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(54) **SCREEN INSTALLATION STRUCTURE AND TENT**

(57) A screen installation structure (80) being configured to mount a screen (5) to a tent, said structure (80) comprising a first mounting element (1), a first retractable component (3), a second retractable component (4) and a second mounting element (2). The first mounting element (1) is suitable to be mounted to the tent or forms a part of the tent. The first retractable component ((3) includes a rotatable first through-cloth tube (31) configured

to connect with one end of the screen (5). The second retractable component (4) is configured to connect with the opposing end of the screen (5), and the second mounting element (2) is configured to fit with the second retractable component (4). The second mounting element (2) is either suitable to be mounted to the tent or forms a part of the tent.

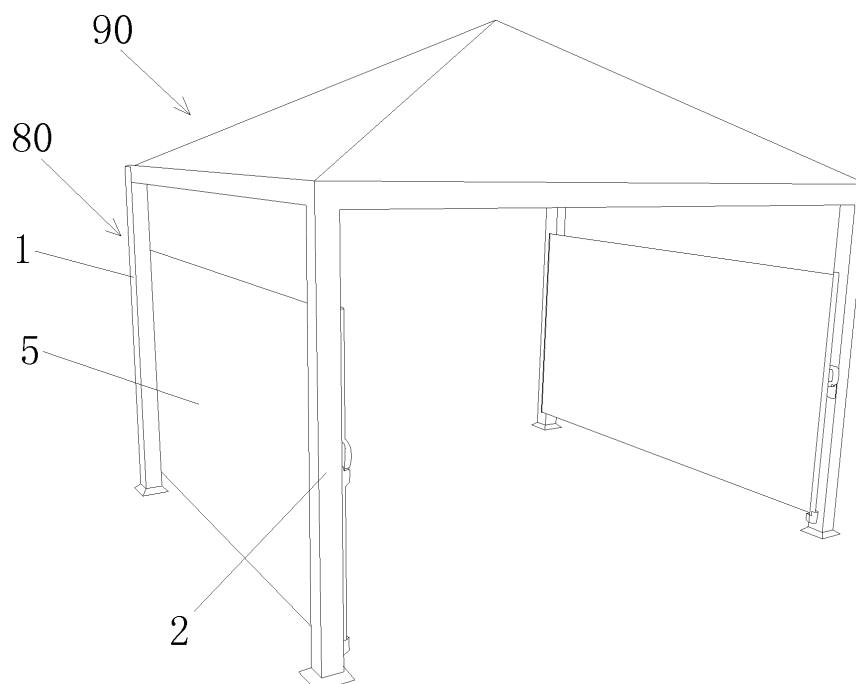


FIG. 14

Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to the tent element field, more particularly, relates to a screen installation structure and a tent.

Description of the Related Art

[0002] As a well performance of screen in shielding sun and wind, numerous applications of it appear in daily life. The traditional tent can't reach a sufficient comfort and privacy in using as limited by its structure and functions, and functions of screen can well compensate for this defect of the tent. However, the traditional screen cooperatively using with a tent is expensive, inconvenient, and occupies larger space while the two can't coexist well with each other.

BRIEF SUMMARY OF THE INVENTION

[0003] The objective of the present invention is to solve the above problem by providing a screen installation structure and a tent, and the screen installation structure can mount a screen on a tent properly with simple structure and convenience.

[0004] To achieve the above object, the present invention provides a screen installation structure configured to mount a screen to a tent. The screen installation structure includes a first mounting element, a first retractable component, a second retractable component, and a second mounting element. The first mounting element is mounted to the tent or is a part of the tent. The first retractable component is mounted in the first mounting element, and the first retractable component includes a rotatable first through-cloth tube configured to connect with one end of the screen. The second retractable component is configured to connect with other end of the screen for opening or collapsing the screen. The second mounting element is configured to fit with the second retractable component. The second mounting element is mounted to the tent or is a part of the tent. When the screen is opened, the second retractable component is anchored to the second mounting element, and when the screen is collapsed, the second retractable component abuts against one side of the first mounting element.

[0005] In one embodiment of the present invention, the first retractable component may further include a torsional spring, a first connecting part and a bearing. The torsional spring may be disposed in the first through-cloth tube and connected with the first through-cloth tube, the first connecting part may be connected with the torsional spring and the first mounting element, and the bearing may be connected with the first through-cloth tube and the first mounting element.

[0006] In one embodiment of the present invention, the first mounting element may include a first tube part, a first mounting part and a second mounting part. The first mounting part and the second mounting part may be disposed at two ends of the first tube part, respectively, the first mounting part may be connected with the first connecting part, the second mounting part may be connected with the bearing, and the first tube part may have a through hole for the screen to pass through.

[0007] In one embodiment of the present invention, the first mounting part may have a connecting hole and a connecting groove, the connecting hole may be connected with the first tube part, and the connecting groove may be connected with the first connecting part.

[0008] In one embodiment of the present invention, the second retractable component may include a second through-cloth tube and a handle component. The second through-cloth tube may be configured to connect with the screen, the handle component may be disposed at the through-cloth tube, the second mounting element may include a second tube part and a handle disposing part, the handle disposing part may be disposed at the second tube part, and the handle disposing part may be configured to be anchored by the handle component.

[0009] In one embodiment of the present invention, the second mounting element may further include a tube disposing part disposed at the second tube part, and the tube disposing part may have a tube receiving groove configured to fit with the second through-cloth tube.

[0010] In one embodiment of the present invention, the handle component may include a handle housing fixedly disposed at the second through-cloth tube, the handle housing may have an arm part, the handle disposing part may have a handle receiving groove, and the handle receiving groove may be configured to fit with the arm part.

[0011] In one embodiment of the present invention, the handle component may further include a grip, a spring and a locking element. The grip may be rotatably mounted at the handle housing, the spring may be connected with the grip and the handle housing, the locking element may be connected with the grip, the locking element and the spring may be located at two ends of the grip, respectively. The arm may have a fixing hole, the locking element may be corresponding to the fixing hole, and the handle disposing part may have a locking hole configured to fit with the locking element.

[0012] In one embodiment of the present invention, an inner side of the grip may be wave-shaped.

[0013] The present invention further provides a tent, and the tent includes the screen installation structure according to any one of the above embodiments.

[0014] Compared with the prior art, the present invention has the following beneficial effects:

[0015] In the screen installation structure and the tent of the present invention, it is a simple structure and convenient that the screen can be mounted on the tent only by connecting one end of the screen with the first through-cloth tube and the other end with the second retractable

component. The screen can be opened by anchoring the second retractable component to the second mounting element through drawing the second retractable component, which is very convenient for shielding wind and light. Removing the second retractable component from the second mounting element, rotating the first through-cloth tube allows the screen to scroll around the first through-cloth tube and the second retractable component to abut well against one side of the first mounting element, and then the screen can be collapsed, as the screen installation structure occupies very small space when the screen is collapsed, the screen can be used well in combination with the tent, so that low comfort and privacy of the tent may be compensated and it is ready to promote for using widely.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

FIG. 1 is a structural schematic illustration of a screen installation structure according to one embodiment of the present invention, wherein a screen is mounted at the screen installation structure and the screen is opened;

FIG. 2 is a schematic illustration of the screen being collapsed according to the embodiment shown in FIG. 1;

FIG. 3 is a structural schematic illustration of a first mounting element according to one embodiment of the screen installation structure of the present invention;

FIG. 4 is a structural schematic illustration of a first mounting part of the first mounting element according to one embodiment of the screen installation structure of the present invention;

FIG. 5 is a structural schematic illustration of a first retractable component according to one embodiment of the screen installation structure of the present invention;

FIG. 6 is a structural schematic illustration of a second retractable component according to one embodiment of the screen installation structure of the present invention;

FIG. 7 is a cross-section illustration of a handle component according to one embodiment of the screen installation structure of the present invention;

FIG. 8 is a structural schematic illustration of a second tube part of a second mounting element according to one embodiment of the screen installation structure of the present invention;

FIG. 9 is a structural schematic illustration of a handle disposing part of the second mounting element according to one embodiment of the screen installation structure of the present invention;

FIG. 10 is a structural schematic illustration of a tube disposing part of the second mounting element according to one embodiment of the screen installation structure in the present invention;

FIG. 11 is a view illustrating a state when inserting an arm of a handle housing into the handle receiving groove according to one embodiment of the screen installation structure of the present invention;

FIG. 12 is a view illustrating a state when extracting the arm of the handle housing from the handle receiving groove according to the screen installation structure of the present invention;

FIG. 13 is a view illustrating a state when inserting a second through-cloth tube into a tube receiving groove according to one embodiment of the screen installation structure of the present invention; and

FIG. 14 is a structural schematic illustration of a tent according to one embodiment of the present invention.

30 DETAILED DESCRIPTION OF THE INVENTION

[0017] The present invention is clearly and completely described below with reference to the accompanying drawings through embodiments.

35 [0018] With reference to FIG. 1, FIG. 2 and FIG. 5, the present invention provides a screen installation structure 80 configured to mount a screen 5 to a tent 90. The screen 5 required to be mounted is a screen that is ready to be wound, such as cloth screen. The screen installation structure 80 includes a first mounting element 1, a first retractable component 3, a second retractable 4, and a second mounting element 2.

40 [0019] The first mounting element 1 is mounted to the tent 90 or is a part of the tent 90. As shown in FIG. 14, the first mounting element 1 is a part of the tent 90. The first retractable component 3 is mounted in the first mounting element 1. The first retractable component 3 includes a rotatable first through-cloth tube 31 configured to connect with one end of the screen 5. The second retractable component 4 is configured to connect with other end of the screen 5 for opening or collapsing the screen 5. The second mounting element 2 is configured to fit with the second retractable component 4, and the second mounting element 2 is mounted to the tent 90 or is a part of the tent 90. When the screen 5 is opened, the second retractable component 4 is anchored to the second mounting element 2, and when the screen 5 is collapsed, the second retractable component 4 abuts

against one side of the first mounting element 1.

[0020] In the screen installation structure 80 of the present invention, it is a simple structure and convenient that the screen 5 can be mounted on the tent 90 only by connecting one end of the screen 5 with the first through-cloth tube 31 and the other end with the second retractable component 4. The screen 5 can be opened by anchoring the second retractable component 4 to the second mounting element 2 through drawing the second retractable component 4, which is very convenient for shielding wind and light. Removing the second retractable component 4 from the second mounting element 2, rotating the first through-cloth tube 31 allows the screen 5 to scroll around the first through-cloth tube 31 and the second retractable component 4 to abut against one side of the first mounting element 1, and then the screen 5 can be collapsed, as the screen installation structure 80 occupies very small space when the screen 5 is collapsed, the screen 5 can be used well in combination with the tent 90, so that low comfort and privacy of the tent 10 may be compensated and it is ready to promote for using widely.

[0021] In one embodiment, both the first mounting element 1 and second mounting element 2 are foot poles of the tent 90, the invention is not limited thereto, both the first mounting element 1 and second mounting element 2 may be mounted independently from elements of the tent 90 at the foot poles of the tent 90 by screws. After the screen 5 is collapsed, the screen 5 may be retractably within 360°, i.e. the first mounting element 1 and second mounting element 2 are not limited to positions in FIG. 1 and FIG. 14 as long as the first mounting element 1 and the second mounting element 2 are two parallel pillars.

[0022] With reference to FIG. 5, in one embodiment, the first retractable component 3 further includes a torsional spring 32, a first connecting part 33 and a bearing 34. The torsional spring 32 is disposed in the first through-cloth tube 31 and connected with the first through-cloth tube 31 to allow the torsional spring 32 and the first through-cloth tube 31 to rotate simultaneously. The first connecting part 33 connects with the torsional spring 32 and the first mounting element 1. The bearing 34 connects the first through-cloth tube 31 and the first mounting element 1, the arrangement of the bearing 34 may allow the first through-cloth tube 31 to rotate more smoothly. The elasticity and torsion of the torsional spring 32 ensure that a force F opposing the rotating direction of the first through-cloth tube 31 may exist when the first through-cloth tube 31 is driven to rotate by pulling the screen 5. Force F generated by the torsional spring 32 upon exerting a force F1 that pulls the screen 5 onto the second retractable component 4 may allow the opened screen 5 to be tightened. Opposing force F generated by the torsional spring 32 upon cancelling F1 that pulls the screen 5 may drive the first through-cloth tube 31 to rotate in a direction opposing to the pulling direction of the screen 5, and then the opened screen 5 is collapsed au-

tomatically, this makes an extreme convenience.

[0023] With reference to FIGs. 2-4, the first mounting 1 includes a first tube part 11, a first mounting part 12 and a second mounting part 13. The first mounting part 12 and the second mounting part 13 are disposed at two ends of the first tube part 11, respectively. The first mounting part 12 is connected with the first connecting part 33. The first mounting part 12 has a connecting hole 121 and a connecting groove 122, the connecting hole 121 is connected with the first tube part 11 by screws, and the connecting groove 122 is connected with the first connecting part 33. The first mounting part 12 has a simple configuration and firm component. The second mounting part 13 is connected with the bearing 34. The bearing 34 has an outer ring rotatably correspondingly with an inner ring, the second mounting part 13 is connected with the outer ring of the bearing 34, the first through-cloth tube 31 is connected with the inner ring of the bearing 34, the rolling connection between the outer ring and the inner ring by a ball may reduce the frictional resistance, allow the relative rotation between the outer ring and the inner ring to be more smooth, so that the first through-cloth tube 31 may rotate smoothly. Suitable bearing is known in the art. The first tube part 11 has a through hole 111 for the screen 5 to pass through, so that the screen 5 may be winded to be received into the first tube part 11, and may protrude the first tube part 11 through the through hole 111.

[0024] With reference to FIG. 6, the second retractable component 4 includes a second through-cloth tube 41 and a handle component 42, the second through-cloth tube 41 is configured to connect with the screen 5, the handle component 42 is disposed at the through-cloth tube to be held by hands. A size of the second through-cloth tube 41 is larger than a size of the through hole 111 of the first tube part 11, this makes sure that the second through-cloth tube 41 may not be pulled into the first tube part 11 due to the force when the first through-cloth tube 31 is driven by the force F generated by the torsional spring 32 to rotate in a direction opposing to the pulling direction of the screen 5, as shown in FIG. 2, the second through-cloth tube 41 abuts against one side of the first tube part 11.

[0025] With reference to FIG. 1, FIG. 8, and FIG. 9, the second mounting element 2 includes a second tube part 21 and a handle disposing part 22. The handle disposing part 22 is disposed at the second tube part 21, and the handle disposing part 22 is configured to be anchored by the handle component 42. When the screen 5 needs to be used, the screen 5 may be opened and fixed by holding the handle component 42 and anchoring the handle component 42 to the handle disposing part 22. In the present embodiment, the handle disposing part 22 and the second tube part 21 are respectively provided with cooperative mounting holes, the handle disposing part 22 is mounted to the second tube part 21 by screws.

[0026] With reference to FIG. 1, FIG. 8, and FIG. 10, the second mounting element 2 further includes a tube

disposing part 23 disposed at the second tube part 21, and the tube disposing part 23 has a tube receiving groove 231 configured to fit with the second through-cloth tube 41. When the screen 5 is opened, inserting a bottom end of the second through-cloth tube 41 into the tube receiving groove 231 may properly anchor the second retractable component 4 to the second mounting element 2. In the present embodiment, the handle disposing part 23 and the second tube part 21 are respectively provided with cooperative mounting holes, the handle disposing part 23 is mounted to the second tube part 21 by screws.

[0027] With reference to FIG. 7 and FIG. 9, the handle component 42 includes a handle housing 421, and the handle housing 421 is fixedly disposed at the second through-cloth tube 41. The handle housing 421 has an arm part 422. The handle disposing part 22 has a handle receiving groove 221 configured to fit with the arm part 422. When in use, it is very convenient for anchoring the second retractable component 4 to the second mounting element 2 only by inserting the arm part 422 into the handle receiving groove 221.

[0028] The handle component 42 further includes a grip 423, a spring 424 and a locking element 425. The grip 423 is rotatably mounted at the handle housing 421. The spring 424 is connected with the grip 423 and the handle housing 421. The locking element 425 is connected with the grip 423. The locking element 425 and spring 424 are located at two ends of the grip 423, respectively. The arm part 422 has a fixing hole 402, and the locking element 425 is corresponding to the fixing hole 402. The locking element 425 is protruded from the fixing hole 402 when no force is exerted onto the grip 423. Pressing the grip 423, the grip 423 rotating around a pivot point drives the locking element 425 to retract into the fixing hole 402. The handle disposing part 22 has a locking hole 202, the locking hole 202 is configured to fit with the locking element 425 for properly securing the handle component 42. An inner side of the grip 423 is wave-shaped to be ready to hold.

[0029] When the screen 5 is needed to use, pulling the grip 423 to the second mounting element 2 by exerting a force horizontally, placing the arm part 422 of the handle housing 421 and the second through-cloth tube 41 into the handle receiving groove 221 and the tube receiving groove 231, as shown in FIG. 11 and FIG. 13. The locking element 425 snapping into the locking hole 202 achieves the goal in securing completely the arm part 422 of the handle housing 421. The pulling force generated by the first retractable component 3 on the screen 5 allows the screen 5 to be hang smoothly between the first mounting element 1 and the second mounting element 2, as shown in FIG. 1. With reference to FIG. 1 and FIG. 12, when the opened screen 5 needs to be collapsed, firstly a force F2 in FIG. 12 is desirable to be exerted on the grip 423 to drive the locking element 425 away from the locking hole 202 for releasing the arm part 422 from being locked, and then a force F3 is exerted upward to drive the arm part 422 and the second through-cloth tube 41 away from

the hand receiving groove 221 and the tube receiving groove 231.

[0030] Moreover, the present invention further provides a tent 90 including the above screen installation structure 80, as shown in FIG. 14, the screen 5 can be well used in combination with the tent 90 through the screen installation structure 80 for solving the problems of the tent in low comfort, low privacy and low wind- and light-shielding capability.

[0031] Although the present invention has been described in considerable detail with reference to certain preferred embodiments thereof, the disclosure is not for limiting the scope of the invention. Persons having ordinary skill in the art may make various modifications and changes without departing from the scope and spirit of the invention. Therefore, the scope of the appended claims should not be limited to the description of the preferred embodiments described above.

Claims

1. A screen installation structure, configured to mount a screen to a tent the screen installation structure comprising:

a first mounting element, mounted to the tent or is a part of the tent;

a first retractable component, mounted in the first mounting element, the first retractable component comprising a rotatable first through-cloth tube configured to connect with one end of the screen;

a second retractable component, configured to connect with other end of the screen for opening or collapsing the screen; and

a second mounting element, configured to fit with the second retractable component, wherein the second mounting element is mounted to the tent or is a part of the tent;

when the screen is opened, the second retractable component is anchored to the second mounting element, and when the screen is collapsed, the second retractable component abuts against one side of the first mounting element.

2. The screen installation structure according to claim 1, wherein the first retractable component further comprises a torsional spring, a first connecting part and a bearing, the torsional spring is disposed in the first through-cloth tube and connected with the first through-cloth tube, the first connecting part is connected with the torsional spring and the first mounting element, and the bearing is connected with the first through-cloth tube and the first mounting element.

3. The screen installation structure according to claim

- 2, wherein the first mounting element comprises a first tube part, a first mounting part and a second mounting part, the first mounting part and the second mounting part are disposed at two ends of the first tube part, respectively, the first mounting part is connected with the first connecting part, the second mounting part is connected with the bearing, and the first tube part has a through hole for the screen to pass through.
4. The screen installation structure according to claim 3, wherein the first mounting part has a connecting hole and a connecting groove, the connecting hole is connected with the first tube part, and the connecting groove is connected with the first connecting part.
5. The screen installation structure according to claim 1, wherein the second retractable component comprises a second through-cloth tube and a handle component, the second through-cloth tube is configured to connect with the screen, the handle component is disposed at the through-cloth tube, the second mounting element comprises a second tube part and a handle disposing part, the handle disposing part is disposed at the second tube part, and the handle disposing part is configured to be anchored by the handle component.
6. The screen installation structure according to claim 5, wherein the second mounting element further comprises a tube disposing part disposed at the second tube part, and the tube disposing part has a tube receiving groove configured to fit with the second through-cloth tube.
7. The screen installation structure according to claim 5, wherein the handle component comprises a handle housing fixedly disposed at the second through-cloth tube, the handle housing has an arm part, the handle disposing part has a handle receiving groove, and the handle receiving groove is configured to fit with the arm part.
8. The screen installation structure according to claim 7, wherein the handle component further comprises a grip, a spring and a locking element, the grip is rotatably mounted at the handle housing, the spring is connected with the grip and the handle housing, the locking element is connected with the grip, the locking element and the spring are located at two ends of the grip, respectively, the arm part has a fixing hole, the locking element is corresponding to the fixing hole, and the handle disposing part has a locking hole configured to fit with the locking element.
9. The screen installation structure according to claim 8, wherein an inner side of the grip is wave-shaped.
10. A tent comprising the screen installation structure according to claim 1.

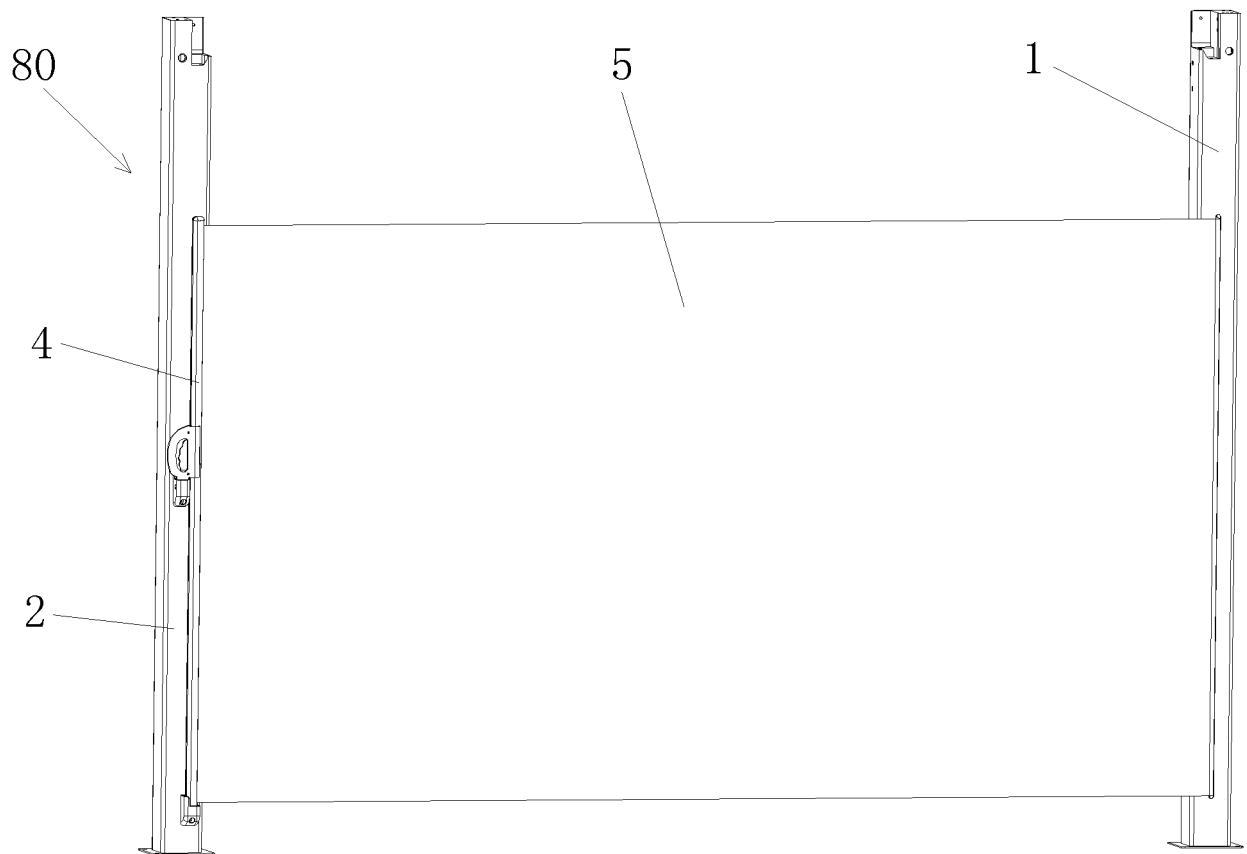


FIG. 1

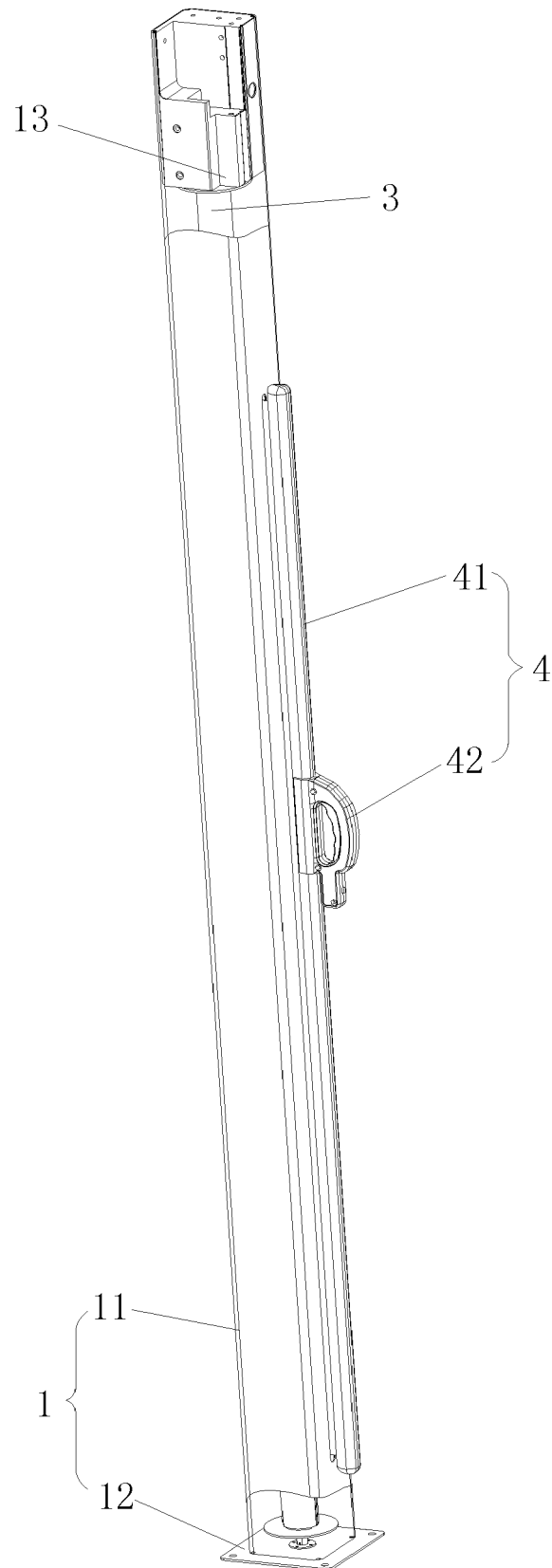


FIG. 2

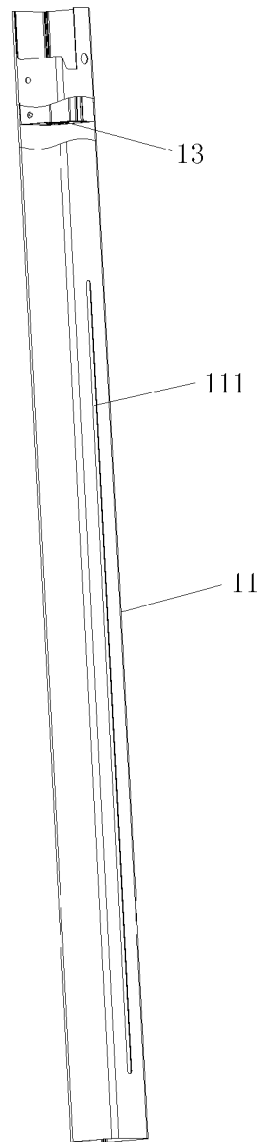


FIG. 3

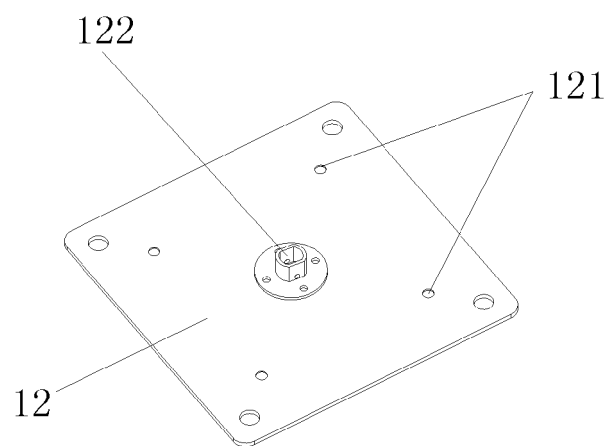


FIG. 4

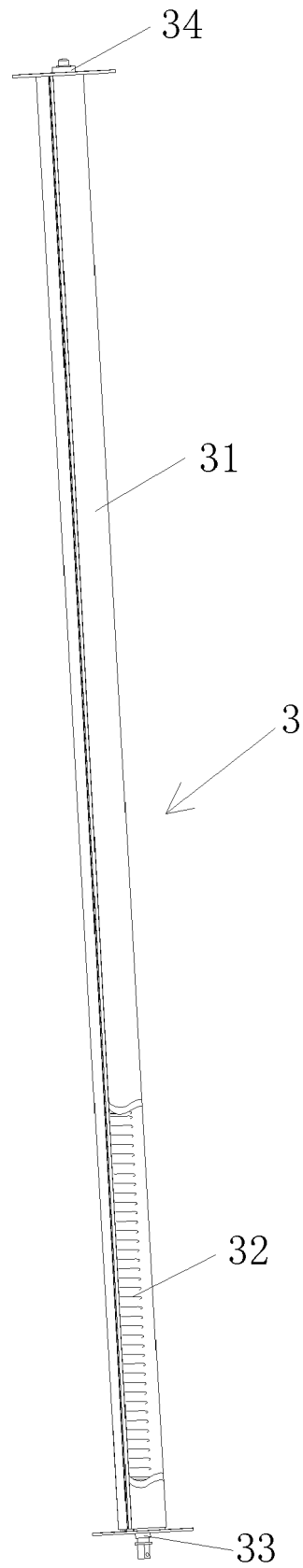


FIG. 5

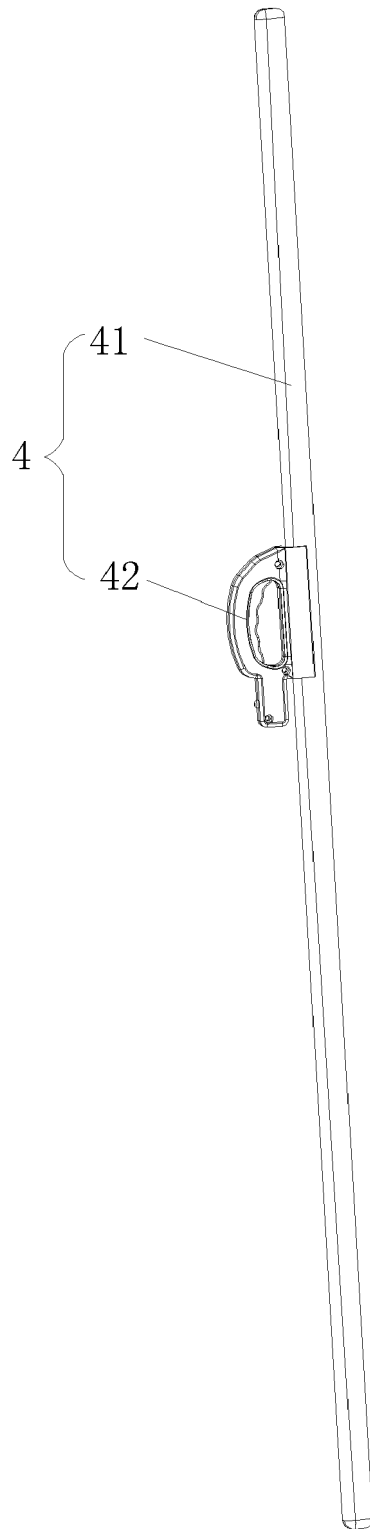


FIG. 6

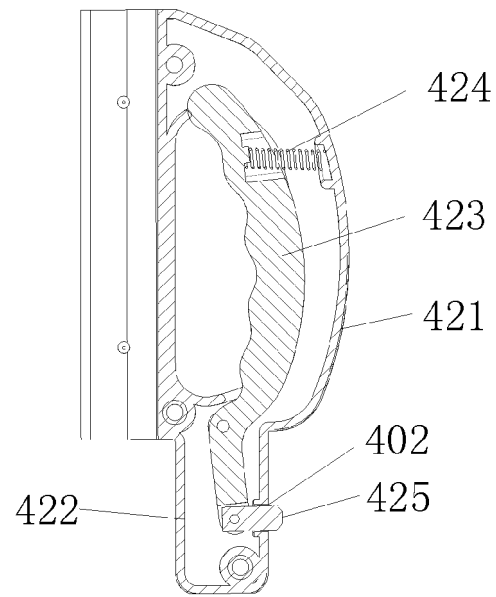


FIG. 7



FIG. 8

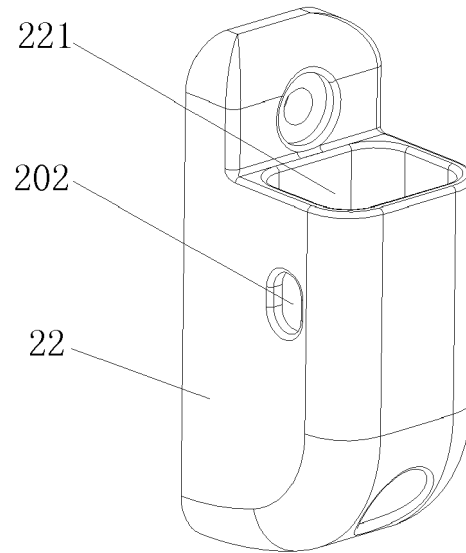


FIG. 9

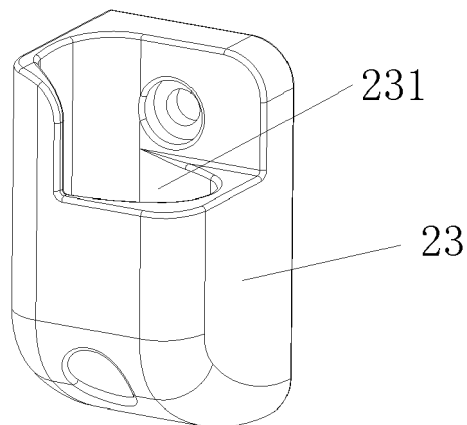


FIG. 10

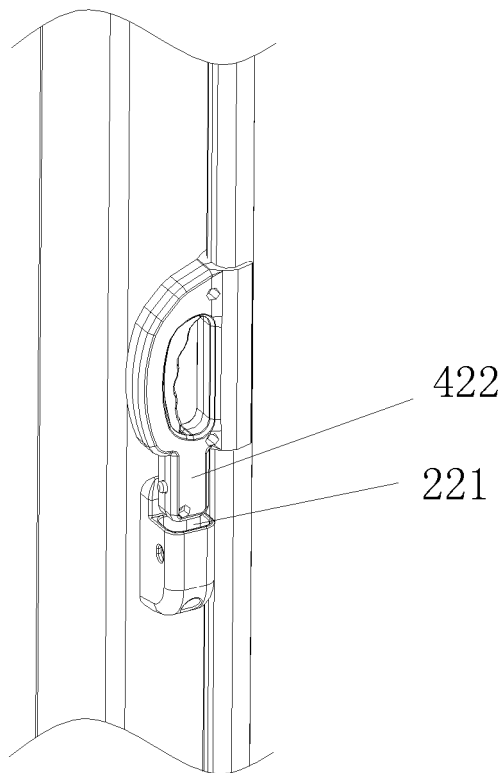


FIG. 11

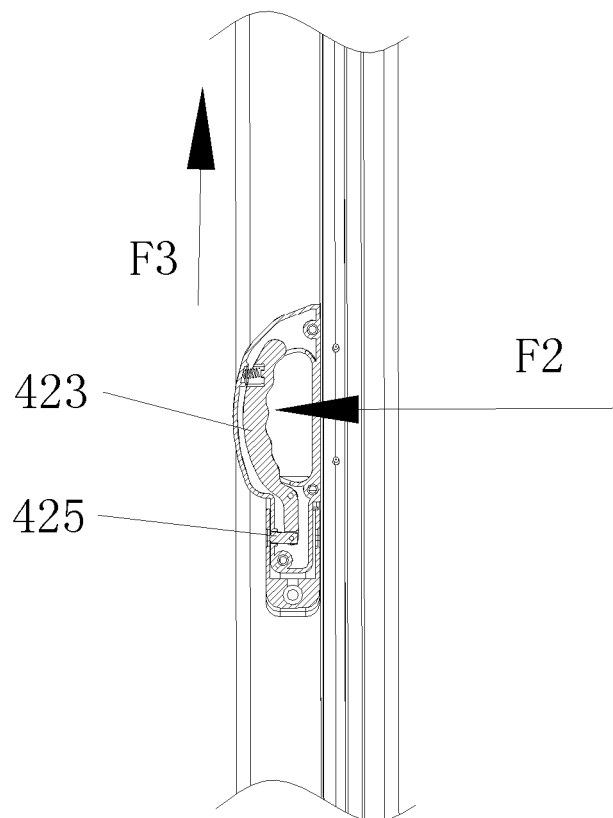


FIG. 12

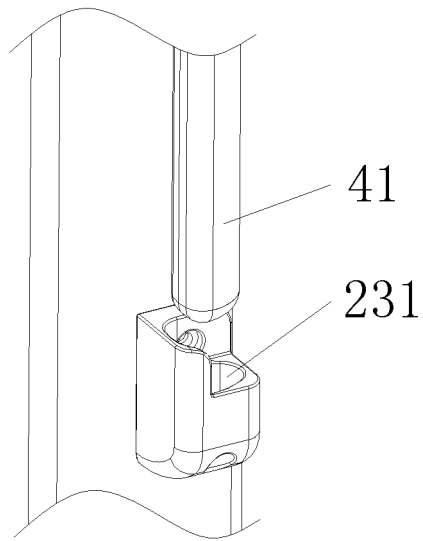


FIG. 13

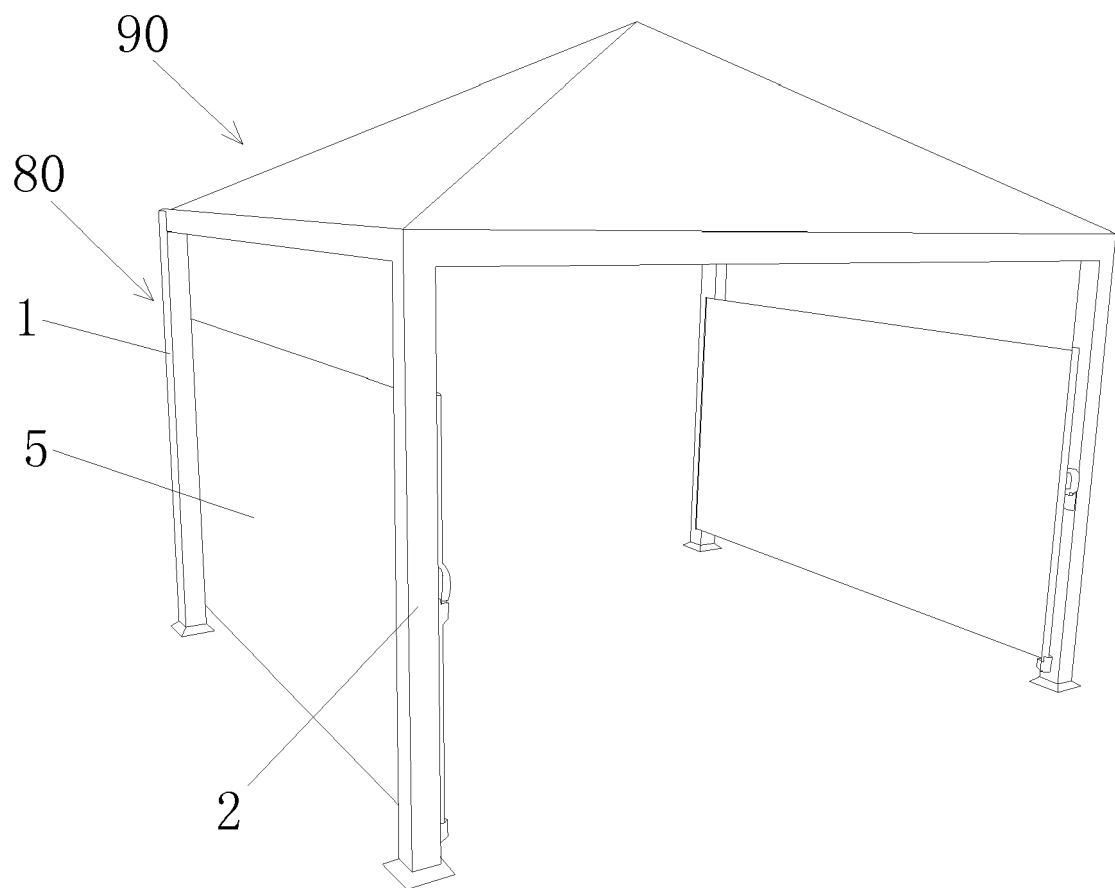


FIG. 14



EUROPEAN SEARCH REPORT

Application Number
EP 18 15 2950

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			E04H E04F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 June 2018	Examiner Decker, Robert
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EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 18 15 2950

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07-06-2018

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82