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(54) CIRCULAR PLASTIC CONTAINER LOCKING STRUCTURE

VERRIEGELUNGSSTRUKTUR FÜR KREISFÖRMIGEN KUNSTSTOFFBEHÄLTER

STRUCTURE DE VERROUILLAGE DE CONTENEURS EN PLASTIQUE CIRCULAIRE

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Description

Technical Field

[0001] The invention relates to a locking mechanism, in particular to a circular plastic container locking mechanism.

Background Art

[0002] In general, hooping type structures are adopted for ensuring locking between barrel covers and barrel bodies of all current commercially available plastic barrels greater than or equal to 200 mm in diameter for packaging and good sealing performance of the plastic barrels. Bodies of the hooping type structures are hoops and are made of metal or engineering plastic.

[0003] The metal surfaces of the hoops made of the metal need coatings so as to enable the metal hoops to have a corrosion protection function. However, the coatings very easily shed in the storage and transportation process due to bump and friction, accordingly the metal surfaces are corroded, and the appearance of product packaging is affected. Furthermore, the metal hoops are higher in production cost, a dozen of parts and dozens of processes are needed for production one metal hoop, the production efficiency is low, and the cost is higher; also, as "sharp edges" of the metal hoops often exist, the hands of product packers or operators of the product user party are often scratched in the using process, occupational injury of employees is caused, and unsafe hidden dangers exist; and the metal hoops cannot be used cyclically, and accordingly the cost and effort for waste disposal of users are increased. Similarly, although the problems of surface corrosion resistance and safety are solved by adopting the plastic hoops and the plastic hoops can be used cyclically, the production cost of the plastic hoops is much more than that of the metal hoops. In addition, both the plastic hoops and the metal hoops have the same problem on the aspects of transportation costs, packaging costs and warehousing costs.

[0004] Document FR 3002522 describes a circular plastic container locking mechanism according to the preamble of claim 1.

Summary of the Invention

[0005] For overcoming the shortcomings of conventional circular plastic container locking structures, the invention provides a circular plastic container locking structure. The metal hoops and the plastic hoops are removed on the premise that the locking function and sealing performance of plastic containers are ensured, so that the production costs and raw material costs of the metal hoops and the plastic hoops and the costs for transportation, package, warehousing and the like are saved, and the working procedure of hooping operation in the packaging process is simplified.

[0006] The invention is achieved by adopting the following technical scheme: a circular plastic container locking mechanism comprises a barrel body and a barrel cover, wherein a plurality of raised barrel cover threaded strips are arranged on the inner side of the barrel cover, a rack is arranged on a surface, connected with the barrel body, on the barrel cover, a plurality of raised barrel body threaded strips are arranged on the outer-side periphery of an edge opening of the barrel body, the barrel cover threaded strips are matched with the barrel body threaded strips, a set of gear is arranged on the edge of an upper opening of the barrel body, a gear-fixing central shaft is arranged in the gear, and the gear is connected with a gear handle. When the barrel body is stationary, the gear handle swings towards a counter-clockwise direction. The gear rotates towards the counter-clockwise direction with the gear handle, and by virtue of the rotating function of the gear, the rack on the barrel cover and the whole barrel cover are driven to move towards a clockwise direction. Due to the fact that the barrel cover and the barrel body can be locked together as long as the barrel cover threaded strips and the barrel body threaded strips are consistent in shape and angle, the tail portions of the barrel cover threaded strips are just located at the head portions of the barrel body threaded strips when the barrel cover and the barrel body are closed up tightly, and the barrel cover threaded strips are located under the barrel body threaded strips, so that a good sealing effect and a fixing effect can be achieved. Ten times of force for locking the barrel body and the barrel cover up and down can be produced with only a small amount of force by utilizing the lever effect of the gear handle and the effect of thread slope movement on the gear to lock the barrel cover and the barrel body; when the gear handle swings towards the clockwise direction, the barrel cover moves towards the counter-clockwise direction, and then the purpose of unlocking the barrel cover with a small amount of force by utilizing the lever effect of the gear handle on the gear can also be achieved; and therefore locking and unlocking are very convenient.

[0007] Preferably, a circle of groove is formed in the inner side of the periphery of the barrel cover, the groove of the barrel cover may be matched and fitted with the edge opening of the barrel body, and the edge opening of the barrel body is tightly fitted with the bottom of the circle of groove of the barrel cover after the barrel cover and the barrel body are locked, so that the good sealing effect and the fixing effect can be achieved.

[0008] Preferably, the barrel cover threaded strips are a plurality of slightly inclined raised square threads distributed at equal distances and are arranged at a certain angle, the angle is greater than or equal to 1 degree, the length of the threaded strips is greater than or equal to 5 mm, the width of the threaded strips is greater than or equal to 1 mm, the height of the threaded strips is greater than or equal to 1.5 mm, the number of the threaded strips is greater than or equal to 2, and the threaded strips have good consistency on the length, width, height and

angle and are distributed at equal distances. By adopting the design, the barrel cover can be more tightly locked with the barrel body.

[0009] Preferably, the distribution condition of the barrel body threaded strips is the same as that of the barrel cover threaded strips, and the angles and directions of the slopes of the barrel body threaded strips are the same as those of the slopes of the barrel cover threaded strips. The barrel body threaded strips are the same as the barrel cover threaded strips in length, width, height and number, and when the barrel cover and the barrel body are closed up tightly, the tail portions of the barrel cover threaded strips are just located at the head portions of the barrel body threaded strips, and the barrel cover threaded strips are located under the barrel body threaded strips, so that the barrel cover and the barrel body are better sealed and fixed.

[0010] Preferably, a left fastener and a right fastener for fixing the gear handle are arranged on two sides of the gear and can fix the gear handle so as to fix the gear and achieve the effect of fixing the barrel cover after locking.

[0011] The invention has the following advantages: (1) removing metal hoops and plastic hoops under the premises that the locking function and sealing performance of the plastic container are ensured, thereby eliminating production costs and raw material costs, as well as transportation, packaging, warehousing and other costs of the metal hoops and the plastic hoops; (2) barrel body threaded strips are matched with the barrel cover threaded strips, and are the same in length, width, height, number distribution condition, as well as the angles and directions of the slopes, and the barrel body and barrel cover can be locked by utilizing the angles of threads, so that good sealing effect and fixing effect can be achieved; and (3) the gear rotates in a counter-clockwise direction under the effect of the handle, the rack on the barrel cover and the whole barrel cover can be driven to move towards a clockwise direction by virtue of the rotating function of the gear, and ten times of the force for locking the barrel body and the barrel cover up and down can be produced with only a small amount of force by utilizing the lever effect of the handle and the effect of thread slope movement on the gear to tightly lock the barrel cover and the barrel body.

Brief Description of the Drawings

[0012]

FIG. 1 is a schematic representation of the structure of the invention.

FIG. 2 is a schematic representation of the structure of the barrel cover of the invention.

FIG. 3 is a schematic representation of the structure of the barrel body of the invention.

Detailed Description of the Invention

[0013] The invention will now be further described with reference to the accompanying drawings and the detailed embodiments.

[0014] As shown in FIG. 1 to FIG. 3, a circular plastic container locking mechanism comprises a barrel body 11 and a barrel cover 12, wherein a plurality of raised barrel cover threaded strips 2 are arranged on the inner side of the barrel cover 12, a rack 1 is arranged on a surface, connected with the barrel body 11, on the barrel cover 12, the length of the rack 1 is about 40 mm, the width of the rack 1 is about 10 mm, the depth of the rack 1 is greater than or equal to 1 mm, a set of gear 9 is arranged at the edge of an upper opening of the barrel body 11, the outer diameter ϕ of the gear 9 is 20-50 mm, and both the height and the depth of the gear are greater than or equal to 1 mm. A plurality of raised barrel body threaded strips 13 are arranged on the outer-side periphery of the edge opening of the barrel body 11, the barrel cover threaded strips 2 are matched with the barrel body threaded strips 13, a set of gear 9 is arranged on the edge of the upper opening of the barrel body 11, a gear-fixing central shaft 8 is arranged in the gear, and the gear 9 is connected with a gear handle 10. When the barrel body 11 is stationary, the gear handle 10 swings towards a counter-clockwise direction, the gear 9 rotates towards the counter-clockwise direction with the gear handle 10, and the rack 1 on the barrel cover 12 and the whole barrel cover 12 are driven to move towards a clockwise direction by utilizing the rotating function of the gear 9. Due to the fact that the barrel cover 12 and the barrel body 11 can be tightly locked together as long as the barrel cover threaded strips 2 and the barrel body threaded strips 3 are consistent in shape and angle, when the barrel cover 12 and the barrel body 11 are closed up tightly, the tail portions of the barrel cover threaded strips 2 are just located at the head portions of the barrel body threaded strips 13, the barrel cover threaded strips 2 are located under the barrel body threaded strips 13 so that a good sealing effect and a fixing effect can be achieved, and ten times of the force for locking the barrel body 11 and the barrel cover 12 up and down can be produced with only a small amount of force by utilizing the lever effect of the gear handle 10 and the effect of thread slope movement on the gear to lock the barrel cover 12 and the barrel body 11; when the gear handle 10 swings towards the clockwise direction, the barrel cover 12 moves towards the counter-clockwise direction, and then the purpose of unlocking the barrel cover 12 with a small amount of force by utilizing the lever effect of the gear handle 10 on the gear 9 can also be achieved; and therefore locking and unlocking are very convenient.

[0015] In this embodiment, a circle of groove 3 is formed in the inner side of the periphery of the barrel cover 12, the groove 3 of the barrel cover 12 can be fitted with the edge opening 6 of the barrel body in a matched mode, and the edge opening 6 of the barrel body is tightly

fitted with the bottom of the circle of groove 3 of the barrel cover 12 after the barrel cover 12 and the barrel body 11 are locked tightly, so that the good sealing effect and the fixing effect can be achieved.

[0016] In this embodiment, the barrel cover threaded strips 2 are a plurality of slightly inclined raised square threads distributed at equal distances and are arranged at a certain angle, the angle is greater than or equal to 1 degree, the length of the threaded strips is greater than or equal to 5 mm, the width of the threaded strips is greater than or equal to 1 mm, the height of the threaded strips is greater than or equal to 1.5 mm, the number of the threaded strips is greater than or equal to 2, and the threaded strips have good consistency on the aspects of length, width, height and angle and are distributed at equal distances. By adopting the design, the barrel cover 12 can be more tightly locked with the barrel body 11.

[0017] In the embodiment, the distribution condition of the barrel body threaded strips 13 is the same as that of the barrel body threaded strips 2, and the angles and directions of the slopes of the barrel body threaded strips 13 are the same as those of the slopes of the barrel body threaded strips 2. The barrel body threaded strips 13 are the same as the barrel body threaded strips 2 in length, width, height and number, and when the barrel cover 12 and the barrel body 11 are closed up tightly, the tail portions of the barrel cover threaded strips 2 are just located at the head portions of the barrel body threaded strips 13, and the barrel cover threaded strips 2 are located under the barrel body threaded strips 13 so that the barrel cover 12 and the barrel body 11 are better sealed and fixed.

[0018] In this embodiment, a left fastener 14 and a right fastener 7 for fixing the gear handle 10 are arranged on two sides of the gear 9 and can fix the gear handle 10 so as to fix the gear 9 and achieve the effect of fixing the barrel cover 12 after locking.

[0019] When the invention is used, firstly, the gear handle 10 swings towards the counter-clockwise direction, when the gear 9 rotates towards the counter-clockwise direction, the rack 1 located on the barrel cover 12 can be driven by virtue of the rotating function of the gear 9, the rack 1 drives the whole barrel cover 12 to move towards the clockwise direction, ten times of the force for locking the barrel body 11 and the barrel cover 12 up and down can be produced with only a small amount of force by utilizing the lever effect of the gear handle 10 and the effect of thread slope movement on the gear 9 to lock the barrel cover 12 and the barrel body 11; the gear handle 10 can be fixed on the right fastener 7 to fix the gear so as to play a role in fixing the barrel cover after locking, the shapes and angles of the barrel cover threaded strips 2 are the same as those of the barrel body threaded strips 13, and the angles and directions of slopes of the barrel body threaded strips 13 are the same as those of slopes of the barrel cover threaded strips 2, so that the barrel cover 12 and the barrel body 11 can be tightly locked together, and the plane of an edge opening 6 of the barrel

body is tightly fitted with the bottom of a circle of groove 3 formed in the barrel cover 12 after the barrel cover 12 and the barrel body 11 are tightly locked, so that good sealing effect and fixing effect are achieved; and when the barrel cover 12 is needed to be released, only the gear handle 10 needs to swing towards the clockwise direction, the gear 9 rotates towards the clockwise direction, the gear handle 10 is fixed on the left fastener 14, the rack 1 on the barrel cover 12 is driven by virtue of the rotating function of the gear 9, the gear 1 drives the whole barrel cover 12 to move towards the counter-clockwise direction, and the barrel cover 12 can be conveniently unlocked with only a small amount of force by utilizing the lever effect of the gear handle 10 on the gear 9; and therefore the locking and unlocking structure is very convenient and practical.

[0020] The protection scope of the invention includes, but is not limited to the above-mentioned embodiments and is subject to the claims, and any replacement, variation and improvement on the art, easily thought by the skilled in the field, should fall into the protection scope of the invention.

Claims

1. A circular plastic container locking mechanism, comprising a barrel body (11) and a barrel cover (12), wherein a plurality of raised barrel cover threaded strips (2) are arranged on the inner side of the barrel cover (12), a plurality of raised barrel body threaded strips (13) are arranged on the outer-side periphery of an edge opening of the barrel body (11), and the barrel cover threaded strips (2) are matched with the barrel body threaded strips (13), **characterized in that** a rack (1) is arranged on a surface, connected with the barrel body (11), on the barrel cover (12) and a set of gear (9) is arranged on the edge of an upper opening of the barrel body (11), a gear-fixing central shaft (8) is arranged in the gear (9), and the gear (9) is connected with a gear handle (10).
2. The circular plastic container locking mechanism of claim 1, **characterized in that:** a circle of groove (3) is formed in the inner side of the periphery of the barrel cover (12), and the groove (3) of the barrel cover (12) can be matched and fitted with the edge opening (6) of the barrel body.
3. The circular plastic container locking mechanism of claim 1, **characterized in that:** the barrel cover threaded strips (2) are a plurality of slightly inclined raised square threads distributed at equal distances.
4. The circular plastic container locking mechanism of claim 3, **characterized in that:** the distribution condition of the barrel body threaded strips (13) is the same as that of the barrel cover threaded strips (2),

and the angles and directions of slopes of the barrel body threaded strips (13) are the same as those of slopes of the barrel cover threaded strips (2).

5. The circular plastic container locking mechanism of claim 3, **characterized in that:** two sides of the gear (9) are provided with a left fastener (14) and a right fastener (7) which are used for fixing the gear handle (10).

(2).

5. Kreisförmiger Kunststoffbehälter-Verriegelungsmechanismus nach Anspruch 3, **dadurch gekennzeichnet, dass:** zwei Seiten des Zahnrades (9) mit einem linken Befestigungselement (14) und einem rechten Befestigungselement (7) versehen sind, die zum Fixieren des Zahnradgriffs (10) verwendet werden.

Patentansprüche

1. Kreisförmiger Kunststoffbehälter-Verriegelungsmechanismus, umfassend einen Zylinderkörper (11) und eine Zylinderabdeckung (12), wobei mehrere angehobene Zylinderabdeckungs-Gewindestreifen (2) auf der Innenseite der Zylinderabdeckung (12) angeordnet sind, mehrere angehobene Zylinderabdeckungs-Gewindestreifen (13) auf der außenseitigen Peripherie einer Randöffnung des Zylinderkörpers (11) angeordnet sind und die Zylinderabdeckungs-Gewindestreifen (2) an die Zylinderabdeckungs-Gewindestreifen (13) angepasst sind, **dadurch gekennzeichnet, dass** eine Zahnstange (1) auf einer Oberfläche, die mit dem Zylinderkörper (11) verbunden ist, auf der Zylinderabdeckung (12) angeordnet ist und ein Zahnradsatz (9) auf dem Rand einer oberen Öffnung des Zylinderkörpers (11) angeordnet ist, wobei eine zentrale Zahnradfixierwelle (8) in dem Zahnrad (9) angeordnet ist und das Zahnrad (9) mit einem Zahnradgriff (10) verbunden ist.
2. Kreisförmiger Kunststoffbehälter-Verriegelungsmechanismus nach Anspruch 1, **dadurch gekennzeichnet, dass:** ein Kreis einer Nut (3) in der Innenseite der Peripherie der Zylinderabdeckung (12) ausgebildet ist und die Nut (3) der Zylinderabdeckung (12) an die Randöffnung (6) des Zylinderkörpers angepasst und in diese eingepasst werden kann.
3. Kreisförmiger Kunststoffbehälter-Verriegelungsmechanismus nach Anspruch 1, **dadurch gekennzeichnet, dass:** die Zylinderabdeckungs-Gewindestreifen (2) mehrere leicht geneigte erhöhte quadratische Gewinde sind, die in gleichen Abständen verteilt sind.
4. Kreisförmiger Kunststoffbehälter-Verriegelungsmechanismus nach Anspruch 3, **dadurch gekennzeichnet, dass:** die Verteilungsbedingung der Zylinderabdeckungs-Gewindestreifen (13) die gleiche ist wie diejenige der Zylinderabdeckungs-Gewindestreifen (2) und die Winkel und Richtungen von Neigungen der Zylinderabdeckungs-Gewindestreifen (13) die gleichen sind wie diejenigen von Neigungen der Zylinderabdeckungs-Gewindestreifen

Revendications

1. Mécanisme de verrouillage de conteneur en plastique circulaire, comprenant un corps de tonneau (11) et un couvercle de tonneau (12), dans lequel une pluralité de bandes filetée exhaussées de couvercle de tonneau (2) sont disposées sur le côté intérieur du couvercle de tonneau (12), une pluralité de bandes filetées exhaussées de corps de tonneau (13) étant disposées sur la périphérie extérieure d'une ouverture de bord du corps de tonneau (11), et les bandes filetées de couvercle de tonneau (2) étant adaptées aux bandes filetées de corps de tonneau (13), **caractérisé en ce qu'**une crémaillère (1) est disposée sur une surface, reliée au corps de tonneau (11), sur le couvercle de tonneau (12) et **en ce qu'**un ensemble d'engrenage (9) est disposé sur le bord d'une ouverture supérieure du corps de tonneau (11), une tige centrale de fixation d'engrenage (8) étant disposée dans l'engrenage (9), et l'engrenage (9) étant relié à une poignée d'engrenage (10).
2. Mécanisme de verrouillage de conteneur en plastique circulaire selon la revendication 1, **caractérisé en ce que :** un cercle de rainure (3) est formé dans le côté intérieur de la périphérie du couvercle de tonneau (12), et la rainure (3) du couvercle de tonneau (12) pouvant être adaptée et ajustée à l'ouverture de bord (6) du corps de tonneau.
3. Mécanisme de verrouillage de conteneur en plastique circulaire selon la revendication 1, **caractérisé en ce que :** les bandes filetées de couvercle de tonneau (2) sont une pluralité de filets carrés exhaussés légèrement inclinés répartis à distances égales.
4. Mécanisme de verrouillage de conteneur en plastique circulaire selon la revendication 3, **caractérisé en ce que :** l'état de répartition des bandes filetées de corps de tonneau (13) est le même que celui des bandes filetées de couvercle de tonneau (2), et les angles et directions de pentes des bandes filetées de corps de tonneau (13) étant les mêmes que ceux de pentes des bandes filetées de couvercle de tonneau (2).
5. Mécanisme de verrouillage de conteneur en plasti-

que circulaire selon la revendication 3, **caractérisé en ce que** : deux côtés de l'engrenage (9) sont dotés d'une fixation de gauche (14) et d'une fixation de droite (7) qui sont utilisées pour fixer la poignée d'engrenage (10).

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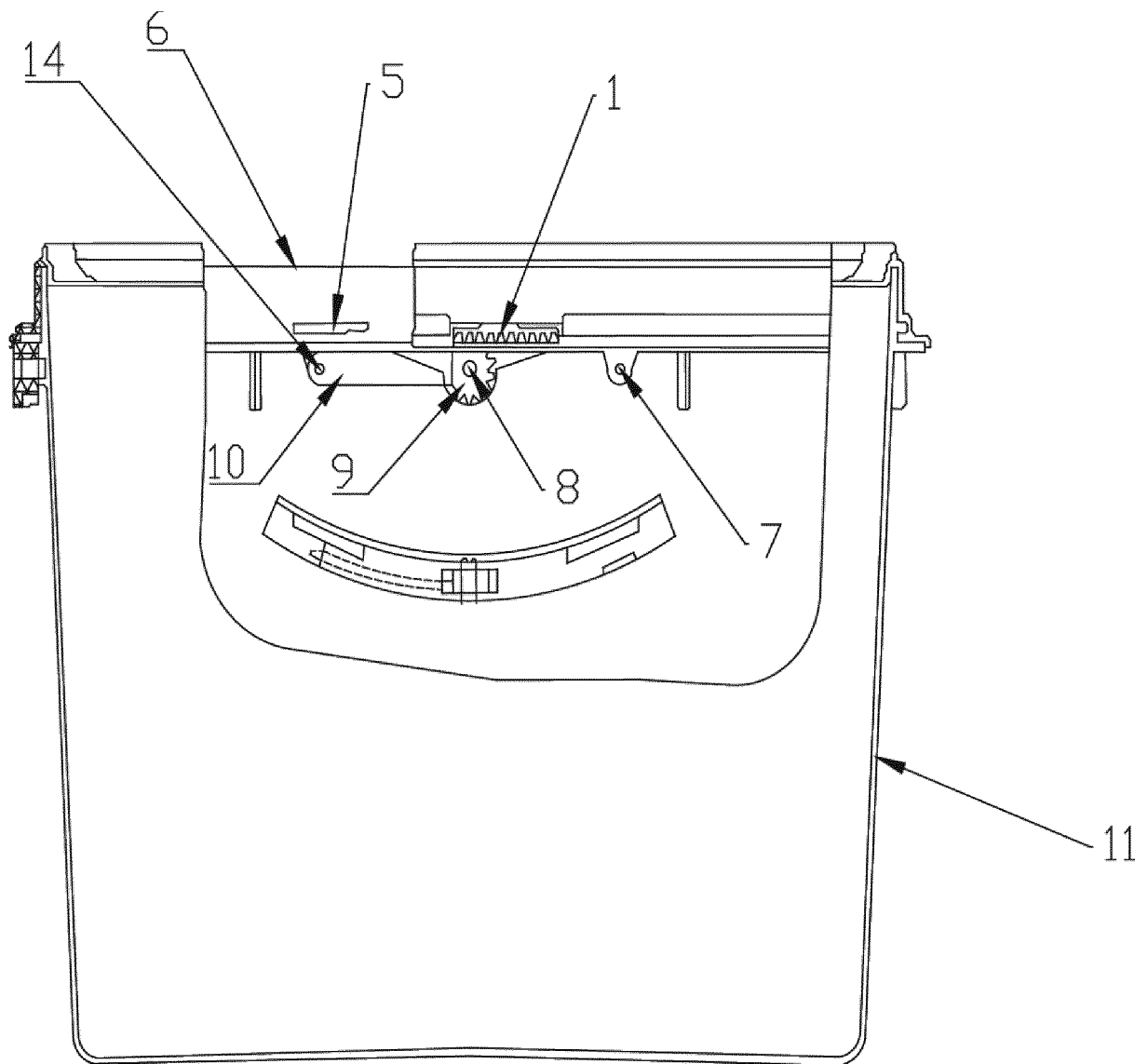


Fig. 1

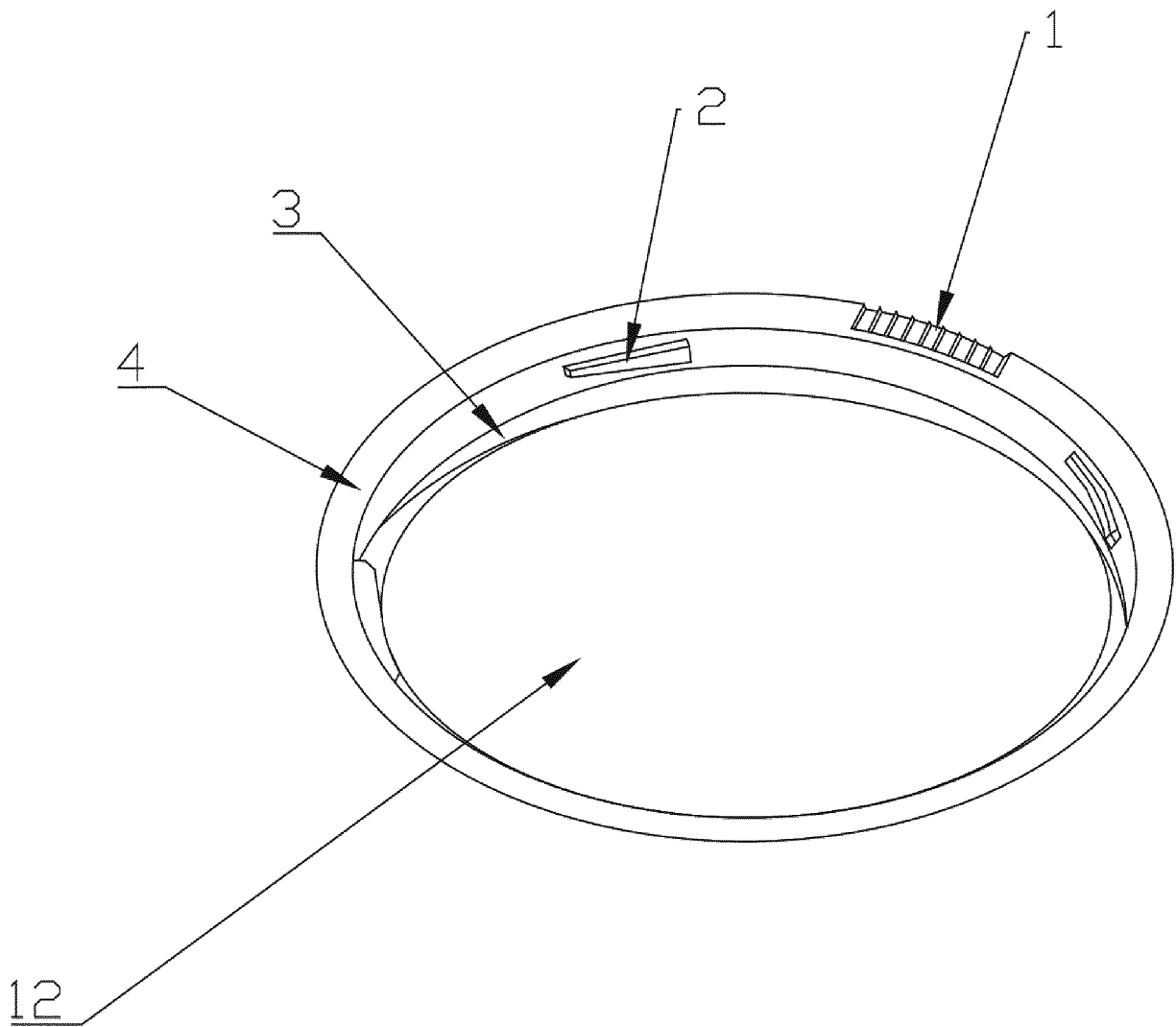


Fig. 2

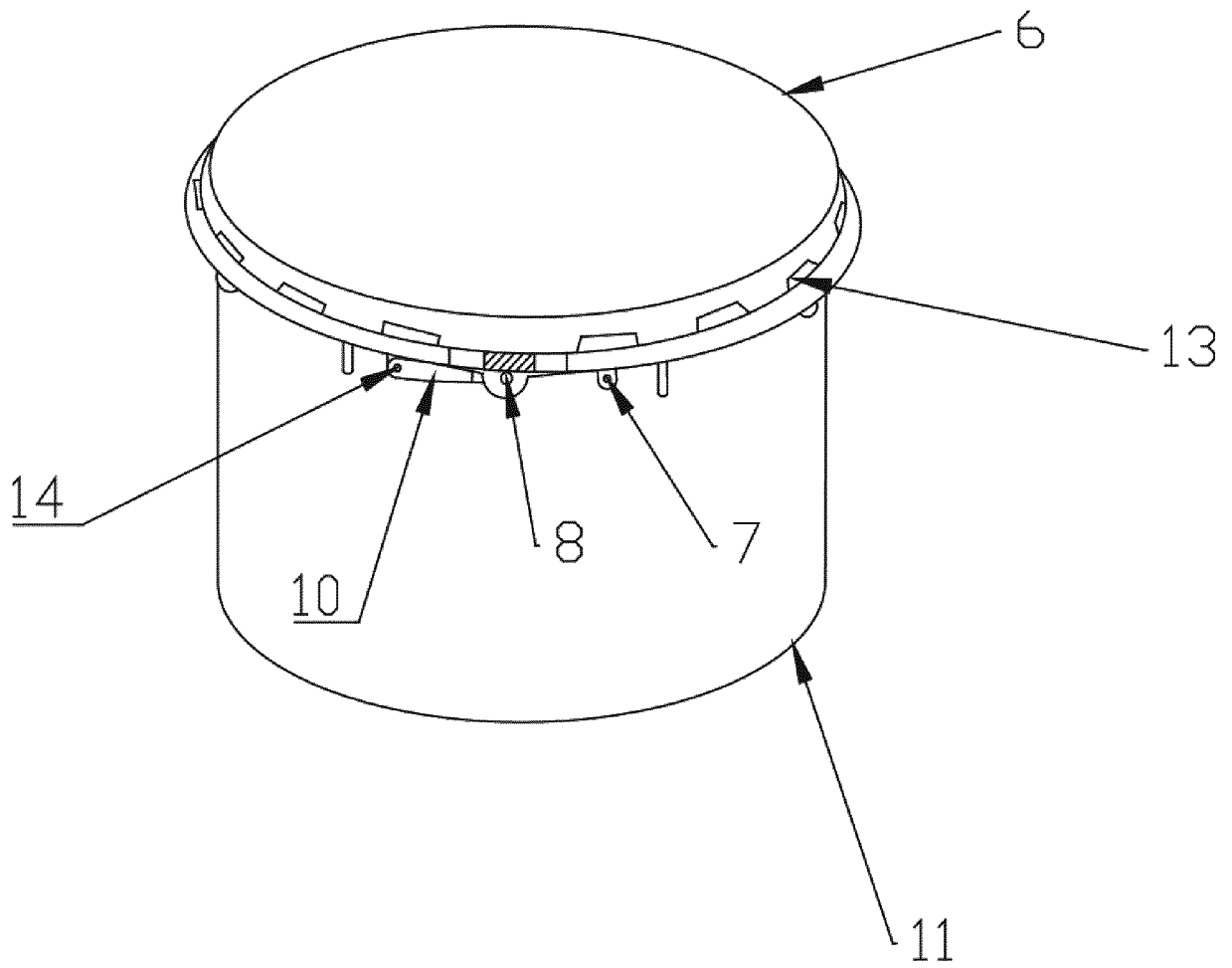


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- FR 3002522 [0004]