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(71) Applicant: **Kooymans Beheer B.V.**
5611 JC Eindhoven (NL)

(72) Inventor: **Kooijmans, Antonius Gerardus Petrus Johannes**
5616 JC, Eindhoven (NL)

(74) Representative: **Verhees, Godefridus Josephus Maria**
Brabants Octrooibureau,
De Pinckart 54
5674 CC Nuenen (NL)

(54) **Umbrella device**

(57) A sunshade apparatus 1 comprises a mast 3 with a module 7 connected to the mast. The module has a hingeable main arm 9 and inside the module a sliding element 13 can slide to which an auxiliary arm 15 is connected. The auxiliary arm 15 is furthermore hingeably connected to the main arm 9.

A sunshade 23 is suspended from the free, second end 21 of the main arm 9. Inside the module 7 there is a spindle 29 for displacing the sliding element 13. By moving the spindle 29 in the right direction, the sliding element 13 moves downwards. As a result, the main arm 9 is unfolded via the auxiliary arm 15. During the unfolding of the main arm the sunshade 23 will open.

The sunshade 23 opens automatically because a cable 33 is connected with one end to the main arm 9 and with the other end to a sub-crown 35 to which sunshade rib supports 37 are connected.

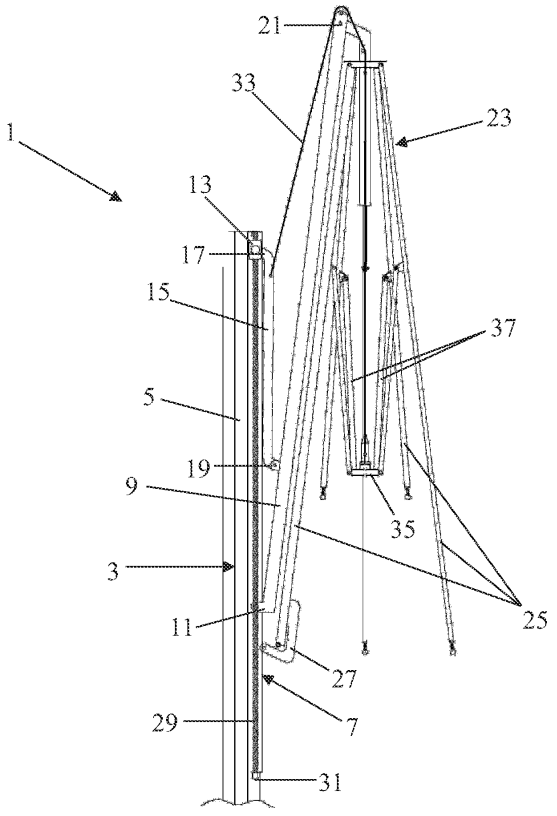

FIG. 1

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Description

Field of the invention.

[0001] The invention relates to a sunshade apparatus comprising a mast element, a main arm which is coupled with a first end to the mast element hingeable around a horizontal axis, an auxiliary arm which is hingeably coupled with a first end to the main arm, a sliding element which, slideable along the mast element, is coupled to the mast element with which the auxiliary arm is hingeably coupled with a second end, a displacement mechanism for displacing the sliding element relative to the mast element, and a sunshade which is connected to a second end of the main arm.

State of the art.

[0002] A sunshade apparatus of this type is generally known. Once the known sunshade apparatus has been erected, nothing can be changed any more. The number and the position of the sunshades is fixed. The position of the sunshade apparatus or the number of sunshade fabrics can only be changed by displacing the sunshade apparatus in its entirety or replacing it with another sunshade apparatus.

Summary of the invention.

[0003] It is an object of the invention to provide a sunshade apparatus of the type defined in the opening paragraph which is more flexible as regards positioning than the known sunshade apparatus. For this purpose the sunshade apparatus according to the invention is characterised in that the mast element is provided with a receiving space and the sunshade apparatus further includes a module which is present in the receiving space and is detachably connected to the mast element, while the first end of the main arm is hingeably connected to the module, the sliding element is slideably coupled to the module and the displacement mechanism is connected to the module. By replacing the module with another module, the sunshade apparatus according to the invention can be varied without displacing or replacing the sunshade apparatus as a whole.

[0004] An embodiment of the sunshade apparatus according to the invention is characterised in that the sunshade apparatus comprises at least one further receiving space and the sunshade apparatus comprises at least one further module which is present in the further receiving space and is detachably connected to the mast element.

[0005] Another embodiment of the sunshade apparatus according to the invention is characterised in that the sunshade apparatus comprises at least one further mast element which is detachably connected to the mast element already present and in that the sunshade apparatus includes at least one further module which is detachably connected to the further mast element.

[0006] A further embodiment of the sunshade apparatus according to the invention is characterised in that the main arm is connected to the module at a distance from the upper end of the module and the sliding element is located above the link point of the main arm and the module.

[0007] The displacement mechanism preferably comprises a rotary spindle with which the sliding element cooperates. The hinge axis of the second end of the auxiliary arm with the sliding element then passes through the centre line of the spindle as a result of which the load on the mast element during unfolding and folding of the main arm is minimised.

[0008] Yet a further embodiment of the sunshade apparatus according to the invention is characterised in that the sunshade comprises a sunshade fabric as well as sunshade ribs which are connected to the sunshade fabric, while one of the sunshade ribs is coupled near one end to the main arm in such a way that the sunshade cannot turn and hinge relative to the main arm.

[0009] In order to keep the sunshade fabric taut, spring elements are located preferably between an end of the sunshade ribs and the sunshade fabric, which spring elements can expand and contract coaxially with the sunshade ribs.

[0010] The sunshade apparatus preferably further includes a base plate and the mast element is connected to the base plate hingeable around the horizontal axis. As a result the mast element can be lowered to the ground, so that it is simpler to install a module or exchange one.

[0011] The sunshade apparatus further preferably includes a ground tube which has a cylindrical hole, as well as a base connected to the mast element, which base is located in the ground tube and is pivotable around a vertical axis, so that the mast element can be turned together with the sunshade apparatus to compensate for changes in the position of the sun.

Brief description of the drawings.

[0012] The following description relating to the appended drawings, the whole given by way of non-limiting example of the sunshade apparatus according to the invention, will provide better understanding of how the invention can be realised, in which:

Fig. 1 shows an embodiment of the sunshade apparatus according to the invention;
Fig. 2 shows a detail of the sliding element of the sunshade apparatus;
Fig. 3 shows a mast of the sunshade apparatus comprising four mast elements;
Fig. 4 shows the mast shown in Fig. 3 with one module coupled thereto;
Fig. 5 shows the mast shown in Fig. 3 with four modules coupled thereto;

Fig. 6 shows a mast comprised of three mast elements fixed to a corner of a building;
Fig. 7 shows a mast element located in a corner of a building;
Fig. 8 shows the hingeable connection between mast and base plate;
Fig. 9 shows the mast in tilted position relative to the base plate;
Fig. 10 shows the pivotable coupling between mast and base;
Fig. 11 shows the end of a sunshade rib with a spring element in expanded position; and
Fig. 12 shows the end of the sunshade rib with a spring element in contracted position.

Detailed description of the drawings

[0013] Fig. 1 shows an embodiment of the sunshade apparatus according to the invention. The sunshade apparatus 1 has a mast 3 comprised of mast elements 5 with a shaft-shaped module 7 connected to the mast 3. The module is located in one of the receiving spaces which are found in the mast elements. To the module 7 is connected a main arm 9 which is connected with a first end 11 to the module 7 hingeable around a horizontal axis. Inside the module can slide a sliding element 13 to which an auxiliary arm 15 with an end 17 is hingeably connected. The other end 19 of the auxiliary arm 15 is hingeably connected to the main arm 9. The main arm is connected to the module at a distance from the upper end of the module 7 and the sliding element 13 is located above the link point of the main arm 9 and the module 7.

[0014] A sunshade 23 is suspended from the free, second end 21 of the main arm 9. The sunshade has a sunshade fabric (the sunshade fabric is not shown in Fig. 1 for clarity) and sunshade ribs 25 connected to the fabric. At an end of one of the sunshade ribs the rib is connected to the main arm 9 by means of a coupling element 27. This prevents the sunshade 23 from turning and hinging relative to the main arm.

[0015] Inside the module 7 there is a displacement mechanism for displacing the sliding element 13 in the module. The displacement mechanism has a rotary spindle 29 with which the sliding element cooperates. The spindle can be operated at the bottom 31. By moving the spindle 29 in the right direction the sliding element 13 moves downwards. As a result the main arm 9 is unfolded via the auxiliary arm 15. During the unfolding of the main arm the sunshade 23 will open. By turning the spindle 29 in the opposite direction the main arm 9 will be folded and the sunshade 23 will close.

[0016] The sunshade 23 opens automatically because a cable 33 is fixed with one end to the main arm 9 and with the other end to a sub-crown 35 to which the sunshade rib supports 37 are hingeably connected with one end. The other end of the sunshade rib supports 37 is hingeably connected to the sunshade ribs 25.

[0017] Fig. 2 shows a detail of the sliding element 13 of the sunshade apparatus. The hinge axis 39 of the end 17 of the auxiliary arm 15 with the sliding element 13 passes through the centre line of the spindle 29 as a result of which the load on the mast element is minimised during the unfolding and folding action of the main arms.

[0018] Fig. 3 shows a plan view of a mast 3 comprised of four mast elements 5 of the sunshade apparatus. Each mast element 5 is formed by a section having a centre portion and two side portions, the side portions being at right angles to each other. The mast elements 5 are detachably connected to each other and each have a receiving space 41. Fig. 4 shows the mast 3 with a module 7 in one of the receiving spaces 41, which module is connected to a respective mast element and Fig. 5 shows the mast 3 with a module 7 in each one of the receiving spaces 41.

[0019] In lieu of four mast elements the mast can also be comprised of fewer mast elements. Figs. 6 and 7 show two examples of this. Fig. 6 shows a mast 43 comprised of three mast elements 5, which mast is fixed to a corner of a building 45 and Fig. 7 shows a mast 47 comprised of one mast element 5, which mast is installed in a corner of a building 49.

[0020] A plate 51, which is connected to a base plate 53 and can hinge around a horizontal axis, is fixed to the bottom of the mast 3, see Fig. 8. The base plate 53 is mounted on a base 55 which is placed in the ground. As a result, the mast 3 can be lowered to the ground in order to simplify the fitting of a module or its exchange. Fig. 9 shows the mast 3 in tilted position.

[0021] The sunshade apparatus further includes a ground tube 57 which has a cylindrical hole, see Fig. 10. The base 55 is inserted in the ground tube 57 and is pivotable around a vertical axis. The mast 3 with the sunshades can thus be turned to follow the movements of the sun.

[0022] In order to keep the sunshade fabric taut, the free ends of the sunshade ribs have spring elements. Fig. 11 shows the free end of a sunshade rib 25 with a spring element in opened position. The spring element is comprised of a pin 59 which is slidable into and out of a hole in the sunshade rib, the pin 59 having a sphere 61 at the end as well as a helical spring 63. Fig. 12 shows the end of the sunshade rib 25 with the spring element in contracted position.

[0023] Albeit the invention has been described in the foregoing with reference to the drawings, it should be pointed out that the invention is not by any manner or means restricted to the embodiments shown in the drawings. The invention also extends over any embodiments deviating from the embodiments shown in the drawing Figures within the spirit and scope defined by the claims. For example, the mast may also be comprised of a single mast element with the mast element being formed by a star-shaped section. Alternatively, it is possible for one or more other modules in lieu of sunshade modules to be connected to the mast, such as for example modules with a tabletop, dustbin or sound box fixed to it.

Claims

1. A sunshade apparatus comprising:

   - a mast element,
   - a main arm which is coupled with a first end to the mast element hingeable around a horizontal axis,
   - an auxiliary arm which is hingeably coupled with a first end to the main arm,
   - a sliding element which, slideable along the mast element, is coupled to the mast element with which the auxiliary arm is hingeably coupled with a second end,
   - a displacement mechanism for displacing the sliding element relative to the mast element, and a sunshade which is connected to a second end of the main arm,

   characterised in that the mast element has a receiving space and the sunshade apparatus further includes a module which is present in the receiving space and is detachably connected to the mast element, while the first end of the main arm is hingeably connected to the module, the sliding element is coupled slidable to the module and the displacement mechanism is connected to the module.

2. A sunshade apparatus as claimed in claim 1, **characterised in that** the mast element includes at least one further receiving space and the sunshade apparatus comprises at least one further module which is present in the further receiving space and is detachably connected to the mast element.

3. A sunshade apparatus as claimed in claim 1, **characterised in that** the sunshade apparatus comprises at least one further mast element which is detachably connected to the mast element already present and **in that** the sunshade apparatus includes at least one further module which is detachably connected to the further mast element.

4. A sunshade apparatus as claimed in claim 1, 2 or 3, **characterised in that** the main arm is connected to the module at a distance from the upper end of the module and the sliding element is located above the link point of the main arm and the module.

5. A sunshade apparatus as claimed in any one of the preceding claims,
   characterised in that the displacement mechanism comprises a rotary spindle with which the sliding element cooperates.

6. A sunshade apparatus as claimed in any one of the preceding claims,
   characterised in that the sunshade comprises a sunshade fabric as well as sunshade ribs which are connected to the sunshade fabric, while one of the sunshade ribs is coupled near one end to the main arm in such a way that the sunshade cannot turn and hinge relative to the main arm.

7. A sunshade apparatus as claimed in claim 6, **characterised in that** spring elements are located between an end of a sunshade rib and the sunshade fabric, which spring elements can contract and expand coaxially with the sunshade ribs.

8. A sunshade apparatus as claimed in any one of the preceding claims,
   characterised in that the sunshade apparatus further includes a base plate and the mast element is connected to the base plate hingeable around the horizontal axis.

9. A sunshade apparatus as claimed in any one of the preceding claims,
   characterised in that the sunshade apparatus further includes a ground tube which has a cylindrical hole, as well as a base connected to the mast element, which base is located in the ground tube and is pivotable around a vertical axis.

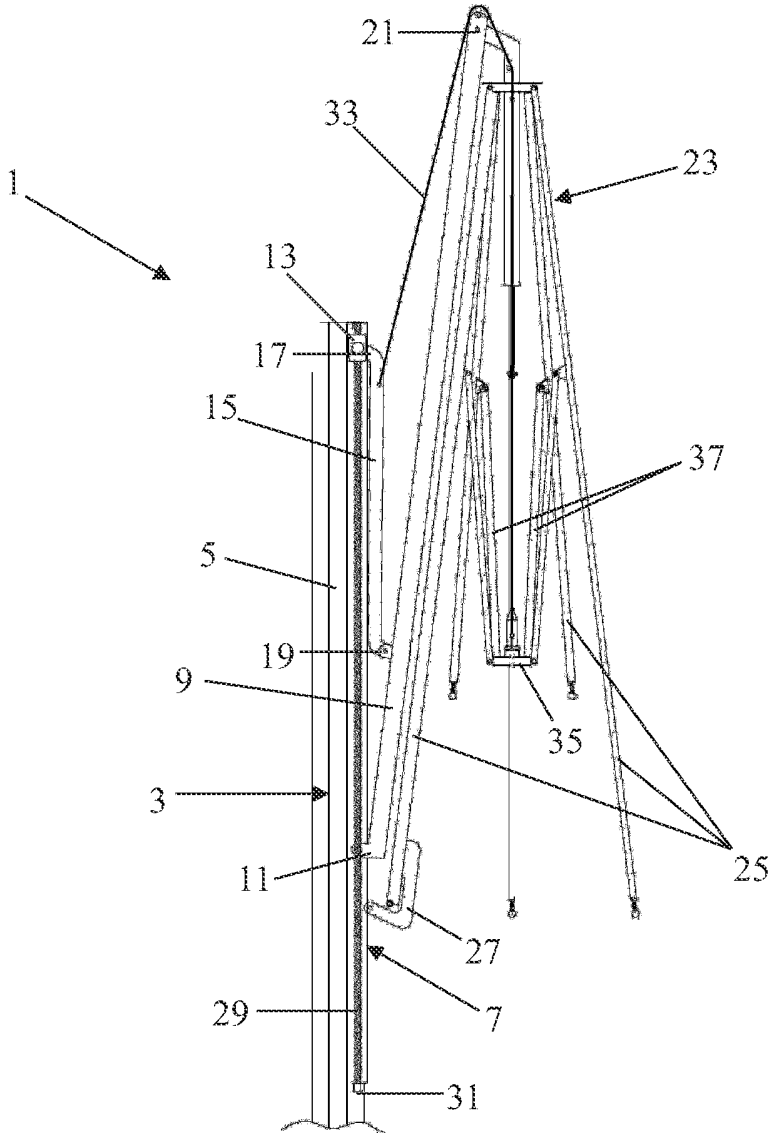

FIG. 1

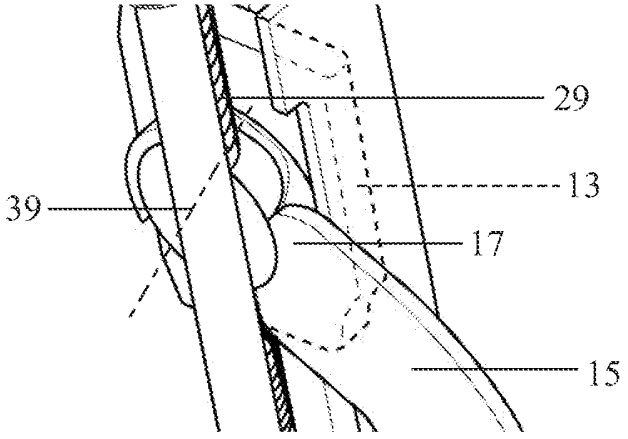

FIG. 2

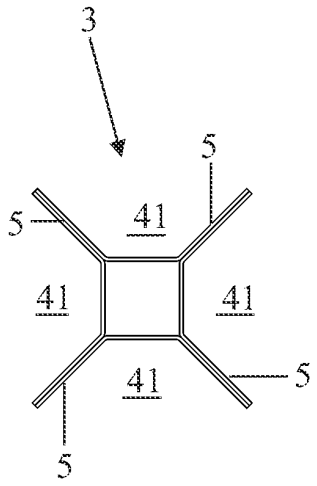

FIG. 3

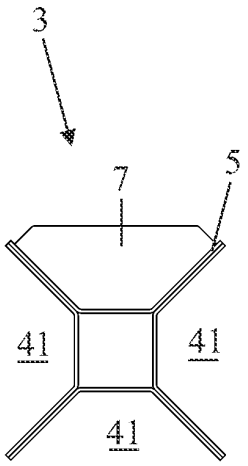

FIG. 4

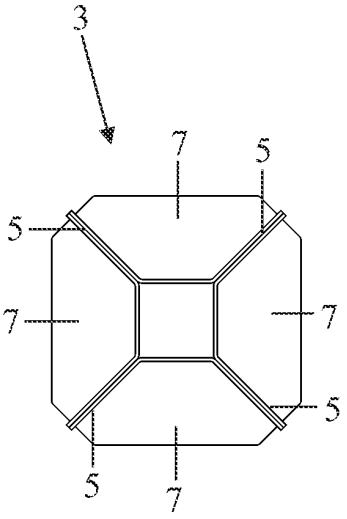

FIG. 5

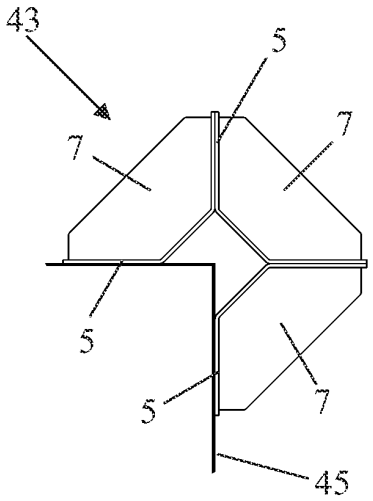

FIG. 6

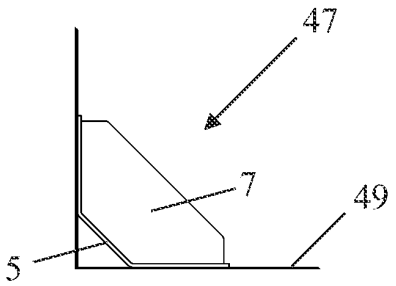

FIG. 7

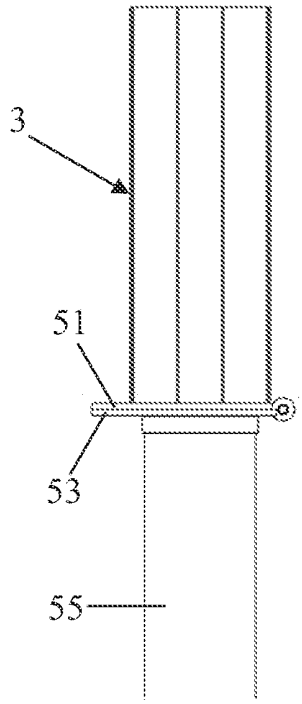

FIG. 8

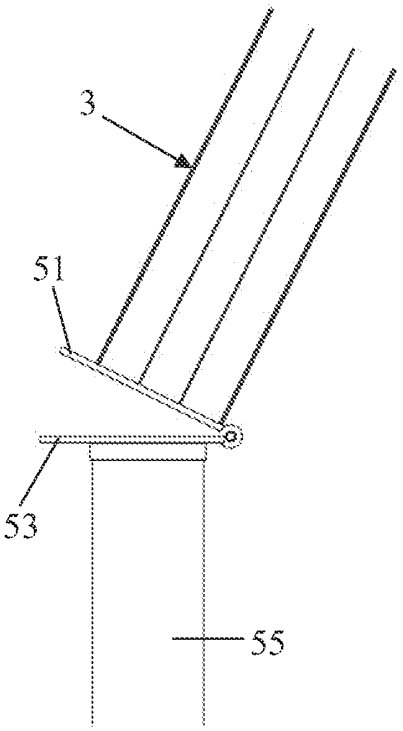

FIG. 9

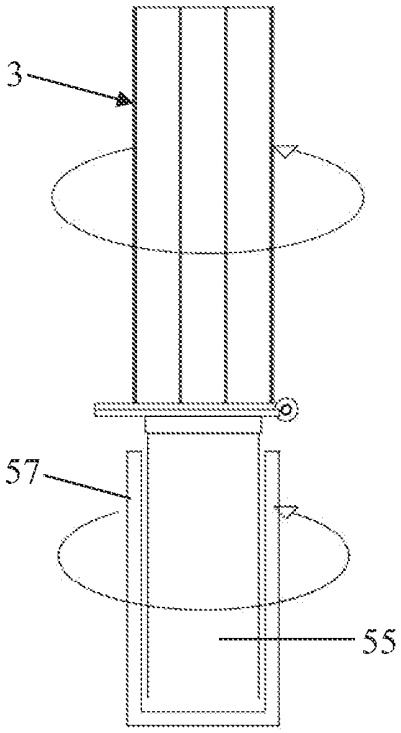

FIG. 10

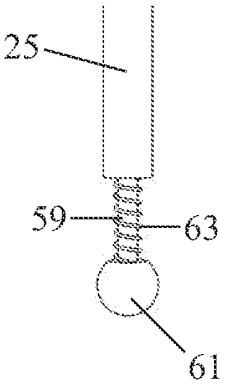

FIG. 11

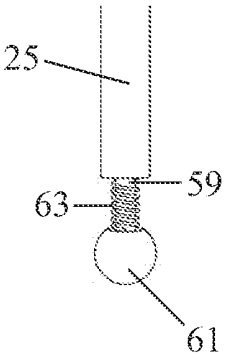

FIG. 12