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(54) **ROPE ADJUSTING DEVICE AND ASSEMBLY**

(57) A rope belt adjusting device and assembly. The rope belt adjusting device comprises: a driving member(1), a wire winding member(2) and a mounting base(3), wherein the driving member(1) and the wire winding member(2) are coaxially arranged, the driving member(1) is movably connected with the wire winding member(2), and both the driving member(1) and the wire winding member(2) are arranged in the mounting base(3); the driving member(1) drives the wire winding member(2) to rotate clockwise or counterclockwise with respect to the mounting base(3); the wire winding member(2) is provided with a fixing portion(24) configured to fix a binding belt and an elastic portion(21) configured to

be connected with the driving member(1), and the driving member(1) is provided thereon with an cirque engagement section(121) configured to be cooperated with the elastic portion(21). When a user performs fixing by the binding belt, the rope belt adjusting device can avoid the tying operation, and a rope belt can be in a tight state by rotatably operating the driving member(1) with only one hand; the rope belt is in a loosened state by disengaging the driving member(1) from the wire winding member(2), which is simple in operation, saves time and is convenient for use by beginners or users with inconvenient use of both hands.

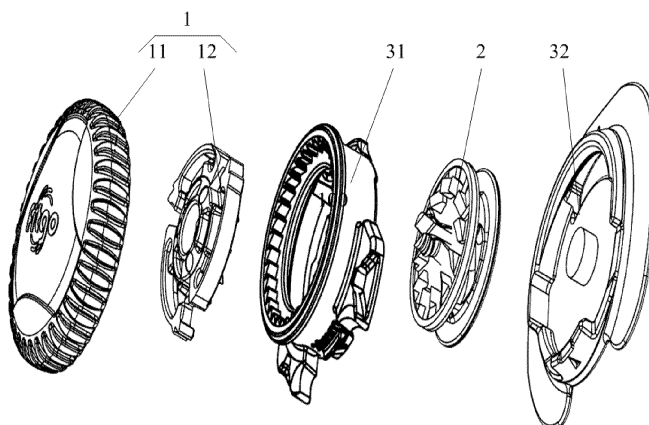


Fig. 2

Description

Cross-reference to Related Application

[0001] The present application claims the priority to a Chinese patent application No. 201810374864.8, filed with the National Intellectual Property Administration, PRC on April 24, 2018 and entitled "Rope Belt Adjusting Device and Assembly", the content of which is incorporated herein by reference in entirety.

Technical Field

[0002] The present application relates to the technical field of daily necessities, and in particular to a rope belt adjusting device and assembly.

Background Art

[0003] At present, it is a conventional fixing method used in footwear, medical protective gears or other daily necessities to fix by a binding belt, where a user adjusts a level of tightness by loosening or tightening the binding belt.

[0004] In the prior art, the tightness is adjusted by the user's hands pulling two ends of the binding belt respectively, and the two ends of the binding belt are knotted for fixation after the adjustment is completed.

[0005] However, it is difficult and complex as well as a waste of time for a user, especially for beginners or users with hands inconvenient in use, to operate to tie and adjust the tightness when fixing is carried out by a binding belt.

Summary

[0006] An object of the present application is to provide a rope belt adjusting device and assembly to solve the technical problem existing in the prior art that it is complex as well as a waste of time for a user, especially for beginners or users with hands inconvenient in use, to operate to tie and adjust the tightness when fixing is carried out by a binding belt.

[0007] The present application provides a rope belt adjusting device, comprising: a driving member, a wire winding member, and a mounting base; the driving member and the wire winding member are provided coaxially, the driving member is movably connected with the wire winding member, and the driving member and the wire winding member are both provided in the mounting base, and the driving member drives the wire winding member to rotate clockwise or counterclockwise with respect to the mounting base; and the wire winding member is provided with a fixing portion configured to fix a binding belt and an elastic portion configured to be connected with the driving member, and the driving member is provided thereon with a cirque engagement section configured to be cooperated with the elastic

portion.

[0008] Further, the driving member comprises an end cap and a rotating pawl; the end cap is fixedly connected with the rotating pawl, and the end cap comprises a cap body and a large engagement buckle, a small engagement buckle and a positioning column provided on the cap body; and the plurality of positioning columns, small engagement buckles and large engagement buckles are all distributed in a circular shape with a center of the cap body as the center, and the positioning column, the small engagement buckle and the large engagement buckle are provided as sequentially spaced apart in a direction of a diameter of the cap body.

[0009] Further, the rotating pawl comprises a main body, and a plurality of positioning holes, a plurality of elastic arm ratchets, an engagement buckle flat section, and a plurality of tooth grooves provided on the main body;

the positioning hole, the engagement buckle flat section and the tooth grooves are provided on both sides of the main body, and the positioning hole and the engagement buckle flat section are configured to match with the positioning column and the small engagement buckle; and the cirque engagement section is provided at a center of the main body, and the plurality of tooth grooves are provided on the main body in an annular shape with a center of the main body as the center, and the tooth grooves are configured to be connected with the wire winding member, an outer edge of the main body is provided thereon with a plurality of protrusions configured to be connected with the elastic arm ratchet, and the plurality of elastic arm ratchets are extended in the same direction, and the elastic arm ratchet is configured to be connected in transmission with the mounting base.

[0010] Further, the wire winding member comprises a belt fitting groove, the fixing portion, an annular tooth, and the elastic portion; and the fixing portion is provided inside the belt fitting groove, the annular tooth and the elastic portion are provided at an end of the belt fitting groove, and the elastic portion is provided at a center of the belt fitting groove, and the plurality of annular teeth are evenly distributed with a center of the belt fitting groove as the center, and the annular tooth matches with the tooth groove.

[0011] Further, the elastic portion comprises a first semi-circular post and a second semi-circular post; and the first semi-circular post and the second semi-circular post are symmetrically provided at a center of the belt fitting groove, and the first semi-circular post and the second semi-circular post are provided spaced apart, the first semi-circular post and the second semi-circular post are respectively provided thereon with a first elastic buckle and a second elastic buckle, and the first elastic buckle and the second elastic buckle are configured to be engaged with the cirque engagement section.

[0012] Further, the elastic portion further comprises an elastic sheet; and

the elastic sheet is detachably provided between the first semi-circular post and the second semi-circular post.

[0013] Further, the elastic sheet is provided thereon with a first fixing hole and a second fixing hole, the first semi-circular post is provided with a first positioning protrusion at an end close to the second semi-circular post, the second semi-circular post is provided with a second positioning protrusion at an end close to the first semi-circular post, and the first fixing hole and the second fixing hole are engaged with the first positioning protrusion and the second positioning protrusion.

[0014] Further, the mounting base comprises a base and a fixing seat;

the base is provided thereon with a through-hole, the base is provided thereon with a brim, an inner helical tooth, a small engagement leg and a large engagement leg, the inner helical tooth is provided on an inner sidewall of the base, and the brim is provided at an end of the base, and the small engagement leg and the large engagement leg are provided on an outer wall of the base; and

the brim is configured to be engaged with the large engagement buckle to prevent upward and downward movement of the cap body along the base, and the inner helical tooth is engaged with the elastic arm ratchet such that the rotating pawl is rotated clockwise or counterclockwise with respect to the base, the large engagement leg and the small engagement leg are configured to be connected with the fixing seat, and the base is further provided on a side with a rope exiting opening configured to be passed through by the binding belt.

[0015] Further, the fixing seat is provided thereon with a central column, a large engagement groove, and a small engagement groove; and

the wire winding member is rotatably provided on the central column, and the large engagement groove and the small engagement groove are engaged with the large engagement leg and the small engagement leg to connect the fixing seat and the base.

[0016] The present application further provides a rope belt adjusting assembly, comprising a binding belt, a plurality of guiding buckles, and a rope belt adjusting device as described above; and

the plurality of guiding buckles are configured to be fixed on an external object, and the plurality of guiding buckles are provided spaced apart; and the binding belt is sequentially passed through the plurality of guiding buckles and fixed onto the fixing portion.

[0017] The present application provides a rope belt adjusting device, comprising: a driving member, a wire winding member, and a mounting base; the driving member and the wire winding member are provided coaxially, the driving member is movably connected with the wire winding member, and the driving member and the wire winding member are both provided in the mounting base, and the driving member drives the wire winding member to rotate clockwise or counterclockwise with respect to the mounting base; and the wire winding member is pro-

vided with a fixing portion configured to fix a binding belt and an elastic portion configured to be connected with the driving member, and the driving member is provided thereon with an cirque engagement section configured to in cooperation with the elastic portion. With the above solution, in use, the driving member moves approaching an end of the wire winding member, so that the driving member is connected with the wire winding member, and in this case, the elastic portion on the wire winding member is engaged with the cirque engagement section on the driving member, and the driving member is provided in the mounting base, the mounting base restricts a rotating direction of the driving member, so that the driving member drives the wire winding member to rotate only clockwise or counterclockwise, so that the fixing portion provided on the wire winding member drives the binding belt to wind around the wire winding member, gradually reducing length of the binding belt outside the device, thereby making the tightness degree of the binding belt tight. When the user needs to loosen the binding belt, the driving member is disengaged from the wire winding member by pulling the driving member, and the binding belt can be adjusted to be in a loosened state by pulling out the external binding belt directly.

[0018] As can be seen from the above, when fixing is carried out by the user using the binding belt, the mentioned rope belt adjusting device can avoid tying operation, and the rope belt can be put into a tight state by rotatably operating the driving member with only one hand, and the rope belt is put into a loosened state by disengaging the driving member from the wire winding member, where such an operation is simple and time-saving, especially convenient to be used by a beginner or a user with hands inconvenient in use.

[0019] The present application provides a rope belt adjusting assembly, and the rope belt adjusting assembly comprises a binding belt, a plurality of guiding buckles, and a rope belt adjusting device, with an effect brought about the same as that of the rope belt adjusting device, which is not repeated here. In addition, the provision of the plurality of guiding buckles allows an external object to be bound by the binding belt more securely.

Brief Description of the Drawings

[0020] Drawings required for use in the description of specific embodiments or the prior art will be introduced briefly below in order to explain the technical solutions of the specific embodiments of the present application or of the prior art more clearly, it will be apparent that the drawings described below are merely illustrative of some embodiments of the present application, and those ordinarily skilled in the art would also obtain, from these drawings, other drawings without inventive efforts.

Fig. 1 is a structural schematic diagram of an assembling of a rope belt adjusting device provided by an embodiment of the present application;

Fig. 2 is a structural exploded diagram of a rope belt adjusting device provided by an embodiment of the present application;

Fig. 3 is a structural sectional diagram of a rope belt adjusting device provided by an embodiment of the present application;

Fig. 4 is a structural schematic diagram of an assembling of a driving member provided by an embodiment of the present application;

Fig. 5 is a structural schematic diagram of an assembling of a wire winding member and a rotating pawl provided by an embodiment of the present application;

Fig. 6 is a structural schematic diagram of an end cap provided by an embodiment of the present application;

Fig. 7 is a structural schematic diagram of a rotating pawl provided by an embodiment of the present application;

Fig. 8 is a structural schematic diagram of a wire winding member provided by an embodiment of the present application;

Fig. 9 is a structural schematic diagram of a base provided by an embodiment of the present application;

Fig. 10 is a structural schematic diagram of a fixing seat provided by an embodiment of the present application;

Fig. 11 is an exploded schematic diagram of a wire winding wheel provided with an elastic sheet provided by an embodiment of the present application;

Fig. 12 is a structural schematic diagram of a cooperation of a binding belt with a wire winding member, a base and a guiding buckle provided by an embodiment of the present application;

Fig. 13 is a structural schematic diagram of a rope belt adjusting device provided by an embodiment of the present application applied in cooperation with a shoe; and

Fig. 14 is a structural schematic diagram of a rope belt adjusting device provided by an embodiment of the present application applied in cooperation with a medical protective gear.

[0021] Reference signs: 1-driving member; 2-wire winding member; 3-mounting base; 4-binding belt; 5-

guiding buckle; 6-rope belt adjusting device; 7-shoe; 8-medical protective sleeve; 11-end cap; 12-rotating pawl; 31-base; 32-fixing seat; 21-elastic portion; 22-annular tooth; 23-belt fitting groove; 24-fixing portion; 110-small engagement buckle; 111-large engagement buckle; 112-positioning column; 120-engagement buckle flat section; 121-cirque engagement section; 122-elastic arm ratchet; 123-tooth groove; 210-first semi-circular post; 211-second semi-circular post; 212-first elastic buckle; 213-second elastic buckle; 214-elastic sheet; 310-brim; 311-inner helical tooth; 312-through-hole; 313-small engagement leg; 314-large engagement leg; 315-rope exiting opening; 321-central column; 322-large engagement groove; 323-small engagement groove; 2101-first positioning protrusion; 2141-first fixing hole; 2142-second fixing hole.

Detailed Description of the Embodiments

[0022] The technical solutions of the present application will be described below clearly and completely with reference to the drawings. It is apparent that the embodiments described are some, but not all of the embodiments of the present application. All the other embodiments, obtained by those ordinarily skilled in the art in light of the embodiments of the present application without inventive efforts, will fall within the claimed scope of the present application.

[0023] In the description of the present application, it should be indicated that orientation or positional relations indicated by terms such as "center", "up", "down", "left", "right", "vertical", "horizontal", "inside" or "outside", if present, are based on the orientation or positional relations as shown in the drawings, only for facilitating description of the present application and simplifying the description, rather than indicating or implying that the referred devices or elements must be in a particular orientation or constructed or operated in the particular orientation, and therefore they should not be construed as limiting the present application. In addition, terms such as "first", "second", or "third", if present, are used only for description, and should not be construed as indicating or implying relative importance.

[0024] In the description of the present application, it should be indicated that unless otherwise expressly specified or defined, terms "mount", "link" or "connect", if present, should be understood broadly, and for example, a connection may be a fixed connection, or a detachable connection, or an integrated connection; may be a mechanical connection or an electric connection; or may be a direct linking, or an indirect linking via an intermediate medium, or may be an internal communication between two elements. The specific meanings of the above-mentioned terms in the present application could be understood by those ordinarily skilled in the art according to specific situations.

[0025] Fig. 1 is a structural schematic diagram of an assembling of a rope belt adjusting device provided by

an embodiment of the present application; Fig. 2 is a structural exploded diagram of a rope belt adjusting device provided by an embodiment of the present application; Fig. 3 is a structural sectional diagram of a rope belt adjusting device provided by an embodiment of the present application; Fig. 4 is a structural schematic diagram of an assembling of a driving member provided by an embodiment of the present application; and Fig. 5 is a structural schematic diagram of an assembling of a wire winding member and a rotating pawl provided by an embodiment of the present application. As shown in Figs. 1-5, the present application provides a rope belt adjusting device, comprising: a driving member 1, a wire winding member 2, and a mounting base 3;

the driving member 1 and the wire winding member 2 are provided coaxially, the driving member 1 is movably connected with the wire winding member 2, and the driving member 1 and the wire winding member 2 are both provided in the mounting base 3, and the driving member drives the wire winding member 2 to rotate clockwise or counterclockwise with respect to the mounting base 3; and

the wire winding member 2 is provided with a fixing portion 24 configured to fix a binding belt 4 and an elastic portion 21 configured to be connected with the driving member 1, and the driving member 1 is provided thereon with a cirque engagement section 121 configured to in cooperation with the elastic portion 21.

[0026] The present application provides a rope belt adjusting device, comprising a driving member 1, a wire winding member 2 and a mounting base 3; and, in use, the driving member 1 moves approaching an end of the wire winding member 2, so that the driving member 1 is connected with the wire winding member 2, and in this case, the elastic portion 21 on the wire winding member 2 is engaged with an cirque engagement section 121 on the driving member 1, and the driving member 1 is provided in the mounting base 3, the mounting base 3 restricts a rotating direction of the driving member 1, so that the driving member 1 drives the wire winding member 2 to rotate only clockwise or counterclockwise, so that the fixing portion 24 provided on the wire winding member 2 drives the binding belt 4 to wind around the wire winding member 2, gradually reducing length of the binding belt 4 outside the device, thereby making the tightness degree of the binding belt 4 tight. When the user needs to loosen the binding belt 4, the driving member 1 is disengaged from the wire winding member 2 by pulling the driving member 1, the wire winding member 2 is disengaged from the mounting base 3, and the binding belt 4 can be adjusted to be in a loosened state by pulling out the external binding belt 4 directly.

[0027] As can be seen from the above, when fixing is carried out by the user using the binding belt 4, the mentioned rope belt adjusting device can avoid tying operation, and the rope belt can be put into a tight state by rotatably operating the driving member 1 with only one hand, and the rope belt can be put into a loosened state

by disengaging the driving member 1 from the wire winding member 2 and the mounting base 3, where such an operation is simple and time-saving, especially convenient to be used by a beginner or a user with hands inconvenient in use.

[0028] Fig. 6 is a structural schematic diagram of an end cap provided by an embodiment of the present application. As shown in Fig. 6, on the basis of the above embodiment, further, the driving member 1 comprises an end cap 11 and a rotating pawl 12;

the end cap 11 is fixedly connected with the rotating pawl 12, and the end cap 11 comprises a cap body and a large engagement buckle 111, a small engagement buckle 110 and a positioning column 112 provided on the cap body; and

the plurality of positioning columns 112, small engagement buckles 110 and large engagement buckles 111 are all distributed in a circular shape with a center of the cap body as the center, and the positioning column 112, the small engagement buckle 110 and the large engagement buckle 111 are provided as sequentially spaced apart in a direction of a diameter of the cap body.

[0029] Wherein the cap body is circular, and the positioning column 112, the small engagement buckle 110, and the large engagement buckle 111 each are provided in the number of three.

[0030] In this embodiment, the end cap 11 is fixedly connected with the rotating pawl 12, the end cap 11 is rotated to drive the rotating pawl 12 to rotate, and when the rope belt needs to be loosened, the rotating pawl 12 is separated from the wire winding member 2 to facilitate the rope belt to loosen; the positioning column 112, the small engagement buckle 110 and the large engagement buckle 111 provided on the cap body are provided spaced apart in a direction of a diameter of the cap body, the large engagement buckle 111 is engaged with the mounting base 3 in such a way to be configured to restrict a position of the cap body on the mounting base 3, the positioning column 112 and the small engagement buckle 110 are both configured to be connected with the rotating pawl 12 to fixedly connect the cap body with the rotating pawl 12 by an engagement buckle.

[0031] Fig. 7 is a structural schematic diagram of a rotating pawl provided by an embodiment of the present application. As shown in Fig. 7, on the basis of the above embodiment, further, the rotating pawl 12 comprises a main body, and a plurality of positioning holes, a plurality of elastic arm ratchets 122, an engagement buckle flat section 120, and a plurality of tooth grooves 123 provided on the main body;

the positioning hole, the engagement buckle flat section 120 and the tooth grooves 123 are provided on both sides of the main body, and the positioning hole and the engagement buckle flat section 120 are configured to match with the positioning column 112 and the small engagement buckle 110; and

the cirque engagement section 121 is provided at a center of the main body, and the plurality of tooth grooves

123 are provided on the main body in an annular shape with a center of the main body as the center, and the tooth grooves 123 are configured to be connected with the wire winding member 2, the main body is provided on an outer edge with a plurality of protrusions configured to be connected with the elastic arm ratchet 122, and the plurality of elastic arm ratchets 122 are extended in the same direction, and the elastic arm ratchet 122 is configured to be connected in transmission with the mounting base 3.

[0032] In this embodiment, a positioning hole configured to be in cooperation with the positioning column 112 and an engagement buckle flat section 120 configured to be in cooperation with the small engagement buckle 110 are provided on the main body, and the provision of the positioning hole and the engagement buckle flat section 120 allows a connection between the end cap 11 and the rotating pawl 12; and an cirque engagement section 121 is further provided at a central position of the main body, the cirque engagement section 121 is further provided with a plurality of tooth grooves 123 on its circumferential direction, and the elastic arm ratchet 122 provided on an edge of the main body is connected with the mounting base 3, and the elastic arm ratchet 122 is connected with the mounting base 3 to make the elastic arm ratchet 122 to rotate only in one direction along an axis of the mounting base 3, such that the end cap 11 can only be rotated in one direction, the end cap 11 is rotated to tighten the rope belt, and the cirque engagement section 121 and the tooth grooves 123 are both connected with the wire winding member 2, and the elastic portion 21 on the wire winding member 2 is engaged with the cirque engagement section 121, that is, putting the wire winding member 2 into a state of connecting with the rotating pawl 12.

[0033] Fig. 8 is a structural schematic diagram of a wire winding member provided by an embodiment of the present application. As shown in Fig. 8, on the basis of the above embodiment, further, the wire winding member 2 comprises a belt fitting groove 23, a fixing portion 24, an annular tooth 22, and the elastic portion 21; and the fixing portion 24 is provided inside the belt fitting groove 23, the annular tooth 22 and the elastic portion 21 are provided at an end of the belt fitting groove 23, and the elastic portion 21 is provided at a center of the belt fitting groove 23, and the plurality of annular teeth 22 are evenly distributed with a center of the belt fitting groove 23 as the center, and the annular tooth 22 matches with the tooth groove 123.

[0034] In this embodiment, the fixing portion 24 is provided in the belt fitting groove 23, the fixing portion 24 is configured to fix the rope belt, the elastic portion 21 is provided at a center of the belt fitting groove 23 and has one end extending outward, and the elastic portion 21 is engaged with the cirque engagement section 121, the annular tooth 22 is cooperated with the tooth groove 123 provided on the rotating pawl 12 to allow a more stable connection between the wire winding member 2 and the

rotating pawl 12.

[0035] Fig. 11 is an exploded schematic diagram of a wire winding wheel provided with an elastic sheet provided by an embodiment of the present application. As shown in Fig. 11, on the basis of the above embodiment, further, the elastic portion 21 comprises a first semi-circular post 210 and a second semi-circular post 211; and the first semi-circular post 210 and the second semi-circular post 211 are symmetrically provided at a center of the belt fitting groove 23, and the first semi-circular post 210 and the second semi-circular post 211 are provided spaced apart, the first semi-circular post 210 and the second semi-circular post 211 are respectively provided thereon with a first elastic buckle 212 and a second elastic buckle 213, and the first elastic buckle 212 and the second elastic buckle 213 are configured to be engaged with the cirque engagement section 121.

[0036] Further, the elastic portion 21 further comprises an elastic sheet 214; and the elastic sheet 214 is detachably provided between the first semi-circular post 210 and the second semi-circular post 211.

[0037] Further, the elastic sheet 214 is provided thereon with a first fixing hole 2141 and a second fixing hole 2142, the first semi-circular post 210 is provided with a first positioning protrusion 2101 at an end close to the second semi-circular post 211, the second semi-circular post 211 is provided with a second positioning protrusion at an end close to the first semi-circular post 210, and the first fixing hole 2141 and the second fixing hole 2142 are engaged with the first positioning protrusion 2101 and the second positioning protrusion.

[0038] In this embodiment, the first semi-circular post 210 and the second semi-circular post 211 are oppositely provided at the center of a mounting groove, and there is a gap between the first semi-circular post 210 and the second semi-circular post 211, a first protrusion and a second protrusion are provided at a side where the first semi-circular post 210 and the second semi-circular post 211 are opposite, and the first protrusion and the second protrusion are configured to be connected with the first fixing hole 2141 and the second fixing hole 2142 on the elastic sheet 214, such that the elastic sheet 214 can be mounted on the first semi-circular post 210 and the second semi-circular post 211, and the first semi-circular post 210 and the second semi-circular post 211 are provided with the first elastic buckle 212 and the second elastic buckle 213, the first elastic buckle 212 and the second elastic buckle 213 are oppositely provided, and the first elastic buckle 212 and the second elastic buckle 213 are configured to be engaged with the cirque engagement section 121, where such a provision allows an increase to an elastic force of the first elastic buckle 212 and the second elastic buckle 213 in case that the wire winding member 2 is used in a highly intensive manner.

[0039] Fig. 9 is a structural schematic diagram of a base provided by an embodiment of the present application; and Fig. 10 is a structural schematic diagram of a fixing seat provided by an embodiment of the present

application. As shown in Figs. 9 and 10, on the basis of the above embodiment, further, the mounting base 3 comprises a base 31 and a fixing seat 32; the base 31 is provided thereon with a through-hole 312, the base 31 is provided thereon with a brim 310, an inner helical tooth 311, a small engagement leg 313 and a large engagement leg 314, the inner helical tooth 311 is provided on an inner sidewall of the base 31, and the brim 310 is provided at an end of the base 31, and the small engagement leg 313 and the large engagement leg 314 are provided on an outer wall of the base 31; and the brim 310 is configured to be engaged with the large engagement buckle 111 to prevent upward and downward movement of the cap body along the base 31, and the inner helical tooth 311 is engaged with the elastic arm ratchet 122 such that the rotating pawl 12 is rotated clockwise or counterclockwise with respect to the base 31, the large engagement leg 314 and the small engagement leg 313 are configured to be connected with the fixing seat 32, and the base 31 is further provided on a side with a rope exiting opening 315 configured to be passed through by a binding belt 4.

[0040] Further, the fixing seat 32 is provided thereon with a central column 321, a large engagement groove 322, and a small engagement groove 323; and the wire winding member 2 is rotatably provided on the central column 321, so that the wire winding member 2 is connected, and the large engagement groove 322 and the small engagement groove 323 are engaged with the large engagement leg 314 and the small engagement leg 313 to connect the fixing seat 32 and the base 31.

[0041] In this embodiment, the base 31 is of a hollow shape, that is, the base 31 is provided thereon with a through-hole 312, and configured to be provided with the wire winding member 2 and the driving member 1 at passing-through position, and the brim 310 is provided on the base 31, and the brim 310 is engaged with the large engagement buckle 111 to restrict a position that the cap body moves on the base 31, and the base 31 is provided on its inner wall with an inner helical tooth 311 engaged with the elastic arm ratchet 122, the provision of the inner helical tooth 311 thus makes the elastic arm ratchet 122 only rotate in one direction with respect to the base 31, the large engagement leg 314 and the small engagement leg 313 provided on the base 31 are connected with the large engagement groove 322 and the small engagement groove 323 on the fixing seat 32 to connect the base 31 and the fixing seat 32, and a rope exiting opening 315 is provided on a side of the base 31 so that the binding belt 4 can pass through the rope exiting opening 315 to connect with the fixing portion 24, allowing the binding belt 4 to be wound in the belt fitting groove 23, and moreover, the fixing seat 32 is provided thereon with a central column 321 which is rotated together with the wire winding member 2.

[0042] Fig. 12 is a structural schematic diagram of a cooperation of a binding belt with a wire winding member, a base and a guiding buckle provided by an embodiment

of the present application; Fig. 13 is a structural schematic diagram of a rope belt adjusting device provided by an embodiment of the present application applied in cooperation with a shoe; and Fig. 14 is a structural schematic diagram of a rope belt adjusting device provided by an embodiment of the present application applied in cooperation with a medical protective gear. As shown in Figs. 12-14, the present application further provides a rope belt adjusting assembly, and the rope belt adjusting assembly comprises a binding belt 4, a plurality of guiding buckles 5, and a rope belt adjusting device, with an effect brought about the same as that of the rope belt adjusting device, which is not repeated here. In addition, the provision of the plurality of guiding buckles 5 allows an external object to be bound by the binding belt 4 more securely.

[0043] Wherein the rope belt adjusting assembly may be applied to a shoe 7, and the rope belt adjusting device 6 is provided at an end of the shoe 7 close to the tongue, and the rope belt adjusting assembly can also be applied to a medical protective sleeve 8.

[0044] Finally, it should be noted that the above embodiments are only used to illustrate the technical solutions of the present application, rather than limiting the same; although the present application has been described in detail with reference to the foregoing embodiments, those ordinarily skilled in the art should understand that: it is still possible to modify the technical solutions described in the foregoing embodiments or equivalently replace some or all of the technical features therein; and these modifications or replacements do not deviate the essence of the corresponding technical solutions from the scope of the technical solutions of the embodiments of the present application.

Claims

1. A rope belt adjusting device, **characterized by** comprising: a driving member, a wire winding member, and a mounting base, wherein the driving member and the wire winding member are provided coaxially, the driving member is movably connected with the wire winding member, and the driving member and the wire winding member are both provided in the mounting base, and the driving member drives the wire winding member to rotate clockwise or counterclockwise with respect to the mounting base; and the wire winding member is provided with a fixing portion configured to fix a binding belt and an elastic portion configured to be connected with the driving member, and the driving member is provided thereon with a cirque engagement section configured to be cooperated with the elastic portion.
2. The rope belt adjusting device according to claim 1, wherein the driving member comprises an end cap

and a rotating pawl;
the end cap is fixedly connected with the rotating pawl, and the end cap comprises a cap body, and a large engagement buckle, a small engagement buckle and a positioning column provided on the cap body; and

the plurality of positioning columns, small engagement buckles and large engagement buckles are all distributed in a circular shape with a center of the cap body as the center, and the positioning column, the small engagement buckle and the large engagement buckle are provided as sequentially spaced apart in a direction of a diameter of the cap body.

3. The rope belt adjusting device according to claim 2, wherein the rotating pawl comprises a main body, and a plurality of positioning holes, a plurality of elastic arm ratchets, an engagement buckle flat section, and a plurality of tooth grooves provided on the main body;
the positioning hole, the engagement buckle flat section and the tooth grooves are provided on both sides of the main body, and the positioning hole and the engagement buckle flat section are configured to match with the positioning column and the small engagement buckle; and
the cirque engagement section is provided at a center of the main body, and the plurality of tooth grooves are provided on the main body in an annular shape with a center of the main body as the center, and the tooth grooves are configured to be connected with the wire winding member, the main body is provided on an outer edge with a plurality of protrusions configured to be connected with the elastic arm ratchets, and the plurality of elastic arm ratchets are extended in a same direction, and the elastic arm ratchets are configured to be connected in transmission with the mounting base.
4. The rope belt adjusting device according to claim 3, wherein the wire winding member comprises a belt fitting groove, the fixing portion, an annular tooth, and the elastic portion; and
the fixing portion is provided inside the belt fitting groove, the annular tooth and the elastic portion are provided at an end of the belt fitting groove, and the elastic portion is provided at a center of the belt fitting groove, and the plurality of annular teeth are evenly distributed with a center of the belt fitting groove as the center, and the annular tooth matches with the tooth grooves.
5. The rope belt adjusting device according to claim 4, wherein the elastic portion comprises a first semi-circular post and a second semi-circular post; and
the first semi-circular post and the second semi-circular post are symmetrically provided at a center of the belt fitting groove, and the first semi-circular post

and the second semi-circular post are provided spaced apart, the first semi-circular post and the second semi-circular post are respectively provided thereon with a first elastic buckle and a second elastic buckle, and the first elastic buckle and the second elastic buckle are configured to be engaged with the cirque engagement section.

6. The rope belt adjusting device according to claim 5, wherein the elastic portion further comprises an elastic sheet; and
the elastic sheet is detachably provided between the first semi-circular post and the second semi-circular post.
7. The rope belt adjusting device according to claim 6, wherein the elastic sheet is provided thereon with a first fixing hole and a second fixing hole, the first semi-circular post is provided with a first positioning protrusion at an end close to the second semi-circular post, the second semi-circular post is provided with a second positioning protrusion at an end close to the first semi-circular post, and the first fixing hole and the second fixing hole are engaged with the first positioning protrusion and the second positioning protrusion.
8. The rope belt adjusting device according to claim 7, wherein the mounting base comprises a base and a fixing seat;
the base is provided thereon with a through-hole, the base is provided thereon with a brim, an inner helical tooth, a small engagement leg and a large engagement leg, the inner helical tooth is provided on an inner sidewall of the base, and the brim is provided at an end of the base, and the small engagement leg and the large engagement leg are provided on an outer wall of the base; and
the brim is configured to be engaged with the large engagement buckle to prevent upward and downward movement of the cap body along the base, and the inner helical tooth is engaged with the elastic arm ratchets such that the rotating pawl is rotated clockwise or counterclockwise with respect to the base, the large engagement leg and the small engagement leg are configured to be connected with the fixing seat, and the base is further provided on a side with a rope exiting opening configured to be passed through by a binding belt.
9. The rope belt adjusting device according to claim 8, wherein the fixing seat is provided thereon with a central column, a large engagement groove, and a small engagement groove; and
the wire winding member is rotatably provided on the central column, and the large engagement groove and the small engagement groove are engaged with the large engagement leg and the small

engagement leg to connect the fixing seat and the base.

10. A rope belt adjusting assembly, **characterized by** comprising a binding belt, a plurality of guiding buckles and the rope belt adjusting device according to any one of claims 1-9, wherein the plurality of guiding buckles are configured to be fixed on an external object, and the plurality of guiding buckles are provided spaced apart; and the binding belt is sequentially passed through the plurality of guiding buckles and fixed onto the fixing portion.

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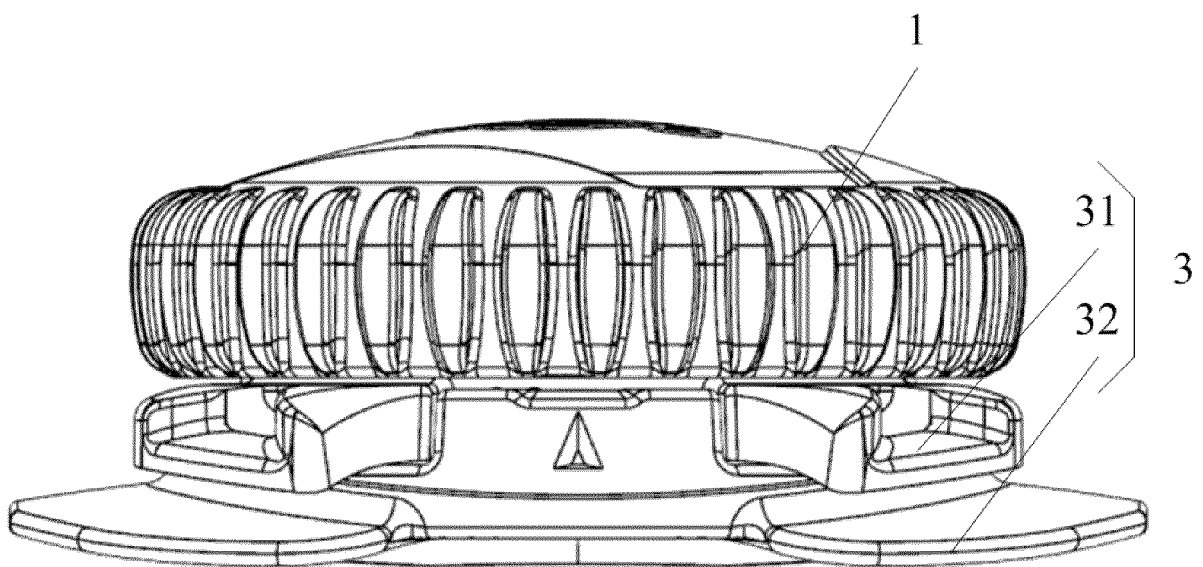


Fig. 1

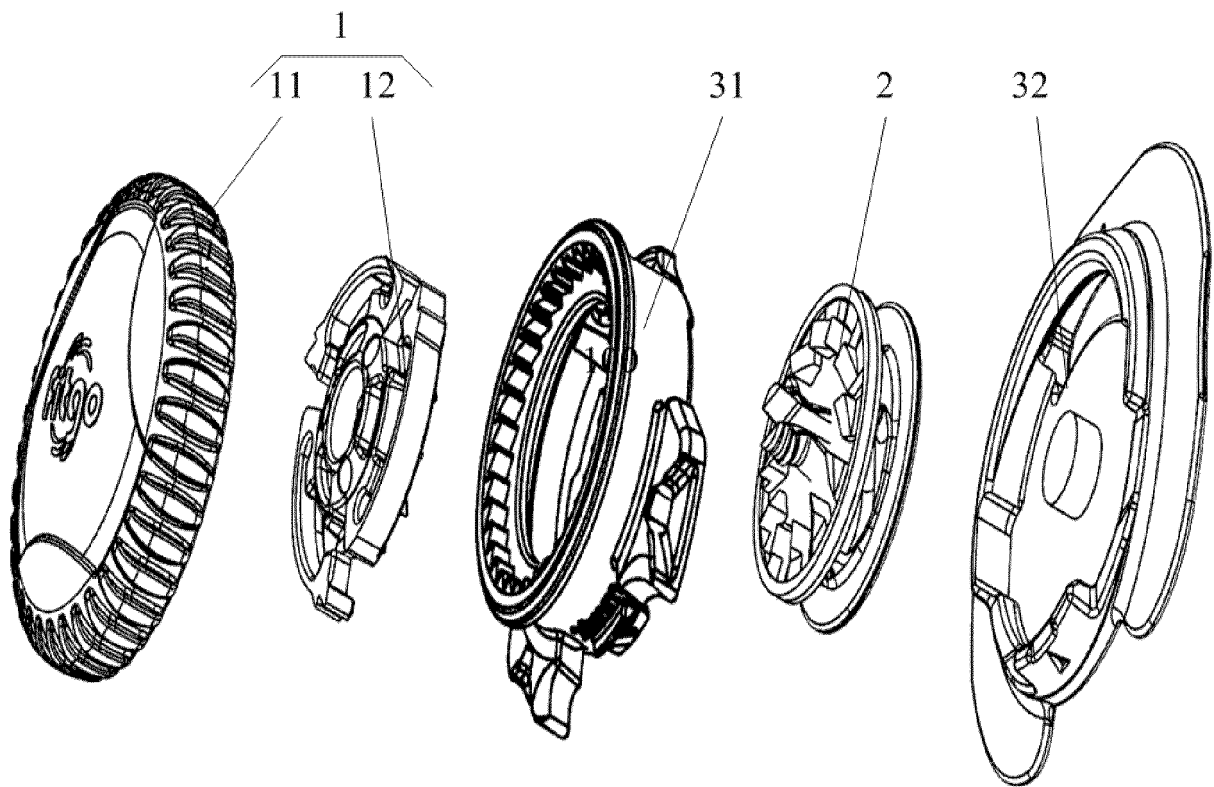


Fig. 2

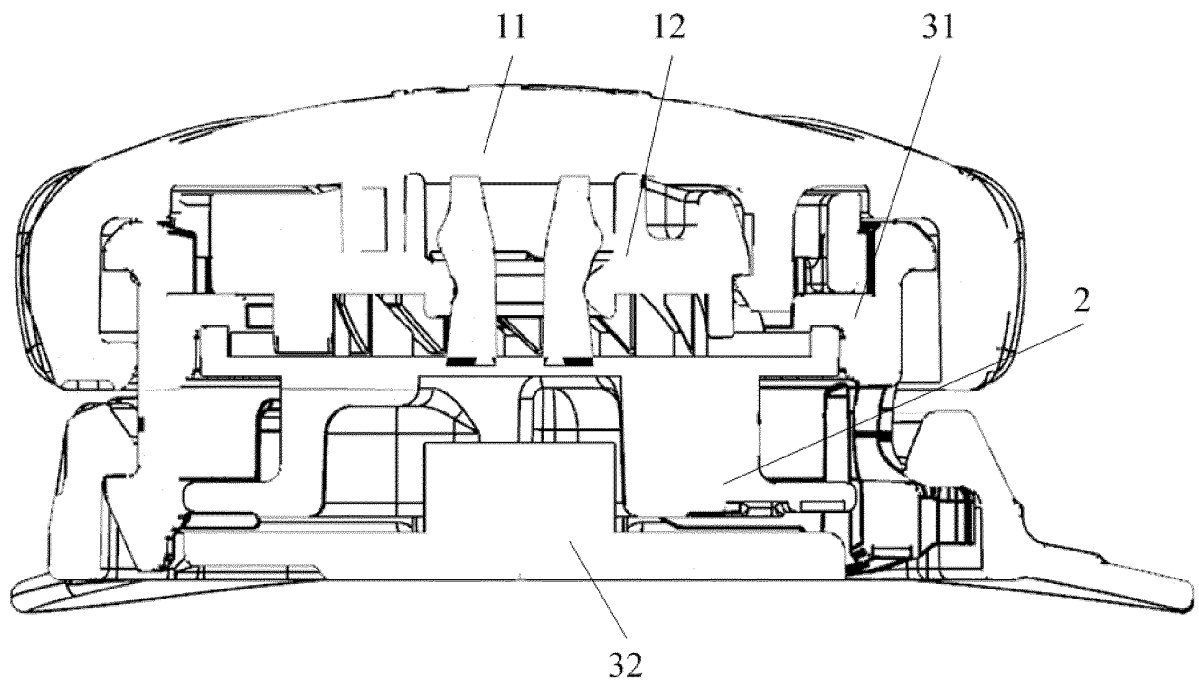


Fig. 3

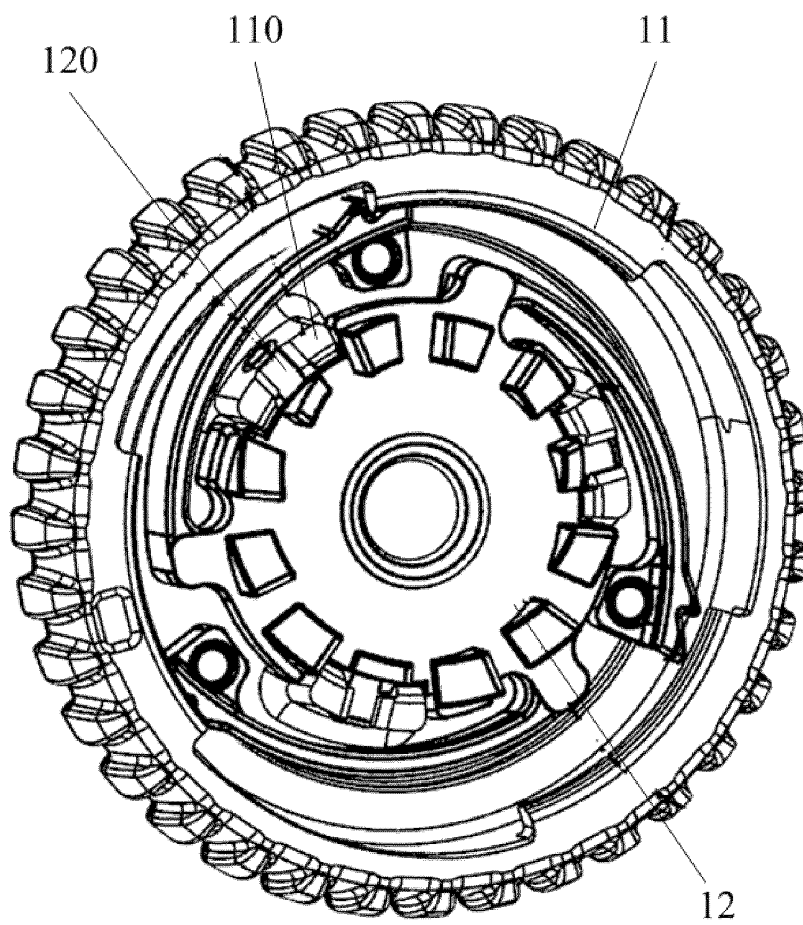


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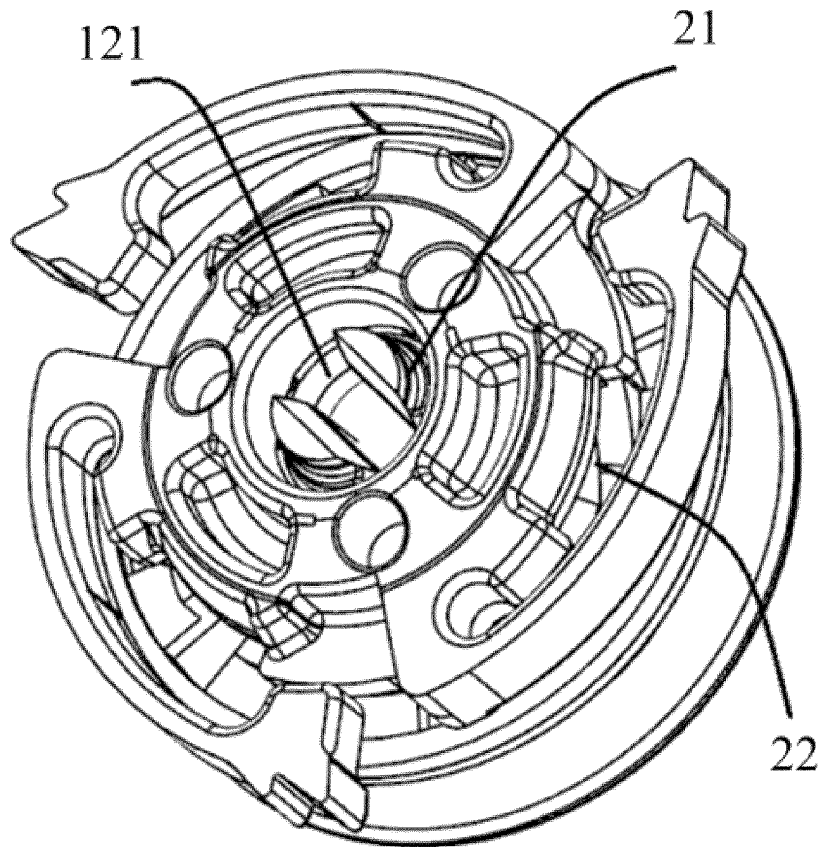


Fig. 5

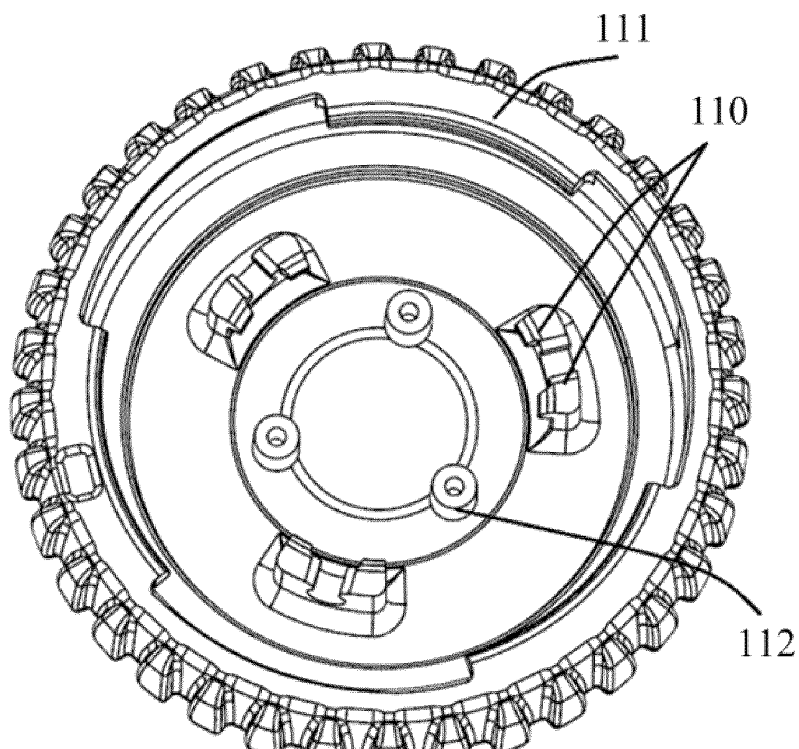


Fig. 6

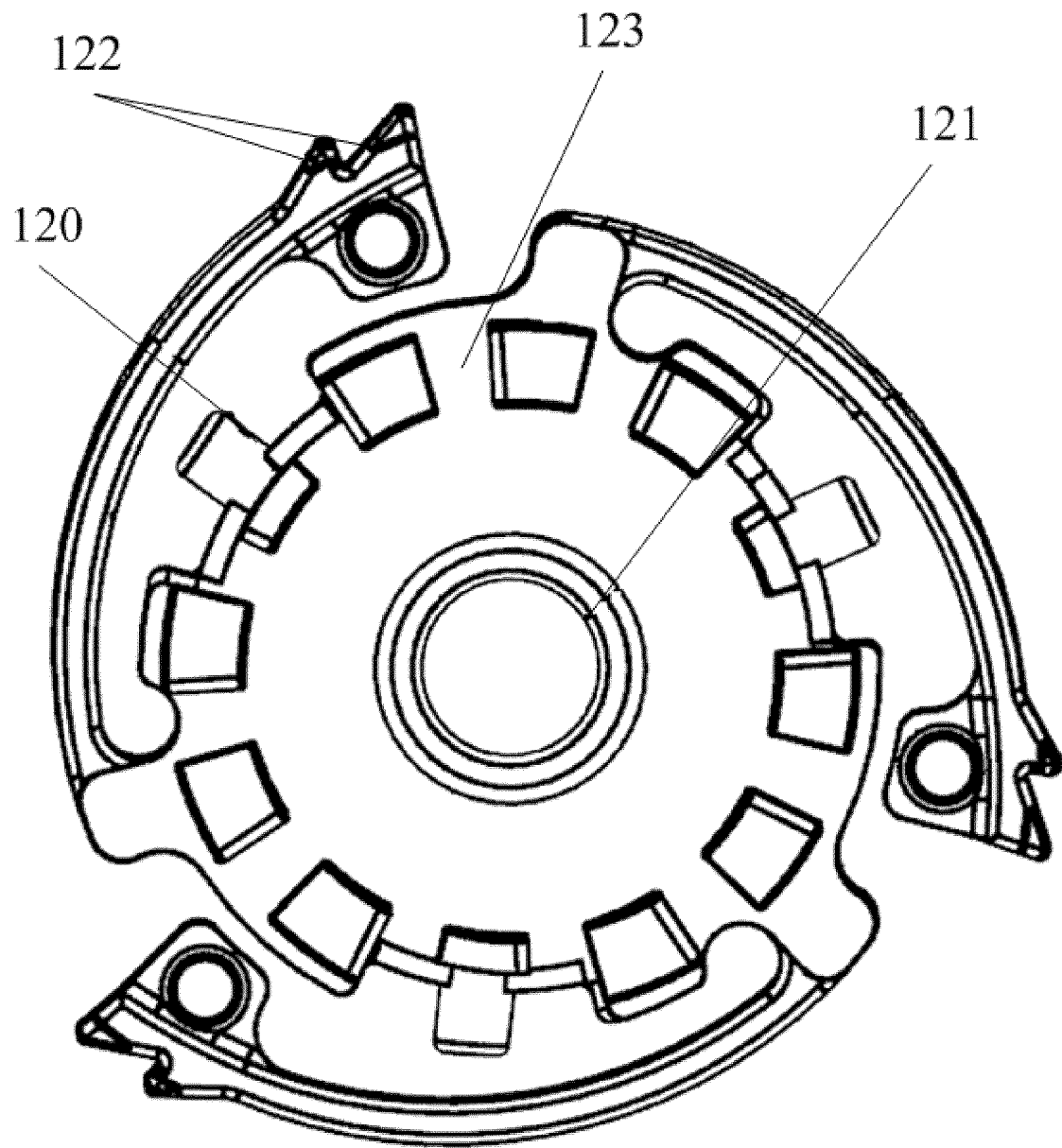


Fig. 7

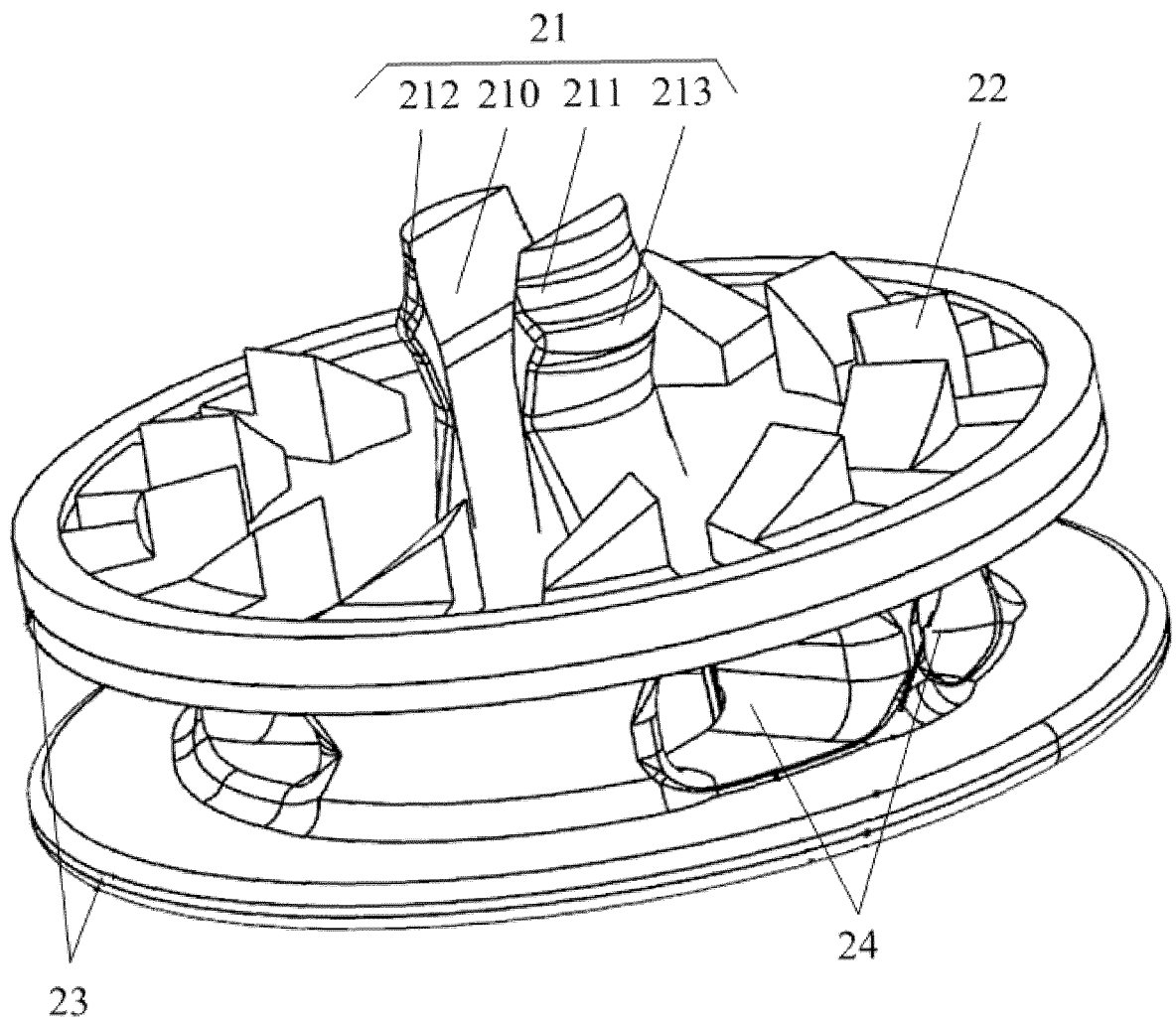


Fig. 8

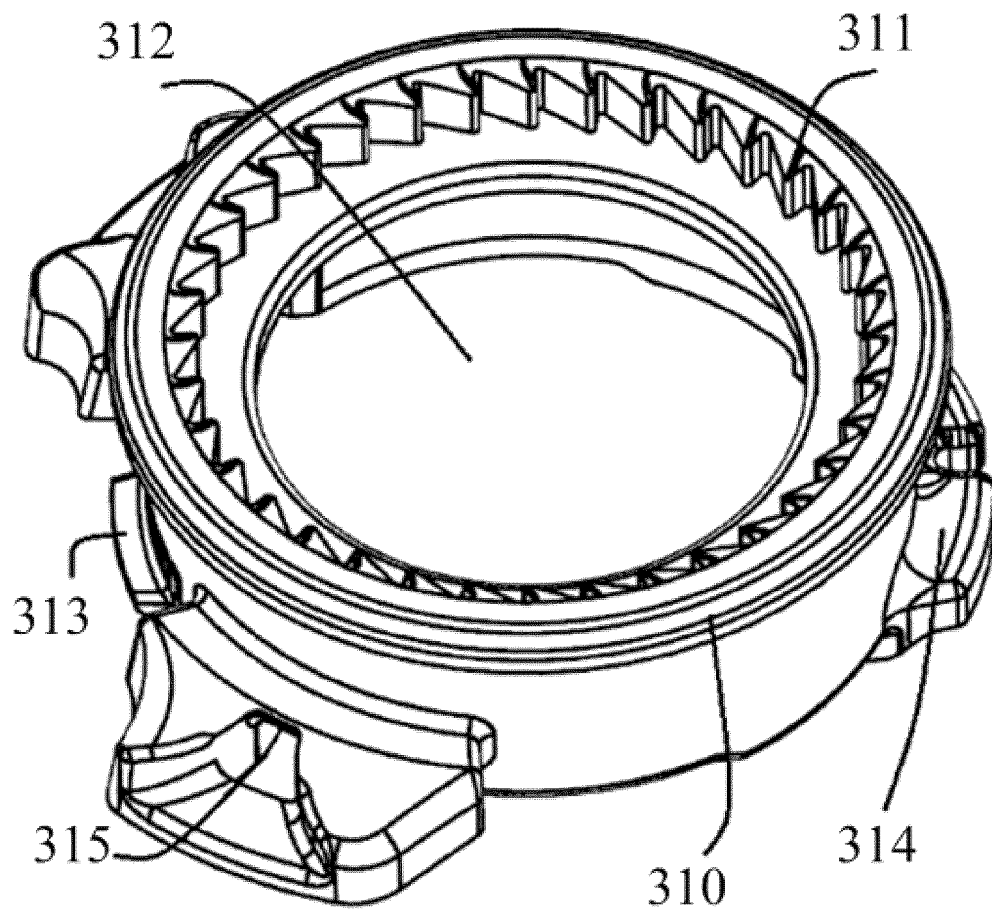


Fig. 9

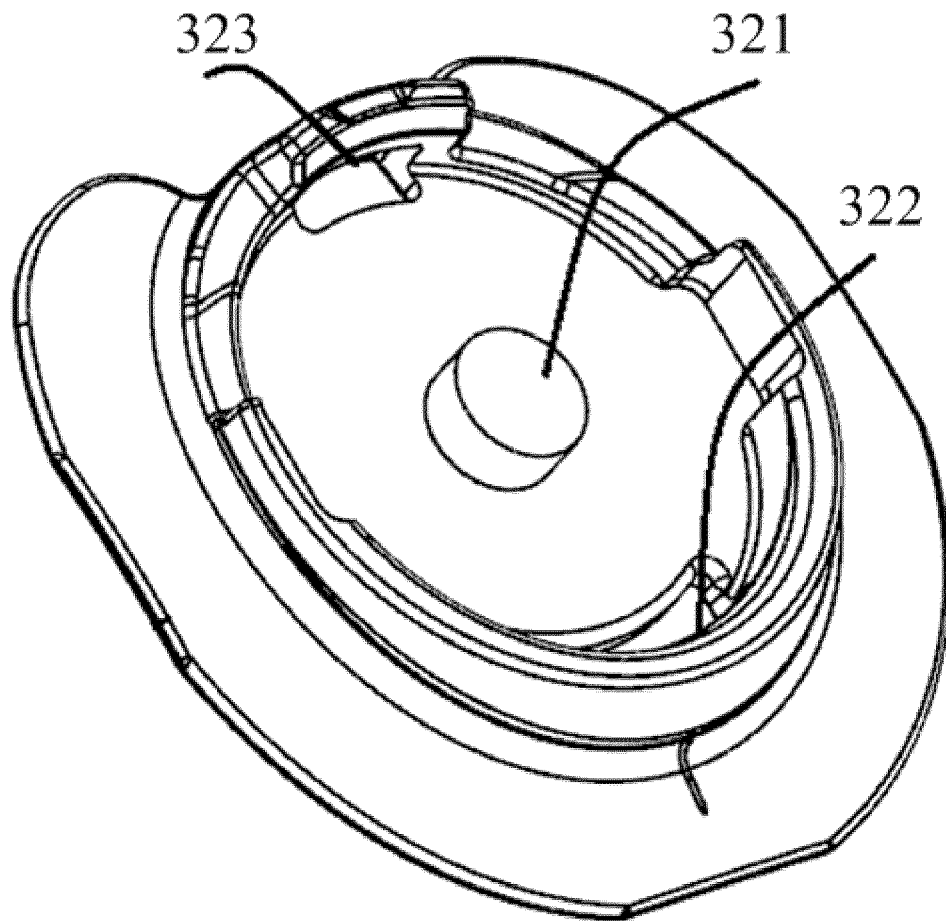


Fig. 10

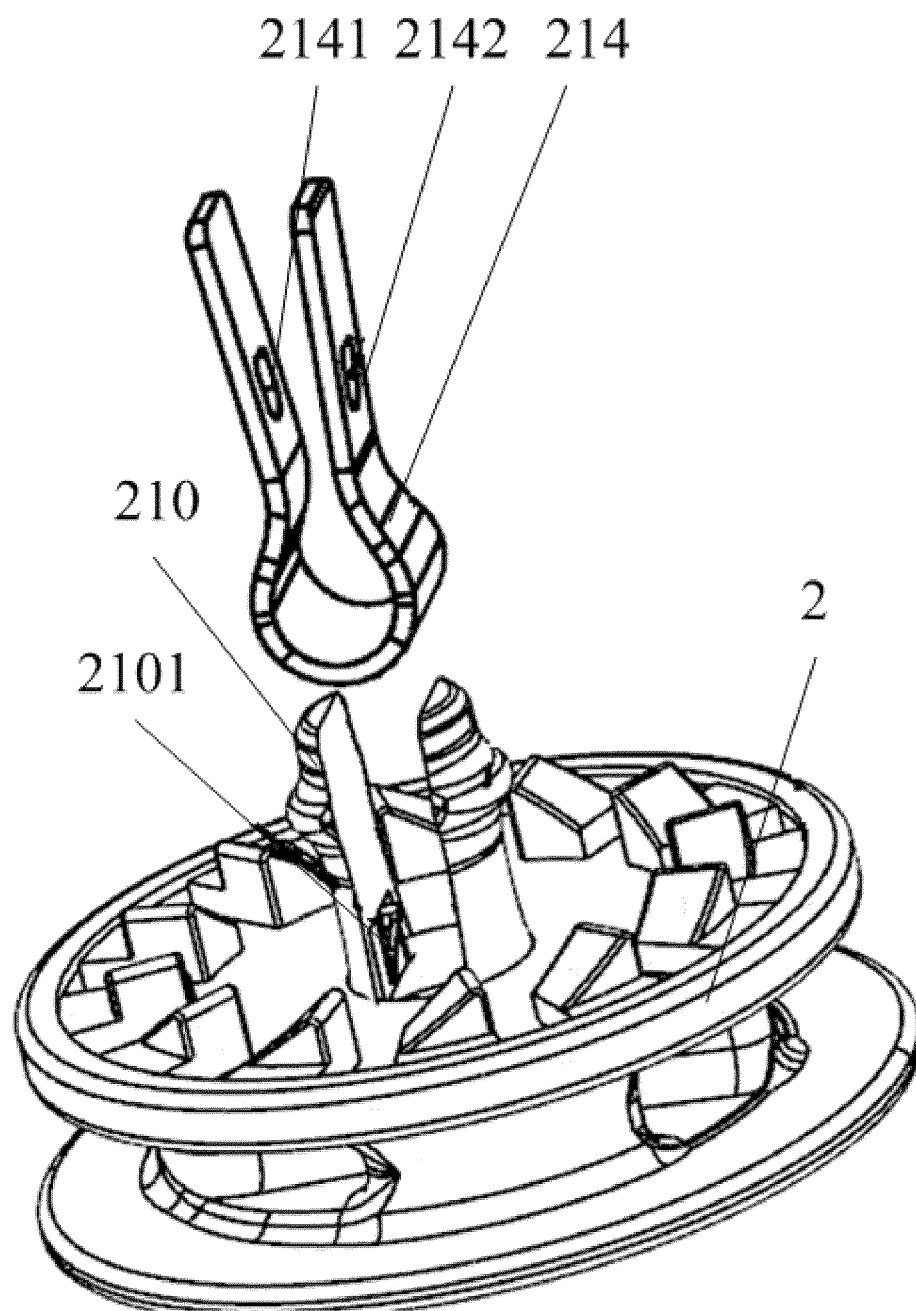


Fig. 11

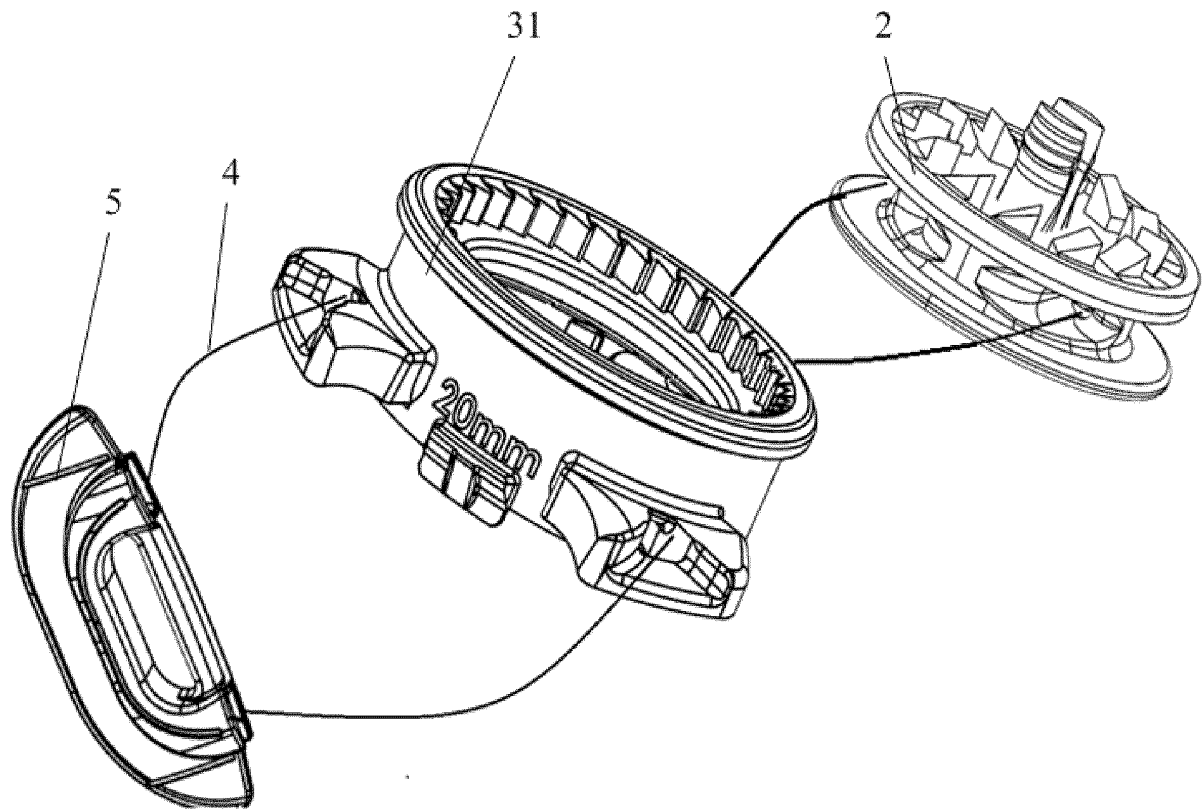


Fig. 12

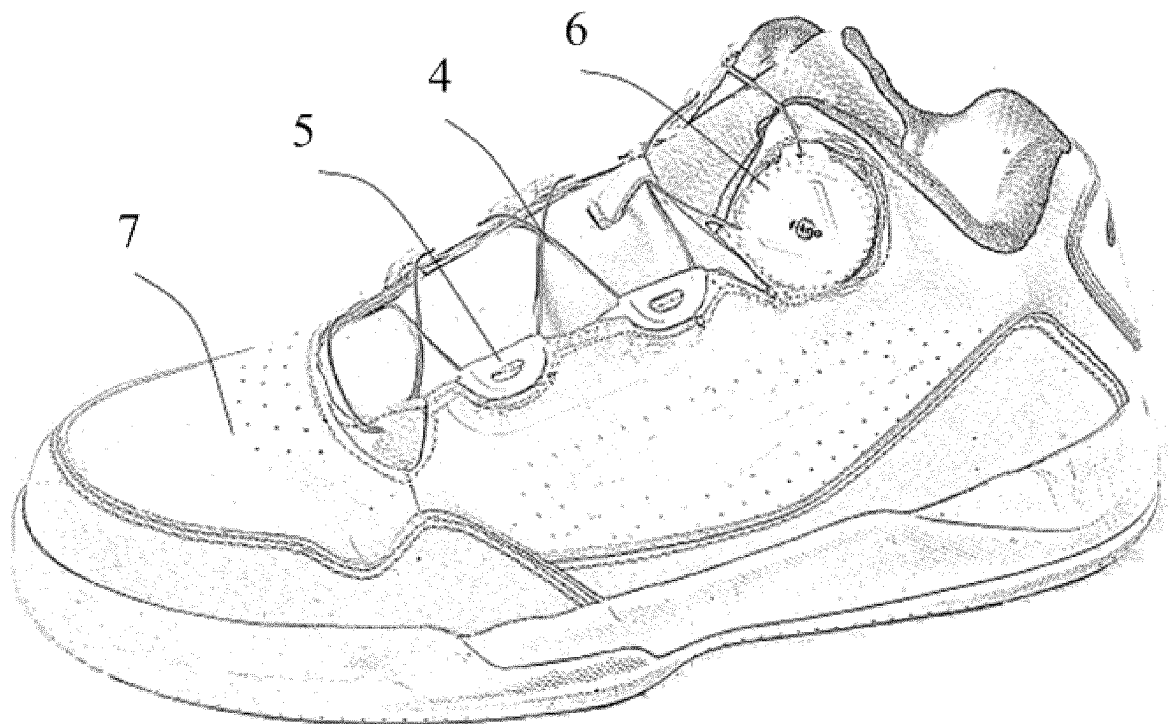


Fig. 13

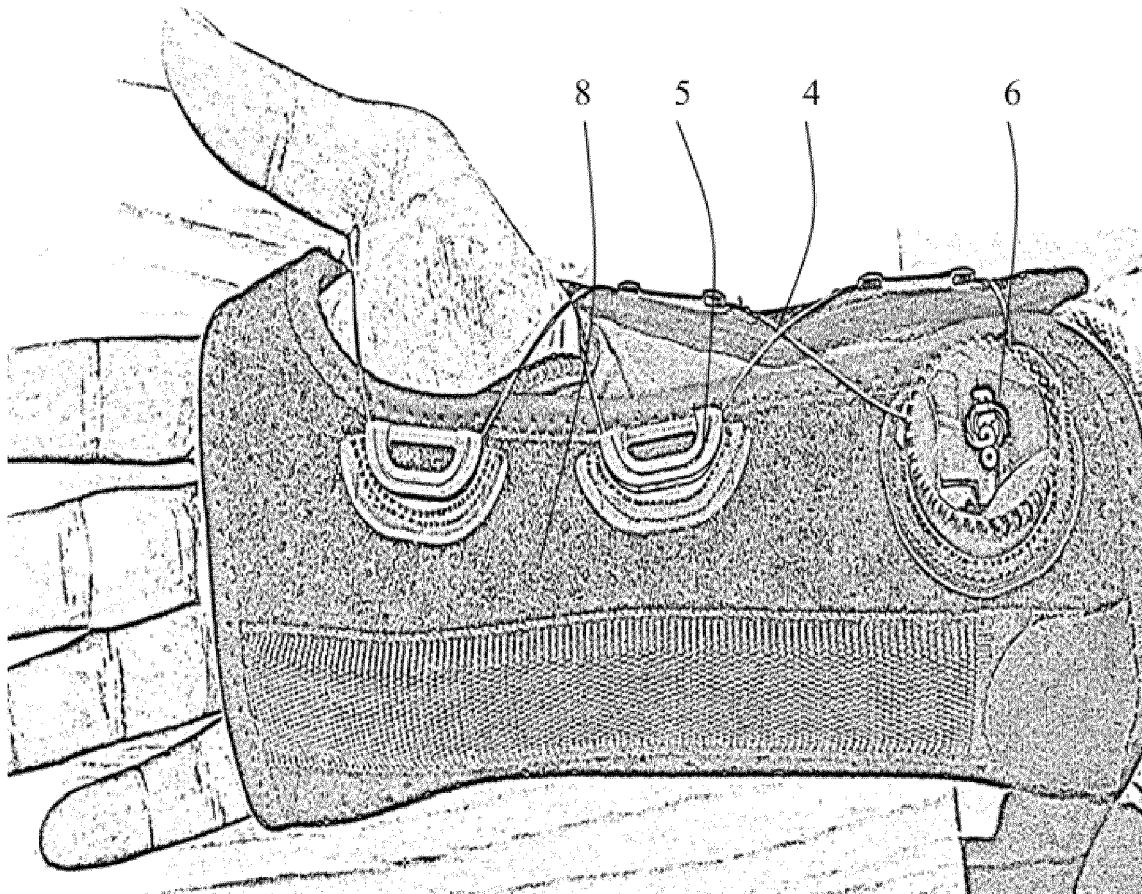


Fig. 14

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2018/091847

A. CLASSIFICATION OF SUBJECT MATTER A43C 11/00(2006.01)i; A43C 7/00(2006.01)i According to International Patent Classification (IPC) or to both national classification and IPC	B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) A43C11, A43C7, A47G25, F16G11, A44B11 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNABS, VEN, CNTXT, USTXT, EPTXT, WOTXT: 旋转, 带扣, 绳扣, 弹片, 弹性, lace, clamp, buckle, spring, rotatable, rotation																		
C. DOCUMENTS CONSIDERED TO BE RELEVANT																			
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>CN 207054983 U (SHI, QIUXIA) 02 March 2018 (2018-03-02) description, paragraphs [0029]-[0036], and figures 1-8</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 106723663 A (SHENZHEN YOUNG TECHNOLOGY CO., LTD.) 31 May 2017 (2017-05-31) entire document</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 206413843 U (SHENZHEN YOUNG TECHNOLOGY CO., LTD.) 18 August 2017 (2017-08-18) entire document</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 206565397 U (FUJIAN PROVINCE JINJIANG CITY CHIDIAN TOWN JINXING SHOES CO., LTD.) 20 October 2017 (2017-10-20) entire document</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>US 2016009523 A1 (OSSUR HF) 14 January 2016 (2016-01-14) entire document</td> <td>1-10</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	CN 207054983 U (SHI, QIUXIA) 02 March 2018 (2018-03-02) description, paragraphs [0029]-[0036], and figures 1-8	1-10	A	CN 106723663 A (SHENZHEN YOUNG TECHNOLOGY CO., LTD.) 31 May 2017 (2017-05-31) entire document	1-10	A	CN 206413843 U (SHENZHEN YOUNG TECHNOLOGY CO., LTD.) 18 August 2017 (2017-08-18) entire document	1-10	A	CN 206565397 U (FUJIAN PROVINCE JINJIANG CITY CHIDIAN TOWN JINXING SHOES CO., LTD.) 20 October 2017 (2017-10-20) entire document	1-10	A	US 2016009523 A1 (OSSUR HF) 14 January 2016 (2016-01-14) entire document	1-10	☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex. * Special categories of cited documents: “A” document defining the general state of the art which is not considered to be of particular relevance “E” earlier application or patent but published on or after the international filing date “L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) “O” document referring to an oral disclosure, use, exhibition or other means “P” document published prior to the international filing date but later than the priority date claimed “T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention “X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone “Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art “&” document member of the same patent family
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																	
X	CN 207054983 U (SHI, QIUXIA) 02 March 2018 (2018-03-02) description, paragraphs [0029]-[0036], and figures 1-8	1-10																	
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A	US 2016009523 A1 (OSSUR HF) 14 January 2016 (2016-01-14) entire document	1-10																	
Date of the actual completion of the international search 18 September 2018	Date of mailing of the international search report 29 September 2018																		
Name and mailing address of the ISA/CN State Intellectual Property Office of the P. R. China (ISA/CN) No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088 China Facsimile No. (86-10)62019451	Authorized officer Telephone No.																		

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2018/091847

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 207054983 U	02 March 2018	None	
CN 106723663 A	31 May 2017	WO 2018137274 A1	02 August 2018
CN 206413843 U	18 August 2017	None	
CN 206565397 U	20 October 2017	None	
US 2016009523 A1	14 January 2016	WO 2016007704 A1	14 January 2016
		EP 3166548 A1	17 May 2017

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REFERENCES CITED IN THE DESCRIPTION

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