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(54) Diving mask with strap provided with regulation means

(57) Diving mask consisting of a stiff body (2), which connects a face (1) made of elastomeric material and a crystal (4) one to the other, and of a strap (3) connected to the sides of said face (1), the regulation means (213) for the tension of said strap (3) being spaced out from the ends of said strap connected to the face (1) of the mask; said strap (3) consists of: two spacers (101; 103; 403; 503; 603) made of elastically extensible and preferably elastomeric material, connected on one end to the face (1) of the mask, and provided on the other end with return means (111; 133) for a flexible, though not extensible, band-shaped element (203), provided on its ends with closing means and regulation means (213).

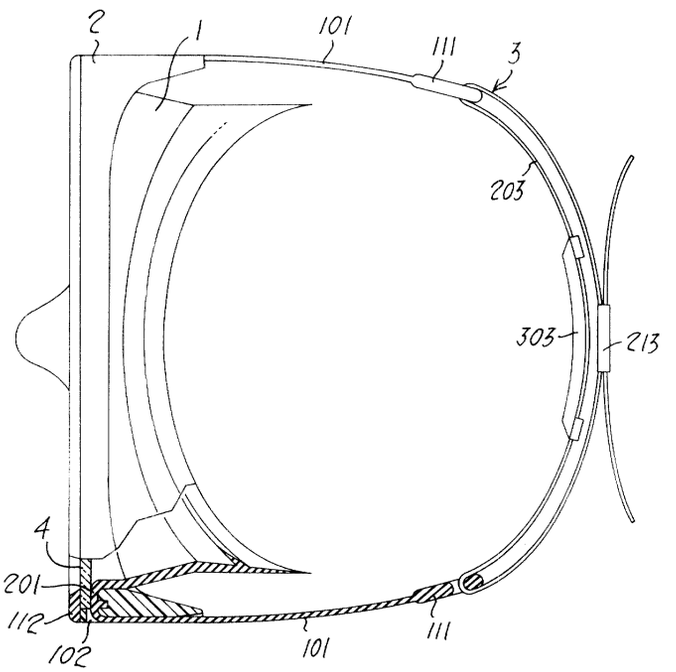

Fig.1

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Description

[0001] The present invention relates to a diving mask, and in particular to a diving mask with strap provided with regulation means spaced out from the ends connected to the mask face.

[0002] In most diving masks commonly on the market the strap is introduced into two buckles connected to the two sides of the mask body, and therefore the regulation of the strap tension is carried out in these two connection points. As a consequence, the regulation which has been carried out on each buckle must be analogous to the other in order to avoid the unbalance of the mask, so that the regulation is difficult to carry out with the mask on.

[0003] An interesting solution to this kind of problem has been provided by the Italian Patent No. 1281802 by the same applicant, which describes a diving mask consisting of a face and a strap connected to the sides of said face; said strap consists of: two support elements open on one end and each connected on the other end to one side of the face of said mask, said support elements housing a pivot pin; and a band-shaped element made of elastomeric material, whose two ends are brought around said pins, said ends being connected with adjustable length to the two respective portions of a rapid-release buckle.

[0004] In practice, this kind of solution moves the regulation means for the strap tension from the points of connection with the mask body to a position which is near the back portion of the diver's head, on the ends of the rapid-release buckle portions, thus making the regulation much easier.

[0005] However, also this kind of approach is not without disadvantages; in particular, a problem consists in the fact that the elastomeric band-shaped element undergoes the tension determining the adhesion force of the mask face onto the diver's face, and therefore its regulation, though differently from what took place for known masks, is rather difficult. Moreover it is exactly this kind of tension which subjects said band-shaped element to a load which can endanger its integrity.

[0006] The present invention aims at providing a mask in which the strap tension can be regulated with an extremely limited effort, and in which the tension load is absorbed outside the regulation means.

[0007] The object of the present invention, therefore, is a diving mask consisting of a stiff body, which connects a face made of elastomeric material and a crystal one to the other, and a strap connected to the sides of said face, the regulation means for the tension of said strap being spaced out from the ends of said strap, said ends being connected to the mask face, characterized in that said strap consists of: two spacers made of elastically extensible material, and preferably elastomeric, connected on one end to the mask face, and provided on the other end with return means for a flexible, though not extensible, band-shaped element, which is provided on its ends with closing means and regulation means.

[0008] The spacers can be carried out as one piece together with the mask face made of elastomeric material, or they can be connected to the face by means of a removable coupling of their end with the stiff body of the mask, said body being mounted on the face.

[0009] Further advantages and characteristics of the mask according to the present invention will be evident from the following detailed description of some forms of embodiment of said invention, carried out as a mere non-limiting example, with reference to the enclosed drawings, in which:

Figure 1 is a top plan view with sectioned parts of a first form of embodiment of the mask according to the invention:
Figure 2 is lateral elevation view of a second form of embodiment of the mask of the invention;
Figure 3 is a top plan view with sectioned parts of the form of embodiment in figure 2;
Figure 4 is a lateral elevation view of a third execution variant of the mask according to the invention;
Figure 5 is an exploded perspective view of a detail of the mask in figure 4;
Figure 6 is an exploded perspective view of a detail belonging to a fourth execution variant of the mask of the invention; and
Figure 7 is an exploded perspective view of a detail belonging to a fifth execution variant of the mask of the invention.

[0010] Figure 1 shows a first form of embodiment of the mask according to the present invention; the numeral 1 indicated the mask face, generally made of elastomeric material, to which a crystal 4 is connected by means of the coupling with the stiff body 2, made of thermoplastic material. From the edge 201 of the mask, which controls the sealed introduction of the crystal 4 into the body 2, the spacers 101 start, said spacers being carried out as one piece together with said face 1, on which free end a ring-shaped loop 111 is formed, into which said band-shaped element 203 returns, said element constituting, together with said spacers 101, the strap 3 of the mask. The spacers 101 pass through the body 2 on the groove 102 formed in said body; the frame 112 blocks the crystal 4 against the edge 201 and closes the groove 102. The headpiece 303 is introduced into the band-shaped element 203, the ends of said headpiece being coupled with the closing and regulation means 213.

[0011] Figure 2 shows a second form of embodiment of the mask of the invention; the same parts are indicated with the same numerals. In this case the strap 3 comprises the spacers 102, substantially V-shaped, whose two arms 113 are connected to the body 2 of the mask thanks to the introduction of the terminal pins 123 into the cavities 202 formed on the bottom of the hollow 332 on the side wall of the body 2. On the opposite end the

spacers 103 show the slot 133 which allows the return of the band-shaped element 203. Moreover, a cap 302 is placed onto the ends of the arms with the pins 123, said cap being coupled with the hollow 332 by means of the toothed protuberances 312. As can be seen from figure 3, the toothed protuberances 312 are introduced into the housings 322 formed in the hollow 332. The arms 113 of the spacer 103 are placed into the grooves 342.

[0012] The form of embodiment shown in figure 4 shows the spacer 403 provided with a ring-shaped extension 413, which is destined to be coupled with the pin 412 protruding within the cavity 402; the portion of spacer 403 near the ring-shaped extension 413 is placed into the flared groove 422. The connection is protected by the cap 432, said cap being provided with the guide tooth 452 and with the tooth 442 for the coupling with the body 2. From figure 5 it can be observed that the cavity 402 is formed on the bottom of a hollow 462 destined to house the cap 432; on the wall of said hollow the joint 482 for the tooth 442 of the cap 432 is formed.

[0013] Figure 6 shows another execution variant; the spacer 503 is provided on the end destined to the connection with the body 2 with a T-shaped extension 513. The hollow 512 formed on the body 2 is equipped on its bottom with a cavity 502 complementary to the T-shaped extension 513; the round cap 532 is introduced onto the hollow 512, the toothed protuberances 542 of said round cap being inserted into the housings 552. The spacer 503 is located into the groove 522.

[0014] Also the execution variant of figure 7 provides for a connection of the spacer 603 carried out on the body 2 of the mask; in this case, too, the body shows on its side a hollow 612 on whose bottom two cavities 602 are obtained, into which will be introduced the strips 613 of the spacer 603, on the ends of which the protuberances 623 are formed. Similarly to what has been previously described, the hollow 612 is provided with a cap 632 whose toothed protuberances 642 are engaged with suitable housings formed in said hollow. The strips 613 of the spacer 603 are placed into the grooves 622.

[0015] The working of the mask according to the present invention will be evident from the following. As previously mentioned, one of the disadvantages of the mask carried out according to the known technics is the difficult adjustment of the strap tension, substantially due to the elasticity of the band-shaped element which undergoes such adjustment. In the mask according to the present invention the adjustable band-shaped element 203 does not undergo any strain due to tension, the latter being completely unloaded on the spacers made of elastomeric material.

[0016] The spacers can be made of the same material as the face 1 and as one piece together with it; the groove 102 of the body allows their passage outside the body 2 of the mask, and said groove is within the frame 112.

[0017] The connection of the spacers to the sides of the face 1 can also be obtained by introducing the ends of said spacers, said ends being suitably shaped, into cavities obtained in the body 2, connected to said face 1. The forms of embodiment shown in figures 2 to 7 and previously described carry out various connection variants of this kind. In all the variants a cap is provided, said cap allowing the fixation of the spacer end to the body 2. The variant in figures 2 and 3 shows a better distribution of the tension load on the body 2, whereas the variant in figures 4 and 5 allows, thanks to the flaring of the groove 422, a certain oscillation angle of the spacer 403.

[0018] Anyway, all the execution variants of figures 2 to 7 shows the indubitable advantage, with respect to the form of embodiment of figure 1, of allowing the replacement of the spacer, if damaged or worn out, without replacing the whole mask.

Claims

1. Diving mask consisting of a stiff body (2), which connects a face (1) made of elastomeric material and a crystal (4) one to the other, and of a strap (3) connected to the sides of said face (1), the regulation means (213) for the tension of said strap (3) being spaced out from the ends of said strap connected to the face (1) of the mask, characterized in that said strap (3) consists of: two spacers (101; 103; 403; 503; 603) made of elastically extensible and preferably elastomeric material, connected on one end to the face (1) of the mask, and provided on the other end with return means (111; 133) for a flexible, though not extensible, band-shaped element (203), provided on its ends with closing means and regulation means (213).

2. Mask according to claim 1, in which said spacers (101) are carried out as one piece together with the face (1) of said mask.

3. Mask according to claim 1, in which said spacers (103; 403; 503; 603) are connected to the sides of the face (1) by means of the removable coupling of their end (123, 413; 513; 613) with the stiff body (2) of the mask, said body being mounted onto said face (1).

4. Mask according to claim 3, in which said body (2) shows, on each side, a hollow (332; 462; 512; 612) on whose bottom at least one cavity (202; 402; 502; 602) is formed, said cavity having a shape which is complementary to that of the extension (123; 413; 513; 623) placed on the end of the spacer (103; 403; 503; 603), said hollow being provided with a cap (302; 432; 532; 632) equipped with coupling means with said hollow, said hollow communicating with at least one groove (342; 422; 522; 622) destined to

house said spacer (103; 403; 503; 603).

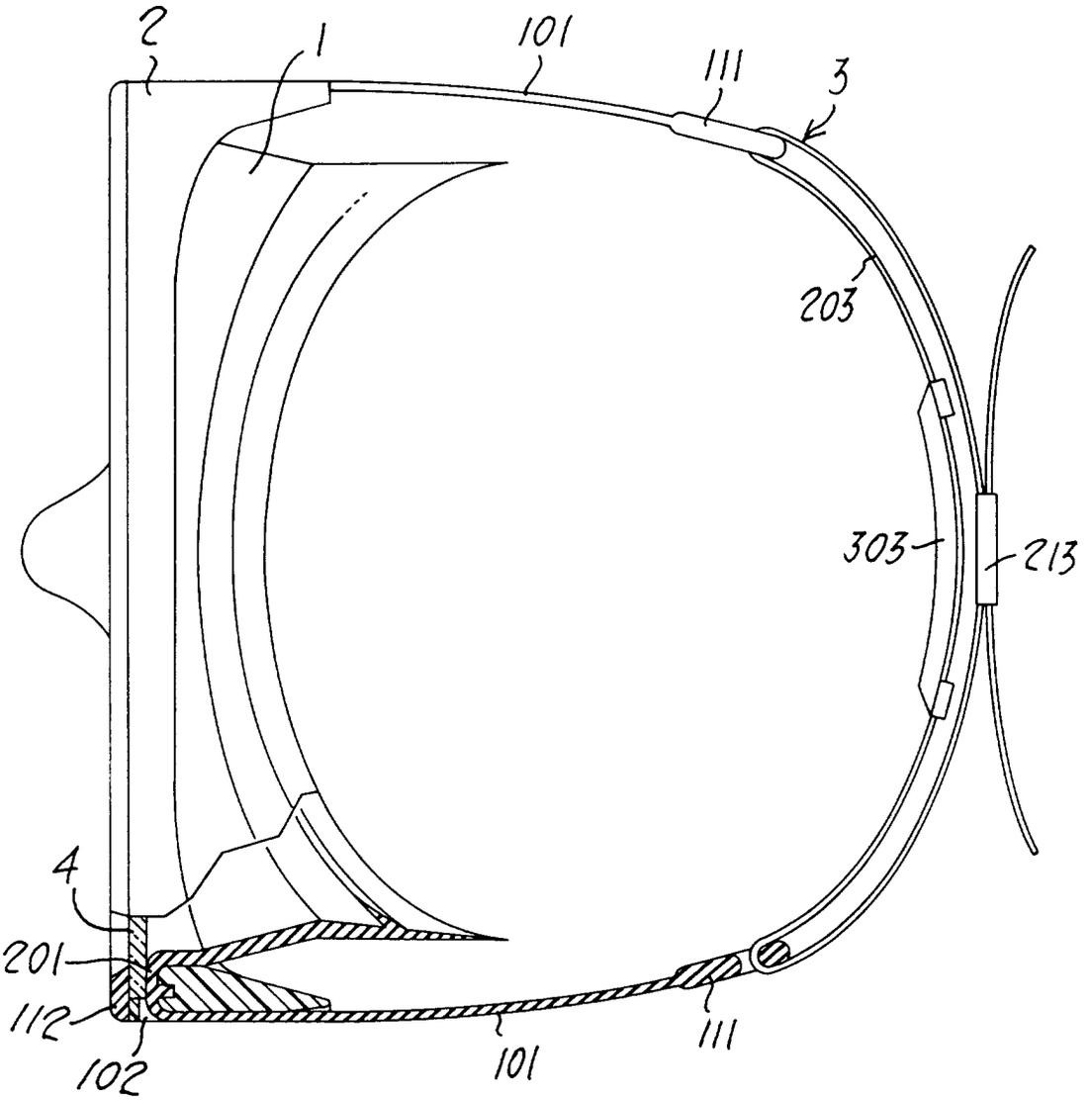
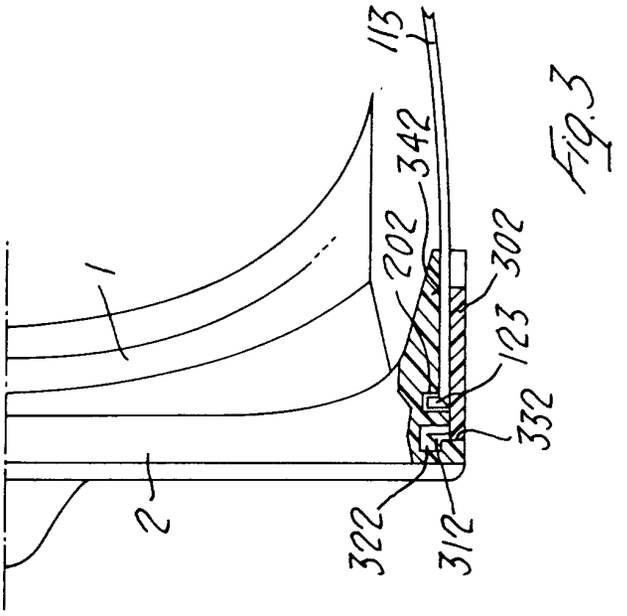


Fig. 1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113
342
202
302
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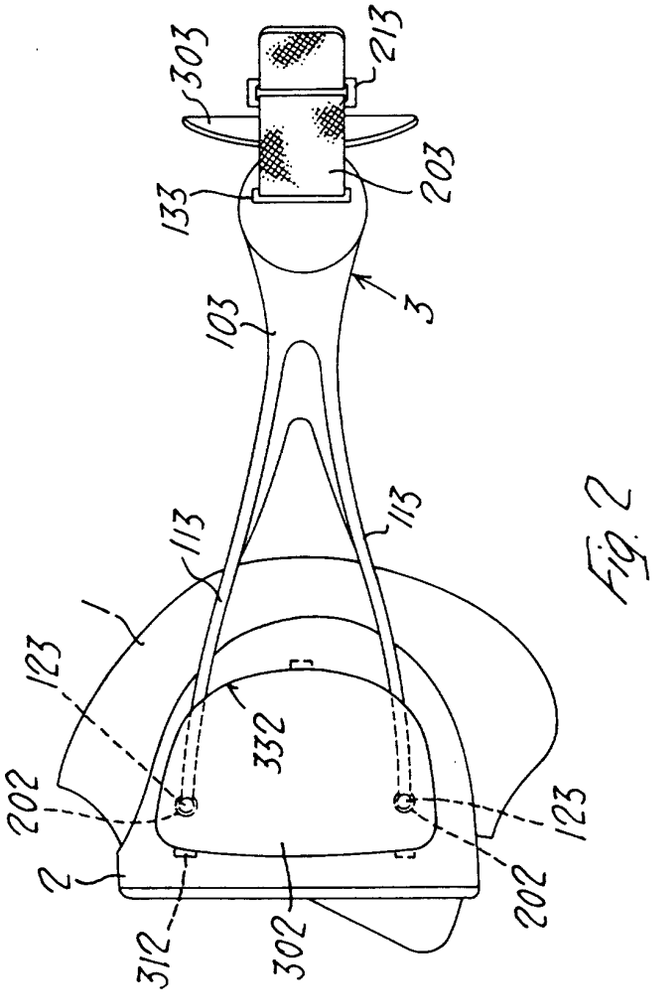
332
322
312

Fig. 3


303
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133
203
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113
113
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332
202
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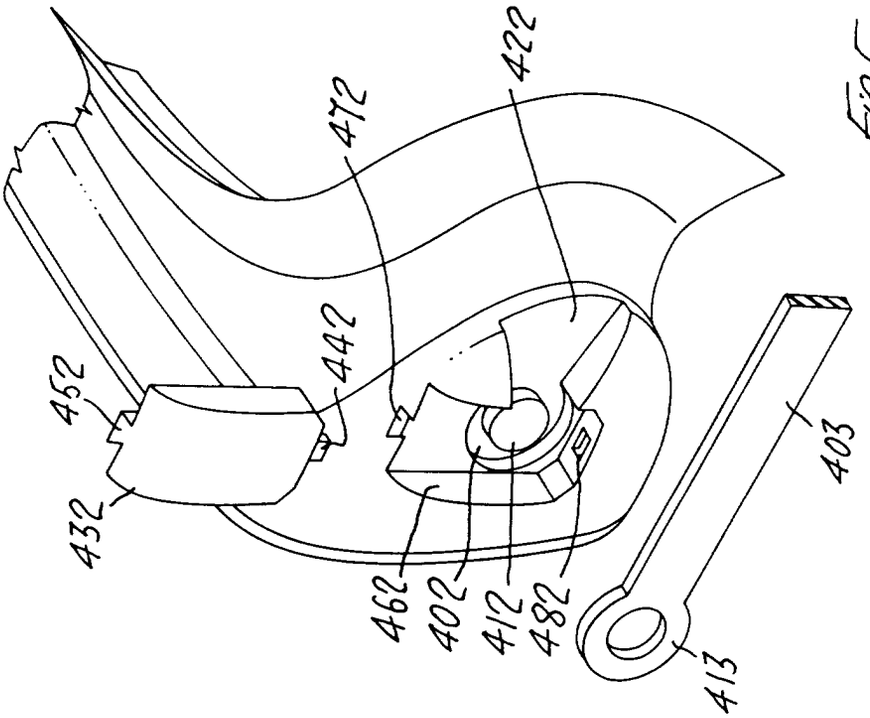
202
312
302

Fig. 2


412
422
442
452
432
462
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482
413
403

Fig. 5

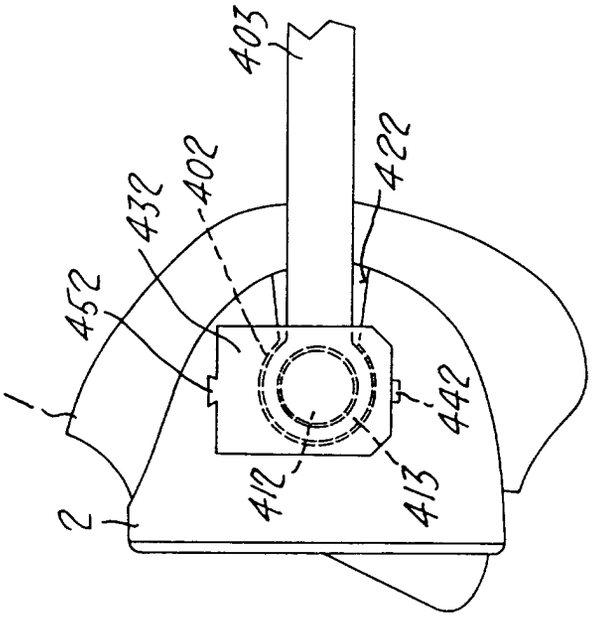
403
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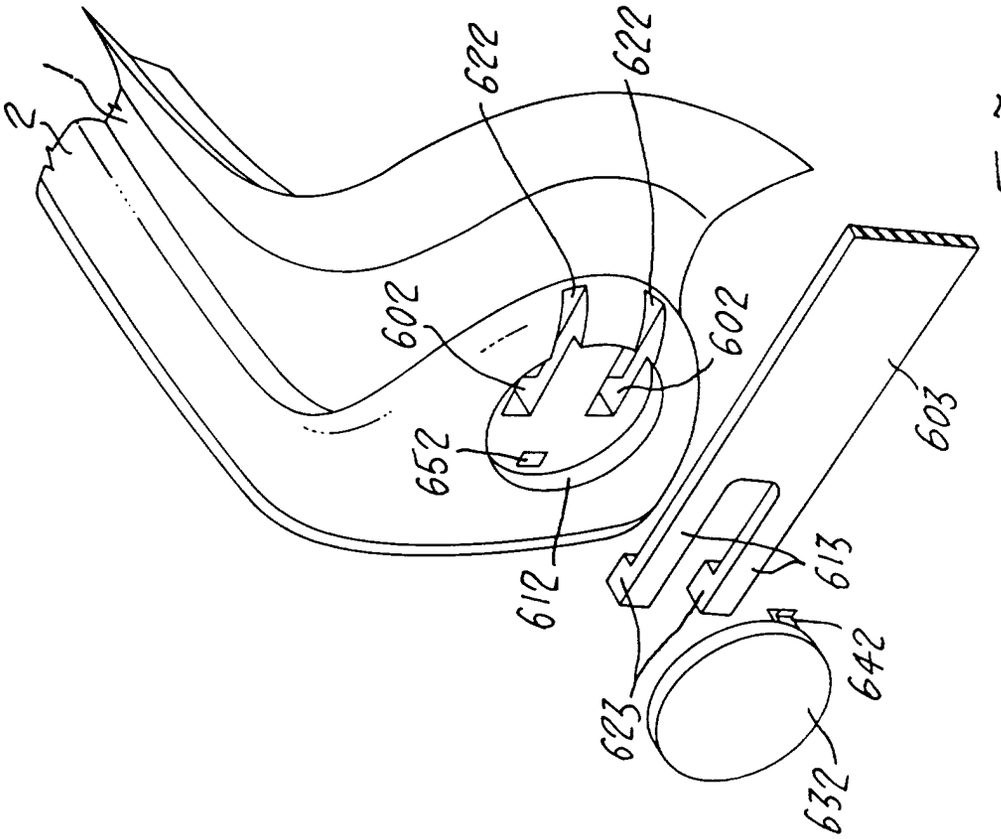
Fig. 4


1
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622
622
602
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652
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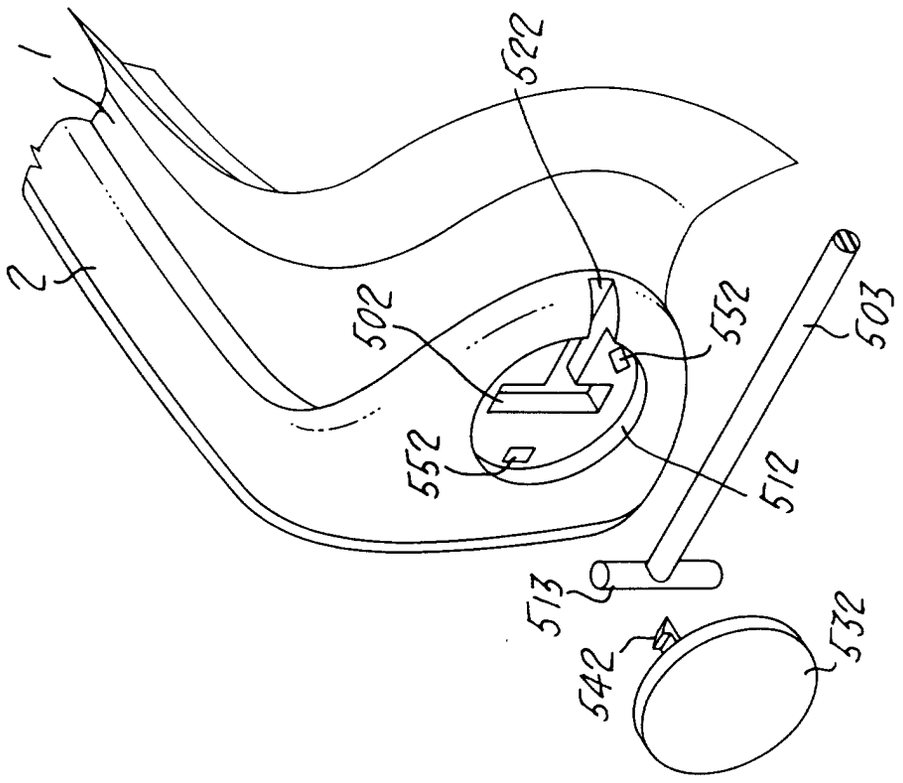
632

Fig. 7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542
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Fig. 6