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(54) **ROPE TAKE-UP DEVICE AND ARTICLE WITH ROPE BELT**

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Description

Technical Field

[0001] The present disclosure relates to the technical field of tying, in particular to a string collecting device and an article having a string.

Background Art

[0002] Products such as shoes, clothes and medical protective gear are usually provided with strings, wherein a user may achieve a purpose of tightening or loosening the products by adjusting tightness of the string (or rope belt).

[0003] US 5 042 177 A relates to a rotary closure for a sports shoe, especially a ski shoe, in which at least one traction element co-operating with the closure element of the shoe can be wound on-to or off of a pulley which can be rotated by an actuating shaft.

[0004] DE 20 2019 105576 U1 relates to a rotary closure for a sport article, luggage, or shoe, in particular a sport shoe, comprising a housing part (1) with a shaft (3) to which a rotary knob (2) is attached in order to actuate a tensioning roller (6) for a tensioning element, in particular a cable.

[0005] CN 205 432 385 U relates to an automatic elasticity shoelace ware, including enclosing cover, rotatory outer lane, the ratchet plate, wire reel, the ring gear base and elastic element on the ratchet plate.

[0006] At present, adjustment of tightness of a string, especially the tightening of the string, needs to be completed by two hands, for example, when tying shoelace, the shoelace can be tightened only by pulling two ends of the shoelace respectively with two hands.

Summary

[0007] An object of the present disclosure lies in providing a string collecting device and an article having a string so as to overcome the defects in the prior art and solve the problem in the prior art that the operation of tightening the string is cumbersome.

[0008] In order to solve the above problem, the present disclosure provides a string collecting device, including a rotating part and a string winding part configured to wind a string;

wherein the rotating part is provided with at least one movable part that can be moved, and
the movable part is configured to be engaged with the string winding part when the rotating part is rotated towards a string collecting direction;
wherein when the movable part is engaged with the string winding part, the rotating part, the at least one movable part and the string winding part are connected in synchronous rotation, wherein
the rotating part is provided with a toggle portion configured to drive the at least one movable part to move in a radial direction of the rotating part,
wherein each movable part comprises a pull-out surface interacting with the toggle portion;the toggle portion comprises a pull-out structure, and the pull-out structure is configured to press the pull-out surface, when the rotating part is rotated towards the string collecting direction, so as to drive the movable part to be engaged with the string winding part;
the pull-out structure is provided on a central axis of the rotating part;the pull-out structure comprises at least one pressing portion which is in one-to-one correspondence with the at least one movable part, and each pressing portion is configured to press against the respective pull-out surface;
the toggle portion further comprises a pull-back structure, and the movable part comprises a pull-back surface arranged opposite to the pull-out surface;the pull-back structure is configured to push and press the pull-back surface, when the rotating part is rotated towards a direction opposite to the string collecting direction, so as to drive the at least one movable part to be separated from the string winding part; and the pull-back structure comprises at least one pull-back block, which is in one-to-one correspondence with the movable part.

[0009] As a further improvement of the above technical solution, each movable part includes meshing teeth, and the string winding part is provided with a gear ring corresponding to the meshing teeth.

[0010] As a further improvement of the above technical solution, the rotating part is provided with a sliding groove, and the movable part is provided with an insertion portion; and
the insertion portion is inserted into and slidably connected with the sliding groove.

[0011] As a further improvement of the above technical solution, the string winding part is rotatably disposed inside a fixing part, and the rotating part is sleeved on and rotatably connected with the fixing part.

[0012] As a further improvement of the above technical solution, the fixing part is provided thereon with a rotation restricting part configured to restrict the rotating part to be rotatable only in the string collecting direction;

wherein the rotation restricting part includes a ratchet wheel, and the rotating part is provided thereon with pawls corresponding to the ratchet wheel; and

the rotating part includes a rotary cover and a turnplate rotatably provided in the rotary cover.

[0013] As a further improvement of the above technical solution, the rotary cover is provided thereon with a driving portion configured to drive the turnplate to rotate in the string collecting direction;

the driving portion includes arc grooves, and the turnplate is provided thereon with protrusions which are coaxially arranged with and are in one-to-one correspondence with the arc grooves; and

the protrusions are inserted into the arc grooves respectively, and by abutting against the protrusions, end portions of the arc grooves enable the turnplate to synchronously rotate with the rotary cover;

wherein a plurality of the arc grooves are provided and are distributed in an array which is annular about a central axis of the rotary cover.

[0014] As a further improvement of the above technical solution, the rotary cover is provided thereon with a snap-fit portion configured to be snap-fitted with the turnplate.

[0015] As a further improvement of the above technical solution, the snap-fit portion includes elastic hooks, and the turnplate is provided thereon with engagement grooves snap-fitted with the hooks respectively; and a plurality of the hooks are provided and distributed in an array which is annular about the central axis of the rotary cover.

[0016] The present disclosure further provides an article having a string, including the string and the string collecting device as described in the above.

[0017] The present disclosure brings about following beneficial effects: the string collecting device provided in the present disclosure includes the rotating part and the stringing winding part, when the user rotates the rotating part towards the string collecting direction, the at least one movable part will be engaged with the string winding part, at which time, the three, namely, the rotating part, the movable part and the string winding part are connected in synchronous rotation. It can thus be seen that when the rotating part is rotated towards the string collecting direction, the string winding part also will rotate towards the string collecting direction, thus completing the operation of tightening the string.

[0018] This string collecting device is simple in structure and easy in operation, wherein when the user needs to tighten the string, the operation can be completed just by rotating the rotating part with a single hand towards the string collecting direction.

Brief Description of Drawings

[0019]

FIG. 1 shows an exploded view of a string collecting device;

FIG. 2 shows a schematic view of a movable part;

FIG. 3 shows a schematic view of a string winding part;

FIG. 4 shows a schematic view when the movable parts and the string winding part are engaged;

FIG. 5 shows a first isometric view of a fixing part;

FIG. 6 shows a second isometric view of the fixing part;

FIG. 7 shows a sectional view of the string collecting device;

FIG. 8 shows a schematic view of a sewing part;

FIG. 9 shows a schematic view of a rotary cover;

FIG. 10 shows a schematic view of a turnplate;

FIG. 11 shows a schematic view showing that pressing portions of a pull-out structure do not act on the movable parts;

FIG. 12 shows a schematic view showing that the pressing portions of the pull-out structure act on the movable parts;

FIG. 13 shows a schematic view showing that a pull-back structure acts on the movable parts; and

FIG. 14 shows a schematic view of connection between the string winding part and a string.

[0020] Reference signs of main elements:
1-rotating part; 2-string winding part; 3-movable part; 4-meshing tooth; 5-gear ring; 6-fixing part; 7-sewing part; 8-string threading hole; 9-string inlet hole; 10-string groove; 11-rotary cover; 12-turnplate; 13-buckle; 14-brim; 15-first connecting portion; 16-second connecting portion; 17-insertion portion; 18-pull-out surface; 19-pull-back surface; 20-pull-out structure; 21-pull-back structure; 22-rotation restricting part; 23-pawl; 24-driving portion; 25-protrusion; 26-snap-fit portion; 27-engagement groove; 28-sliding groove; 29-insertion pin; 30-positioning pin; 31-insertion hole; 32-positioning slot; 33-pressing portion.

Detailed Description of Embodiments

[0021] Embodiments of the present disclosure are described in detail below, and examples of the embodiments are shown in the accompanying drawings, in which like or similar signs represent like or similar elements or elements having like or similar functions throughout the accompanying drawings. The embodiments described below with reference to the accompanying drawings are exemplary, and merely used to explain the present disclosure, but cannot be construed as limitation to the present disclosure.

[0022] In the description of the present disclosure, it

should be understood that orientational or positional relations indicated by terms such as "center (central)", "longitudinal", "lateral", "length", "width", "thickness", "upper", "lower", "front", "back", "left", "right", "vertical", "horizontal", "top", "bottom", "inner", "outer", "clockwise", "anticlockwise", "axial", "radial", "circumferential" are based on orientational or positional relations as shown in the accompanying drawings, merely for facilitating the description of the present disclosure and simplifying the description, rather than indicating or implying that related devices or elements have to be in the specific orientation or configured and operated in a specific orientation, therefore, they should not be construed as limitation to the present disclosure.

[0023] Besides, terms "first" and "second" are merely for descriptive purpose, but should not be construed as indicating or implying importance in the relativity or suggesting the number of a related technical feature. Thus, a feature defined with "first" and "second" may explicitly or implicitly means that one or more such features are included. In the description of the present disclosure, "multiple (a plurality of)" means two or more, unless otherwise explicitly defined specifically.

[0024] In the present disclosure, unless otherwise specified and defined explicitly, terms such as "mount", "join", "connect" and "fix" should be construed in a broad sense. For example, a connection may be a fixed connection, a detachable connection, or an integral connection; it may be a mechanical connection, and also may be an electrical connection; it may be a direct connection, an indirect connection via an intermediary, or internal communication between two elements or interaction between two elements. For those ordinarily skilled in the art, specific meanings of the above-mentioned terms in the present disclosure can be understood according to specific circumstances.

[0025] In the present disclosure, unless otherwise specified and defined explicitly, a first feature being "above" or "below" a second feature may include the first feature and the second feature being in direct contact or the first feature and the second feature being in indirect contact through an intermediary. Moreover, the first feature being "on", "above" or "over" the second feature may be that the first feature is right above or not right above the second feature, or merely means that the level of the first feature is higher than that of the second feature. The first feature being "under", "below" or "beneath" the second feature may be that the first feature is directly below or not directly below the second feature, or merely means the level of the first feature being lower than that of the second feature.

Embodiment 1

[0026] Referring to FIG. 1, in the present embodiment, a string collecting device is provided, including a rotating part 1 and a string winding part 2 configured to wind a string. The rotating part 1 is provided thereon with at least one movable part 3 that can be moved, wherein the movable part 3 is configured to be engaged with the string winding part 2 when the rotating part 1 is rotated towards a string collecting direction. In the above, when the movable part 3 is engaged with the string winding part 2, the three, namely, the rotating part 1, the at least one movable part 3 and the string winding part 2, are synchronously in rotational connection.

[0027] After a user rotates the rotating part 1 by a certain angle towards the string collecting direction, the movable part 3 will be engaged with the string winding part 2, so as to enable the three, namely, the rotating part 1, the at least one movable part 3 and the string winding part 2 to be synchronously in rotational connection. It can thus be seen that when the rotating part 1 is rotated towards the string collecting direction, the string winding part 2 also will be rotated towards the string collecting direction, thus completing the operation of tightening the string.

[0028] In the present embodiment, two movable parts 3 may be provided in consideration of production cost, stability and other factors. In the above, the movable parts 3 may be distributed in an annular array about an axis of rotation of the rotating part 1.

[0029] However, in an actual production and manufacturing process, the number of the at least one movable part 3 may be set as desired, for example, one, three or four.

[0030] As shown in FIG. 2 and FIG. 3, each movable part 3 includes meshing teeth 4, and the string winding part 2 is provided with a gear ring (or tooth ring) 5 corresponding to the meshing teeth 4. In the above, the string winding part 2 may be provided with an internally toothed gear ring.

[0031] As shown in FIG. 4, when the movable parts 3 are engaged with the string winding part 2, the meshing teeth 4 will be kept in a meshed state with the gear ring 5, thus achieving a synchronous rotational connection between the movable parts 3 and the string winding part 2.

[0032] As shown in FIG. 1, in the present embodiment, besides the rotating part 1 and the string winding part 2, the string collecting device further includes a fixing part 6 and a sewing part 7, wherein the sewing part 7 is provided on the fixing part 6. In the above, the sewing part 7 and the fixing part 6 may be fixedly connected by snap-fitting, bonding or the like.

[0033] As shown in FIG. 6, a bottom portion of the fixing part 6 may be provided with an insertion pin 29 and a positioning pin 30.

[0034] As shown in FIG. 8, the sewing part 7 may be provided in a circular shape as a whole, wherein the sewing part 7 may be made of plastic or other materials. In order to facilitate the connection between the fixing part 6 and the sewing part, the sewing part 7 may be provided with an insertion hole 31 corresponding to the insertion pin 29 and provided with a positioning slot 32 corresponding to the positioning pin 30, wherein during installation,

the insertion pin 29 is inserted into the insertion hole 31 and the positioning pin 30 is inserted into the positioning slot 32.

[0035] As shown in FIG. 7, the string winding part 2 is rotatably disposed inside the fixing part 6, and the rotating part 1 is sleeved on and rotatably connected with the fixing part 6. In the above, the rotating part 1 and the sewing part 7 are disposed at a top portion and the bottom portion of the fixing part 6, respectively. The sewing part 7 is not shown in FIG. 7.

[0036] As shown in FIG. 3 and FIG. 5, in order to facilitate the installation of the string, the fixing part 6 may be provided with string threading holes (holes for passing string therethrough) 8, and the string winding part 2 may be provided with string inlet holes 9 corresponding to the string threading holes 8 respectively. In the above, the string inlet holes 9 are arranged in a string groove 10 of the string winding part 2.

[0037] Referring to FIG. 14, after passing through the string threading holes 8 and the string inlet holes 9 in sequence, an end portion of the string is inserted into the inside of the string winding part 2; and the end portion of the string is extended out of an opening at a bottom portion of the string winding part 2, and then the end portion of the string is knotted such that the end portion becomes thick and cannot slip out of the string inlet hole 9. When the string is being wound, the string winding part 2 rotates relative to the fixing part 6, and the string will be wound on the string groove 10 on an outer side wall of the string winding part 2, thus the string can be tightened.

[0038] The string collecting device may be mounted to articles having strings such as shoes, backpacks, or medical protective gear by the sewing part 7 by gluing or by sewing with needle and thread and so on.

[0039] For the sake of easier understanding, component parts of the string collecting device are illustrated below.

[0040] As shown in FIG. 9 and FIG. 10, in the present embodiment, the rotating part 1 includes a rotary cover 11 and a turnplate 12 which is rotatably provided in the rotary cover 11, wherein the turnplate 12 is rotatable relative to the rotary cover 11 within a certain range of angles. In the above, after the rotary cover 11 is rotated by a certain angle towards the string collecting direction, the rotary cover 11 will abut against the turnplate 12, so that the turnplate 12 rotates synchronously with the rotary cover 11.

[0041] As shown in FIG. 7, the rotary cover 11 is sleeved on the fixing part 6. The rotary cover 11 may be provided with an elastic buckle 13, and a top portion of the fixing part 6 may be provided with an annular brim (or convex edge) 14, wherein assembling between the rotary cover 11 and the fixing part 6 may be achieved just by buckling the buckle 13 on the brim 14.

[0042] As shown in FIG. 2, the movable part 3 includes a first connecting portion 15 and a second connecting portion 16, wherein the meshing teeth 4 are provided on the first connecting portion 15. The meshing teeth 4 and the second connecting portion 16 are respectively provided on two opposite sides of the first connecting portion 15.

[0043] The movable part 3 may be provided with an insertion portion 17, wherein the insertion portion 17 is provided in a bottom portion of the first connecting portion 15.

[0044] The second connecting portion 16 includes two opposite surfaces, which are a pull-out surface 18 and a pull-back surface 19. In the above, the pull-out surface 18 is a surface of the second connecting portion 16 remote from and facing away from the meshing teeth 4, and the pull-back surface 19 is a surface of the second connecting portion 16 close to and facing the meshing teeth 4.

[0045] In the present embodiment, the at least one movable part 3 may be made of plastic or hardware through processing and manufacturing, wherein the first connecting portion 15 and the second connecting portion 16 together form a one-piece structure.

[0046] As shown in FIG. 10, in order to realize movable connection between the movable part 3 and the string winding part 2, the turnplate 12 of the rotating part 1 may be provided thereon with sliding grooves 28.

[0047] The insertion portion 17 of the movable part 3 is inserted into and slidably connected with the sliding grooves 28. In the above, the sliding grooves correspond to the movable parts 3 one to one.

[0048] In the present embodiment, two sliding grooves 28 are provided, which are in one-to-one correspondence with the movable parts 3.

[0049] A central portion of the turnplate 12 is provided with a central through hole which is located between the two sliding grooves 28. As shown in FIG. 10, the central through hole communicates with the sliding grooves 28 on two sides thereof.

[0050] In the present embodiment, each movable part 3 is movable in a radial direction of the rotating part 1.

[0051] In order to drive the movable part 3 to move, and realize its engagement with and separation from the string winding part 2, in the present embodiment, the rotary cover 11 of the rotating part 1 may be provided with a toggle portion configured to drive the movable part 3 to move in a radial direction of the rotating part 1. In the above, when the rotary cover 11 is rotated towards the string collecting direction, the toggle portion interacts with the pull-out surface 18 of the movable part 3, so that the movable part 3 is driven to be engaged with the string winding part 2; and when the rotary cover 11 is rotated towards the direction opposite to the string collecting direction, the toggle portion interacts with the pull-back surface 19 of the movable part 3, thereby driving the movable part 3 to be separated from the string winding part 2.

[0052] As shown in FIG. 9, the toggle portion includes a pull-out structure 20, wherein when the rotary cover 11 is rotated towards the string collecting direction, the pull-out structure 20 presses against the pull-out surface 18 so as to drive the movable part 3 to be engaged with the

string winding part 2.

[0053] The pull-out structure 20 may be provided on a central axis of the rotating part 1. In the above, when the turnplate 12 is mounted on the rotary cover 11, the pull-out structure 20 will be inserted into the central through hole of the turnplate 12.

[0054] In the present embodiment, the pull-out structure 20 includes pressing portions 33 which are in one-to-one correspondence with the movable parts 3, and the pressing portions 33 are configured to press against the pull-out surface 18. In the above, the pressing portions 33 are regarded as a whole, then on the pull-out structure 20, the pressing portions 33 are farthest from a center of the pull-out structure 20.

[0055] Referring to FIG. 11 and FIG. 12, an anticlockwise direction in the drawings is the string collecting direction.

[0056] When the rotating part 1 is rotated towards the anticlockwise direction, an end surface of the pressing portion 33 will be attached to the pull-out surface 18 and thereby drive the movable part 3 to move until the meshing teeth 4 of the movable parts 3 are meshed with the gear ring 5. After the meshing teeth 4 are meshed with the gear ring 5, the movable parts 3 cannot continue moving because of restriction by the gear ring 5, so that the three, namely, the pull-out structure 20, the movable parts 3 and the gear ring 5, are in a relatively static state.

[0057] In the present embodiment, the cross section of the pull-out structure 20 may be set to be a parallelogram in consideration of the number of movable parts 3, the manufacturing cost and so on. Thus, the pull-out structure 20 has two opposite side surfaces which are in one-to-one correspondence with the movable parts 3.

[0058] In the above, in order to ensure the tightness of the attachment between the pull-out surface 18 and the end surface of the pressing portion 33, the pull-out surface 18 may be set as a flat surface.

[0059] As shown in FIG. 11 and FIG. 12, a distance between the pull-out surface 18 and the central axis of the rotating part 1 increases gradually in the string collecting direction. Correspondingly, in order to correspond to the pull-out surface 18, the distance between the end surface of the pressing portion 33 and the central axis of the rotating part is gradually reduced in the string collecting direction, so that the cross section of the pull-out structure 20 is a nonrectangular parallelogram, and in FIG. 11, a lowermost angle of the cross section of the pull-out structure 20 is an acute angle.

[0060] In this way, it facilitates the attachment between the end surface of the pressing portion 33 and the pull-out surface 18; meanwhile, once the end surface of the pressing portion 33 is attached to the pull-out surface 18, if the rotary cover 11 is continuously rotated towards the string collecting direction, the end surface of the pressing portion 33 will be attached to the pull-out surface 18 more closely and they won't be separated from each other.

[0061] It should be noted that, in the actual manufacturing process, as the number of movable parts 3 changes, the shape of the pull-out structure 20 also needs to be adjusted correspondingly.

[0062] As shown in FIG. 9, the toggle portion further includes a pull-back structure 21, and the movable part 3 further includes the pull-back surface 19 arranged opposite to the pull-out surface 18. In the above, when the rotary cover 11 of the rotating part 1 is rotated towards the direction opposite to the string collecting direction, the pull-back structure 21 pushes and presses the pull-back surface 19 so as to drive the movable part 3 to be separated from the string winding part 2.

[0063] The pull-back structure 21 may include pull-back blocks, which are in one-to-one correspondence with the movable parts 3.

[0064] As shown in FIG. 13, when the movable parts 3 are separated from the string winding part 2, an inner side of each pull-back block will push and press the pull-back surface 19 of the respective movable part 3, so that the movable part 3 is moved. In the above, in order to make the contact between the pull-back block and the movable part 3 smoother, an arc guide surface is provided on the inner side of the pull-back block, and correspondingly, the pull-back surface 19 may be provided as an arc surface.

[0065] When the user needs to loosen the string, the rotary cover 11 can be rotated towards the direction opposite to the string collecting direction, so that the pressing portion 33 is separated from the pull-out surface 18, thus realizing the separation of the movable part 3 from the string winding part 2. At this time, the user may loosen the string by pulling the string to reversely rotate the string winding part 2.

[0066] As shown in FIG. 5, the fixing part 6 is provided thereon with a rotation restricting part 22 configured to restrict the rotating part 1 to be rotatable only in the string collecting direction.

[0067] As shown in FIG. 5 and FIG. 10, the rotation restricting part 22 may be a ratchet wheel, and correspondingly, the turnplate 12 of the rotating part 1 is provided thereon with pawls (or ratchets) 23 corresponding to the ratchet wheel. In the above, the pawls 23 may be elastic. Thus, when the rotary cover 11 is rotated reversely, no relative rotation may occur between the turnplate 12 and the fixing part 6.

[0068] When the rotary cover 11 is rotated towards the string collecting direction, the turnplate 12 is required to move synchronously with the rotary cover to complete the operation of tightening the string. It is because that only when the turnplate 12 is rotated, the movable parts 3 slidably provided on the turnplate 12 can rotate, thereby realizing the rotation of the string winding part 2.

[0069] The rotary cover 11 is provided thereon with a driving portion 24 configured to drive the turnplate 12 to rotate in the string collecting direction.

[0070] As shown in FIG. 9 and FIG. 10, the driving portion 24 may include arc grooves, and the turnplate 12 is provided thereon with protrusions 25 which are coaxially arranged with and are in one-to-one correspondence with

the arc grooves. In the above, the protrusions 25 are inserted into the arc grooves respectively, and end portions of the arc grooves enable the turnplate 12 to synchronously rotate with the rotary cover 11 by abutting against the respective protrusions 25.

[0071] When the rotary cover 11 is rotated, and the protrusions 25 are moved to reach the end portions of the respective arc grooves, the end portions of the arc grooves will abut against the protrusions 25, thereby pushing the protrusions 25 to rotate, and realizing the synchronous rotation of the turnplate 12 and the rotary cover 11.

[0072] A plurality of arc grooves may be provided and distributed in an annular array about a central axis of the rotary cover 11. Thus, the driving force from the rotary cover 11 to the turnplate 12 can be more stable and balanced, thus avoiding the situation that a single protrusion 25 is broken due to excessive stress.

[0073] During daily use, in order to avoid looseness between the rotary cover 11 and the turnplate 12 caused by movement or vibration, the rotary cover 11 is provided thereon with a snap-fit portion 26 configured to be snap-fitted with the turnplate 12.

[0074] When no external force is applied, the end surface of the pressing portion 33 and the pull-out surface 18 are kept in an attached state with each other by the action of the snap-fit portion 26. Only when the rotary cover 11 is rotated reversely, the snap-fit portion 26 of the rotary cover 11 is separated from the turnplate 12.

[0075] As shown in FIG. 9 and FIG. 10, in the present embodiment, the snap-fit portion 26 may include elastic hooks, and the turnplate 12 is provided thereon with engagement grooves 27 snap-fitted with the hooks. In the above, a plurality of hooks are provided and distributed in an annular array about a central axis of the rotary cover 11.

[0076] When the engagement grooves 27 are processed, attention needs to be paid to the orientation of an entrance of each engagement groove 27, so that the respective hook can be inserted into and snap-fitted with the engagement groove 27 from the entrance of the engagement groove 27 only when the rotary cover 11 is rotated towards the string collecting direction.

[0077] In order to save the space inside the rotary cover 11 and facilitate the processing, the hooks can be integrally molded with the pull-back blocks.

[0078] In the present embodiment, an article having a string is further provided, including a string and the string collecting device described in the text above.

[0079] In the above, the article having a string includes shoes, backpacks, medical protective gear and so on.

[0080] In the description of the present description, descriptions with reference to terms such as "one embodiment", "some embodiments", "example", "specific example" or "some examples" indicate that specific features, structures, materials or characteristics described in combination with this embodiment or example are included in at least one embodiment or example of the present disclosure. In the present description, exemplary expressions of the above terms do not necessarily refer to the same embodiment or example. Moreover, the specific features, structures, materials or characteristics described can be combined in any appropriate manner in any one or more embodiments or examples. Besides, a person skilled in the art could compound and combine different embodiments or examples and features of different embodiments or examples described in the present description, without contradiction.

Claims

1. A string collecting device, comprising a rotating part (1) and a string winding part (2) configured to wind a string,

wherein the rotating part (1) is provided with at least one movable part (3) that can be moved, and

each movable part (3) is configured to be engaged with the string winding part (2) when the rotating part (1) is rotated towards a string collecting direction,

wherein when the movable part (3) is engaged with the string winding part (2), the rotating part (1), the at least one movable part (3) and the string winding part (2) are connected to be in synchronous rotation,

wherein the rotating part (1) is provided with a toggle portion configured to drive the at least one movable part (3) to move in a radial direction of the rotating part (1),

wherein each movable part (3) comprises a pull-out surface (18) interacting with the toggle portion;

the toggle portion comprises a pull-out structure (20), and the pull-out structure (20) is configured to press the pull-out surface (18), when the rotating part (1) is rotated towards the string collecting direction, so as to drive the movable part (3) to be engaged with the string winding part (2);

the pull-out structure (20) is provided on a central axis of the rotating part (1);

the pull-out structure (20) comprises at least one pressing portion (33) which is in one-to-one correspondence with the at least one movable part (3), and each pressing portion (33) is configured to press against the respective pull-out surface (18);

the toggle portion further comprises a pull-back structure (21), and the movable part (3) comprises a pull-back surface (19) arranged opposite to the pull-out surface (18);

the pull-back structure (21) is configured to push and press the pull-back surface (19), when the rotating part (1) is rotated towards a direction

opposite to the string collecting direction, so as to drive the at least one movable part (3) to be separated from the string winding part (2); and
the pull-back structure (21) comprises at least one pull-back block, which is in one-to-one correspondence with the movable part (3).

2. The string collecting device according to claim 1, wherein each movable part (3) comprises meshing teeth (4), and the string winding part (2) is provided with a gear ring (5) corresponding to the meshing teeth (4).

3. The string collecting device according to claim 1 or 2, wherein the rotating part (1) is provided with a sliding groove (28), and the movable part (3) is provided with an insertion portion (17),
wherein the insertion portion (17) is inserted into and slidably connected with the sliding groove (28).

4. The string collecting device according to any one of claims 1 to 3, wherein the string winding part (2) is rotatably disposed inside a fixing part (6), and the rotating part (1) is sleeved on and rotatably connected with the fixing part (6).

5. The string collecting device according to claim 4, wherein the fixing part (6) is provided thereon with a rotation restricting part (22) configured to restrict the rotating part (1) such that the rotating part (1) is rotatable only in the string collecting direction,

wherein the rotation restricting part (22) comprises a ratchet wheel, and the rotating part (1) is provided thereon with pawls (23) corresponding to the ratchet wheel; and
the rotating part (1) comprises a rotary cover (11) and a turnplate (12) rotatably provided in the rotary cover (11).

6. The string collecting device according to claim 5, wherein the rotary cover (11) is provided thereon with a driving portion (24) configured to drive the turnplate (12) to rotate in the string collecting direction,

wherein the driving portion (24) comprises arc grooves, and the turnplate (12) is provided thereon with protrusions which are coaxially arranged with and are in one-to-one correspondence with the arc grooves; and
the protrusions are inserted into the arc grooves respectively, and by abutting against the respective protrusions, end portions of the arc grooves enable the turnplate (12) to synchronously rotate with the rotary cover (11),
wherein a plurality of the arc grooves are provided and distributed in an array which is annular about a central axis of the rotary cover (11).

7. The string collecting device according to claim 5, wherein the rotary cover (11) is provided thereon with a snap-fit portion (26) configured to be snap-fitted with the turnplate (12).

8. The string collecting device according to claim 7, wherein the snap-fit portion (26) comprises elastic hooks, and the turnplate (12) is provided thereon with engagement grooves (27) which are snap-fitted with the hooks respectively; and
a plurality of the hooks are provided and distributed in an array which is annular about a central axis of the rotary cover (11).

9. An article having a string, **characterized by** comprising the string and the string collecting device according to any one of claims 1-8.

Patentansprüche

1. Schnuraufnahmegerät, umfassend ein drehendes Teil (1) und ein Schnurwickelteil (2), das zum Wickeln einer Schnur konfiguriert ist,

wobei das drehende Teil (1) mit zumindest einem beweglichen Teil (3) versehen ist, das bewegt werden kann, und
wobei jedes bewegliche Teil (3) dazu konfiguriert ist, mit dem Schnurwickelteil (2) in Eingriff gebracht zu werden, wenn das drehende Teil (1) zu einer Schnuraufnahmerichtung hin gedreht wird,
wobei, wenn das bewegliche Teil (3) mit dem Schnurwickelteil (2) in Eingriff steht, das drehende Teil (1), das zumindest eine bewegliche Teil (3) und das Schnurwickelteil (2) derart verbunden sind, dass sie sich in synchroner Drehung befinden,
wobei das drehende Teil (1) mit einem Umschaltabschnitt versehen ist, der zum Antreiben des zumindest einen beweglichen Teils (3) zur Bewegung in einer radialen Richtung des drehenden Teils (1) konfiguriert ist,
wobei jedes bewegliche Teil (3) eine Ausziehfläche (18) umfasst, die mit dem Umschaltabschnitt interagiert;
wobei der Umschaltabschnitt eine Ausziehstruktur (20) umfasst und die Ausziehstruktur (20) zum Pressen der Ausziehfläche (18) konfiguriert ist, wenn das drehende Teil (1) zur Schnuraufnahmerichtung hin gedreht wird, um das bewegliche Teil (3) in Eingriff mit dem Schnurwickelteil (2) zu treiben;
wobei die Ausziehstruktur (20) auf einer Mittelachse des drehenden Teils (1) vorgesehen ist;
wobei die Ausziehstruktur (20) zumindest einen Pressabschnitt (33) umfasst, der in Eins-zu-

Eins-Entsprechung zu dem zumindest einen beweglichen Teil (3) steht, und wobei jeder Pressabschnitt (33) zum Pressen gegen die jeweilige Ausziehfläche (18) konfiguriert ist;
wobei der Umschaltabschnitt ferner eine Rückzugstruktur (21) umfasst und das bewegliche Teil (3) eine Rückzugfläche (19) umfasst, die gegenüber der Ausziehfläche (18) angeordnet ist;
wobei die Rückzugstruktur (21) zum Schieben und Pressen der Rückzugfläche (19) konfiguriert ist, wenn das drehende Teil (1) zu einer Richtung hin gedreht wird, die der Schnuraufnahmerichtung entgegengesetzt ist, um das zumindest eine bewegliche Teil (3) derart anzutreiben, dass es vom Schnurwickelteil (2) getrennt wird; und
wobei die Rückzugstruktur (21) zumindest einen Rückzugblock umfasst, der in Eins-zu-Eins-Entsprechung zum beweglichen Teil (3) steht.

2. Schnuraufnahmegerät nach Anspruch 1, wobei jedes bewegliche Teil (3) ineinandergreifende Zähne (4) umfasst und das Schnurwickelteil (2) mit einem Zahnkranz (5) versehen ist, der den ineinandergreifenden Zähnen (4) entspricht.

3. Schnuraufnahmegerät nach Anspruch 1 oder 2, wobei das drehende Teil (1) mit einer Gleitnut (28) versehen ist und das bewegliche Teil (3) mit einem Einsatzabschnitt (17) versehen ist,
wobei der Einsatzabschnitt (17) in die Gleitnut (28) eingesetzt und gleitbar damit verbunden ist.

4. Schnuraufnahmegerät nach einem der Ansprüche 1 bis 3, wobei das Schnurwickelteil (2) drehbar innerhalb eines Befestigungsteils (6) angeordnet ist und das drehende Teil (1) auf das Befestigungsteil (6) gehülst und drehbar damit verbunden ist.

5. Schnuraufnahmegerät nach Anspruch 4, wobei das Befestigungsteil (6) mit einem Dreheinschränkungsteil (22) daran versehen ist, das zum Einschränken des drehenden Teils (1) konfiguriert ist, sodass das drehende Teil (1) nur in der Schnuraufnahmerichtung drehbar ist,

wobei das Dreheinschränkungsteil (22) ein Klinkenrad umfasst und das Drehteil (1) mit Klinken (23) daran versehen ist, welche dem Klinkenrad entsprechen; und
wobei das drehende Teil (1) eine Drehabdeckung (11) und einen Drehteller (12) umfasst, der drehbar in der Drehabdeckung (11) vorgesehen ist.

6. Schnuraufnahmegerät nach Anspruch 5, wobei die Drehabdeckung (11) mit einem Antriebsabschnitt (24) daran versehen ist, der zum Antreiben der Drehplatte (12) zum Drehen in der Schnuraufnahmerichtung konfiguriert ist,

wobei der Antriebsabschnitt (24) Bogennuten umfasst und die Drehplatte (12) mit Vorsprüngen daran versehen ist, die koaxial zu den Bogennuten angeordnet sind und in Eins-zu-Eins-Entsprechung dazu stehen; und
wobei die Vorsprünge jeweils in die Bogennuten eingesetzt sind und Endabschnitte der Bogennuten dem Drehteller (12) durch Anstoßen an die jeweiligen Vorsprünge ermöglichen, synchron mit der Drehabdeckung (11) zu drehen,
wobei mehrere der Bogennuten in einer Gruppierung vorgesehen und verteilt sind, die ringförmig um eine Mittelachse der Drehabdeckung (11) verläuft.

7. Schnuraufnahmegerät nach Anspruch 5, wobei die Drehabdeckung (11) mit einem Einschnappabschnitt (26) daran versehen ist, der dazu konfiguriert ist, mit dem Drehteller (12) einzuschnappen.

8. Schnuraufnahmegerät nach Anspruch 7, wobei der Einschnappabschnitt (26) elastische Haken umfasst und der Drehteller (12) mit Eingriffsnuten (27) daran versehen ist, die jeweils mit den Haken eingeschnappt sind; und
wobei mehrere der Haken in einer Gruppierung vorgesehen und verteilt sind, die ringförmig um eine Mittelachse der Drehabdeckung (11) verläuft.

9. Gegenstand mit einer Schnur, **dadurch gekennzeichnet, dass** er die Schnur und das Schnuraufnahmegerät nach einem der Ansprüche 1 bis 8 umfasst.

Revendications

1. Dispositif collecteur de ficelle, comprenant une pièce rotative (1) et une pièce d'enroulement de ficelle (2) configurée pour enrouler une ficelle,

la pièce rotative (1) étant pourvue d'au moins une pièce mobile (3) qui peut être déplacée, et chaque pièce mobile (3) étant configurée pour s'engager dans la pièce d'enroulement de ficelle (2) lorsque la pièce rotative (1) est tournée dans une direction de collecte de ficelle,
lorsque la pièce mobile (3) est engagée dans la pièce d'enroulement de ficelle (2), la pièce rotative (1), l'au moins une pièce mobile (3) et la pièce d'enroulement de ficelle (2) étant connectées de manière à être en rotation synchrone,
la pièce rotative (1) étant pourvue d'une section de basculement configurée pour entraîner l'au

moins une pièce mobile (3) en mouvement dans un sens radial de la pièce rotative (1),
chaque pièce mobile (3) comprenant une surface d'extraction (18) interagissant avec la section de basculement ;
la section de basculement comprenant une structure d'extraction (20), et la structure d'extraction (20) étant configurée pour comprimer la surface d'extraction (18) lorsque la pièce rotative (1) est tournée dans le sens de collecte de ficelle, de manière à entraîner la pièce mobile (3) pour qu'elle s'engage dans la pièce d'enroulement de ficelle (2) ;
la structure d'extraction (20) étant prévue sur un axe central de la pièce rotative (1) ;
la structure d'extraction (20) comprenant au moins une section de compression (33) qui est en correspondance d'un à un avec l'au moins une pièce mobile (3), et chaque section de compression (33) étant configurée pour appuyer contre la surface d'extraction respective (18) ;
la section de basculement comprenant en outre une section de recul (21), et la pièce mobile (3) comprenant une surface de recul (19) disposée à l'opposé de la surface d'extraction (18) ;
la section de recul (21) étant configurée pour pousser et comprimer la surface de recul (19) lorsque la pièce rotative (1) est tournée dans un sens opposé au sens de collecte de ficelle, de manière à entraîner l'au moins une pièce mobile (3) pour qu'elle se sépare de la pièce d'enroulement de ficelle (2) ; et
la section de recul (21) comprenant au moins un bloc de recul qui est en correspondance d'un à un avec la pièce mobile (3).

2. Dispositif collecteur de ficelle selon la revendication 1, dans lequel chaque pièce mobile (3) comprend des dents engrenées (4), et la pièce enroulement de ficelle (2) est pourvue d'un anneau d'engrenage (5) correspondant aux dents engrenées (4).

3. Dispositif collecteur de ficelle selon la revendication 1 ou 2, dans lequel la pièce rotative (1) est pourvue d'une gorge de coulissement (28), et la pièce mobile (3) est pourvue d'une section d'insertion (17),
la section d'insertion (17) étant insérée dans et connectée de manière à pouvoir coulisser à la gorge de coulissement (28).

4. Dispositif collecteur de ficelle selon une quelconque des revendications 1 à 3, dans lequel la pièce d'enroulement de ficelle (2) est disposée de manière à pouvoir tourner à l'intérieur d'une pièce de fixation (6), et la pièce rotative (1) est emmanchée sur et connectée de manière à pouvoir tourner à la pièce de fixation (6).

5. Dispositif collecteur de ficelle selon la revendication 4, dans lequel la pièce de fixation (6) est prévue dessus avec une pièce de restriction de rotation (22) configurée pour restreindre la pièce rotative (1), de sorte que la pièce rotative (1) peut tourner seulement dans le sens de collecte de ficelle,

la pièce de restriction de rotation (22) comprenant une roue à cliquet, et la pièce rotative (1) étant prévue dessus avec des cliquets (23) correspondant à la roue à cliquet ; et
la pièce rotative (1) comprenant un capot rotatif (11) et une plaque tournante (12) prévus de manière à pouvoir tourner dans le capot rotatif (11).

6. Dispositif collecteur de ficelle selon la revendication 5, dans lequel le capot rotatif (11) est prévu dessus avec une section d'entraînement (24) configurée pour entraîner la plaque tournante (12) en rotation dans le sens de collecte de ficelle,

la section d'entraînement (24) comprenant des gorges arquées, et la plaque tournante (12) étant prévue dessus avec des saillies qui sont disposées coaxialement avec et sont en correspondance d'un à un avec les gorges arquées ; et les saillies étant respectivement insérées dans les gorges arquées, en butant contre les saillies respectives, les sections terminales des gorges arquées permettant à la plaque tournante (12) de tourner de manière synchrone avec le capot rotatif (11),
une pluralité des gorges arquées étant prévues et réparties en un réseau qui est annulaire autour d'un axe central du capot rotatif (11).

7. Dispositif collecteur de ficelle selon la revendication 5, dans lequel le capot rotatif (11) est prévu dessus avec une section d'ajustement à déclic (26) configurée pour être ajustée par déclic avec la plaque tournante (12).

8. Dispositif collecteur de ficelle selon la revendication 7, dans lequel la section d'ajustement à déclic (26) comprend des crochets élastiques, et la plaque tournante (12) est prévue dessus avec des gorges d'engagement (27) qui sont respectivement ajustées par déclic avec les crochets ; et
une pluralité des crochets étant prévus et répartis en un réseau qui est annulaire autour d'un axe central du capot rotatif (11).

9. Article comportant une ficelle, **caractérisé en ce qu'**il comprend la ficelle et le dispositif collecteur de ficelle selon l'une quelconque des revendications 1 à 8.

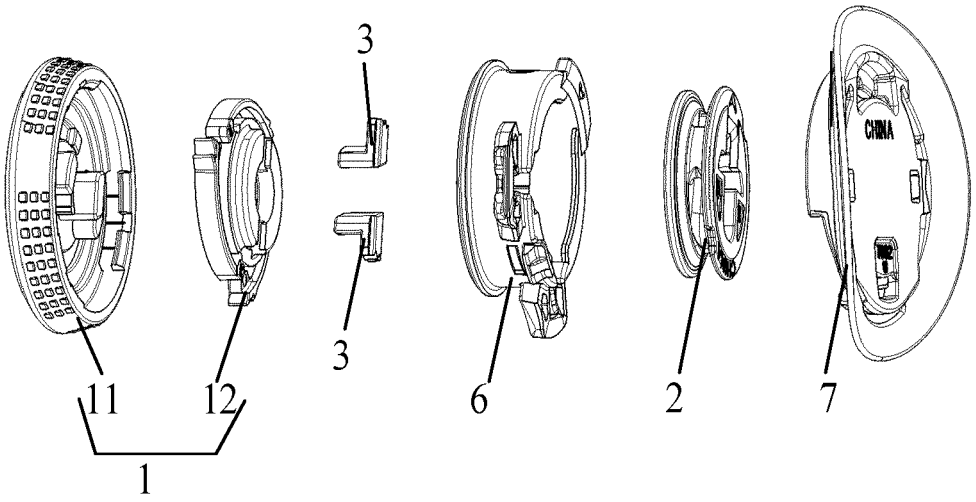

FIG. 1

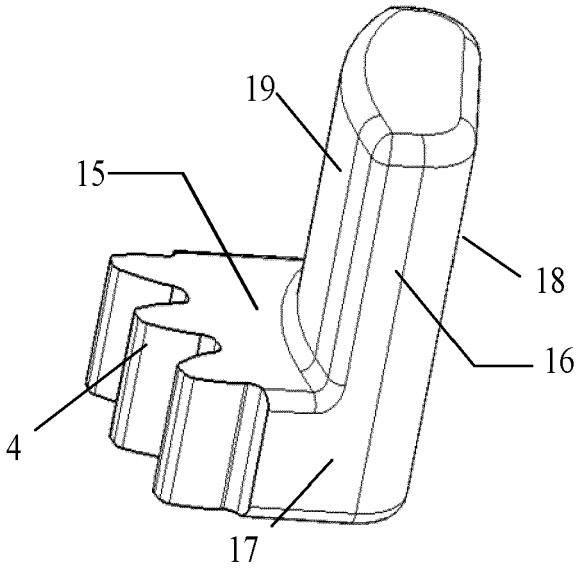

FIG. 2

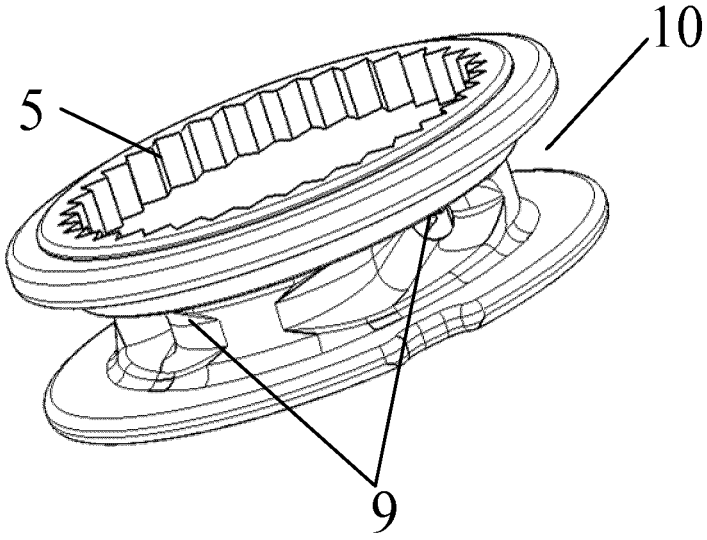

FIG. 3

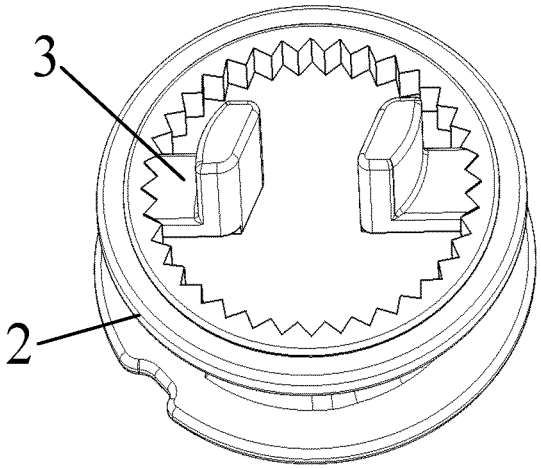

FIG. 4

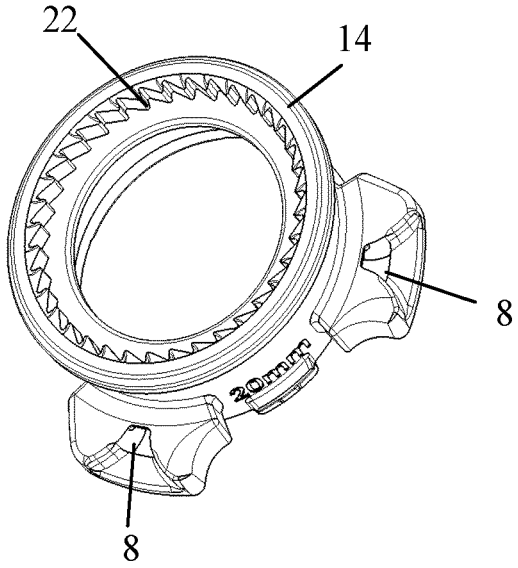

FIG. 5

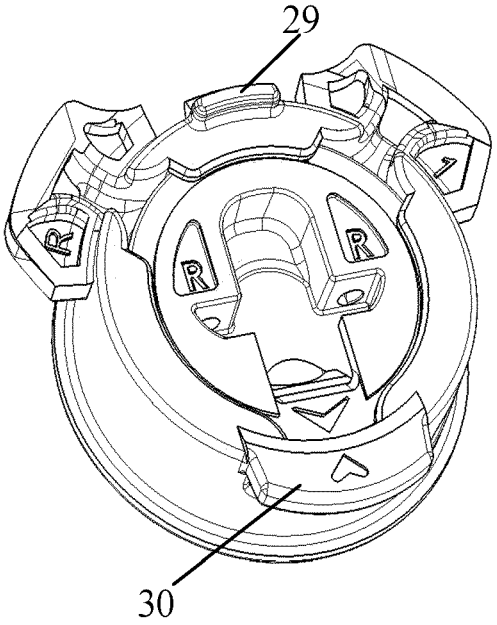

FIG. 6

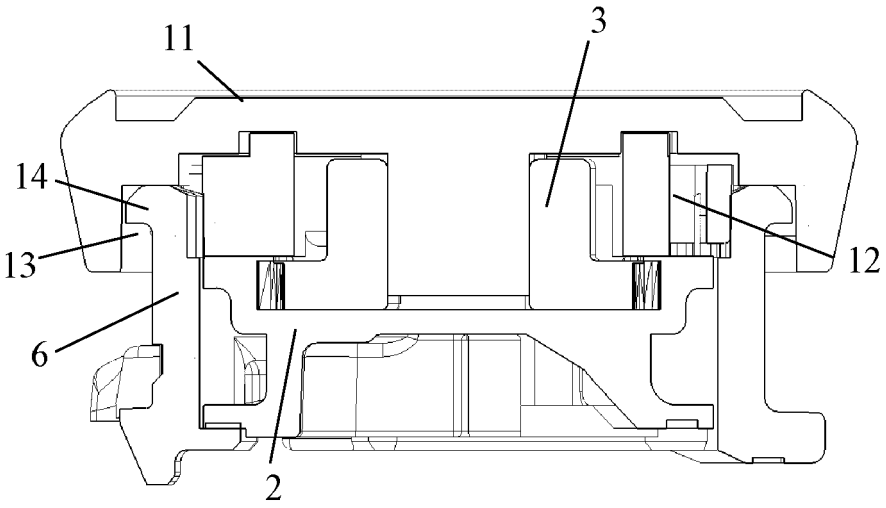

FIG. 7

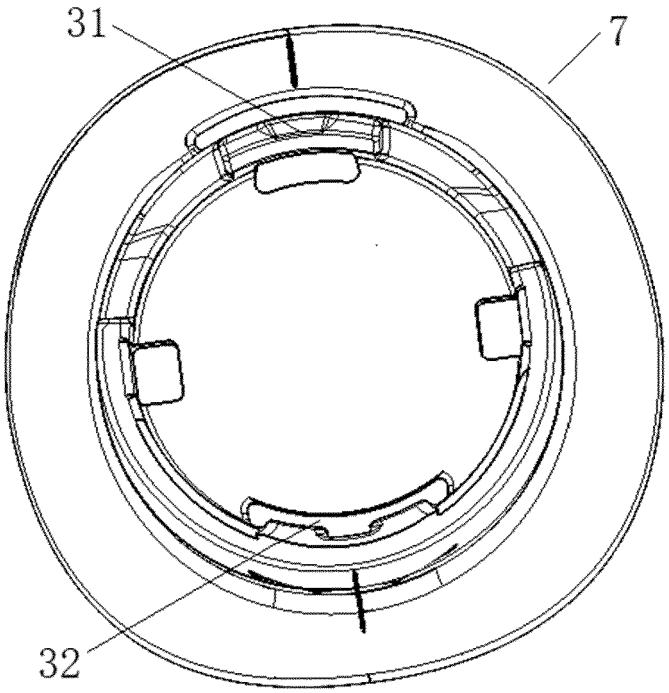

FIG. 8

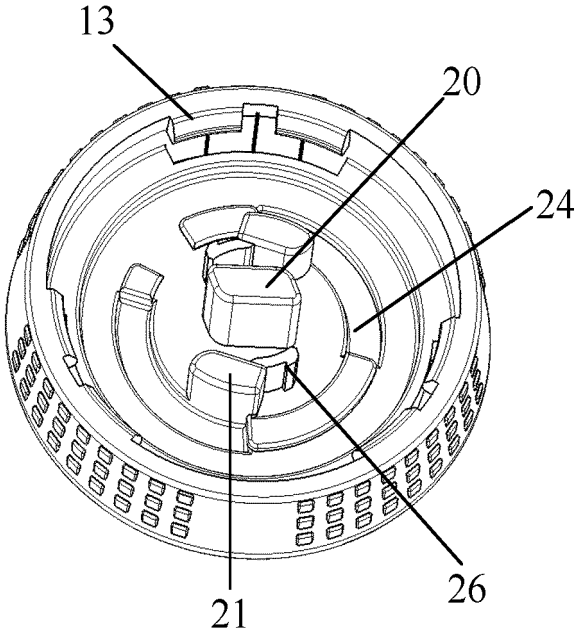

FIG. 9

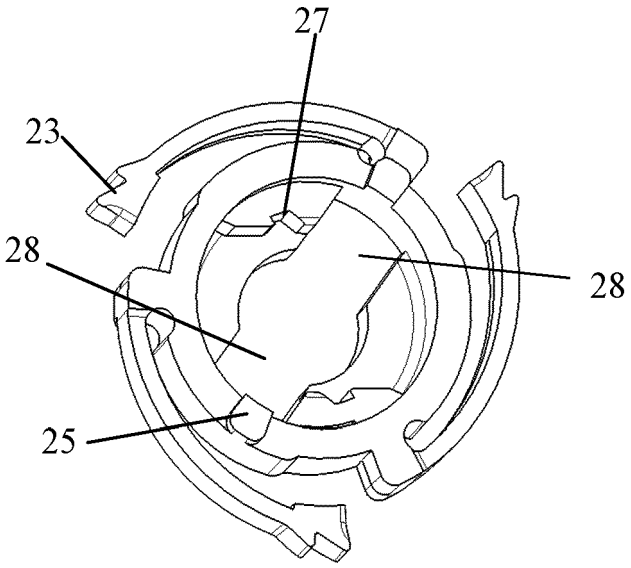

FIG. 10

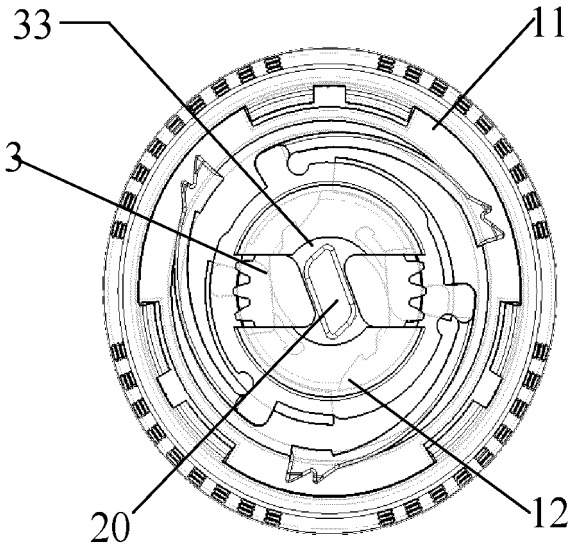

FIG. 11

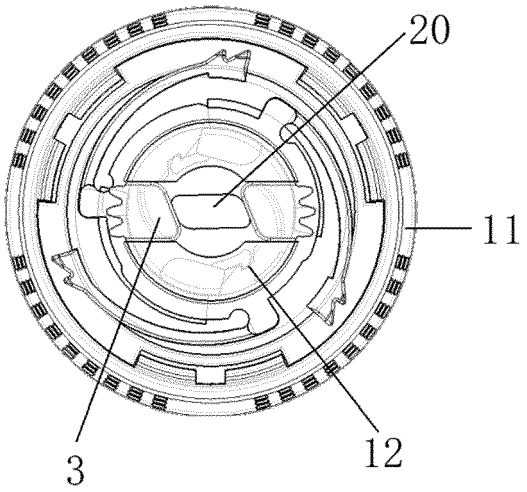

FIG. 12

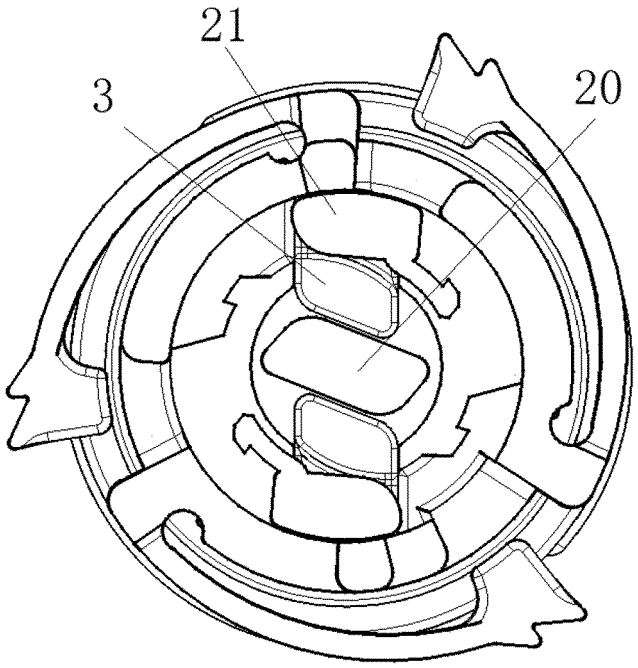

FIG. 13

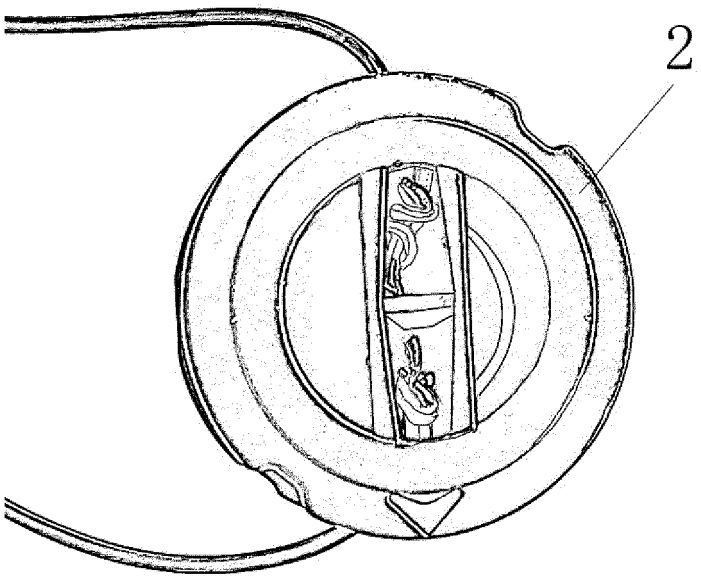

FIG. 14

REFERENCES CITED IN THE DESCRIPTION

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