



- (51) **International Patent Classification:** Not classified
- (21) **International Application Number:** PCT/IL2013/050556
- (22) **International Filing Date:** 1 July 2013 (01.07.2013)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
61/669,696 10 July 2012 (10.07.2012) US
61/836,173 18 June 2013 (18.06.2013) US
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- (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, BN, 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, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, 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.

- (84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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, KM, 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:** A BUCKLE SYSTEM

(57) **Abstract:** This invention provides a buckle system comprising a female component capable of engaging a first male component and then being engaged to a second male component with the simultaneous automatic release of said first male component, wherein said first male component is attachable to a first strap or rope, said female component is attachable to a second strap or rope and said second male component is attachable to a third strap or rope, wherein each of said male components comprises a main body; and a guiding element extending from said main body for engaging with said female component; wherein said female component comprises: a substantially hollow upper portion having spaced apart guide rails sized to receive said guiding element therebetween, a proximal end and a distal end; and a lower portion having a proximal end and a distal end, said lower portion comprising a proximal stopper for preventing said male component coupled therewith from shifting proximally, and a distal stopper for preventing said male component coupled therewith from shifting distally; and wherein said upper and lower portions are flexibly displaceable relative to each other and said female component further comprises a locking position wherein said proximal and distal stoppers protrude into said hollow of said upper portion to retain said guiding element inserted therebetween, and a releasing position wherein said proximal and distal stoppers are at least partially distanced from said hollow of said upper portion to enable disengagement of said guiding element from said female component via said distal end of said upper portion; the arrangement being such that, when a first male component is coupled with said female component and locked between said guide rails and said proximal and distal stoppers, a second male component is insertable into the proximal ends of said female component in a manner that first engages said proximal stopper and then simultaneously flexibly displaces both said proximal and distal stoppers from said locking position relative said first male component, whereby said first male component can be advanced past said distal stopper to enable disengagement of the guiding element thereof from said female component via said distal end of said female component while said second male component is advanced past said proximal stopper and takes the place of said first male component in said locking position.



A BUCKLE SYSTEM

FIELD OF THE INVENTION

[001] The present invention relates to the field buckles. More particularly, the present invention relates to a buckle system for carrying bags.

BACKGROUND OF THE INVENTION

[002] A conventional backpack has two shoulder straps, one for hanging over each shoulder. The upper end of each strap is attached to one of each of the left and right sides of an upper portion of the backpack, and the lower end of each strap is attached respectively to one of each of the left and right sides of a lower portion of the backpack. The lower ends of the straps are typically adjustably attached to the backpack to enable the user to lengthen or shorten the straps so that the backpack can sit comfortably on the user's shoulders.

[003] In certain situations it may be desirable to wear the shoulder straps of a backpack in unconventional positions. For instance, instead of the lower end of the left shoulder strap being attached to the lower left portion of the backpack as described above, the user might feel more comfortable with a strap in the "left sling" position, wherein the left shoulder strap crosses the chest, and the lower end is attached to the lower right portion of the backpack. Alternatively, it might be preferable for the right strap to be in the "right sling" position, wherein the right shoulder strap crosses the chest, and the lower end is attached to the lower left portion of the backpack. Yet alternatively, the user might desire the straps to be in the "x" position, wherein both straps cross the chest, and the lower end of the left strap is attached to the lower right portion of the backpack and the lower end of the right strap is attached to the lower left portion of the backpack.

[004] There exist a variety of different types of buckle devices for fastening the two ends of one or more straps or ropes together. One buckle type, commonly found on backpacks and the like, is known as a side release buckle, which comprises a male

component having two spring side arms for engaging with the side openings of a female component. When the side arms are pressed inward, the male component may be released from the engaged state and removed from the female component.

[005] In some backpacks, the lower ends of the straps may be attached to the backpack with side release buckles. This way, the user can release one end of a strap from the backpack and replace it with the end of another strap, thereby selectively alternating between “conventional”, “sling” and “x” positions. However, in order to exchange strap positions the user must first release the end of the first strap before replacing it with the second strap, leaving the straps loose and essentially unsupported throughout. If the user desires to change strap positions while wearing the backpack, performing such a maneuver could lead to dropping the backpack and thereby breaking its contents.

[006] Accordingly, it is a principal object of the present invention to provide a buckle system for a carrying bag, which overcomes at least the drawbacks associated with the buckles as described herein above.

[007] It is another object of the present invention to provide a buckle system that allows the user to exchange positions of two straps while requiring only one strap to be disengaged at a time.

[008] It is yet another object of the present invention to provide a buckle system that requires little or no skill to operate.

[009] Additional objects and advantages of the invention will become apparent from the description provided hereinafter.

SUMMARY OF THE INVENTION

[0010] In one embodiment of the present invention, a buckle system is provided which comprises a female component capable of engaging a first male component and then being engaged to a second male component with the simultaneous automatic release of the first male component, wherein the first male component is attachable to a first strap or rope, the female component is attachable to a second strap or rope and the second male component is attachable to a third strap or rope.

[0011] Each of the male components preferably comprises a main body and a guiding element extending from the main body for engaging with the female component.

[0012] The female component preferably comprises a substantially hollow upper portion having spaced apart guide rails sized to receive the guiding element therebetween, a proximal end and a distal end. The female component preferably further comprises a lower portion having a proximal end and a distal end. The lower portion comprises a proximal stopper for preventing the male component coupled therewith from shifting proximally, and a distal stopper for preventing the male component coupled therewith from shifting distally.

[0013] The upper and lower portions are flexibly displaceable relative to each other. The female component further comprises a locking position wherein the proximal and distal stoppers protrude into the hollow of the upper portion to retain the guiding element inserted therebetween, and a releasing position wherein the proximal and distal stoppers are at least partially distanced from the hollow of the upper portion to enable disengagement of the guiding element from the female component via the distal end of the upper portion.

[0014] The arrangement between the male and female components is such that when a first male component is coupled with the female component and locked between the guide rails and the proximal and distal stoppers, a second male component is insertable into the proximal ends of the female component in a manner that first engages the proximal stopper and then simultaneously flexibly displaces both the proximal and distal stoppers from the locking position relative the first male component. The first male component can then be advanced past the distal stopper to enable disengagement of the guiding element thereof from the female component via the distal end of the female component while the second male component is advanced past the proximal stopper and takes the place of the first male component in the locking position.

[0015] The guiding element preferably comprises a wide section and a narrow section for engaging with the guide rails of the upper portion of the female component.

- [0016] Preferably, the proximal stopper comprises a proximal wall over which the guiding element is traversable in a distal direction, and prevented from being traversed in a proximal direction when the female component is in the locking position.
- [0017] The proximal wall preferably comprises an inclined proximal face and a vertical distal face.
- [0018] The distal stopper preferably comprises a distal wall for preventing the guiding element from shifting in the distal direction entirely past the distal end of the upper portion when the female component is in the locking position.
- [0019] The proximal end of the lower portion of the female component is preferably attached to the proximal end of the upper portion. The female component is preferably shiftable from the locking position to the releasing position by separating the distal end of the lower portion from the distal end of the upper portion.
- [0020] Preferably, the proximal end of the lower portion is integrally joined with the proximal end of the upper portion, and the distal end of the lower portion is normally in contact with the distal end of the upper portion.
- [0021] Preferably, the male component is insertable into the female component when the distal end of the lower portion is separated from the distal end of the upper portion. Alternatively, the distal end of the lower portion is separated from the distal end of the upper portion during the insertion of the male component into the female component.
- [0022] The male component is releasable from the female component when the distal end of the lower portion is separated from the distal end of the upper portion.
- [0023] When the first male component is coupled with the female component and the second male component is inserted into the female component, the distal end of the lower portion is preferably separated from the distal end of the upper portion to simultaneously release the first male component from the female component and couple the second male component with the female component.
- [0024] The lower portion of the female component further preferably comprises an aligning means for maintaining the lower portion aligned with the upper portion. The aligning means preferably comprises at least one projection extending from the lower

portion and a corresponding opening in the upper portion for receiving the projection therein.

[0025] The buckle system preferably comprises at least an additional female component attached to a fourth strap, for joining any one of the first and third straps thereto.

[0026] The male component preferably further comprises a positioning member extending therefrom for maintaining the male component aligned with the female component when coupling therewith.

BRIEF DESCRIPTION OF THE FIGURES

[0027] To accomplish the above and related objects, the invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that changes may be made in the specific construction illustrated and described.

[0028] Fig. 1 shows an exploded view of the buckle system of the present invention;

[0029] Fig. 2 shows the female component of the present invention in an assembled front perspective view, in the locking position and with the male component coupled thereto;

[0030] Fig. 3 shows the female component of the present invention in the releasing position for releasing a male component of the present invention from being coupled therewith;

[0031] Fig. 4 shows the view of Fig. 2, with a second male component of the present invention ready to be inserted into the female component;

[0032] Fig. 5 shows the second male component inserted into the female component, and the release of the first male component from the female component;

[0033] Fig. 6 shows the view of Fig. 5, with the main body and narrow section of the first and second male components removed for clarity; and,

[0034] Fig. 7 shows the first male component release from the female component, and the second male component coupled with the female component.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0035] One embodiment of the buckle system of the present invention comprises a female component capable of engaging a first male component and then being engaged to a second male component with the simultaneous automatic release of the first male component. The first male component is attachable to a first strap or rope, the female component is attachable to a second strap or rope and the second male component is attachable to a third strap or rope.

[0036] With reference to Fig. 1, male and female components of the buckle system of the present invention are shown in an exploded view, generally designated by numeral (100). Buckle system (100) comprises a male component (102), and a female component (104) comprised of an upper portion (106) and a lower portion (108).

[0037] Male component (102) comprises a main body (110) and a guiding element (112) extending therefrom, for insertion into and engaging with female component (104). Guiding element (112) preferably has a wide section (114) shown in the shape of a disk, and a narrow section (116) comprising a shaft for integrally connecting wide section (114) to main body (110).

[0038] Although male component (102) is shown in the figures in a triangular shape, this is only for illustrative purposes, and other suitable shapes are equally contemplated for the present invention. Similarly, the location of guiding element (112) on main body (102) as well as the shapes of wide section (114) and narrow section (116) are merely examples shown in the figures, and other suitable respective locations and shapes of guiding element (112) are equally contemplated.

[0039] Upper portion (106) of female component (104) is substantially hollow, has a proximal end (118) and a distal end (120), and spaced apart guide rails (122) sized to receive guiding element (112) therebetween. Lower portion (108) of female component (104) comprises a proximal end (124) and a distal end (126), and further comprises a proximal stopper (128) for preventing male component (102), when coupled with female component (104), from shifting proximally, and a distal stopper (130) for preventing male component (102), when coupled with female component (104), from shifting distally.

[0040] Referring particularly to Fig. 2, showing the assembled female component (104), and male component (102) is coupled with female component (104). When

assembled, proximal end (118) of upper portion (106) and the proximal end (not seen) of lower portion (108) are attached. Alternatively, the proximal ends are manufactured to be integrally joined with each other.

[0041] Distal end (126) of lower portion (108) is normally in contact with distal end (120) of upper portion (106). Upper portion (106) and lower portion (108) are flexibly displaceable relative to each other, as described further herein below.

[0042] Proximal stopper (128) comprises a wall (132) having an inclined proximal face (134) over which guiding element (112) is traversable in a distal direction, and having a vertical distal face (136) for preventing guiding element (112) from traversing proximal wall (132) in a proximal direction when female component (104) is in a locking position, as described further herein below. Distal stopper (130) comprises an end wall (138) at distal end (126) of lower portion (108) for preventing guiding element (112) from shifting in the distal direction entirely past distal end (120) of upper portion (106) when female component (104) is in the locking position.

[0043] Although not shown in the figures, male component (102) is insertable into female component (104) after first separating distal end (126) of lower portion (108) from distal end (120) of upper portion (106). Alternatively, distal end (126) of lower portion (108) is separated from distal end of (120) upper portion (106) during the insertion of male component (102) into female component (104).

[0044] As seen only in Fig. 3, male component (102) further comprises a pushing member (140) extending from a central section (142) of main body (110), preferably along the central longitudinal axis of main body (110). Central section (142) is partially cut out of main body (110) creating a cantilever type element, and provides a spring-like movement when pressing thereon. When inserting male component (102) into female component (104) as described herein above, central section (142) may be pressed downward such that pushing member (140) contacts the proximal stopper and forces it away from upper portion (106), thereby separating distal end (126) of lower portion (108) from distal end (120) of upper portion (106).

[0045] As mentioned above and seen in Fig. 2, female component (104) when assembled comprises a locking position wherein proximal and distal stoppers (128), (130) protrude into the hollow of upper portion (106) for retaining guiding element (112)

inserted therebetween. Female component (104) further comprises a releasing position wherein proximal and distal stoppers (128), (130) are at least partially distanced from the hollow of upper portion (106), for enabling the disengagement of guiding element (112) from female component (104) via distal end (120) of upper portion (106).

[0046] By separating the distal end (126) of lower portion (108) from distal end (120) of upper portion (106), female component (104) is shiftable from the locking position to the releasing position

[0047] Fig. 3 shows female component (104) in a releasing position for releasing male component (102) therefrom. Upper and lower portions (106), (108) are shown flexibly displaced such that guiding element (112) is slidable over distal stopper (130) of distal end (126) of lower portion (108).

[0048] As seen in the figures and best seen in Fig. 1, lower portion (108) further comprises an aligning means (146) for maintaining lower portion (108) aligned with upper portion (106). Aligning means (146) comprises two projections (148) extending from opposing transverse edges (149) of lower portion (108). A corresponding opening (150) is situated in each side wall (152) of upper portion (106) for receiving projections (148) therein. Projections (148) comprise a vertical proximal wall (154) and an inclined distal wall (156), and openings (150) comprise a corresponding vertical proximal wall (158) and inclined distal wall (160) such that projections may be inserted into and removed from openings (150) when shifting female component (104) between locking and releasing positions. The tip of each projection comprises an inwardly directed lip (162) for serving as a segment of guide rails (122) of upper portion (106).

[0049] Fig. 4 shows the view of Fig. 2, where a first male component (102a) is coupled with female component (104) and locked between guide rails (122) and proximal and distal stoppers (128), (130), and a second male component (102b) is shown ready to be inserted into female component (104) at proximal end (118) of upper portion (106) of female component (104).

[0050] With reference to Fig. 5, second male component (102b) is inserted into female component (104) at proximal end (118) in a manner that the guiding element (not

seen in the figure) shifts along guide rails (122) and first engages proximal stopper (not seen in the figure) and then simultaneously flexibly displaces both the proximal stopper and distal stopper (130) from the locking position to the releasing position relative to first male component (102a). Fig. 6 shows female component (104) of Fig. 5 with the main body and the narrow sections of the first and second male components removed for clarity. Wide section (114b) of guiding element (112b) of the second male component is shown positioned over proximal stopper (128), thereby enabling wide section (114a) of guiding element (112a) of the first male stopper to shift past guide rails (122) at distal end (120) of upper portion (106) and over distal stopper (130) at distal end (126) of lower portion (108).

[0051] Thus, as seen in Fig. 5, first male component (102a) can be advanced past distal stopper (130) to enable the disengagement of guiding element (112a) thereof from female component (104), while second male component (102b) is advanced past proximal stopper (128) and takes the place of first male component (102a) coupled with female component (104) in the locking position.

[0052] Fig. 7 shows first male component (102a) following its release from female component (104), and second male component (102b) coupled with female component (104), locked between guide rails (122) and proximal and distal stoppers (128), (130).

[0053] As seen in the figures, particularly in Fig. 1, the distal end (164) of male component (102) and proximal end (118) of upper portion (106) of female component (104) comprise slots (103), (105) through which the end of a strap (not shown) of a carrying bag (not shown) may be fastened. Thus, in a preferred embodiment, the buckle system of the present invention comprises a first male component attached to a first strap and a female component attached to a second strap, wherein the coupling of the first male component with the female component joins together the first and second straps of a carrying bag. A second male component is attached to a third strap for selectively exchanging positions with the first male component, to couple with the female component.

[0054] In an alternative preferred embodiment (not shown), the buckle system of the present invention further comprises at least an additional female component attached to a fourth strap, for joining together with any one of the first and third straps.

[0055] It is understood that the above description of the embodiments of the present invention are for illustrative purposes only, and is not meant to be exhaustive or to limit the invention to the precise form or forms disclosed, as many modifications and variations are possible. Such modifications and variations are intended to be included within the scope of the present invention as defined by the accompanying claims.

[0056] CLAIMS

1. A buckle system comprising a female component capable of engaging a first male component and then being engaged to a second male component with the simultaneous automatic release of said first male component, wherein said first male component is attachable to a first strap or rope, said female component is attachable to a second strap or rope and said second male component is attachable to a third strap or rope,

wherein each of said male components comprises:

- a. a main body; and
- b. a guiding element extending from said main body for engaging with said female component;

wherein said female component comprises:

- a. a substantially hollow upper portion having spaced apart guide rails sized to receive said guiding element therebetween, a proximal end and a distal end; and
- b. a lower portion having a proximal end and a distal end, said lower portion comprising a proximal stopper for preventing said male component coupled therewith from shifting proximally, and a distal stopper for preventing said male component coupled therewith from shifting distally; and

wherein said upper and lower portions are flexibly displaceable relative to each other and said female component further comprises a locking position wherein said proximal and distal stoppers protrude into said hollow of said upper portion to retain said guiding element inserted therebetween, and a releasing position wherein said proximal and distal stoppers are at least partially distanced from said hollow of said upper portion to enable disengagement of said guiding element from said female component via said distal end of said upper portion;

the arrangement being such that, when a first male component is coupled with said female component and locked between said guide rails and said proximal and distal stoppers, a second male component is insertable into the proximal ends of

said female component in a manner that first engages said proximal stopper and then simultaneously flexibly displaces both said proximal and distal stoppers from said locking position relative said first male component, whereby said first male component can be advanced past said distal stopper to enable disengagement of the guiding element thereof from said female component via said distal end of said female component while said second male component is advanced past said proximal stopper and takes the place of said first male component in said locking position.

2. A buckle system according to claim 1, wherein the guiding element comprises a wide section and a narrow section for engaging with the guide rails of the upper portion of the female component.
3. A buckle system according to claim 1, wherein the proximal stopper comprises a proximal wall over which the guiding element is traversable in a distal direction, and prevented from being traversed in a proximal direction when the female component is in the locking position.
4. A buckle system according to claim 3, wherein the proximal wall comprises an inclined proximal face and a vertical distal face.
5. A buckle system according to claim 1, wherein the distal stopper comprises a distal wall for preventing the guiding element from shifting in the distal direction entirely past the distal end of the upper portion when the female component is in the locking position.
6. A buckle system according to claim 1, wherein the proximal end of the lower portion of the female component is attached to the proximal end of the upper portion, and wherein the female component is shiftable from the locking position to the releasing position by separating the distal end of said lower portion from the distal end of said upper portion.

7. A buckle system according to claim 6, wherein the proximal end of the lower portion is integrally joined with the proximal end of the upper portion.
8. A buckle system according to claim 6, wherein the distal end of the lower portion is normally in contact with the distal end of the upper portion.
9. A buckle system according to claim 6, wherein the male component is insertable into the female component when the distal end of the lower portion is separated from the distal end of the upper portion.
10. A buckle system according to claim 6, wherein the distal end of the lower portion is separated from the distal end of the upper portion during the insertion of the male component into the female component.
11. A buckle system according to claim 6, wherein the male component is releasable from the female component when the distal end of the lower portion is separated from the distal end of the upper portion.
12. A buckle system according to claim 6, wherein when the first male component is coupled with the female component and the second male component is inserted into said female component, the distal end of the lower portion is separated from the distal end of the upper portion to simultaneously release said first male component from said female component and couple said second male component with said female component.
13. A buckle system according to claim 1, wherein the lower portion of the female component further comprises an aligning means for maintaining said lower portion aligned with the upper portion.

14. A buckle system according to claim 13, wherein the aligning means comprises at least one projection extending from the lower portion and a corresponding opening in the upper portion for receiving said projection therein.
15. A buckle system according to claim 1, further comprising at least an additional female component attached to a fourth strap, for joining any one of the first and third straps thereto.
16. A buckle system according to claim 1, wherein the male component further comprises a positioning member extending therefrom for maintaining said male component aligned with the female component when coupling therewith.

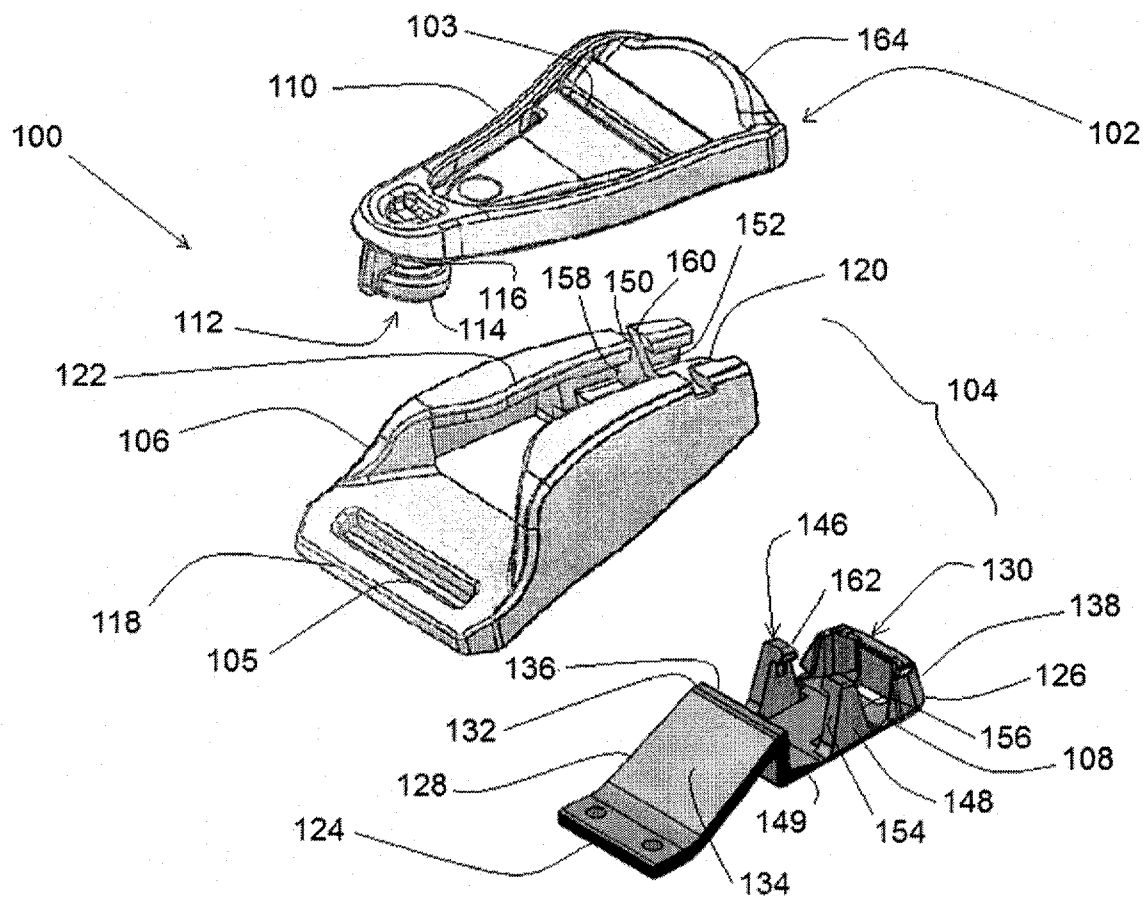


Fig. 1

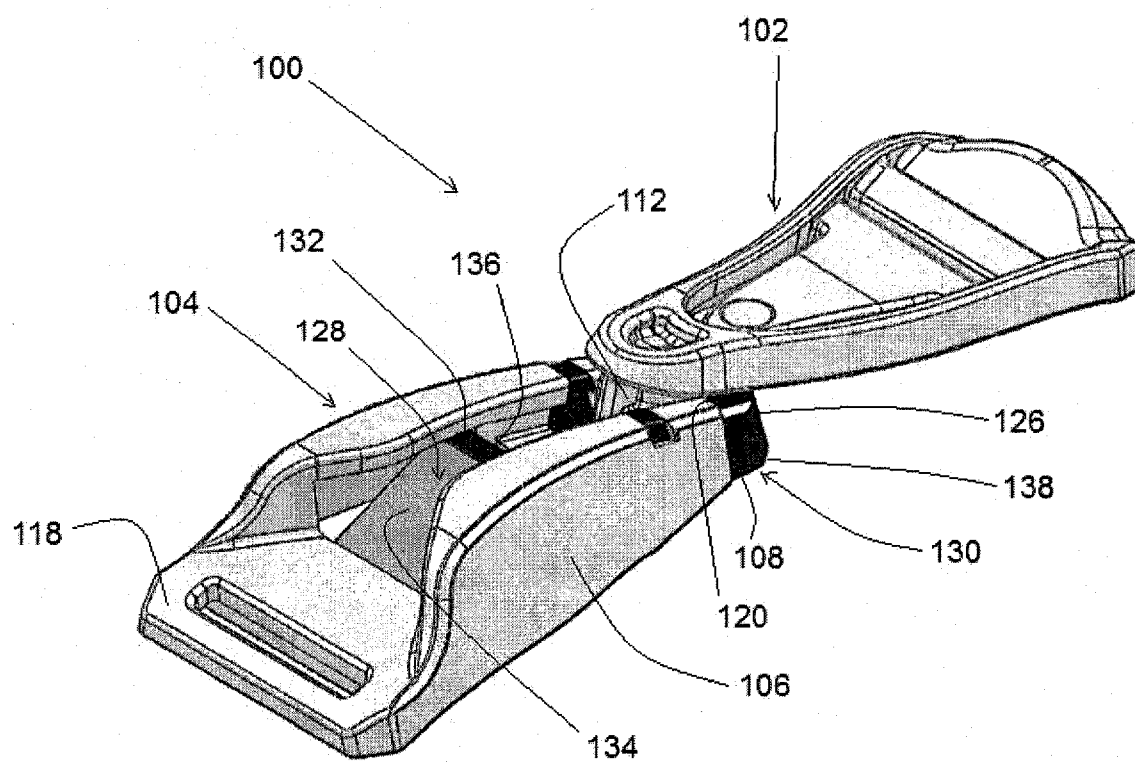


Fig. 2

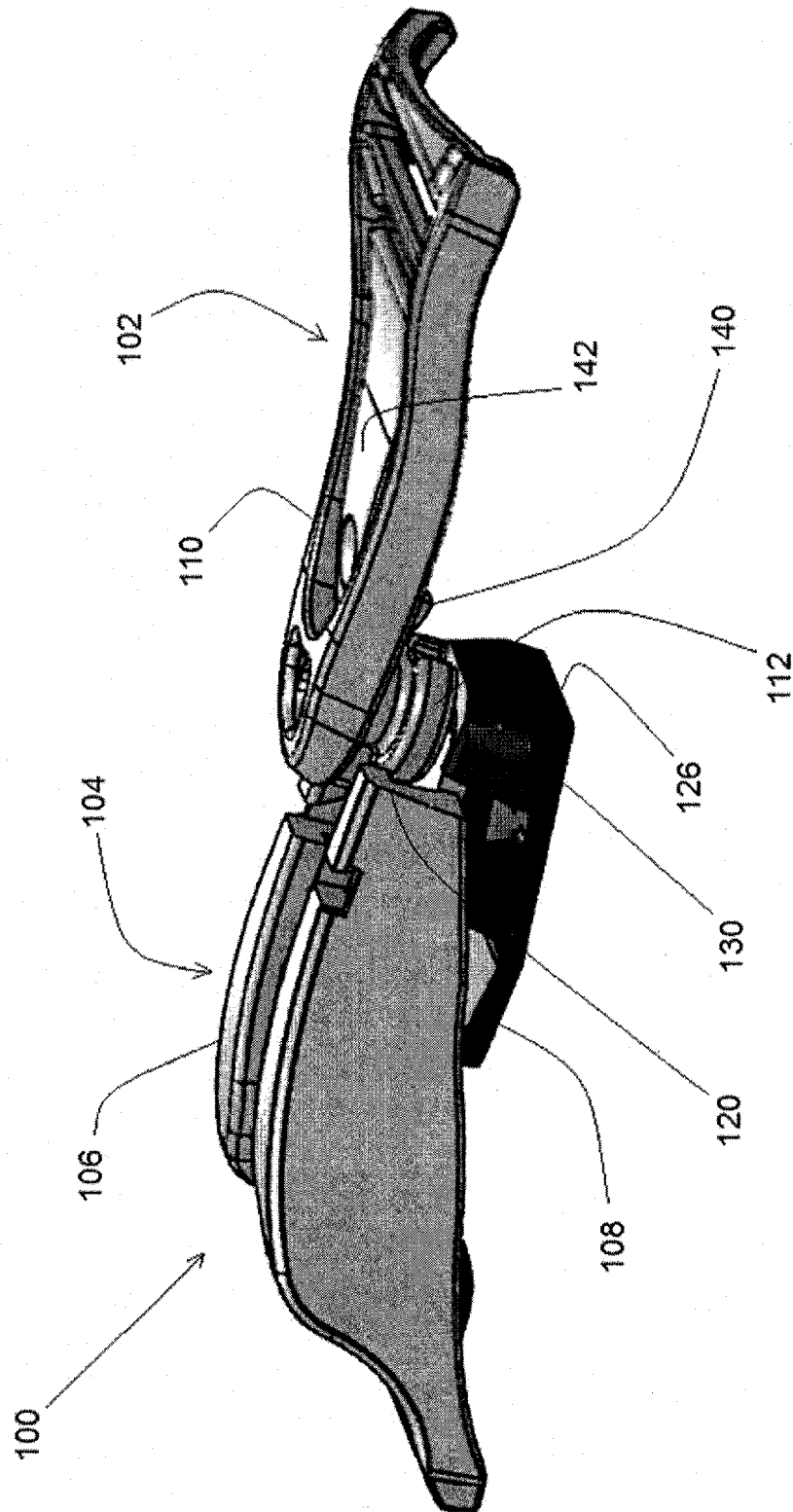


Fig. 3

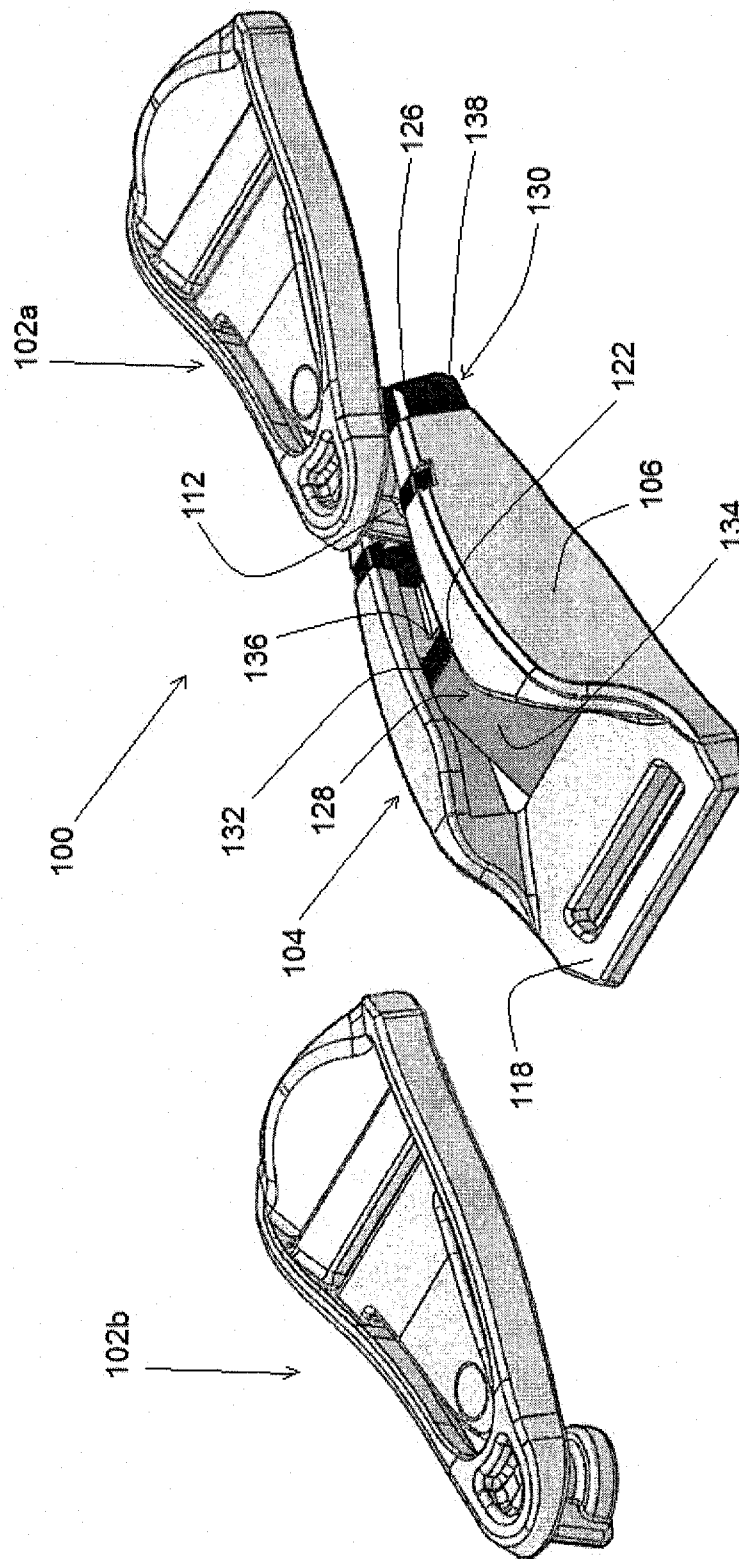


Fig. 4

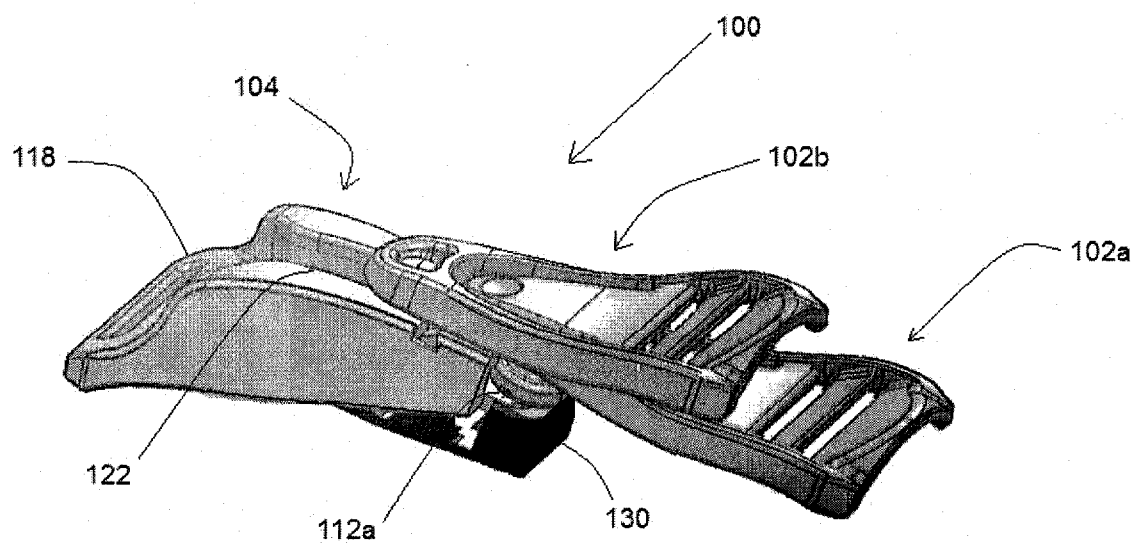


Fig. 5

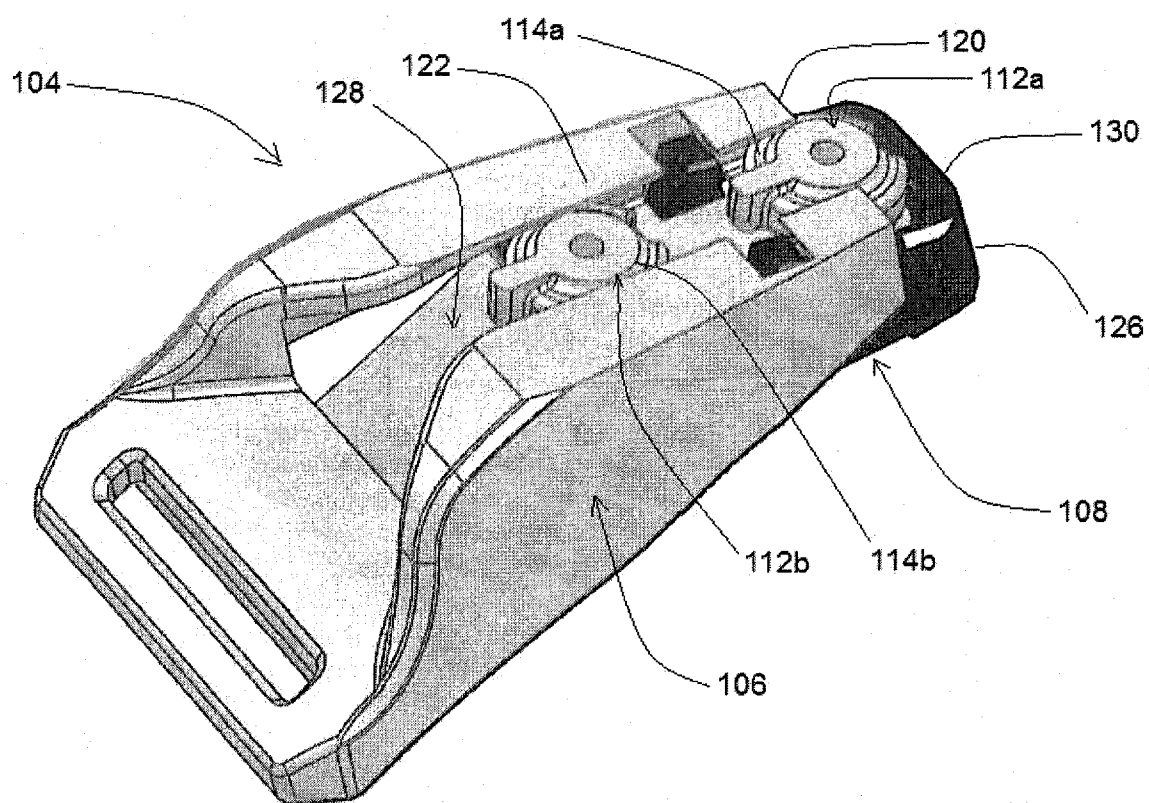


Fig. 6

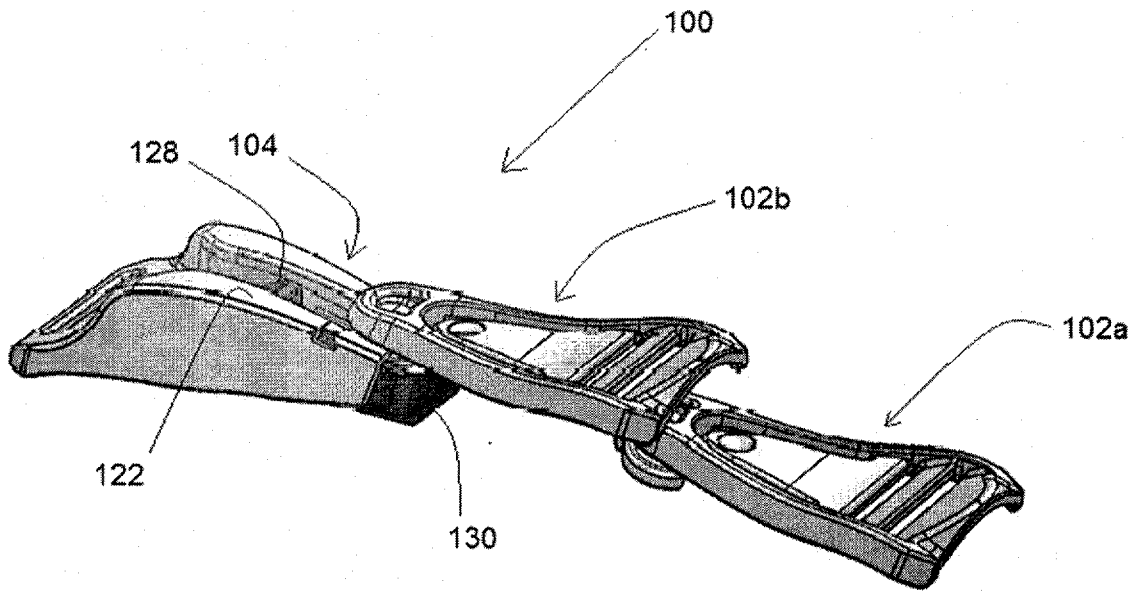


Fig. 7