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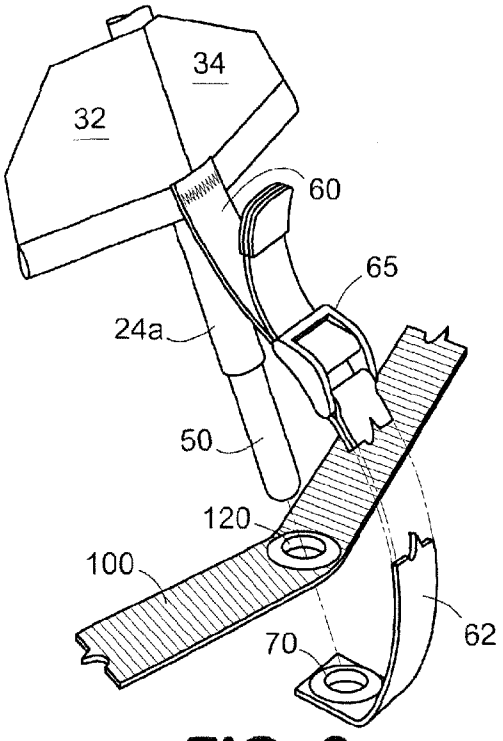

FIG. 3

(57) **Abstract:** An example method for providing a flexible base structure for a portable shelter includes the steps of forming a continuous loop of a flexible material and attaching a plurality of rib intersections at respective locations along the flexible loop. An alternative method for constructing a flexible base structure for a floorless portable shelter includes forming a continuous loop of a flexible material and arranging a plurality of openings at respective locations along the continuous loop. An embodiment of a base structure for supporting the ribs of a portable shelter includes a flexible loop and a plurality of rib intersections arranged along the flexible loop. Each of the plurality of rib intersections forms an opening for receiving a respective end of a rib that supports the portable shelter.

WO 2008/115637 A1

FLEXIBLE BASE STRUCTURE FOR PORTABLE SHELTERS

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BACKGROUND

[0001] Outdoor portable shelters such as tents have been used to provide temporary shelter and protection from the sun, wind, precipitation, harsh temperatures, condensation, biting insects, and other outdoor elements for workers, equipment, and outdoor enthusiasts for many years. Aside from protecting an interior volume from the elements, modern day shelters should be quick to set-up and portable. To be portable, the temporary shelter should be lightweight so it is easily carried to a proposed site as well as easy to assemble and disassemble.

[0002] Most conventional tents are configured with a floor that is made of a heavier material than that used for the portions of the tent that will not be in contact with the ground. The weight of the heavier material used to construct the floor of these tents makes up a significant portion of the overall weight of the tent. The floor is often configured with loops at fixed locations along the perimeter of the tent for receiving a stake that sets or fixes the floor of the tent to the ground. These floors are often configured with additional hardware and or loops for locating and receiving an end of a flexible support rib. Once all the support ribs are flexed and set at their designated receiving ends in or near the perimeter of the floor, the upper panels of the tent can be supported from the ribs. Some conventional tents use sleeves formed or otherwise attached to the outer surface of the upper panels of material to suspend the tent. Other conventional tents use hooks connected to tabs or other extensions that are sewn to the upper panels of the tent to suspend the tent under the support ribs. Many of these conventional tents use a rain fly to further shelter the tent.

[0003] A rain fly protects the tent from harmful ultraviolet radiation from the sun. In addition to protecting the tent from the sun, a rain fly provides an additional barrier in the rain and snow, can help keep sparks from a fire or wood stove away from the exterior surface of the tent and when set up correctly can provide an insulating layer when it is cold. Conventional rain flies are made from a relatively lightweight fabric made from man-made fibers (e.g., nylon, polyester) with canvas ties or other heavier fabrics used together with hook and loop fasteners for fixing the rain fly to support ribs. The fabric is often treated or coated with various waterproofing and fire

resistant agents. When appropriate, a hole for a stove jack or vent will be formed with canvas or reinforced webbing.

[0004] Some outdoor enthusiasts prefer to travel with as little gear as possible. For example, some hikers and climbers when faced with transporting food, water, fuel, a sleeping bag and roll, a portable shelter and perhaps additional items including a community shelter for meeting, cooking, or other functions will elect to carry a relatively lightweight rain fly with the necessary support ribs rather than a conventional tent with a floor.

[0005] However, absent the orientation and resistance provided by a conventional tent with a floor, a lightweight rain fly or other lightweight portable shelter without a floor can be difficult if not impossible to set-up by oneself. Setup of a lightweight cover, such as a rain fly, is problematic for at least the reason that it is difficult to align and flex the various ribs into their desired orientation absent the footprint provided by the floor of the corresponding tent.

[0006] Accordingly, it would be desirable to develop an apparatus and various methods that overcome these shortcomings.

SUMMARY

[0007] A flexible and scalable base structure for floorless portable shelters and methods for constructing and using the same are invented and disclosed.

[0008] One embodiment of a base structure for floorless portable shelters includes a flexible loop and a plurality of rib intersections arranged along the flexible loop, each of the plurality of rib intersections forming an opening for receiving a respective end of a rib. The flexible loop is arranged in a length that enables each of the rib intersections to be positioned to receive a corresponding end of a rib or other flexible member that supports the material of a rain fly or other cover in a desired configuration.

[0009] An alternative embodiment of a base structure for a floorless portable shelter includes a flexible loop having an adjustable length and a plurality of rib receiving members arranged along the length of the flexible loop. Each of the plurality of rib receiving members can be moved along the length of the flexible loop. In this alternative embodiment, an even number of the rib receiving members can be suitably positioned to support any number of floorless portable shelters by setting the length of the perimeter formed by the flexible loop and moving each of the rib receiving members to an appropriate location along the flexible loop.

[0010] Another embodiment of a base structure for floorless portable shelters includes a flexible loop and a plurality of rib receiving members arranged at fixed positions relative to each other along the length of the flexible loop.

[0011] An embodiment of a method for providing a flexible base structure for a portable shelter includes the steps of forming a continuous loop of a flexible material and attaching a plurality of rib intersections at respective locations along the flexible loop.

[0012] An alternative embodiment of a method for constructing a flexible base structure for a floorless portable shelter includes the steps of forming a continuous loop of a flexible material and arranging a plurality of openings at respective locations along the continuous loop.

[0013] Other devices, methods, features and advantages will be or will become apparent to one skilled in the art upon examination of the following figures and

detailed description. All such additional devices, methods, features and advantages are defined and protected by the accompanying claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The flexible base structure for portable shelters, as defined in the claims, can be better understood with reference to the following drawings. The components within the drawings are not necessarily to scale relative to each other; emphasis instead is placed upon clearly illustrating the elements, features and principles involved in supporting the ribs or flexible poles of a fly, rain cover, or floorless tent with the flexible base structure.

[0015] FIGs. 1 and 2 are schematic diagrams illustrating an embodiment of a base structure in relationship with an assembled portable shelter.

[0016] FIGs. 3 and 4 are schematic diagrams detailing the integration of a supporting rib and cover of a portable shelter at a select location along the base structure of FIGs. 1 and 2.

[0017] FIG. 5 is a schematic diagram illustrating the integration of a supporting rib of a portable shelter with an alternative base structure.

[0018] FIG. 6 is a schematic diagram illustrating the integration of a supporting rib of a portable shelter with a third alternative base structure.

[0019] FIGs. 7-11 are schematic diagrams illustrating various alternative embodiments of a base structure for portable shelters that integrate with three support ribs.

[0020] FIG. 12 is a schematic diagram illustrating a base structure for portable shelters that integrates with four support ribs.

[0021] FIG. 13 is a schematic diagram illustrating a portion of a base structure having an adjustable length.

DETAILED DESCRIPTION

[0022] Flexible and scalable base structures for floorless portable shelters and methods for constructing and using the same are invented and disclosed. The base structures for floorless portable shelters are lightweight and enable a user to assemble easily a floorless portable shelter without the assistance of others.

[0023] The base structures include a primary loop that can be formed from webbing, rope, cable or wire or other lightweight materials that will not stretch or shrink significantly over a range of temperature, humidity and in the presence of contaminants. In some configurations, the primary loop forms a fixed perimeter. In a first alternative embodiment, a first end of webbing, rope or other materials is connected to a strap or buckle that can receive the opposing end of the webbing, rope or other material to enable a user to form a primary loop with an adjustable length. In a second alternative embodiment, one or more sections or segments of the primary loop are arranged with respective friction lock collars that are fixed to respective ends of a wire or cable. The friction lock collars provide a mechanism for adjusting the perimeter of the flexible base structure.

[0024] Rib intersections are arranged at desired locations along the loop. The rib intersections receive respective rib ends (i.e., the ends of support members) of the portable shelter to be constructed and supported using the base structure. In certain embodiments, a grommet is used to engage the end of a rib. Some of the illustrated embodiments show the grommet directly embedded within the primary loop (i.e., in the webbing), while other embodiments include a secondary loop with a respective grommet for receiving and locating the rib ends. Embodiments that include a secondary loop can be arranged such that the secondary loop is at a fixed location along the length of the primary loop. Alternatively, one or more of the secondary loops can be configured to be moved along the length of the primary loop. Embodiments that use a secondary loop of sufficient size that surrounds the primary loop can be twisted to align an opening for receiving and holding a respective rib end. These arrangements can be constructed without grommets. A rib intersection can also be formed by a member with a channel for receiving a portion of the primary loop and a tab with a suitably sized hole for receiving a rib end.

[0025] Having generally described the base structures for floorless portable shelters, various additional embodiments will be described in detail with respect to FIGs. 1–13. FIG. 1 is an exploded front view illustrating a portable shelter 10 above a base structure 100. Portable shelter 10 is supported by three ribs. A first rib end 20a extends beyond the lower edge of panel 40 and the lower edge of panel 42 at the intersection of the panels. Rib 20 forms an arch that extends to an opposing side of the portable shelter 10 where rib end 20b extends below the lower edge of panel 34 and panel 36 at the intersection of the panels. A second rib end 22a extends beyond the lower edge of panel 42 and the lower edge of panel 32 at the intersection of the panels. Rib 22 forms an arch that extends to an opposing side of the portable shelter 10 where rib end 22b extends below the lower edge of panel 36 and panel 38 at the intersection of the panels. A third rib end 24a extends beyond the lower edge of panel 32 and the lower edge of panel 34 at the intersection of the panels. Rib 24 forms an arch that extends to an opposing side of the portable shelter 10 where rib end 24b extends below the lower edge of panel 38 and the lower edge of panel 40 at the intersection of the panels.

[0026] Panel 30, panel 32, panel 34, panel 36, panel 38, panel 40 and panel 42 lie above rib 20, rib 22, and rib 24. Each of the panels is made from a lightweight fabric made from man-made fibers (e.g., nylon, polyester). The panels may be treated with various sprays, solutions or other agents to make the portable shelter 10 resistant to fire, wind and water penetration and damage from ultraviolet radiation. Each of the panels is configured with hooks, ties or hook-and-loop fasteners to keep the panels correctly positioned above and in close contact with the respective ribs.

[0027] Unlike most conventional tents, portable shelter 10 is open to the ground or surface that will support rib end 20a, rib end 20b, rib end 22a, rib end 22b, rib end 24a and rib end 24b.

[0028] Panel 30 is located at the upper edge of panel 42 and between panel 40 and panel 32. The edges of panel 42 are connected to panel 30 and one or both of panel 40 and 32 via a zipper so that panel 42 can be removed or inserted in place to enable access and egress to the interior of the portable shelter 10.

[0029] As illustrated in FIG. 1, base structure 100 can be placed along a supporting surface and arranged such that rib intersections 110 align with a corresponding rib end from the portable shelter 10. Rib end 20a is received by rib intersection 110f. Rib end 22a is received by rib intersection 110e. Rib intersection 24a is received by rib intersection 110d. Rib end 20b is received by rib intersection 110c. Rib end 22b is received by rib intersection 110b. Rib intersection 24b is received by rib intersection 110a.

[0030] FIG. 2 shows portable shelter 10 in position over base structure 100. Panel 42 is folded over panel 32 to reveal the interior volume of portable shelter 10. In the field, an assembler constructs the portable shelter 10 by arranging base structure 100 along the ground. Next, rib 20, rib 22 and rib 24 are positioned in the base structure 100 by engaging a first rib end such as rib end 20a in rib intersection 110f and flexing rib 20 until rib end 20b can be inserted into rib intersection 110c. The flexed rib 20 is then placed on the ground in its flexed condition. Next, another rib end, such as rib end 22a is inserted in rib intersection 110e. Rib 22 is flexed until the opposing rib end 22b can be inserted in rib intersection 110b. The flexed rib 22 is placed on the ground in its flexed condition. Thereafter, the remaining rib, rib 24 is added by placing rib end 24a into rib intersection 110d and flexing rib 24 until rib end 24b can be inserted in rib intersection 110a. After the ribs have been flexed, they can be lifted and arranged close to one another above the ground in proximity with the center of the area encompassed by the base structure 100 where they can be tied, clamped or otherwise connected to each other such that they remain standing above the ground.

[0031] Upon easily accomplishing the heretofore difficult task of arranging the support ribs for the portable shelter 10, the assembler arranges the various panel intersections over the ribs and connects the panel intersections to corresponding ribs with the provided hooks, ties, or hook and loop fasteners so that the base edge of each of the respective panels is proximally located to the base structure 100.

[0032] FIGs. 3 and 4 are schematic diagrams detailing the integration of a supporting rib and cover of a portable shelter at a select location along the base structure 100 of FIGs. 1 and 2. FIG. 3 shows rib end 24a separated from a first grommet 120 integrated with base structure 100 and a second grommet 70 integrated with an

extension strap 62. Rib end 24a includes probe 50, which fits within the corresponding openings formed by grommet 120 and grommet 70. Once probe 50 engages grommet 120 and grommet 70, extension strap 62 and cover strap 60 can be adjusted via buckle 65 or some other tensioning apparatus to pull panel 32 and panel 34 into position near base structure 100.

[0033] FIG. 5 is a schematic diagram illustrating the integration of a supporting rib of a portable shelter with an alternative base structure. As illustrated in FIG. 5, a secondary loop 130 with a corresponding grommet 135 can be located at an appropriate position along base structure 100 for receiving probe 50 of rib end 24a. In the illustrated embodiment, secondary loop 130 is fixed to base structure 100 by sewing the secondary loop 130 to the webbing as indicated by stitch pattern 132.

[0034] FIG. 6 is a schematic diagram illustrating the integration of a supporting rib of a portable shelter with a third alternative base structure. As shown in FIG. 6, a secondary loop 130 with a corresponding grommet 135 can be sewn together via stitches 134 beyond the webbing of base structure 100, such that secondary loop 130 can be positioned as may be desired along the length of base structure 100.

[0035] In still another embodiment (not shown), a secondary loop 130 can be formed absent a grommet. The secondary loop 130 can be fixed to the base structure 100 as indicated in FIG. 5 or configured as shown in FIG. 6 such that the secondary loop 130 can be manipulated along base structure 100. As long as the secondary loop can be twisted to receive probe 50, no grommet is required. This alternative configuration would benefit from a slot or groove in probe 50 or near the intersection of probe 50 and rib end 24a to engage the secondary loop.

[0036] FIGs. 7-11 are schematic diagrams illustrating various embodiments of a base structure for portable shelters 10 that integrate with three support ribs. The base structures illustrated in FIGs. 7-11 are shown in a taught arrangement as if they were positioned by flexed ribs.

[0037] FIG. 7 includes base structure 700 made of a length of webbing sewn together at junction 710 to form a primary loop. Rib intersections include grommets 120 strategically separated from their nearest neighbor grommets along the length of base structure 700. An uppermost segment 100a is defined by grommet 120a and grommet

120b. Moving in a clockwise rotation around base structure 700, segment 100b is defined by grommet 120b and junction 710. Segment 100c is defined by junction 710 and grommet 120c. Segment 100d is defined by grommet 120c and grommet 120d. Segment 100e is defined by grommet 120d and grommet 120e. Segment 100f is defined by grommet 120e and grommet 120f. Lastly, segment 100g is defined by grommet 120f and grommet 120a. As described above in association with FIGs. 1 and 2, grommets 120 are separated from their nearest neighbor grommets such that each of the grommets can receive a respective rib end of a correspondingly arranged portable shelter.

[0038] FIG. 8 includes base structure 800 made of a length of webbing coupled together at buckle 810 to form a primary loop. The addition of buckle 810 permits easy adjustment of the length of base structure 800. Rib intersections include grommets 120 strategically separated from their nearest neighbor grommets along the length of base structure 800. Additional grommets are integrated in the webbing to enable a user to select the most appropriate grommet for receiving a probe to form a desired portable shelter. In this regard, grommets may be color coded, labeled or otherwise marked to indicate a set of grommets that can be used to support the ribs of a portable shelter. An uppermost segment 800a is defined by grommet 120a and grommet 120b with additional grommets disposed between the two. Moving in a clockwise rotation around base structure 800, segment 800b is defined by grommet 120b and buckle 810. Segment 800c is defined by buckle 810 and grommet 120c. Segment 800d is defined by grommet 120c and grommet 120d. Segment 800e is defined by grommet 120d and grommet 120e. Segment 800f is defined by grommet 120e and grommet 120f. Lastly, segment 800g is defined by grommet 120f and grommet 120a. As with segment 800a, each of the remaining segments includes additional grommets between the end grommets that define the segment. As described above in association with FIGs. 1 and 2, grommets 120 are configured to receive a respective rib end of a correspondingly arranged portable shelter. However, in the adjustable embodiment illustrated in FIG. 8 only a select number of the grommets available will be used to support a rib end.

[0039] FIG. 9 includes base structure 900 made of a length of webbing 910 that forms a primary loop. Rib intersections include grommets 135 in secondary loops 130 separated from their nearest neighbor grommets along the length of base structure 900. As described above, secondary loops 130 can be arranged to slide along the length of webbing 910. An uppermost portion is defined by secondary loop 130a and grommet 135a at a left most location and secondary loop 130b and grommet 135b at a right most location. Moving in a clockwise rotation around base structure 900, an upper right side portion is defined by secondary loop 130b and grommet 135b at an upper location and secondary loop 130c and grommet 135c at a lower location. A lower right side portion is defined by secondary loop 130c and grommet 135c at an upper location and secondary loop 130d and grommet 135d at a lower location. A lowermost portion is defined by secondary loop 130d and grommet 135d at a rightmost location and secondary loop 130e and grommet 135e at a leftmost location. A lower left side portion is defined at a lower location by secondary loop 130e and grommet 135e at a rightmost location and secondary loop 130f and grommet 135f at a leftmost location. A last portion is defined by secondary loop 130f and grommet 135f at a leftmost location and secondary loop 130a and grommet 135a at a rightmost location. As described above in association with FIGs. 1 and 2, grommets 135 are separated from their nearest neighbor grommets such that each of the grommets can receive a respective rib end of a correspondingly arranged portable shelter.

[0040] FIG. 10 includes base structure 1000 made of a length of cord 200. Cord 200 may be tied to itself, crimped or otherwise coupled via a mechanical coupler. Rope, wire, cable, etc. can be used as substitutes for cord 200 as long as the material used is arranged in a primary loop. Rib intersections include grommets 135 in secondary loops 130 strategically separated from their nearest neighbor grommets along the length of base structure 1000. As described above, secondary loops 130 can be arranged to slide along the length of cord 200. An uppermost portion is defined by secondary loop 130a and grommet 135a at a left most location and secondary loop 130b and grommet 135b at a right most location. Moving in a clockwise rotation around base structure 1000, an upper right side portion is defined by secondary loop 130b and grommet 135b at an upper location and secondary loop 130c and grommet

135c at a lower location. A lower right side portion is defined by secondary loop 130c and grommet 135c at an upper location and secondary loop 130d and grommet 135d at a lower location. A lowermost portion is defined by secondary loop 130d and grommet 135d at a rightmost location and secondary loop 130e and grommet 135e at a leftmost location. A lower left side portion is defined at a lower location by secondary loop 130e and grommet 135e at a rightmost location and secondary loop 130f and grommet 135f at a leftmost location. A last portion is defined by secondary loop 130f and grommet 135f at a leftmost location and secondary loop 130a and grommet 135a at a rightmost location. As described above in association with FIGs. 1 and 2, grommets 135 are separated from their nearest neighbor grommets such that each of the grommets can receive a respective rib end of a correspondingly arranged portable shelter.

[0041] FIG. 11 includes base structure 1100 made of a length of webbing sewn together at junction 1110 to form a primary loop. Rib intersections include grommets 120 strategically separated from their nearest neighbor grommets along the length of base structure 1100. An uppermost segment 1100a is defined by grommet 120a and grommet 120b. Moving in a clockwise rotation around base structure 1100, segment 1100b is defined by grommet 120b and junction 1110. Segment 1100c is defined by junction 1110 and grommet 120c. Segment 1100d is defined by grommet 120c and grommet 120d. Segment 1100e is defined by grommet 120d and grommet 120e. Segment 1100f is defined by grommet 120e and grommet 120f. Lastly, segment 1100g is defined by grommet 120f and grommet 120a. As described above in association with FIGs. 1 and 2, grommets 120 are separated from their nearest neighbor grommets such that each of the grommets can receive a respective rib end of a correspondingly arranged portable shelter.

[0042] Base structure 1100 differs from base structure 700 (FIG. 7) in that the uppermost and lowermost segments have a length that is longer than the other segments. Other arrangements are possible as may be desired to support variously configured portable shelters.

[0043] FIG. 12 is a schematic diagram illustrating a base structure for portable shelters that integrates with four support ribs. FIG. 12 includes base structure 1200

made of a length of webbing sewn together at junction 1210 to form a primary loop. Rib intersections include grommets 120 strategically separated from their nearest neighbor grommets along the length of base structure 1200. An uppermost segment 1200a is defined by grommet 120a and grommet 120b. Moving in a clockwise rotation around base structure 1200, segment 1200b is defined by grommet 120b and grommet 120c. Segment 1200c is defined by junction 1210 and grommet 120c. Segment 1200d is defined by junction 120 and grommet 120d. Segment 1200e is defined by grommet 120d and grommet 120e. Segment 1200f is defined by grommet 120e and grommet 120f. Segment 1200g is defined by grommet 120f and grommet 120g. Segment 1200h is defined by grommet 120g and grommet 120h. Lastly, segment 1200i is defined by grommet 120h and grommet 120a. As described above in association with FIGs. 1 and 2, grommets 120 are separated from their nearest neighbor grommets such that each of the grommets can receive a respective rib end of a correspondingly arranged portable shelter. Those skilled in the art will appreciate that various base structure configurations are possible. For example, base structure configurations that include more or less rib intersections.

[0044] FIG. 13 is a schematic diagram illustrating an adjustable length segment 1300 or portion of a base structure. Member 125d includes a channel that encompasses a portion of a cable or wire used to form the primary loop. Member 125d further includes a tab with a hole suitably configured for receiving a rib end. Member 125e includes similar features (i.e., the channel and tab) for receiving a different rib end. A first cable portion 1310, which traverses the channel of member 125e is coupled to friction lock collar 1315. A second cable portion 1320, which traverses the channel of member 125d is coupled to friction lock collar 1325. Length "D," or the distance along the primary loop defined by the location of the respective friction lock collars is adjusted by rotating the coupled portion of the friction lock collar towards the closer of the two members to disengage the collar from the cable. Once disengaged, the friction lock collar can be adjusted along the length of the opposing cable. Once the friction lock collar is positioned where desired, the friction lock collar can be re-engaged along the opposing cable.

[0045] A method for constructing a flexible base structure 100 for a floorless portable shelter 10 includes the steps of forming a continuous loop of a flexible material and arranging openings at respective locations along the continuous loop.

[0046] A method for providing a flexible base structure for a portable shelter includes the steps of forming a continuous loop of a flexible material and attaching rib intersections at respective locations along the flexible loop. Thereafter, the continuous loop can be placed along a surface to form a perimeter that closely approximates a base edge of a desired portable shelter.

[0047] Although disclosed embodiments use arrangements configured to engage flexible portable shelters that use three and four ribs to support a fabric cover, it should be understood that alternative arrangements are possible. For example, a flexible base structure can be configured to engage as few as two ribs and up to as many ribs as may be desired.

[0048] The foregoing description has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the scope of the claims to the precise forms disclosed. Modifications or variations are possible in light of the above teachings. The embodiments discussed, however, were chosen and described to enable one of ordinary skill to utilize various embodiments of the present flexible base structures and methods for constructing and using the same. All such modifications and variations are within the scope of the appended claims when interpreted in accordance with the breadth to which they are fairly and legally entitled.

CLAIMS

What is claimed is:

1. A base structure for supporting the ribs of a portable shelter, comprising:

a flexible loop;

a plurality of rib intersections arranged along the flexible loop, each of the plurality of rib intersections including an opening for receiving a respective end of a rib.

2. The base structure of claim 1, wherein the flexible loop comprises a material selected from the group consisting of webbing, cord, rope, wire and cable.

3. The base structure of claim 1, the flexible loop comprises at least one length adjustable segment between adjacent rib intersections and at least one rib intersection comprises a member arranged with a channel for receiving a portion of the flexible loop and a tab that encompasses the opening.

4. The base structure of claim 1, wherein the rib intersections comprise respective grommets located at fixed locations.

5. The base structure of claim 1, wherein the rib intersections comprise grommets fixed in a second loop formed of webbing, the second loop surrounding the flexible loop.

6. The base structure of claim 5, wherein the second loop is fixed to the flexible loop.

7. The base structure of claim 5, wherein the second loop is adjustable along the length of the flexible loop between nearest neighbor loops.

8. A method for providing a flexible base structure for a portable shelter, comprising:

forming a continuous loop of a flexible material; and

attaching a plurality of rib intersections at respective locations along the flexible loop.

9. The method of claim 8, wherein the plurality of rib intersections comprise a respective secondary loop of flexible material that surrounds the continuous loop.

10. The method of claim 9, further comprising:

forming an opening in a secondary loop.

11. The method of claim 10, wherein forming an opening comprises inserting a grommet.

12. The method of claim 8, further comprising:

arranging the continuous loop upon a surface to form a perimeter that closely approximates a base edge of the portable shelter.

13. A method for constructing a flexible base structure for a floorless portable shelter, comprising:

forming a continuous loop of a flexible material; and

arranging a plurality of openings at respective locations along the continuous loop.

14. The method of claim 13, wherein at least one of the openings is formed with a grommet.

15. The method of claim 13, wherein at least one of the openings is formed with a second loop of a flexible material that surrounds the continuous loop, the second loop of flexible material being substantially smaller than the continuous loop and large enough to receive an end of a support rib.

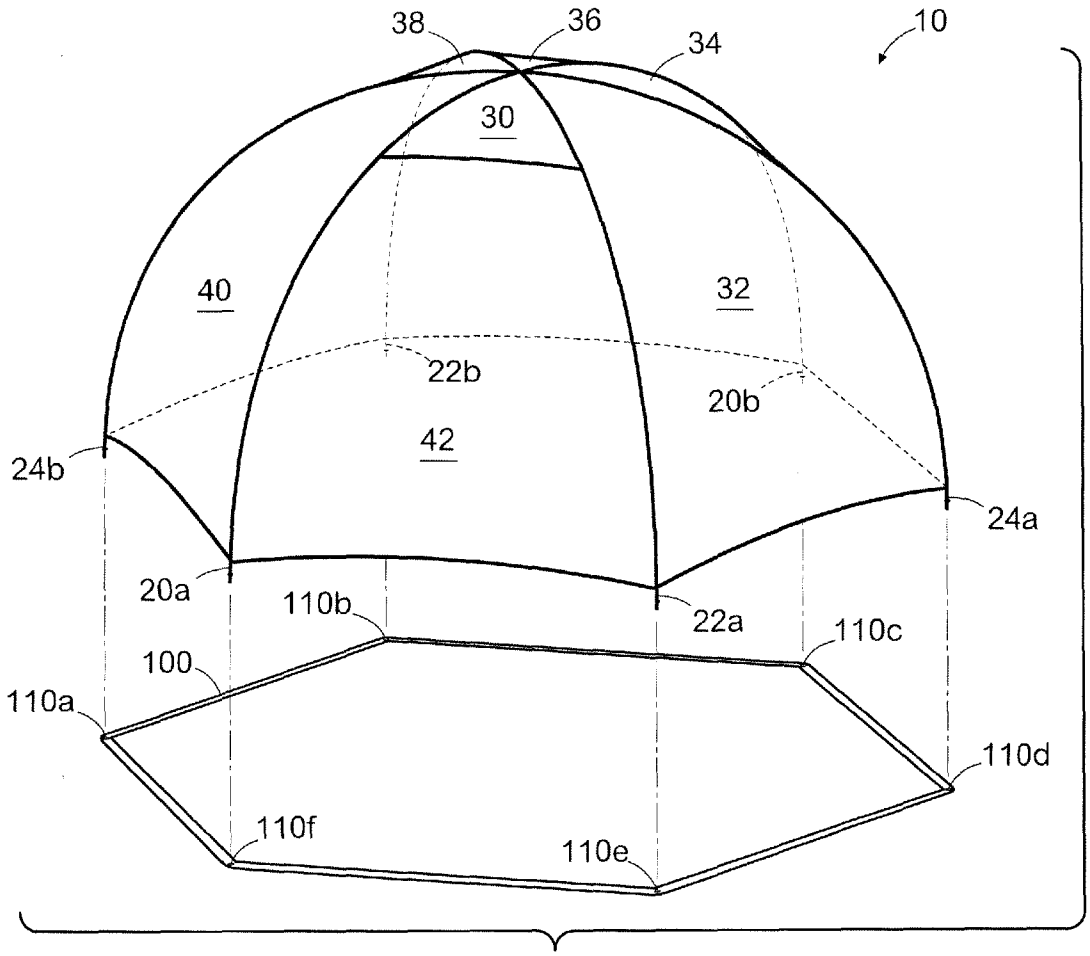
16. The method of claim 13, wherein at least one of the openings is formed with a second loop of flexible material that surrounds the continuous loop, the second loop of flexible material having a grommet.

17. The method of claim 13, wherein arranging a plurality of openings at respective locations along the continuous loop comprises a set of fixed locations relative to each other along the continuous loop.

18. The method of claim 13, wherein forming a continuous loop of a flexible material comprises connecting a first end of a length of the flexible material to a second end to complete the loop.

19. The method of claim 18, wherein connecting comprises sewing.

20. The method of claim 18, wherein connecting comprises coupling.


38
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34
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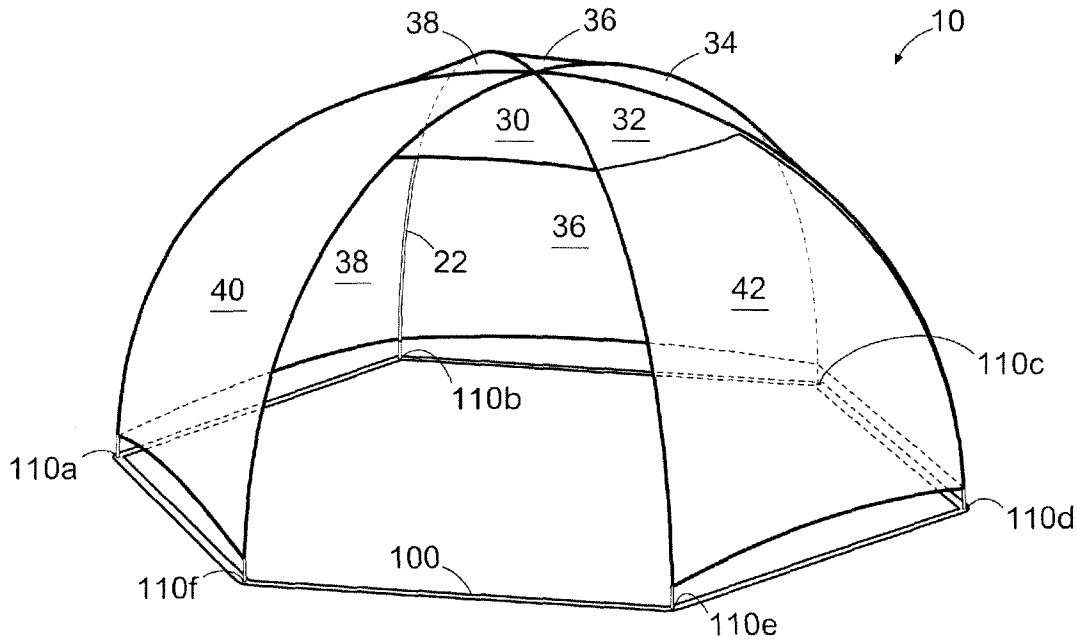
30
40
32
22b
20b
42
24b
24a
20a
110b
22a
110c
100
110a
110d
110f
110e

FIG. 1


38
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110c
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110f
110e

FIG. 2

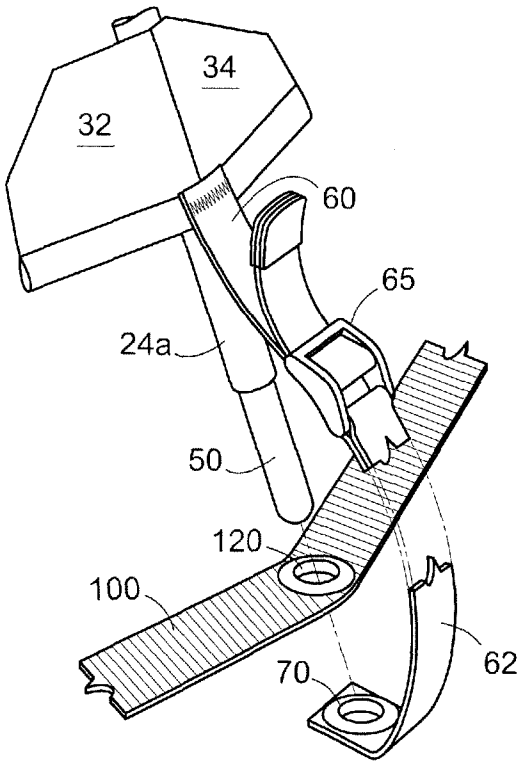

FIG. 3

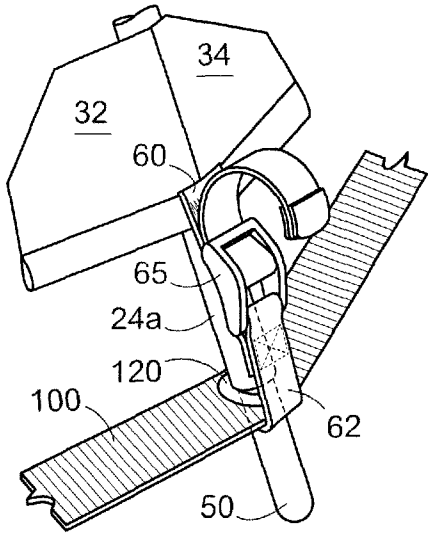

FIG. 4

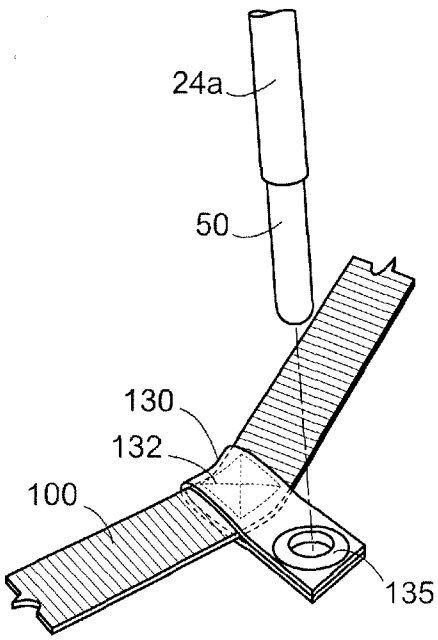

FIG. 5

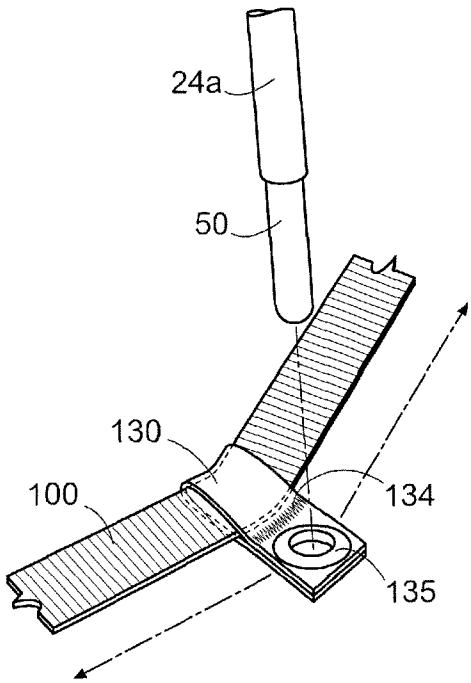

FIG. 6

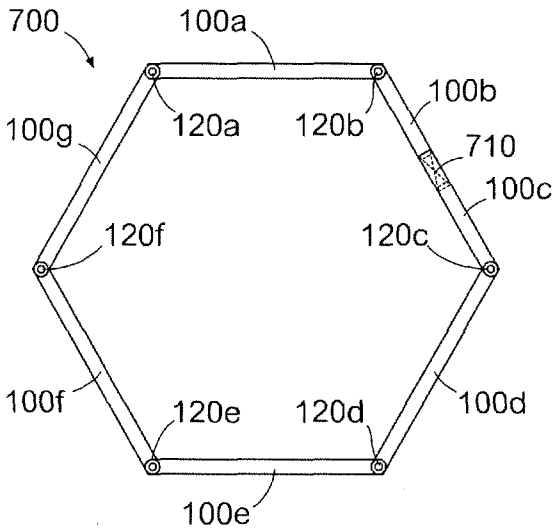

FIG. 7

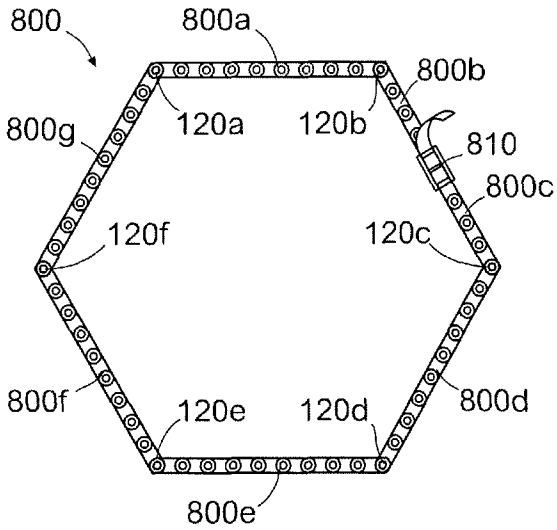

FIG. 8

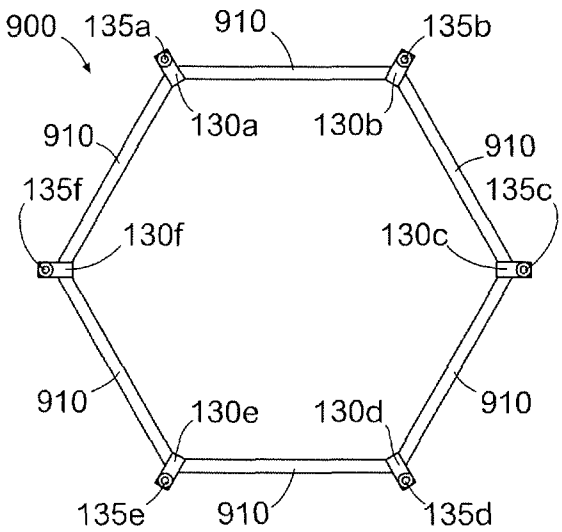

FIG. 9

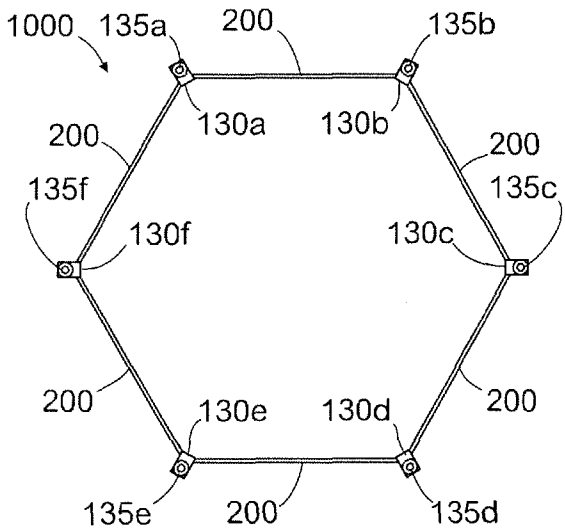

FIG. 10

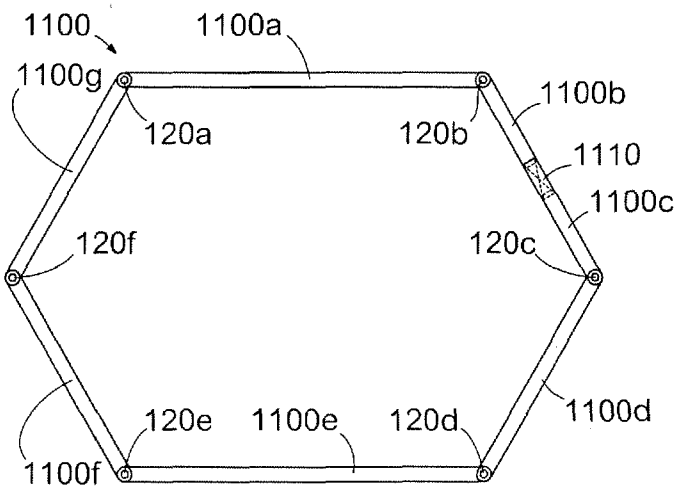

FIG. 11

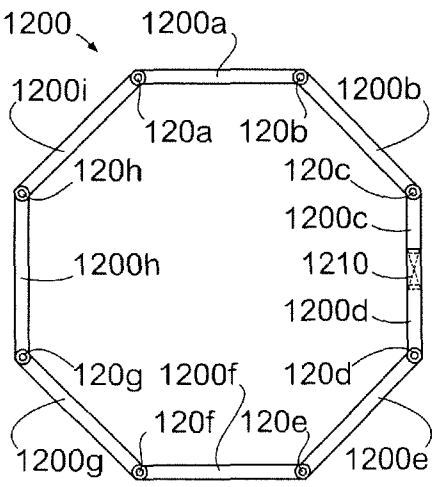

FIG. 12

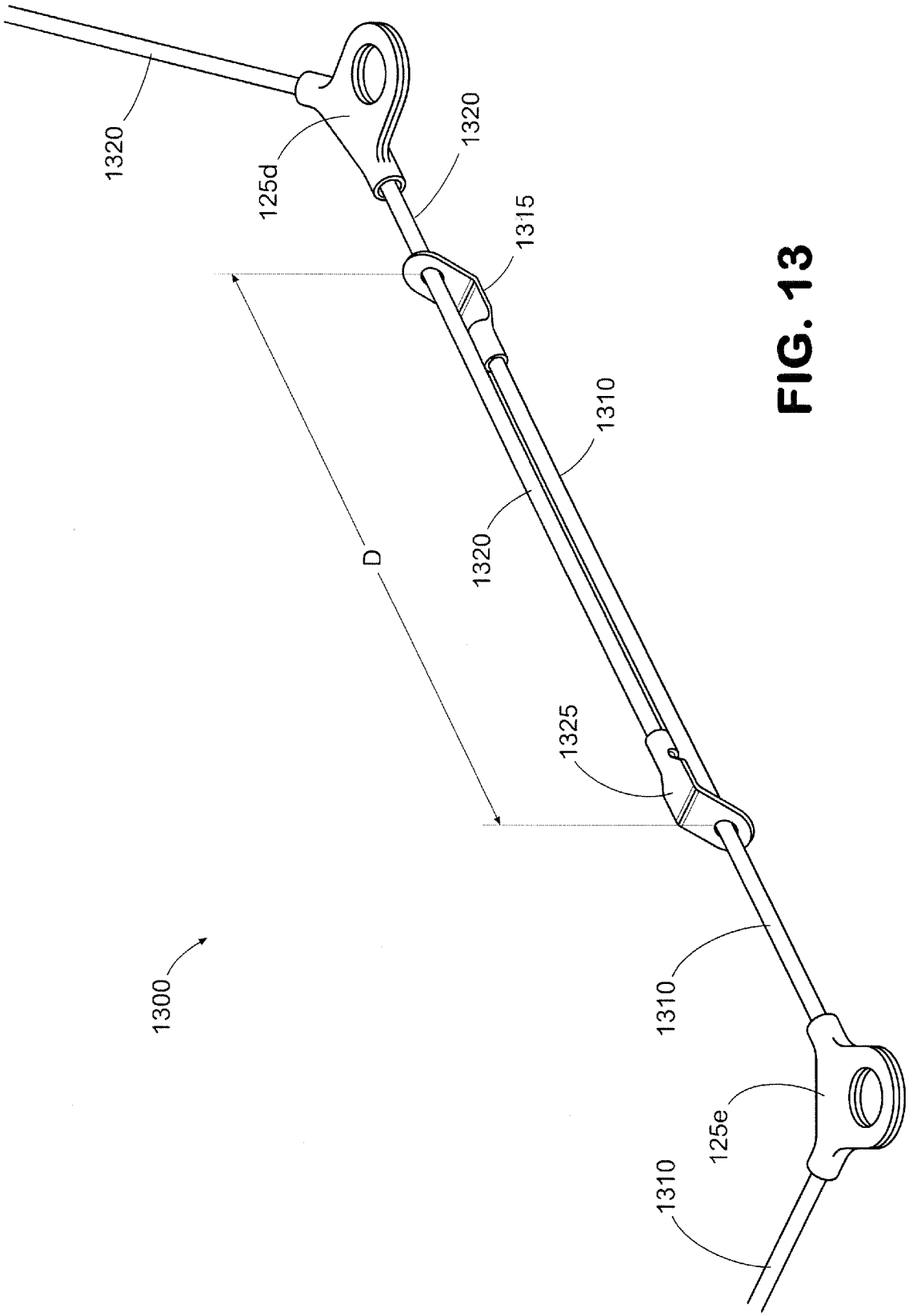

FIG. 13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/053907

A. CLASSIFICATION OF SUBJECT MATTER

E04H 15/32(2006.01)i, E04H 15/64(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 8: E04H15/32, E04H15/64

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models since 1975

Japanese utility models and applications for utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS (KIPO internal) & keywords: "tent", "shelter"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	KR 1020060120858 A (SHIN, M.) 28 NOV. 2006 See abstract and figure 2a	1-2, 4, 8, 12-14, 17-20 --- 3, 5-7, 9-11, 15, 16
Y	KR 200250570 Y1 (CHANG, J.) 19 OCT. 2001 See abstract and figures 1-3	3
Y	KR 2019910005928 U (KIM, W.) 24 APR. 1991 See abstract and figures 1-2	5-7, 9-11, 15, 16

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
08 JULY 2008 (08.07.2008)	**08 JULY 2008 (08.07.2008)**

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Facsimile No. 82-42-472-7140

Authorized officer

KWON, JANG SEOB

Telephone No. 82-42-481-8178

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2008/053907

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 1020060120858 A	28.11.2006	NONE	
KR 200250570 Y1	19.10.2001	NONE	
KR 2019910005928 U	24.04.1991	KR 9108160 Y1	12.10.1991