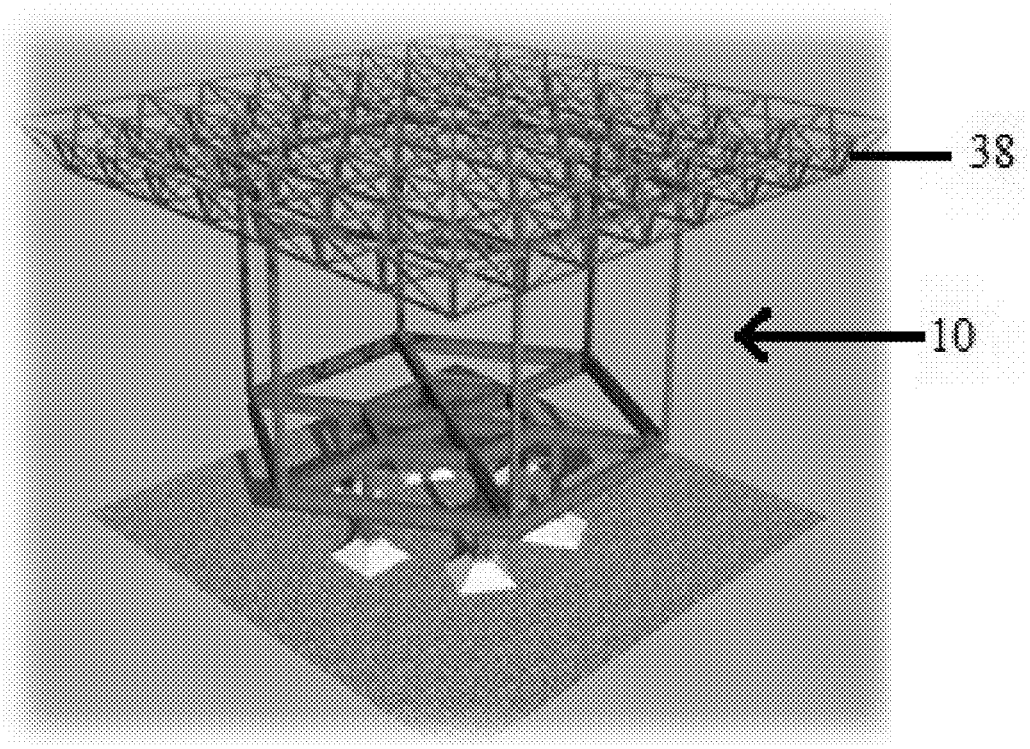


FIG. 5

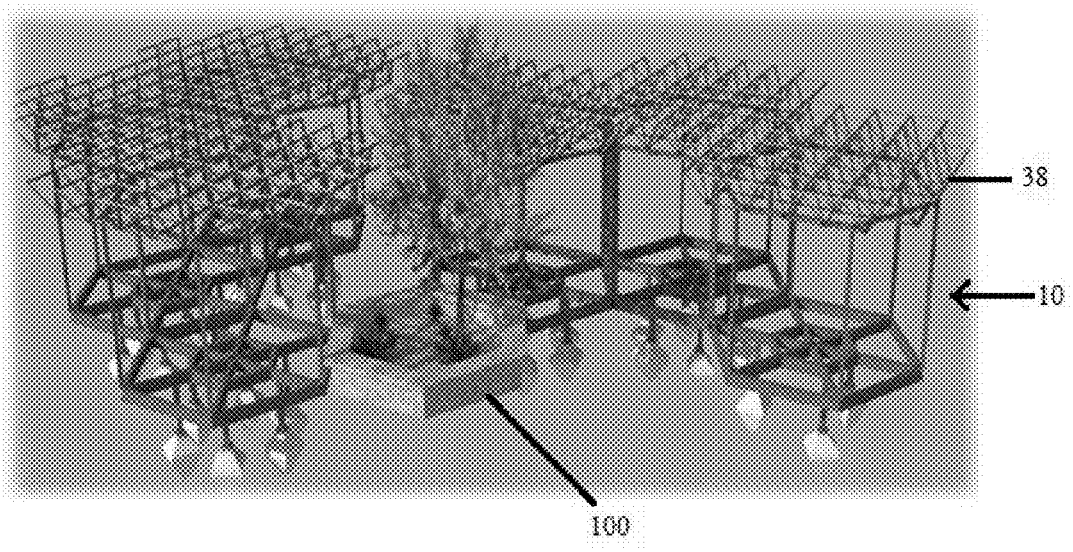


FIG. 6

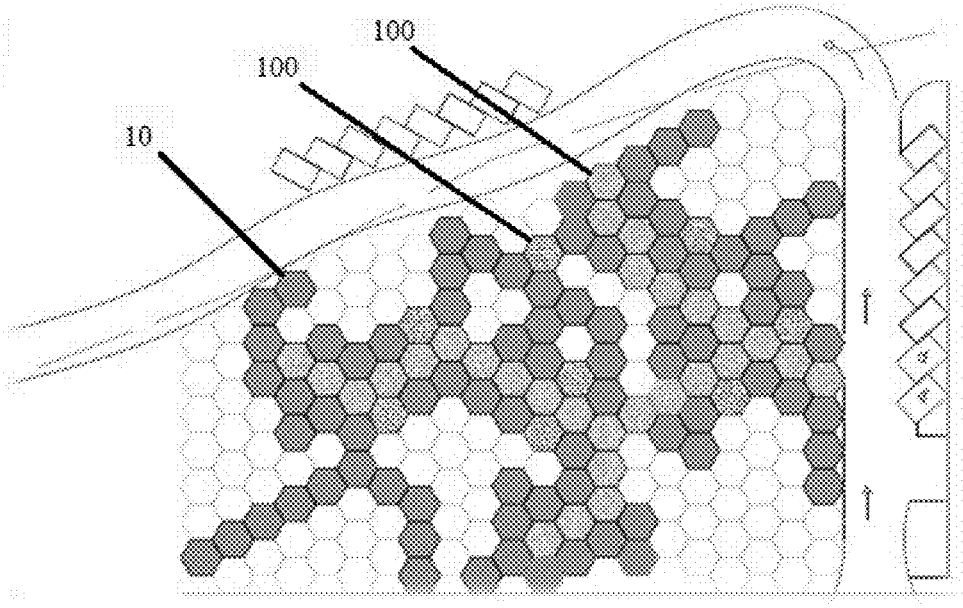


FIG. 7

HEXAGONAL BUILDING ASSEMBLY

[0001] This application is based upon and claims priority from U.S. Provisional application Ser. No. 62/196,827, which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] Applicants' invention relates to a device for building modular structures and method for same. More particularly, it relates to polygonal, often anticipated to be hexagonal, building modules or pods, referred to herein as Hexapods.

SUMMARY OF THE INVENTION

[0003] The present invention is a Hexapod building structure. As used herein, the Hexapod is a polygonal structure that has five (5) or more sides, however in a preferred embodiment the Hexapod has six (6) sides. The method of the present invention includes linking multiple Hexapod units into a single, free formed structure.

[0004] The Hexapod structure is designed to withstand inclement weather. It is intended to be able to be assembled in the field (at the building site) with handheld power tools and with a minimal use of cranes and manpower. The structures could be elevated and erected in flood plain areas, as well as have the ability to connect to one another giving flexibility and an extensive array of design possibilities.

[0005] The Hexapod structure combines triangles and squares, but the area enclosed by a hexagon is greater than that enclosed by either a triangle or square.

[0006] The form of a structure constructed from a multiplicity of the Hexapod units can be grouped in harmonious shapes and figures. Platting a development and organizing the hexagonal shapes, the layout surges when form and function are taken into account. When given commercial uses and anthropometric dimensions, the end result is a project that accommodates the Hexapods in perfect symmetry, since there are no empty spaces between the buildings and corridors, resulting in a layout that, by its symmetry, can accommodate as many modules as necessary, given that there are six sides to grow the sets as the project requires.

[0007] The layout of the Hexapods can be placed as needed to accommodate desired natural and landscaped objects, allowing the shape of the Hexapod based structure to be formed around desirable objects and in ways that the building shape can imitate nature.

[0008] Today, construction projects have to be erected taking into consideration both time and budget. Return on investment is always a consideration, and the metal structure of the Hexapod with its bottom concentric rings, and elevated structure, gives the Hexapod an advantage to incorporate innovative materials as well as allowing the use of common dimensional items used in construction. The building configuration adapts to fulfill the needs of inexpensive construction projects, as well as being able to incorporate state of the art materials. Working with metal, adds the advantage of creating additions to the existing in ergonomic fashion.

[0009] The benefits of constructing with a Hexapod metal structure include:

[0010] i. the resulting structure rests on a foundation that is tied to the beams or supports;

[0011] ii. the roofing system is designed to work in conjunction with the vertical beams;

[0012] iii. the Hexapod modules allow for rapid construction and deployment;

[0013] iv. durability;

[0014] v. vermin and pest resistant;

[0015] vi. ease of maintenance; and

[0016] vii. can improve the return on investment for the developer on the project.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] FIG. **1** is a top, perspective view of the present invention.

[0018] FIG. **2** is a side, perspective view of the present invention.

[0019] FIG. **3** is a partial, perspective view of the central portion of the present invention.

[0020] FIG. **4** is a partial, perspective view of the floor portion of the present invention.

[0021] FIG. **5** is a perspective view of the present invention, with a ceiling structure.

[0022] FIG. **6** is a perspective view of a multiplicity of the present invention combined to create the frame of a structure.

[0023] FIG. **7** is a schematic showing possible connections of the present invention to create varying shaped structures.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0024]

10	Hexapod
12	Second circumferential ring member
14	First circumferential ring member
16	Radial member
18	Upper joint
20	Center piece
22	Upper circumferential member
24	Upright member
26	Bracket
28	Lower joint
30	Brace member
32	Footing
34	Brace plate
36	Fastener
38	Ceiling Structure
100	Landscape feature

[0025] Referring to the figures, FIG. **1** illustrates a top, perspective view of the present invention. The Hexapod **10** of the present invention is a polyhedral, generally anticipated to be hexagonal, building module. Because of the shape, multiple units of the Hexapod **10** can be adjoined and connected in order to create building structures of varying shapes and sizes. The Hexapod **10** has a floor with a top and bottom. The floor structure that is made up of a number of five (5) or more radial members—generally anticipated to be six (6). The floor structure is further made up of a center piece **20** connected to a first end of each of the six (6) radial members **16**, thus the center piece **20** is attached to the bottom of the floor generally at the center of the polyhedral floor. The length of each of the six (6) radial members **16** is approximately equal. The radial members **16** extend outwardly from the center piece **20** with the angles between the radial members **16** being approximately equal. The ends

opposite the center piece **20**, or the second ends, of adjacent radial members **16** are connected creating an outer circumference. A second circumferential ring member **12** is attached to the bottom of the floor near the outer circumference of the floor. In order to complete a hexagon will shape, a single Hexapod **10** will have six (6) second circumferential ring members **12** creating an outer circumferential ring.

[0026] Each of the six (6) second circumferential ring members **12** is approximately the same length. Due to the commonality of the sides (or length of the six (6) second circumferential ring members **12**), multiple Hexapod **10** units can have sides placed adjacent to one another and the sides will be the same length. However, it is anticipated that Hexapods **10** of varying sizes can be used to create building units.

[0027] The floor structure of the Hexapod **10** also may have an intermediary, first ring (or inner circumferential ring) made up of six (6) first circumferential ring members **14**. The six (6) first circumferential ring members **14** are also anticipated to be of approximately equal length with one another. Each and of the six (6) first circumferential ring members **14** are connected at a first end to a radial member **16** at a point along the radial member's **16** length and at a second end to an adjoining radial member **16** at a point along the adjoining radial member's **16** length.

[0028] Each radial member **16** is connected to its two (2) adjoining radial members **16** at a midpoint by first circumferential ring members **14** and at its second end by second circumferential ring members **12**. Thus, there is a "double ring" about the center piece **20** in the floor structure of the Hexapod **10**. However, it is anticipated that a second embodiment of the Hexapod **10** could be constructed without the first circumferential ring members **14** leaving only a single, outer ring.

[0029] The point at which the second and of the radial member **16** connects with the second circumferential ring members **12** is the lower joint **28**. Connected at the lower joint **28** and extending upwardly (or at generally a right angle from the plane of the floor) from the floor structure of the Hexapod **10** may be a upright member **24**. The upright members **24** are used to support upper circumferential members **22** and a ceiling structure **38**. While an upright member **24** they be attached at each lower joint **28**, is anticipated that some lower joint **28** may not have an attached upright member **24** in order to allow for the flexibility of rooms within the building structure when multiple Hexapods **10** are connected. The upright members **24** are each attached at the upright member's **24** first end to a single lower joint **28**. While the radial members **16** extend horizontally from the center piece **20**, the upright members **24** extend vertically from the lower joints **28**. The six (6) upright members **24** (or however many upright members **24** depending upon the embodiment), are connected by upper circumferential members **22**. Each upper circumferential member **22** is connected at one end to the second end of the upright member **24** at a upper joint **18**. Thus, the upper circumferential members **22** are generally parallel with the second circumferential ring members **12**.

[0030] It is anticipated that it may be beneficial to raise the floor structure of the Hexapod **10** up off of the ground. Therefore, a first end of a multiplicity of brace members **30** may be attached to the underside of the floor structure—generally anticipated to be attached to the radial members **16**, but potentially to the first circumferential ring members **14** or second circumferential ring members **12**. The brace members **30** are attached vertically to the floor structure but in the opposite direction from the upright members **24**. The brace members **30** are intended to support the Hexapod **10** and raise it off of the substrate. The second and of the brace members **30** may be attached to a brace plate **34**. The brace plate **34** acts as an apparatus that allows for connection of the brace member **32** the substrate. Alternatively, the brace member **30** and brace plate **34** may be attached to a footing **32**. It is generally anticipated that the footing **32** would be made from concrete or some similar material. The connections of the brace members **30** and brace plates **34** to the substrate or footings **32** act to anchor the Hexapod **10** in place.

[0031] While other building materials could be used, is generally anticipated that the Hexapod **10** will be constructed from steel beams or rods. In order to connect such beams or rods is anticipated that brackets **26** and fasteners **36** may be used. The brackets **26** may be of many different designs but are generally a support that holds or bears the weight of the connected pieces. Often, the brackets **26** and various pieces of the Hexapod **10** will be connected using fasteners **36** and it is anticipated that the fasteners **36** may include all of the regular construction fastening modes such as bolts/nuts, screws, rivets, welds, adhesives, and the like.

[0032] FIG. **2** is a side, perspective view of the present invention. It illustrates the orientation of the various structural members of the Hexapod **10**. The floor structure with its center piece **20**, radial members **16**, and first and second circumferential ring members **14** & **12** are generally horizontal in relation to the substrate or ground. The brace members **30** extend vertically down from the floor structure to the substrate or ground upon which the Hexapod **10** rests. The lower joints **28** baby held together using brackets **26** and fasteners **36**. At the lower joints **28** and extending vertically upward from the floor structure are the upright members **24**. At the opposite end of the upright members **24** from the floor structure are the upper circumferential members **22** which are connected to the upright members **24** at the upper joints **18**. The ring created by the multiplicity of upper circumferential members **22** and support a ceiling structure **38**. When completed, multiple Hexapods **10** will be connected along second circumferential ring members **12** creating a unitary structure with "rooms" within individual Hexapod **10** units or within multiple Hexapods **10**.

[0033] FIG. **3** is a partial, perspective view of the central portion of the present invention. It illustrates more clearly how the radial members **16** extend outwardly from the center piece **20**. First ends of the radial members **16** are attached to the center piece **20**. They may be connected using brackets **26** and fasteners **36**. The brace members **30** may also be attached to the radial members **16** using brackets **26** and fasteners **36**. As shown in this figure, the footings **32** are generally anticipated to rest upon the ground or substrate.

[0034] FIG. **4** is a partial, perspective view of the floor portion of the present invention. In this figure, it is as illustrated how steel I-beams may be used in order to construct the floor structure of the Hexapod **10**.

[0035] FIG. **5** is a perspective view of the present invention, with a ceiling structure. In order to complete a building, the Hexapod **10**, or multiplicity of connected Hexapods **10**, need to have roofs (not shown). A ceiling structure **38** may

be added at the top of the Hexapod **10** in order to support a roof (not shown). In an alternative embodiment, and annex may be attached to, or hung, from an outside wall. In the overall structure of the connected Hexapods **10**, the Annex could act as an additional room such as a porch, bathroom, closet, or the like.

[0036] FIG. **6** is a perspective view of a multiplicity of the present invention combined to create the frame of a structure. As illustrated in this figure, the Hexapods **10** may be connected to one another in an orientation such as to construct a building that extends around landscape features **100**.

[0037] FIG. **7** is a schematic showing possible connections of the present invention to create varying shaped structures. Again, the Hexapods **10** may be connected so as to create a building that "flows" around landscape features **100**. Thus, architecturally pleasing buildings may be created that incorporate natural and desirable features in the landscaping. The building of connected Hexapods **10** is exceptionally flexible because it can be manufactured into virtually any shape. When Hexapods **10** are connected various walls or upright members **24** will become unnecessary or unwanted. It is particularly anticipated that such upright members **24** would not be used in conjunction with Hexapods **10** that are in the interior of a multiple Hexapod **10** structure.

[0038] Although the invention has been described with reference to specific embodiments, this description is not meant to be construed in a limited sense. Various modifications of the disclosed embodiments, as well as alternative embodiments of the inventions will become apparent to persons skilled in the art upon the reference to the description of the invention. It is, therefore, contemplated that the appended claims will cover such modifications that fall within the scope of the invention.

I claim:

1. A building module comprising:

a polyhedral floor having a top and a bottom, said floor having five (5) or more sides;

a floor structure comprising said floor, a center piece connected to said bottom of said floor generally at the center of said polyhedral floor, and a circumferential ring attached to said floor bottom near the outer circumference of said floor bottom;

an upright member connected to said circumferential ring, wherein said upright member extends at generally a right angle from the plane of the floor;

a ceiling structure attached to said upright member at an opposite end of said upright member from said floor; and

wherein a side of said outer circumferential ring is capable of being attached to a side of a outer circumferential ring from a second building module.

2. The building module of claim **1**, wherein said floor structure further comprises an inner circumferential ring attached to said floor bottom between said outer circumference of said floor bottom and said center of said floor bottom.

3. The building module of claim **2**, wherein said outer circumferential ring and said inner circumferential ring are manufactured from steel beams.

4. The building module of claim **1**, further comprising a multiplicity of brace members attached to said bottom of said floor structure, wherein said brace members raise said floor structure off of a substrate.

5. The building module of claim **2**, further comprising a multiplicity of brace members attached to said bottom of said floor structure, wherein said brace members raise said floor structure off of a substrate.

6. The building module of claim **1**, wherein a side of said outer circumferential ring is capable of being attached to a side of a outer circumferential ring from a second building module with handheld power tools at a building site.

7. A building module comprising:

a hexagonal floor having a top and a bottom, said floor having six (6) sides;

a floor structure comprising said floor, a center piece connected to said bottom of said floor generally at the center of said polyhedral floor, and a circumferential ring attached to said floor bottom near the outer circumference of said floor bottom;

an upright member connected to said circumferential ring, wherein said upright member extends at generally a right angle from the plane of the floor;

a ceiling structure attached to said upright member at an opposite end of said upright member from said floor; and

wherein a side of said outer circumferential ring is capable of being attached to a side of a outer circumferential ring from a second building module.

8. The building module of claim **7**, wherein said floor structure further comprises an inner circumferential ring attached to said floor bottom between said outer circumference of said floor bottom and said center of said floor bottom.

9. The building module of claim **8**, wherein said outer circumferential ring and said inner circumferential ring are manufactured from steel beams.

10. The building module of claim **7**, further comprising a multiplicity of brace members attached to said bottom of said floor structure, wherein said brace members raise said floor structure off of a substrate.

11. The building module of claim **8**, further comprising a multiplicity of brace members attached to said bottom of said floor structure, wherein said brace members raise said floor structure off of a substrate.

12. The building module of claim **7**, wherein a side of said outer circumferential ring is capable of being attached to a side of a outer circumferential ring from a second building module with handheld power tools at a building site.

13. A building module comprising:

a floor structure comprising six (6) radial members of generally equal length attached at a center piece and extending outwardly from said center piece wherein angles between the radial members are approximately equal, and a circumferential ring attached to said radial members at the ends of said radial members opposite from said center piece;

an upright member connected to said circumferential ring, wherein said upright member extends at generally a right angle from the plane of said floor structure;

a ceiling structure attached to said upright member at an opposite end of said upright member from said floor structure; and

wherein a side of said outer circumferential ring is capable of being attached to a side of a outer circumferential ring from a second building module.

14. The building module of claim **13**, wherein said floor structure further comprises an inner circumferential ring

attached to said radial members between said outer circumferential ring of said floor structure and said center piece.

15. The building module of claim **14**, wherein said radial members, said outer circumferential ring, and said inner circumferential ring are manufactured from steel beams.

16. The building module of claim **13**, further comprising a multiplicity of brace members attached to said bottom of said floor structure, wherein said brace members raise said floor structure off of a substrate.

17. The building module of claim **14**, further comprising a multiplicity of brace members attached to said bottom of said floor structure, wherein said brace members raise said floor structure off of a substrate.

18. The building module of claim **13**, wherein a side of said outer circumferential ring is capable of being attached to a side of a outer circumferential ring from a second building module with handheld power tools at a building site.

* * * * *