

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
1 March 2012 (01.03.2012)

(10) International Publication Number  
**WO 2012/027680 A2**

(51) International Patent Classification:  
*A63B 21/055* (2006.01)    *A45C 13/30* (2006.01)  
*A63B 21/02* (2006.01)

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(21) International Application Number:  
PCT/US2011/049369

(22) International Filing Date:  
26 August 2011 (26.08.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
61/377,700    27 August 2010 (27.08.2010)    US

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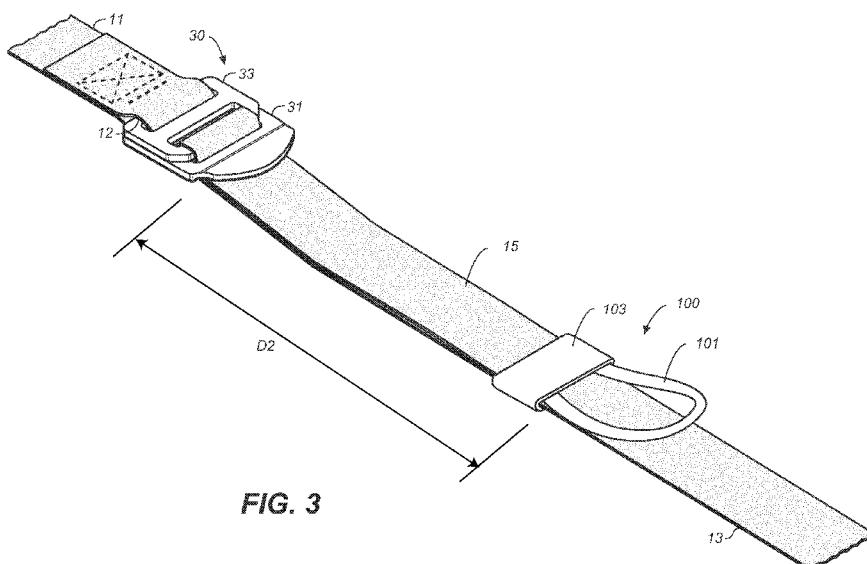
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(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report (Rule 48.2(g))

(54) Title: STRAP RESTRAINT APPARATUS



(57) Abstract: A strap restraint for a device having adjustable straps is disclosed. In one embodiment, a strap restraint for an adjustable device is provided. The device has a strap with an end that doubles back through a length-adjustment mechanism and over the strap. The strap restraint includes an elastic band attached to the end, where the band encircles the strap, and a pair of flexible inelastic fastening elements attached to the end. The strap restraining permits the user to select the force with which the strap restraint holds the end against the strap.

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## STRAP RESTRAINT APPARATUS

### TECHNICAL FIELD

**[0001]** The present invention generally relates to devices having adjustable straps, and in particular to restraints for straps for adjustable length exercise devices.

### BACKGROUND ART

**[0002]** Resistance exercise devices allow a user to exercise by providing a resistance to the movement of a user's arms, legs, or torso. Thus, for example, such devices allow a user to exercise by working one muscle against another, or by working against the weight of the user, by providing a resistance to the movement of a user's arms, legs, or torso. Resistance exercise devices typically include either elastic bands or inelastic straps.

**[0003]** In some devices, straps of variable length are provided so that the user may adjust the size of the device. It can sometimes be difficult to adjust the length of the straps. In addition, the adjustment sometimes results in excess length that can be distracting or a danger to the user.

**[0004]** There is need to provide straps that are more easily adjusted. There is also a need to provide straps that are configured for any excess length to be easily and safely stowed.

### DISCLOSURE OF INVENTION

**[0005]** The present invention overcomes certain disadvantages of prior art by providing straps having an easily grippable portion for adjusting the strap length.

**[0006]** In certain embodiments, an adjustable strap for an exercise device is provided. The strap includes a length of cord attached to an end of the strap.

**[0007]** The present invention overcomes certain other disadvantages of prior art by providing a restraining device affixed to the end of exercise device straps.

**[0008]** In certain embodiments, a strap restraint for an adjustable device is provided. The device has a strap with an end that doubles back through a length-adjustment mechanism and over the strap. The strap restraint includes an elastic band attached to the end, where the band encircles the strap, and a pair of flexible elements attached to the end, where the element is inelastic, is of sufficient size to wrap about the strap, and is fastenable to the other element of the pair of elements. The force with which the strap restraint holds the end against the strap is adjustable by fastening the pair of flexible surfaces about the strap.

[0009] In certain other embodiments, a strap restraint for an adjustable device is provided. The device has a strap having an end that doubles back over the strap through a strap length adjustment mechanism. The strap restraint includes a first mechanism for holding the end against the strap; and a second mechanism for holding the end against the strap.

[0010] In yet other embodiments, an exercise device having adjustable straps and a strap restraint is provided. The exercise device has a strap with an end that doubles back through a length-adjustment mechanism and over the strap. The strap restraint includes an elastic band attached to the end, where the band encircles the strap, and a pair of flexible elements attached to the end, where the element is inelastic, is of sufficient size to wrap about the strap, and is fastenable to the other element of the pair of elements. The force with which the strap restraint holds the end against the strap is adjustable by fastening the pair of flexible surfaces about the strap.

[0011] In certain embodiments, an exercise device having adjustable straps and a strap restraint is provided. The exercise device has a strap having an end that doubles back over the strap through a strap length adjustment mechanism. The strap restraint includes a first mechanism for holding the end against the strap; and a second mechanism for holding the end against the strap.

[0012] These features together with the various ancillary provisions and features which will become apparent to those skilled in the art from the following detailed description, are attained by the apparatus of the present invention, embodiments thereof being shown with reference to the accompanying drawings, by way of example only, wherein:

#### BRIEF DESCRIPTION OF DRAWINGS

[0013] FIG. 1 is a perspective view of one embodiment of strap ends on an exercise device;

[0014] FIG. 2 is a detailed perspective view of a strap end of FIG. 1 at a first position;

[0015] FIG. 3 is a detailed perspective view of the strap ends in a second position;

[0016] FIGS. 4A and 4B are front and back views, respectively, showing the first steps in the construction of the strap end of FIG. 2;

[0017] FIGS. 5A and 5B are front and back views, respectively, showing further steps in the construction of the strap end of FIG. 2;

[0018] FIG. 5C is a sectional view 5C-5C of FIG. 5A; and

[0019] FIGS. 6A and 6B are a perspective view and a sectional view 6B-6B, respectively, illustrating a method for loosening or tightening the strap restraint of FIG. 2.

[0020] Reference symbols and names are used in the Figures to indicate certain components, aspects or features shown therein, with reference symbols common to more than one Figure indicating like components, aspects or features shown therein.

#### MODE(S) FOR CARRYING OUT THE INVENTION

[0021] Figure 1 shows a perspective view of an exercise device **10** including one embodiment of strap ends **100**, shown individually as strap ends **100a** and **100b**. Exercise device **10** is shown for illustrative purposes only, and is not meant to limit the scope of the present invention, except as explicitly claimed.

[0022] Exercise device **10**, for example, includes a door mount **20**, a first inelastic strap **13**, and second and third inelastic straps **11a** and **11b** terminating in grips **17a** and **17b**, respectively. Straps **11a**, **11b**, and **13** pass through mechanisms **30**, shown as mechanism **30a** and **30b** that restrain the movement of strap **13**. As is further shown in FIG. 1, strap **13** includes a first portion **13a** that doubles back through mechanism **30a** as a portion **15a** terminating at strap end **100a**, and a second portion **13b** that doubles back through mechanism **30b** as a portion **15b** terminating at strap end **100b**. The distance between grips **17a** and **17b** may be adjusted according to the length of portions **15a** and/or **15b** by pulling strap ends **100a** and/or **100b** away from mechanism **30a** and/or **30b**.

[0023] Examples of exercise device **10** may be found, for example and without limitation, in co-owned United States Patent Numbers 7,044,896 and 7,762,932, the contents of which are incorporated herein by reference.

[0024] Each strap end **100** includes a strap pull **101** and a strap restraint **103**. Thus, for example, strap end **100a** has a strap pull **101a** and a strap restraint **103a**, and strap end **100b** has a strap pull **101b** and a strap restraint **103b**. As discussed subsequently, strap pull **101** provides a convenient extension of strap **13** to permit the length of the strap to be adjusted. Strap restraint **103** and wraps about strap **13** to keep the strap end from moving about.

[0025] Figure 2 is a detailed perspective view of one strap end **100** provided a first position, **D1**, as measured from mechanism **30**. Strap **11** forms a loop **12** that passes through a ring **31** and a ring **33** of mechanism **30**. Mechanism **30** is shown for connecting and adjusting straps **11** and

**13** and may be, for example and without limitation, the device described in co-owned and pending in United States Patent Serial No. 13/194,522, the contents of which are incorporated herein by reference. Strap **13** passes through rings **31** and **33**, with strap portion **15** extending from mechanism **30** to strap end **100**.

**[0026]** Figure 3 is a detailed perspective view of strap end **100** in another configuration. Specifically, strap pull **101** of FIG. 2 has been pulled away from mechanism **30**, as shown in by the arrow in FIG. 3, to a larger distance, **D2**, as shown in FIG. 3, thus shortening the distance between grips **17a** and **17b**. The grip-to-grip distance can be lengthened by releasing mechanism **30** and pulling on grips **17a/17b**.

**[0027]** Figures 4A, 4B, 5A, 5B, and 5C illustrate the construction of one embodiment of strap end **100**, where FIGS. 4A and 4B are front and back views, respectively, showing the first steps in the construction of the strap end of FIG. 2, FIGS. 5A and 5B are front and back views, respectively, showing further steps in the construction of the strap end of FIG. 2, and FIG. 5C is a sectional view 5C-5C of FIG. 5A.

**[0028]** As shown in FIGS. 4A and 4B, strap restraint **103** includes a piece of material **400** having a length **L** and width **3 W**, where **W** is the width of strap portion **17**. Material **400** forms a central portion **403** that, along with strap pull **101**, is attached to the end of strap portion **17** by stitching **406**. Material **400** also includes with equally sized wings **401** and **405** that extend away from the strap portion. Wing **401** has a fastening surface **402** on one side of material **400**, and wing **405** has a matching fastening surface **404** on the opposite side of material **400**. Matching surfaces **402** and **404** may be, for example and without limitation, a pair of matching hook and loop surfaces of a set of hook-and-loop fasteners.

**[0029]** Next, as shown in FIGS. 5A, 5B, and 5C, strap restraint **103** further includes a material **500** which is an elastic material sewn into a loop by stitching **501** and is attached to central portion **403** by stitching **503**. As shown in more detail in FIG. 5C, wings **401** and **405** may be surrounded by elastic material **500**. Strap restraint **103** thus holds portion **15** against strap **13** with fasteners - that is, by wing **401** folded first, then wing **405** folded over wing **401** – and with the elastic of material **500**.

**[0030]** FIGS. 6A and 6B are a perspective view and a sectional view 6B-6B, respectively, illustrating a method for loosening or tightening the strap restraint of FIG. 2. Material **500** may be pulled way from strap **13**, permitting wings **401** and **405** to be moved and adjusted to control the force by which strap restraint **103** holds strap end **101** to strap **13**.

[0031] In an alternative embodiment, strap restraint **103** includes wings **401** and **405**, but does not include the outer covering of material **500**.

[0032] The material of strap **13** and material **400** may be, for example, a nylon webbing, such as a CORDURA® webbing. In one embodiment, **W** is 37 mm and **L** is 23 mm. The material of strap pull **101** may be, in general, any cord-like material that is relatively inelastic. The material of strap pull **101** may be, for example from 1 to 10 mm in diameter, and may form a loop that extends from 1 cm to 10 cm from the end of strap portion **17**. In one embodiment, the material of strap pull **101** is a 12 cm length of a 7 mm nylon woven cord formed into a loop approximately 6 cm in size. Material **500** may be, for example and without limitation, a 23 mm wide elastic band.

[0033] The invention described herein includes all of the different combinations embodied herein. In addition, throughout this specification, the term “comprising” shall be synonymous with “including,” “containing,” or “characterized by,” is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. “Comprising” is a term of art which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the statement.

[0034] Although the invention(s) presented herein have been disclosed in the context of certain preferred embodiments and examples, it will be understood by those skilled in the art that the invention(s) extend beyond the specifically disclosed embodiments to other alternative embodiments and/or uses of the invention(s) and obvious modifications and equivalents thereof. Thus, it is intended that the scope of the invention(s) herein disclosed should not be limited by the particular embodiments described above, but should be determined only by a fair reading of the claims that follow.

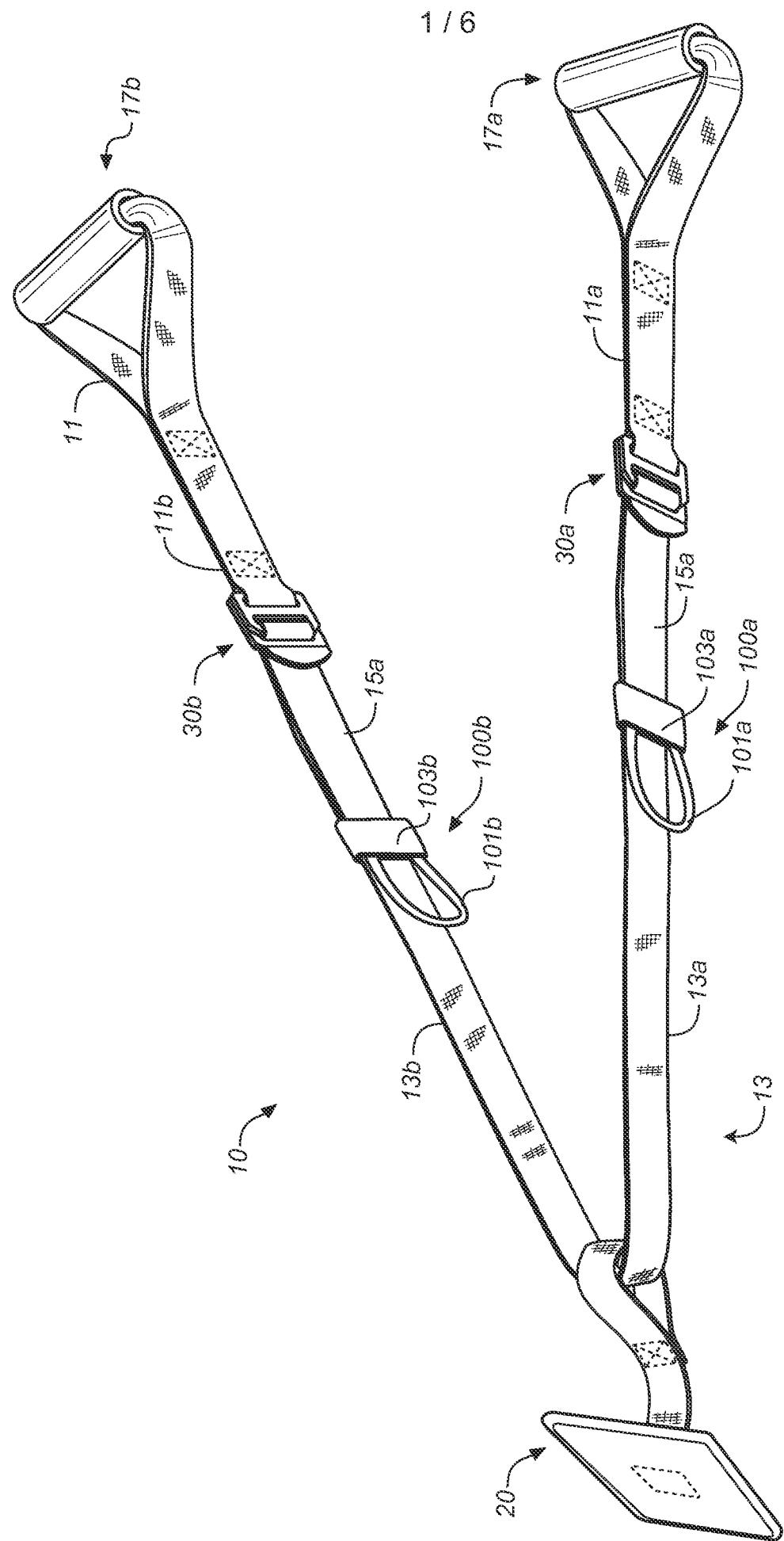
## CLAIMS

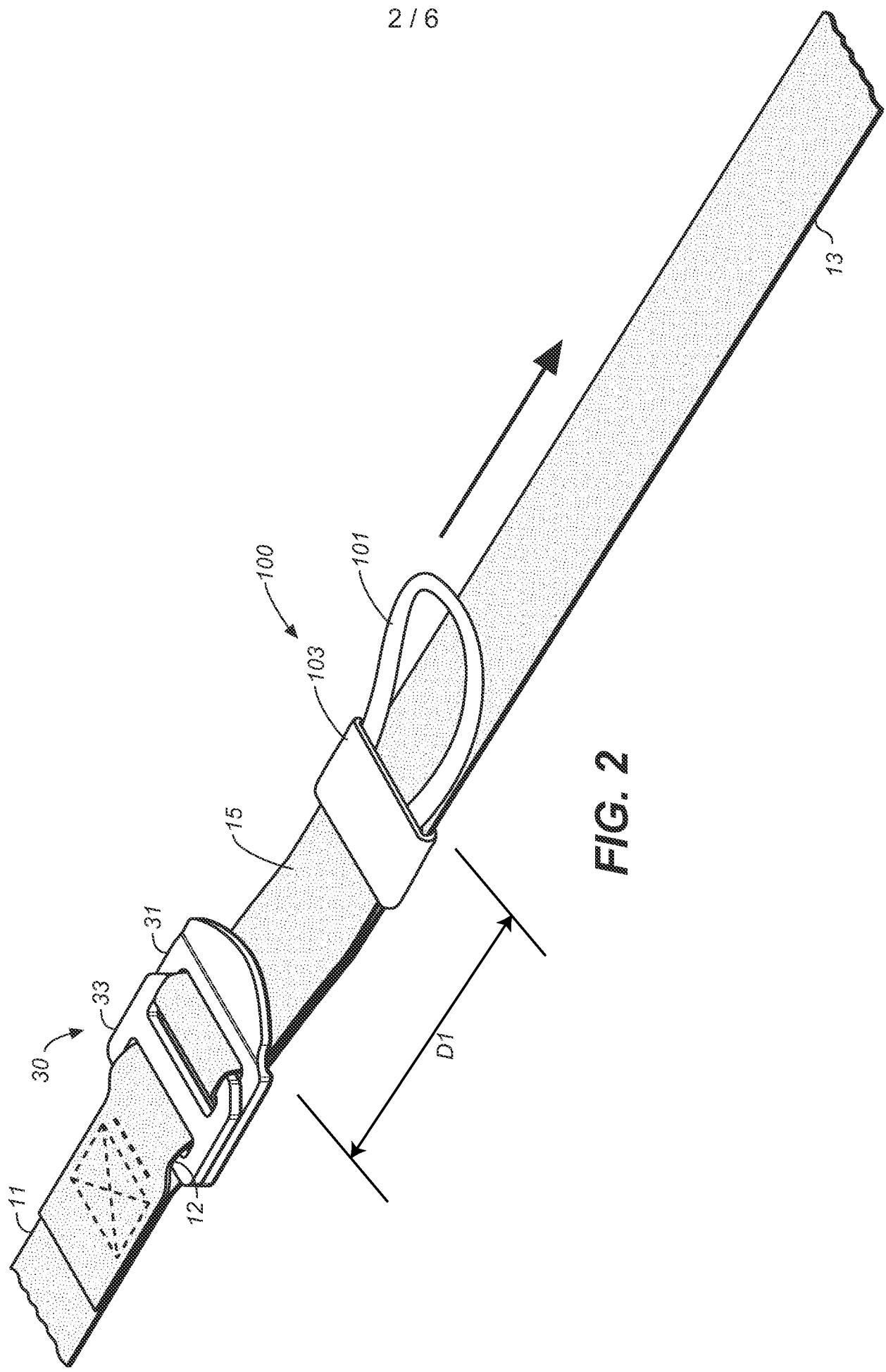
What is claimed is:

1. A strap restraint for an adjustable device having a strap with an end that doubles back through a length-adjustment mechanism and over the strap, the strap restraint comprising:
  - an elastic band attached to the end, where the band encircles the strap; and
  - a pair of flexible elements attached to the end, where the element is inelastic, is of sufficient size to wrap about the strap, and is fastenable to the other element of the pair of elements,

such that the force with which the strap restraint hold the end against the strap is adjustable by fastening the pair of flexible surfaces about the strap.
2. The strap restraint of Claim 1, where the strap has a width W, where each of the pair of elements extends away from the strap by approximately a length W, where each of the pair of elements has one of a pair of fastening surfaces, and where the elements are fastened folding each surface around the strap.
3. The strap restraint of Claim 2, where each of the pair of elements includes one of a hook and loop surface of a hook and loop fastener.
4. The strap restraining of Claim 1, further including strap pull including a loop of material fastened to the strap end.
5. An exercise device having adjustable straps and a strap restraint of Claim 1.
6. A strap restraint for an adjustable device including a strap having an end that doubles back over the strap through a strap length adjustment mechanism, the strap restraint comprising:
  - a first mechanism for holding the end against the strap; and
  - a second mechanism for holding the end against the strap.
7. The strap restraint of Claim 6, where the first mechanism includes an elastic band.
8. The strap restraint of Claim 7, where the second mechanism includes an adjustable band.
9. The strap restraint of Claim 8, where the adjustable band includes a pair of flexible elements fastenable to each other,
10. The strap restraint of Claim 9, where each of the pair of flexible elements includes one of a hook and loop surface of a hook and loop fastener.
11. The strap restraining of Claim 6, further including strap pull including a loop of material fastened to the strap end.

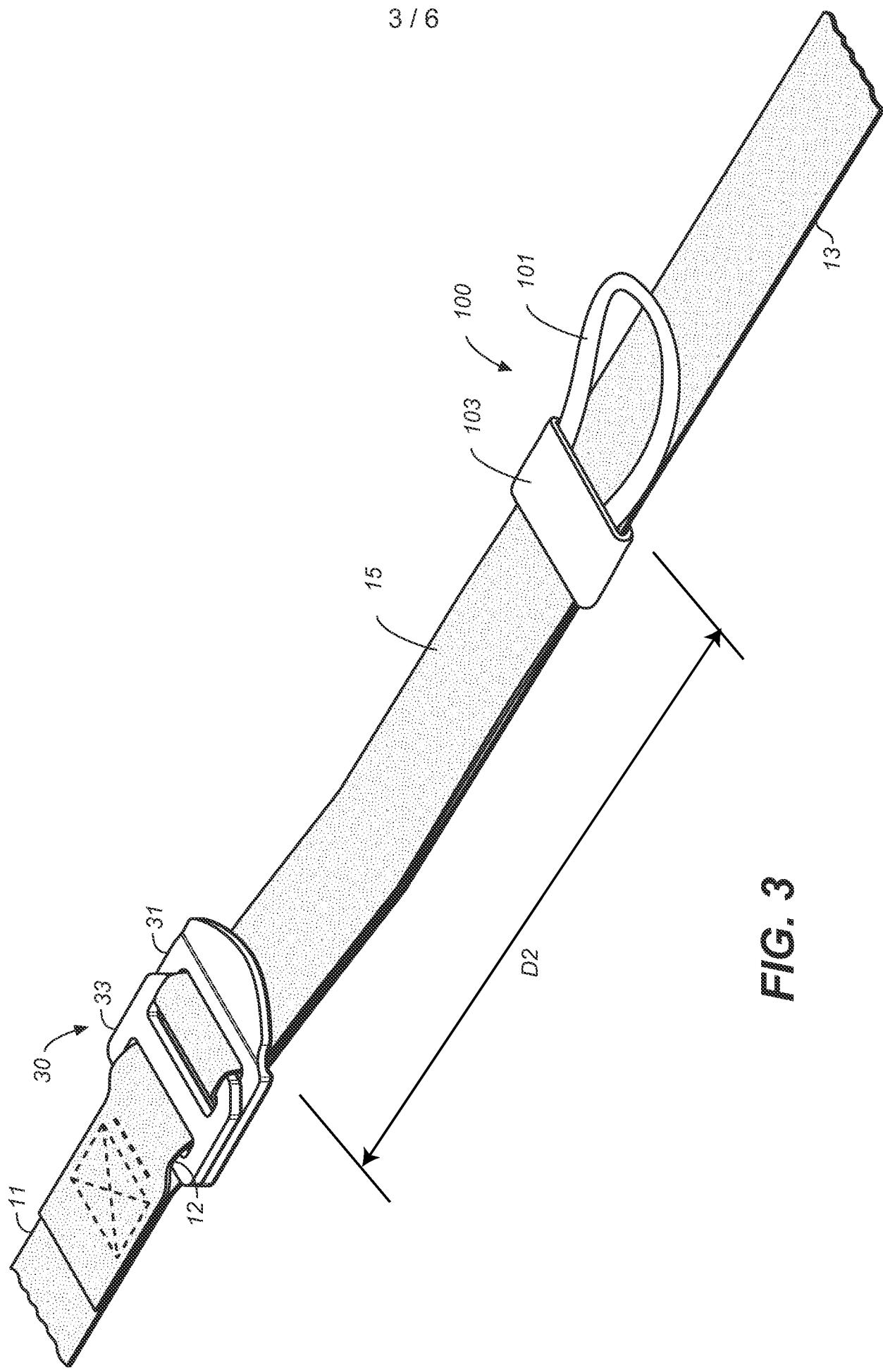
12. An exercise device having adjustable straps including a strap having an end that doubles back over the strap through a strap length adjustment mechanism, said exercise device comprising:
  - a strap restraint including:
    - a first mechanism for holding the end against the strap; and
    - a second mechanism for holding the end against the strap.
13. The strap restraint of Claim 12, where the first mechanism includes an elastic band.
14. The strap restraint of Claim 13, where the second mechanism includes an adjustable band.
15. The strap restraint of Claim 14, where the adjustable band includes a pair of flexible elements fastenable to each other,
16. The strap restraint of Claim 15, where each of the pair of flexible elements includes one of a hook and loop surface of a hook and loop fastener.
17. The strap restraining of Claim 12, further including strap pull including a loop of material fastened to the strap end.
18. A device substantially as shown and described.

**FIG. 1**

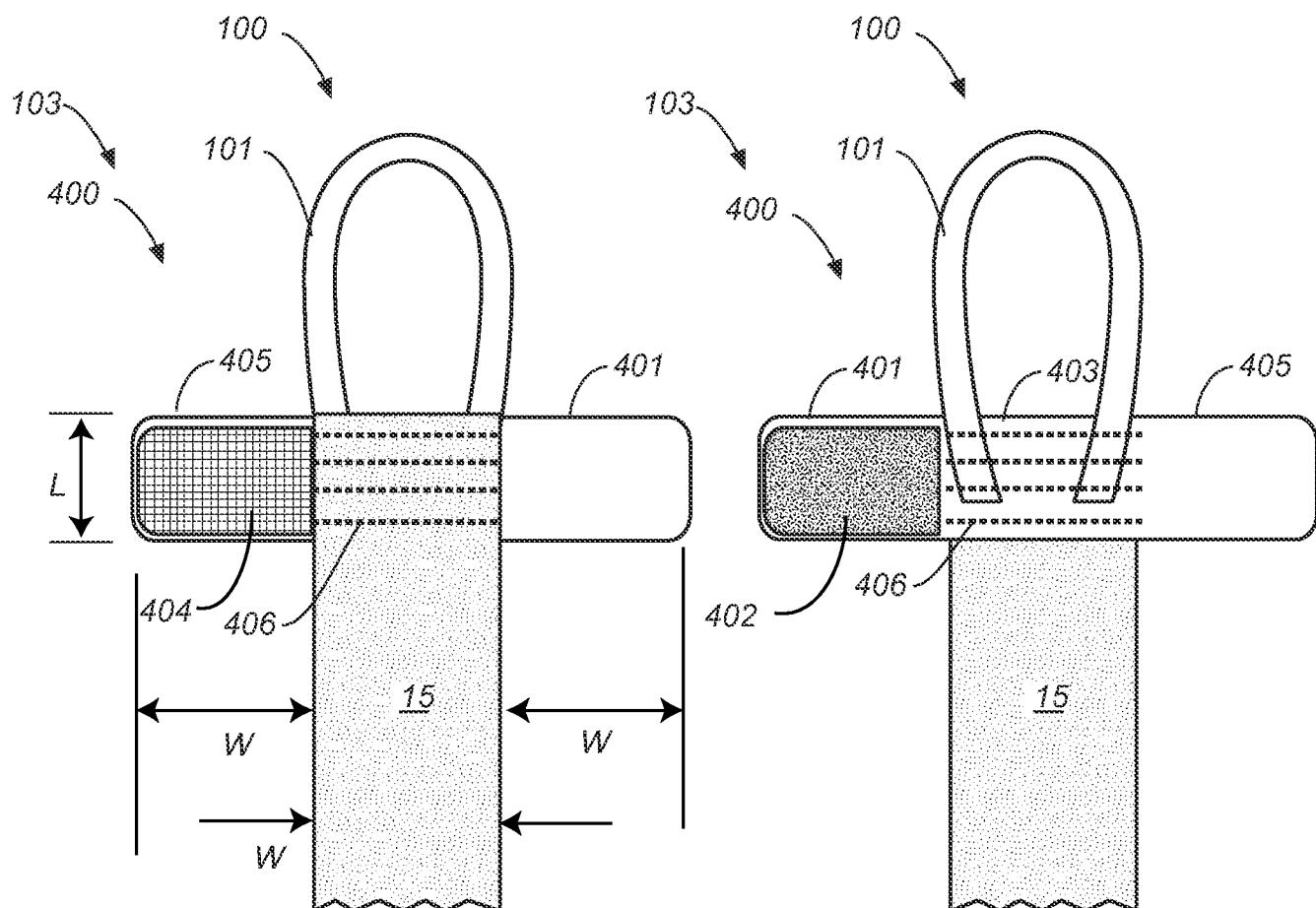


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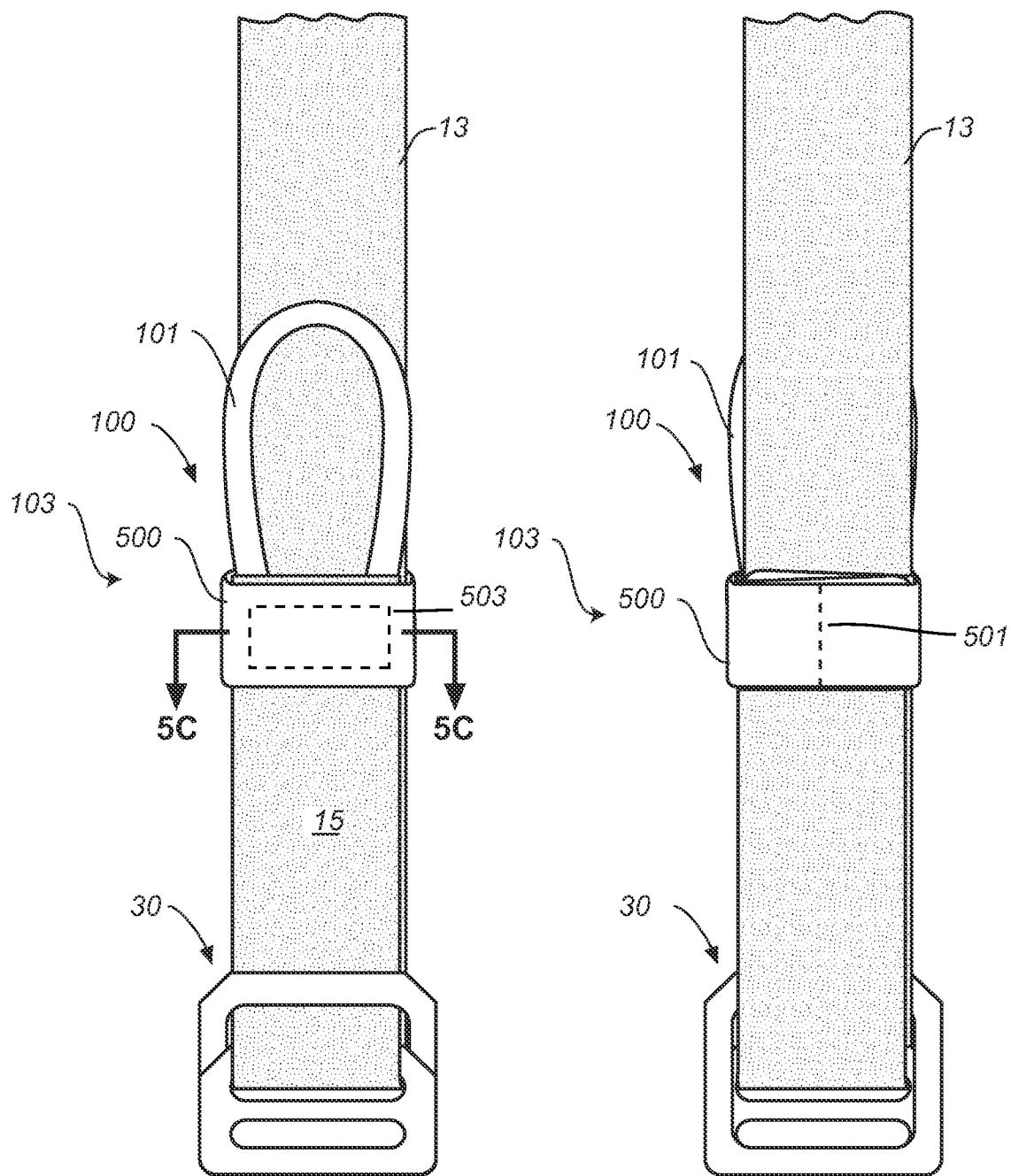


FIG. 5A

FIG. 5B

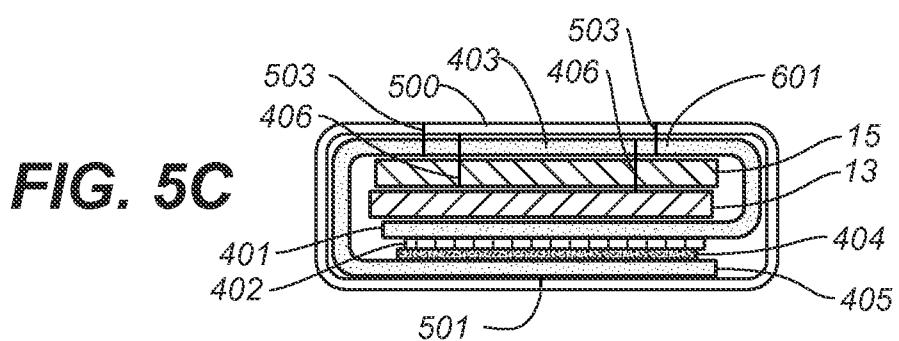


FIG. 5C

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FIG. 6A

