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### Mounting bracket of wind-driven plate

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#### Abstract

The present invention discloses a mounting bracket of a wind-driven plate, and relates to the field of decoration. The mounting bracket includes brackets and mounting mechanisms. When the wind-driven plate is required to be turned over, it is only necessary to rotate the first connecting pieces and the second connecting pieces of the mounting mechanisms relative to the brackets in a first direction, and then the wind-driven plate rotates relative to the second connecting pieces around a second direction, so that the wind-driven plate can be turned over and can be hung on the second connecting pieces. According to the present invention, the wind-driven plate can be rotated and turned over through two rotating motions of the wind-driven plate, so high flexibility is achieved, and a user can make corresponding display patterns according to the actual situation, thereby achieving a good display effect.

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Field of Classification Search

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS

(1) The present application claims priority to Chinese Patent Application No. 202422726163X, filed on Nov. 8, 2024, the entire disclosure of which is incorporated herein by reference.

TECHNICAL FIELD

(2) The present invention relates to the field of decoration, and in particular to a mounting bracket of a wind-driven plate.

## BACKGROUND

(3) A wind-driven plate is a decoration material, and has become more and more popular in architecture and interior design. The wind-driven plate can swing slightly under the action of wind and produce a dynamic visual effect. The wind-driven plate usually adopts modular design, and is convenient to mount and dismount rapidly and suitable for various decorative scenarios.

(4) The mounting structure of the existing wind-driven plate has the following problems: a part connected to the wind-driven plate is fixed, so that the wind-driven plate cannot be turned over, the wind-driven plate only can display one color, a user cannot make corresponding display patterns according to the actual situation, the displayed content is single and the decorative effect is not good.

## SUMMARY

(5) Embodiments of the present invention provide a mounting bracket of a wind-driven plate, so that the wind-driven plate can be turned over, a user can make corresponding display patterns according to the actual situation, and high flexibility is achieved.

(6) The present invention provides a mounting bracket of a wind-driven plate, including brackets and a plurality of mounting mechanisms arranged on the brackets, where the mounting mechanisms include first connecting pieces and second connecting pieces; the first connecting pieces are rotatably arranged on the brackets around a first direction; the second connecting pieces are connected to the first connecting pieces; the second connecting pieces are movably connected to the wind-driven plate; the wind-driven plate is capable of rotating on the second connecting pieces around a second direction; and the first direction and the second direction intersect in a plane.

(7) The mounting bracket of the wind-driven plate provided by the present invention has the following beneficial effects.

(8) The mounting bracket provided by the present invention includes the brackets and the mounting mechanisms. When the wind-driven plate is required to be turned over, it is only necessary to rotate the first connecting pieces and the second connecting pieces of the mounting mechanisms relative to the brackets in a first direction, and then the wind-driven plate rotates relative to the second connecting pieces around a second direction, so that the wind-driven plate can be turned over and can be hung on the second connecting pieces. According to the present invention, the wind-driven plate can be rotated and turned over through two rotary motions of the wind-driven plate, so high flexibility is achieved, colors displayed by the wind-driven plate can be diversified, and a user can make corresponding display patterns according to the actual situation, thereby achieving a good display effect.

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## Description

### BRIEF DESCRIPTION OF THE DRAWINGS

(1) Various other advantages and benefits will become apparent to those skilled in the art by reading the detailed description of the preferred embodiments below. The accompanying drawings are used to only illustrate the preferred embodiments and are not considered to limit the present invention. In addition, in all the accompanying drawings, a same reference symbol is used to represent a same part. In the drawings:

(2) FIG. 1 is a schematic structural diagram of a mounting bracket according to the present invention (showing a wind-driven plate);

(3) FIG. 2 is a schematic structural diagram of a mounting bracket according to the present invention (not showing a wind-driven plate);

(4) FIG. 3 is a horizontal sectional view of a mounting bracket (showing a partial view);

- (5) FIG. 4 is a vertical sectional view of a mounting bracket (showing a partial view);
- (6) FIG. 5 is a schematic structural diagram of a mounting mechanism and a wind-driven plate;
- (7) FIG. 6 is another schematic structural diagram of a mounting mechanism and a wind-driven plate;
- (8) FIG. 7 is a vertical sectional view of FIG. 6 (showing a partial view);
- (9) FIG. 8 is a schematic structural diagram of the wind-driven plate in FIG. 6;
- (10) FIG. 9 is a schematic diagram of a turning action process of a wind-driven plate; and
- (11) FIG. 10 is another schematic diagram of a turning action process of a wind-driven plate.

#### DETAILED DESCRIPTION OF THE EMBODIMENTS

(12) The features and exemplary embodiments of each aspect of the present invention will be described below in detail. To make the objectives, technical solutions and advantages of the present invention more clearly, the following further describes the present invention in detail with reference to the accompanying drawings and the specific embodiments. It should be understood that the specific embodiments described herein are only used for explaining the present invention, and are not intended to limit the present invention. For a person skilled in the art, the present invention may be implemented without some of these specific details. The following descriptions of the embodiments are merely intended to provide examples of the present invention to better understand the present invention.

(13) It should be noted that in this specification, relational terms such as first and second are only used to distinguish one entity or operation from another entity or operation, and do not necessarily require or imply that there is any such actual relationship or order between these entities or operations. Furthermore, the terms “comprise”, “include” or any other variant thereof are intended to cover non-exclusive inclusion, so that a process, method, object or device including a series of elements not only includes those elements, but also includes other elements not explicitly listed, or also includes elements inherent to such process, method, object or device. Without more restrictions, an element defined by the phrase “including a . . .” does not exclude the presence of another same element in a process, method, article or device that includes the element.

(14) As shown in FIG. 1, this embodiment discloses a mounting bracket of a wind-driven plate; the mounting bracket includes a bracket **100** and a plurality of mounting mechanisms **200** arranged on the bracket **100**; the mounting mechanisms **200** are used to mount the wind-driven plate **300**; the wind-driven plate **300** can swing with wind on the mounting mechanisms **200** to produce a dynamic visual effect; and various colors and patterns can be designed on the wind-driven plate **300** according to the requirements of users, which is not limited in this embodiment.

(15) As shown in FIG. 2, the brackets **100** include a plurality of transverse frames and a plurality of vertical frames, and the plurality of transverse frames and the plurality of vertical frames are connected in a staggered manner to form the brackets **100**. First pin portions are arranged on the transverse frames of the brackets **100**, pin holes **101** are provided in the first pin portions, second pin portions are arranged on the vertical frames of the brackets **100**, pins **102** are arranged on the second pin portions, the two adjacent brackets **100** can be spliced together through the cooperation of the pins **102** and the pin holes **101**, and the plurality of brackets **100** are spliced into a large bracket structure through the cooperation of the pins **102** and the pin holes **101**. In addition, the two adjacent brackets **100** also can be connected through magnetic attraction to form a large bracket structure.

(16) As shown in FIG. 2, a plurality of mounting mechanisms **200** are provided, the specific number is selected according to the actual situation, the plurality of mounting mechanisms **200** are arranged on the brackets **100** in an array manner, and the wind-driven plates **300** are arranged on the mounting mechanisms **200** in a one-to-one correspondence manner.

(17) As shown in FIG. 3, the mounting mechanisms **200** include first connecting pieces **201** and second connecting pieces **202**; the first connecting pieces **201** are rotatably arranged on the brackets **100**, and the rotatable direction of the first connecting pieces **201** is configured as a first

direction; the second connecting pieces **202** are connected to the first connecting pieces **201**; when the first connecting pieces **201** rotate, the second connecting pieces **202** can rotate relative to the brackets **100** around the first direction; the second connecting pieces **202** are movably connected to the wind-driven plate **300**; and the wind-driven plate **300** can rotate relative to the second connecting pieces **202**, and the wind-driven plate **300** can rotate relative to the second connecting pieces **202** around a second direction. In this embodiment, the wind-driven plate **300** can follow the first connecting pieces **201** and the second connecting pieces **202** to rotate around the first direction, the wind-driven plate **300** can rotate around the second direction at the same time, and through two rotating motions of the wind-driven plate **300**, the wind-driven plate **300** can be turned over, and a user can convert a front surface or a rear surface of the wind-driven plate **300** into a windward surface according to the requirements. In this embodiment, the first direction and the second direction intersect vertically in a horizontal plane.

(18) As shown in FIG. 3, the first connecting pieces **201** are rotatably connected to the brackets **100**. The rotating connection modes include: 1. movable parts (such as bearings and universal joints, which are not shown in this embodiment) are connected between the first connecting pieces **201** and the brackets **100**; and 2. the brackets **100** are provided with mounting holes **103** (round through holes) in one-to-one correspondence with the first connecting pieces **201**, the axial direction of the mounting holes **103** is configured as the first direction, and the first connecting pieces **201** are coaxially arranged in the mounting holes **103**, so that the first connecting pieces **201** can rotate relative to inner walls of the mounting holes **103** around the first direction.

(19) As shown in FIG. 4, the first connecting pieces **201** include first limiting portions **2011**, rotating portions **2012** and second limiting portions **2013** which are connected sequentially in the first direction, where the first limiting portions **2011** are located at an end away from the wind-driven plate **300**, and the second limiting portions **2013** are movably connected to the wind-driven plate **300**. The outer diameters of the first limiting portions **2011** and the second limiting portions **2013** are greater than the inner diameters of the mounting holes **103**, the rotating portions **2012** (cylindrical) penetrate into the mounting holes **103** in the first direction, and the first limiting portions **2011** and the second limiting portions **2013** respectively abut against two side surfaces of the brackets **100**, thereby avoiding the offset of the front and rear positions of the first connecting pieces **201** in the first direction. In some preferred embodiments, the first limiting portions **2011**, the rotating portions **2012** and the second limiting portions **2013** are integrally formed.

(20) As shown in FIG. 4, an end of each of the first limiting portions **2011** away from the rotating portions **2012** is configured as a tapered end, a tip part of the tapered end is away from the rotating portions **2012**, and when the first limiting portions **2011** in this embodiment are mounted on the brackets **100**, the tapered end can face toward the mounting holes **103** and pass through the mounting holes **103** in the first direction, so that the rotating portions **2012** of the first connecting pieces **201** can penetrate into the mounting holes **103**, and the mounting convenience of the first connecting pieces **201** can be improved. In some embodiments, the first connecting pieces **201** are overall made of an elastic material, such as rubber, silica gel and polyurethane.

(21) As shown in FIG. 4, in some preferred embodiments, the first limiting portions **2011** and at least part of the rotating portions **2012** are provided with U-shaped notch grooves **2014**; and in the axial direction of the first limiting portions **2011** (that is, the first direction), the notch grooves **2014** extend from the middle positions of the rotating portions **2012** to the first limiting portions **2011** and penetrate through the first limiting portions **2011**. In this embodiment, the notch grooves **2014** are designed, so that the first limiting portions **2011** have a certain folding margin; a worker presses the first limiting portions **2011** to reduce the outer diameters of the first limiting portions **2011** when mounting the first connecting pieces **201**, the first limiting portions can pass through the mounting holes **103** after the outer diameters of the first limiting portions **2011** is reduced, and the outer diameters can be restored to a natural state after the first limiting portions **2011** pass through the mounting holes **103**.

(22) The second connecting pieces **202** are used to connect the wind-driven plate **300**. In this embodiment, the second connecting pieces **202** include the following two forms:

(23) 1. As shown in FIG. 5, the second connecting pieces **202** include hook portions **2021**, an end of each of the hook portions **2021** is connected to the second limiting portions **2013** of the first connecting pieces **201**, the wind-driven plate **300** is provided with a connecting hole **301**, the hook portions **2021** penetrate into the connecting hole **301**, at least part of the hook portions **2021** extend around the second direction and can form a C-shaped ring portion **20211**, and the wind-driven plate **300** can be turned over 180 degrees in the extending direction of the C-shaped ring portion **20211** (that is, the wind-driven plate **300** can rotate around the second direction), so that the wind-driven plate **300** can be turned over and can be hung on the C-shaped ring portion **20211** through the connecting hole **301** after being turned over; and the C-shaped ring portion **20211** forms an incomplete closed structure, so the connecting hole **301** of the wind-driven plate **300** can be hooked from one end of the C-shaped ring portion **20211** (that is, the tip of the hook portion **2021**) and hung on the C-shaped ring portion **20211**. The inner diameter of the C-shaped ring portion **20211** can meet the requirement that the wind-driven plate **300** hung on the C-shaped ring portion **20211** swings with the wind to produce a dynamic visual effect.

(24) 2. As shown in FIG. 6 to FIG. 8, the second connecting pieces **202** include sphere portions **2022**, and an end of each of the sphere portions **2022** is connected to the second limiting portions **2013** of the first connecting pieces **201**; rotating blind grooves **2023** are arranged at two sides of the sphere portions **2022**; in the second direction, the two rotating blind grooves **2023** are respectively located on two sides of the sphere portions **2022**, and the depth direction of the rotating blind grooves **2023** is configured as the second direction; and two inserting lugs **302** in one-to-one correspondence with the rotating blind grooves **2023** are arranged on the wind-driven plate **300** at intervals, the inserting lugs **302** are inserted in the rotating blind grooves **2023**, the minimum inner diameter  $D$  of the rotating blind grooves **2023** is greater than the width  $L$  of the inserting lugs **302** (for example, the minimum inner diameter is 1.5 to 3 times the width of the inserting lugs), so that the inserting lugs **302** can rotate relative to the rotating blind grooves **2023** around the second direction, and the inserting lugs **302** also can be deflected relative to the rotating blind grooves **2023**, so that the wind-driven plate **300** can rotate around the second direction and swing with the wind to achieve the turning of the wind-driven plate **300** and produce the dynamic visual effect. In some preferred embodiments, the outline of the rotating blind grooves **2023** is elliptical in the second direction, the short-axis direction of the elliptical rotating blind grooves **2023** is parallel to the first direction, and the short-axis length of the elliptical rotating blind grooves **2023** is configured as the minimum inner diameter  $D$  of the rotating blinding grooves **2023**.

(25) In some preferred embodiments, as shown in FIG. 7 and FIG. 8, the sphere portions **2022** are provided with sockets **2024** communicating with the rotating blind grooves **2023** in the first direction, the sockets **2024** communicate with the rotating blind grooves **2023** in a one-to-one correspondence manner, the extending direction of the sockets **2024** is parallel to the first direction, and the inserting lugs **302** of the wind-driven plate **300** can be inserted into the sockets **2024** in the first direction and pass through the sockets **2024** to fall into the rotating blind grooves **2023**.

(26) The working principle of the mounting bracket of this embodiment is as follows: if it is necessary to turn over a certain wind-driven plate **300**, the wind-driven plate **300** is required to be rotated twice: the first rotation: a worker rotates the second connecting pieces **202**, so that the first connecting pieces **201**, the second connecting pieces **202** and the wind-driven plate **300** arranged on the second connecting pieces **202** overallly rotate 180 degrees around the first direction; since there are two forms of second connecting pieces **202** in this embodiment, the second rotation of the wind-driven plate **300** has two forms: the first (form of hook portions), as shown in FIG. 9, after the first rotation is completed (the arrow  $F1$  shows the first rotation direction of the wind-driven plate), the connecting hole **301** on the wind-driven plate **300** moves relative to the C-shaped ring portion **20211** on the hook portions **2021**, and the wind-driven plate **300** rotates 180 degrees from

top to bottom around the second direction in the extending direction of the C-shaped ring portion **20211**, so that the second rotation is achieved (the arrow F2 shows the second rotation direction of the wind-driven plate), and the turning of the wind-driven plate **300** is achieved through two rotations of the wind-driven plate **300**; and the second (form of sphere portions), as shown in FIG. **10**, after the first rotation is completed (the arrow F1 shows the first rotation direction of the wind-driven plate), the inserting lugs **302** on the wind-driven plate **300** rotate relative to the inner walls of the rotating blind grooves **2023** around the second direction, and at this time, the wind-driven plate **300** rotates 180 degrees from top to bottom, so that the second rotation is achieved (the arrow F2 shows the second rotation direction of the wind-driven plate), and the turning of the wind-driven plate **300** is achieved through two rotations of the wind-driven plate **300**.

(27) The foregoing descriptions are merely specific embodiments of the present invention. Those skilled in the art can clearly understand that to describe conveniently and concisely, for a specific working process of the system, module and unit described above, refer to the corresponding process in the foregoing method embodiments. Details are not described herein again. It should be understood that the protection scope of the present invention is not limited to this. Any equivalent modification or replacement readily figured out by a person skilled in the art within the technical scope disclosed in the present invention shall fall within the protection scope of the present invention.

## Claims

1. A mounting bracket of a wind-driven plate, comprising a frame and a plurality of mounting mechanisms arranged on the frame, wherein the mounting mechanisms comprise first connecting pieces and second connecting pieces; the first connecting pieces are rotatably arranged on the frame around a first direction; the second connecting pieces are connected to the first connecting pieces; the second connecting pieces are movably connected to the wind-driven plate; the wind-driven plate is capable of rotating on the second connecting pieces around a second direction; and the first direction and the second direction intersect in a plane; wherein the second connecting pieces comprise sphere portions, and an end of each of the sphere portions is connected to the first connecting pieces; and rotating blind grooves are provided at two ends of the sphere portions in the second direction, inserting lugs in one-to-one correspondence with the rotating blind grooves are arranged on the wind-driven plate at intervals, and the minimum inner diameter of the rotating blind grooves is greater than the widths of the inserting lugs, so that the wind-driven plate and the inserting lugs are capable of rotating around the second direction.
2. The mounting bracket according to claim 1, characterized in that the frame is provided with pin holes and pins.
3. The mounting bracket according to claim 1, wherein the plurality of mounting mechanisms are arranged on the frame in an array manner.
4. The mounting bracket according to claim 3, wherein the frame is provided with mounting holes, and the first connecting pieces of the mounting mechanisms are rotatably arranged in the mounting holes.
5. The mounting bracket according to claim 4, characterized in that the first connecting pieces comprise first limiting portions, rotating portions and second limiting portions which are connected sequentially; the outer diameters of the first limiting portions and the second limiting portions are greater than the inner diameters of the mounting holes; the rotating portions are rotatably arranged in the mounting holes; and the second limiting portions are connected to the second connecting pieces.
6. The mounting bracket according to claim 5, characterized in that an end of each of the first limiting portions away from the rotating portions is configured as a tapered end.
7. The mounting bracket according to claim 5, characterized in that the limiting portions are

provided with notch grooves in the axial direction of the first limiting portions, and the notch grooves at least partially extend into the rotating portions.

8. The mounting bracket according to claim 1, characterized in that the second connecting pieces comprise hook portions, an end of each of the hook portions is connected to the first connecting pieces, the hook portions penetrate through a connecting hole on the wind-driven plate, and at least part of the hook portions extend around the second direction, so that the wind-driven plate is capable of rotating around the second direction in extending directions of the hook portions.

9. The mounting bracket according to claim 1, characterized in that the sphere portions are provided with sockets communicating with the rotating blind grooves in the first direction, and the sockets are used for the inserting lugs to be inserted into the rotating blind grooves.

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