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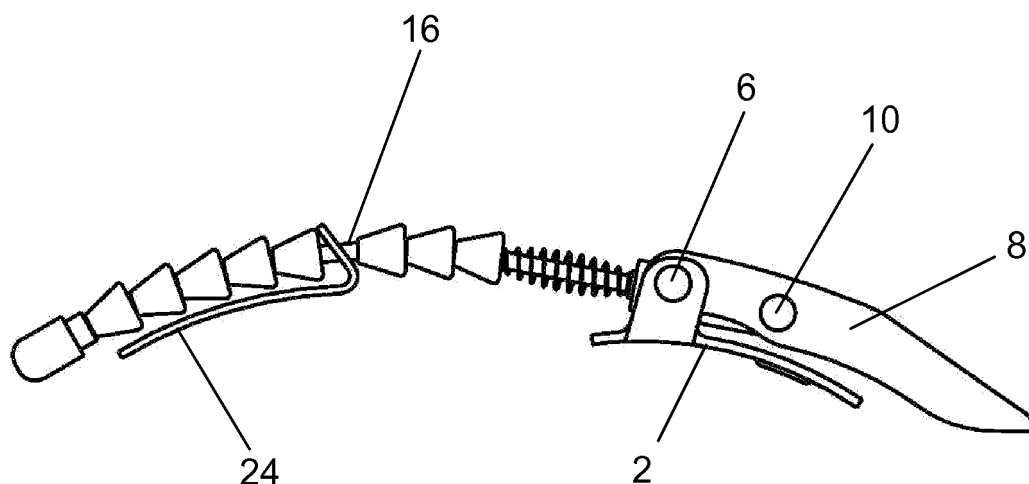
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(54) **Fastening device for sports footwear**

(57) A fastening device for sports footwear, to be applied to the sides of footwear to cause these sides to approach each other, characterised by comprising:
- at least a puller (16) fixed at one end to a side of the vamp and consisting of at least one flexible, inextensible

cable along which there freely slide a plurality of blocks (20,30,42) through which said puller freely passes,
- a coupling element (24,50,44) fixable to the other side of the footwear and selectively interposable between two adjacent blocks,
- traction (8,46) means for the puller.

FIG. 2



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

[0005] 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.

[0006] 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.

[0007] The lever arm is U-shaped, with an internally threaded bush 12 being pivoted between its sides, about a rivet 10.

[0008] 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.

[0009] 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.

[0010] 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 between 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.

[0011] If the clamping effect is not as required, the cable can be engaged in a position between two different blocks and the operation repeated.

[0012] When the desired configuration has been achieved, micro-adjustment is possible by rotating the cable terminal 14 about the threaded bush 12.

[0013] 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.

[0014] 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).

[0015] 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.

[0016] Undesired torsion effects are also eliminated.

[0017] 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.

[0018] This solution has the advantage of being able to engage the blocks in the fork with a single hand.

[0019] 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.

[0020] This embodiment has the advantage of improved puller support on the vamp.

[0021] 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.

[0022] 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.

[0023] This embodiment allows a virtually millimetric degree of tensioning by virtue of the facility offered by

the constraint of the Velcro strip.

[0024] 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 footwear to cause these sides to approach each other, **characterised by** comprising:
 - at least a puller (16) fixed at one end to a side of the vamp and consisting of at least one flexible, inextensible cable along which there freely slide a plurality of blocks (20,30,42) through which said puller freely passes,
 - a coupling element (24,50,44) fixable to the other side of the footwear and selectively interposable between two adjacent blocks,
 - traction (8,46) means for the puller.
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).

FIG. 1

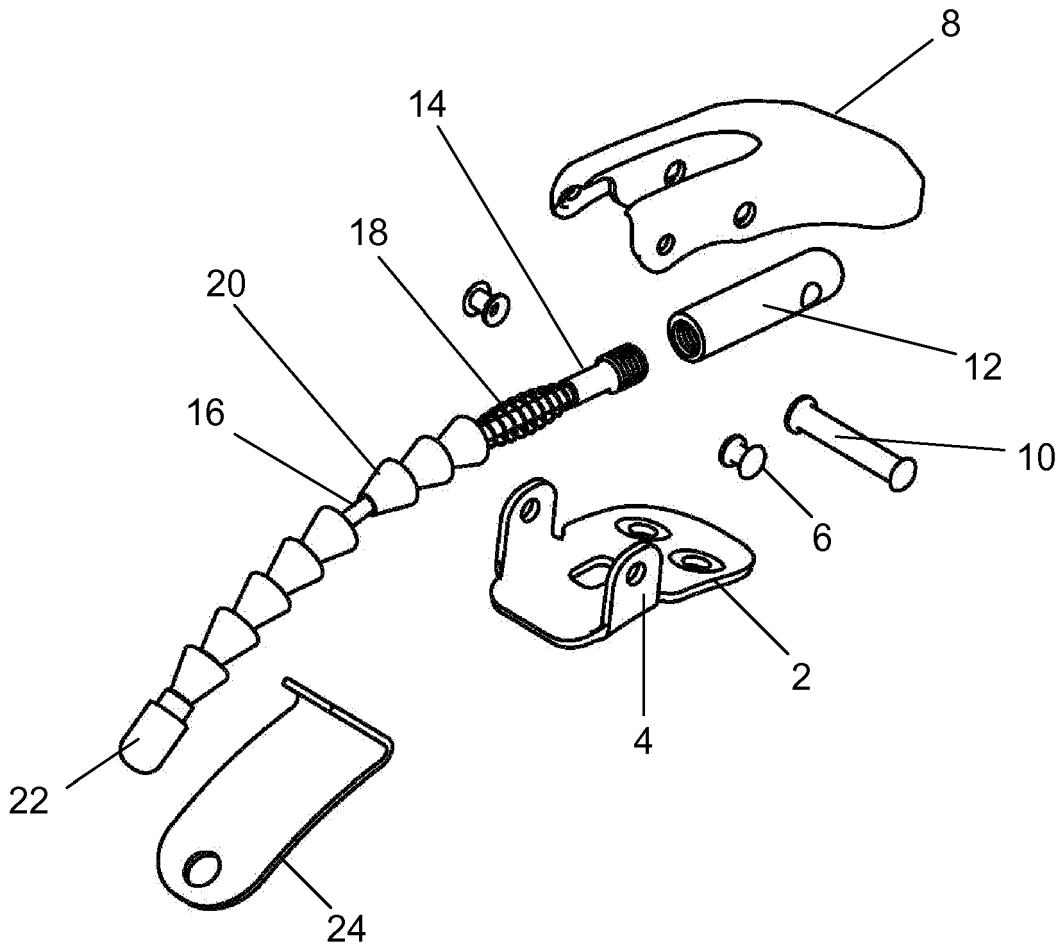


FIG. 2

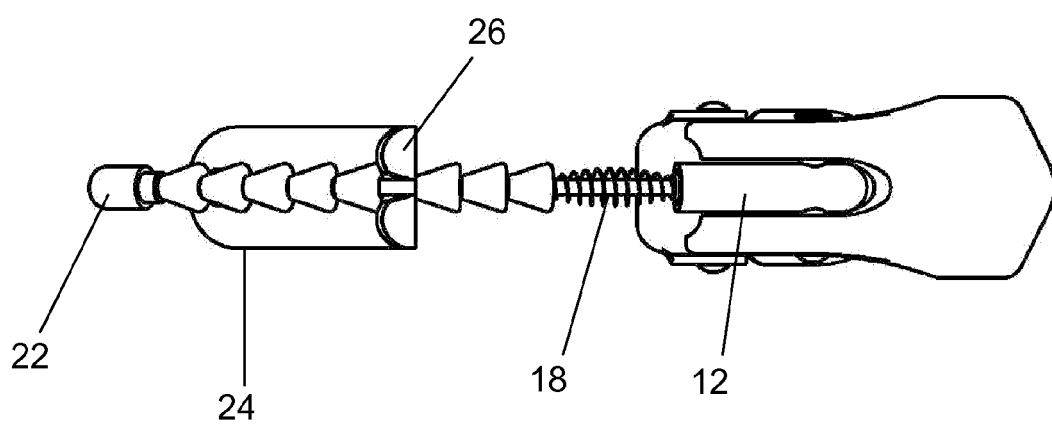
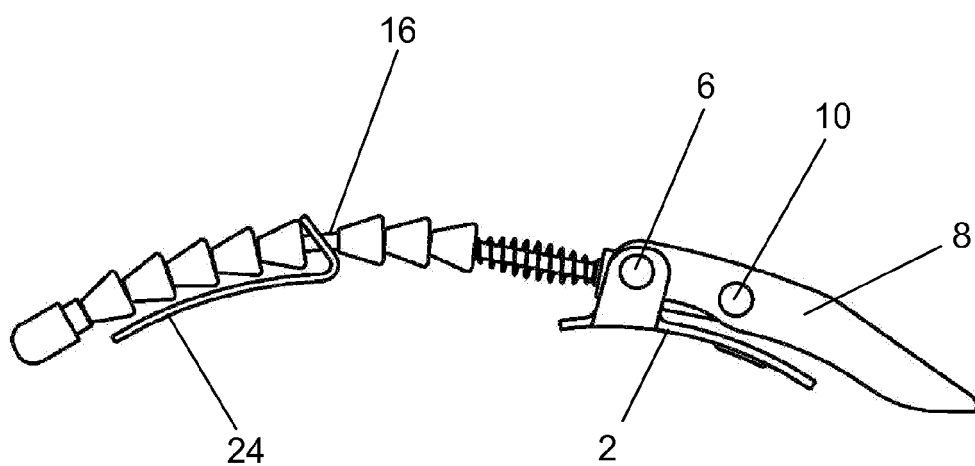


FIG. 3

FIG. 4

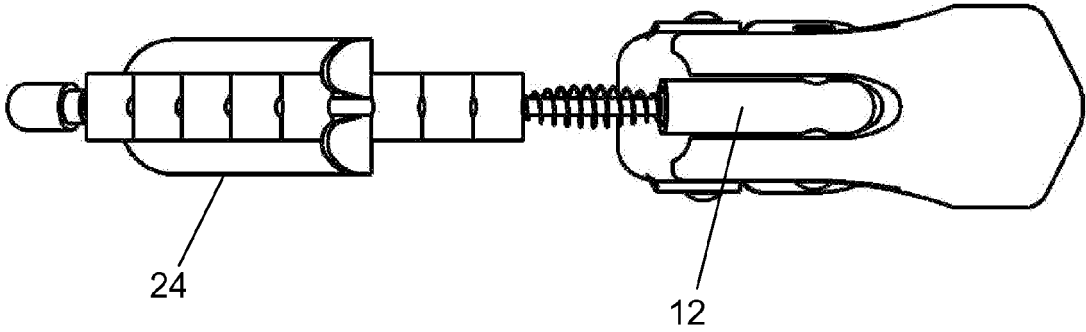
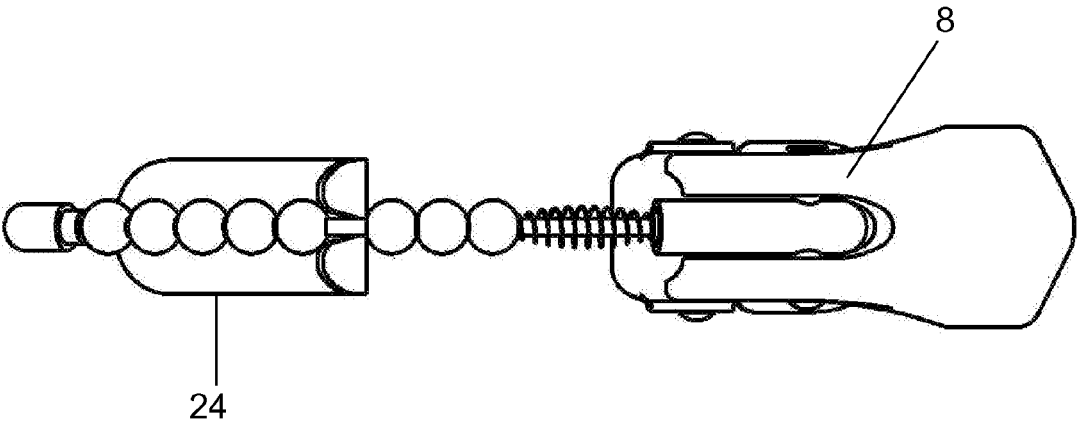


FIG. 5

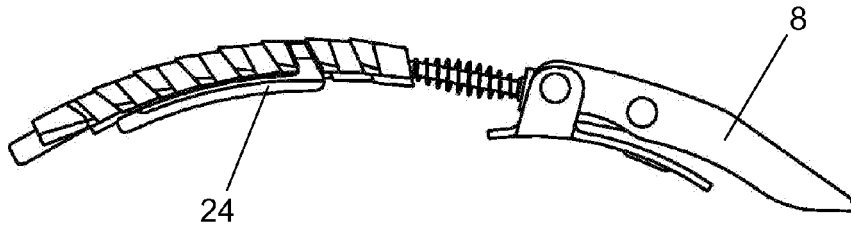


FIG. 6

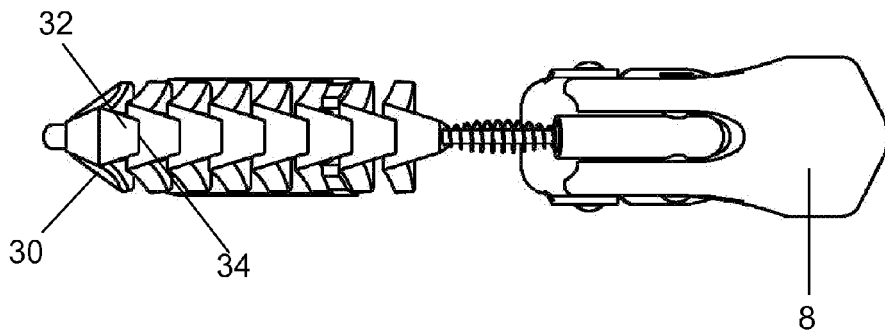


FIG. 7

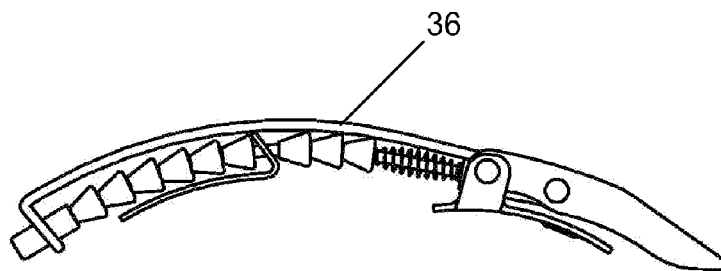


FIG. 8

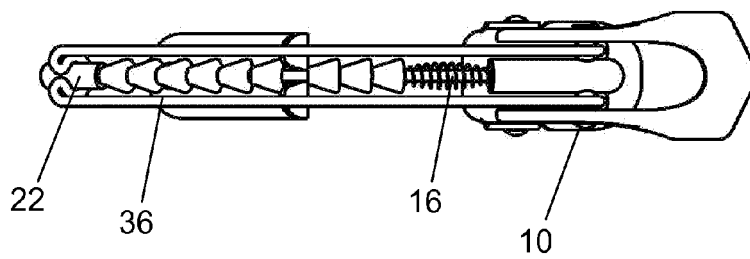


FIG. 9

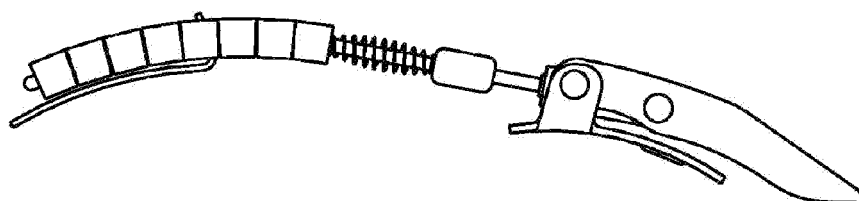


FIG. 10

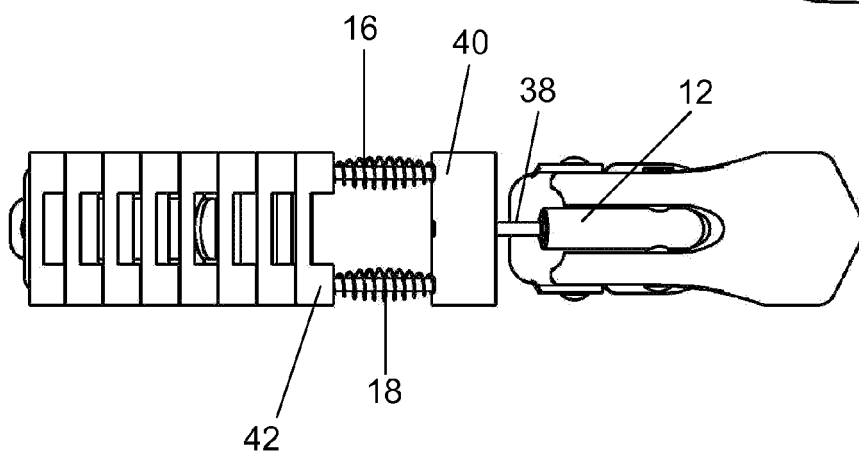


FIG. 11

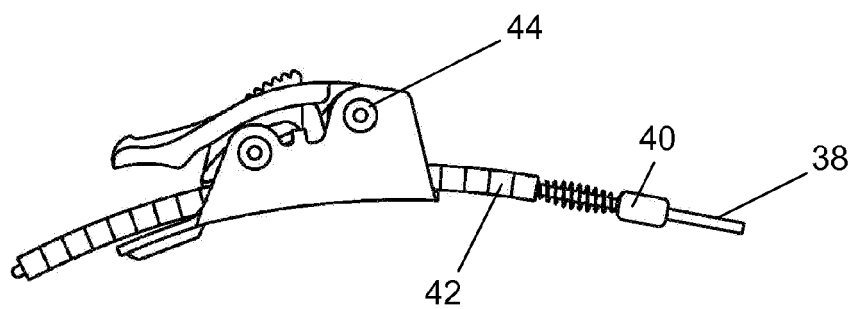


FIG. 12

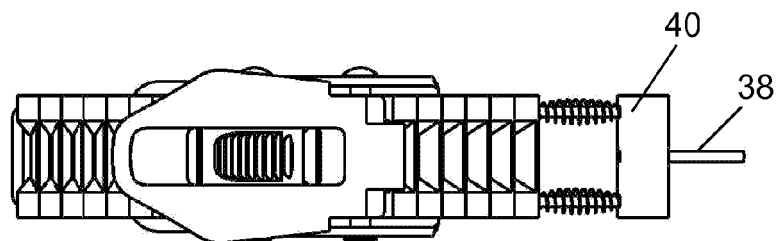


FIG. 13

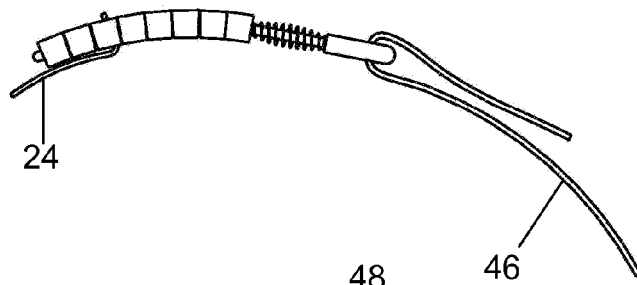


FIG. 14

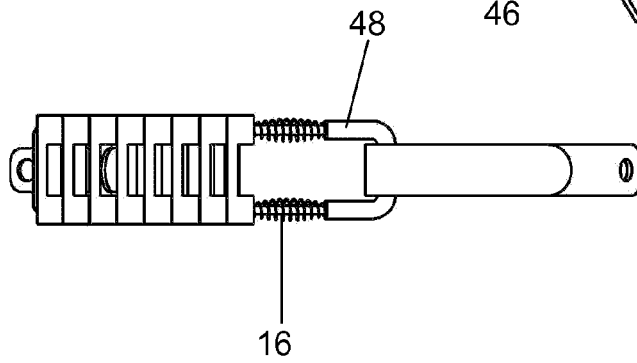


FIG. 15

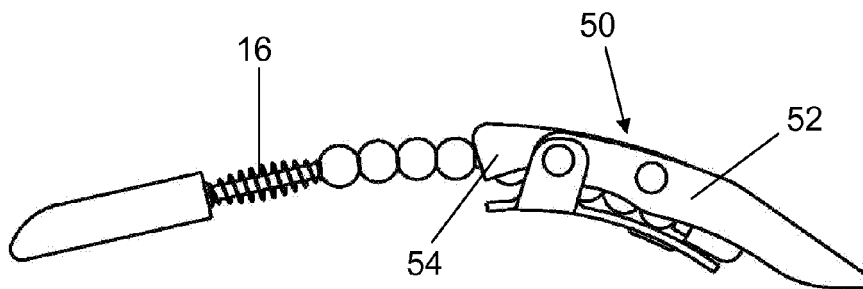


FIG. 16

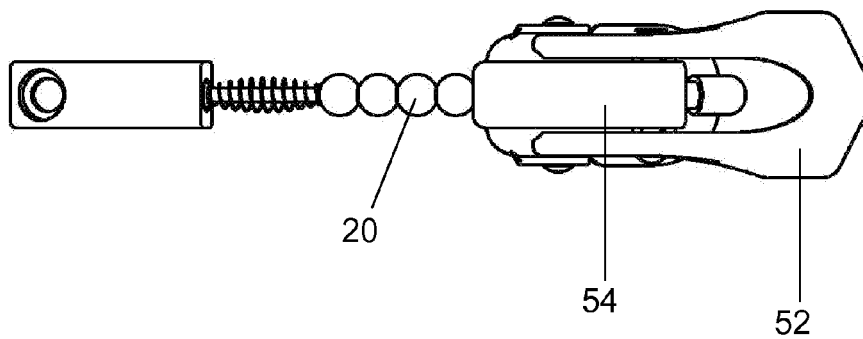


FIG. 17



EUROPEAN SEARCH REPORT

Application Number
EP 08 15 7346

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 39 20 151 A1 (OLIVIERI ICARO & C [IT]) 28 December 1989 (1989-12-28) * the whole document *	1	INV. A43C11/14 A44B11/00
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A	FR 2 536 968 A (OLIVIERI ICARO & C [IT]) 8 June 1984 (1984-06-08) * page 3, line 15 - page 4, line 36; figures *	1	
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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Place of search The Hague		Date of completion of the search 17 October 2008	Examiner Cianci, Sabino
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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17-10-2008

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