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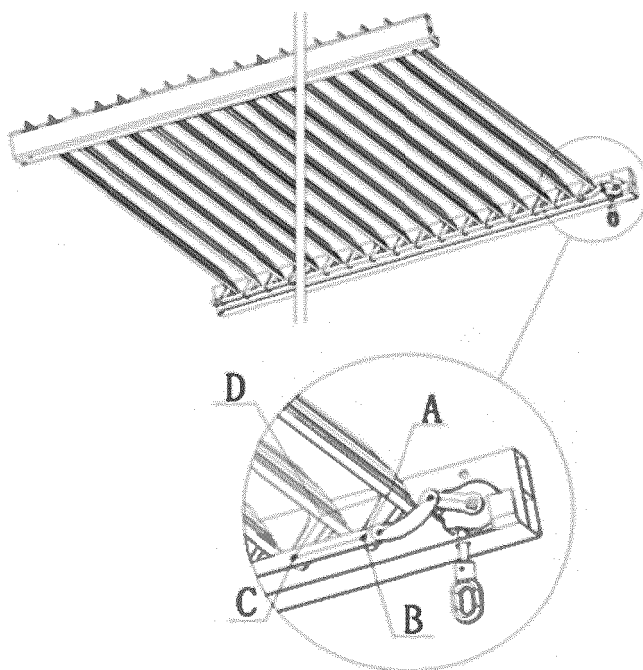
This application was filed on 18-08-2020 as a divisional application to the application mentioned under INID code 62.

(54) **ALUMINUM LOUVER IN THE WALL OF A TENT**

(57) The invention relates to an opening and closing structure (louver) in the ceiling of a tent, comprising louver blades (1) located in a frame, wherein said louver blades

(1) can be rotated by means of a worm mechanism relative to said frame and can be installed or disassembled at will.

Fig. 16



Description

[0001] The invention relates to a demountable louver in the wall of a tent, including a rotation transmission structure and a complete draining system.

Background

[0002] With the rapid economic developments and the improved standards of living, people have higher expectations regarding the living quality. The use of tents is becoming more common and frequent in the field of entertainment and pleasure.

[0003] Currently there are various types of tents on the market, which can be categorized into several groups according to their style, size, material and color. Different kinds of tents differ in their applications. However, most of the tents have a fixed ceiling, made of cloth, metal material, solar panels, etc. These can only achieve either sun shading or sun bathing mode, they do not allow the users to adjust the sunlight as they wish in order to enjoy the sunshine and to feel the weather. A ceiling made of cloth will be damaged after a certain period, this affects the tent's appearance and accordingly impairs the ambience people wish to enjoy outside. Currently, most metal ceilings cannot be opened, and the appearances are not flexible at all, this causes trouble in enjoying the sunshine and is bad for ventilation.

Detailed description

[0004] In the context of the present specification, the term "louver" relates to an opening and closing structure in the ceiling of a tent.

[0005] An opening and closing structure (louver) in the ceiling of a tent is provided. The louver comprises louver blades (1), a ring beam one (2), blade fasteners (3), a connecting device one (4), a connecting device two (5), a connecting long strip one (6), a turbine shaft device (7), a ring beam two (8), and a connecting long strip two (9). The blade fasteners (3) are connected with said connecting long strip one (6) and said ring beam one (2). One end of said connecting device one (4) is connected to said connecting long strip one (6), the other end is connected to said connecting device two (5). Said turbine shaft device (7) is fixed to said ring beam one (2). One end of said connecting device two (5) is fixed to the worm shaft (7a). Said blade fasteners (3) are connected to said ring beam two (8) and said connecting long strip two (9). Both ends of each louver blade (1) are fixed to said blade fastener (3) of said ring beam one (2) and said blade fastener (3) of said ring beam two (8). Said louver blades (1) can rotate with a certain degree to said ring beam (2) and can be installed or disassembled at will. The louver comprises a draining system.

[0006] In certain embodiments, the louver blade (1) comprises a barb one (1a) and a barb two (1b).

[0007] In certain embodiments, the blade fastener (3)

is L shaped or T shaped. The blade fastener (3) comprises one side comprising a barb one (3a) and a barb two (3b) that coordinate with said louver blade (1). The blade fastener (3) further comprises a hole one (3c) that coordinates with said ring beam one (2) or said ring beam two (8). The blade fastener (3) further comprises another side comprising a hole two (3d) that coordinates with said connecting long strip one (6) or said connecting long strip two (9). The backside of said barb two (3b) comprises a trigger (3e).

[0008] In certain embodiments, the ring beam one (2) comprises a number of evenly arranged holes one (2a) that coordinate with said blade fasteners (3) and holes two (2b) that coordinate with the turbine shaft device (7).

[0009] In certain embodiments, both ends of said connecting device one (4) comprise a hole one (4a) that coordinates with said connecting long strip one (6) and a hole two (4b) that coordinates with said connecting device two (5).

[0010] In certain embodiments, one end of said connecting device two (5) comprises a hole one (5a) that coordinates with a worm shaft (7a) and the other end of said connecting device two (5) comprises a hole two (5b) that coordinates with said connecting device one (4). In certain embodiments, hole one (5a) is square shaped. In certain embodiments, hole one is non-round shaped.

[0011] In certain embodiments, the connecting long strip one (6) comprises a hole one (6a) that coordinates with said connecting device one (4) and a number of evenly arranged holes two (6b) that coordinate with said blade fasteners (3).

[0012] In certain embodiments, the turbine shaft device (7) comprises a hole one (7b) that coordinates with said worm shaft (7a) and said ring beam one (2). In certain embodiments, the head of said worm shaft (7a) is square shaped. In certain embodiments, the head of said worm shaft (7a) non-round shaped.

[0013] In certain embodiments, the ring beam two (8) comprises a number of evenly arranged holes one (8a) that coordinate with said blade fasteners (3).

[0014] In certain embodiments, the connecting long strip two (9) comprises a number of evenly arranged holes one (9a) that coordinate with said blade fasteners (3).

[0015] In certain embodiments, the louver is designed to prevent rain water from getting inside the tent when said louver blades (1) are closed.

[0016] In certain embodiments, the louver blades (1) comprise a water groove (1c) and a water shield (1d), wherein said water shield (1d) is placed in the middle of said water groove (1c) of said front louver blade (1) when said louver blades (1) are closed.

[0017] In certain embodiments, the ring beam one (2) and the ring beam two (8) comprise water grooves (2c and 8b).

[0018] This utility model relates to a unique aluminium louver against the wall of a tent, its appearance is beautiful. The ceiling of the tent uses a louver structure, the

louver blade (1) can be opened and closed at will, its installation and disassembly is very easy. In addition, this utility model possesses a special draining system.

[0019] In certain embodiments, the opening and closing structure (louver) of a tent is provided. It comprises a tent's installation and disassemble structure of its ceiling, as well as a tent's draining system, the louver blade (1) on the top of the louver tent can rotate with a certain degree to the ring beam (2) and a fixed structure, and every louver blade (1) at the top of the louver tent can be installed or disassembled at will, in addition the draining system on top of the louver tent; it includes louver blade (1), ring beam one (2), blade fastener (3), connecting device one (4), connecting device two (5), connecting long strip one (6), turbine shaft device (7), ring beam two (8), connecting long strip two (9). Its special features are as follows: a number of the described blade fastener (3), each blade fastener (3) are respectively connected with connecting long strip one (6) and ring beam one (2); The described connecting device one's (4) one end is connected to the connecting long strip one (6), another end is connected to the connecting device two (5); the described turbine shaft device (7) is fixed to the ring beam one (2); the described connecting device two's (5) one end is fixed to the worm shaft (7a); a number of the described blade fastener (3), each blade fastener (3) is respectively connected to the ring beam two (8) and connecting long strip two (9); a number of the described louver blade (1), each louver blade's (1) both ends are respectively fixed to the ring beam one's (2) blade fastener (3) and ring beam two's (8) blade fastener (3).

[0020] This utility model's appearance possesses a unique style, it is original but simple.

[0021] In certain embodiments, the described louver blade (1) possesses barb one (1a) and a barb two (1b).

[0022] In certain embodiments, the described blade fastener (3) is L shaped or T shaped, one of the side possesses barb one (3a) and barb two (3b) that coordinates with the louver blade (1) and the described blade fastener (3) possesses a hole one (3c) that coordinates with ring beam one (2) or ring beam two (8). Furthermore, the described blade fastener's (3) another side possesses hole two (3d) that coordinates with connecting long strip one (6) or connecting long strip two (9), the described barb two's (3b) backside possesses trigger (3e).

[0023] In certain embodiments, the described ring beam one (2) possesses a number of evenly arranged hole one (2a) that coordinate with blade fastener (3) and hole two (2b) that coordinate with turbine shaft device (7).

[0024] In certain embodiments, the described connecting device one's (4) both ends respectively possess hole one (4a) that coordinates with connecting long strip one (6) and hole two (4b) that coordinates with connecting device two (5).

[0025] In certain embodiments, the described connecting device two's (5) one end possesses hole one (5a) that coordinates with worm shaft (7a), another end possesses hole two (5b) that coordinates with connecting

device one (4), hole one (5a) is square shaped hole or non-round shaped hole.

[0026] In certain embodiments, the described connecting long strip one (6) possesses hole one (6a) that coordinates with connecting device one (4) and a number of evenly arranged hole two (6b) that coordinates with blade fastener (3).

[0027] In certain embodiments, the described turbine shaft device (7) possesses hole one (7b) that coordinates with worm shaft (7a) and ring beam one (2), the head of worm shaft (7a) are square shaped or non-round shaped.

[0028] In certain embodiments, the ring beam two (8) possesses a number of evenly arranged hole one (8a) that coordinates with blade fastener (3).

[0029] In certain embodiments, the described connecting long strip two (9) possesses a number of evenly arranged hole one (9a) that coordinates with blade fastener (3).

[0030] In certain embodiments, when a number of louver blade (1) located on the described tent top are closed, it can prevent water from getting inside the tent while raining and it will lead the water to the side, then it will flow out through ring beam one (2) and ring beam two (8) located on both sides.

[0031] In certain embodiments, the described louver blade (1) possesses water groove (1c) and water shield (1d). When a number of louver blade (1) are closed, the back louver blade's (1) water shield (1d) is placed in the middle of the front louver blade's (1) water groove (1c).

[0032] In certain embodiments, the described ring beam one (2) and ring beam two (8) possess water groove (2c and 8b).

[0033] The tent's louver blade (1) at the top can be opened and closed through a turbine shaft device (7), blade fasteners (3) and the connecting device that connects them. The user can rotate the handle to control the closing and opening of the louver blade (1).

[0034] The tent's louver blade's (1) installation is achieved through two sets of barb that coordinate with the louver blade (1) and the blade fasteners (3), the louver blade (1) and blade fasteners (3) connect on one end, and it is easy to connect them on the other end. The louver blade's (1) disassembly is achieved through installing a trigger on one of the blade fasteners (3). Pulling the trigger can disconnect the louver blade (1) and blade fastener (3).

[0035] The tent's louver blade (1) can make the water between the louver blade (1) flow to the ring beam one (2) or ring beam two (8) on the side when it is closed, then the water flows out of the water groove located at both ends of the ring beam one (2) or ring beam two (8), this forms a complete draining system.

[0036] The purpose of this utility model can be achieved through the following technical solution: a tent's rotation transmission structure, demountable structure and draining system including louver blades (1), a ring beam one (2), blade fasteners (3), a connecting device one (4), a connecting device two (5), a connecting long

strip one (6), a turbine shaft device (7), a ring beam two (8) and a connecting long strip two (9).

[0037] The described louver blade (1) possesses a barb one (1a) and a barb two (1b), a water groove (1c) and a water shield (1d); see Figure 1.

[0038] The described blade fastener (3) comprises a L shape or T shape, on one side it possesses a barb one (3a) and a barb two (3b) that coordinate with louver blade (1). In its middle portion the blade fastener (3) possesses a hole one (3c) that coordinates with ring beam one (2) or ring beam two (8). The blade fastener's (3) further end possesses a hole two (3d) that coordinates with connecting long strip one (6) or connecting long strip two (9). The backside of barb two (3b) possesses a trigger (3e); see Figure 2.

[0039] The described ring beam one (2) possesses a number of evenly arranged holes one (2a) that coordinate with blade fastener (3). Holes two (2b) and water groove (2c) coordinate with the turbine shaft device (7); see Figure 3.

[0040] Both ends of the described connecting device one (4) possess a hole one (4a) that coordinates with a connecting long strip one (6) and a hole two (4b) that coordinates with a connecting device two (5); see Figure 4.

[0041] One end of the described connecting device two (5) possesses a hole one (5a) that coordinates with a worm shaft (7a), the other end possesses a hole two (5b) that coordinates with a connecting device one (4). Hole one (5a) is square shaped or non-round shaped; see Figure 5.

[0042] The described connecting long strip one (6) possesses a hole one (6a) that coordinates with a connecting device one (4) and a number of evenly arranged holes two (6b) that coordinate with the blade fasteners (3); see Figure 6.

[0043] The described turbine shaft device (7) possesses a worm shaft (7a) and a hole one (7b) that coordinates with ring beam one (2). The head of said worm shaft (7a) is square shaped or non-round shaped; see Figure 7.

[0044] The described ring beam two (8) possesses a number of evenly arranged holes one (8a) that coordinate with the blade fasteners (3) and the water groove (8b); see Figure 8.

[0045] The described connecting long strip two (9) possesses a number of evenly arranged holes one (9a) that coordinate with the blade fasteners (3); see Figure 9.

[0046] For a number of the described blade fastener (3), hole two (3d) of each blade fastener (3) is connected with hole two (6b) of the connecting long strip one (6), hole one (3c) of each blade fastener (3) is connected with the hole one (2a) of ring beam one (2). Hole one (7b) of the turbine shaft device (7) is combined with the hole two (2b) of the ring beam one (2). Hole one (5a) of the connecting device two (5) is locked with the worm shaft (7a), hole two (5b) is connected to hole two (4b) of the connecting device one (4). Hole one (4a) of the connecting device one (4) is connected to hole one (6a) of the con-

necting long strip one (6); see Figure 10.

[0047] For a number of the described blade fastener (3), hole two (3d) of each blade fastener (3) is connected to hole one (9a) of the connecting long strip two (9), hole one (3c) is connected to hole one (8a) of the ring beam two (8); see Figure 11.

[0048] The described louver blade's (1) one end is fixed to the blade fastener (3) on ring beam one (2), another end is fixed to the blade fastener (3) on ring beam two (8); see Figure 12 and Figure 13.

Brief description of the figures

[0049]

Figure 1 - 9 show the components of the utility model.

Figure 10 - 13 illustrate the installation of the utility model.

Figure 14 - 16 illustrate the employment of the utility model.

Figure 17 illustrates the installation and detachment of the louver blades.

Figure 18 - 19 illustrate the draining system.

[0050] The invention is further illustrated by the following examples and figures, from which further embodiments and advantages can be drawn. These examples are meant to illustrate the invention but not to limit its scope.

Examples

[0051] In certain embodiments, ring beam one (2), a number of blade fasteners (3) and connecting long strip one (6) form a parallelogram ABCD; see Figure 14. When the turbine shaft device (7) operates, the worm shaft (7a) leads the connecting device two (5) with hole one (5a) on one end as center. Hole two (5b) at the other end performs an arc motion. This leads the leg BC of the parallelogram ABCD to move back and forth through the connecting device one (4), in order to make the blade fastener (3) perform a rotation around the hole one (3c) with a certain degree. This enables the opening and closing function of a number of louver blades (1) that coordinate with blade fasteners (3); see Figure 15 and Figure 16. While the described turbine shaft device (7) cannot operate reversely, the parallelogram ABCD is not able to function as a driving device, and when the turbine shaft device (7) stops to operate, the louver blade (1) stops to rotate accordingly and becomes still.

[0052] In certain embodiments, the driving device can be changed into a power motor device, set up the power motor's motion to lead the parallelogram ABCD's BC leg to perform a certain motion of swinging back and forth,

this enables the opening and closing of the louver blade (1) .

[0053] In certain embodiments, at first barb one (1a) of the louver blade (1) and barb one (3a) of the blade fastener (3) are coordinated, then the louver blade (1) or blade fastener (3) are rotated in order to close the gap between barb two (1b) of the louver blade (1) and barb two (3b) of the blade fastener (3). Louver blade (1) and blade fastener (3) are slightly pressed to combine barb two (1b) of the louver blade (1) and barb two (3b) of blade fastener (3). Barb two (3b) of blade fastener (3) possesses a trigger (3e) on its backside. The trigger (3e) is pulled to separate barb two (1b) of the louver blade (1) and barb two (3b) of the blade fastener (3). In this way, the louver blade (1) can be disassembled conveniently; see Figure 17.

[0054] In certain embodiments, when the neighboring two louver blade (1) are closed, the water shield (1d) of back louver blade (1) is placed in the middle of the water groove (1c) of front louver blade (1). This prevents water from flowing inside the tent; water groove (1c) can lead the water to the side into ring beam one (2) and ring beam two (8), then the water flows out of the water groove (2c and 8b) of ring beam one (2) and ring beam two (8), this forms a complete draining system; see Figure 18 and Figure 19.

[0055] In comparison with current technology, this utility model allows solid ceilings to open and close freely. As a result, the users can enjoy the sunshine and sky better than before. It is especially easy to operate, and the louver blades on the top can be installed and disassembled conveniently, this reduces installation time and difficulties. When a certain louver blade is damaged, the user can exchange it easily. This whole product provides a sense of high quality and its appearance is original, simple and beautiful.

[0056] The application examples presented in this text are merely to illustrate the idea of this utility model. The technical staff that specialize in the technology field of this utility model is entitled to make all kinds of amendments, supplements and replacements, and such do not derive from the idea of this utility model, neither do it they exceed the limitations of the attached claims.

Claims

1. An opening and closing structure (louver) in the ceiling of a tent, comprising

- a. louver blades (1),
- b. a ring beam one (2),
- c. blade fasteners (3),
- d. a connecting device one (4),
- e. a connecting device two (5),
- f. a connecting long strip one (6),
- g. a turbine shaft device (7),
- h. a ring beam two (8), and

i. a connecting long strip two (9);

characterized in that

said blade fasteners (3) are connected with said connecting long strip one (6) and said ring beam one (2); one end of said connecting device one (4) is connected to said connecting long strip one (6), the other end is connected to said connecting device two (5); said turbine shaft device (7) is fixed to said ring beam one (2); one end of said connecting device two (5) is fixed to the worm shaft (7a); said blade fasteners (3) are connected to said ring beam two (8) and said connecting long strip two (9); both ends of each louver blade (1) are fixed to said blade fastener (3) of said ring beam one (2) and said blade fastener (3) of said ring beam two (8); wherein said louver blades (1) can rotate with a certain degree to said ring beam (2) and can be installed or disassembled at will, and wherein said louver comprises a draining system.

2. The louver according to claim 1, **characterized in that** said louver blade (1) comprises a barb one (1a) and a barb two (1b).

3. The louver according to claim 1, **characterized in that** said blade fastener (3) is L shaped or T shaped; comprises one side comprising a barb one (3a) and a barb two (3b) that coordinate with said louver blade (1); comprises a hole one (3c) that coordinates with said ring beam one (2) or said ring beam two (8); comprises another side comprising a hole two (3d) that coordinates with said connecting long strip one (6) or said connecting long strip two (9); wherein the backside of said barb two (3b) comprises a trigger (3e).

4. The louver according to claim 1, **characterized in that** said ring beam one (2) comprises a number of evenly arranged holes one (2a) that coordinate with said blade fasteners (3) and holes two (2b) that coordinate with said turbine shaft device (7).

5. The louver according to claim 1, **characterized in that** both ends of said connecting device one (4) comprise a hole one (4a) that coordinates with said connecting long strip one (6) and a hole two (4b) that coordinates with said connecting device two (5).

6. The louver according to claim 1, **characterized in that** one end of said connecting device two (5) comprises a hole one (5a) that coordinates with a worm shaft (7a) and the other end of said connecting device two (5) comprises a hole two (5b) that coordinates with said connecting device one (4), wherein

hole one (5a) is square shaped or non-round shaped.

7. The louver according to claim 1, **characterized in that** said connecting long strip one (6) comprises a hole one (6a) that coordinates with said connecting device one (4) and a number of evenly arranged holes two (6b) that coordinate with said blade fasteners (3). 5

8. The louver according to claim 1, **characterized in that** said turbine shaft device (7) comprises a hole one (7b) that coordinates with said worm shaft (7a) and said ring beam one (2), wherein the head of said worm shaft (7a) is square shaped or non-round shaped. 10
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9. The louver according to claim 1, **characterized in that** said ring beam two (8) comprises a number of evenly arranged holes one (8a) that coordinate with said blade fasteners (3). 20

10. The louver according to claim 1, **characterized in that** said connecting long strip two (9) comprises a number of evenly arranged holes one (9a) that coordinate with said blade fasteners (3). 25

11. The louver according to claim 1, **characterized in that** it is designed to prevent rain water from getting inside the tent when said louver blades (1) are closed. 30

12. The louver according to claim 1, **characterized in that** said louver blades (1) comprise a water groove (1c) and a water shield (1d), wherein said water shield (1d) is placed in the middle of said water groove (1c) of said front louver blade (1) when said louver blades (1) are closed. 35

13. The louver according to claim 1, **characterized in that** said ring beam one (2) and said ring beam two (8) comprise water grooves (2c and 8b). 40

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Fig. 1

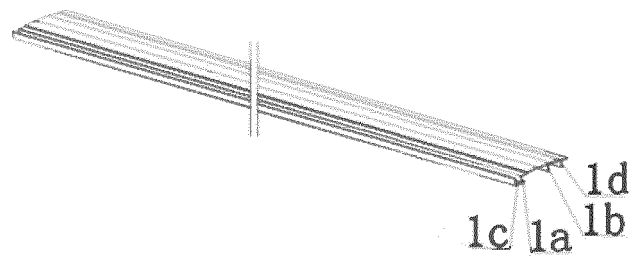


Fig. 2

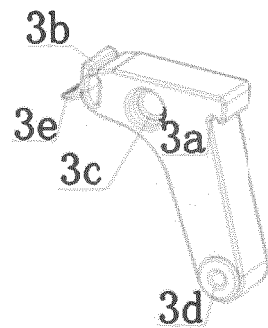


Fig. 3

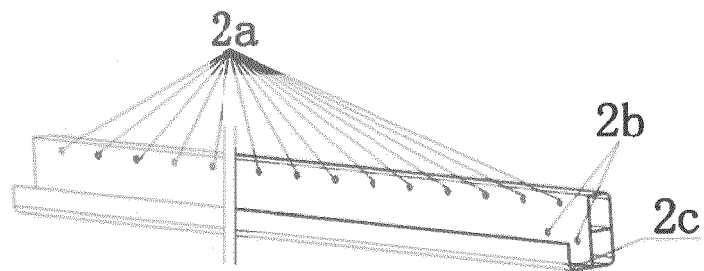


Fig. 4



Fig. 5



Fig. 6

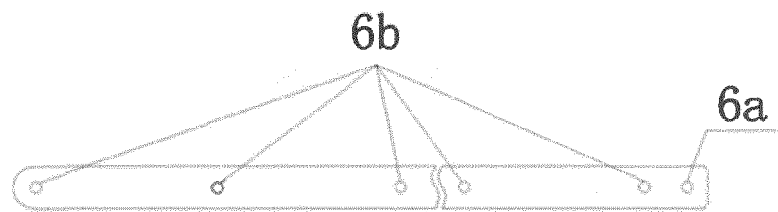


Fig. 7

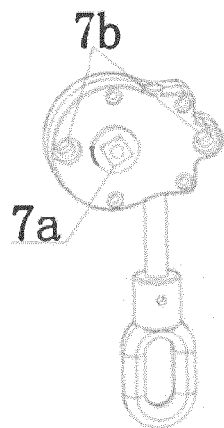


Fig. 8

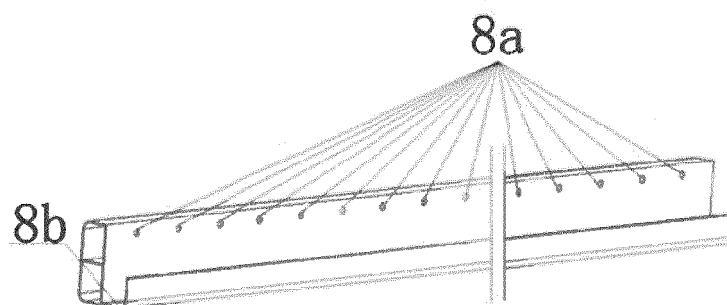


Fig. 9

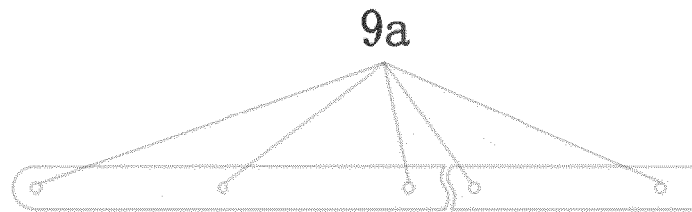


Fig. 10

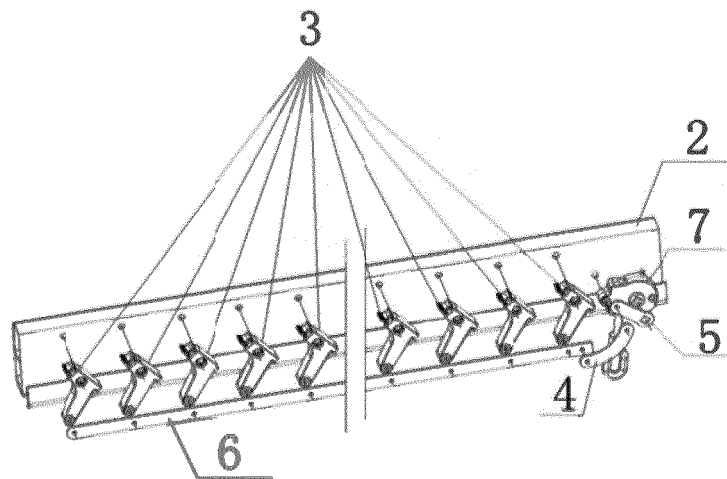


Fig. 11

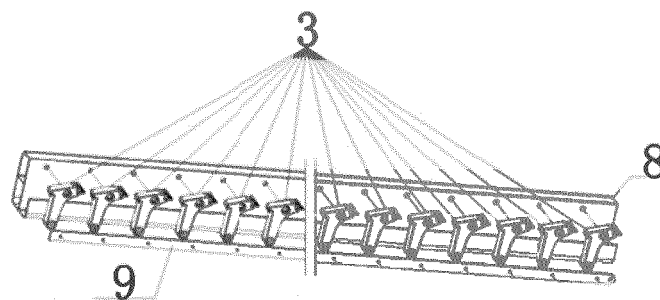


Fig. 12

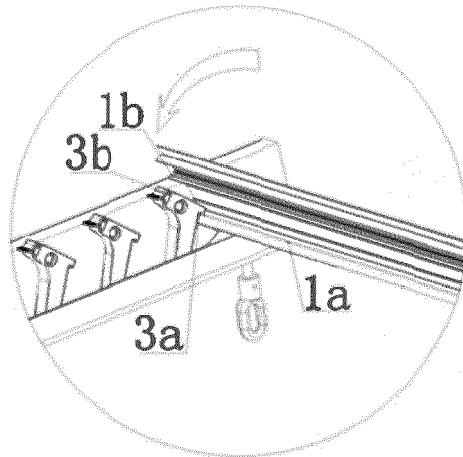


Fig. 13

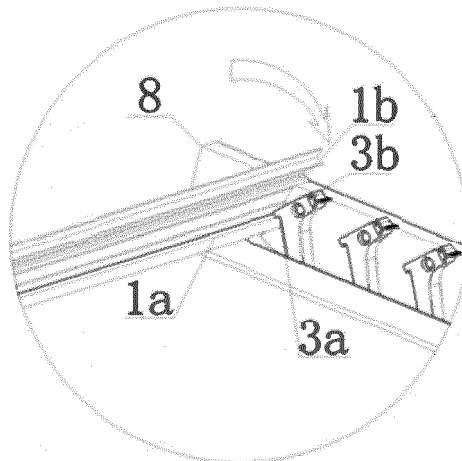


Fig. 14

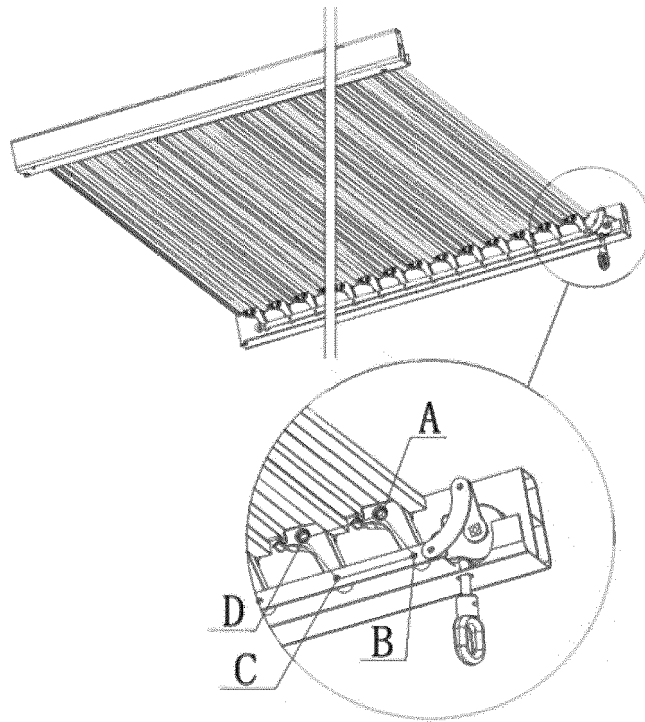


Fig. 15

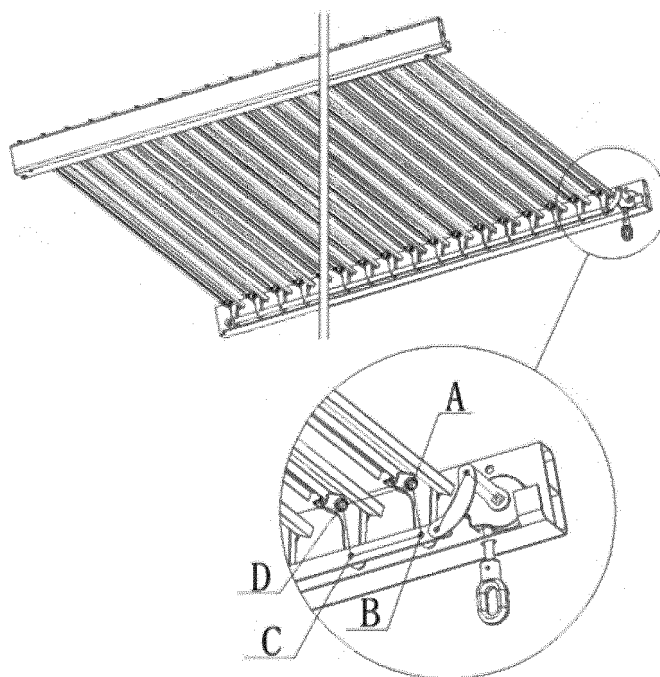


Fig. 16

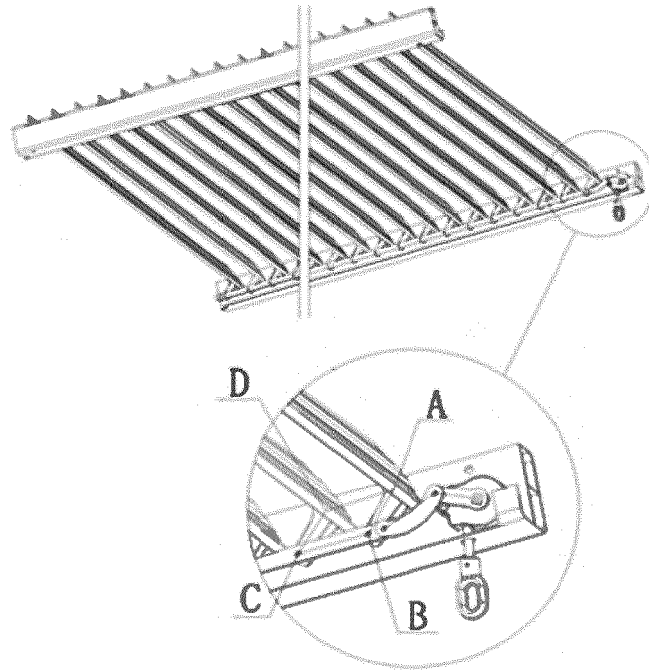


Fig. 17

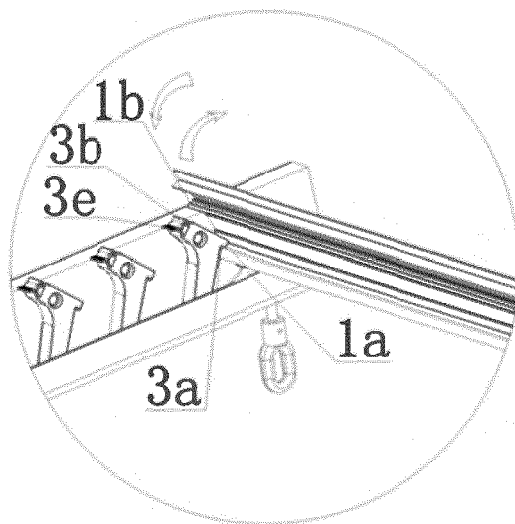


Fig. 18

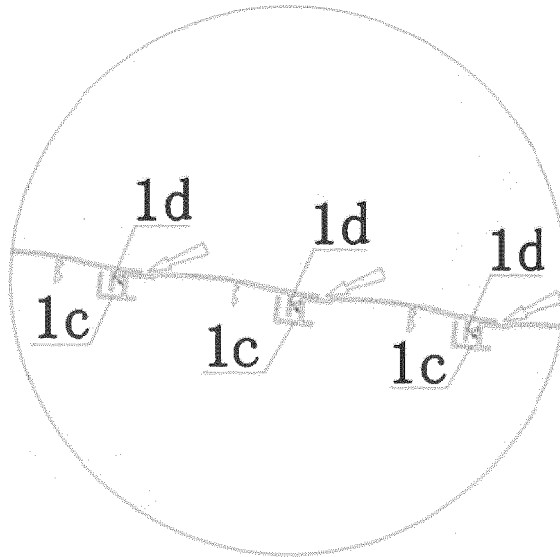
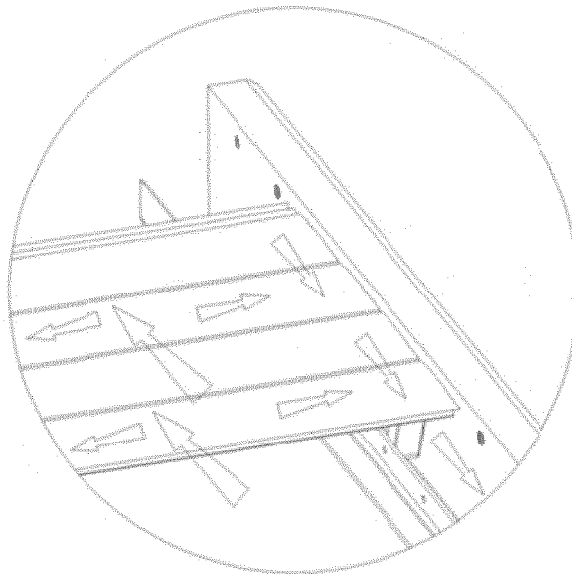


Fig. 19





EUROPEAN SEARCH REPORT

Application Number
EP 20 19 1618

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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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Place of search Munich		Date of completion of the search 28 October 2020	Examiner Rosborough, John
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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