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(54) **TENT STRUCTURE OR SUN PROTECTION STRUCTURE**

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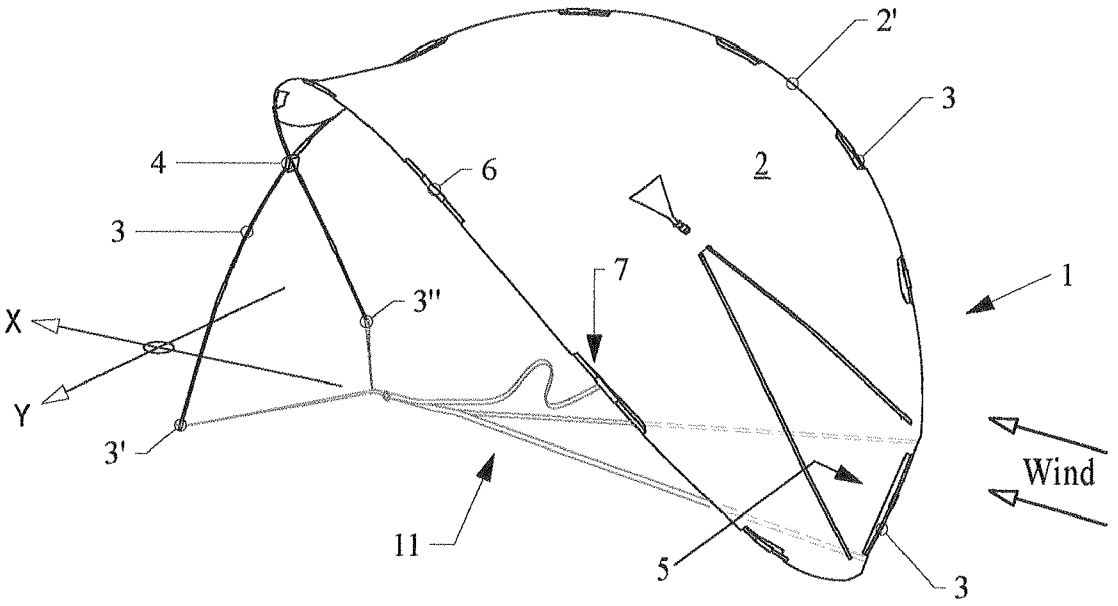
(57) **ABSTRACT**

The invention relates to a tent or sun protection structure (**1**), in which a canvas, a cloth, a fabric, a sheet or the like (**2**) is tensioned using at least one flexible supporting pole. In order to achieve a stable structure, the supporting pole is bent into an open or closed loop, the free ends of which (**3'**, **3"**)are braced with the vertex area (**5**) of the loop—with the supporting pole including tensioned canvas being bent into a convex structure, and wherein the structure is placed on the ground with the free ends (**3'**, **3"**) of the supporting pole (**3**) and the vertex area (**5**) of the loop and anchored there, if necessary.



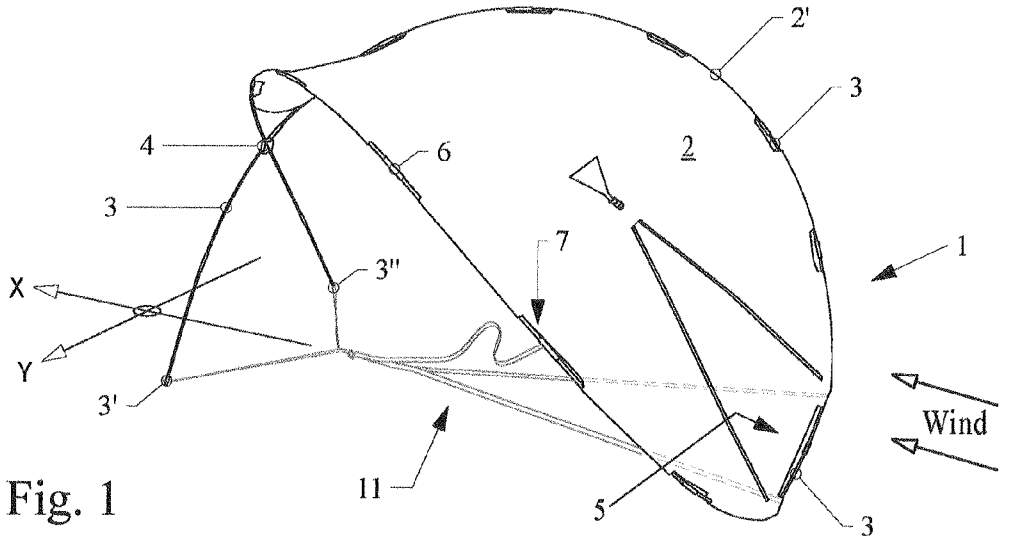


Fig. 1

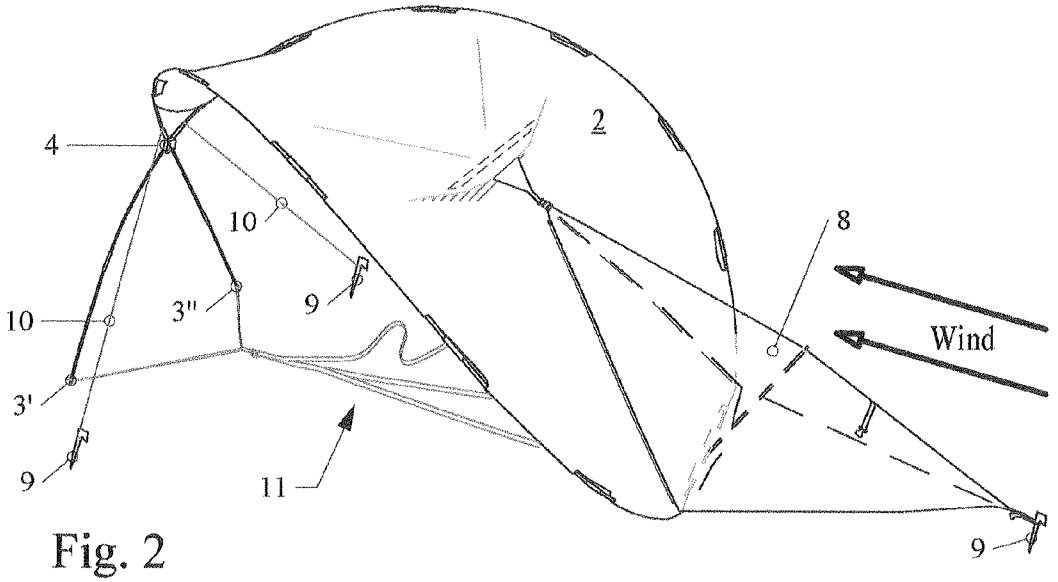


Fig. 2

Fig. 3

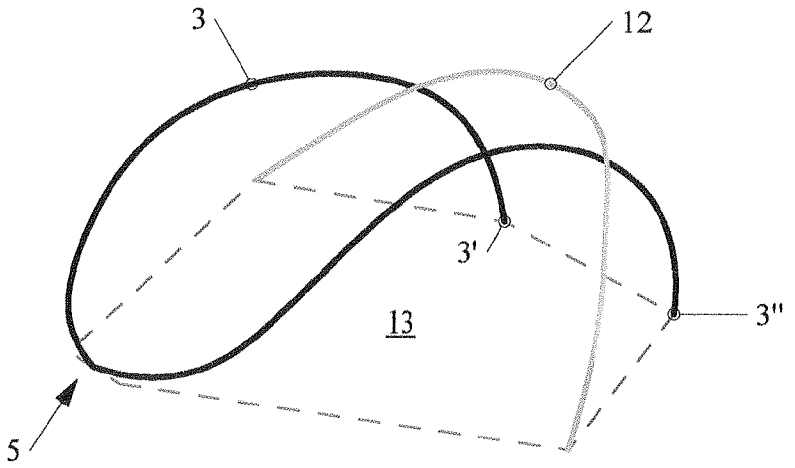


Fig. 4

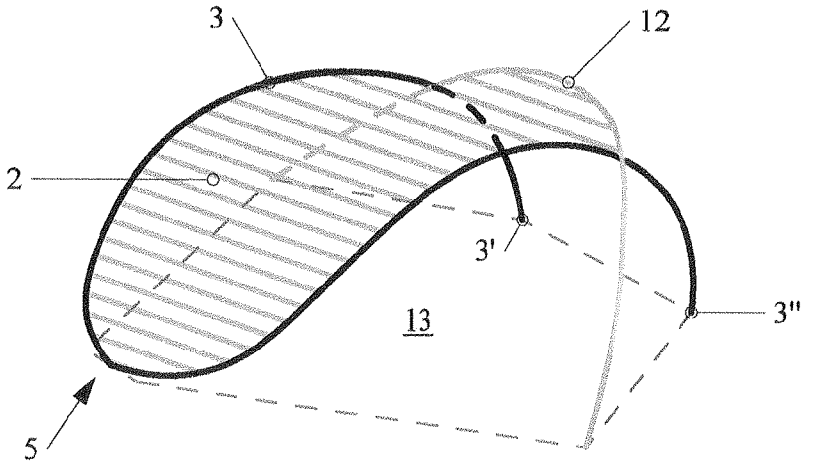
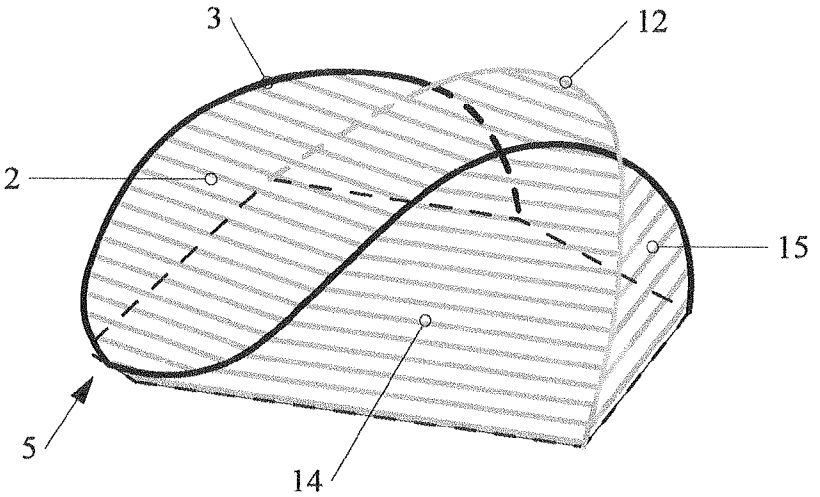


Fig. 5



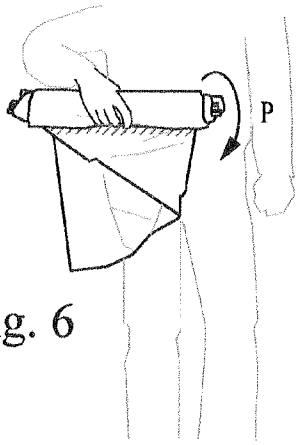


Fig. 6

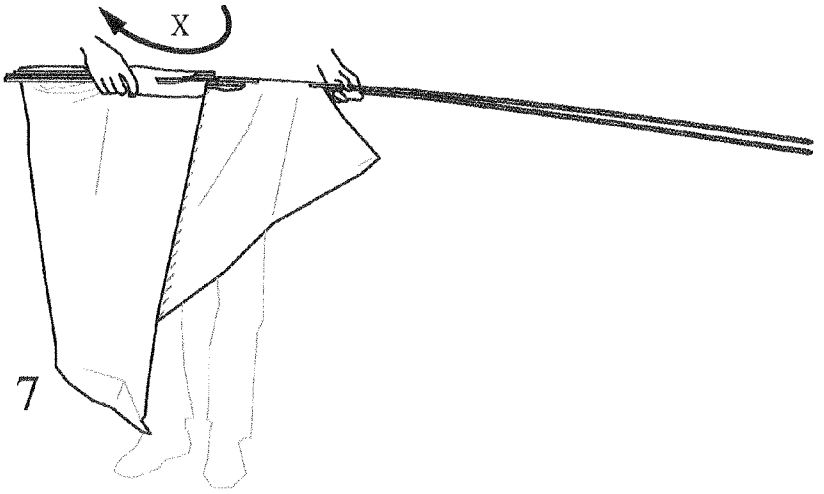


Fig. 7

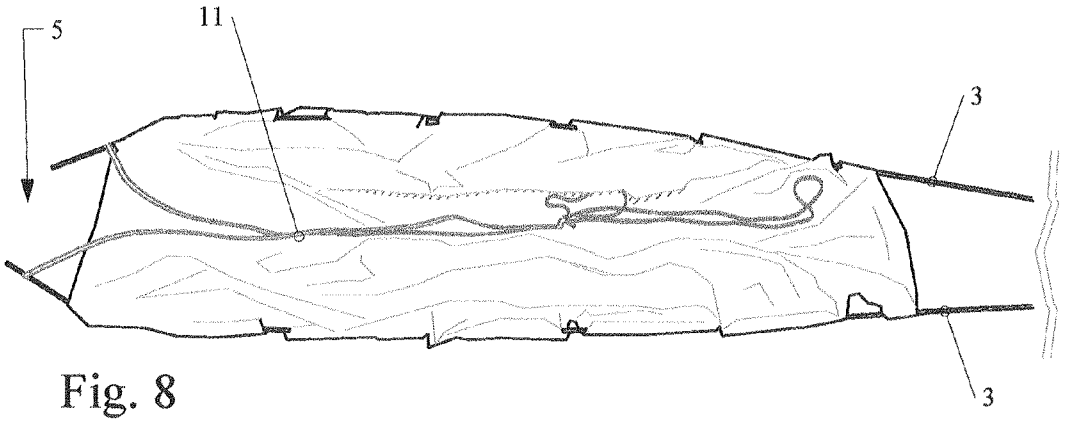


Fig. 8

Fig. 9

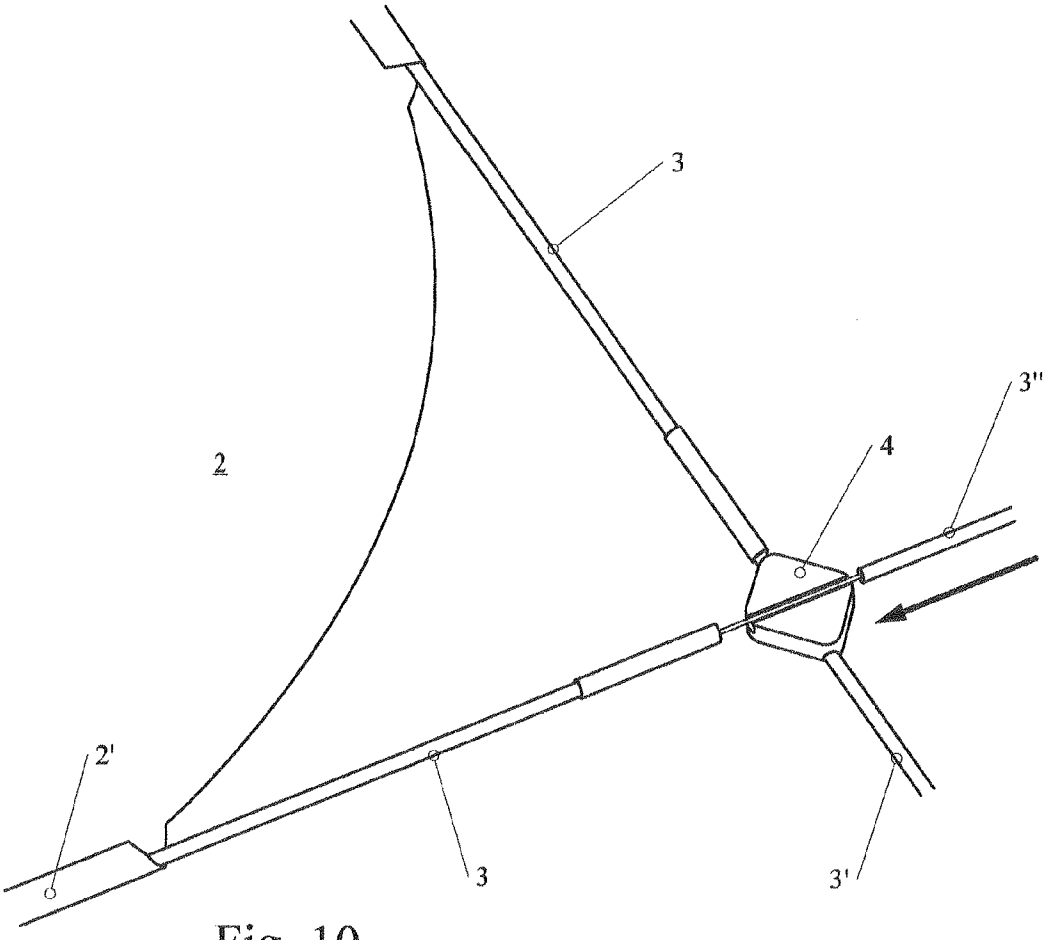


Fig. 10

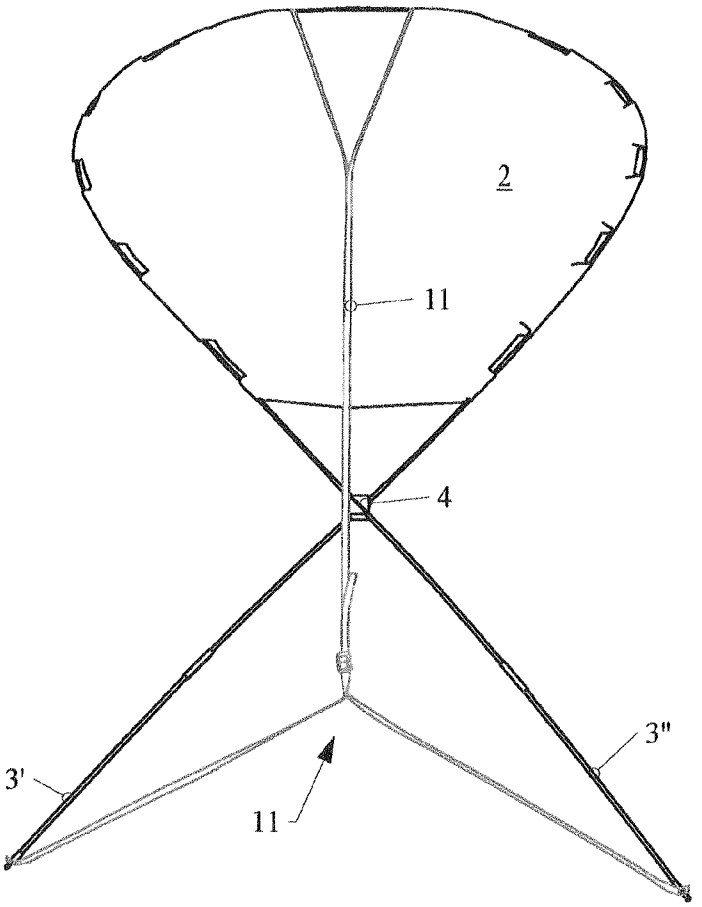


Fig. 11

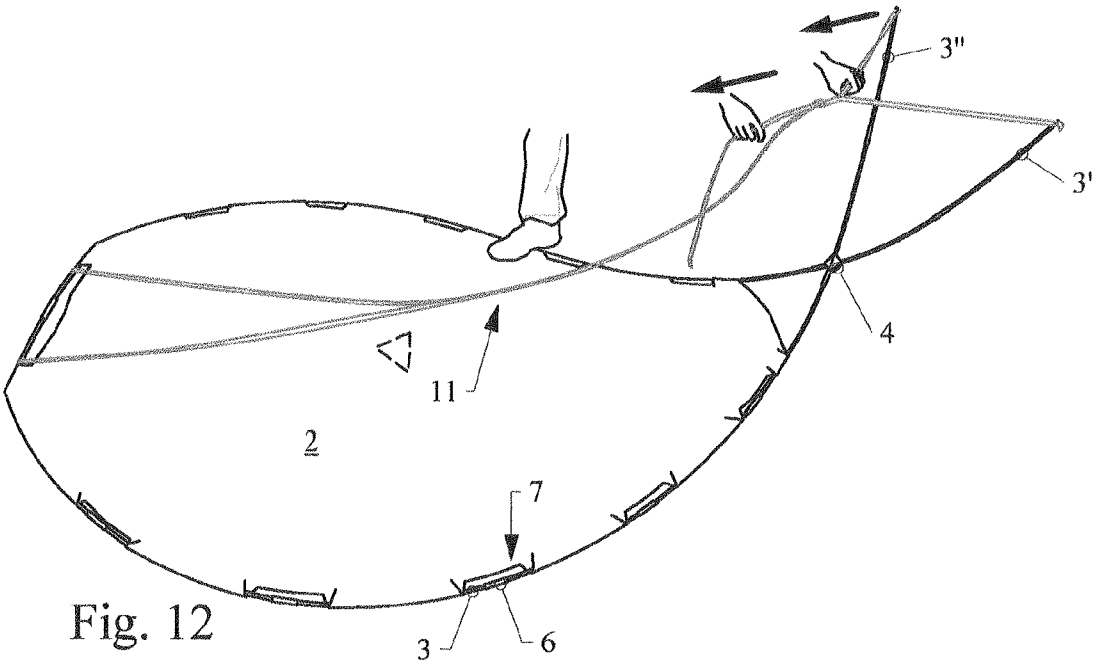


Fig. 12

TENT STRUCTURE OR SUN PROTECTION STRUCTURE

[0001] The invention relates to a tent structure or sun protection structure, in which a canvas, a cloth, a fabric, a sheet or the like is tensioned using at least one flexible supporting pole.

[0002] Several kinds of transportable tents or sun protection tents for beach, garden, meadow and exterior spaces in general with various advantages and disadvantages are known. In the following, only some of the most frequent variants are stated in an exemplary manner.

[0003] Parasols must be fixed in the ground or held using a heavy foot, in order to withstand the wind, and with their mostly round shape with a central pole, do not offer optimum shade for the user(s). The net weight is considerable and the pack size is large.

[0004] Self-unfolding tents and beach tents consist of an interconnected structure (mostly two rings and a covering incl. a base) and independently unfold due to the deformation forces of the arch structure and are stable in themselves. On the other hand, however, they usually have a small volume, since the ring-shaped flat bearing configuration has a large diameter, which increases with the size of the tent—whereby transport is being complicated. The interior of the beach tent mostly is too small for adults in order to provide sufficient shade, the air therein heats up easily and the view is open in one direction only.

[0005] Dome tents, beach dome tents and similar tents are completely assembled from their individual elements (normally: poles, covering incl. base, ropes and ground anchors) and disassembled each time in a time-consuming fashion. Stability of the tent structure is mostly only achieved with several bracings using ground anchors in the ground, which restricts mobility. On the other hand, they have a small pack size and a higher variety in shape. The interior of beach dome tents—tents open on one side—mostly has a trapezoidal shape with a small depth and thus is not well usable. With overhangs, and sometimes complex mounting frames, it is attempted to enlarge the shaded area.

[0006] Other sun protection devices, as known from patent application DE 10 2006 024 488 A1, require 2 main poles and 3 or more transverse poles, several straps—in part with Velcro fasteners to tension the canvas. These sun protection devices offer no protection against wind.

[0007] The invention is based on the object to create a tent structure or sun protection structure of the kind initially stated, which can be designed respectively large, so that it offers protection against sun, rain and wind for several persons and still is light and handy to transport. Furthermore, quick pitching without any problems is to be possible, too.

[0008] According to the invention, this object is solved by the supporting pole being shaped into an open or closed loop, the free ends of which are braced with the vertex area of the loop—with the supporting pole including tensioned canvas being bent into a convex structure, wherein the structure rests on the ground with the free ends of the supporting pole and the vertex area of the loop and is anchored there, if necessary. Thus, a structure is created, which rests on the ground in a stable fashion, wherein a respective shape can be defined due to the layout of the canvas or the cloth, the fabric or the sheet, resp. Bracing the ends of the supporting pole with the vertex area and therewith creating the convex curving of the structure, tension results at the supporting pole, also transverse to the canvas level, whereby a structure is created, which is stable in itself, since the three main elements (pole/canvas/bracing) mutually hold one another in position.

[0009] Advantageously, the free ends of the supporting pole can be intersected and continue beyond the point of intersection, wherein the supporting pole sections in the intersection area are preferably fixed against one another using a connecting element. Therewith, the structure of the loop is reinforced even further, since the legs of the loop are secured against collapsing. Furthermore, the supporting pole can be divided, and the individual parts can be rigidly connectable, e.g., using plug connections or lockable joints, wherein the canvas, in particular at the edge, has lugs, loops, hooks or tubular receiving elements, also called "pole sleeves", for the pole, wherein the receiving elements are interrupted in the area of the rigid connections. This enables folding of the structure to a small dimension for transport, wherein the supporting poles can remain connected with the canvas and must only be plugged together for pitching, which is easily possible since the connections are arranged in an exposed fashion. In that, the individual pole parts and/or connecting elements can be straight, curved or angled, whereby the shape of the structure can be respectively designed.

[0010] In a further advantageous embodiment of the subject matter of the invention, preferably at about half the distance between the vertex area of the loop and the free ends of the supporting pole, one or several further flexible pole(s) can be provided, which span(s) above or below the loop or cross (es) it, which, if applicable, is/are connected with the structure via lugs, loops, hooks or tubular receiving elements provided at the canvas and with its/their free ends likewise rest(s) on the ground, wherein the free ends of this or these, resp., further pole(s) are braced with one another. Therewith, a further increase in stability of the structure and a greater possibility for design for the shape of the canvas is achieved and the interior of the tent structure or sun protection structure, resp., is enlarged. In that, the tensioning element(s) bracing the vertex area of the supporting pole with its ends, and, if applicable, the tensioning element(s) bracing the ends of the further pole(s) with one another, can be adjustable in length. This enables respective adjustment of the curvature or the size of the footprint, resp., and pitching is facilitated. In order to achieve braced fixation of the free ends of the supporting pole with its vertex area and, if applicable, also of the free ends of the further pole (or the further poles), a particularly flexible bottom part, e.g., made of fabric, sheet or mat or a groundsheet, can be provided, which has receiving means for the free ends of the poles or the vertex area of the loop, respectively. Therewith, a base structure is created, which, e.g., upon pitching on sandy ground or the like, prevents that the person using the tent gets in contact with the ground. It is also prevents that, should the tent structure or sun protection structure be pitched on moist ground, the person using the tent gets in contact with the moist underground. In a particularly advantageous manner, the bottom part is integrally designed with the canvas, which is above all reasonable when the canvas is an enveloping tent case, since therewith, a closed tent results, which protects against various weather conditions.

[0011] In a further embodiment, within the tent structure or sun protection structure, which preferably is designed waterproof and/or water-repellent and/or windproof, an inner tent can be attachable or attached maintaining an intermediate air layer. With the air circulation, as common in tent construction, the inconveniences of condensation as well as overheat-

ing upon solar irradiation are limited. However, reversely, there may also be a covering case attachable or attached above the tent structure or sun protection structure, which preferably is designed waterproof and/or water-repellent and/or windproof.

[0012] Finally, preferably in the vertex area of the loop, a pocket-like space can be attached at the canvas, which is in particular accessible from the inside, which can be additionally anchored to the ground. Therewith, on the one hand, a storage space is created within the structure, in which luggage can be accommodated and, on the other hand, with respective anchoring to the ground, the pocket-like space enables particularly good wind resistance in respect of the tent structure or sun protection structure according to the invention.

[0013] In the following, still further advantages of the subject matter of the invention are outlined.

[0014] The tent or sun protection tent according to the invention can almost entirely be manufactured cost-effectively from commercially available individual parts and is thus economically competitive.

[0015] The sun protection tent offers an unobstructed view towards several sides and enables sufficient air circulation in order to prevent heating up of the area to be shaded. Simultaneously, it offers protection against wind and for that can be erected in a wind-stable manner.

[0016] Only few main components form the tent or sun protection tent. It is not necessary to disassemble the interconnected main components into individual parts upon disassembly, which enables fast pitching and striking.

[0017] The self-supporting tent structure substantially consists of **3** elements, which stabilize one another and balance one another:

- **[0018]** at least one flexible, long, foldable pole, possibly designed with bends, which in its condition of use is held in a three-dimensionally bent shape, wherein the pole can be also divided into two or more individual poles,
- **[0019]** and a covering /roof area (fabric, textile, sheet, mat) or something similar stretched thereon,
- **[0020]** as well as a tensioning system (made of bottom fabric, bottom sheet and/or ropes and/or straps and the like).

[0021] Such poles have been used in tent construction for a long time and can be made of glass or carbon fiber, aluminum or other reversibly bendable materials. Should the pole be bent that far that its ends intersect, the structure can be stabilized with a connecting element in the point of intersection.

[0022] Adding further poles to the main structure, the tent or sun protection tent can be further stabilized and enlarged. In the points of intersection, the poles can be loose, detachably connected or fixedly connected.

[0023] The tensioning system (ropes, straps, bottom fabric or the like with or without tensioning device) can be fixedly fastened to the poles or the covering in the center area, and in the condition of use, it can be fastened at the ends using plug connections or the like, whereby fast pitching and striking are accomplished.

[0024] When the receiving elements of the covering, for fastening at the pole, in respect of the individual segments of the pole, are designed such that the connecting points of the individual segments remain exposed, then the tent or sun protection tent can be folded as a whole and subsequently rolled up, without sliding the pole out of the receiving elements, whereby pitching and striking are simplified and accelerated very much and the ease of use is highly increased. There are no loose individual parts, which can go missing.

[0025] For additional wind stability, the tent or sun protection tent can be braced using the packing bag or a (e.g.: fold-out) space attached to the canvas, wherein the packing bag can simultaneously form a storage space on the outside of the structure, which is accessible from the inside through an opening in the fabric, which, e.g., can be opened and closed using a zipper. Putting weight into the packing bag/the attached space, no tent peg is required.

[0026] For even more additional wind stability, the tent or sun protection tent can be fastened to the ground using ground anchors and braced using ropes.

[0027] The invention cannot only be used as a sun protection tent, but is also very well usable as a tent. For that, the covering and the tensioning system are preferably connected or designed as one element, respectively. Thus results a closed tent interior with a floor area, which is tensioned and held in shape.

[0028] Within the structure made of pole(s) and covering, which can be designed wind- and/or waterproof, an inner tent (an inner chamber), as is common in tent construction, can be assembled via spacers, in order to create an intermediate air layer between outer and inner tent, which reduces/solves the condensation problem. Alternatively, a covering case can be positioned and fastened over the structure of pole(s) and case, which can be designed wind- and/or waterproof.

[0029] The drawings represent one embodiment of the subject matter of the invention.

[0030] FIG. **1** shows the tent structure or sun protection structure according to the invention in a graph.

[0031] FIG. **2** is an illustration analogous to FIG. **1**, however with folded-out additional storage space and with indicated bracing to the ground.

[0032] FIG. **3** schematically shows the course of the supporting pole in an embodiment with non-intersected supporting pole and additional pole.

[0033] In FIG. **4**, the hatching shows the canvas in an embodiment according to FIG. **3**.

[0034] FIG. **5** shows a variant of the structure according to FIG. **3**, which is closed on all sides. FIGS. **6** to **12** show the sequence of pitching the structure with an intersected supporting pole, and in detail, FIG. **6** shows the unrolling of the structure folded for transport.

[0035] FIG. **7** illustrates the unfolding of the canvas with the supporting pole parts inserted.

[0036] FIG. **8** shows the canvas in the spread condition, wherein the supporting pole parts of the loop's legs are connected already.

[0037] FIG. **9** then shows the closing of the loop in the vertex area.

[0038] FIG. **10** shows, on a larger scale, the connection in the intersection area of the loop.

[0039] FIG. **11** is a bottom view of the loop in the still flat condition.

[0040] FIG. **12** then illustrates the tensioning of the tensioning elements in order to achieve the convex structure.

[0041] The structure **1** according to the invention consists of a canvas **2**, which is tensioned by a supporting pole **3** bent into a loop. This canvas can either be a cloth, a fabric, a sheet or just a tarpaulin, it must only be flexible and have tensile strength and preferably protect against UV radiation. The supporting pole **3** is a flexible pole, which is a tent pole common in tent construction made of hollow individual ele-

ments, which can be plugged into one another and, if necessary, are also held together with an elastic rope. For that, various flexible materials can be used, e.g. glass fiber or carbon fiber, aluminum or others. The individual elements are interconnected via connecting pieces **6** and fixed against one another. The loop has a vertex area **5**, which lies in the area of the bend of the supporting pole **3** into the loop. The simplest shape of the structure thus formed rests on the ground with its vertex area **5** as well as the end areas **3'** or **3"**, resp., of the supporting pole, wherein the free ends **3'**, **3"** are braced with the vertex area **5** of the loop via one or several tensioning elements **11**, whereby a convexly curved structure is achieved. The supporting pole is guided in the canvas **2** in lugs, loops, hooks, tubular receiving elements **2'** or the like (FIG. **10**), wherein the receiving elements **2'** have recesses **7** in the area of the connecting pieces **6**, so that the connecting pieces are freely accessible for connection.

[0042] In the variant shown, the free ends **3'**, **3"** of the supporting pole **3** are intersected and attached to one another in an intersection piece **4**. However, the supporting pole **3** could also be bent into an open loop (also called "bay"), and the legs of the supporting pole **3** could run in parallel to one another, as indicated in FIGS. **3** to **5**. It is also possible to bend the pole more strongly or less strongly than illustrated in FIGS. **3** to **5**.

[0043] In the stated embodiments of FIGS. **3** to **5**, in addition to the supporting pole **3**, a further flexible pole **12** is provided, which runs intersecting the two legs of the supporting pole **3**. The ends of this further pole **12**, too, are braced with one another such that the further pole **12** runs overlapping in an arched shape. In the embodiments illustrated in FIGS. **3** to **5**, instead of a strap-shaped tensioning element **11**, a continuous groundsheet **13** made of flexible material is provided, which has receiving elements for receiving the vertex area **5** as well as the ends **3'**, **3"** of the supporting pole **3** and the ends of the additional pole **12**.

[0044] As illustrated in FIG. **5**, in addition to the canvas **2**, further canvasses or fabrics, resp., sheets or the like can be connected, as indicated with **14** and **15** in FIG. **5**. In this manner, a closed tent is achieved, which not only protects against sun and wind, but also against precipitation and other weather conditions.

[0045] As shown in FIG. **2**, a further canvas section **8** is attached to the canvas **2**, which serves as storage space and is accessible from inside below the canvas **2**. **9** designates ground hooks (tent pegs), using which the structure **1** is fastened to the ground. For that, beside part **8**, which serves as storage space, one or several ropes **10** are also provided, which are preferably attached to the bent supporting pole **3** in the area of the point of intersection.

[0046] As far as the tensioning elements **11** are concerned, these can be formed as individual straps or just as illustrated by Y-type connected straps, in which conventional turnbuckles or clamping buckles, resp., are installed for contracting and thus arching the structure.

[0047] However, instead of the tensioning elements, as stated, the groundsheet **13** could preferably be provided with individual lashing straps for the free ends of the poles. It can be reasonable to position straps with receiving elements at the corners of the groundsheet, wherein each strap can be tensioned, whereby each individual pole end can be shifted individually.

[0048] The individual canvasses **2**, **14**, **15** as well as, if applicable, the bottom part **13** can either be designed integrally with the canvas or connected to the canvas **2** as needed via conventional connecting means like zippers, Velcro or the like.

[0049] Furthermore, it is provided, however not shown, that in closed tent variants as in FIG. **5**, an inner tent is fastened to the pole structure **3** and **12** or to the canvas **2** using spacers, like loops, lugs, Velcro, hooks or the like.

[0050] Alternatively, the canvas **2** can be designed as an inner tent, which is connected to the pole structure via spacers, like loops, lugs, hooks, tubular receiving elements or the like, over which a tent covering can be positioned and fastened. Both types of the two-layered tent constructions with a ventilation level are common in tent construction.

[0051] The inner tent is a fine grid mesh—i.e. actually a mosquito net, the purpose of which is that the user does not get in contact with the condensation. The outer tent provides any protection against weather conditions.

[0052] 1.) In the conventional case, the inner tent holds the poles in shape; in that, however, it lies clearly within the pole structure, and the outer tent is arranged above it and tensioned. Therefore, the pitching sequence is to pitch the inner tent with poles and to anchor it in the ground first and to position the outer tent above it and to brace it in the ground thereafter.

[0053] 2.) In pop-up tents and several others, the inner tent is already assembled in the outer tent using suspensions—and thus both tents are pitched simultaneously.

[0054] It is important for both variants, that the inner tent is slightly offset towards the inside, and that the outer tent always rests against the poles. For that, there are various types of suspension means.

[0055] Pitching of the structure is now explained on the basis of FIGS. **6** to **12**. FIG. **6** shows the structure in its completely folded condition, i.e., the individual parts of the supporting pole **3** are released from one another, and the canvas is then folded around the individual parts and rolled up. In FIG. **6**, arrow P indicates, how the structure is unrolled. Thereafter, as indicated with the arrow X in Fig.**7**, the canvas, including the individual supporting pole parts, is unfolded, and thereafter, the individual parts of the supporting pole **3** are plugged together along the legs via the connecting pieces **6**. Then, the structure shown in FIG. **8** is obtained, wherein in the vertex area **5**, the parts of the supporting pole **3** must still be joined, as is shown in FIG. **9**. Therewith, the canvas **2** is stretched due to the elasticity of the supporting pole **3**, whereby a planar structure is obtained, the ends **3** of which are then interconnected in the intersection piece **4**. The end pieces **3'**, **3"** protruding beyond the intersection piece **4** as well as the vertex area **5** are then interconnected using the tensioning element **11**, as shown in FIG. **11**. Now the tensioning element **11** is tensioned according to the arrows in FIG. **12**, whereby a convex structure is obtained, which then is to be erected on the vertex area **5** and the ends **3'**, **3"** of the supporting pole. This basic structure can, as already described above, be connected into a tent with additional supporting poles **12** or also additional canvasses **14** and **15**, respectively. Instead of the tensioning element **11**, a closed tent can be obtained with a uniform flexible groundsheet **13** as well as with the further canvas parts **14** and **15**.

[0056] As is apparent from the above description, pitching and striking of the structure take place quickly and easily, without having to insert the poles into the receiving elements again. The main structure does without loose individual parts, since all the essential elements can be packed up without

complete disassembly, i.e., the respective portions of the flexible supporting pole **3** remain in the associated receiving elements and the tensioning element **11** is preferably fixedly connected with the pole **3** in the vertex area **5** and the connecting element **4** is preferably preassembled at one pole leg, whereby pitching of the structure is considerably facilitated.

[0057] Furthermore, pitching is easily possible even in windy conditions, since the individual parts are plugged together while the structure is still lying flat on the ground, and the structure is only erected once it has been respectively stabilized with the stretching, thus arching the structure. Pitching a two-layered tent is easy, too, since either the inner tent is already fastened in the canvas **2**, or since the outer tent is fastened above the tent structure following its erection as described above.

1. Tent structure or sun protection structure, wherein a canvas, a cloth, a fabric, a foil or the like is tensioned using a flexible supporting pole, characterized in that the supporting pole is bent into an open or closed loop or arch, the free ends of which are braced with the vertex area of the loop—with the supporting pole including tensioned canvas being bent into a convex structure, wherein the structure is placed on the ground with the free ends of the supporting pole and the vertex area of the loop and is anchored there, if necessary.

2. Tent structure or sun protection structure according to claim **1**, characterized in that the free ends of the supporting pole are crossed over and continue beyond the point of intersection, wherein the supporting pole sections in the intersection area are preferably fixed to one another using a connecting element.

3. Tent structure or sun protection structure according to claim **1**, characterized in that the supporting pole is divided and the individual parts are rigidly connectable, e.g. using plug connections or lockable joints, wherein the canvas is fitted, especially at the edge, with flaps, loops, hooks, tubular receiving elements or the like for the pole, and the receiving elements are preferably interrupted in the area of the pole connections.

4. Tent structure or sun protection structure according to claim **1**, characterized in that said individual pole parts and/or connecting elements are straight, curved or angled or forked or cross-shaped.

5. Tent structure or sun protection structure according to claim **1**, characterized in that preferably at about half the distance between said vertex area of said loop and said free ends of said supporting pole, one or several further flexible pole(s) is/are provided spanning above or below said loop or intersecting it, which is/are connected with said structure, if applicable, via lugs, loops, hooks, tubular receiving elements or the like provided at said canvas and is/are likewise placed on the ground with its/their free ends, wherein said free ends of this or these, resp., further pole(s) are braced with one another.

6. Tent structure or sun protection structure according to claim **1**, characterized in that the tensioning element(s) bracing said vertex area of said supporting pole with its ends, and, if applicable, the tensioning element(s) bracing said ends of said further pole or said further poles, resp., with one another, is/are adjustable in length.

7. Tent structure or sun protection structure according to claim **1**, characterized in that a particularly flexible bottom part, for example, made of fabric, foil or mat, or a floor plate, which is fitted with attachment devices for the free ends of the poles and/or the vertex area of the loop, is provided for the tensioned fixing of the free ends of the supporting pole with its vertex area and, as the case may be, also the free ends of the other pole (or the other poles).

8. Tent structure or sun protection structure according to claim **7**, characterized in that the bottom part is designed in one piece with the tarpaulin.

9. The tent structure or sun protection structure according to claim **1**, characterized in that, within said tent or sun protection structure, which preferably is designed waterproof and/or water-repellent and/or windproof, an inner tent is attachable or attached maintaining an intermediate air layer.

10. Tent structure or sun protection structure according to claim **1**, characterized in that an upper cover, which preferably is designed waterproof and/or water-repellent and/or windproof, can be fixed or is fixed above the tent structure or sun protection structure.

11. Tent structure or sun protection structure according to claim **1**, characterized in that, e.g., in said vertex area of said loop, a pocket-like space is attached to said canvas, which is in particular accessible from the inside, which can be additionally anchored to the ground.

* * * * *