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(54) **SIMPLE FIXING FASTENER FOR ELASTIC ROPE OF TRAMPOLINE**

(57) A simple fixing fastener (100) for an elastic rope (63) of a trampoline (60) is used for connecting at least one elastic rope (63) and a frame (61) of the trampoline (60). The simple fixing fastener (100) comprises an elastic rope configuration space (10) surrounded by a stressed base (11) and flexible portions (12) extending from at least two sides of the stressed base (11), and a frame loading space (20) surrounded by a first clamping body (21) and a second clamping body (22), which extend from the at least two flexible portions (12), in a clamped and enclosed state. At least one elastic rope (63) may be placed in the elastic rope configuration space (10) through the frame loading space (20) when the clamped and enclosed state is released. The simple fixing fastener (100) of the present invention has a structure different from that of the existing products, has the characteristics of easy production and convenient operation, and provides consumers with different consumption choices.

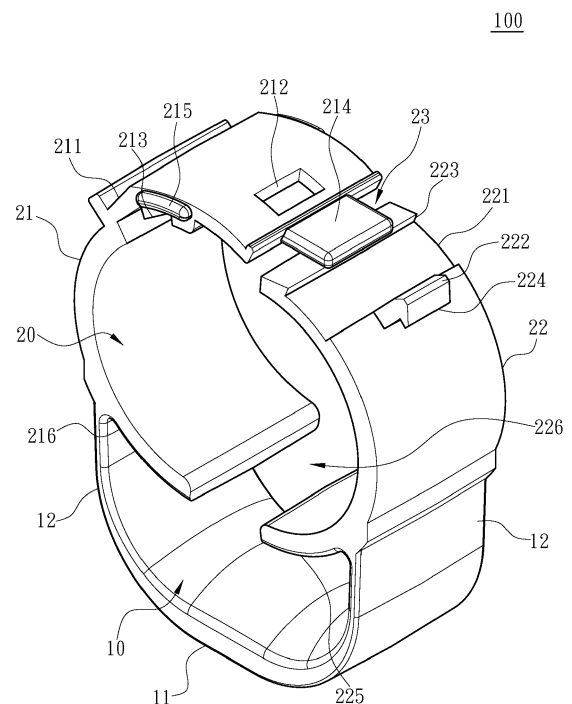


Fig. 1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a fixing fastener for an elastic rope of trampoline, in particular to a simple fixing fastener which has different forms and is easy to produce and convenient to operate.

BACKGROUND OF THE INVENTION

[0002] The trampoline activity is a kind of leisure and entertainment for all ages in recent years. A trampoline not only provides people with a space for leisure and play, but also can be a kind of aerobic exercise equipment. In general, the trampoline comprises a trampoline frame, a bouncing body, at least one elastic rope connecting with the bouncing body, and at least one fixing fastener connecting with one of the elastic ropes to the trampoline frame.

[0003] Related conventional fasteners can be found in CN 201123975Y. An elastic connector disclosed in this patent mainly comprises an elastic rope and two hooks, wherein these hooks are provided at two ends of the elastic rope and are respectively connected to a trampoline frame and trampoline cloth. The elastic connector provides the trampoline cloth to be connected to the trampoline frame. In addition, the patent CN 205007493U discloses a plastic fastener provided in the trampoline main frame. The plastic fastener comprises a main body portion, a fastening portion provided at the rear end of the main body portion, and a first clamping portion and a second clamping portion respectively extending outwardly from two sides of the main body portion and being bent. The fastening portion is connected to the trampoline cloth. The first clamping portion and the second clamping portion are connected to the elastic rope that is looped on the main frame of the trampoline. The plastic fastener also provides a function that the trampoline cloth can be used by people by hanging on the main frame of the trampoline.

SUMMARY OF THE INVENTION

[0004] A main objective of the present invention is to provide a simple fixing fastener which has a structure different from a conventional fixing fastener, such that consumers have different consumption choices. In the meantime, the simple fixing fastener has the characteristics of simple structure, easy production and easy operation, and is easy for both adults and children to use.

[0005] In order to achieve the above objective, the present invention provides a simple fixing fastener for an elastic rope of a trampoline; the trampoline comprises a frame and a bouncing body located in the frame and connected to the frame through at least one elastic rope; a plurality of simple fixing fasteners are provided at a position where the elastic rope is connected to the frame;

the simple fixing fastener comprises an elastic rope configuration space and a frame loading space; the elastic rope configuration space is surrounded by a stressed base and flexible portions extending from at least two sides of the stressed base in a direction of the frame; the frame loading space extends from the at least two flexible portions in a direction away from the stressed base to form a first clamping body and a second clamping body; in addition, the first clamping body and the second clamping body are oppositely provided with deformation points based on the flexible portions, and the first clamping body and the second clamping body being assembled with each other to form a first limiting section and a second limiting section in a clamped and enclosed state with the frame; the frame loading space is surrounded by the first clamping body and the second clamping body in the clamped and enclosed state; further, the first clamping body and the second clamping body are oppositely provided with an open end when the clamped and enclosed state is released, such that at least one elastic rope is placed into the elastic rope configuration space through the open end and the frame loading space.

[0006] In one embodiment, the first limiting section and the second limiting section are at least provided with a protrusion and a recess to form the clamped and enclosed state.

[0007] In one embodiment, the first limiting section and the second limiting section are further provided with a first tooth portion and a second tooth portion to strengthen the clamped and enclosed state as well as construct of an engaged state.

[0008] In one embodiment, the protrusion is further provided with a hooking portion.

[0009] In one embodiment, the recess is further provided with a force application portion to facilitate releasing the clamped and enclosed state.

[0010] In one embodiment, the first clamping body or the second clamping body is further provided with a reinforcing rib.

[0011] In one embodiment, the connected ends of the first clamping body and the second clamping body are located in the frame loading space and the elastic rope configuration space, and extended in opposite directions to form a first coating section and a second coating section to assist in clamping the frame; the relative distance between a tail end of the first coating section and a tail end of the second coating section forms a rope inlet for the elastic rope to pass through.

[0012] In one embodiment, the first coating section and the second coating section have the same shape as the surface of the frame.

[0013] In one embodiment, inner circumferential surfaces of the first clamping body and the second clamping body have the same shape as a surface of the frame.

[0014] According to the foregoing disclosure, the present invention has the following characteristics as compared with the conventional technique: the simple fixing fastener of the present invention comprises the

elastic rope configuration space and the frame loading space, such that the elastic rope and the frame can be provided in a penetrating manner in the elastic rope configuration space and the frame loading space, respectively. In detail, the elastic rope configuration space is surrounded by the stressed base and the at least two flexible portions, and further, the frame loading space is supported by the first clamping body and the second clamping body in the clamped and enclosed state. The simple fixing fastener has a structure different from the conventional fixing fastener, such that consumers may have different consumption choices. Furthermore, the simple fixing fastener of the present invention has the characteristics of simple structure, easy production and convenient operation, such that the manufacturer can produce the simple fixing fasteners in large quantities in single batch, and consumers can get the best experience from the simple fixing fasteners.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

Fig. 1 is a structural schematic diagram of an embodiment of the present invention.

Fig. 2 is a front schematic diagram of an embodiment of the present invention.

Fig. 3 is a schematic diagram of an implementation state of an embodiment of the present invention.

Fig. 4 is a sectional diagram of an implementation manner of an embodiment of the present invention.

Fig. 5 is a schematic diagram of an embodiment implemented in cooperation with a trampoline of the present invention.

Fig. 6 is a schematic diagram of another embodiment implemented in cooperation with the trampoline of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] The detailed description and technical contents of the present invention will be described below in conjunction with the accompanying drawings.

[0017] Please refer to Fig. 1 and Fig. 5, the present invention provides a simple fixing fastener 100 for an elastic rope 63 of a trampoline 60. The trampoline 60 comprises a frame 61, a bouncing body 62 located in the frame 61 and at least one elastic rope 63 connected to the frame 61 and the bouncing body 62. Each simple fixing fastener 100 is provided at a position where each elastic rope 63 is connected to the frame 61, wherein the simple fixing fastener 100 may be an integrated plastic piece. The simple fixing fastener 100 comprises an elastic rope configuration space 10 and a frame loading space 20. The elastic rope configuration space 10 is surrounded by a stressed base 11 and at least two flexible portions 12 which, to be specific, extend from at least two sides

of the stressed base 11 in a direction of the frame 61. That is to say, the at least two flexible portions 12 are connected to the stressed base 11 and integrated with the stressed base 11. In addition, each of two edges of the stressed base 11 is a curved surface, such that when the elastic rope 63 is arranged in the elastic rope configuration space 10 during the implementation process, the elastic rope 63 is stressed to prop against the stressed base 11, thereby preventing the elastic rope 63 from rubbing against the stressed base 11 to cause wear. On the other hand, the inside surface of the stressed base 11 is a flat plane or a curved surface. That is to say, the middle position of the stressed base 11 can be thicker than two ends of the stressed base 11. In the meantime, the thickness of the stressed base 11 needs to be larger than the thickness of the flexible portions 12, this is because the elastic rope 63 is located in the elastic rope configuration space 10 during the implementation process and props against the stressed base 11 to apply a very large pulling force to the stressed base 11. In order to withstand the acting force of the elastic rope 63, it is necessary to thicken the stressed base 11 to enhance the strength of the stressed base 11 and thus stably withstand the acting force from the elastic rope 63.

[0018] On the other hand, please refer to Fig. 3, Fig. 4, and Fig. 5. The frame loading space 20 is surrounded by a first clamping body 21 and a second clamping body 22 in a clamped and enclosed state. In detail, the first clamping body 21 and the second clamping body 22 extend from the at least two flexible portions 12 in a direction away from the stressed base 11. In addition, in the clamped and enclosed state, the first clamping body 21 and the second clamping body 22 are oppositely provided with deformation points based on the flexible portions 12, and the first clamping body 21 and the second clamping body 22 being assembled with each other to form a first limiting section 211 and a second limiting section 221. In the clamped and enclosed state, the frame 61 is placed in the frame loading space 20, and is limited the position by the first clamping body 21 and the second clamping body 22. That is, the first clamping body 21 and the second clamping body 22 are required to stably limit the frame 61 in the clamped and enclosed state. The inner circumferential surface of each of the first clamping body 21 and the second clamping body 22 has the same shape as the surface of the frame 61. In other words, when the surface of the frame 61 is arc-shaped, the inner circumferential surface of each of the first clamping body 21 and the second clamping body 22 has to be arc-shaped. It is worth noting that the surface shape of the frame 61 is not limited to those illustrated in the drawings. In addition, in order for the simple fixing fastener 100 to fasten the frame 61, the pipe diameter of the frame 61 corresponds to the inner circumference diameter defined by the first clamping body 21 and the second clamping body 22 in the clamped and enclosed state, so as to prevent excessive displacement of the simple fixing fastener 100, thereby prevent the bouncing body 62 from

being wrinkled during use and causing an accident of the user.

[0019] In order to ensure that the first clamping body 21 and the second clamping body 22 stably limit the frame 61 in the clamped and enclosed state, and the frame 61 cannot fall from the frame loading space 20, the first limiting section 211 and the second limiting section 221 are at least provided with a recess 212 and a protrusion 222. As shown in Fig. 1, the recess 212 may be provided on the first limiting section 211, and the protrusion 222 may be provided on the second limiting section 221. In addition, the protrusion 222 and the recess 212 may correspond with each other. A chamfer may be provided on two sides of the protrusion 222. In the clamped and enclosed state, the chamfers may assist the protrusion 222 in clamping into the recess 212 more easily to limit the first clamping body 21 and the second clamping body 22. On the other hand, when the first clamping body 21 and the second clamping body 22 are released from the clamped and enclosed state, the first clamping body 21 and the second clamping body 22 are not assembled each other and from an open end 23. At least one elastic rope 63 may pass through the open end 23 and then be placed in the elastic rope configuration space 10. That is to say, in the production process, although the first clamping body 21 and the second clamping body 22 can be integrally formed with the at least two flexible portions 12 and the stressed base 11, the first clamping body 21 and the second clamping body 22 are in a separated state normally, so that the at least one elastic rope 63 may be placed in the elastic rope configuration space 10.

[0020] Referring to Fig. 3, Fig. 4, and Fig. 5, embodiments of the simple fixing fastener 100 will now be described. First, it is assumed that the simple fixing fastener 100 is released from the clamped and enclosed state when it does not undergo a force. As shown in Fig. 2, when the simple fixing fastener 100 is assembled with the frame 61 and the elastic rope 63 during the implementation process, it is assumed that the simple fixing fastener 100 in the clamped and enclosed state in the case. When the simple fixing fastener 100 is released from the clamped and enclosed state, the open end 23 may face the frame 61 so as to place the elastic rope 63 in the elastic rope configuration space 10. In the meantime, the frame 61 is placed in the frame loading space 20 by the open end 23. Since the simple fixing fastener 100 is made of plastic, the first clamping body 21 and the second clamping body 22 may be extruded by an external force and relatively displaced with each other to deform. The protrusion 222 is placed in the recess 212 to limit the first clamping body 21 and the second clamping body 22, and the first limiting section 211 overlaps with the second limiting section 221 at the time. As such, the frame 61 may be completely limited in the frame loading space 20 to finish assembly. After assembling, the elastic rope 63 is normally pulled against the stressed base 11 by force. That is, the elastic rope 63 will be located in the elastic rope configuration space 10, without moving to

the rope inlet 226. If it is desired to release the clamped and enclosed state, a force may be applied to the first clamping body 21 and the second clamping body 22 again to release the assembled state of the recess 212 and the protrusion 222. The first clamping body 21 may be separated from the second clamping body 22 again, and the frame 61 and the elastic rope 63 may be detached from the simple fixing fastener 100 again via the open end 23.

[0021] Accordingly, the simple fixing fastener 100 of the present invention has the same function but different structure comparing with the conventional fixing fastener. The simple fixing fastener 100 may be formed integrally, and has the advantage of simple production. Moreover, the simple fixing fastener 100 may be made of plastic, such that the production cost of the simple fixing fastener 100 is low. In addition, the simple fixing fastener 100 has a simple operation mode for adults or children to operate independently. Therefore, it is considered that the simple fixing fastener 100 of the present invention will make the consumer more convenient in assembling the trampoline 60, and at the same time can bring different consumption choices to the consumer, so that the consumer has different use experiences from the existing product.

[0022] In an embodiment, referring to Fig. 1 and Fig. 5, in order to strengthen the clamped and enclosed state and prevent the frame 61 and the elastic rope 63 from being easily detached during the implementation process, the first limiting section 211 and the second limiting section 221 are respectively provided with a first tooth portion 213 and a second tooth portion 223 which correspond to each other. In the clamped and enclosed state, the first tooth portion 213 and the second tooth portion 223 will be engaged with each other in an engaged state. The first tooth portion 213 and the second tooth portion 223 may resist an acting force that separates outwardly the first clamping body 21 from the second clamping body 22, and disperse a stress from the protrusion 222 which is placed in the recess 212 to form the clamped and enclosed state. On the other hand, the protrusion 222 is further provided with a hooking portion 224. The hooking portion 224 is located on the protrusion 222 and extends from the protrusion 222. In addition, the hooking portion 224 protrudes from the protrusion 222. In the clamped and enclosed state, the protrusion 222 is placed in the recess 212, and the hooking portion 224 limits the protrusion 222 to prevent the protrusion 222 from being detached from the recess 212 so as to strengthen the clamped and enclosed state. When it is desired to release the clamped and enclosed state, it is further necessary to remove the hooking portion 224 from the recess 212, and therefore the first clamping body 21 and the second clamping body 22 can be separated completely.

[0023] Referring to Fig. 1, the hooking portion 224 is provided in order to strengthen the clamped and enclosed state. The hooking portion 224 can effectively strengthen the clamped and enclosed state, but the simple fixing fastener 100 cannot be easily operated by the

consumer to release the clamped and enclosed state. Therefore, the recess 212 is provided with a force application portion 214 in the production process. The force application portion 214 is connected to the first limiting section 211 and thus can assist the consumer in separating the recess 212 from the protrusion 222. When the simple fixing fastener 110 needs to be released from the clamped and enclosed state, the recess 212 may be detached from the limit of the hooking portion 224 and thus separated from the protrusion 222 by merely pulling the force application portion 214 upwards. Furthermore, in the production process, the thickness of the junction between the force application portion 214 and the first limiting section 211 may be larger than the thickness of the first limiting section 211 for strengthening the junction between the force application portion 214 and the first limiting section 211 and increasing the use stability of the force application portion 214.

[0024] In an embodiment, referring to Fig. 3, in order to strengthen the use stability of the simple fixing fastener 100, the first clamping body 21 or the second clamping body 22 is further provided with a reinforcing rib 215. The reinforcing rib 215 has the following function: in the clamped and enclosed state, the simple fixing fastener 100 is assembled with the frame 61 and needs to withstand the acting force from the frame 61, the reinforcing rib 215 can enhance the strengths of the first limiting section 211 and the second limiting section 221, and meanwhile disperse the stress borne by the first limiting section 211 and the second limiting section 221. The reinforcing rib 215 can be located on the first limiting section 211 as shown in Fig. 1 or on the second limiting section 221. The position of the reinforcing rib 215 can be adjusted during the production process in accordance with the use conditions and is not limited to those illustrated in the drawings.

[0025] Moreover, referring to Fig. 2 and Fig. 3, in an embodiment, the first clamping body 21 and the second clamping body 22 are provided with a first coating section 216 and a second coating section 225 respectively. The first coating section 216 and the second coating section 225 are located at connected ends of the frame loading space 20 and the elastic rope configuration space 10, and extend in opposite directions from the first clamping body 21 and the second clamping body 22. The first coating section 216 and the second coating section 225 are used for assisting in clamping the frame 61. That is, the first limiting section 211, the second limiting section 221, the first coating section 216 and the second coating section 225 surround the frame 61 under the clamped and enclosed state. In order to make the first coating section 216 and the second coating section 225 clamp the frame 61 stably so that the first coating section 216 and the second coating section 225 have the same shape as the surface of the frame 61. Therefore, the surface shapes of the first coating section 216 and the second coating section 225 need to cooperate with the frame 61. In addition, the shapes of the first coating section 216 and the

second coating section 225 are not limited to those illustrated in the drawings. On the other hand, the first coating section 216 and the second coating section 225 are not connected, instead of the tail end of the first coating section 216 is spaced from the tail end of the second coating section 225 with a distance so as to form the rope inlet 226. The elastic rope 63 passes through the rope inlet 226 and then enters into the elastic rope configuration space 10.

[0026] Then, in order to describe the use conditions of the simple fixing fastener 100 in cooperation with the trampoline 60 in detail, first, the shape of the trampoline 60 can be a circle or a polygon according to a combined form of the frame 61, and the shape of the trampoline 60 is not limited to those illustrated in drawings. Next, in an embodiment, referring to Fig. 5, when the elastic ropes 63 are looped on the bouncing body 62 and concentric with the bouncing body 62, a plurality of simple fixing fasteners 100 may be provided on the elastic ropes 63, and a distance between every two adjacent simple fixing fasteners 100 is a fixed distance, in order to uniformly support the bouncing body 62 to be hung on the frame 61 when the elastic ropes 63 are connected. In another embodiment, as shown in Fig. 6, when a plurality of elastic ropes 63 is provided on the bouncing body 62 and radically shaped from the bouncing body 62, each elastic rope 63 is passed by one simple fixing fastener 100, and each simple fixing fastener 100 is assembled onto the frame 61 to support the bouncing body 62 to be hung on the frame 61.

Claims

1. A fixing fastener (100) for an elastic rope (63) of a trampoline (60), wherein the trampoline (60) comprises a frame (61) and a bouncing body (62) located in the frame (61) and connected to the frame (61) through at least one elastic rope (63), and a plurality of simple fixing fasteners (100) is provided at a position where the elastic rope (63) is connected to the frame (61), each of the plurality of simple fixing fasteners (100) comprising:

an elastic rope configuration space (10) surrounded by a stressed base (11) and flexible portions (12) extending from at least two sides of the stressed base (11) in a direction of the frame (61); and

a frame loading space (20) extending from the at least two flexible portions (12) in a direction away from the stressed base (11) to form a first clamping body (21) and a second clamping body (22), the first clamping body (21) and the second clamping body (22) are oppositely provided with deformation points based on the flexible portions (12), and the first clamping body (21) and the second clamping body (22) being assem-

- bled with each other to form a first limiting section (211) and a second limiting section (221) in a clamped and enclosed state with the frame (61), the frame loading space (20) is surrounded by the first clamping body (21) and the second clamping body (22) in the clamped and enclosed state, further, the first clamping body (21) and the second clamping body (22) are oppositely provided with an open end (23) when the clamped and enclosed state is released, such that the at least one elastic rope (63) is placed into the elastic rope configuration space (10) through the open end (23) and the frame loading space (20).
2. The fixing fastener (100) for the elastic rope (63) of the trampoline (60) according to claim 1, wherein the first limiting section (211) and the second limiting section (221) are at least provided with a protrusion (222) and a recess (212) to form the clamped and enclosed state.
 3. The fixing fastener (100) for the elastic rope (63) of the trampoline (60) according to claim 2, wherein the first limiting section (211) and the second limiting section (221) are further provided with a first tooth portion (213) and a second tooth portion (223) to strengthen the clamped and enclosed state as well as construct of an engaged state.
 4. The fixing fastener (100) for the elastic rope (63) of the trampoline (60) according to claim 2 or 3, wherein the protrusion (222) is further provided with a hooking portion (224).
 5. The fixing fastener (100) for the elastic rope (63) of the trampoline (60) according to one of claims 2-4, wherein the recess (212) is further provided with a force application portion (214) to facilitate releasing the clamped and enclosed state.
 6. The fixing fastener (100) for the elastic rope (63) of the trampoline (60) according to one of the preceding claims, wherein the first clamping body (21) or the second clamping body (22) is further provided with a reinforcing rib (215).
 7. The fixing fastener (100) for the elastic rope (63) of the trampoline (60) according to one of the preceding claims, wherein connected ends of the first clamping body (21) and the second clamping body (22) are located in the frame loading space (20) and the elastic rope configuration space (10), and extended in opposite directions to form a first coating section (216) and a second coating section (225) to assist in clamping the frame (61), the relative distance between a tail end of the first coating section (216) and a tail end of the second coating section (225) forms a rope inlet (226) for the elastic rope (63) to pass through.
 8. The fixing fastener (100) for the elastic rope (63) of the trampoline (60) according to claim 7, wherein the first coating section (216) and the second coating section (225) have the same shape as the surface of the frame (61).
 9. The fixing fastener (100) for the elastic rope (63) of the trampoline (60) according to claim 7 or 8, wherein inner circumferential surfaces of the first clamping body (21) and the second clamping body (22) have the same shape as a surface of the frame (61).

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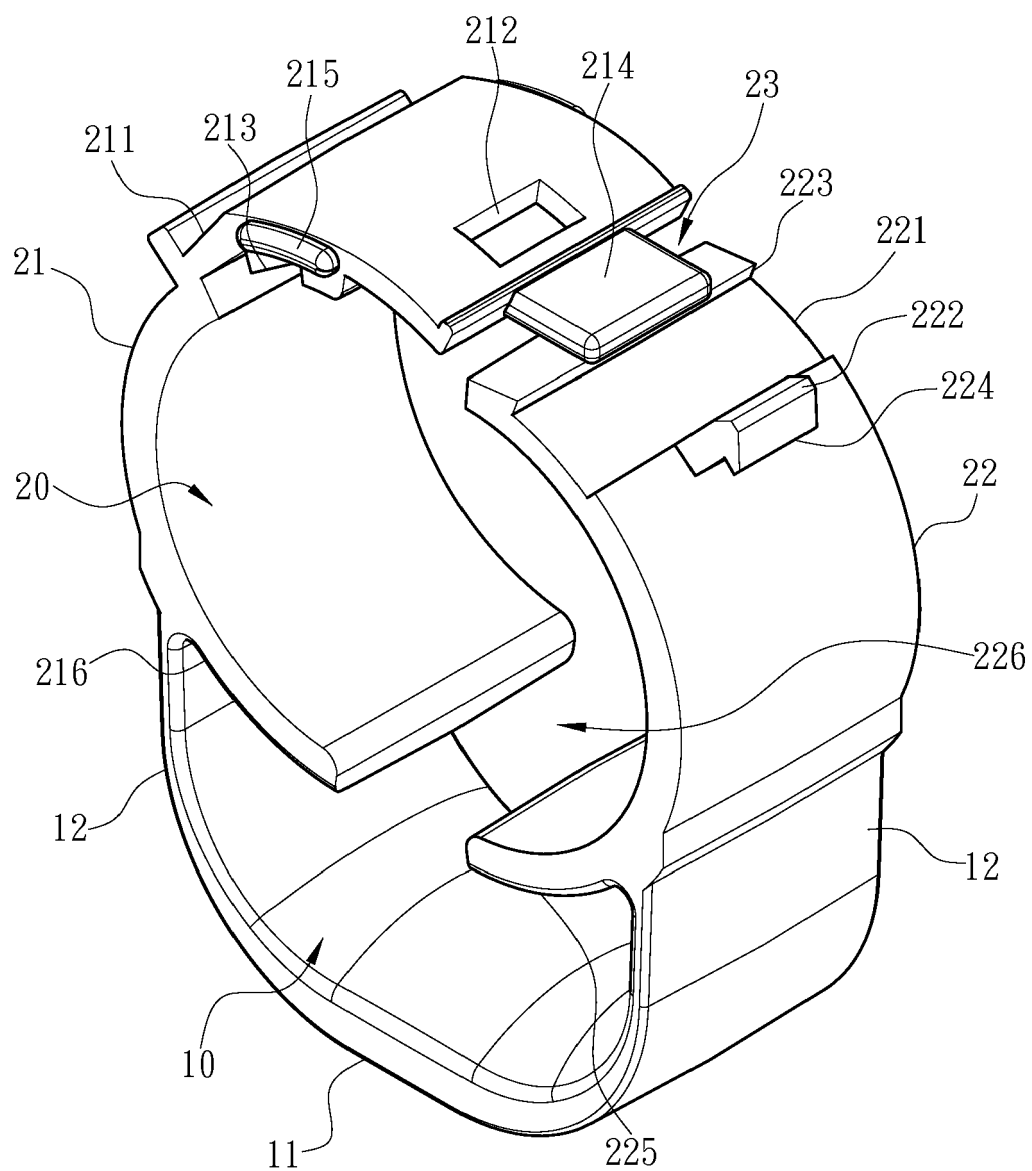


Fig. 1

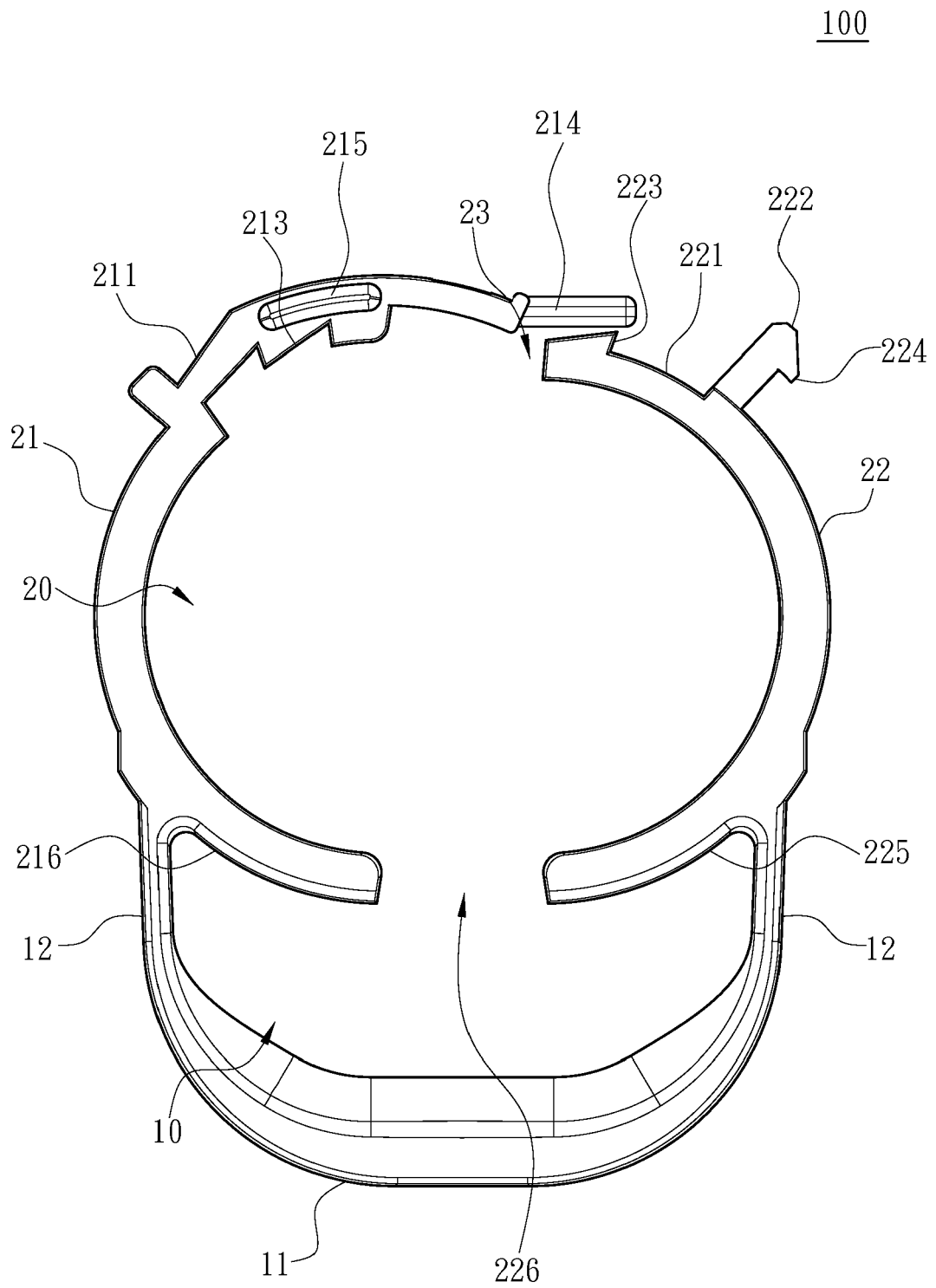


Fig. 2

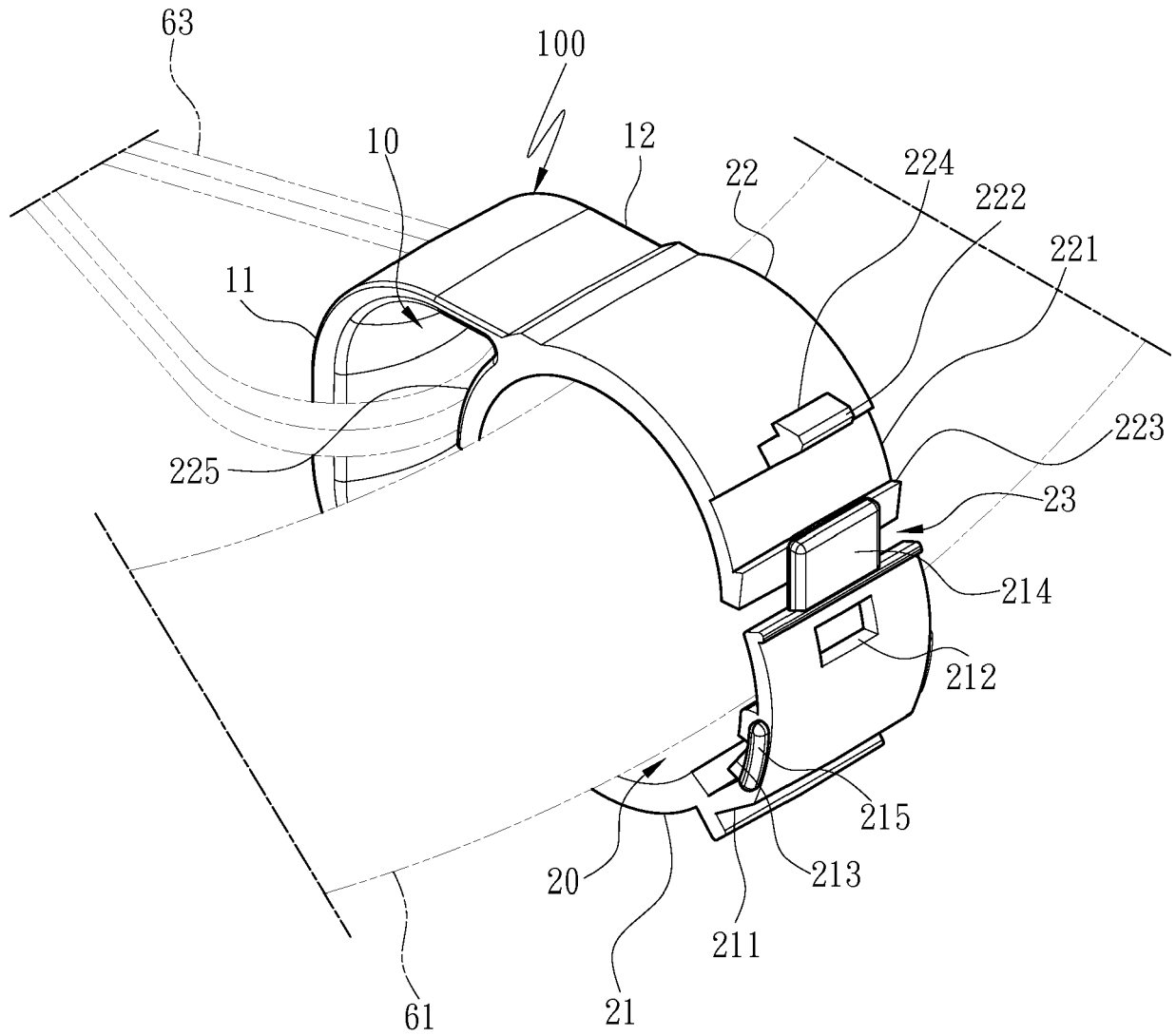


Fig. 3

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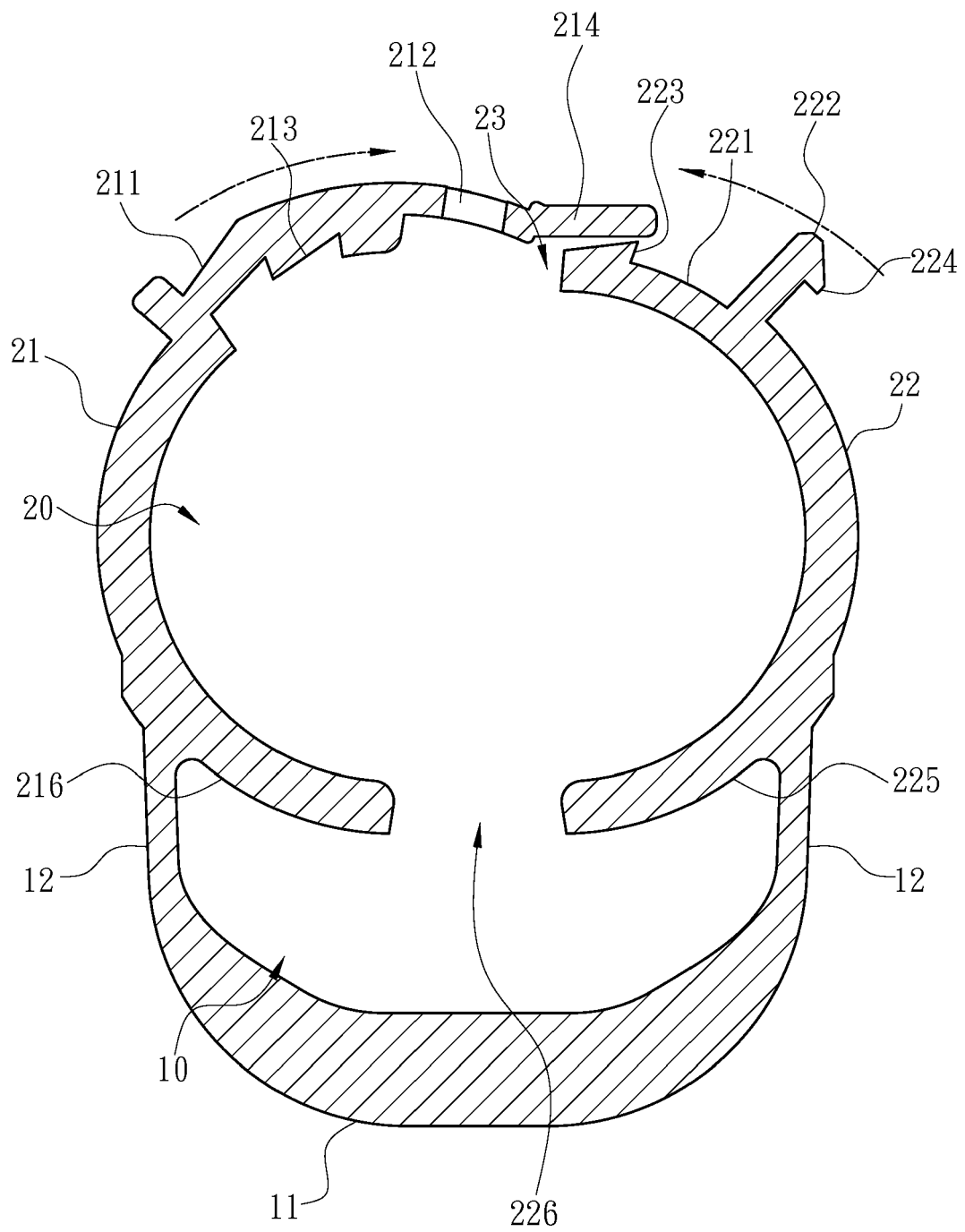


Fig. 4

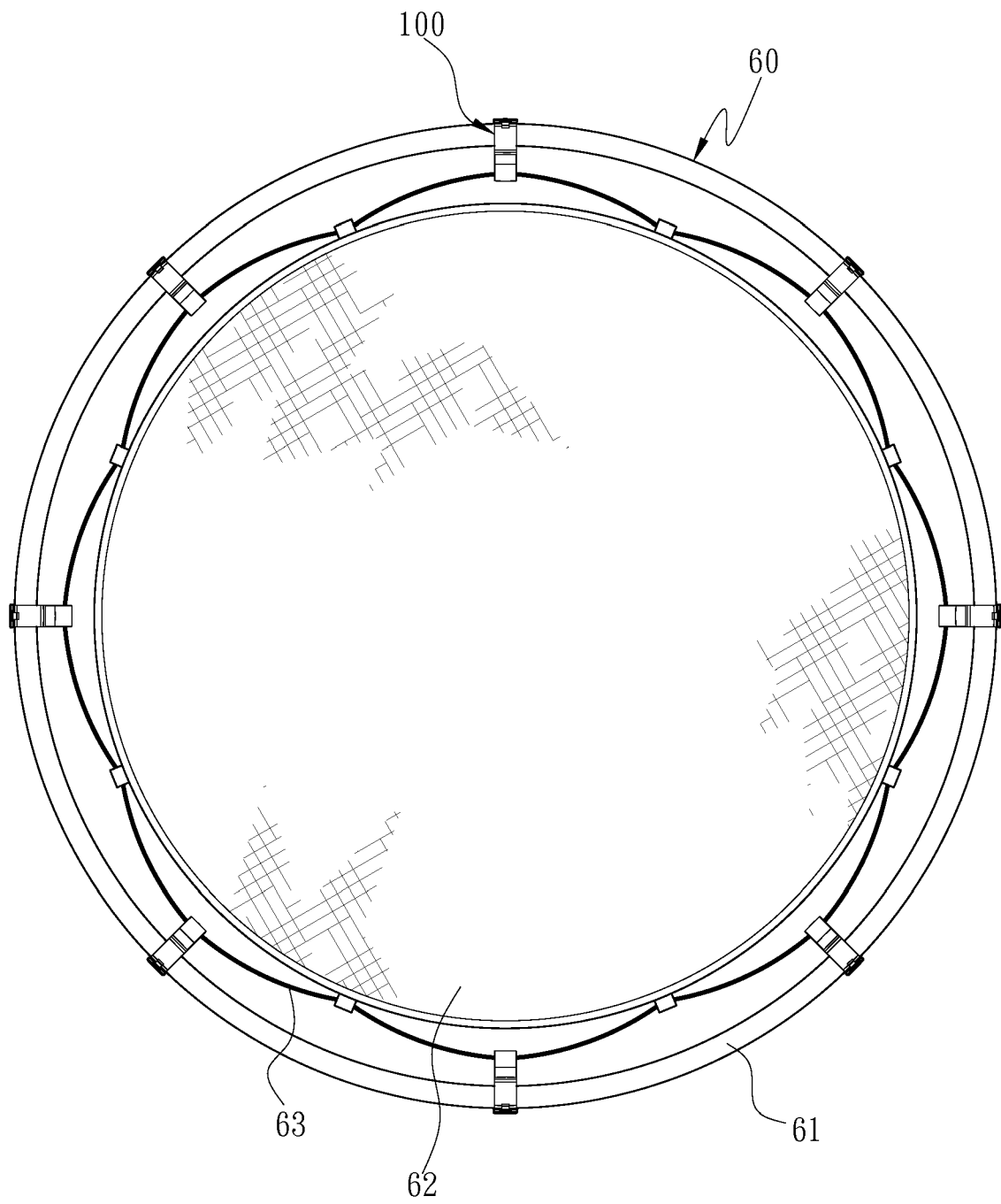


Fig. 5

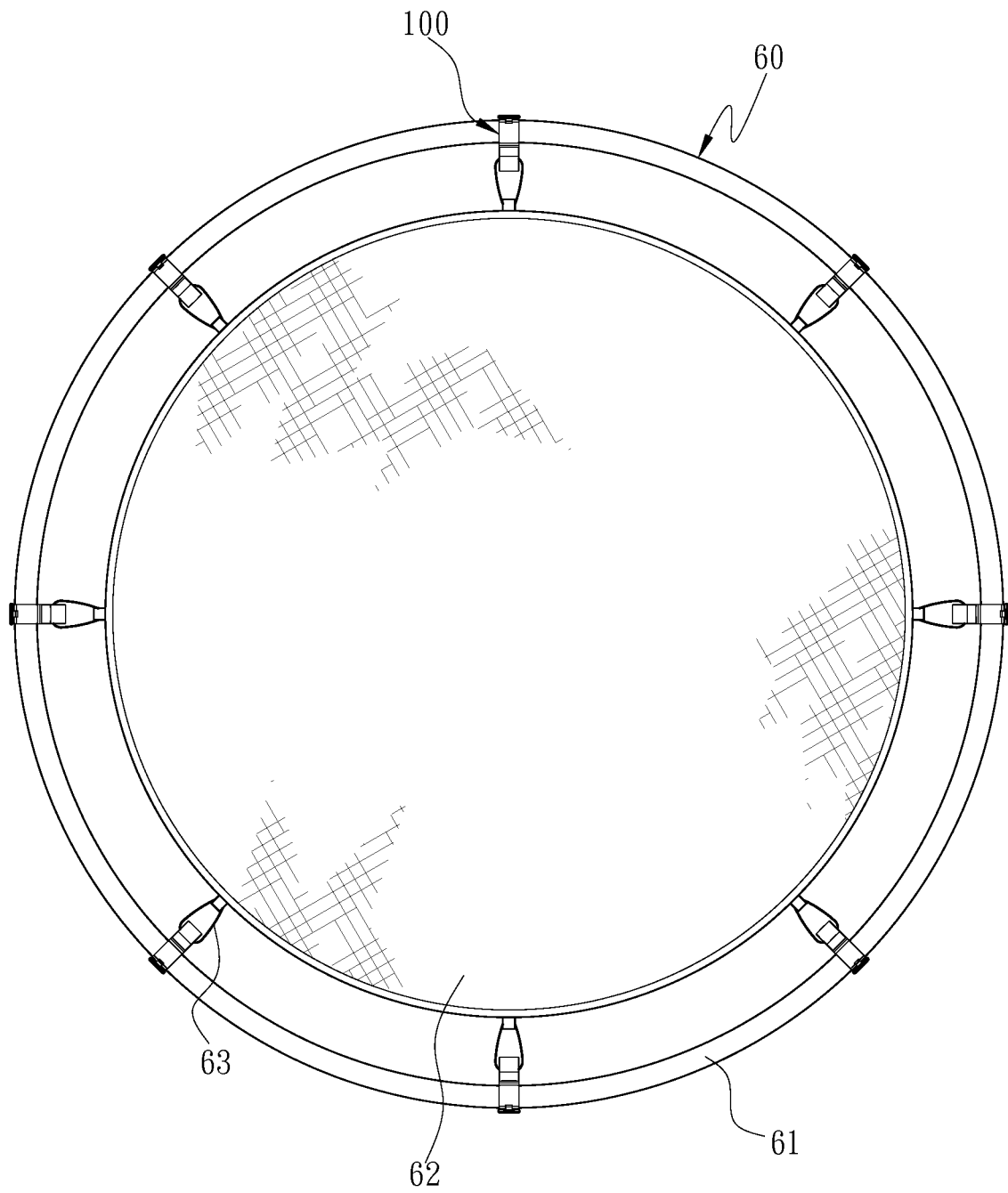


Fig. 6



EUROPEAN SEARCH REPORT

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Place of search Munich		Date of completion of the search 4 July 2019	Examiner Herry, Manuel
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