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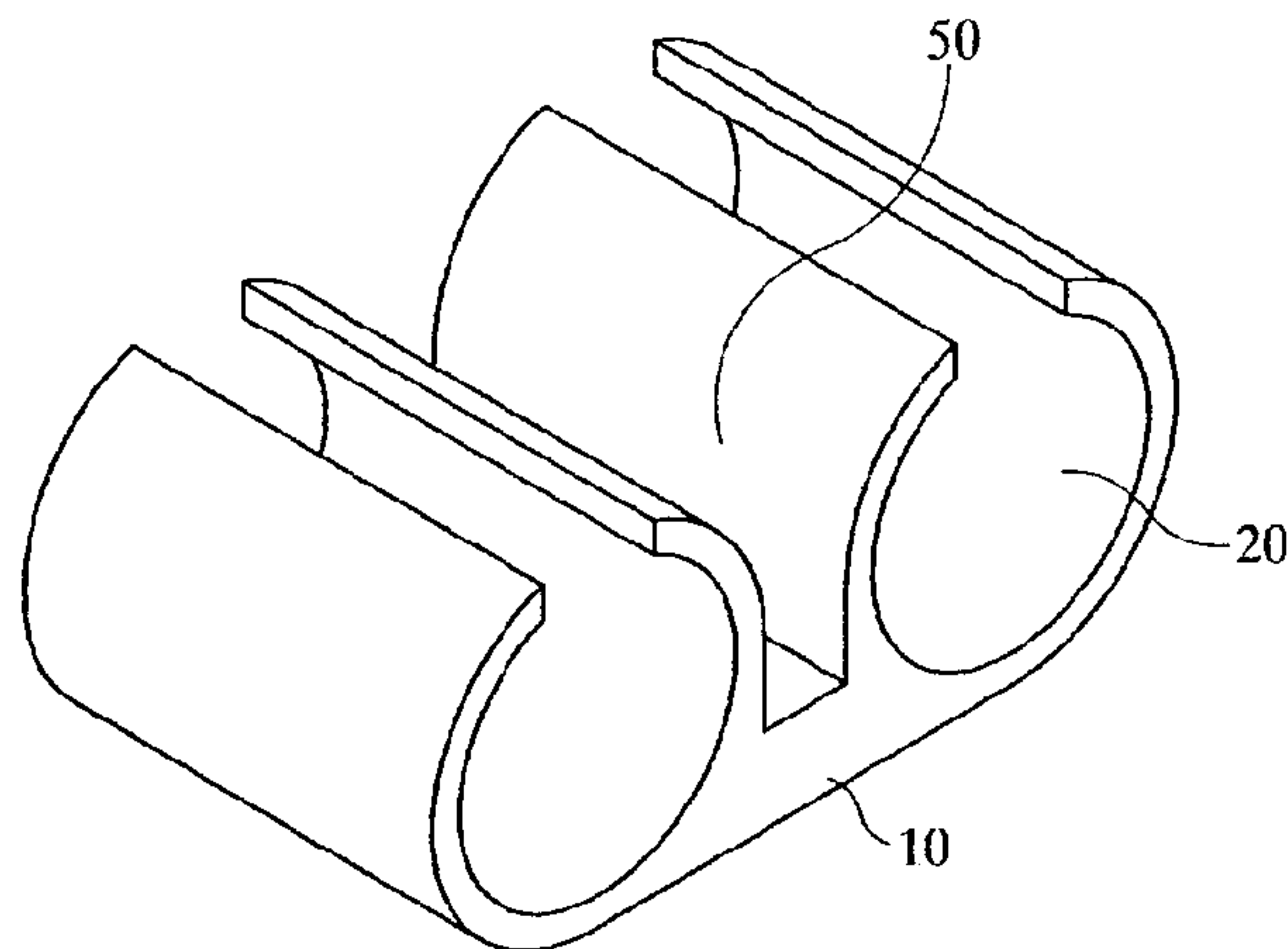
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(57) **Abrégé/Abstract:**

The present invention relates to a swimming aid, and more specifically, to a swimming aid worn on both feet of a user to allow the user to float in water by buoyancy, and enabling a waist swimming stroke like that of a swimming fish by the repeated flowing of the waist in the right and left directions, thereby helping to strengthen the waist muscle of the user. Therefore, a patient complaining of a knee joint pain or a waist pain, or a lower extremity-handicapped person can use the swimming aid for a medical purpose such as pain relief, treatment.

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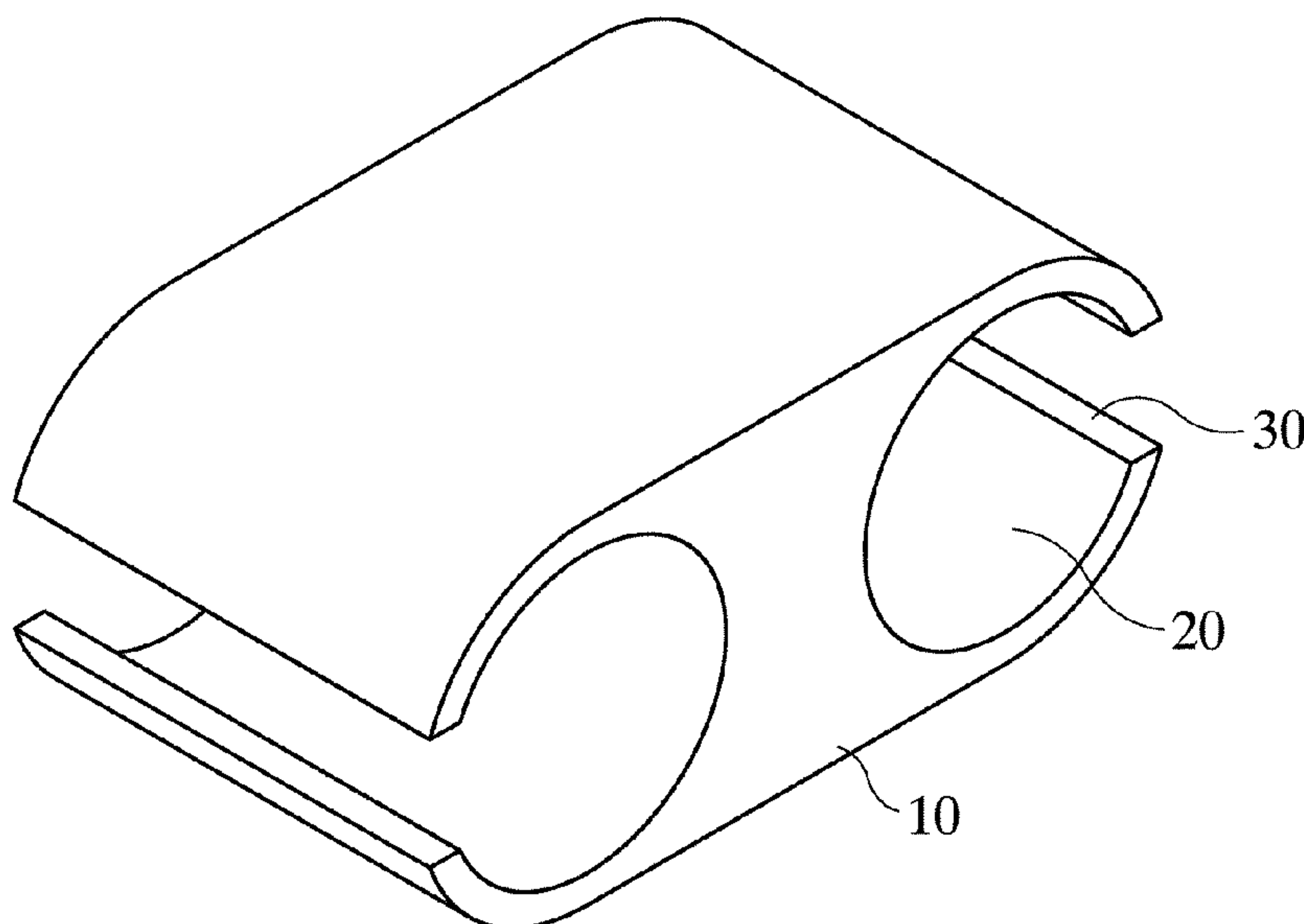
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(54) Title: SWIMMING AID

(54) 발명의 명칭 : 수영보조기구



(57) Abstract: The present invention relates to a swimming aid, and more specifically, to a swimming aid worn on both feet of a user to allow the user to float in water by buoyancy, and enabling a waist swimming stroke like that of a swimming fish by the repeated flowing of the waist in the right and left directions, thereby helping to strengthen the waist muscle of the user. Therefore, a patient complaining of a knee joint pain or a waist pain, or a lower extremity-handicapped person can use the swimming aid for a medical purpose such as pain relief, treatment.

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본 발명은 수영보조기구에 관한 것으로서, 더욱 상세하게는 사용자의 양발에 착용되어 부력에 의해 사용자가 물에 뜨도록 할 뿐만 아니라 허리를 좌측 및 우측방향으로 반복 유동하는 것에 의해 마치 물고기가 헤엄치는 것과 같은 허리영법으로 수영을 할 수 있도록하여 사용자의 허리근육 강화에 도움을 줄 수 있는 수영보조기구에 관한 것이다. 이에 따르면 무릎관절통증, 허리통증을 호소하는 환자나, 하지 장애인의 경우에도 통증완화 또는 치료 등의 의료 목적으로 수영보조기구를 이용할 수 있는 효과가 있다.

SWIMMING AID

FIELD OF THE INVENTION

The present invention relates to a swimming assistance
5 apparatus. More particularly, the present invention relates to
a swimming assistance apparatus which supplies buoyancy to a
part of a user's body under water to aid the user to correct a
swimming posture or to concentrate on reinforcement of upper
body muscles and waist muscles. Moreover, the present
10 invention relates to a swimming assistance apparatus which can
relieve and treat symptoms, such as lumbar herniated
intervertebral disc or scoliosis.

BACKGROUND OF THE INVENTION

15 Swimming is one of whole body exercises to improve lung
capacity or endurance and reinforce the whole body. Therefore,
swimming is being spotlighted as popular life sports all over
the worlds, such as Korea, United States, Europe, Australia,
Japan, China, and so on.

20 There are conventional swimming assistance apparatuses,
such as swim tubes, floats, boards, and the likes. The swim
tube is formed in a doughnut shape. A user can wear the swim
tube to surround the waist or to support the user's upper body
by covering a part of the swim tube with the hand. The float
25 is formed in a ball which has a hand-grip. The user holds the
hand-grip of the float to receive buoyancy. The board is

formed in a plate type. The user holds the board to receive buoyancy.

SUMMARY OF THE INVENTION

5 **Technical Problem**

However, the conventional swimming assistance apparatuses, such as the swim tubes, the floats and the boards, have a disadvantage in that the user has to hold them with the hand when the user swims. Therefore, the conventional swimming
10 assistance apparatuses interrupt the user's arm movements. Accordingly, the user cannot take a perfect swimming posture in case that the user uses such swimming assistance apparatuses.

Moreover, the conventional swimming assistance apparatuses are easily separated from the user's hand, and hence, swimming
15 beginners may let the swimming assistance apparatus slip through the user's hand. Such an experience may give evasion of swimming or resistance to swimming to the swimming beginner, and it may be trauma in the swimming beginner's head for a long time.

Furthermore, the conventional swimming assistance
20 apparatuses have another disadvantage in that the user has to always make muscle of the arm tense when using the swimming assistance apparatuses. So, the user tires easily and cannot gain confidence of swimming. Additionally, because muscles are
25 tense, it is difficult to correct the swimming posture smoothly.

In addition, the floats and the boards of the conventional

swimming assistance apparatuses has a disadvantage in that the user can train only whip kick, because the user moves forward by whip kick in a state where the user holds the float or the board with both hands and keeps the user's arms and body
5 straight.

Moreover, a vest type float of the conventional swimming assistance apparatuses has a disadvantage in that there is a limit in swimming styles and it is difficult to take a swimming posture under water, because the user floats vertically under
10 water by the vest type float.

Furthermore, swimming styles which can be carried out when the user uses the conventional swimming assistance apparatuses are very limited. In general, when the user uses the conventional swimming assistance apparatuses, the user can show
15 just the swimming style to move the waist up and down. Such a swimming style increases backache of patients who suffer from backache by lumbar herniated intervertebral disc.

Additionally, it is impossible for persons who have disability in the lower body, such as paraplegia, to do whip
20 kick or move the waist up and down while swimming, and the persons who have disability in the lower body go under water in a state where the legs are drifted open when they enter the water. Therefore, the persons who have disability in the lower body cannot use the conventional swimming assistance
25 apparatuses.

Not only the persons who have disability in the lower body

but also general teenagers and adults with normal body functions, who have scoliosis generated when the persons study or work sitting in chairs for a long time, it is hard to correct the twisted pelvis or treat scoliosis through swimming.

5 Accordingly, the present invention has been made in an effort to solve the above-mentioned problems occurring in the prior arts.

It is an object of the present invention to provide a swimming assistance apparatus which is worn on a use's feet to
10 make the user float on water by buoyancy and to make the user swim in the swimming style like fish swimming to repeatedly move the waist from side to side, thereby correcting the swimming posture or concentrating on reinforcement of upper body muscles and waist muscles.

15 It is another object of the present invention to provide a swimming assistance apparatus which makes the user swim while moving the waist from side to side repeatedly, thereby relieving or treating pains of patients who suffer from knee joint pain or backache or persons who have disability in the
20 lower body.

Technical Solution

To achieve the above objects, the present invention provides a swimming assistance apparatus. The swimming
25 assistance apparatus includes a body made of a material which floats on water or formed in a hollow tube type which floats on

water, a fitting hole formed in a hollow cylinder shape and penetrating through the body to surround a part of a user's lower body, and a cut part formed in the wall of one side of the fitting hole in such a way that a part of the user's lower
5 body can be inserted into the fitting hole. When the user swims in a state where the user's lower body is inserted into the fitting hole, the user's lower body floats on water by buoyancy of the body.

Moreover, a part of the user's lower body inserted into
10 the fitting hole may be the ankle or the calf.

Furthermore, the fitting hole may include a first fitting hole and a second fitting hole configured in such a manner that the user can insert the right and left legs into the first and second fitting holes respectively, and the user's legs are
15 collected and fixed by the first and second fitting holes.

Additionally, the fitting hole may include a first fitting hole and a second fitting hole configured in such a manner that the user can insert the right and left legs into the first and second fitting holes respectively. The body is configured to
20 be divided between the first and second fitting holes. The swimming assistance apparatus further includes detachable fixing means formed on each inner face of the divided body. The detachable fixing means is one of Velcro tapes, magnets, buttons, male and female coupling parts, hooks and zippers
25 which can attach and detach the first and second fitting holes.

In addition, the cut part may be formed in the outer wall of the fitting hole in the longitudinal direction of the fitting hole to enable the user to easily insert the user's lower body.

5 Moreover, the fitting hole may include a first fitting hole and a second fitting hole configured in such a manner that the user can insert the right and left legs into the first and second fitting holes respectively. The cut part may include at least one of a first cut part formed in one side wall of the
10 first fitting hole and a second cut part formed in one side wall of the second fitting hole. At least one among the first and second cut parts may be formed in the upper side wall of the first fitting hole and the second fitting hole to enable the user to easily put the user's lower body thereon.

15 Furthermore, the fitting hole may include a first fitting hole and a second fitting hole configured in such a manner that the user can insert the right and left legs into the first and second fitting holes respectively. The cut part may include first and second cut parts respectively formed in the side
20 walls of the first and second fitting holes. The first cut part is formed in the upper side wall of the first fitting hole and the second cut part is formed in the lower side wall of the second fitting hole.

25 Additionally, the swimming assistance apparatus further includes a plurality of protrusion parts formed on the inner face of the fitting hole in the diameter direction and extend

in the longitudinal direction of the fitting hole so as to provide the user's lower body with comfort and enhance fixation power of the user's lower body.

5 In addition, the swimming assistance apparatus further includes a plurality of protrusion parts formed on the inner face of the fitting hole in the diameter direction and are formed in a spherical shape so as to provide the user's lower body with comfort and enhance fixation power of the user's lower body.

10 Moreover, the swimming assistance apparatus further includes a plurality of protrusion parts formed on the inner face of the fitting hole in the diameter direction and extend spirally in the longitudinal direction of the fitting hole so as to provide the user's lower body with comfort and enhance
15 fixation power of the user's lower body.

Furthermore, the swimming assistance apparatus further includes at least one among: wings formed at both sides of the body in the longitudinal direction and have a predetermined curvature at the front face, which is the user's advancing
20 direction, in order to reduce underwater resistance, and at least one of fins which vertically protrude from the upper side and the lower side of the middle part of the body and have a predetermined curvature at the front face, which is the user's advancing direction, in order to reduce underwater resistance,
25 thereby offsetting a rotational force around the user's advancing direction.

Additionally, the body may be formed in a flat board type and the fitting hole may be formed to get in contact with one side of the body. The swimming assistance apparatus further includes wings formed at both sides of the body in the
5 longitudinal direction and have a predetermined curvature at the front face, which is the user's advancing direction, in order to reduce underwater resistance.

In addition, the fitting hole may include a first fitting hole and a second fitting hole configured in such a manner that
10 the user can insert the right and left legs into the first and second fitting holes respectively. The swimming assistance apparatus further includes a through hole formed in the body and penetrating through the inside of the body between the first fitting hole and the second fitting hole, so as to reduce
15 underwater resistance generated in the user's advancing direction.

Moreover, the swimming assistance apparatus further includes at least one hand-grip depressed in one side of the body or penetrates through the body, such that the user can
20 insert at least one finger into the hand-grip to grasp the body.

Furthermore, the swimming assistance apparatus further includes at least one among: wings formed at both sides of the body in the longitudinal direction and have a predetermined curvature at the front face, which is the user's advancing
25 direction, in order to reduce underwater resistance, and at least one of fins which vertically protrude from the upper side

and the lower side of the middle part of the body and have a predetermined curvature at the front face, which is the user's advancing direction, in order to reduce underwater resistance, thereby offsetting a rotational force around the user's
5 advancing direction. The swimming assistance apparatus further includes at least one hand-grip depressed in one side of the wing or the fin or penetrates through the wing or the fin, such that the user can insert at least one finger into the hand-grip to grasp the body.

10 Additionally, the swimming assistance apparatus further includes a plate type partition wall formed inside the hollow body for maintaining the form of the body and relieving distortion of the body.

In addition, the swimming assistance apparatus further
15 includes a plurality of plate type partition walls formed inside the hollow body for maintaining the form of the body and relieving distortion of the body. The plurality of partition walls cross each other.

Moreover, the swimming assistance apparatus further
20 includes a plurality of plate type partition walls formed inside the hollow body for maintaining the form of the body and relieving distortion of the body. The plurality of partition walls are connected with one another in a honey comb shape.

Furthermore, the swimming assistance apparatus further
25 includes separation preventing means disposed at one side of

the cut part to close the cut part and prevents the inserted user's lower body from being separated from the cut part.

Additionally, the separation preventing means may be one of Velcro tapes, magnets, buttons, male and female coupling
5 parts, hooks and zippers.

In addition, the fitting hole may include a first fitting hole and a second fitting hole configured in such a manner that the user can insert the right and left legs into the first and second fitting holes respectively. The swimming assistance
10 apparatus further includes a depressed part inwardly depressed to a specific depth between the first fitting hole and the second fitting hole of the body, such that the user inserts and fixes a part of the user's lower body into the first fitting hole and the second fitting hole or compresses and fixes a part
15 of the user's lower body to the depressed part.

As described above, the swimming assistance apparatus according to the embodiments of the present invention has the following effects.

First, the swimming assistance apparatus according to the
20 embodiments of the present invention makes the swimming beginners to concentrate on arm movements or the swimming style to move the waist from side to side.

Second, the swimming assistance apparatus according to the embodiments of the present invention can relieve or treat pains
25 of the patients who suffer from knee joint pain or backache or the persons who have disability in the lower body.

Third, the swimming assistance apparatus according to the embodiments of the present invention can give great help to rehabilitation and enhance swimming skills by training upper body muscles and waist muscles because the user can move the
5 waist from side to side.

BRIEF DESCRIPTION OF THE DRAWINGS

The following drawings attached to the description of the present invention are to illustrate embodiments of the present
10 invention and for a more complete understanding of the detailed description and technical idea of the present invention. Therefore, it will be understood by those of ordinary skill in the art that the present invention is not limited to the matters described or illustrated in the attached drawings.

15 FIG. 1 is a perspective view of a swimming assistance apparatus according to a first embodiment of the present invention.

FIG. 2 is a perspective view of a swimming assistance apparatus according to a second embodiment of the present
20 invention.

FIG. 3 is an exploded view of a swimming assistance apparatus according to the second embodiment of the present invention.

FIG. 4 is a perspective view of a swimming assistance
25 apparatus according to a modification of the second embodiment of the present invention.

FIG. 5 is a perspective view of a swimming assistance apparatus according to a third embodiment of the present invention.

FIG. 6 is a perspective view of a swimming assistance
5 apparatus according to a fourth embodiment of the present invention.

FIG. 7 is a perspective view of a swimming assistance apparatus according to a fifth embodiment of the present invention.

10 FIG. 8 is a perspective view of a swimming assistance apparatus according to a first modification of the fifth embodiment of the present invention.

FIG. 9 is a perspective view of a swimming assistance apparatus according to a second modification of the fifth
15 embodiment of the present invention.

FIGS. 10 to 12 are side views and a plan view showing used states of the swimming assistance apparatus according to the second modification of the fifth embodiment of the present invention.

20 FIG. 13 is a perspective view of a swimming assistance apparatus according to a sixth embodiment of the present invention.

FIG. 14 is a perspective view of a swimming assistance apparatus according to a seventh embodiment of the present
25 invention.

FIG. 15 is a perspective view of a swimming assistance apparatus according to a modification of the seventh embodiment of the present invention.

FIG. 16 is a perspective view of a swimming assistance
5 apparatus according to an eighth embodiment of the present invention.

FIG. 17 is a perspective view of a swimming assistance apparatus according to a modification of the eighth embodiment of the present invention.

10 FIG. 18 is a perspective view of a swimming assistance apparatus according to a ninth embodiment of the present invention.

FIG. 19 is a perspective view of a swimming assistance apparatus according to a tenth embodiment of the present
15 invention.

FIG. 20 is a perspective view of a swimming assistance apparatus according to an eleventh embodiment of the present invention.

FIG. 21 is a perspective view of a swimming assistance
20 apparatus according to a first modification of the eleventh embodiment of the present invention.

FIG. 22 is a perspective view of a swimming assistance apparatus according to a second modification of the eleventh embodiment of the present invention.

FIG. 23 is a perspective view of a swimming assistance apparatus according to a twelfth embodiment of the present invention.

FIG. 24 is a perspective view of a swimming assistance
5 apparatus according to a first modification of the twelfth embodiment of the present invention.

FIG. 25 is a perspective view of a swimming assistance apparatus according to a second modification of the twelfth embodiment of the present invention.

10 FIG. 26 is a perspective view of a swimming assistance apparatus according to a thirteenth embodiment of the present invention.

FIG. 27 is a perspective view of a swimming assistance apparatus according to a fourteenth embodiment of the present
15 invention.

FIGS. 28 and 29 are a side view and a plan view showing a used state of the swimming assistance apparatus according to one embodiment of the present invention.

20 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Reference will be now made in detail to the embodiments of the present invention with reference to the attached drawings. In the description of the present invention, when it is judged that detailed descriptions of known functions or structures
25 related with the present invention may make the essential

points vague, the detailed descriptions of the known functions or structures will be omitted.

Moreover, in the drawings, parts having similar functions and actions have the same reference numerals. In the
5 description of the present invention, to connect some part with another part means that some part is directly connected with another part and that some part is indirectly connected with another part through an element. Furthermore, unless otherwise defined herein, to include a component does not mean that the
10 mortise lock excludes other component but means that the mortise lock can include other components more.

Embodiment 1

In relation with the basic structure of a swimming
15 assistance apparatus, the first embodiment of the present invention will be described. FIG. 1 is a perspective view of a swimming assistance apparatus according to a first embodiment of the present invention. As shown in FIG. 1, the swimming assistance apparatus according to the embodiment of the present
20 invention may include a body 10, a fitting hole 20 and a cut part 30.

The body 10 may be made of a material which floats on water or be formed in a hollow tube type which floats on water. The material for the body 10 may be a resin material, for
25 instance, compressed polystyrene foam. The body 10 is

basically, formed in a shape of an elliptic cylinder, and may be formed in various shapes as described hereinafter.

The body 10 provides a user's lower body with buoyancy. Buoyancy of the body 10 is determined by volume of the body 10
5 which is submerged in water and density of the body 10. If volume of the body 10 submerged in water is large and density of the body 10 is small, buoyancy becomes stronger.

The fitting hole 20 is formed in a hollow cylinder shape and penetrates through the body 10. Just one fitting hole 20
10 may be formed in such a way that the user's both ankles are inserted and fixed into the fitting hole and are surrounded by the swimming assistance apparatus. Alternatively, two fitting holes 20 may be formed in such a way that the user's right ankle and left ankle are respectively inserted and fixed into
15 the fitting holes 20 and are surrounded by the swimming assistance apparatus. In a case that the two fitting holes 20 are formed, the fitting hole to which the left ankle is inserted and fixed is defined as a first fitting hole, and the fitting hole to which the right ankle is inserted and fixed is
20 defined as a second fitting hole.

The fitting hole 20 may have different sizes according to the user's body conditions. For instance, the size of the fitting hole is varied according to age or gender of the users.

The fitting hole 20 can collect the user's legs within a
25 distance that the user does not feel inconvenience. That is, the first fitting hole and the second fitting hole may be

formed to have a specific distance from each other. The user's legs are fixed by the fitting hole 20. The user who is fixed in legs can concentrate on the upper body's movements while swimming, reinforce upper body muscles and waist muscles, and especially, show the swimming style to move the waist from side to side. Moreover, persons who have disability in the lower body can enjoy swimming. Furthermore, the problem that swimming beginners cannot concentrate on the upper body posture because splashing water with the feet, which is the swimming beginners' typical problem, can be solved.

The cut part 30 is formed at one side of the fitting hole 20 to make the user's lower body be inserted into the fitting hole 20 easily. Preferably, the cut direction of the cut part 30 is formed in the longitudinal direction of the fitting hole 20. The cut part 30 may be formed at both sides of the longitudinal direction of the body 10, namely, at upper and lower sides of the fitting hole 20.

The cut part 30 makes the user easily insert the legs into the fitting hole 20. Due to the cut part 30 formed in the longitudinal direction of the fitting hole 20 in the embodiment of the present invention, the user's legs are not easily separated from each other under water, and the user can take the legs out of the fitting hole 20 if the user puts his or her mind to it in an emergency situation. Finally, the cut part 30 increases the utility of the swimming assistance apparatus but decreases dangerousness. According to the first embodiment of

the present invention, the cut part 30 is formed at right and left sides of the fitting hole 20. However, if the user does not try to take the legs out of the fitting hole 20, the user's legs are not separated from the fitting hole 20 because power
5 is applied to the inside of both legs when the user is swimming.

The cut part 30 may be formed in at least one among the first fitting hole and the second fitting hole. That is, there is no need to form the cut part 30 in both fitting holes 20. Even though the cut part 30 is formed only in one fitting hole
10 20, the object of the present invention can be achieved.

In a case that the body 10 is made of a synthetic resin material with elasticity, the cut part 30 is widened when the user inserts the user's lower part into the fitting hole 20 and is returned to its initial width when the user's lower part is
15 completely inserted into the fitting hole 20.

The swimming assistance apparatus according to the embodiment of the present invention has not only the first embodiment but also other various embodiments which will be described later.

20

Embodiment 2

In connection with the second embodiment of the present invention, FIG. 2 is a perspective view of a swimming assistance apparatus according to the second embodiment of the
25 present invention, and FIG. 3 is an exploded view of a swimming assistance apparatus according to the second embodiment of the

present invention. As shown in FIGS. 2 and 3, the swimming assistance apparatus according to the second embodiment of the present invention may include a male and female coupling part 40, which is detachable fixing means configured to divide the
5 body 10 in half and separate the fitting holes 20 from each other.

The swimming assistance apparatus according to the second embodiment of the present invention enhances convenience in wearing. The user wears the swimming assistance apparatus by
10 each leg and inserts a male coupling part 42 into the female coupling part 41. Moreover, a magnet may be mounted on the male and female coupling part 40. Alternatively, instead of the male and female coupling part 40, as the detachable fixing means, Velcro tapes, snap fasteners, magnets, hooks, or zippers
15 or combinations of the Velcro tapes, the snap fasteners, the magnets, the hooks and the zippers may be disposed on the inner faces of the divided body 10.

FIG. 4 is a perspective view of a swimming assistance apparatus according to a modification of the second embodiment
20 of the present invention. As shown in FIG. 4, the swimming assistance apparatus according to the modification of the second embodiment of the present invention is identical with the swimming assistance apparatus according to the second embodiment of the present invention in that the body is divided
25 in half. As the modification of the second embodiment, the detachable fixing means configured in such a manner that the

fitting holes 20 are separated from each other may be round magnets which are coupled in male and female coupling.

Embodiment 3

5 In connection with the third embodiment of the present invention, FIG. 5 is a perspective view of a swimming assistance apparatus according to the third embodiment of the present invention. As shown in FIG. 5, the swimming assistance apparatus according to the third embodiment of the present
10 invention may include the cut part 30 formed at an upper side of the fitting hole 20.

According to the third embodiment of the present invention, a lower side of the fitting hole 20 comes into contact with the user's leg by buoyancy of the body 10, such that the fitting
15 hole is not easily separated from the user's leg under water. At the same time, when the user lifts the leg upwardly from the fitting hole 20, the leg can be easily separated from the fitting hole 20, and hence, the user can attach and detach the swimming assistance apparatus under an emergent situation if
20 the user puts the user's mind to it.

Embodiment 4

In connection with the fourth embodiment of the present invention, FIG. 6 is a perspective view of a swimming
25 assistance apparatus according to the fourth embodiment of the present invention. As shown in FIG. 6, the swimming assistance

apparatus according to the fourth embodiment of the present invention may include the cut parts 30 which are formed in the first fitting hole and the second fitting hole cornerwise. For instance, the cut part 30 is formed at an upper side of the first fitting hole, and the other cut part 30 is formed at a lower side of the second fitting hole. Alternatively, the cut part 30 is formed at an upper side of the first fitting hole, and the other cut part 30 is formed at a right or left side of the second fitting hole.

The swimming assistance apparatus according to the fourth embodiment of the present invention can provide various effects according to positions of the cut parts 30. For instance, when the cut part 30 is formed at an upper side of the first fitting hole 20, because the lower side of the fitting hole 20 comes into contact with the user's leg under water by buoyancy of the body 10, the swimming assistance apparatus is not easily separated from the user's leg under water but the user can easily take the legs from the fitting holes 20 by lifting the legs upwardly from the fitting holes 20, and hence, the user can attach and detach the swimming assistance apparatus under an emergent situation if the user puts the user's mind to it.

Embodiment 5

In connection with the fifth embodiment of the present invention, FIG. 7 is a perspective view of a swimming assistance apparatus according to the fifth embodiment of the

present invention. As shown in FIG. 7, the swimming assistance apparatus according to the fifth embodiment of the present invention may include a depressed part 50 which is transversely depressed in the middle of the body 10. The depressed part 50
5 may be formed from the upper side to the lower side of the body 10 or from the lower side to the upper side of the body 10. Moreover, the depressed part 50 may be formed from the upper and lower sides toward the inside of the body 10. Furthermore, the depressed part 50 may be formed inwardly from the back and
10 forth direction.

According to the fifth embodiment of the present invention, the depressed part 50 decreases manufacturing costs of the swimming assistance apparatus. Additionally, because a vertical cross-section area of the body 10 is decreased,
15 underwater resistance is also decreased. The swimming assistance apparatus illustrated in FIG. 7 is depressed from the upper side to the lower side of the body 10 and a cut part is formed at the upper side of the fitting hole 20.

In relation with a first modification of the fifth
20 embodiment, FIG. 8 is a perspective view of a swimming assistance apparatus according to a first modification of the fifth embodiment of the present invention. The swimming assistance apparatus according to the first modification of the fifth embodiment of the present invention may include a
25 depressed part 50 which is depressed from the upper side to the lower side of the body 10 and the cut parts 30 which are

respectively formed at right and left sides of fitting holes 20. According to the first modification of the fifth embodiment of the present invention, the swimming assistance apparatus can obtain an effect by the depressed part 50 and effects created
5 by the cut parts 30 formed at the right and left sides of the fitting holes 20.

In relation with a second modification of the fifth embodiment of the present invention, FIG. 9 is a perspective view of a swimming assistance apparatus according to the second
10 modification of the fifth embodiment of the present invention. The swimming assistance apparatus according to the second modification of the fifth embodiment of the present invention may include depressed parts 50 which is depressed from the upper and lower sides of the body 10 toward the inside of the
15 body 10 and cut parts 30 which are respectively formed at right and left sides of fitting holes 20. According to the second modification of the fifth embodiment of the present invention, the swimming assistance apparatus can carry out as a pull buoy for swimming training which is called a 'peanut' or a 'peanut
20 helper'.

In a case that the user wants to train the upper body or correct the swimming posture, the swimming assistance apparatus according to the second modification of the fifth embodiment of the present invention is fit between the knees or the thighs
25 and inwardly presses the user's lower body to serve as the pull buoy. In a case that the user wants to do aquarobics, the

swimming assistance apparatus according to the second modification of the fifth embodiment of the present invention serves as the pull buoy when the user insert the ankles into the depressed parts 50 to press the user's lower body, when the
5 user uses the swimming assistance apparatus while grasping the depressed parts 50 with both hands, or when the user fits the swimming assistance apparatus under the user's arm in such a manner that the user's upper arms and the sides of the chest are inserted into the depressed parts 50. The user can
10 selectively use the general function of the swimming assistance apparatus and the pull buoy function according to the second modification of the fifth embodiment as described above.

FIGS. 10 to 12 are side views and a plan view showing used states of the swimming assistance apparatus according to the
15 second modification of the fifth embodiment of the present invention. The swimming assistance apparatus according to the second modification of the fifth embodiment of the present invention can be used in the first used state illustrated in FIG. 10 or in the second used state illustrated in FIGS. 11 and
20 12.

In the first used state of the second modification of the fifth embodiment illustrated in FIG. 10, like the first embodiment, the user wears the swimming assistance apparatus by inserting the user's legs into the fitting holes through the
25 cut parts formed at the sides of the body 10 of the swimming assistance apparatus. By the swimming assistance apparatus

according to the second modification of the fifth embodiment, the user's legs are collected and fixed.

In the second used state of the second modification of the fifth embodiment illustrated in FIGS. 11 and 12, the user wears the swimming assistance apparatus according to the second modification of the fifth embodiment between the knees and the thighs by fitting the knees or thighs on the depressed parts 50, and strongly presses the swimming assistance apparatus toward the inside of the user's lower body.

10

Embodiment 6

In relation with the sixth embodiment, FIG. 13 is a perspective view of a swimming assistance apparatus according to the sixth embodiment of the present invention. As shown in FIG. 13, the swimming assistance apparatus according to the sixth embodiment of the present invention may include wings 62 disposed at right and left sides of the body 10. The wings 62 are formed in a shape of a plate which becomes gradually narrowed in width when they become further from the body 10.

The wings 62 may have a streamlined shape, namely, an oval cross section, to reduce underwater resistance in front of the swimming assistance apparatus. The wings 62 are formed outside the body 10 in the lateral direction, and the longitudinal direction of the body 10 and the plane of the wing are generally parallel.

25

The swimming assistance apparatus having the wings 62 according to the sixth embodiment of the present invention may be a form that two fitting holes 20 are formed in the board, which is one of the conventional swimming assistance apparatuses. The swimming assistance apparatus having the wings 62 is increased in volume occupying underwater and increases buoyancy by the wings 62. Moreover, the swimming assistance apparatus having the wings 62 increases power to overcome surface tension of the surface of the water because a contact area between the swimming assistance apparatus and the surface of water is widened. That is, because underwater resistance is increased vertically, the user's legs float well on water. Finally, the wings 62 have an effect to provide the swimming beginners with more buoyancy. Furthermore, the wings 62 prevent the swimming assistance apparatus from rotating around the progress direction under water.

Embodiment 7

In relation with the seventh embodiment of the present invention, FIG. 14 is a perspective view of a swimming assistance apparatus according to the seventh embodiment of the present invention. As shown in FIG. 14, the swimming assistance apparatus according to the seventh embodiment of the present invention may include fins 60 which are formed in a shape of a plate which becomes gradually narrowed in width when they become further from the body 10. The fins 60 may have a

streamlined shape, namely, an oval cross section, to reduce underwater resistance in front of the swimming assistance apparatus. The fins 60 are formed outside the body 10 in the vertical direction of the body 10, and the longitudinal
5 direction of the body 10 and the normal line direction of the plane of the fin 60 are generally parallel.

The swimming assistance apparatus having the fins 60 according to the seventh embodiment of the present invention enhances the user's propulsive force because the fins 60 push
10 out water when the user swims while moving the waist from side to side. Finally, when the user uses the swimming assistance apparatus having the fins 60, it increases exercise effect. Additionally, the fins 60 serve to keep the balance of the swimming assistance apparatus so as to prevent the swimming
15 assistance apparatus from rotating around the progress direction under water.

FIG. 15 is a perspective view of a swimming assistance apparatus according to a modification of the seventh embodiment of the present invention. As shown in FIG. 15, the swimming
20 assistance apparatus according to the modification of the seventh embodiment of the present invention may include a fin 60 which is formed at one side of the upper and lower sides of the body 10.

25 **Embodiment 8**

In relation with the eighth embodiment of the present invention, FIG. 16 is a perspective view of a swimming assistance apparatus according to the eighth embodiment of the present invention and FIG. 17 is a perspective view of a swimming assistance apparatus according to a modification of the eighth embodiment of the present invention. As shown in FIGS. 16 and 17, the swimming assistance apparatus according to the eighth embodiment of the present invention may include a protrusion part 70 which protrudes inwardly from at least a part of the inner face of the fitting hole 20. The protrusion part 70 may be in a straight line form as shown in FIG. 16 or in a semi-spherical form as shown in FIG. 17 showing the modification of the eighth embodiment. Additionally, the protrusion part 70 may have a spiral shape like a screw thread in order to increase grounding power with the user's legs in the back and forth direction of the swimming assistance apparatus.

According to the eighth embodiment of the present invention, the swimming assistance apparatus having the protrusion part 70 reinforces grounding power between the inside of the fitting holes 20 and the user's legs.

Embodiment 9

In relation with the ninth embodiment of the present invention, FIG. 18 is a perspective view of a swimming assistance apparatus according to the ninth embodiment of the

present invention. As shown in FIG. 18, the swimming assistance apparatus according to the ninth embodiment of the present invention may include a through hole 80 which is formed in the middle of the body 10 and penetrates through the swimming assistance apparatus in the back and forth direction. The cross section form of the through hole 80 may be one of a circle, a polygon, an oval and so on. Moreover, as shown in FIG. 18, a wall of uniform thickness is formed on the outside of the fitting holes 20, and the through hole 80 may have a rectangular cross section of which the middle part is concave to secure the maximum cross section area of the hole.

According to the ninth embodiment of the present invention, the swimming assistance apparatus having the through hole 80 can reduce underwater resistance and manufacturing costs.

Embodiment 10

In relation with the tenth embodiment of the present invention, FIG. 19 is a perspective view of a swimming assistance apparatus according to the tenth embodiment of the present invention. As shown in FIG. 19, the swimming assistance apparatus according to the tenth embodiment of the present invention may include a fin 60 which is vertically formed at right angles to the body 10 and formed outside the central portion of the body 10 and a plurality of hand-grips 90 of a hole form which penetrate the fin 60 in the width direction. One to five hand-grips 90 may be formed in such a

manner that the user can insert each finger into each hand-grip or the plural fingers into one hand-grip. According to a modification of the tenth embodiment of the present invention, the hand-grip 90 may be formed in the body 10 or in one side of
5 the wing 62.

According to the tenth embodiment of the present invention, the swimming assistance apparatus having the hand-grip 90 enables the user to easily grasp the swimming assistance apparatus.

10

Embodiment 11

In relation with the eleventh embodiment of the present invention, FIG. 20 is a perspective view of a swimming assistance apparatus according to the eleventh embodiment of the present invention, FIG. 21 is a perspective view of a
15 swimming assistance apparatus according to a first modification of the eleventh embodiment of the present invention, and FIG. 22 is a perspective view of a swimming assistance apparatus according to a second modification of the eleventh embodiment
20 of the present invention. As shown in FIGS. 20, 21 and 22, the swimming assistance apparatus according to the eleventh embodiment of the present invention may be formed in a hollow tube type and include partition walls 100 formed inside the body 10 to increase the general strength of the swimming
25 assistance apparatus. The partition walls 100 may be in a flat

form as shown in FIG. 20, in a crisscross form as shown in FIG. 21, or in a honeycomb form as shown in FIG. 22.

The swimming assistance apparatus having the partition walls 100 according to the eleventh embodiment of the present invention reduces manufacturing costs and reinforces buoyancy because the inside of the swimming assistance apparatus is generally hollow. Furthermore, swimming assistance apparatus having the partition walls 100 of the crisscross form as shown in FIG. 21 prevents distortion of the swimming assistance apparatus because it increases strength of the swimming assistance apparatus in all directions. In addition, swimming assistance apparatus having the partition walls 100 of the honeycomb form as shown in FIG. 22 increases strength of the swimming assistance apparatus the most.

15

Embodiment 12

In relation with the twelfth embodiment of the present invention, FIG. 23 is a perspective view of a swimming assistance apparatus according to the twelfth embodiment of the present invention, FIG. 24 is a perspective view of a swimming assistance apparatus according to a first modification of the twelfth embodiment of the present invention, and FIG. 25 is a perspective view of a swimming assistance apparatus according to a second modification of the twelfth embodiment of the present invention. As shown in FIGS. 23, 24 and 25, the swimming assistance apparatus according to the twelfth

embodiment of the present invention may include separation preventing means to close at least a part of the cut part 30 according to the user's selection. The separation preventing means may be a Velcro tape 110 as shown in FIG. 23, may be male and female coupling means, such as a button 112 as shown in FIG. 24, or may be a zipper 114 as shown in FIG. 25. In the first modification of the twelfth embodiment illustrated in FIG. 24, as detachable fixing means of the separation preventing means, a magnet may be used. The magnet makes use of the separation preventing means easy.

The swimming assistance apparatus having the separation preventing means according to the twelfth embodiment of the present invention can have an effect to fix the swimming assistance apparatus to the user's legs according to the user's selection. The swimming assistance apparatus having the separation preventing means can be used usefully to the persons who have disability in the lower body, such as paraplegia, because it prevents the user's legs from being separated from the fitting holes 20.

20

Embodiment 13

In relation with the thirteenth embodiment of the present invention, FIG. 26 is a perspective view of a swimming assistance apparatus according to the thirteenth embodiment of the present invention. As shown in FIG. 26, the swimming assistance apparatus according to the thirteenth embodiment of

25

the present invention may be formed in a hollow tube type and include an air injection hole 45 for injecting air into the swimming assistance apparatus. In order to minimize underwater friction, the air injection hole 45 is formed on the front face
5 of the body 10. The swimming assistance apparatus according to the thirteenth embodiment of the present invention can compress the swimming assistance apparatus to the minimum volume to be stored and carried easily by discharging the air, which fills the inside the swimming assistance apparatus, out of the air
10 injection hole 45.

Embodiment 14

In relation with the fourteenth embodiment of the present invention, FIG. 27 is a perspective view of a swimming
15 assistance apparatus according to the fourteenth embodiment of the present invention. As shown in FIG. 27, the swimming assistance apparatus according to the fourteenth embodiment of the present invention may include the fitting holes 20 having outer walls which are dislocated at the cut parts 30. The
20 swimming assistance apparatus having the outer walls of the fitting holes 20 which are dislocated at the cut parts 30 makes the user easily insert the legs into the fitting holes 20 and makes the swimming assistance apparatus be fixed to the user's legs more stably. Preferably, the dislocated size of the outer
25 walls of the fitting holes 20 at the cutting parts 30 is 0.5cm to 3cm, and more preferably, is 1cm. If the dislocated size of

the outer walls of the fitting holes 20 at the cutting parts 30 becomes larger, the swimming assistance apparatus is fixed to the user's legs more stably. However, if the dislocated size of the outer walls of the fitting holes 20 at the cutting parts 5 30 becomes smaller, the user's legs are inserted into the fitting holes 20 more easily.

Used states of swimming assistance apparatus

In relation with used states of the swimming assistance apparatus, FIGS. 28 and 29 are a side view and a plan view 10 showing a used state of the swimming assistance apparatus according to the embodiment of the present invention. As shown in FIGS. 28 and 29, the swimming assistance apparatus according to the embodiment of the present invention is worn to the 15 user's legs when the user inserts the user's legs into the fitting holes through the cut parts of the sides of the body 10 of the swimming assistance apparatus. By the swimming assistance apparatus, the user's legs are gathered and fixed. The user can wear the swimming assistance apparatus onto the 20 calves, knees or thighs, and more preferably, onto the ankles. Moreover, the swimming assistance apparatus having the fins 60 as shown in FIGS. 14 and 15 can be used.

The user can train various swimming styles while moving the waist from side to side or swinging the arms in the state 25 where the user's legs are fixed using the swimming assistance apparatus. The user's lower body floats on water by buoyancy

of the swimming assistance apparatus. Therefore, the user can perform various swimming styles without taking care about the lower body. The user can move forward in a good swimming style while moving the waist from side to side like a fish which swims using the caudal fin. Therefore, the user can reinforce upper body muscles and waist muscles and correct the user's twisted pelvises.

Because the user can swim while moving only the upper body using the swimming assistance apparatus according to the embodiment of the present invention without whip kick, the persons who have disability in the lower body, children or the aged who are weak in strength of the lower body can swim using the swimming assistance apparatus.

Especially, the persons who have disability in the lower body can use the swimming assistance apparatus for medical purposes, such as pain relief or treatment. The persons who have disability in the lower body, such as paraplegia, cannot swim while doing whip kick or moving the waist up and down, and they go under water with the legs drifted open when they enter the water. Therefore, when the persons who have disability in the lower body uses the swimming assistance apparatus according to the embodiment of the present invention, it can help in treating pains because a physical therapist can keep eye contact with the patients and communion between the physical therapist and the patients is increased.

As described above, while the present invention has been particularly shown and described with reference to the example embodiments thereof, it will be understood by those of ordinary skill in the art that the present invention can be executed in other forms without changing the technical idea or essential features of the present invention. Therefore, it would be understood that the embodiments disclosed in the present invention are all exemplified and are not limited to the specific embodiments of the present invention. It should be also understood that the protective scope of the present invention is interpreted by the following claims and all changes and modifications derived from the meaning, scope and equivalent concept of the claims belong to the technical scope of the present invention.

15

CLAIMS:

1. A swimming assistance apparatus comprising:

a body made of a material which floats on water or formed in a hollow tube which floats on water;

5 a fitting hole formed in a hollow cylinder shape and penetrating through the body to surround a part of a user's lower body; and

a cut part formed in the wall of one side of the fitting hole in such a way that a part of the user's lower body can be
10 inserted into the fitting hole,

wherein when the user swims in a state where the user's lower body is inserted into the fitting hole, the user's lower body floats on water by buoyancy of the body,

wherein the fitting hole comprises a first fitting hole
15 and a second fitting hole configured in such a manner that the user can insert the right and left legs into the first and second fitting holes respectively,

wherein the swimming assistance apparatus further comprises,

20 a depressed part inwardly depressed to a specific depth between the first fitting hole and the second fitting hole of the body, such that the user inserts and fixes a part of the user's lower body into the first fitting hole and the second

fitting hole or compresses and fixes a part of the user's lower body to the depressed part,

wherein the depressed part extends longitudinally along the length of the body between the fitting holes, and

5 wherein both sides of the depressed part are defined in a curved surface, and a width of the depressed part gradually narrows in inward direction.

2. The swimming assistance apparatus as claimed in claim 1,
10 wherein the depressed part is formed on upper and lower sides of the body and the body is configured to be divided into two parts.

3. The swimming assistance apparatus as claimed in claim 1,
15 wherein the cut part comprises at least one of a first cut part formed in one side wall of the first fitting hole and a second cut part formed in one side wall of the second fitting hole, and

wherein at least one among the first and second cut parts
20 is respectively formed in the upper side wall of the first fitting hole and the second fitting hole to enable the user to easily put the user's lower body thereon.

4. The swimming assistance apparatus as claimed in claim 1,
wherein the cut part comprises first and second cut parts
respectively formed in the side walls of the first and second
fitting holes, and

5 wherein the first cut part is formed in the upper side
wall of the first fitting hole and the second cut part is
formed in the lower side wall of the second fitting hole.

5. The swimming assistance apparatus as claimed in claim 1,
10 further comprising:

 a protrusion part disposed on an inner surface of the
fitting hole and protruded in a diameter direction so as to
provide the user's lower body with comfort and enhance
fixation power of the user's lower body.

15

6. The swimming assistance apparatus as claimed in claim 1,
further comprising:

 a protrusion part disposed on an inner surface of the
fitting hole and protruded in a diameter direction and is
20 protruded in a semi-spherical shape so as to provide the
user's lower body with comfort and enhance fixation power of
the user's lower body.

7. The swimming assistance apparatus as claimed in claim 1,
further comprising:

5 a protrusion part disposed on an inner surface of the
fitting hole and protruded in a diameter direction and extends
spirally in the longitudinal direction of the fitting hole so
as to provide the user's lower body with comfort and enhance
fixation power of the user's lower body.

8. The swimming assistance apparatus as claimed in claim 1,
10 further comprising at least one among:

wings formed at both sides of the body in the
longitudinal direction and have a predetermined curvature at a
front face, which is the user's advancing direction, in order
to reduce underwater resistance; and

15 at least one fin which vertically protrude from the upper
side and the lower side of a middle part of the body and have
a predetermined curvature at the front face, which is the
user's advancing direction, in order to reduce underwater
resistance.

20

9. The swimming assistance apparatus as claimed in claim 1,
wherein the body is formed in a flat board type and the
fitting hole is formed in contact with one side of the body,

wherein the swimming assistance apparatus further comprises,

wings formed at both sides of the body in the longitudinal direction and have a predetermined curvature at a front face, which is the user's advancing direction, in order to reduce underwater resistance.

10. The swimming assistance apparatus as claimed in claim 1, wherein the swimming assistance apparatus further comprises,
10 a through hole formed in the body and penetrating through the inside of the body between the first fitting hole and the second fitting hole, so as to reduce underwater resistance generated in the user's advancing direction.

15 11. The swimming assistance apparatus as claimed in claim 1, further comprising:

at least one hand-grip depressed in one side of the body or penetrates through the body, such that the user can insert at least one finger into the hand-grip to grasp the body.

20

12. The swimming assistance apparatus as claimed in claim 1, further comprising at least one among:

wings formed at both sides of the body in the

longitudinal direction and have a predetermined curvature at a front face, which is the user's advancing direction, in order to reduce underwater resistance; and

at least one fin which vertically protrude from the upper
5 side and the lower side of a middle part of the body and have a predetermined curvature at the front face, which is the user's advancing direction, in order to reduce underwater resistance, thereby offsetting a rotational force around the user's advancing direction, and

10 wherein the swimming assistance apparatus further comprises,

at least one hand-grip depressed in one side of the wing or the fin or penetrates through the wing or the fin, such that the user can insert at least one finger into the hand-
15 grip to grasp the body.

13. The swimming assistance apparatus as claimed in claim 1, further comprising:

a plate type partition wall formed inside the hollow body
20 for maintaining the form of the body and relieving distortion of the body.

14. The swimming assistance apparatus as claimed in claim 1,
further comprising:

5 a plurality of plate type partition walls formed inside
the hollow body for maintaining the form of the body and
relieving distortion of the body,

wherein the plurality of partition walls cross each other.

15. The swimming assistance apparatus as claimed in claim 1,
10 further comprising:

a plurality of plate type partition walls formed inside
the hollow body for maintaining the form of the body and
relieving distortion of the body,

15 wherein the plurality of partition walls are connected
with one another in a honey comb shape.

16. The swimming assistance apparatus as claimed in claim 1,
further comprising:

20 separation preventing means disposed at one side of the
cut part to close the cut part and prevents the inserted
user's lower body from being separated from the cut part.

17. The swimming assistance apparatus as claimed in claim 1,
wherein the depressed part is formed on upper and lower sides
of the body, and

5 wherein the thickness of the body formed between the
depressed part formed on the upper side of the body and the
depressed part formed on the lower side of the body is thicker
than the thickness of the body formed between the cut part and
the depressed part.

10

18. The swimming assistance apparatus as claimed in claim 1,
wherein the depressed part is formed on upper and lower sides
of the body, and

15 wherein the thickness of a central part of the body where
the depression part is formed is greater than the thickness of
the body surrounding the fitting hole.

19. The swimming assistance apparatus as claimed in claim 1,
wherein the depressed part is formed on upper and lower sides
of the body, and

wherein a transverse thickness of the body formed between
5 the first fitting hole and the second fitting hole is thicker
than the thickness of the body formed between the cut part and
the depressed part.

20. The swimming assistance apparatus as claimed in claim 1,
10 wherein the cut part comprises first and second cut parts
respectively formed in the side walls of the first and second
fitting holes,

wherein the first fitting hole is formed on a left side
of the body and the second fitting hole is formed on a right
15 side of the body, and

wherein the first cut part is formed in an upper right
side wall of the first fitting hole and the second cut part is
formed in a bottom left side wall of the second fitting hole.

20 21. The swimming assistance apparatus as claimed in claim 1,
wherein the cut part comprises first and second cut parts
respectively formed in the side walls of the first and second
fitting holes,

wherein the first cut part is formed in the upper side wall of the first fitting hole and the second cut part is formed in the lower side wall of the second fitting hole, and

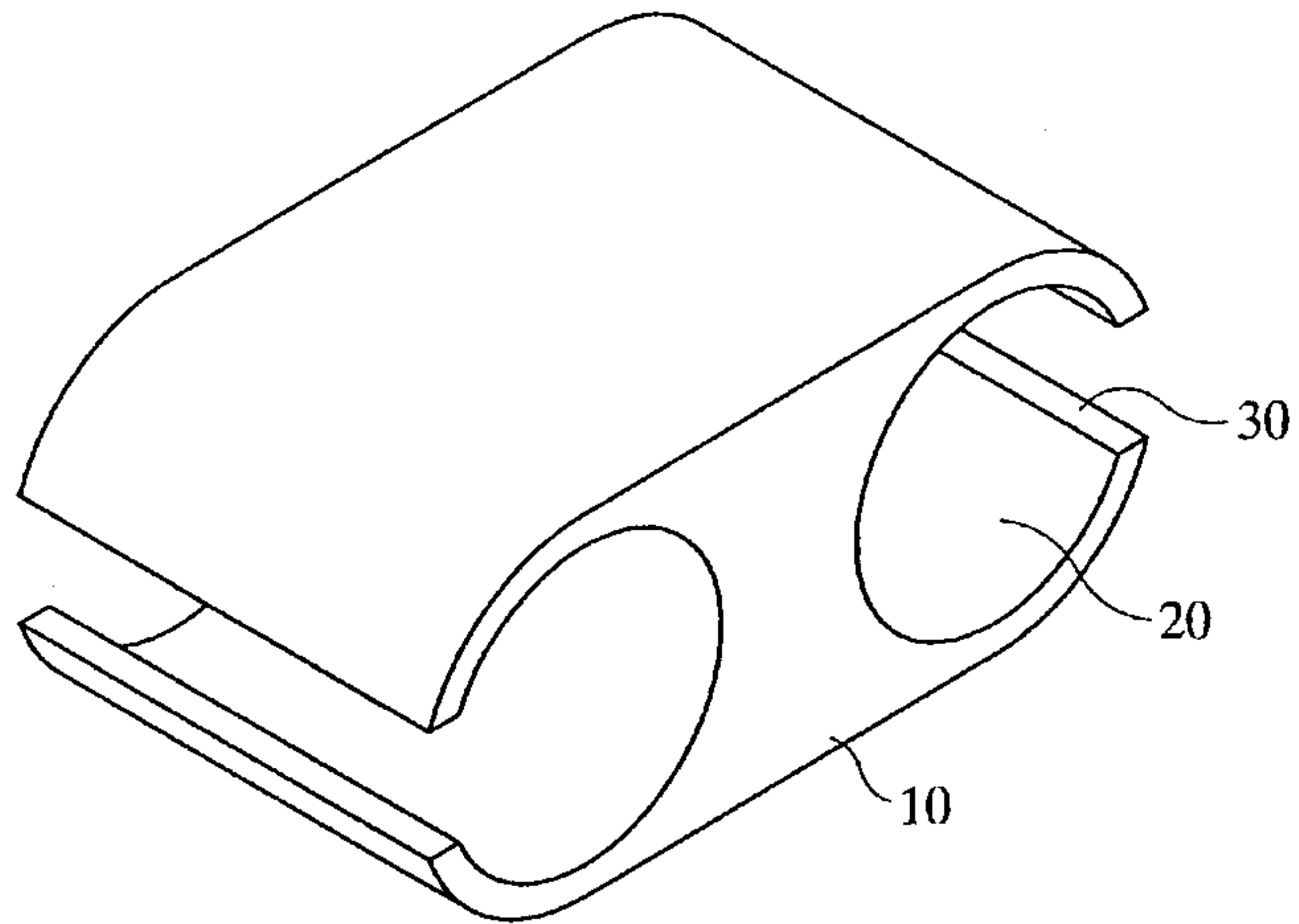
wherein an end of the body surrounding the first fitting
5 hole extends beyond a center top of the first fitting hole and
an end of the body surrounding the second fitting hole extends
through a lower center of the second fitting hole.

22. The swimming assistance apparatus as claimed in claim 1,
10 wherein the cut part comprises first and second cut parts
respectively formed in the side walls of the first and second
fitting holes,

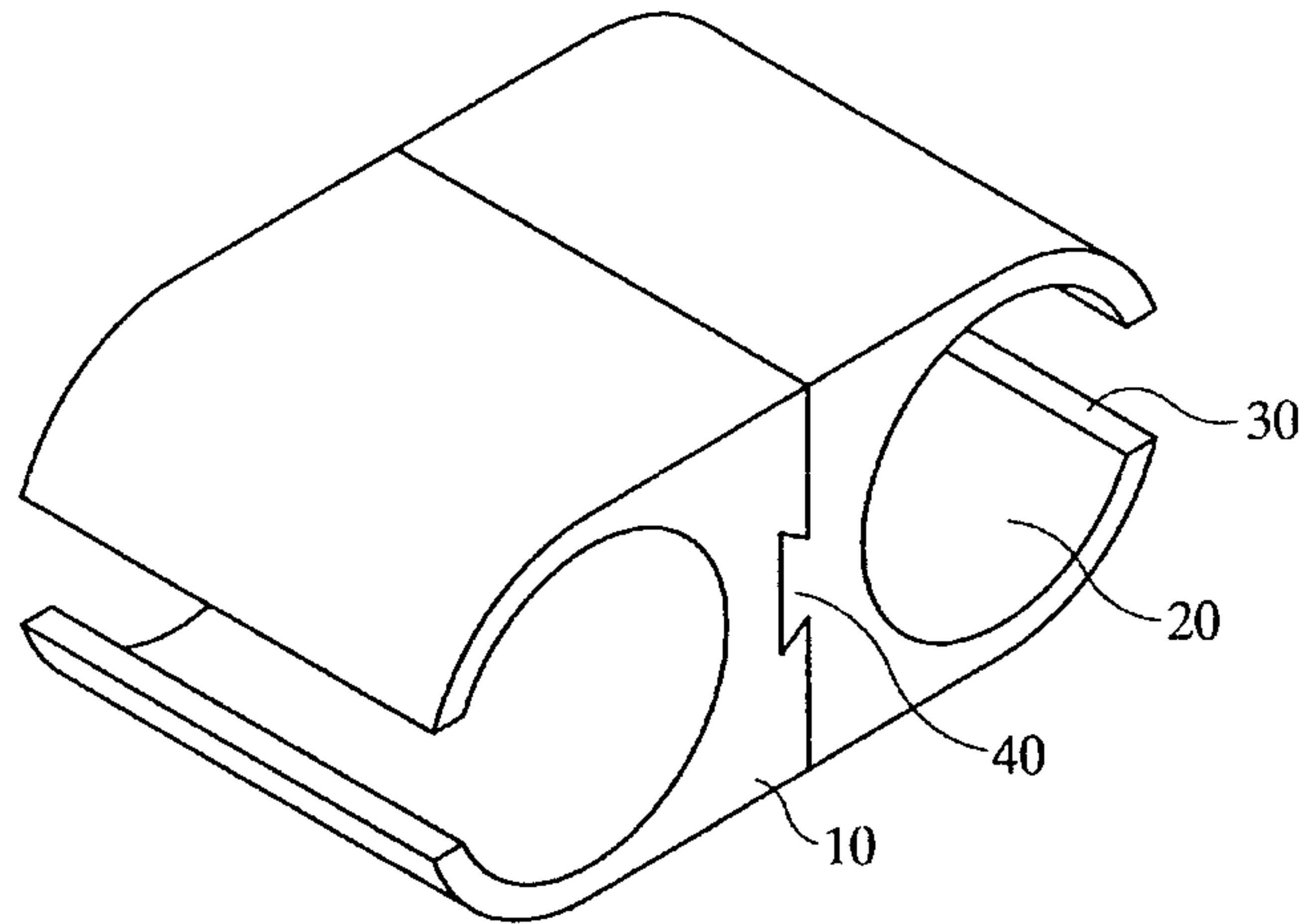
wherein the first cut part is formed in the upper side
wall of the first fitting hole and the second cut part is
15 formed in the lower side wall of the second fitting hole, and

wherein an end of the body surrounding the first fitting
hole is directed toward a downward direction of the body, and
an end of the body surrounding the second fitting hole is
directed toward an upward direction of the body.

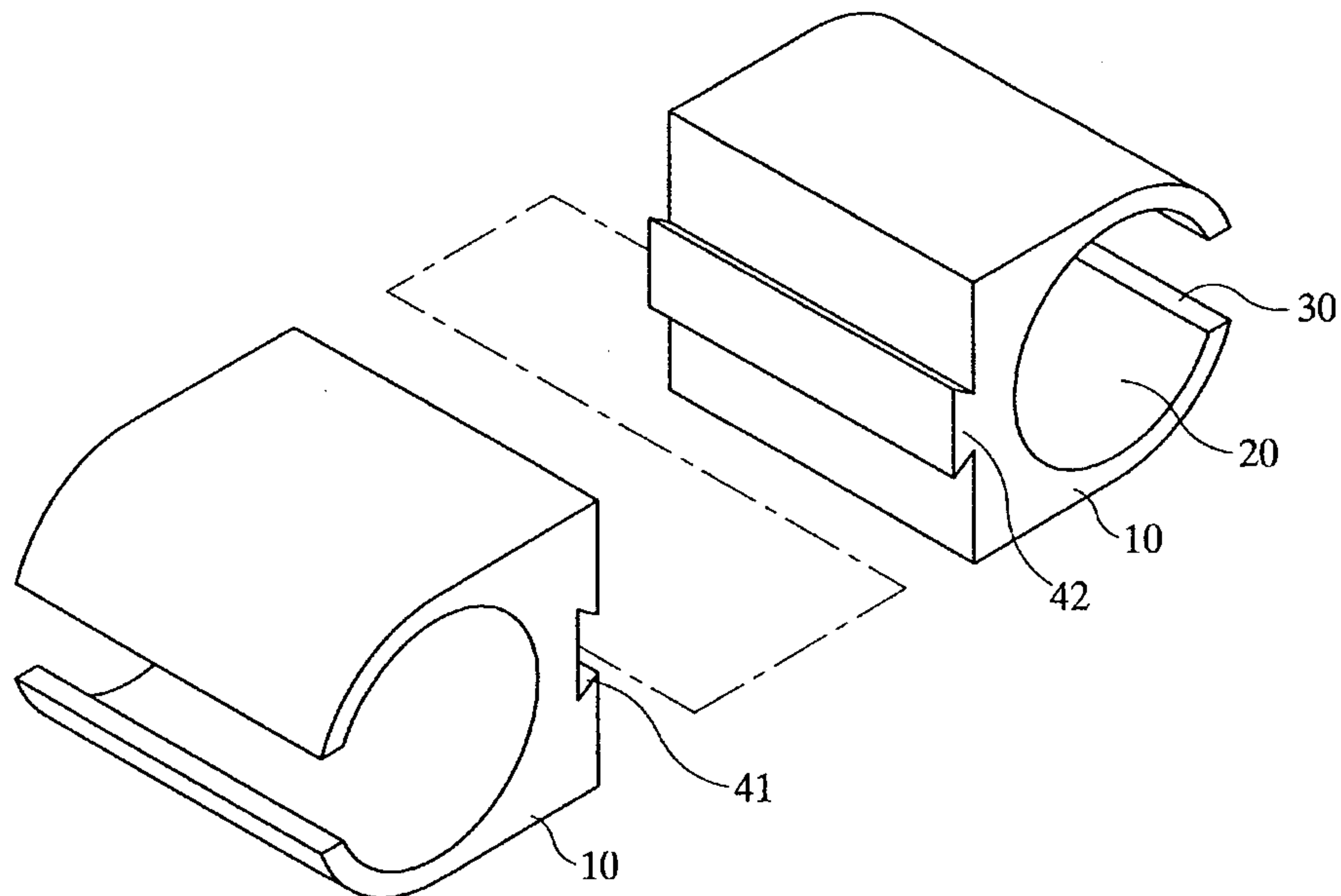
[Fig. 1]



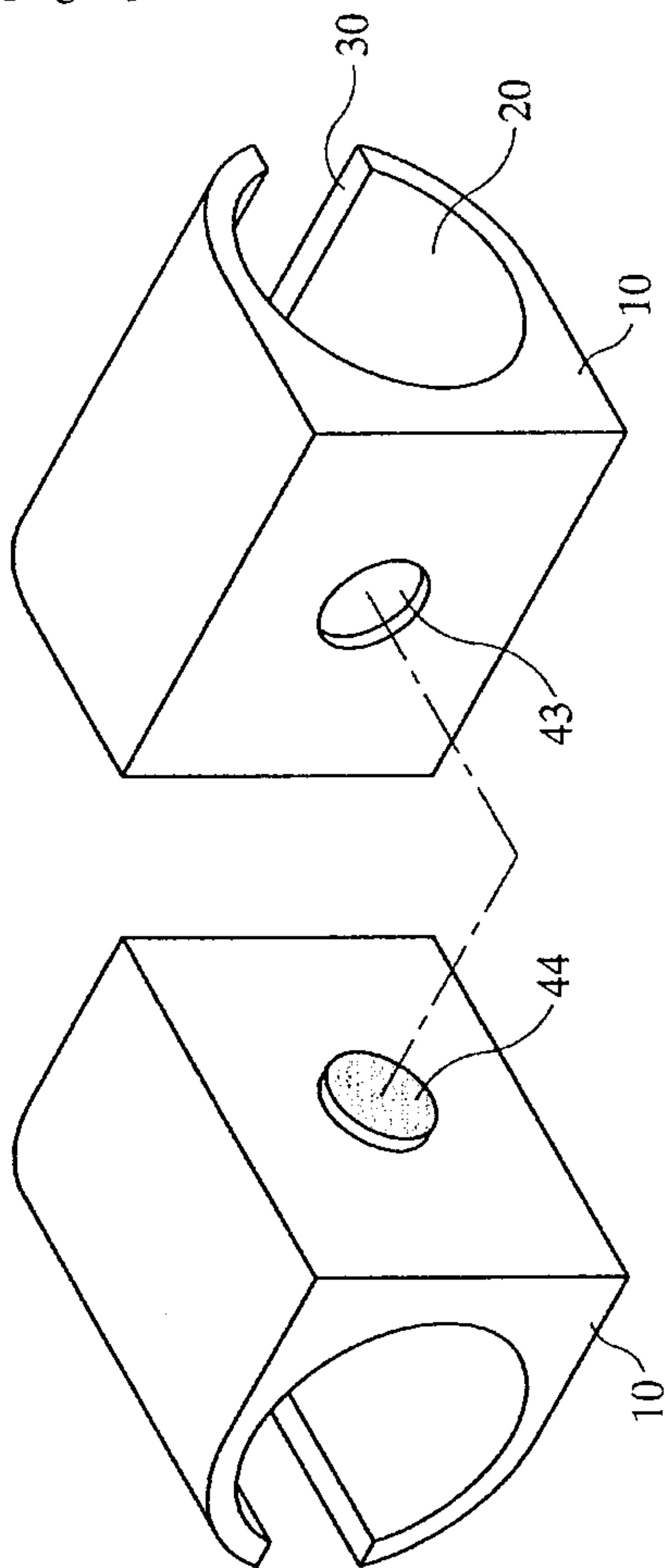
[Fig. 2]



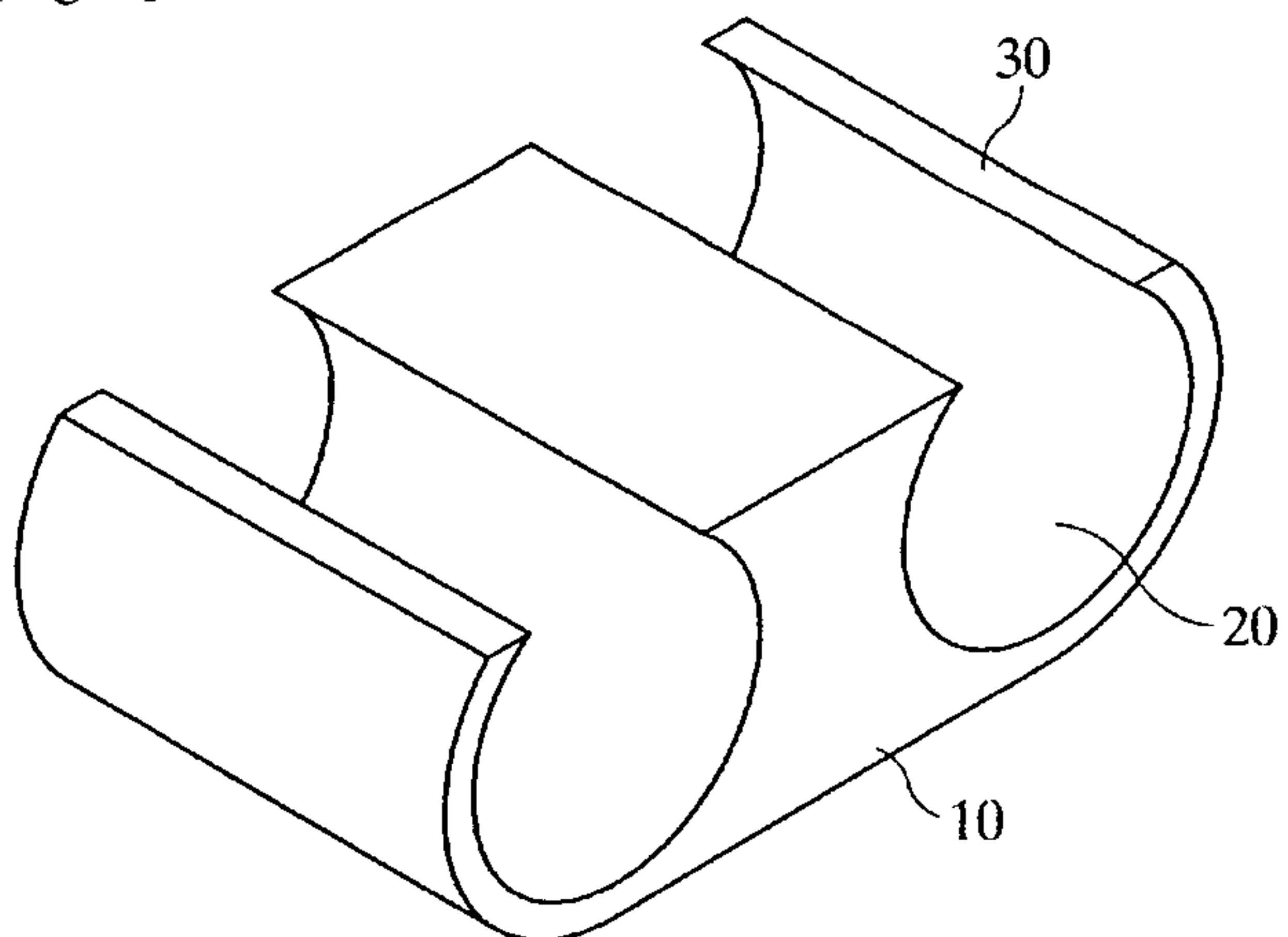
[Fig. 3]



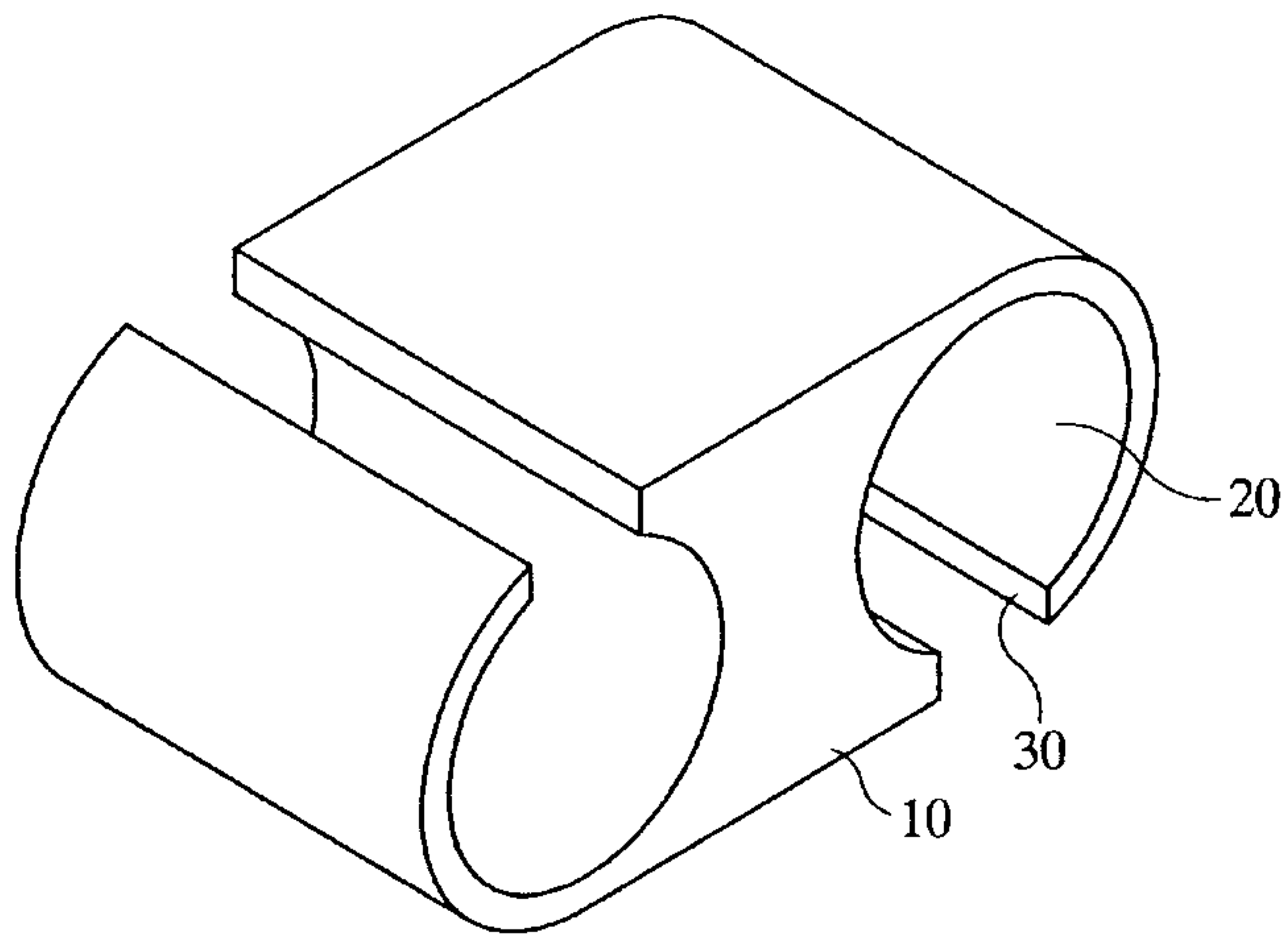
[Fig. 4]



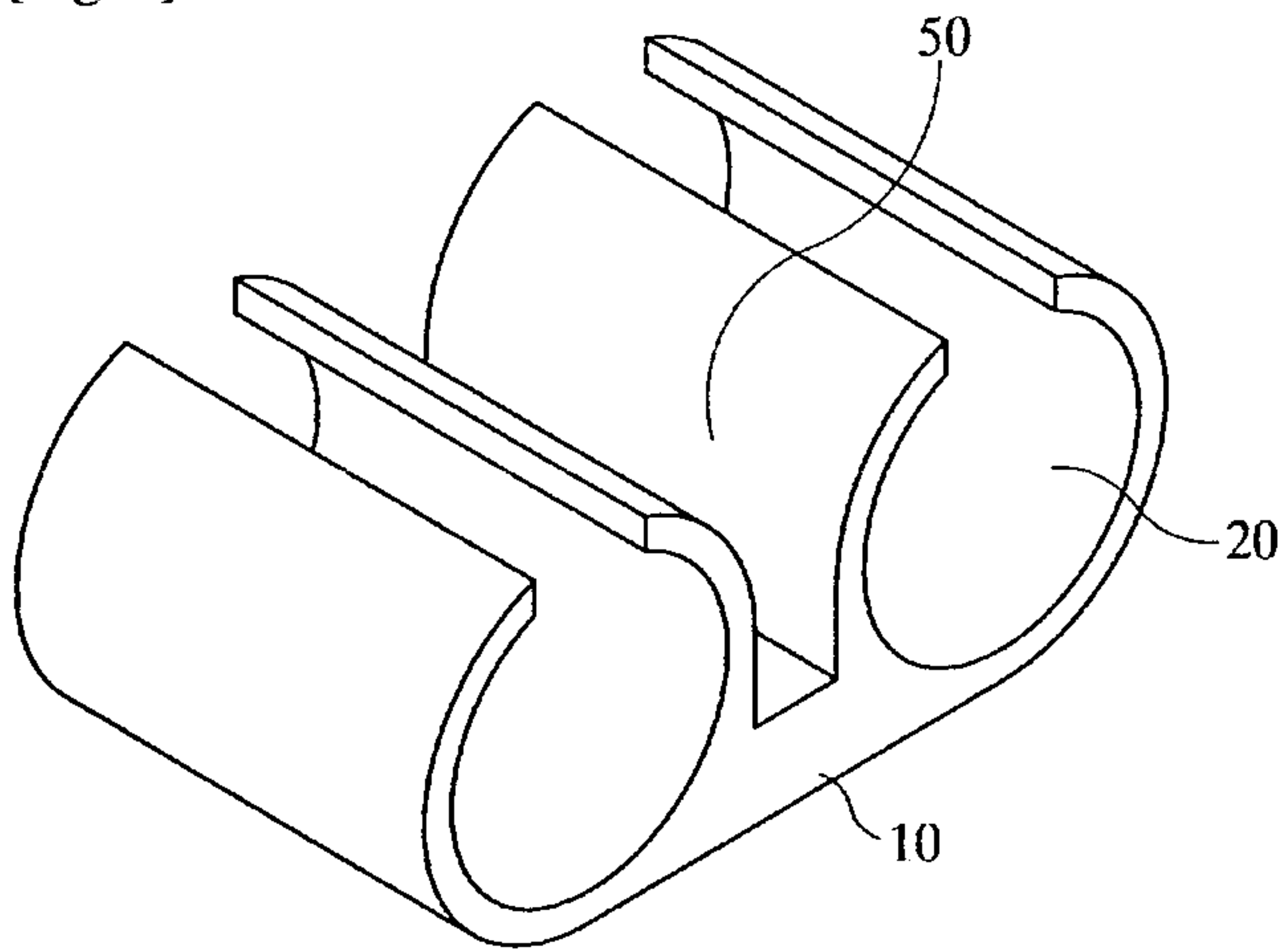
[Fig. 5]



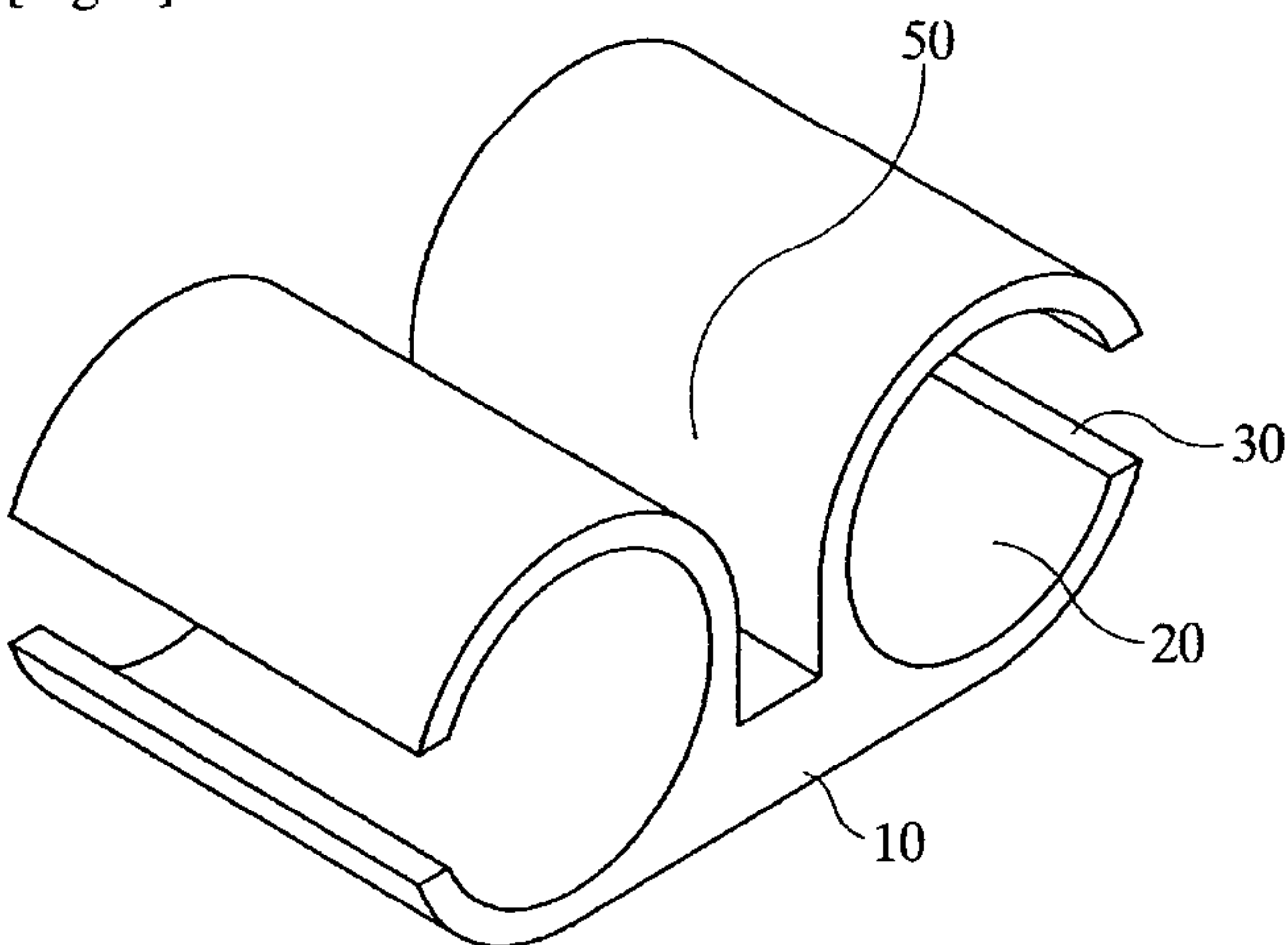
[Fig. 6]



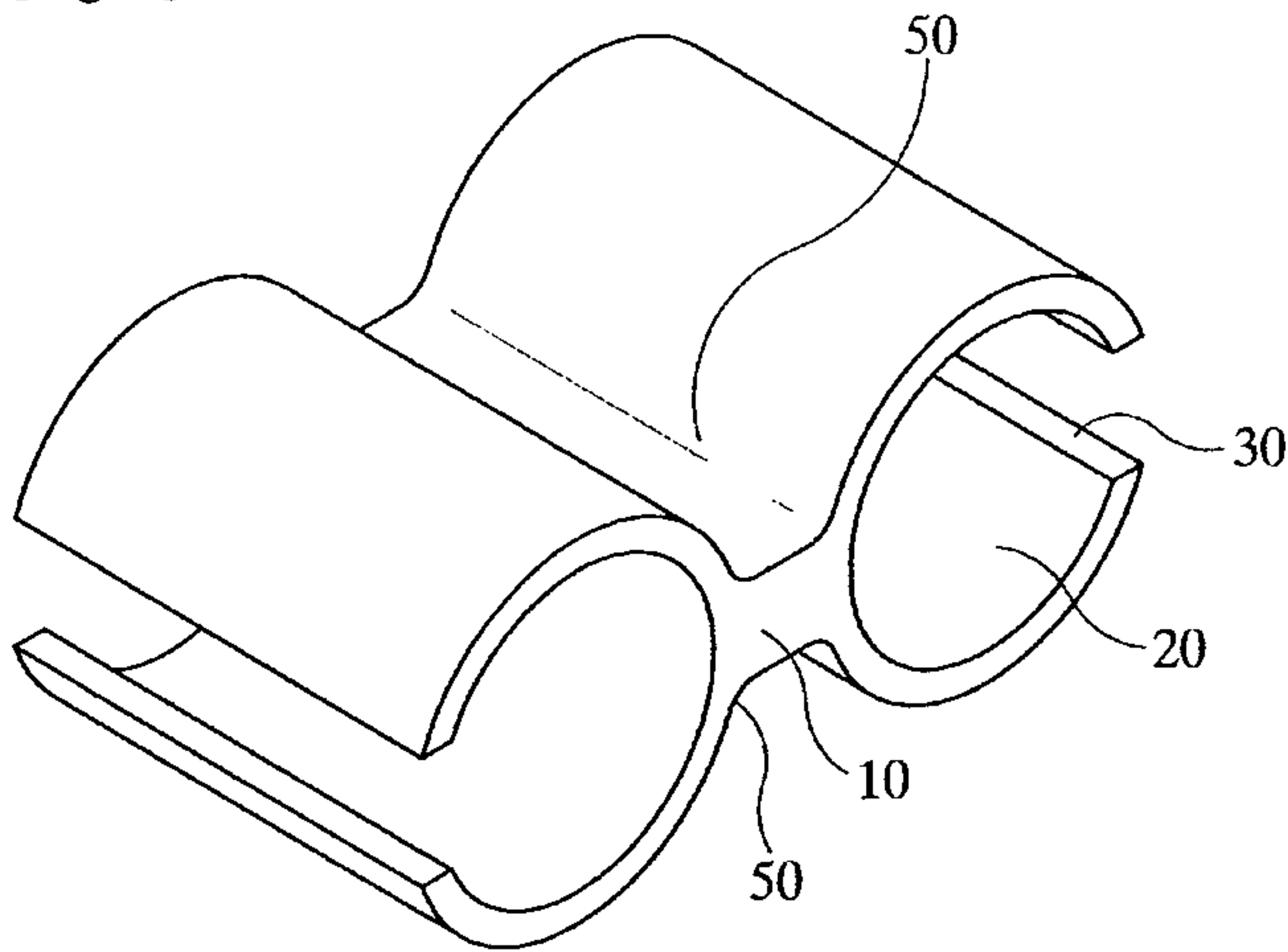
[Fig. 7]



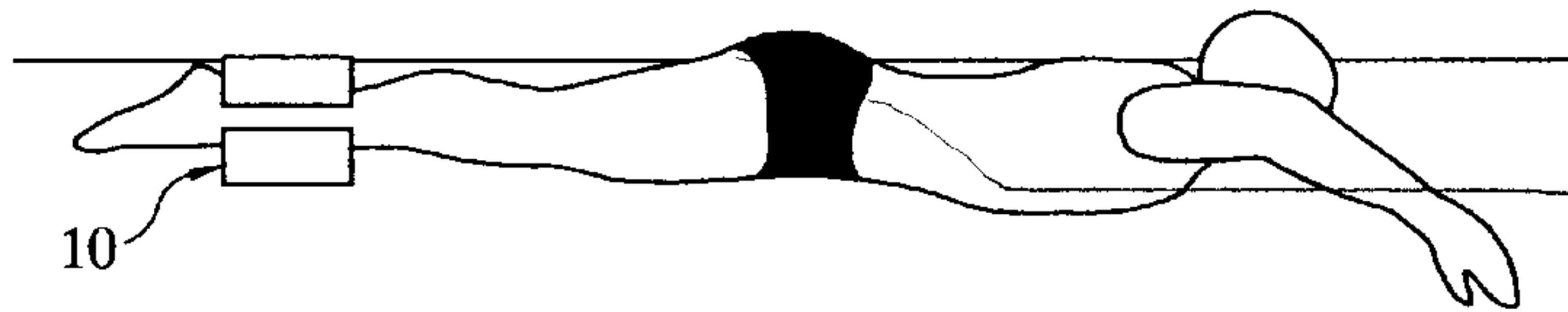
[Fig. 8]



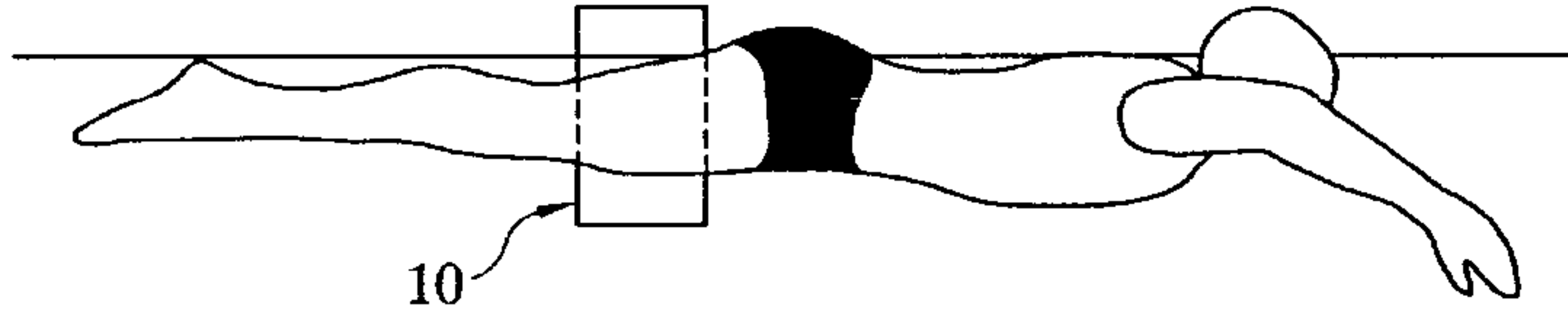
[Fig. 9]



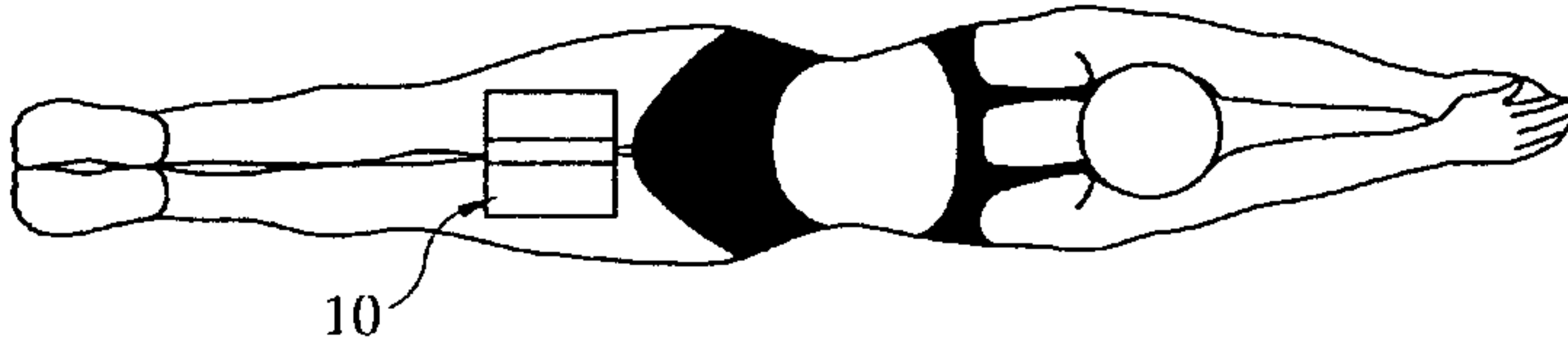
[Fig. 10]



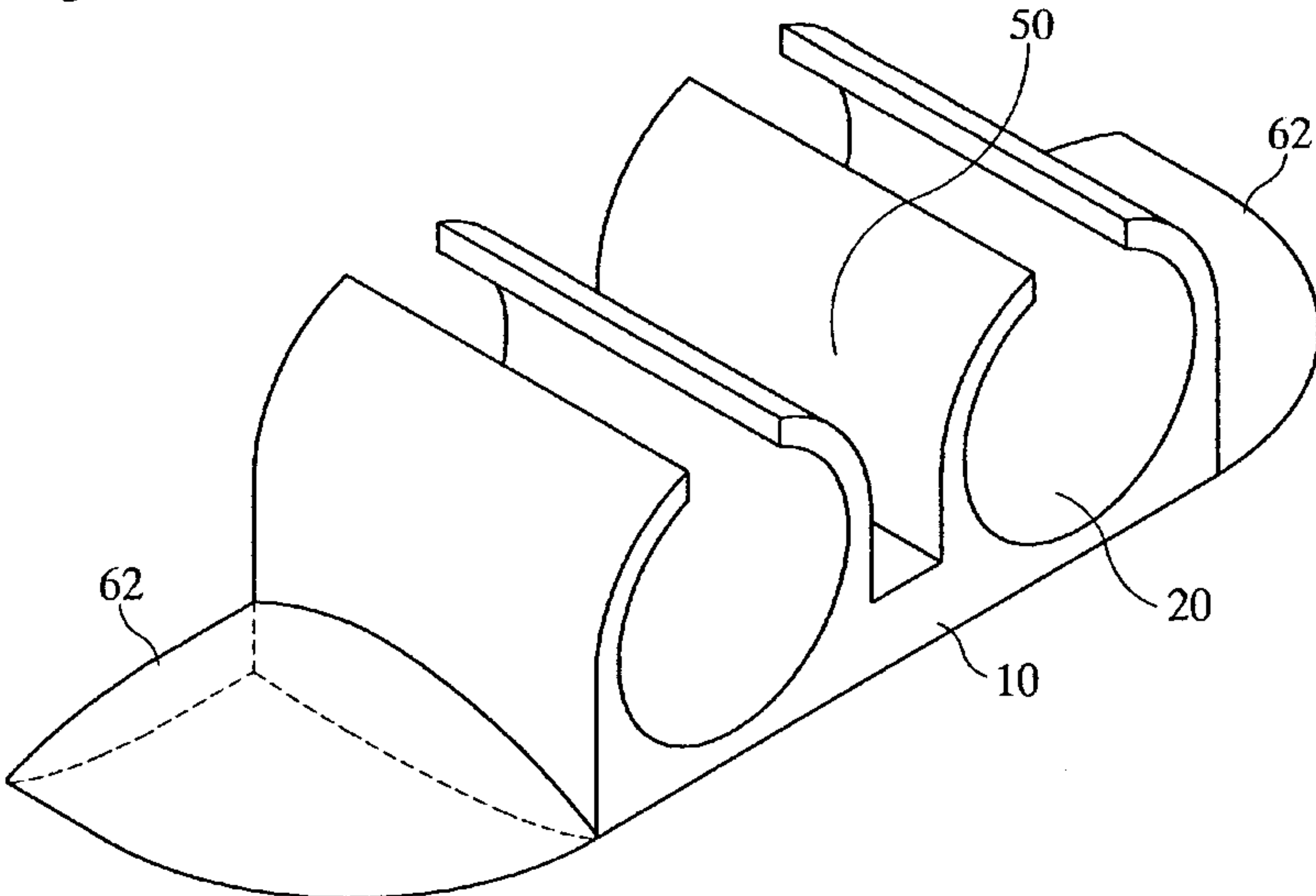
[Fig. 11]



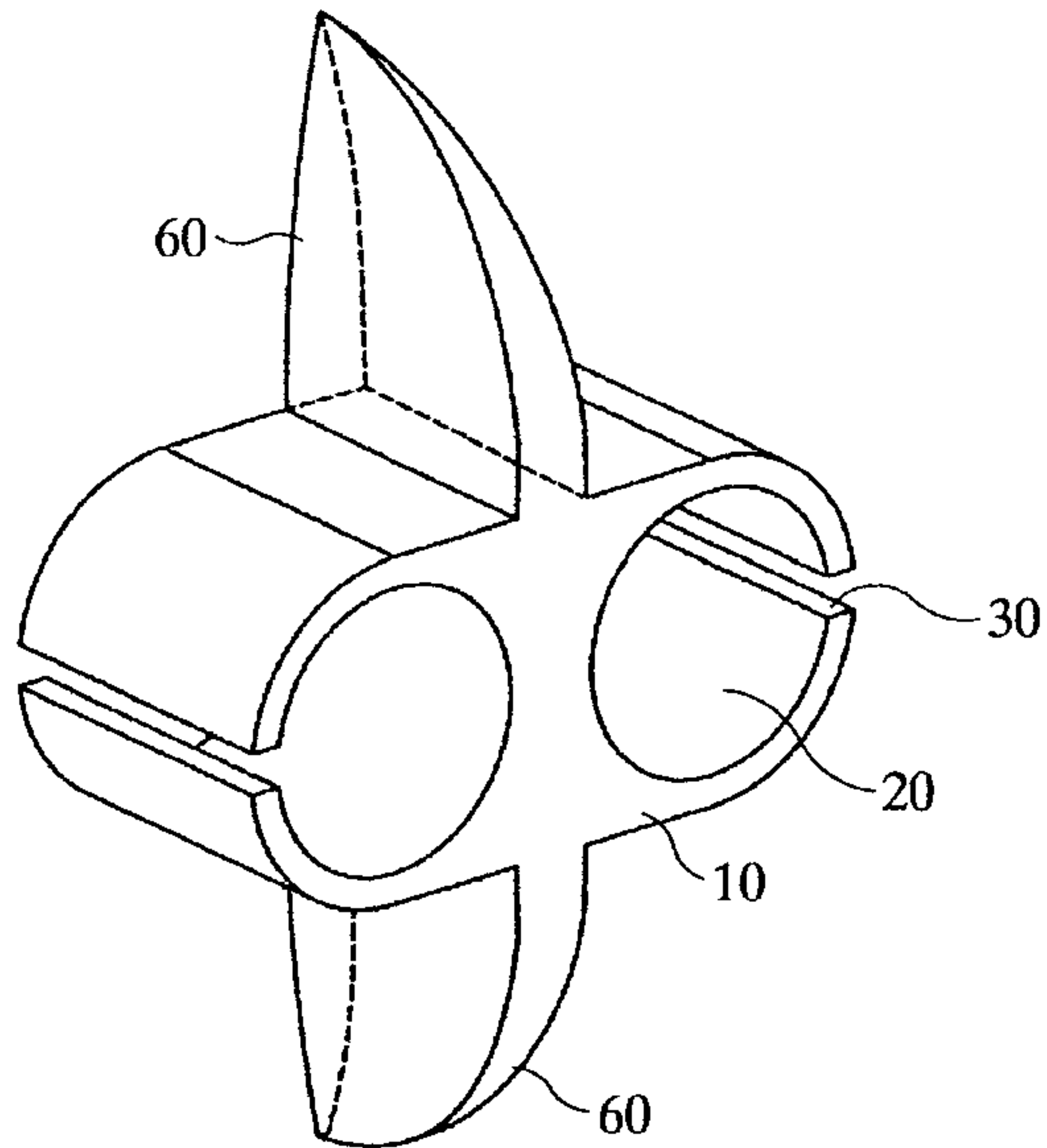
[Fig. 12]



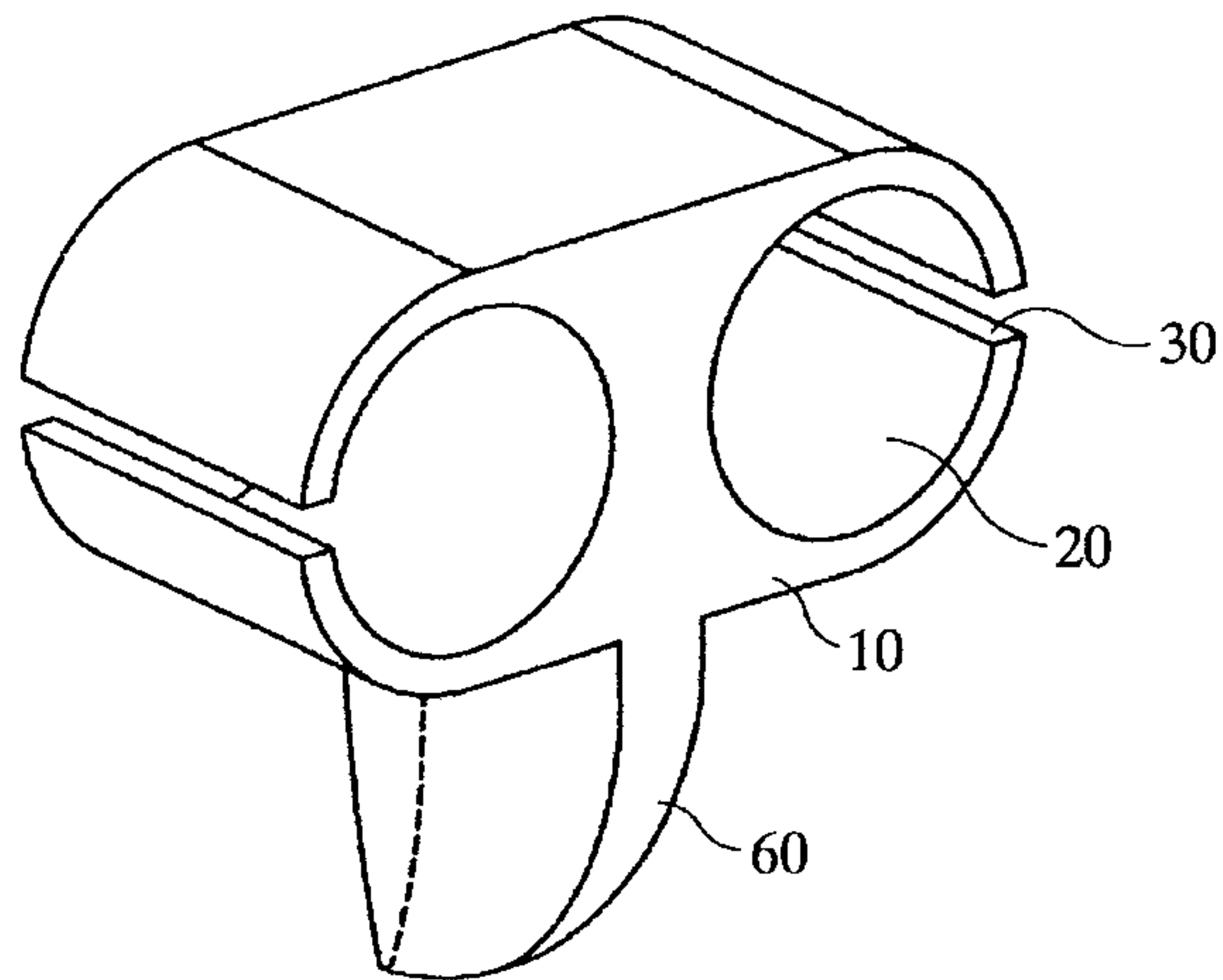
[Fig. 13]



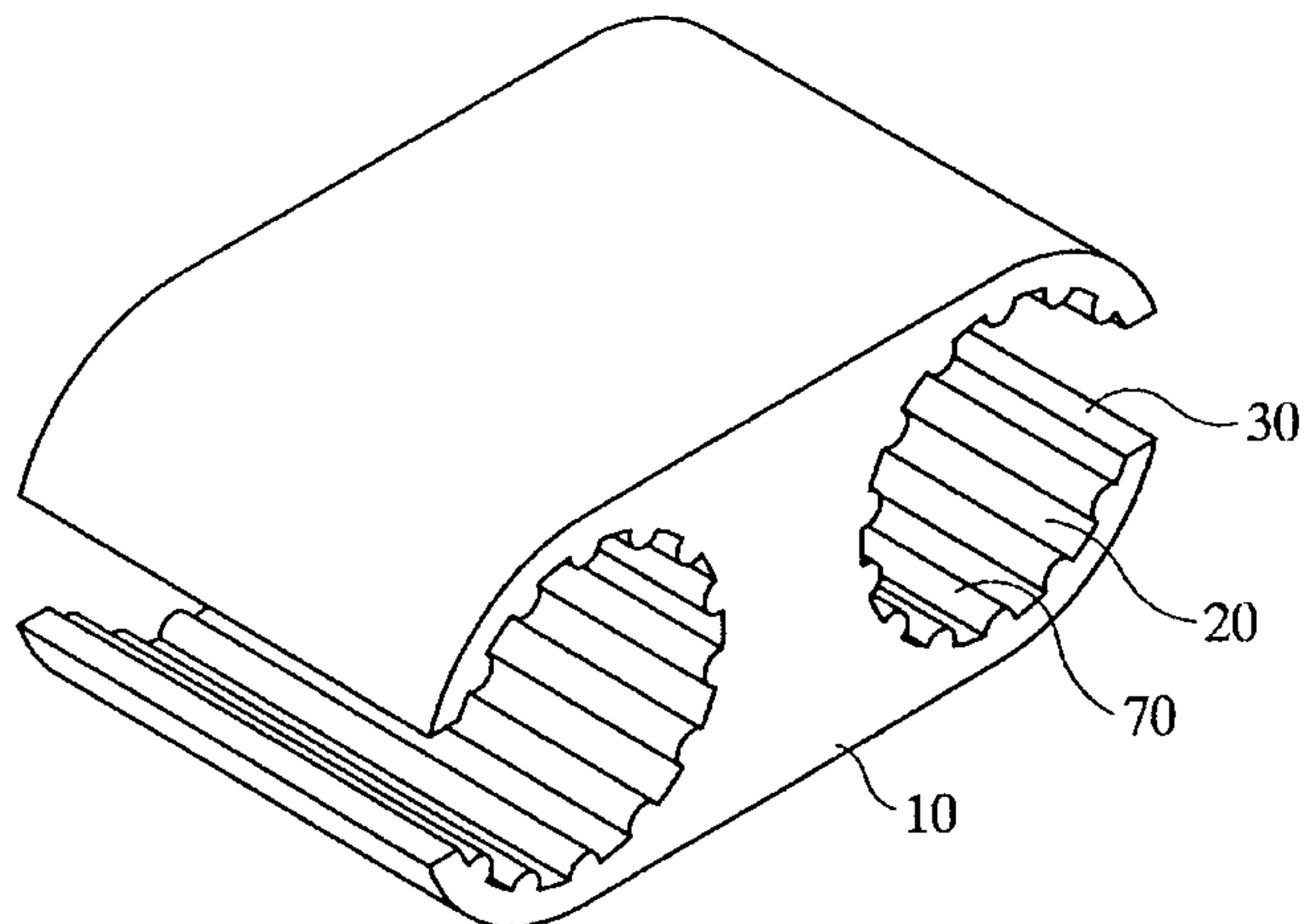
[Fig. 14]



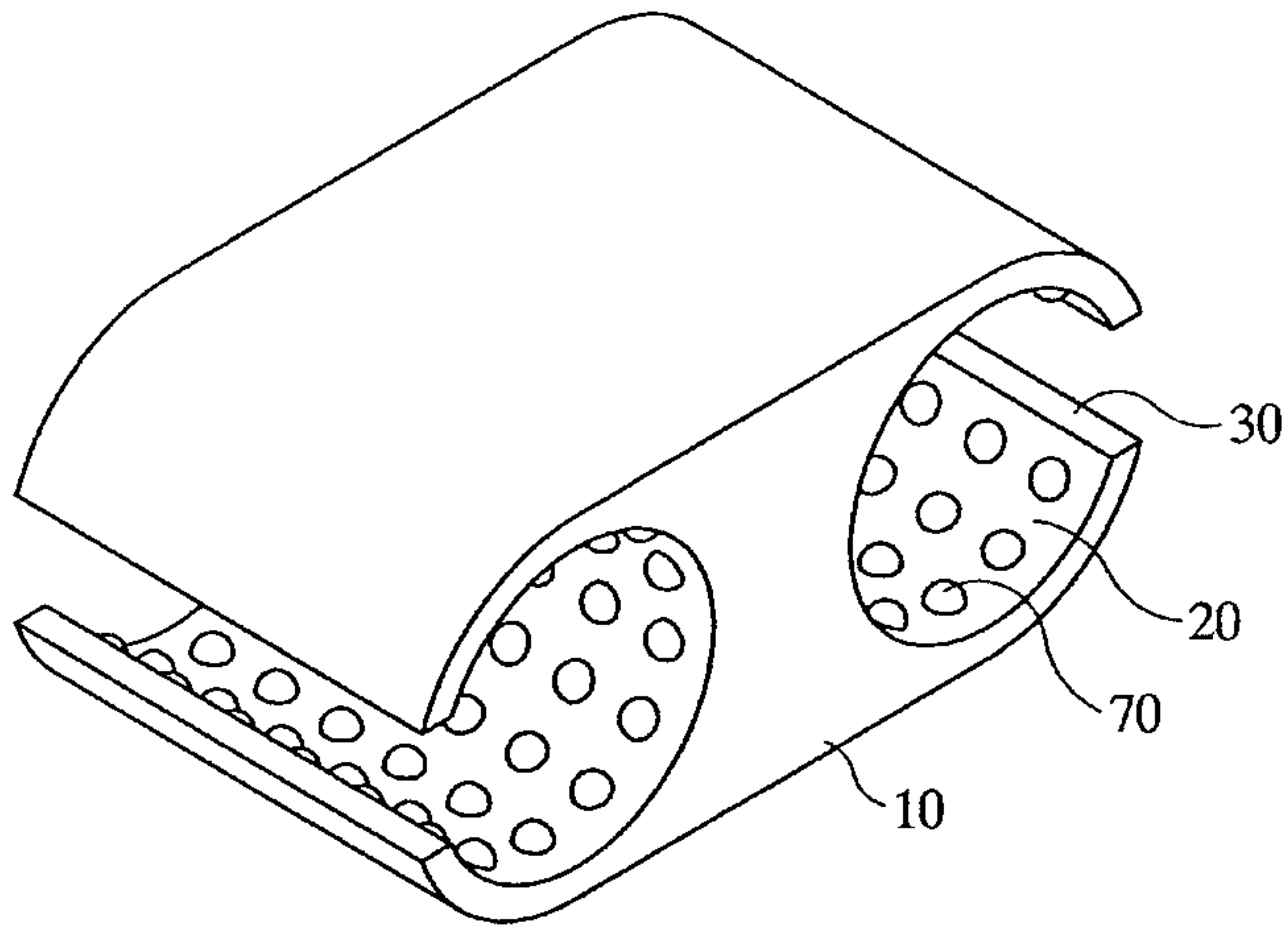
[Fig. 15]



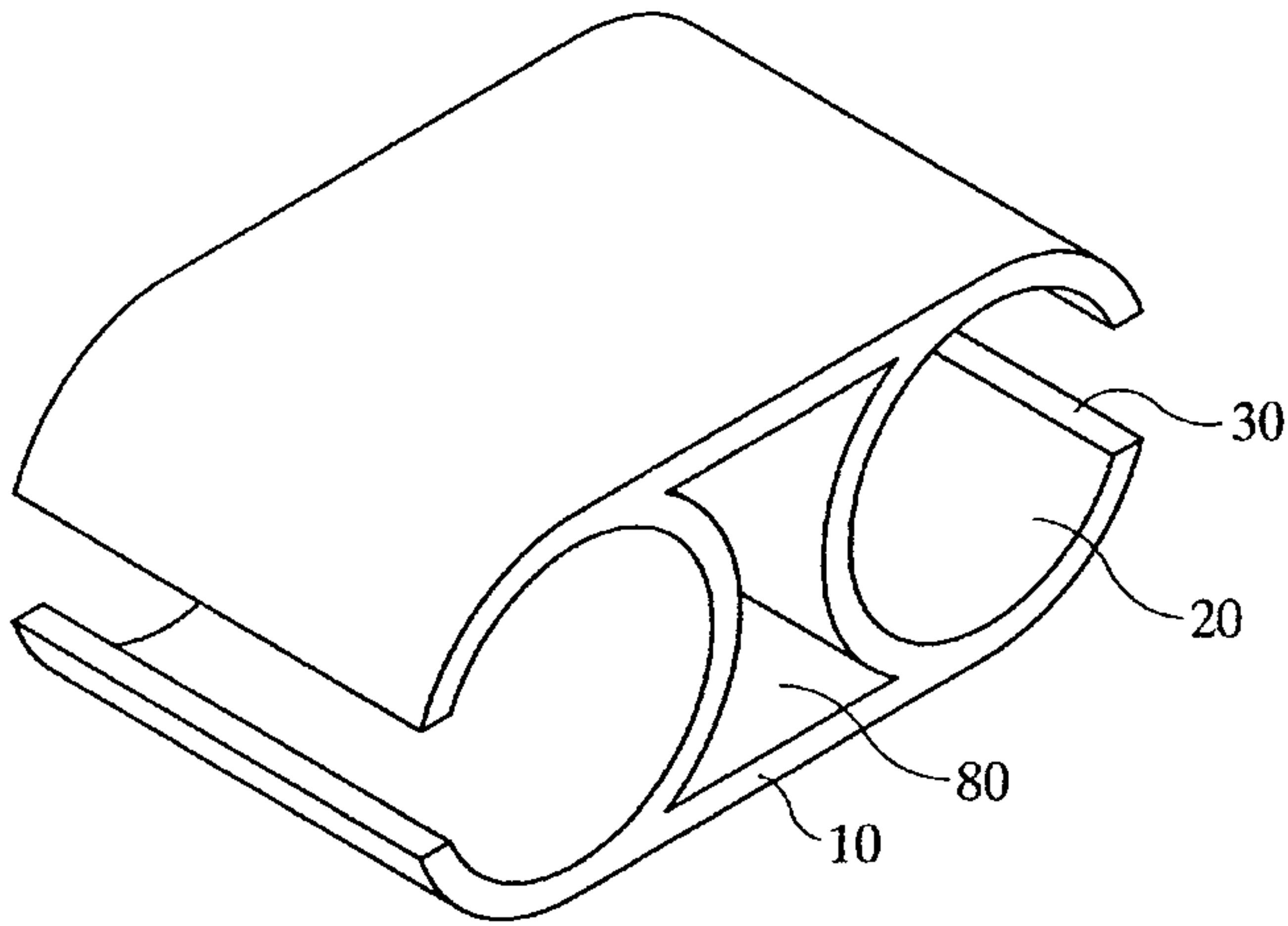
[Fig. 16]



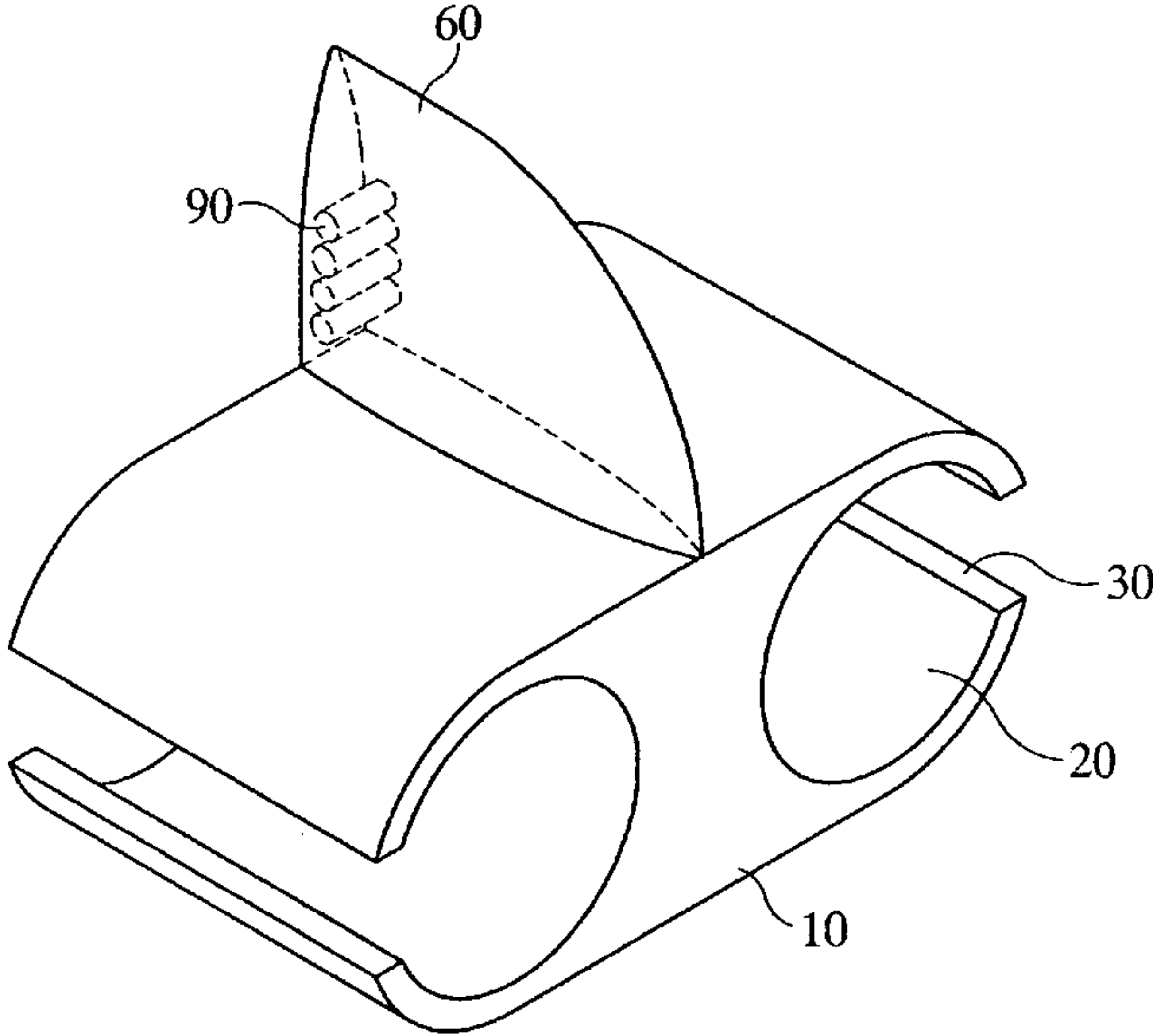
[Fig. 17]



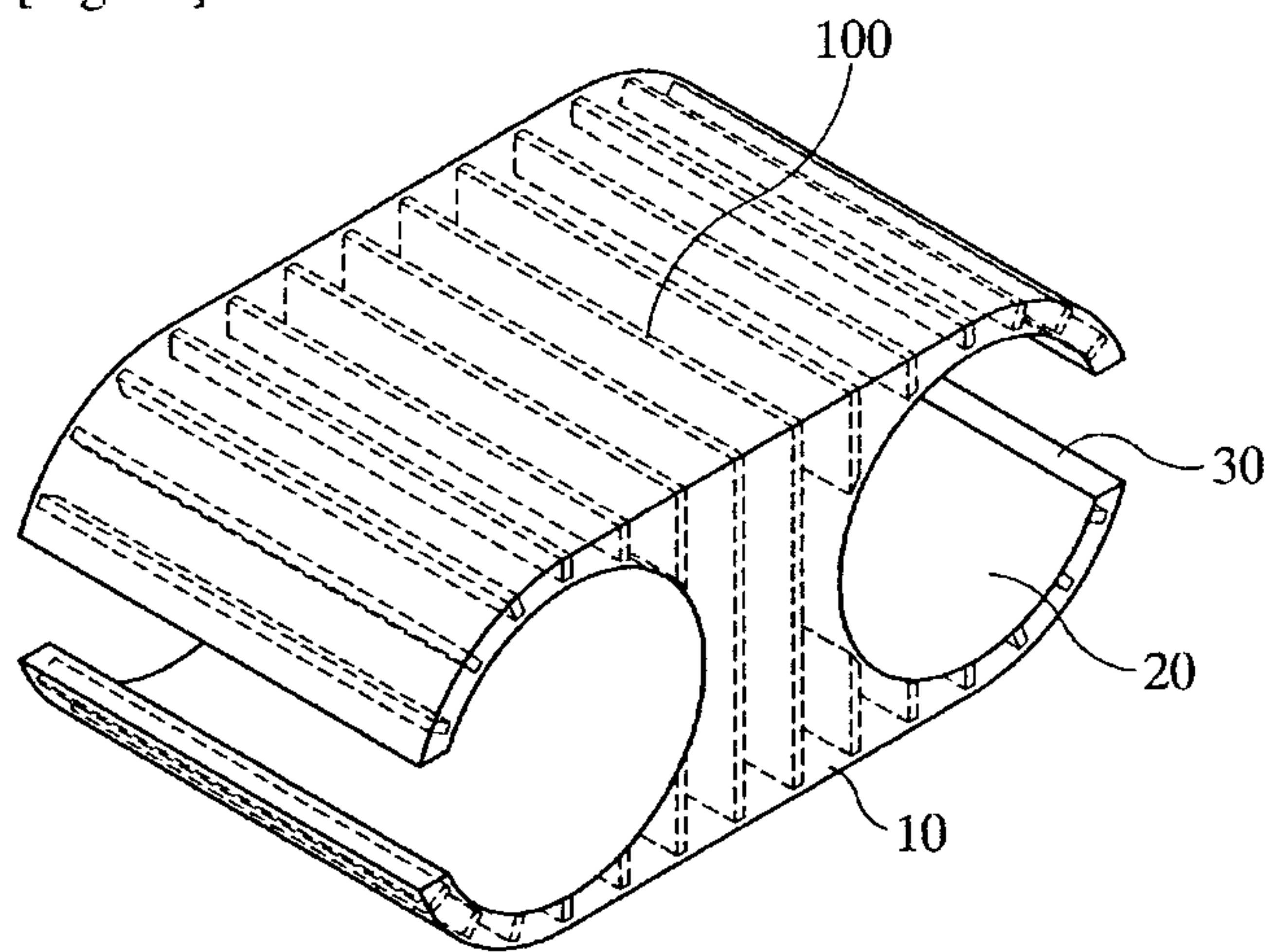
[Fig. 18]



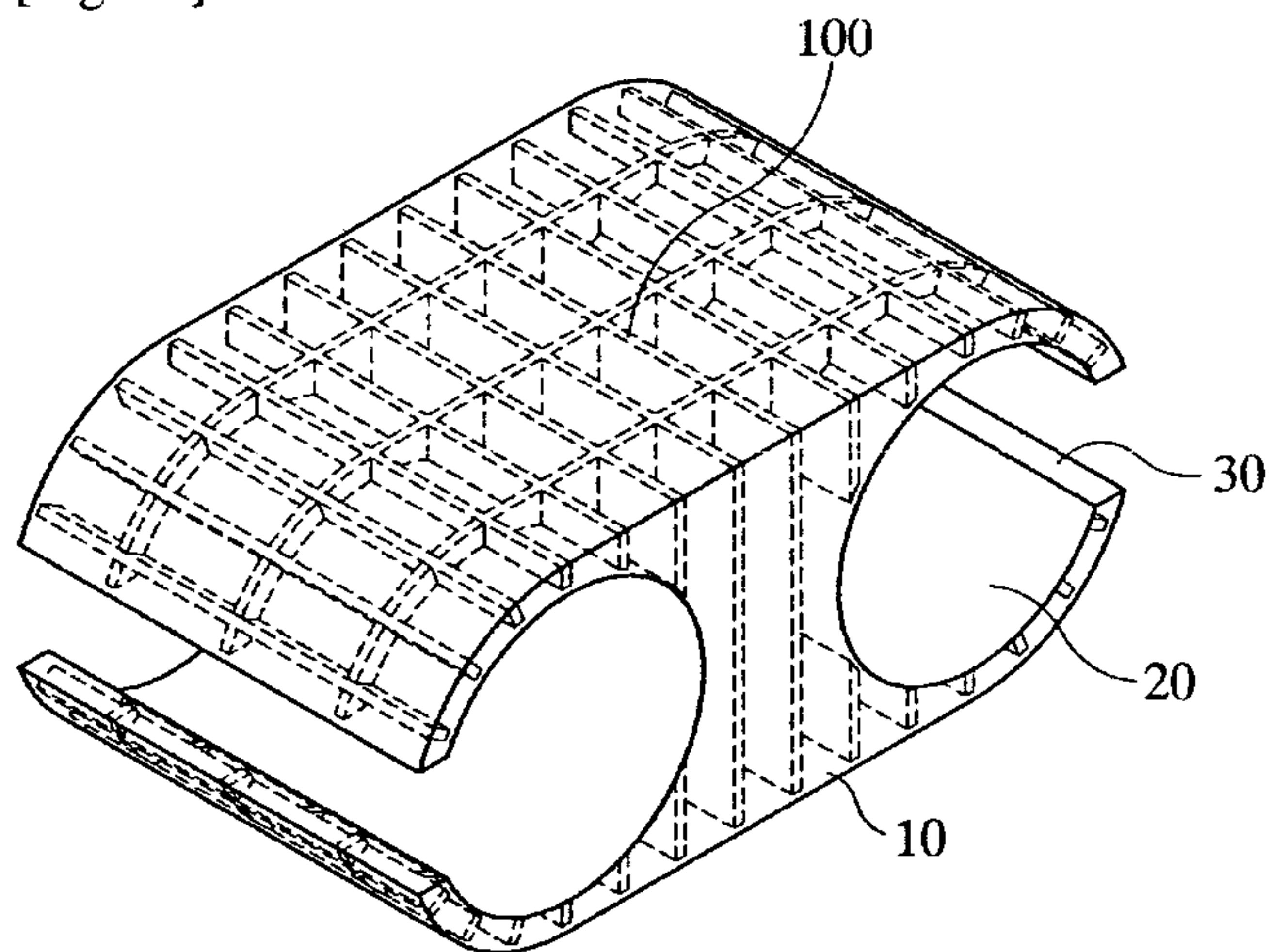
[Fig. 19]



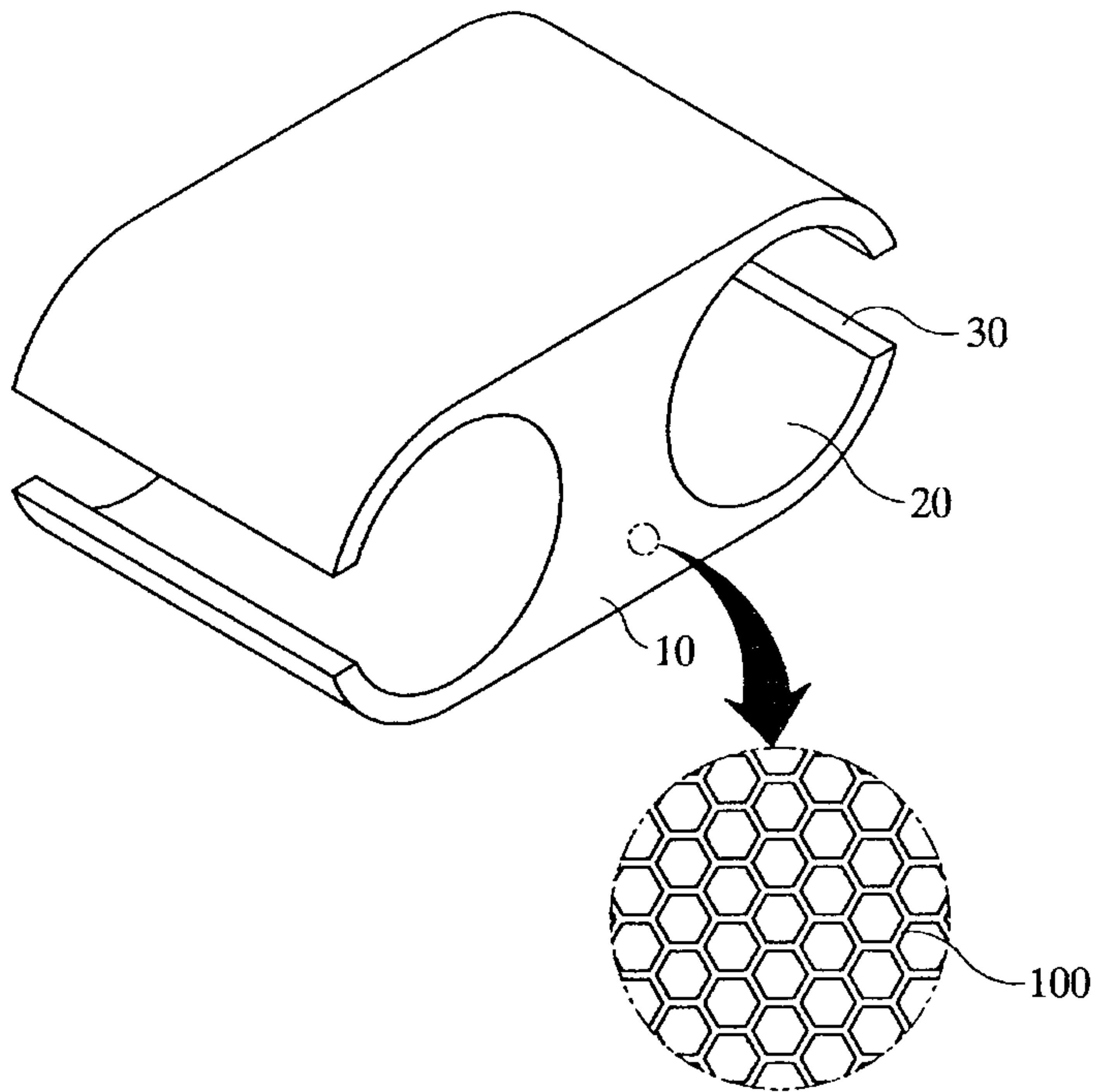
[Fig. 20]



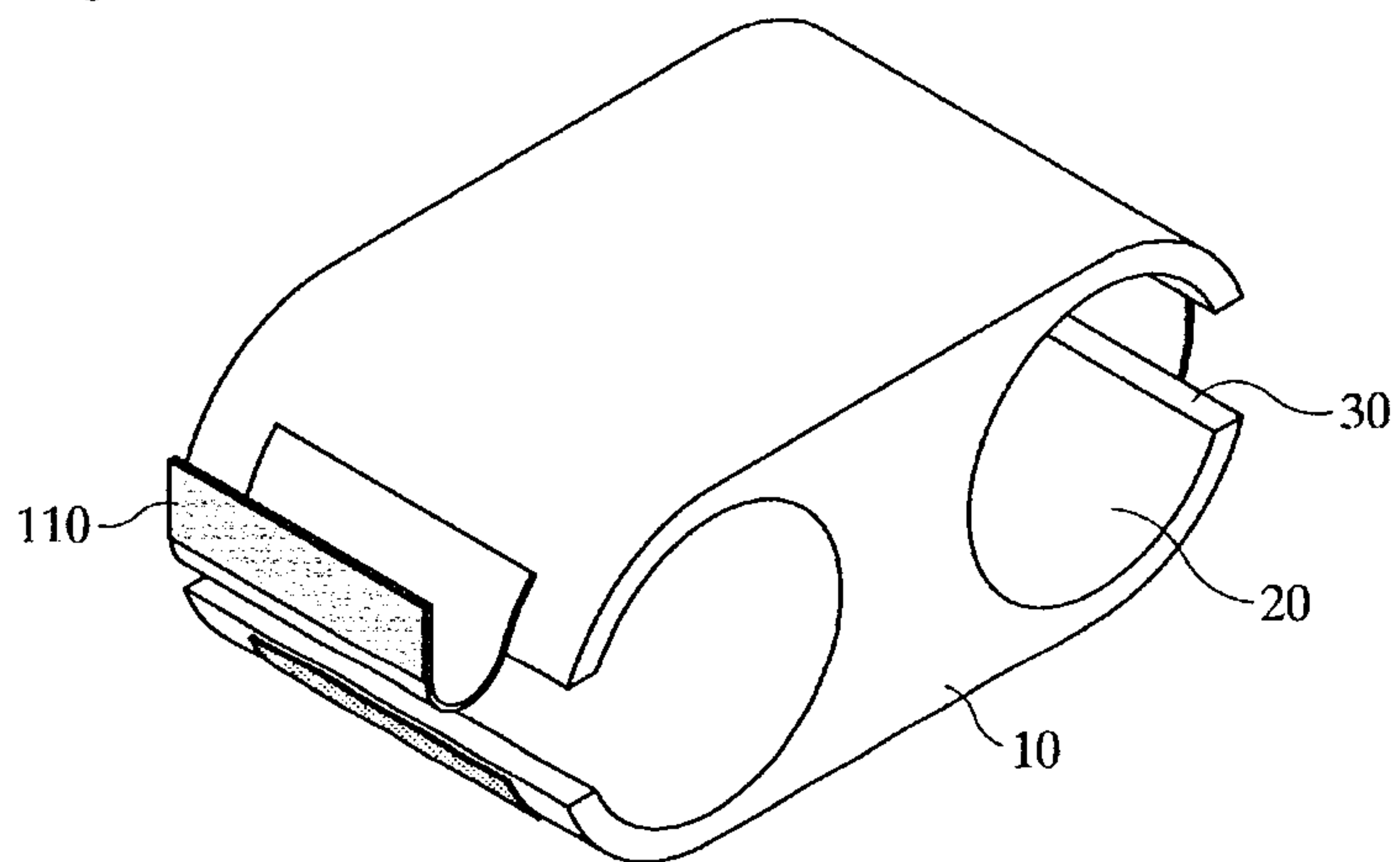
[Fig. 21]



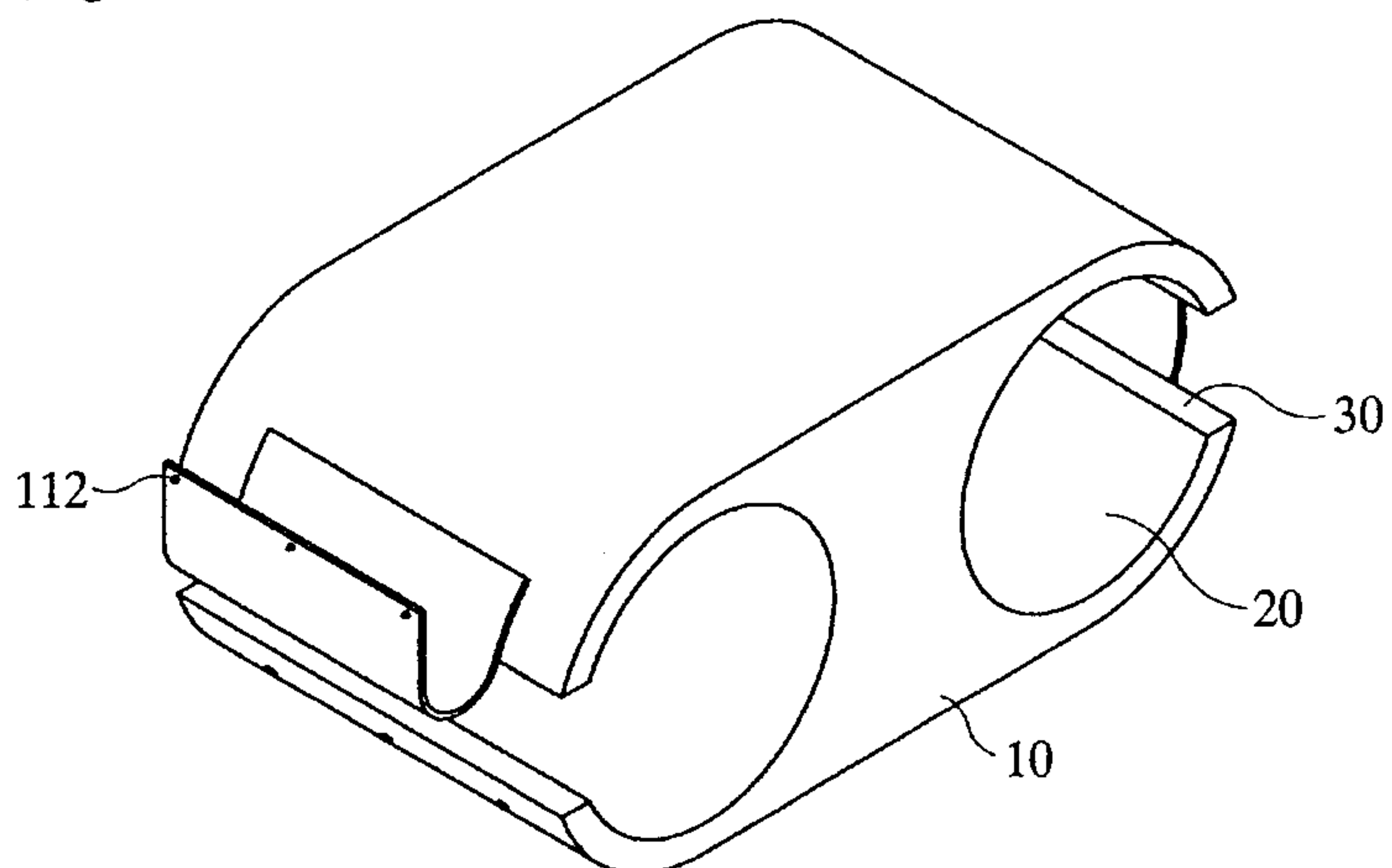
[Fig. 22]



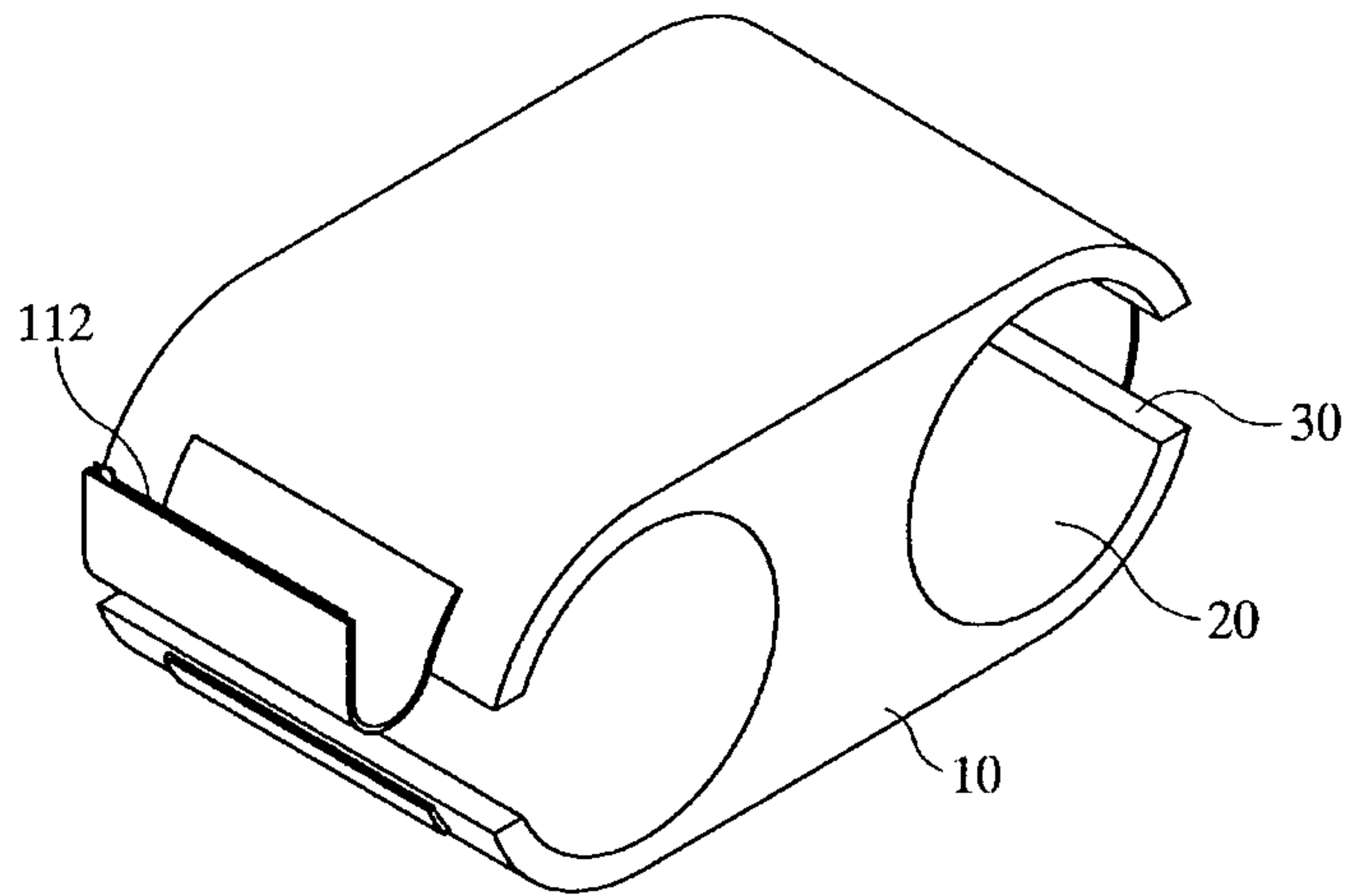
[Fig. 23]



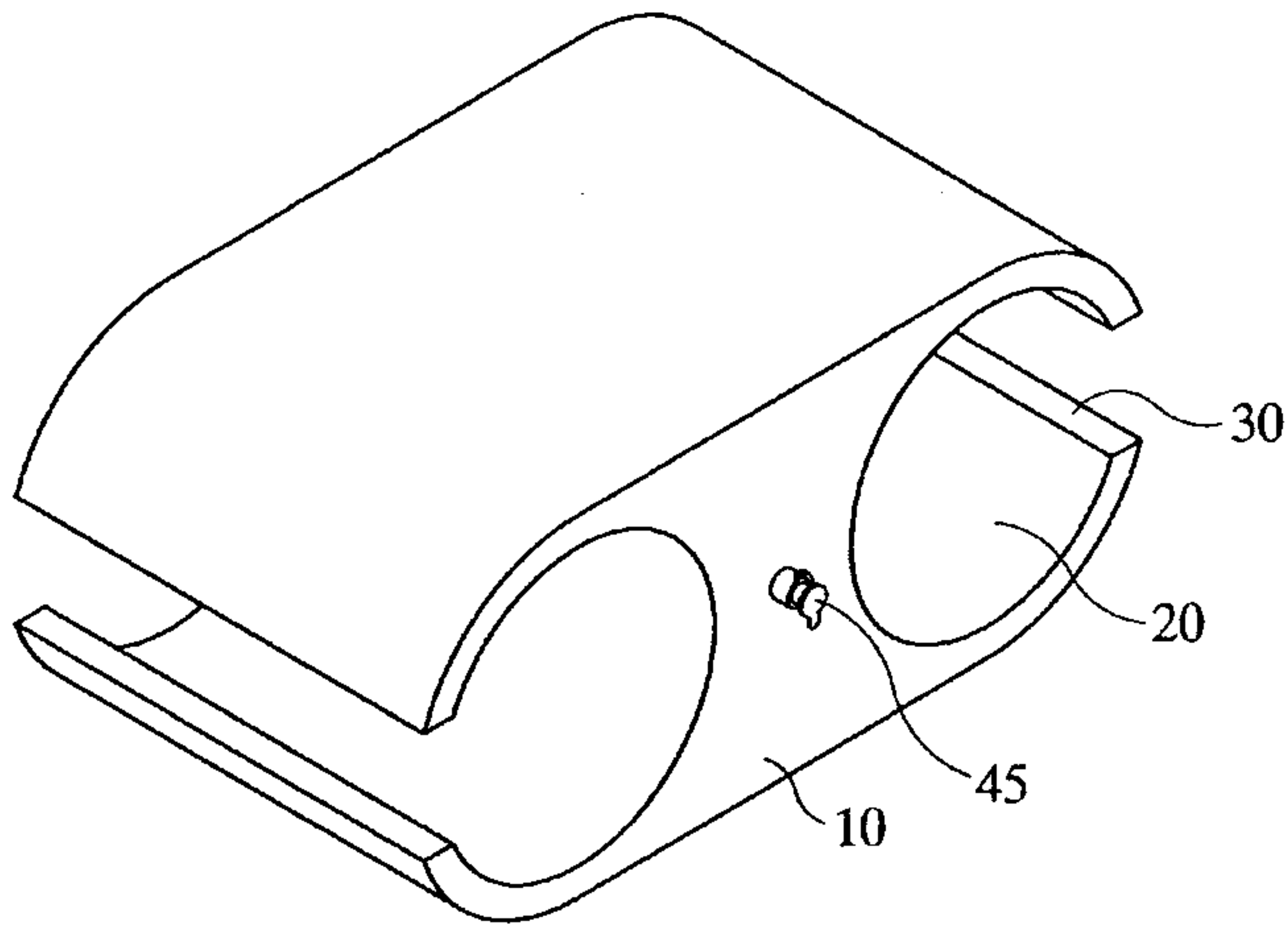
[Fig. 24]



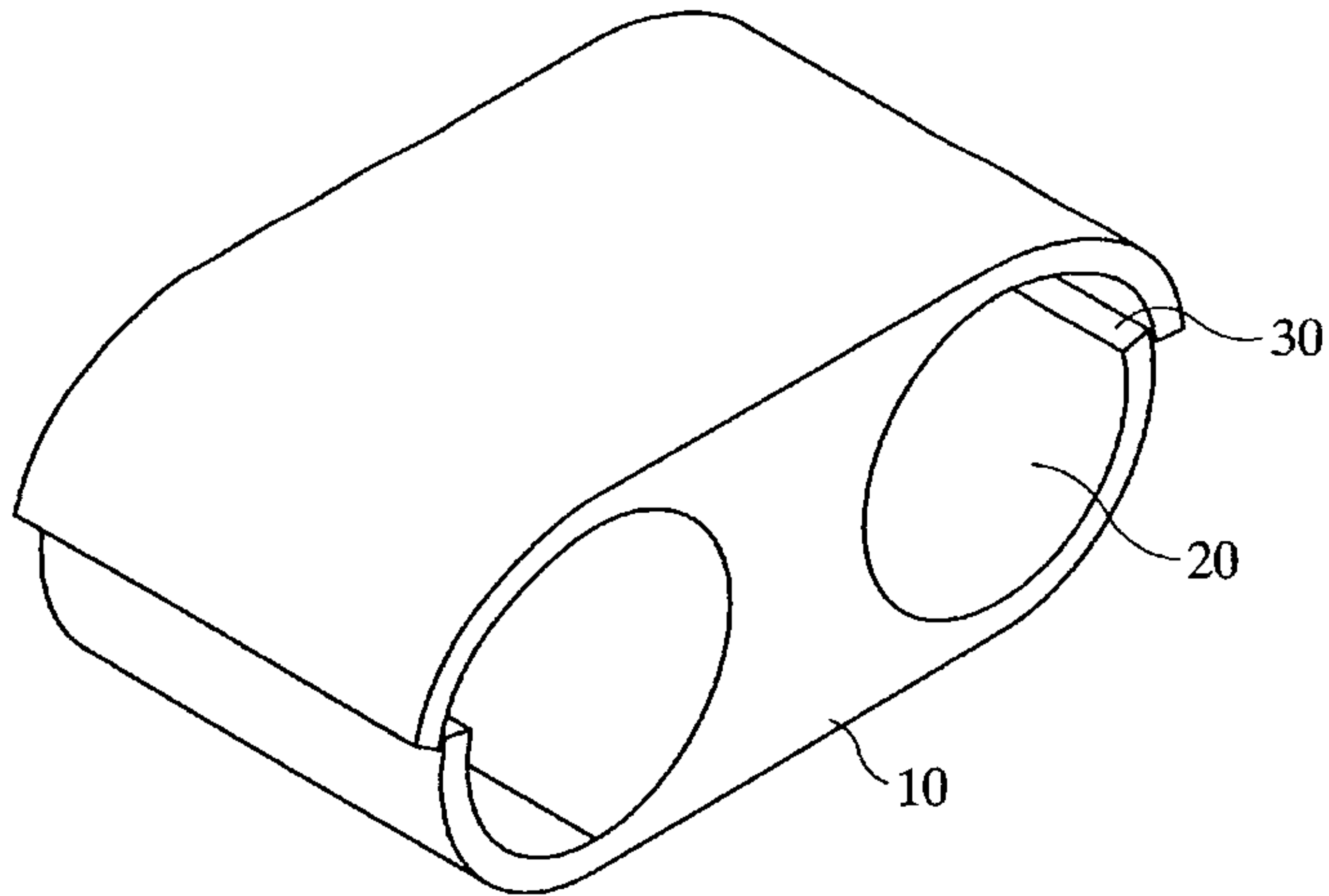
[Fig. 25]



[Fig. 26]

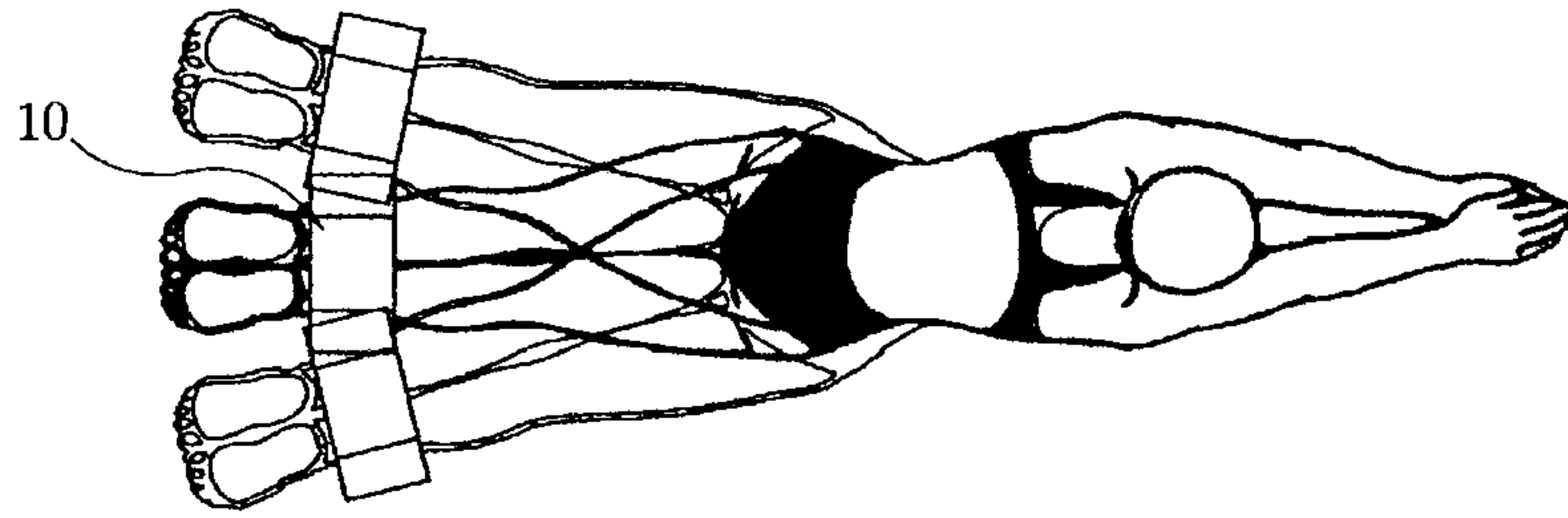


[Fig. 27]



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[Fig. 28]



[Fig. 29]

