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(54) **SPORTS SHOE, IN PARTICULAR FOR CYCLING**

(57) A sport shoe (100), in particular for cycling, comprising first lacing strip (101), a second lacing strip (102), an intermediate strip (103) and a closing device (10), which comprises a first winder (1) and a second winder (2) for stressing the first lacing strip and the second lacing strip so as to bring them closer together, and actuation

means (3) for selectively rotating the first winder or the second winder. The first winder (1), the second winder (2) and the actuation means (3) are rotatably supported on a single support unit (4). The shoe further comprises plug-in means (6) of the support unit on the intermediate strip.

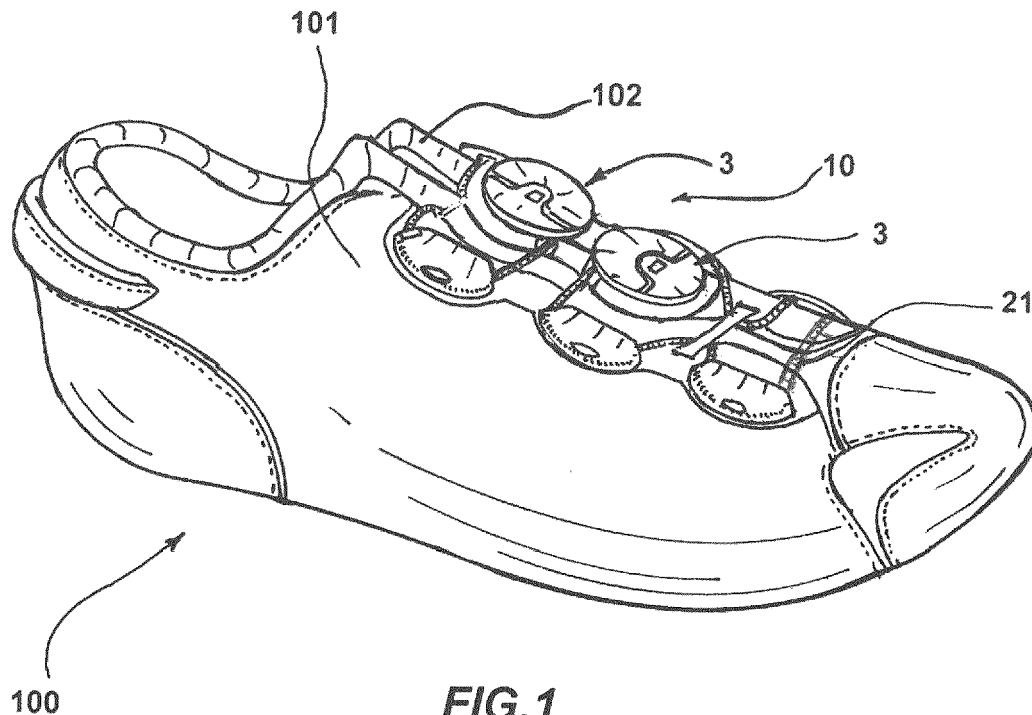


FIG. 1

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Description

[0001] The present invention relates to a shoe for cycling, of the type including a closing device comprising a tightening cord that can be wound on a winding device for stressing two strips of the shoe upper to close them.

[0002] In the sports shoe field, in particular in cycling shoes, it is known to provide for closing systems that use a cord extending between a cord-wrapping disc secured to a side of the shoe and a hooking element secured to a strip facing such side. Winding the cord on the disc allows bringing the cord back with the aim of bringing the strips closer together, or, more generally, tightening them on the side of the shoe upper.

[0003] An example of such shoe is disclosed in the patent application WO 94/27456 by the same Applicant.

[0004] A further example is represented by a cycling shoes comprising two reels fixed on the tongue of the upper allowing to tighten or loosen the shoe.

[0005] However, the need is felt to provide closing systems that allow easily differentiating the lacing tension at different zones of the foot, while allowing to ensure a high comfort and easiness of use to the user.

[0006] The problem underlying the present invention is to provide a closing device for shoes that is devised to meet the above-mentioned needs with reference to the above prior art.

[0007] This problem is solved by the present invention by means of a sport shoe produced according to claim 1.

[0008] Preferred characteristics of the invention are defined in the dependent claims.

[0009] The finding according to present invention allows differentiating the lacing tension at different parts of the foot, while ensuring a uniform distribution of the lacing tension.

[0010] In this manner, it is possible to maintain a high comfort for the user.

[0011] Furthermore, the shoe can be easily put on and it allows a simple adjustment of the lacing tension also during a sporting activity.

[0012] The characteristics and advantages of the invention will be best understood by the description of a preferred, non-exclusive implementation example thereof, by way of illustrative, non-limiting example, with reference to the accompanying drawings, in which:

- Fig. 1 is a perspective view of a cycling shoe produced in accordance with the present invention;
- Fig. 2 is a plan view of a detail of the shoe of Fig. 1 and a relative closing device;
- Fig. 3 is a perspective view of the closing device of the shoe of Fig. 2;
- Fig. 4 shows the closing device of Fig. 3 according to a different perspective view;
- Figs. 5 and 6 are two different, partially exploded, perspective views of the closing device of Fig. 3;
- Fig. 7 is a perspective view of an implementation variation of the closing device of the shoe according

to the present invention;

- Fig. 8 is a partially exploded perspective view of the closing device of Fig. 7; and
- Figs. 9 and 10 are two different exploded perspective views of the closing device of Fig. 7.

[0013] Referring to Fig. 1, a sport shoe, preferably of the cycling type, is indicated on the whole by the reference numeral 100.

[0014] The shoe comprises a shoe upper of a conventional type, on which two mutually facing lacing strips 101 and 102 are defined.

[0015] According to a preferred embodiment, the shoe 100 further comprises a further substantially tab-shaped intermediate strip 103, located between the two facing strips 101, 102.

[0016] The shoe 100 further comprises a closing device, indicated on the whole by the reference numeral 10, which is secured to the shoe, for example, in this embodiment, at the further intermediate strip 103.

[0017] The closing device 10 comprises a first winder 1 for a first tightening cord 11 and a second winder 2 for a second tightening cord 21.

[0018] Preferably, the first winder 1 and the second winder 2 have axes of rotation X, X' that are parallel and spaced apart along a longitudinally extending direction of the shoe 100.

[0019] With reference to Figs 1 and 2, the first tightening cord 11 and the second tightening cord 21 are capable of stressing so as to bring the first lacing strip 101 and the second lacing strip 102 closer together by means of a relative winding on the respective winder, respectively.

[0020] To this aim, in a preferred embodiment, the shoe 100 comprises a first pair of cord-feed supports 71 and a second pair of cord-feed supports 72, indented to engage a tightening cord portion, respectively.

[0021] The cord-feed supports 71 and 72 have a respective seating, only partially illustrated in the figure, which allows slidably housing the cord, while holding it in a direction of mutual closing together between the two strips.

[0022] Preferably, the tightening cords are ring-shaped and closed onto the winder, so that winding the cord on the latter decrease the free length of the tightening cord and closes the ring. Therefore, it is apparent that such movement allows stressing the strips 101 and 102, bringing them closer to one another, thus obtaining a closure of the shoe.

[0023] To this aim, preferably, each cord guide of the first pair of cord-feed supports 71 and of the second pair of cord-feed supports 72 is placed at the first lacing strip 101 and the second lacing strip 102, respectively.

[0024] In a preferred configuration, the first tightening cord 11 is at least partly wound on the first pair of cord-feed supports 71. Preferably, the second tightening cord 21 is at least partly wound around said second pair of cord-feed supports 72. In addition, according to a preferred embodiment, the shoe further comprises a further

second pair of cord-feed supports 72', on which the second cord 21 is wound. Preferably, the cord 21 intertwines when exiting the second cord-feed support 72, before arriving to the further support 72'.

[0025] Preferably, the shoe comprises a cord-feed seating 73 and an auxiliary cord-feed seating 74 secured to the intermediate strip 103 and suitable to slidably hold the first and second first tightening cords, respectively.

[0026] Referring now also to the Figs. 3 and 4, the closing device comprises selectively engageable means 5 for locking the first winder 1 and the second winder 2.

[0027] Such locking means allow preventing, or anyhow limiting, the winders rotation. Preferably, the locking means 5 are preferably obtained by means of a ratchet defined by an engaging tooth 52 selectively engageable on a ring gear of the winder.

[0028] To this aim, each winder comprises a respective ring gear 13, 23 and a respective engaging tooth 52, which is stressed to engage on the respective ring gear by means of elastic means, not shown in the figure.

[0029] According to a preferred embodiment, the ratcheting can be obtained so as to be mono-directional, i.e., allowing the rotation of the winder to a direction, which is the cord winding direction, and preventing it in the opposite direction. Therefore, the ratcheting can be unlocked, thus allowing a free rotation of the winding device or, alternatively, a controlled rotation, by means of an unlocking means, a button actuating element 51 of which is visible in the figures.

[0030] The button actuating element 51 allows moving the engaging tooth 52 away from the ring gear 13.

[0031] The closing device 10 further comprises actuation means 3 for selectively actuating in rotation the first winder 1 or the second winder 2.

[0032] In one embodiment, the actuation means 3 comprise a first gripping element 31 and a second gripping element 32, which rotate together with, and are coaxial with, said first winder 1 and said second winder 2, respectively.

[0033] In other words, the user will be able to act on the gripping elements 31 and 32 to rotate the respective winder which it is firmly secured to.

[0034] According to a preferred embodiment, each gripping element can rotate about an axis of rotation extending inside a plane that is parallel to the planar net of the respective winder and is offset with respect to its axis of rotation X.

[0035] The rotation of the gripping element about the above-mentioned axis allows to bring it from a retracted position, shown in the figures, and in which it is arranged substantially parallel to a radially extending plane of the winding device, to an extended position, away from the winder and thus the shoe 100 and substantially perpendicular to the former, at which it can be easily grasped by the user.

[0036] To this aim, the solution disclosed in the patent application PD2014A000102 by the same owner can be advantageously used.

[0037] Based on an alternative embodiment, illustrated in Figs. 7 to 10, the actuation means 3 comprise a single gripping element 33 and transmission means 35 capable of selectively transmitting the rotation of the gripping element 33 to the first winder 1 or the second winder 2.

[0038] Preferably, in this embodiment, the actuation means 3 further comprise an actuating ring gear 34 that rotates together with the gripping element 33. The first winder 1 and the second winder 2 also comprise a respective ring gear 13, 23.

[0039] The actuation means 3 are moveable so as to engage the actuating ring gear 34 with one of the two ring gears of the winders.

[0040] In this manner, a single gripping element allows to selectively actuate either winders.

[0041] Referring back to Figs. 3 to 6, the first winder 1, the second winder 2 and the actuation means 3 are rotatably supported on a single support unit 4. The closing device also comprises plug-in holding means 6 of the support unit 4 on the intermediate strip 103 that allows to fix the support unit 4 on the strip 103 in a removable manner. In other words, the plug-in holding means 6 are of the removable type.

[0042] Preferably, the support unit 4 comprises a box-shaped body 40 inside which the first winder 1, said second winder 2 and the actuation means 3 are supported.

[0043] In one embodiment, the box-shaped body 40 comprises openings 41 for the first tightening cord 11 and the second tightening cord 21, so as to allow the winding thereof on the respective winder.

[0044] According to a preferred embodiment, the plug-in means 6 comprise an extension 60 and a complementary recess 61 obtained on the support unit 4 and the intermediate strip 103, respectively, or vice versa, and capable of a reciprocal engagement.

[0045] Preferably, in order to improve the stability of the engagement of the support unit 4, the intermediate strip 103 comprises a support element 104 inside which a housing seating 105 is defined.

[0046] According to a preferred embodiment, the recesses 61 are preferably defined on the housing seating 105.

[0047] In this manner, the invention achieves the proposed objects, thus obtaining a number of advantages on known solutions.

[0048] In particular, the device according to the present invention allows obtaining an adjustment of the optimum closing tension by means of a selective action on the first or the second winders.

[0049] Furthermore, the plug-in holding means allow removing the support unit 4, thus achieving an optimum fit of the foot into the shoe, and a simple replacement of the device in the event of breakage.

[0050] Also, the gripping element is easily provide to the user, thus allowing for an easy handling of the closing device, hence an easy adjustment of the lacing tension.

[0051] In addition, the implementation described above advantageously allows producing a particularly ro-

bust and reliable structure, formed by a relatively low number of components.

Claims

1. Sport shoe (100), in particular for cycling, comprising a first lacing strip (101), a second lacing strip (102), an intermediate strip (103), positioned between said first lacing strip (101) and said second lacing strip (102) and a closing device (10), said closing device (10) comprising:

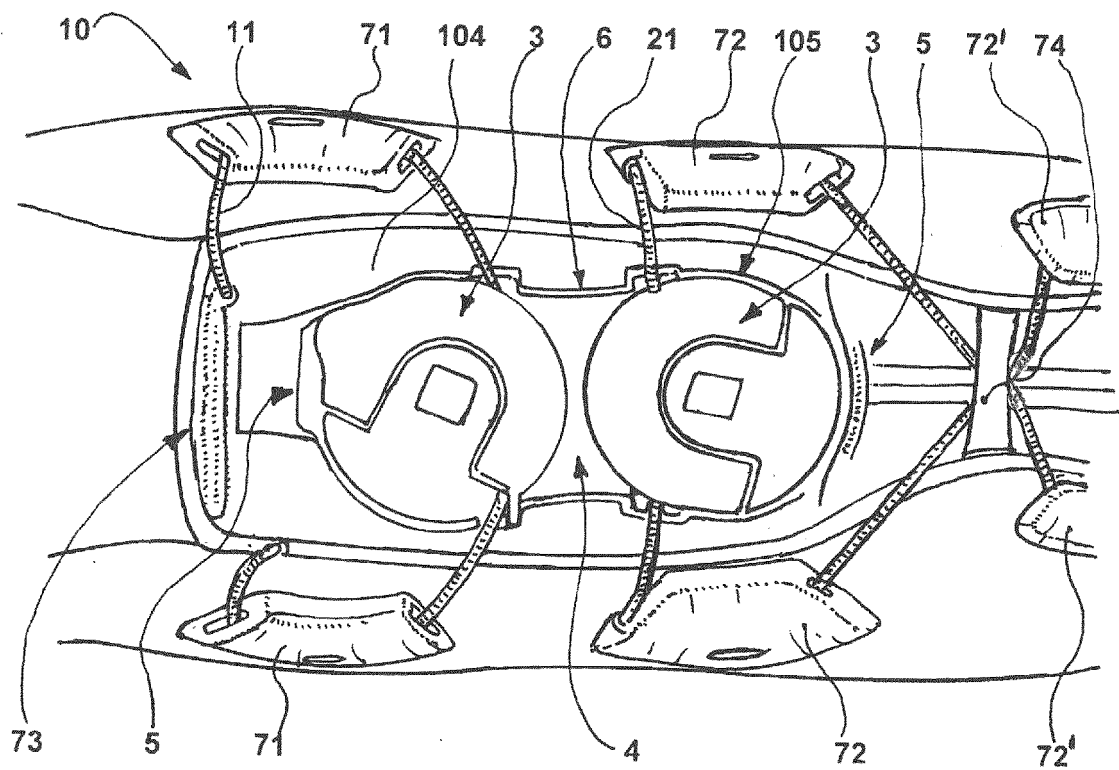
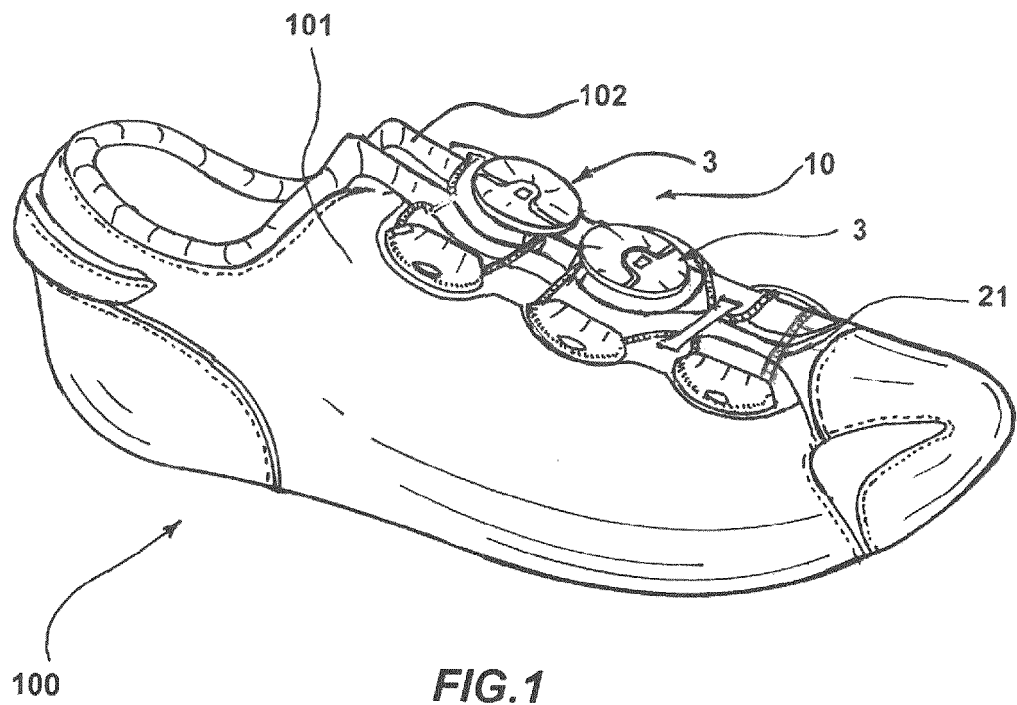
- a. a first winder (1) for a first tightening cord (11) and a second winder (2) for a second tightening cord (21), said first tightening cord (11) and said second tightening cord (21) each being capable of stressing said first lacing strip (101) and said second lacing strip (102) so as to bring them closer together by means of relative winding on said first winder (1) and on said second winder (2), respectively;
- b. selectively engageable means (5) for locking said first winder (1) and second winder (2), which means are capable of preventing or limiting the rotation of said winders;
- c. actuation means (3) for selectively rotating said first winder (1) or said second winder (2);

characterised in that said first winder (1), said second winder (2) and said actuation means (3) are rotatably supported on a single support unit (4), and **in that** they comprise plug-in holding means (6) for holding said support unit (4) on said intermediate strip (103) in a removable manner.

2. Sport shoe (100) according to claim 1, wherein said support unit (4) comprises a box-shaped body (40), onto which both said first winder (1), said second winder (2) and said actuation means (3) are supported.
3. Sport shoe (100) according to any of the preceding claims, wherein said intermediate strip (103) comprises a support element (104) which is at least partially rigid and onto which said support unit (4) is supported.
4. Sport shoe (100) according to claim 3, wherein a housing seating (105) is defined onto said support element (104).
5. Sport shoe (100) according to any of the preceding claims, wherein said plug-in holding means (6) comprise an extension (60) and a complementary recess (61) produced on said support unit (4) and on said intermediate strip (103), respectively, or vice versa, and capable of reciprocal engagement.

6. Sport shoe (100) according to claim 4 and 5, wherein said recesses (61) are defined on the housing seating (105).

7. Sport shoe (100) according to any one of the preceding claims, wherein said intermediate strip (103) comprises a support element (104), in which a seating (105) is defined for housing said support unit (4).
8. Sport shoe (100) according to any one of the preceding claims, comprising a first pair of cord-feed supports (71) and a second pair of cord-feed supports (72), each cord-feed support of said first pair of cord-feed supports (71) and second pair of cord-feed supports (72) being placed on said first lacing strip (101) and said second lacing strip (102), respectively, said first tightening cord (11) being at least partly wound around said first pair of cord-feed supports (71) and said second tightening cord (21) being at least partly wound around said second pair of cord-feed supports (72).
9. Sport shoe (100) according to any one of the preceding claims, comprising a cord-feed seating (73) fixed to said intermediate strip (103) and capable of slidably holding said first tightening cord (11).
10. Sport shoe (100) according to any one of the preceding claims, wherein said first winder (1) and said second winder (2) have parallel axes of rotation (X, X') that are spaced apart in the longitudinally extending direction of the shoe (100).
11. Sport shoe (100) according to any one of the preceding claims, wherein actuation means (3) comprise a first gripping element (31) and a second gripping element (32), which rotate together with and are coaxial with said first winder (1) and said second winder (2), respectively.
12. Sport shoe (100) according to one of the claims 1 to 10, wherein actuation means (3) comprise a single gripping element (33) rotatably connected to said support unit (4), and transmission means (35) capable of selectively transmitting the rotation of said single gripping element (33) to said first winder (1) and said second winder (2).
13. Sport shoe (100) according to claim 12, wherein actuation means (3) further comprise an actuating ring gear (34) which rotates together with said single gripping element (33), said first winder (1) and said second winder (2) comprising a respective ring gear (13, 23), said actuation means (3) being moveable on said support unit (4) in such a way as to selectively engage said actuating ring gear (34) with a ring gear (13) of said first winder (1) or a ring gear (23) of said second winder (2).



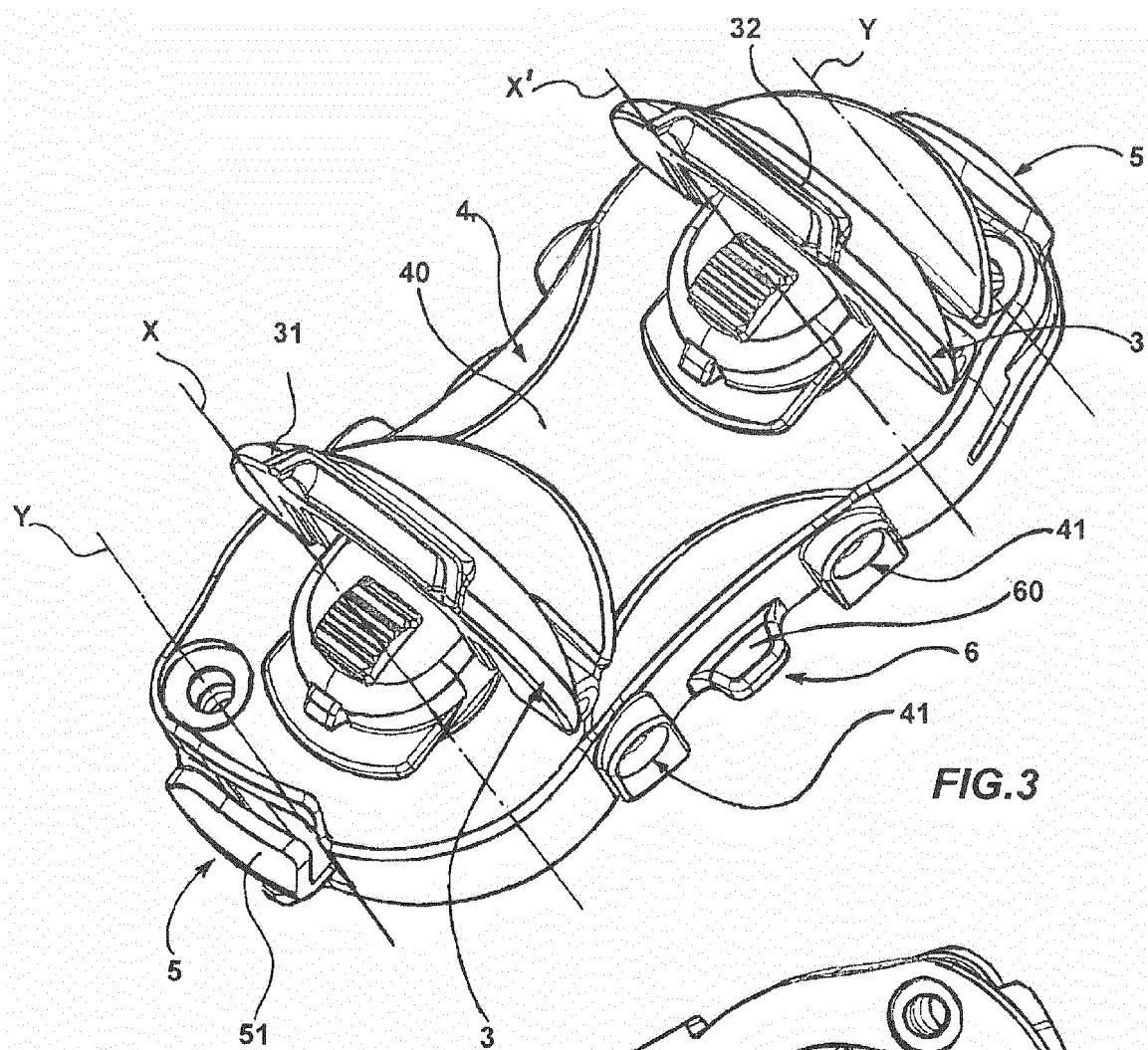


FIG. 3

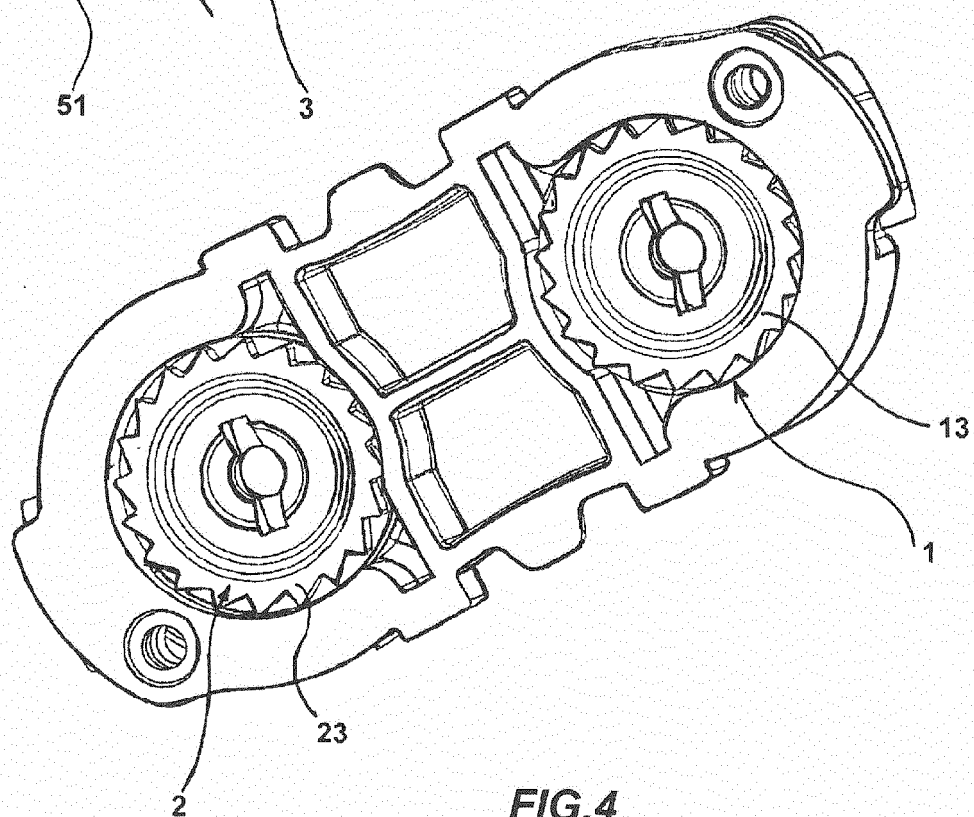


FIG. 4

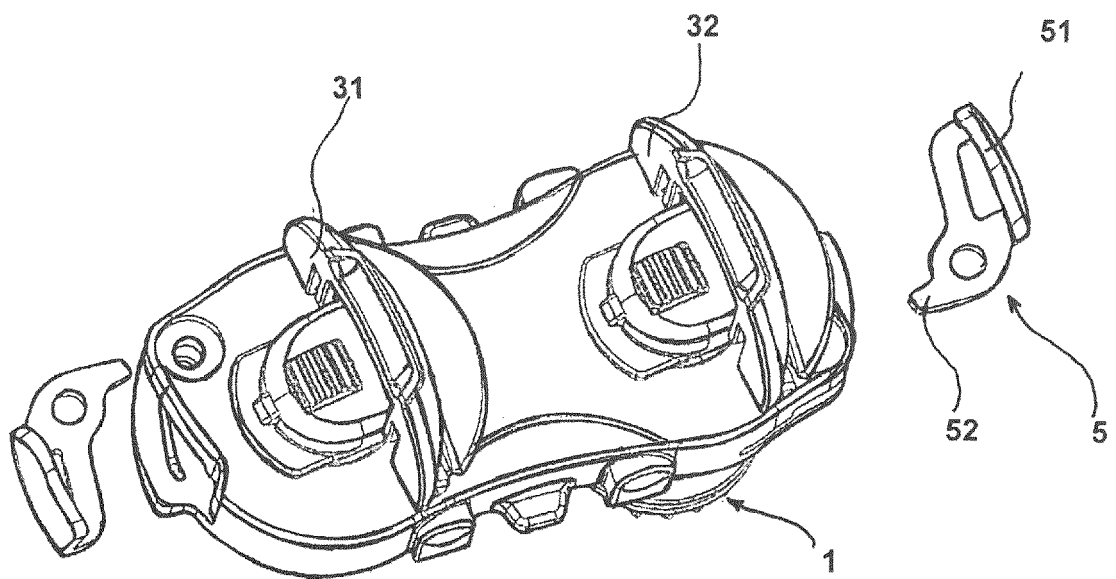


FIG. 5

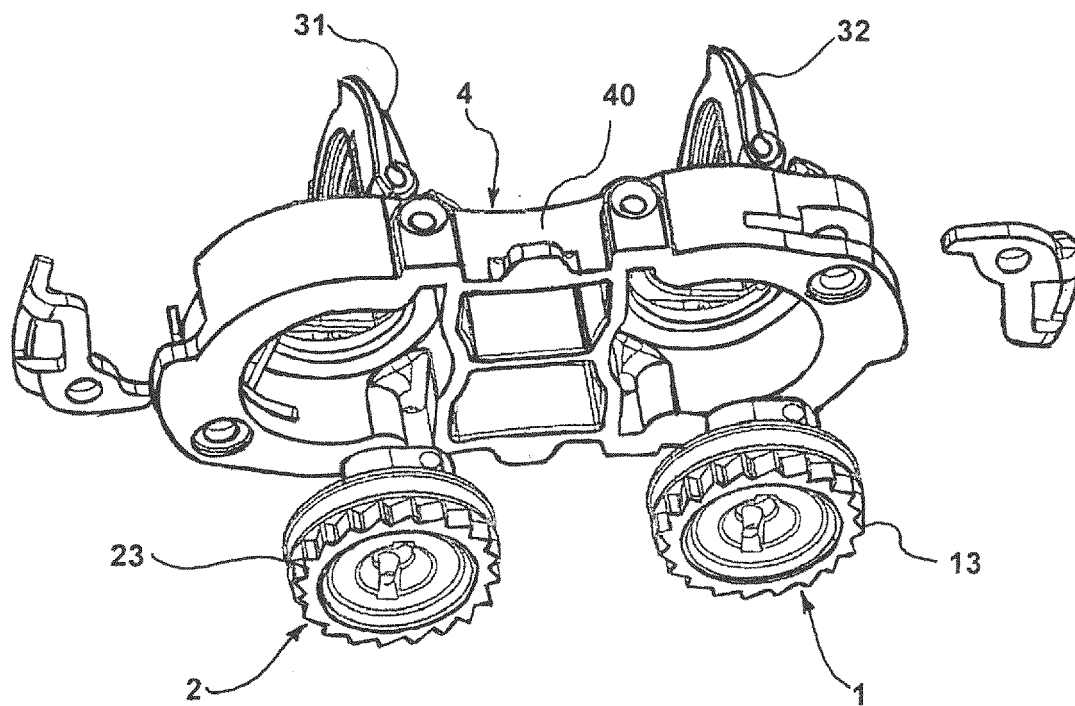
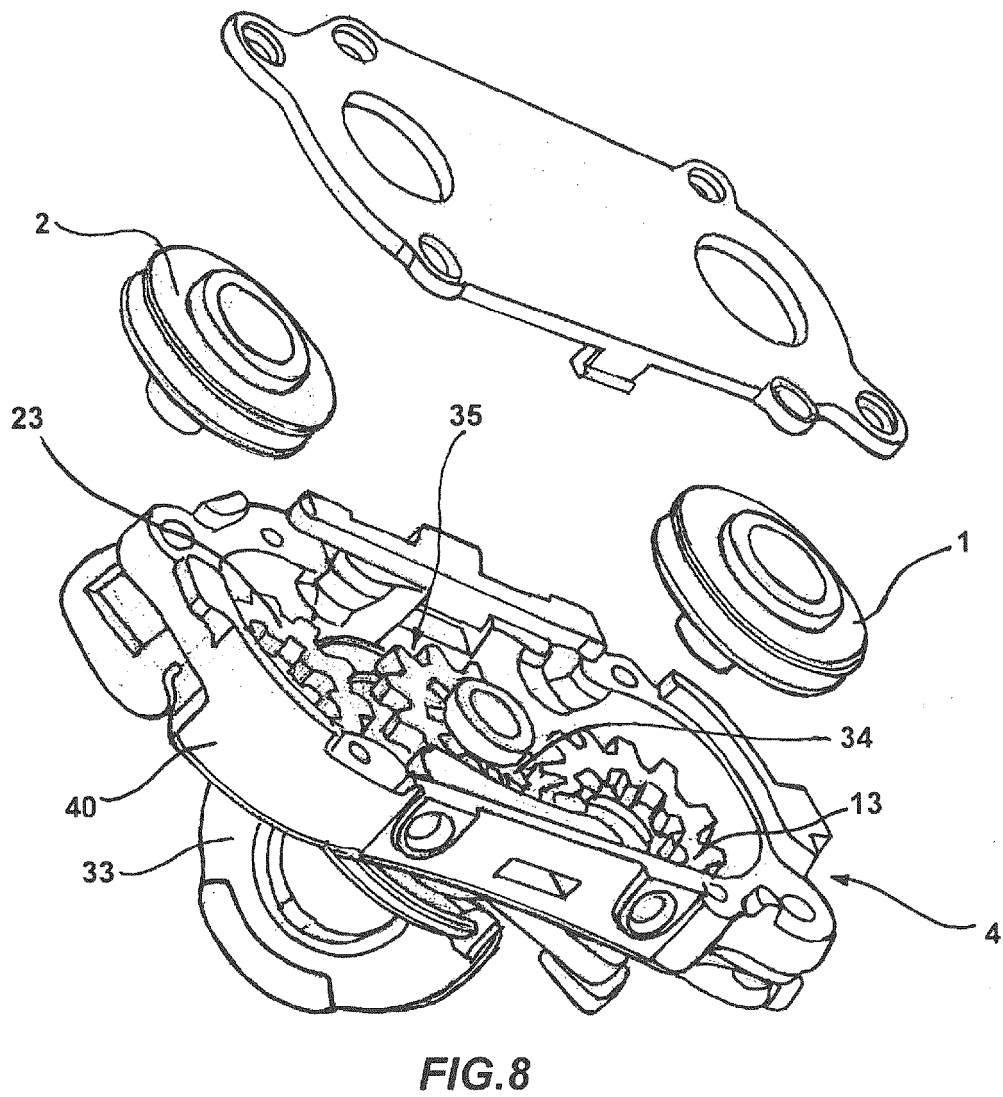
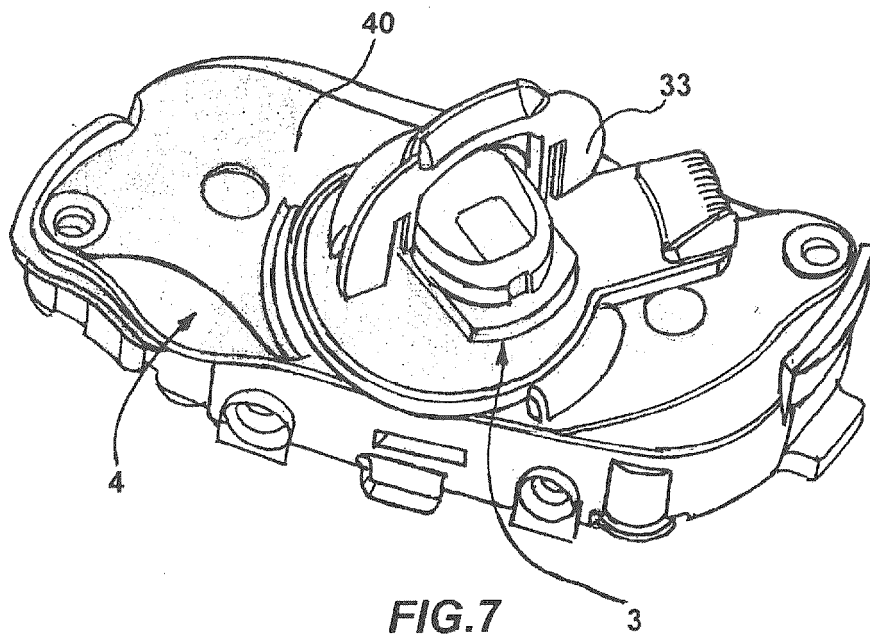


FIG. 6



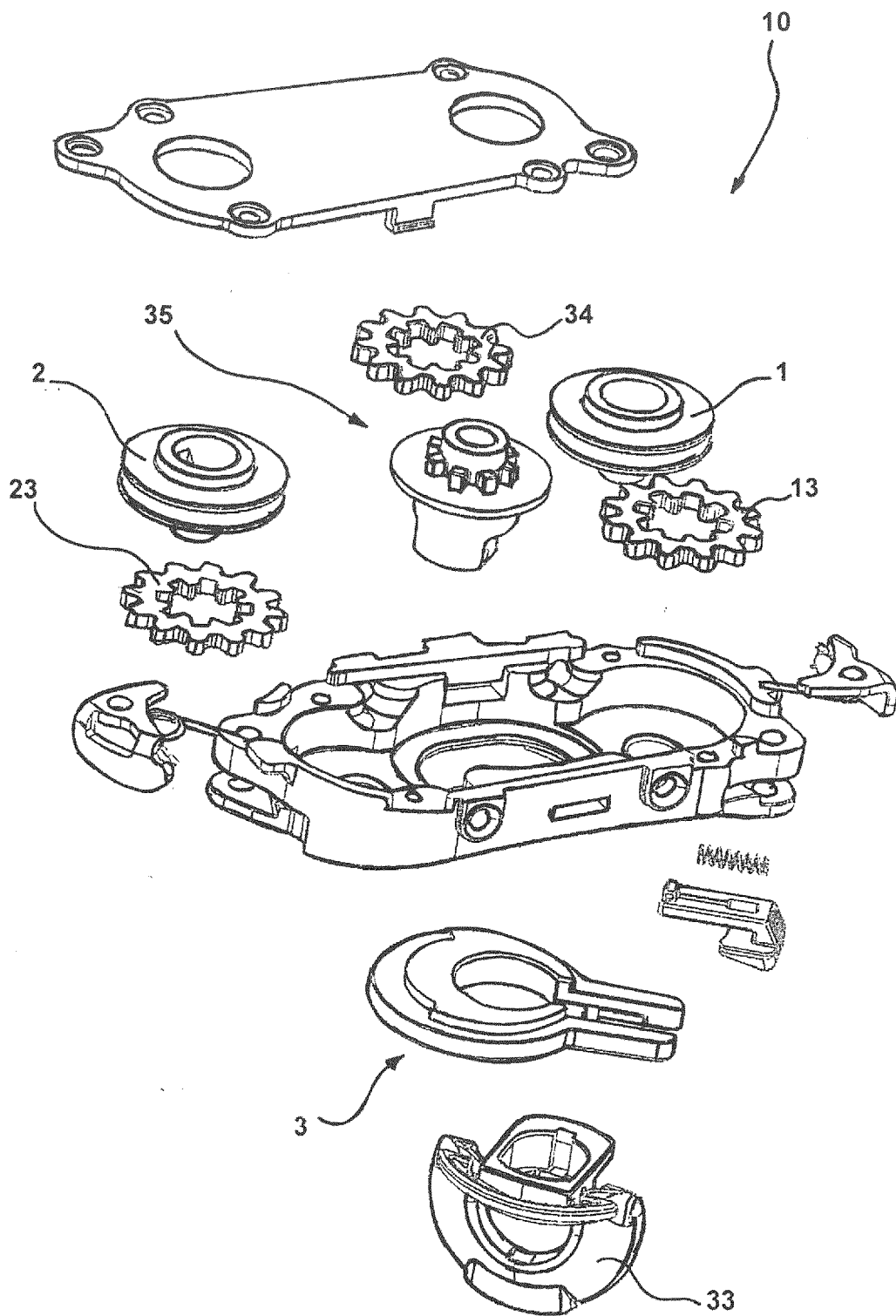


FIG.9

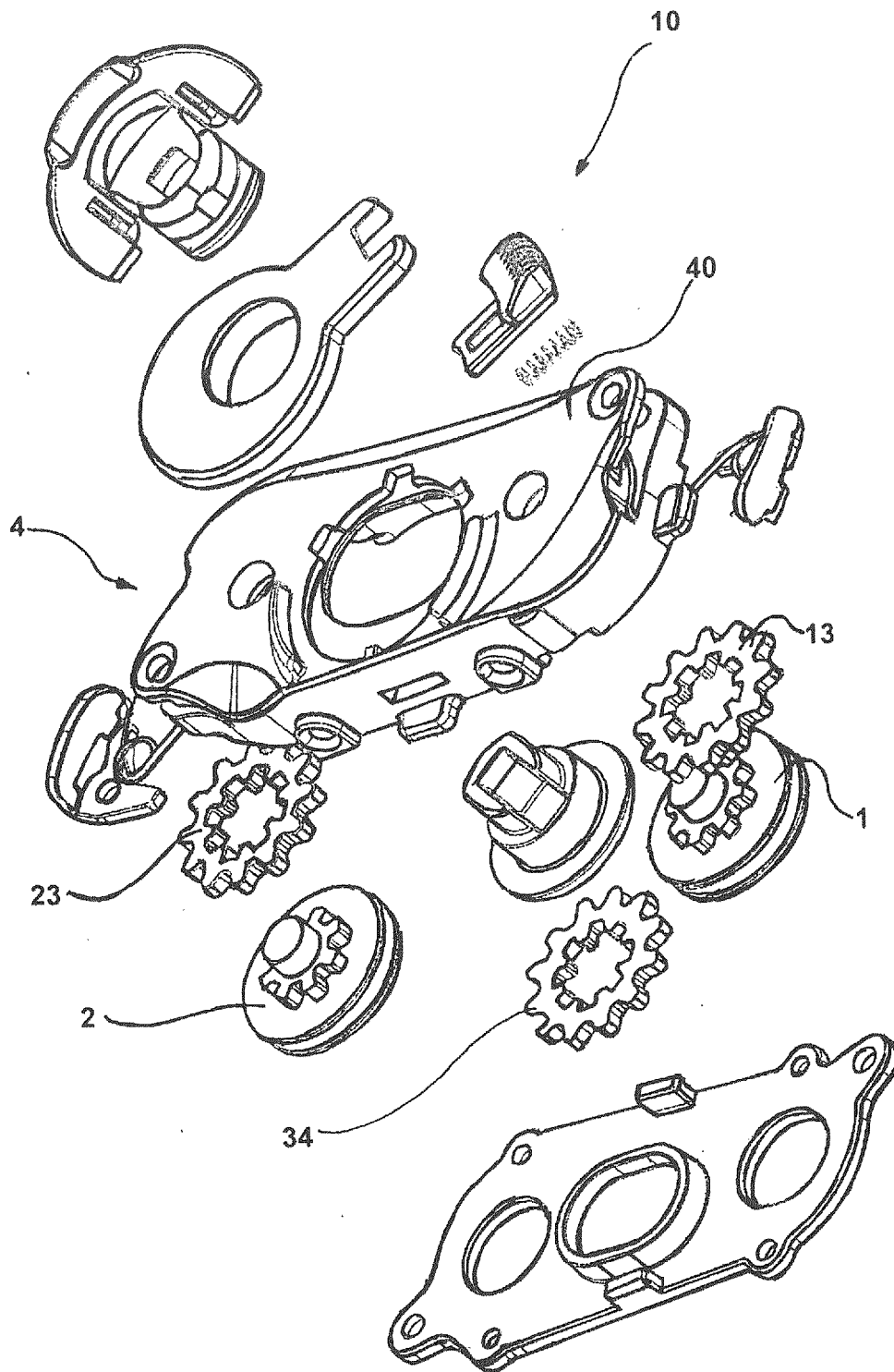


FIG.10



EUROPEAN SEARCH REPORT

Application Number
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 2 October 2017	Examiner Claudel, Benoît
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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