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(54) **Fastening device for sports footwear**

Verschlussvorrichtung für Sportschuhe

Dispositif de fixation pour chaussures de sport

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EP 2 020 186 B1

Description

[0001] The present invention relates to a fastening device for sports footwear.

[0002] Lever fastening devices for sports footwear are known: they generally comprise, rigid with a side of the vamp, a lever arm to which a puller is hinged for selective engagement with one of the teeth of a rack secured to the other side of the vamp.

[0003] These known devices present however certain drawbacks, and in particular:

- possible ice formation between the rack teeth,
- considerable rack length to achieve a wide adjustment range,
- the need to use different racks depending on the shape of the footwear vamp.

[0004] DE 3920151 A discloses a tensioning closure for ski boots with a pull rod with a number of notches which can be brought releasably into engagement with a fastening part. Use is made of a slide which can be displaced in the fastening part against the action of resilient means transversely to the pull rod in such a manner that it engages in one of said notches.

[0005] According to the invention a fastening device for sports footwear is provided as claimed in claim 1.

[0006] The present invention is further clarified hereinafter with reference to the accompanying drawings, in which:

Figure 1 is an exploded perspective view of the fastening device of the invention,
 Figure 2 is a side view thereof,
 Figure 3 is a plan view thereof,
 Figures 4 and 5 are plan views of two variants,
 Figures 6 to 17 are side and plan views of a further six embodiments.

[0007] As can be seen from the figures, the lever fastening device of the invention comprises substantially a fork-shaped base 2 fixable to a side of the footwear vamp, between the flanges 4 of which there engages a hinge pin 6 for a lever arm 8.

[0008] The lever arm is U-shaped, with an internally threaded bush 12 being pivoted between its sides, about a rivet 10.

[0009] A puller consisting of a threaded cable terminal 14 engages the bush to retain a flexible cable 16 which engages a spring 18 and a plurality of frusto-conical blocks 20, freely slidable, retained by a knob 22.

[0010] The invention also comprises a fork element 24 secured to the other side of the vamp and having its prongs 26 defining an aperture of width slightly greater than the diameter of the flexible cable 16.

[0011] The use of the fastening device is traditional in that, when the lever arm has been rotated anticlockwise (with reference to Figure 2), the puller is engaged be-

tween the prongs 26 of the fork 24, after which the lever arm 8 is rotated clockwise to cause the sides of the footwear vamp to approach each other by virtue of the counteraction of the block 20 in contact with the fork 24.

[0012] If the clamping effect is not as required, the cable can be engaged in a position between two different blocks and the operation repeated.

[0013] When the desired configuration has been achieved, micro-adjustment is possible by rotating the cable terminal 14 about the threaded bush 12.

[0014] From the foregoing it is apparent that the device is particularly advantageous compared with known devices, and in particular:

- it is easier to secure the puller as any ice formation, which can occur in the case of traditional racks, is no longer possible,
- the fork is of reduced length as the adjustment range is given by the length of the flexible cable and the number of blocks,
- it adapts to any curvature of the footwear vamp because of the cable flexibility,
- micrometric adjustment is possible, with the lever slackened, without disengaging the puller from the fork,
- if blocks of different colour are used, it enables the cable engagement position between the two blocks to be visually memorized, to hence allow immediate repositioning in the same configuration.

[0015] In the embodiment shown in Figures 4 and 5, two fastening devices are shown using the same inventive principle, but differing only in the shape of the blocks, which are respectively spherical (Figure 4) and cylindrical (Figure 5).

[0016] In the embodiment shown in Figures 6 and 7, each block 30 presents an appendix 32 which is inserted into a corresponding seat 34 of the adjacent block. This solution has the advantage of causing the blocks to assume a curved configuration to adapt to the boot curvature.

[0017] Undesired torsion effects are also eliminated.

[0018] In the embodiment shown in Figures 8 and 9, a curved rigid element 36 is also pivoted on the same pivoting rivet 10 for the lever puller 16, to retain the knob 22 and maintain it curved in accordance with the curvature of the boot.

[0019] This solution has the advantage of being able to engage the blocks in the fork with a single hand.

[0020] In the embodiment shown in Figures 10 and 11, the bush 12 is engaged by a flexible cable 38, to the end of which an element 40 is secured from which two parallel pullers 16 with springs 18 extend to engage the blocks 42.

[0021] This embodiment has the advantage of improved puller support on the vamp.

[0022] In the embodiment shown in Figures 12 and 13, the flexible cable 38 is secured to a side of the vamp (not shown in the drawings), while the blocks 42 engage in a

traditional coupling pawl assembly 44 fixed to the other side of the vamp.

[0023] In the embodiment shown in Figures 14 and 15, the lever arm is replaced by a Velcro strip 46 retaining a U-shaped element 48 to which the pullers 16 are secured.

[0024] This embodiment allows a virtually millimetric degree of tensioning by virtue of the facility offered by the constraint of the Velcro strip.

[0025] In the embodiment shown in Figures 16 and 17, flexible cable 16 and the blocks 20 are secured to one side of the vamp, to the other side of the vamp there being secured a lever 50, the arm 52 of which operates a fork 54 selectively engagable between the blocks 20.

Claims

1. A fastening device for sports footwear, to be applied to the sides of the vamp of the footwear to cause these sides to approach each other, comprising at least a puller (16) fixed at one end to a side of the vamp, a coupling element (24,50,44) fixable to the other side of the vamp of the footwear and traction (8,46) means for the puller **characterized in that** the puller (16) consists of at least one flexible, inextensible cable along which there freely slide a plurality of blocks (20,30,42) through which said puller (16) freely passes and **in that** the coupling element is selectively interposable between two of said adjacent blocks.
2. A fastening device as claimed in claim 1, **characterised in that** a solenoid spring (18) is also applied to the puller (16) to act elastically on the blocks.
3. A fastening device as claimed in claim 1, **characterised in that** the blocks are of frusto-conical shape.
4. A fastening device as claimed in claim 1, **characterised in that** the blocks are of cylindrical shape.
5. A device as claimed in claim 1, **characterised in that** the blocks are of spherical shape.
6. A device as claimed in claim 1, **characterised in that** each block (30) presents an appendix (32) insertable into a corresponding seat (34) provided in the adjacent block.
7. A device as claimed in claim 1, **characterised in that** traction means consist of a lever (8) hinged to a base fixed to a side of the footwear, the puller (16) being articulately connected to the lever.
8. A device as claimed in claim 1, **characterised in that** the traction means consist of a lever (50) hinged to a base fixed to one side of the footwear and are provided with coupling elements (54), the puller (16)

being secured to the other side of the footwear.

9. A device as claimed in claim 1, **characterised in that** the traction means consist of a velcro strip (46) secured to one side of the footwear.
10. A device as claimed in claim 1, **characterised in that** the puller is provided with a threaded cable terminal (14) engaging in a corresponding seat provided in a bush (12) articulately connected to the lever (8).
11. A device as claimed in claim 10, **characterised in that** a curved rigid (36) element retaining the puller end is also articulately connected to the lever.
12. A device as claimed in claim 8 **characterised in that** the blocks (42) engage a coupling pawl assembly (44).

Patentansprüche

1. Befestigungsvorrichtung für Sportschuhwerk, die an den Seiten von Schuhwerk anzubringen ist, um diese Seiten zusammenzuziehen, **dadurch gekennzeichnet, dass** sie Folgendes umfasst:
 - mindestens eine Ziehvorrichtung (16), die an einem Ende einer Seite des Oberleders befestigt ist und aus mindestens einer flexiblen, nicht dehnbaren Schnüre besteht, an der eine Vielzahl von Blöcken (20, 30, 42), durch welche die Ziehvorrichtung frei hindurch geht, frei gleitet,
 - ein Kopplungselement (24, 50, 44), das an der anderen Seite des Schuhwerks fixierbar ist und wahlweise zwischen zwei angrenzenden Blöcken einsetzbar ist,
 - Zugmittel (8, 46) für die Ziehvorrichtung.
2. Befestigungsvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** eine Magnetfeder (18) ebenfalls an die Ziehvorrichtung (16) angelegt wird, um elastisch auf die Blöcke einzuwirken.
3. Befestigungsvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Blöcke kegelstumpfförmig sind.
4. Befestigungsvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Blöcke zylinderrförmig sind.
5. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Blöcke kugelförmig sind.
6. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** jeder Block (30) einen Ansatz (32)

aufweist, der in einen entsprechenden Sitz (34) einfügbar ist, der in dem angrenzenden Block bereitgestellt wird.

7. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Zugmittel aus einem Hebel (8) bestehen, der an einer Basis angelegt ist, die an einer Seite des Schuhwerks fixiert ist, wobei die Ziehvorrichtung (16) angelenkt mit dem Hebel verbunden ist. 5
8. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Zugmittel aus einem Hebel (50) bestehen, der an einer Basis angelenkt ist, die an einer Seite des Schuhwerks fixiert ist, und mit Koppelungselementen (54) versehen sind, wobei die Ziehvorrichtung (16) an der anderen Seite des Schuhwerks befestigt ist. 10
9. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Zugmittel aus einem Klettband (46) bestehen, das an einer Seite des Schuhwerks befestigt ist. 15
10. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Ziehvorrichtung mit einem Gewindekabelendverschluss (14) versehen ist, der in einen entsprechenden Sitz eingreift, der in einer Buchse (12) bereitgestellt wird, die gelenkig mit dem Hebel (8) verbunden ist. 20
11. Vorrichtung nach Anspruch 10, **dadurch gekennzeichnet, dass** ein gekrümmtes starres (36) Element, welches das Ziehvorrichtungsende festhält, ebenfalls gelenkig mit dem Hebel verbunden ist. 25
12. Vorrichtung nach Anspruch 8, **dadurch gekennzeichnet, dass** die Blöcke (42) in eine Kopplungsklinkenanordnung (44) eingreifen. 30

Revendications

1. Dispositif de fixation pour chaussures de sport, à appliquer sur les côtés d'une chaussure pour amener ces côtés à se rapprocher l'un de l'autre, **caractérisé en qu'il comprend :** 35
 - au moins un dispositif de traction (16) fixé à une extrémité sur un côté de la claque et constitué d'au moins un câble flexible et inextensible le long duquel glisse librement une pluralité de blocs (20, 30, 42) à travers lesquels ledit dispositif de traction passe librement, 40
 - un élément de couplage (24, 50, 44) pouvant être fixé sur l'autre côté de la chaussure et qui peut être interposé sélectivement entre deux blocs adjacents, 45

- des moyens de traction (8, 46) pour le dispositif de traction.

2. Dispositif de fixation selon la revendication 1, **caractérisé en ce qu'un** ressort solénoïde (18) est également appliqué au dispositif de traction (16) pour agir de manière élastique sur les blocs. 5
3. Dispositif de fixation selon la revendication 1, **caractérisé en ce que** les blocs ont une forme tronconique. 10
4. Dispositif de fixation selon la revendication 1, **caractérisé en ce que** les blocs ont une forme cylindrique. 15
5. Dispositif selon la revendication 1, **caractérisé en ce que** les blocs ont une forme sphérique. 20
6. Dispositif selon la revendication 1, **caractérisé en ce que** chaque bloc (30) présente un appendice (32) pouvant être inséré dans une assise correspondante (34) se trouvant dans le bloc adjacent. 25
7. Dispositif selon la revendication 1, **caractérisé en ce que** les moyens de traction sont constitués d'un levier (8) articulé sur une base fixée sur un côté de la chaussure, le dispositif de traction (16) étant relié par articulation au levier. 30
8. Dispositif selon la revendication 1, **caractérisé en ce que** les moyens de traction sont constitués d'un levier (50) articulé sur une base fixée sur un côté de la chaussure et sont pourvus d'éléments de couplage (54), le dispositif de traction (16) étant fixé sur l'autre côté de la chaussure. 35
9. Dispositif selon la revendication 1, **caractérisé en ce que** les moyens de traction sont constitués d'une bande velcro (46) fixée sur un côté de la chaussure. 40
10. Dispositif selon la revendication 1, **caractérisé en ce que** le dispositif de traction est pourvu d'un embout de câble fileté (14) s'accouplant à une assise correspondante se trouvant dans une douille (12) reliée par articulation au levier (8). 45
11. Dispositif selon la revendication 10, **caractérisé en ce qu'un** élément rigide incurvé (36) retenant l'extrémité du dispositif de traction est également relié par articulation au levier. 50
12. Dispositif selon la revendication 8, **caractérisé en ce que** les blocs (42) s'accouplent à un ensemble cliquet de couplage (44). 55

FIG. 1

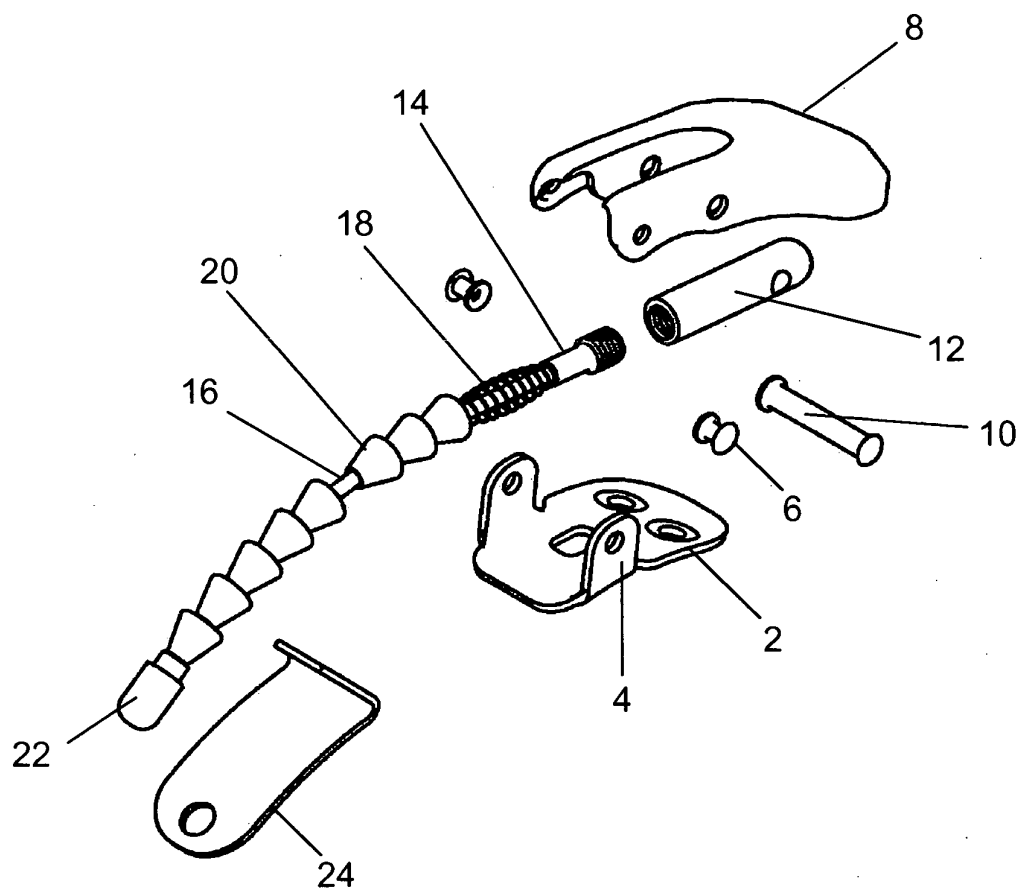


FIG. 2

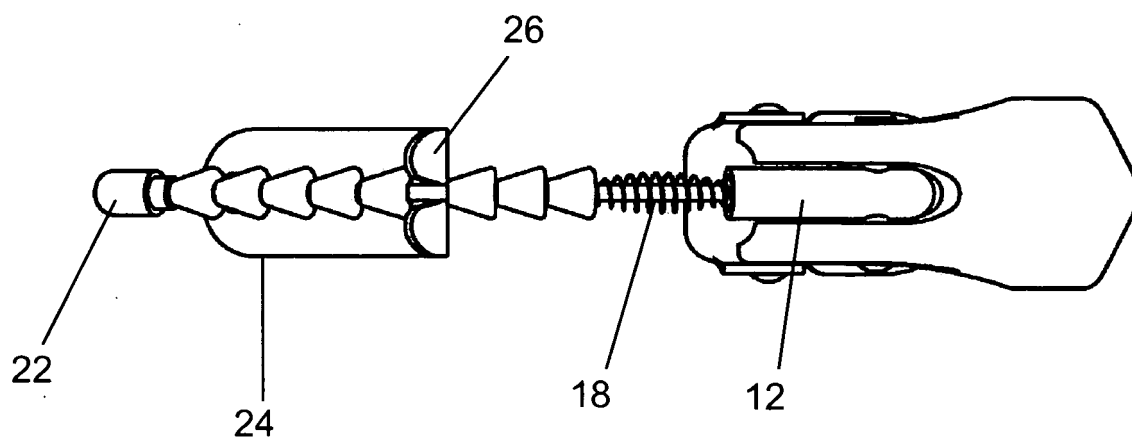
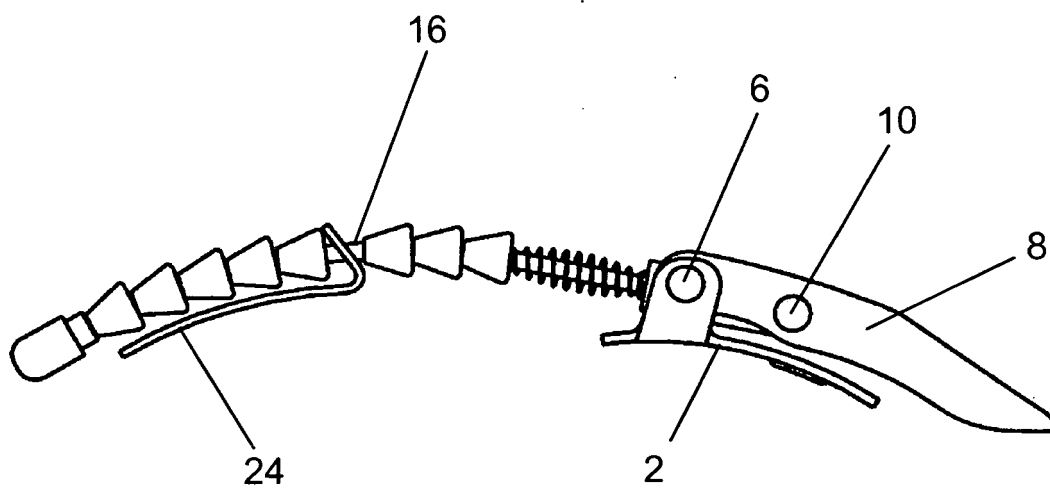


FIG. 3

FIG. 4

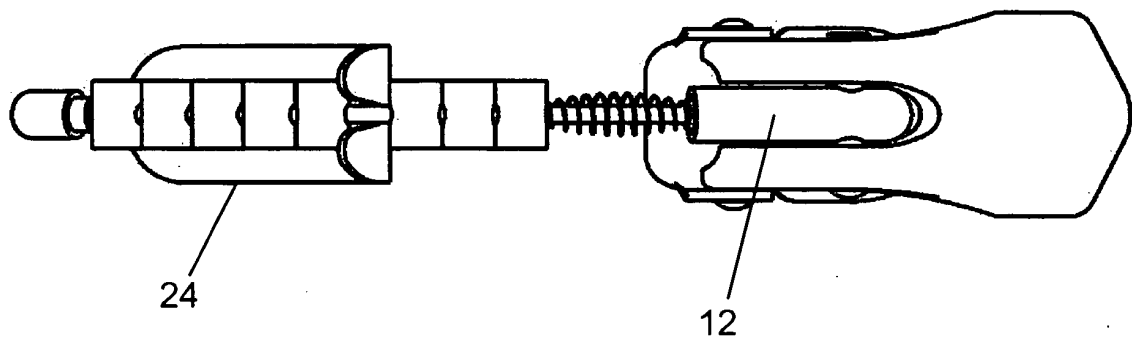
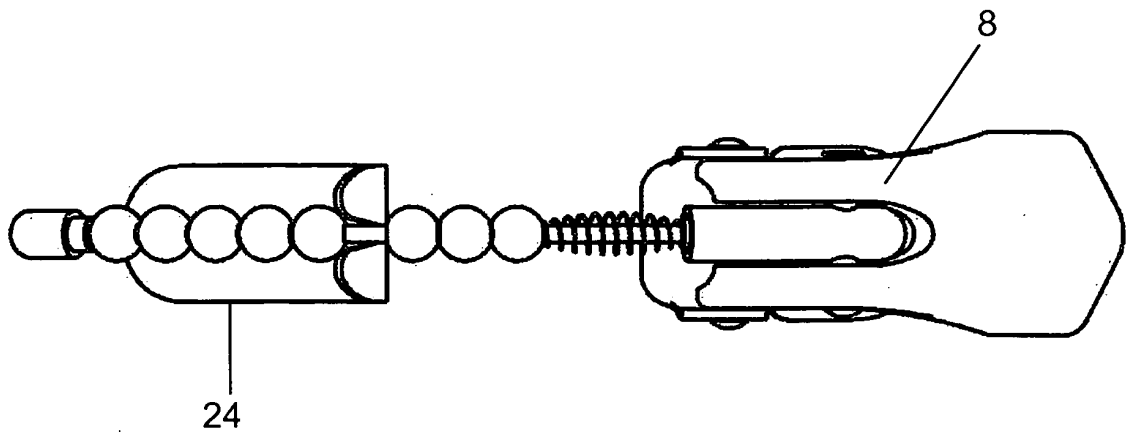


FIG. 5

FIG. 6

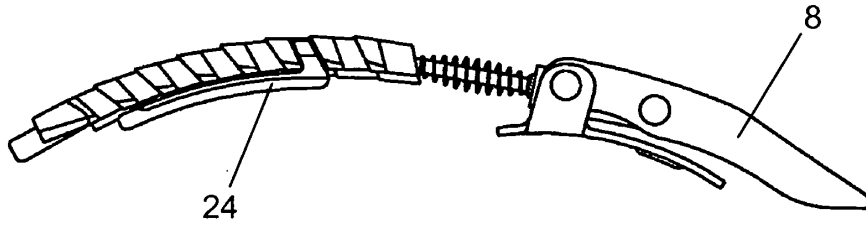


FIG. 7

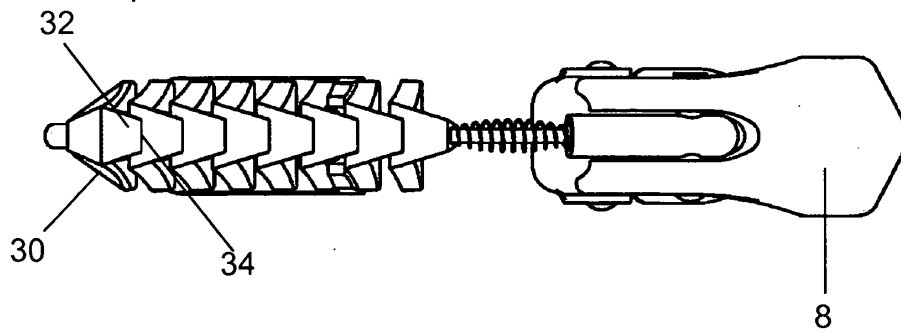


FIG. 8

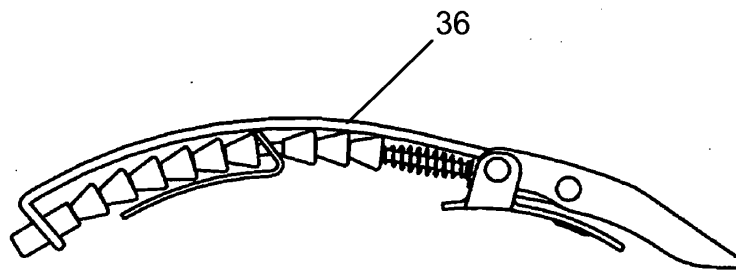
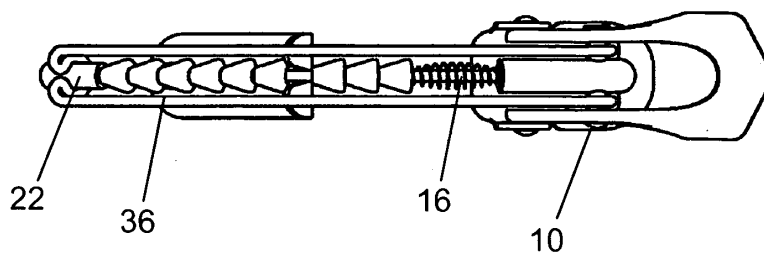


FIG. 9



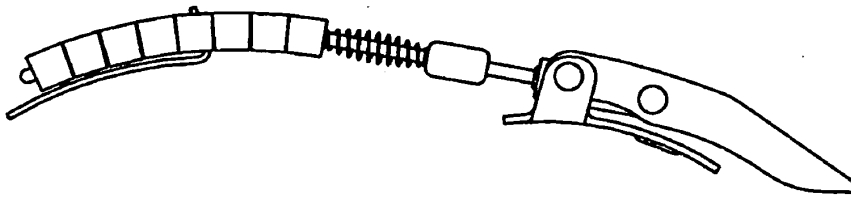


FIG. 10

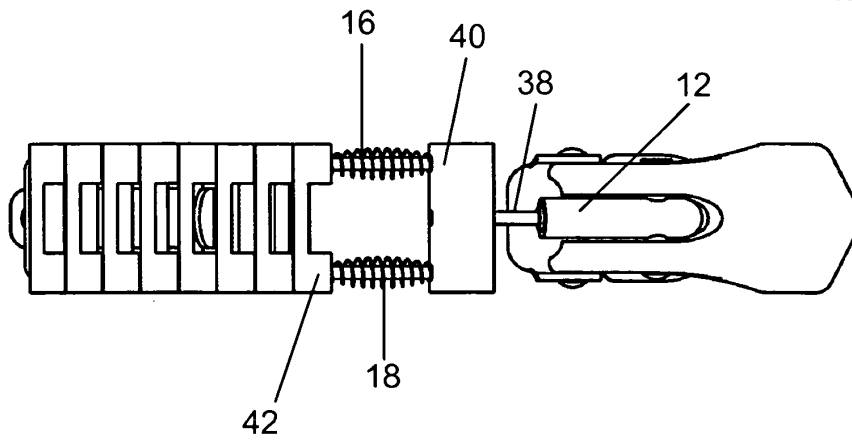


FIG. 11

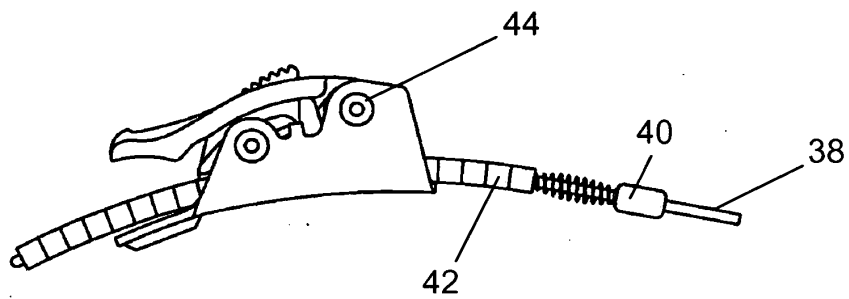


FIG. 12

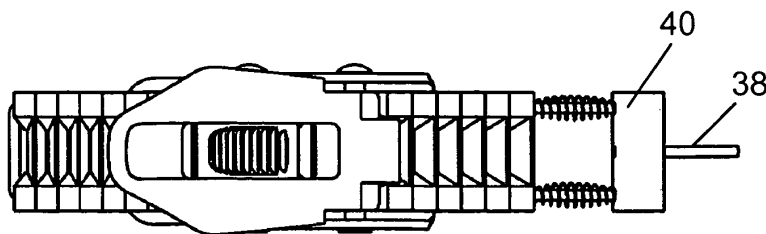


FIG. 13

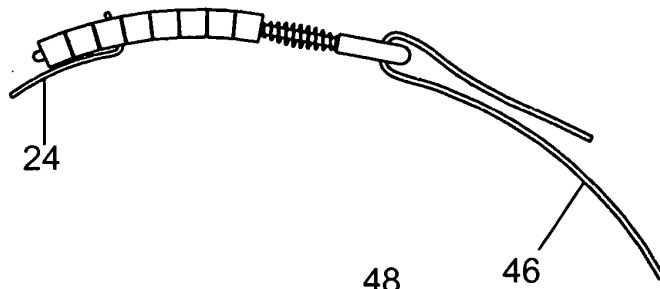


FIG. 14

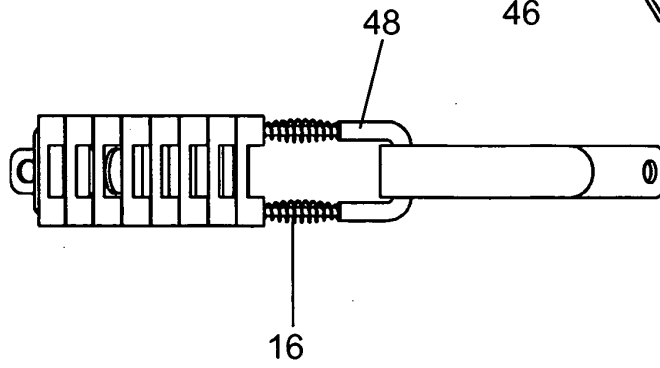


FIG. 15

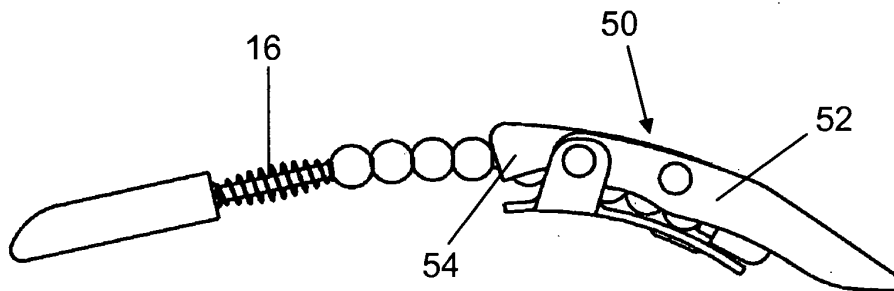


FIG. 16

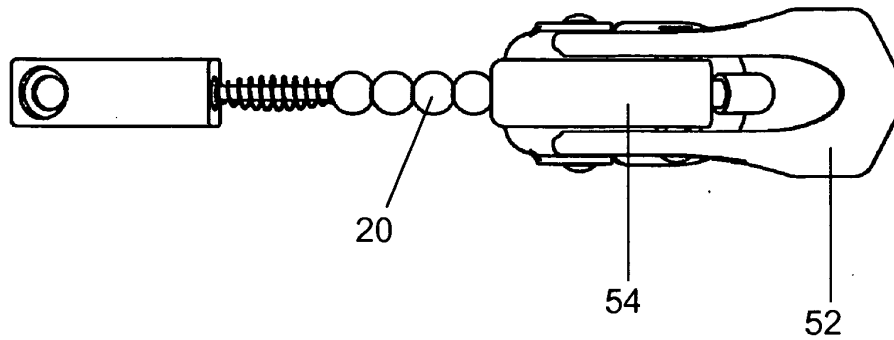


FIG. 17

REFERENCES CITED IN THE DESCRIPTION

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