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(54) Title: ATTACHMENT CLIP ASSEMBLY

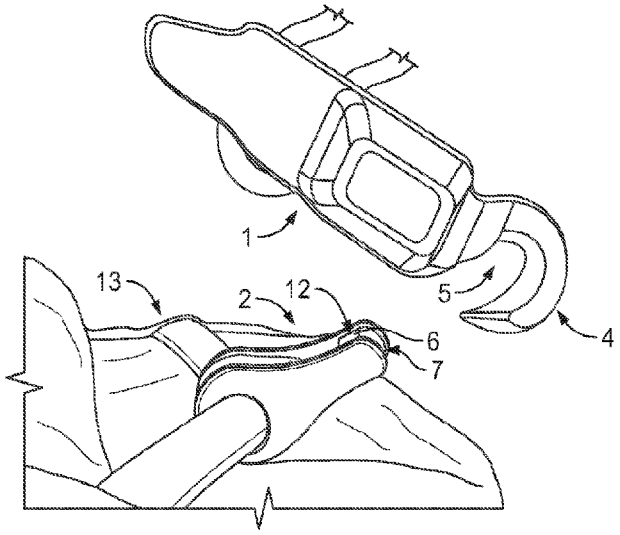

FIG. 3

(57) Abstract: An attachment clip assembly (1) is provided that includes a clip configured to be coupled with a first component. The clip includes a hook (4) that partially encircles a slot (5). The assembly also includes an attachment member (2) configured to be coupled with a second component. The attachment member includes an elongated attachment bar (6) shaped to fit inside the slot defined by the hook of the clip. The clip and the attachment member are configured to couple the first component with the second component by rotating one or more of the clip or the attachment member in a first direction relative to the other of the clip or attachment member, inserting the attachment bar of the attachment member into the slot defined by the hook of the clip, and then rotating the one or more of the clip or the attachment member in an opposite, second direction.

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ATTACHMENT CLIP ASSEMBLY

RELATED APPLICATIONS

[0001] This application relates to and claims priority to U.S. Provisional Patent Application No. 62/456,195, entitled "Attachment Clip Assembly," and filed 08-February-2017, the entire disclosure of which is incorporated herein by reference.

FIELD OF EMBODIMENTS OF THE DISCLOSURE

[0002] Embodiments generally relate to attachment assemblies, and, more particularly, to attachment clips that are configured to operatively couple to attachment members.

BACKGROUND

[0003] Buckles are used to connect one strap to another strap, or another component. For example, buckles may be used to fasten components of backpacks, luggage, or the like.

[0004] Certain buckles that are used with respect to backpacks, for example, are relatively long, and occupy a relatively large amount of space on a chest of a wearer. Further, various individuals (such as children and older adults) may find connecting and disconnecting the buckles difficult due to releasing mechanisms and angles that the releasing mechanisms are to be grasped.

SUMMARY OF EMBODIMENTS OF THE DISCLOSURE

[0005] In one embodiment, an attachment clip assembly is provided that includes a clip configured to be coupled with a first component. The clip includes a hook that partially encircles a slot. The assembly also includes an attachment member configured to be coupled with a second component. The attachment member includes an elongated attachment bar shaped to fit inside the slot defined by the hook of the clip. The clip and the attachment member are configured to couple the first component with the second component by rotating one or more of the clip or the attachment member in a first direction relative to the other of the clip or attachment member, inserting the attachment bar of the attachment member into the slot defined by the hook of the clip, and then rotating the one or more of the clip or the attachment member in an opposite, second direction.

[0006] In one embodiment, another attachment clip assembly is provided that includes a clip configured to be coupled with a first portion of an enclosure. The clip includes a rigid hook. The assembly also includes an attachment member configured to be coupled with a second portion of the enclosure. The attachment member includes an elongated attachment bar. The clip and the attachment member are configured to couple the first portion of the enclosure with the second portion of the enclosure. The clip and the attachment member are configured to couple with each other by rotating one or more of the clip or the attachment member, inserting the attachment bar of the attachment member into the hook of the clip, and then rotating the one or more of the clip or the attachment member in an opposite, second direction.

[0007] In one embodiment, an attachment clip assembly includes a clip configured to be coupled with a first portion of a bag. The clip includes a hook that partially encircles a slot. The assembly also includes an attachment member configured to be coupled with a second portion of the bag. The attachment member includes an elongated attachment bar shaped to fit inside the slot defined by the hook of the clip. The clip and the attachment member are configured to couple with each other to close the bag by rotating one or more of the clip or the attachment member in a first direction relative to the other of the clip or attachment member, inserting the attachment bar of the attachment member

into the slot defined by the hook of the clip, and then rotating the one or more of the clip or the attachment member in an opposite, second direction.

BRIEF DESCRIPTION OF SEVERAL VIEWS OF THE DRAWINGS

[0008] Figure 1 illustrates one embodiment of an attachment clip assembly;

[0009] Figure 2 illustrates one embodiment of an attachment member 2 shown in Figure 1;

[0010] Figure 3 illustrates one embodiment of a method or process for coupling a clip with the attachment member shown in Figure 1;

[0011] Figure 4 illustrates an additional step in the method or process for coupling a clip with the attachment member;

[0012] Figure 5 illustrates an additional step in the method or process for coupling a clip with the attachment member;

[0013] Figure 6 illustrates one embodiment of a method or process for detaching or disconnecting the clip from the attachment member;

[0014] Figure 7 illustrates an additional step in the method or process for detaching or disconnecting the clip from the attachment member;

[0015] Figure 8 illustrates another embodiment of a clip 1 that can be used as part of a buckle;

[0016] Figure 9 illustrates a corresponding embodiment of an attachment member for the clip shown in Figure 8; and

[0017] Figure 10 illustrates another embodiment of the attachment member shown in Figure 1.

DETAILED DESCRIPTION

[0018] Figure 1 illustrates one embodiment of an attachment clip assembly 100. The attachment clip assembly 100 can be used to maintain an enclosure in a closed state, such as by keeping opposing or opposite portions of a pocket, backpack, bag, luggage, or the like, in a closed position. The attachment clip assembly 100 includes a clip 1 that is configured to couple with an attachment member 2. The clip 1 and the attachment member 2 may be rigid bodies that operate together as a buckle assembly to couple components with each other. With continued reference to the attachment clip assembly 100 shown in Figure 1, Figure 2 illustrates one embodiment of the attachment member 2 shown in Figure 1. The clip 1 is formed from a body that includes an adjustment end 3 configured to retain webbing and a hook 4 to securely attach to the attachment member 2. The adjustment end 3 is formed from plural (e.g., two) slots 9, 10 separated from each other by a bar 11. The webbing, such as strap, string, rope, cord, or the like, is inserted into the clip 1 through one slot 9 or 10, placed or threaded underneath the bar 11, and then exits from the clip 1 through the other slot 10 or 9.

[0019] The attachment member 2 includes a channel 14 through which another webbing or part of another component can extend through. For example, one side of a pocket in a backpack, satchel, luggage, or the like, can be coupled with the attachment member 2 through the channel 14. Another side of the pocket can be coupled with the adjustment end 3 of the attachment member 2. The clip 1 and attachment member 2 can then be connected with each other (as described herein) to couple these components (e.g., opposite sides of a pocket) with each other.

[0020] The hook 4 has a curved arm that at least partially bends around an angled slot 5. This slot 5 is configured to securely attach onto the attachment member 2. For example, the attachment member 2 includes a four-sided bar 6 that is flat on a top or first side 12 of the bar 6, that is rounded, curved, or otherwise blunted on an opposite second or bottom side 7 and on lateral sides 8 that connect and extend between the top side 11 and the bottom side 7. The curved surface of the bottom side 7 allows the attachment bar 6 to more easily be received into the slot 5 of the hook 4, while the flat surfaces of the top side

11 and lateral sides 8 help prevent the attachment bar 6 from being removed from the slot 5 defined by the hook 4. For example, the interfaces between the flat surfaces 11, 8 can provide larger dimensions of the attachment bar 6 that help prevent inadvertent removal of the attachment bar 6 from the slot 5.

[0021] The attachment clip assembly 100 can be easier to connect and disconnect, as compared to traditional side release buckles. The combination of the hook 4 and the bar 6 allows for easy disassembly and articulation on uneven contours and corners. The attachment clip assembly 100 allows for angled connection and disconnection between the hook 4 and the bar 6 while allowing adjustment of the webbing in the adjustment end 3. Instead of pressing a clip into a flexible receptacle as is done in a snap-fit buckle, the bar 6 of the clip 1 securely clips onto the hook 4 of the attachment member 2. This non-press fit coupling allows for easy disconnection from the attachment member 2 when desired.

[0022] The shape or geometry of the bar 6 allows the clip 1 and the attachment member 2 to stay connected. The hook 4 and bar 6 shapes and geometry allow the clip 1 to follow any contour of a backpack or other mounting device that is coupled with the adjustment end 3 without the clip 1 and attachment member 2 from detaching from each other, unlike traditional, rigid buckles. In one embodiment, the largest separation distance between the top and bottom sides 12, 7 of the bar 6 in a direction that is perpendicular to both of the sides 12, 7 may be smaller than the largest separation distance between the opposite lateral sides 8 of the bar 6 in a direction that is perpendicular to both of the sides 8. This can allow for the width of the bar 6 between the sides 12, 7 to more easily fit into the slot 5 of the hook 4, and can result in the width of the bar 6 between the sides 8 to prevent the bar 6 from being easily or inadvertently removed from the slot 5 in the hook 4.

[0023] By attaching the clip 1 directly to the attachment member 2, the clip assembly 100 can be shorter than standard side release buckles, for example. Further, the attachment clip assembly 100 may include a sternum slider which may support other components, such as a whistle, which may be smaller and easier to use than traditional components.

[0024] In one embodiment, the clip 1 can include one or more additional accessories, such as a whistle 15. The whistle 15 can be integral to the clip 1, such as by being formed from the same material and/or by being part of the same unitary body as the rest of the clip 1. A user can blow into one open end 16 of the whistle 15 to generate sound out of an opposite open end 17 of the whistle 15. The whistle 15 can be used to attract attention to the user and/or to scare away animals in the event that the user of the assembly 100 is in need of assistance. Optionally, the attachment member 2 can include the whistle 15.

[0025] Figures 3 through 5 illustrate one embodiment of a method or process for coupling the clip 1 with the attachment member 2. To secure the clip 1 to the attachment member 2, the attachment member 2 may be anchored to a component 13, such as a chord, webbing, strap, or the like, of a bag. The slot 5 (defined by the curvature or other shape of the hook 4) of the clip 1 is aligned with the flat top and bottom sides 12, 7 of the attachment bar 6. Alternatively, the flat top and bottom sides 12, 7 of the attachment bar 6 can be aligned with the slot 5 of the clip 1. This alignment operation or step of the method is shown in Figure 3. The alignment can be performed or accomplished by rotating the clip 1 and/or attachment member 2 relative to the other of the attachment member 2 and/or clip 1, as shown in Figure 3.

[0026] This bar 6 is received into the slot 5 in the hook 4. The clip 1 can be slightly or partially rotated to receive the bar 6 into the slot 5, and then slightly or partially rotated back in an opposite direction to secure the clip 1 to the attachment member 2. The hook 4 can extend around at least a majority, at least two-thirds, or at least three quarters of the circumference of the slot 5. This can require the clip 1 to be rotated and oriented at an acute angle relative to the attachment member 2 before the attachment bar 6 can be received into the slot 5, as shown in Figure 3.

[0027] The attachment bar 6 can be inserted or urged into the slot 5 defined by the hook 4 of the clip 1, as shown in Figure 4. The slot 5 of the hook 4 can be slightly larger than the size of the attachment bar 6 to allow the bar 6 to be received into and retained within the slot 5 of the hook 4. As the bar 6 slides into the slot 5 of the hook 4, the clip 1

can be free to rotate around or about attachment bar 6 (while the clip 1 and attachment bar 6 remain coupled with each other). For example, as shown in Figure 5, the clip 1 and/or attachment member 2 can rotate relative to the other so that the clip 1 and attachment member 2 lie flat.

[0028] The hook 4 may encircle the slot 5 by a large enough distance (e.g., as measured in degrees, radians, circumference, etc.) to prevent inadvertent removal of the bar 6 from the slot 5 in the hook 4 when the clip 1 and attachment member 2 are coupled and lying flat. For example, in the flat state of the assembly 100 shown in Figure 5, the inner surface of the hook 4 may concurrently or simultaneously contact three of the sides 12, 7, 8, such as the top side 12, the opposite bottom side 7, and one (but not both) of the lateral sides 8. If the webbings to which the clip 1 and/or attachment member 2 are connected are tightened, these webbings can cause the hook 4 to apply a pulling force on the attachment bar 6, which helps prevent the bar 6 from inadvertently moving out of the slot 5 that is defined by the hook 4.

[0029] Figures 6 and 7 illustrate one embodiment of a method or process for detaching or disconnecting the clip 1 from the attachment member 2. To disconnect the clip 1 from the attachment member 2, the clip 1 (and/or the attachment member 2) is rotated so that the opening of the hook 4 is aligned with the flat top side 12 and flat bottom side 7 of the attachment bar 6, as shown in Figure 6. This opening is the spacing between the end of the hook 4 and the remainder of the clip 1, and also is the same opening through which the attachment bar 6 is received into the hook 4.

[0030] A light load can be placed onto the clip 1 and/or attachment member 2 to eject the attachment bar 6 from the slot 5 in the hook 4, as shown in Figure 7. For example, a person can pull on webbing, push on the end of the clip 1 that is opposite of the hook 4, or the like, to force the hook 4 away from the attachment bar 6 and/or to force the attachment bar 6 out of the slot 5 in the hook 4. The hook 4 can self-eject from the bar 6 at a disconnection angle shown in Figure 7. Alternatively, the bar 6 may be pulled out of the slot 5 formed by the hook 4.

[0031] The shape of the clip 1 and/or the attachment member 2 can vary from what is shown in Figures 1 through 7, so long as the clip 1 includes some sort of hook 4 to couple with the attachment bar 6 of the attachment member 2. For example, Figure 8 illustrates another embodiment of the clip 1 that can be used as part of a LADDERLOC buckle. This clip 1 includes the slots 9, 10 and the bar 11, but part of the body of the clip 1 is angled beneath the slot 9 that is farther from the hook 4. The angled portion of the body of the clip 1 helps to ensure that the webbing that passes through the slots 9, 10 does not move (e.g., remains tightened) during use until or unless an end 18 of the clip 1 (that is opposite of the hook 4) is lifted. Lifting this end 18 of the clip 1 can allow for the webbing to more easily pass through the slots 9, 10 to loosen the webbing. Figure 9 illustrates a corresponding embodiment of the attachment member 2. The attachment member 2 shown in Figure 9 can be used with the clip 1 shown in Figure 8, such as by being the remaining component of a LADDERLOC buckle. The attachment member 2 includes the attachment bar 6, but does not include the channel 14 shown in Figure 1. Instead, the attachment member 2 shown in Figure 9 includes an additional attachment bar 19 that can be coupled with webbing, such as by wrapping or looping the webbing around the attachment bar 19.

[0032] Figure 10 illustrates another embodiment of the attachment member 2. The attachment member 2 shown in Figure 10 includes the attachment bar 6, and also includes slots 20, 21 that are separated from each other by a segmented bar 22. The bar 22 and slots 20, 21 can be used to couple webbing to the attachment member 2 shown in Figure 10 in a different orientation than the attachment member 2 shown in Figure 1. For example, the slots 20, 21 and the bar 22 are elongated in directions that are perpendicular to the direction in which the attachment bar 6 shown in Figure 10 is elongated, while the slots 9, 10 and the bar 11 are elongated in directions that are parallel to the direction in which the attachment bar 6 shown in Figure 1 is elongated.

[0033] Embodiments of the inventive subject matter described herein provide an attachment clip assembly that is configured to be used with respect to various articles, such as backpacks, luggage, and the like. The clip assembly includes a clip that is configured to couple to an attachment member through a hook that engages a bar of the

attachment member. Unlike buckles, the attachment clip assembly does not connect and disconnect through a press-fit operation, but instead connects and disconnects via a simpler and easier hooking process. Further, while known buckles are relatively long and flat, the attachment clip assembly is substantially shorter, and is configured to articulate, thereby allowing webbing that is coupled thereto to lay flat.

[0034] In one embodiment, an attachment clip assembly is provided that includes a clip configured to be coupled with a first component. The clip includes a hook that partially encircles a slot. The assembly also includes an attachment member configured to be coupled with a second component. The attachment member includes an elongated attachment bar shaped to fit inside the slot defined by the hook of the clip. The clip and the attachment member are configured to couple the first component with the second component by rotating one or more of the clip or the attachment member in a first direction relative to the other of the clip or attachment member, inserting the attachment bar of the attachment member into the slot defined by the hook of the clip, and then rotating the one or more of the clip or the attachment member in an opposite, second direction.

[0035] Optionally, the attachment bar of the attachment member includes a top side, an opposite bottom side, and opposite lateral sides.

[0036] Optionally, the top side of the attachment bar of the attachment member is a curved surface and the bottom side and lateral sides of the attachment bar are flat surfaces.

[0037] Optionally, a separation distance between the lateral sides of the attachment bar is smaller than a separation distance between the top and bottom sides of the attachment bar.

[0038] Optionally, an inner surface of the hook of the clip assembly extends around the slot by a circumference distance that is large enough to result in the inner surface of the hook assembly to concurrently engage at least three different sides of the attachment bar of the attachment member.

[0039] Optionally, the hook extends around at least a majority of a circumference around the slot defined by the hook such that the clip is required to oriented at an acute angle relative to the attachment member before the attachment bar is received into the slot.

[0040] Optionally, the clip is coupled with a first portion of a bag, backpack, pocket, or luggage, and the attachment member is coupled with a second portion of the bag, backpack, pocket, or luggage.

[0041] In one embodiment, another attachment clip assembly is provided that includes a clip configured to be coupled with a first portion of an enclosure. The clip includes a rigid hook. The assembly also includes an attachment member configured to be coupled with a second portion of the enclosure. The attachment member includes an elongated attachment bar. The clip and the attachment member are configured to couple the first portion of the enclosure with the second portion of the enclosure. The clip and the attachment member are configured to couple with each other by rotating one or more of the clip or the attachment member, inserting the attachment bar of the attachment member into the hook of the clip, and then rotating the one or more of the clip or the attachment member in an opposite, second direction.

[0042] Optionally, the attachment bar of the attachment member includes a top side, an opposite bottom side, and opposite lateral sides.

[0043] Optionally, the top side of the attachment bar of the attachment member is a curved surface and the bottom side and lateral sides of the attachment bar are flat surfaces.

[0044] Optionally, a separation distance between the lateral sides of the attachment bar is smaller than a separation distance between the top and bottom sides of the attachment bar.

[0045] Optionally, an inner surface of the hook of the clip assembly extends around a circumference distance that is large enough to result in the inner surface of the

hook assembly to concurrently engage at least three different sides of the attachment bar of the attachment member.

[0046] Optionally, the hook extends around at least a majority of a circumference defined by the hook such that the clip is required to oriented at an acute angle relative to the attachment member before the attachment bar is received into the hook.

[0047] Optionally, the clip is coupled with the first portion of a bag, backpack, pocket, or luggage, and the attachment member is coupled with the second portion of the bag, backpack, pocket, or luggage.

[0048] In one embodiment, an attachment clip assembly includes a clip configured to be coupled with a first portion of a bag. The clip includes a hook that partially encircles a slot. The assembly also includes an attachment member configured to be coupled with a second portion of the bag. The attachment member includes an elongated attachment bar shaped to fit inside the slot defined by the hook of the clip. The clip and the attachment member are configured to couple with each other to close the bag by rotating one or more of the clip or the attachment member in a first direction relative to the other of the clip or attachment member, inserting the attachment bar of the attachment member into the slot defined by the hook of the clip, and then rotating the one or more of the clip or the attachment member in an opposite, second direction.

[0049] Optionally, the attachment bar of the attachment member includes a top side, an opposite bottom side, and opposite lateral sides.

[0050] Optionally, the top side of the attachment bar of the attachment member is a curved surface and the bottom side and lateral sides of the attachment bar are flat surfaces.

[0051] Optionally, a separation distance between the lateral sides of the attachment bar is smaller than a separation distance between the top and bottom sides of the attachment bar.

[0052] Optionally, an inner surface of the hook of the clip assembly extends around the slot by a circumference distance that is large enough to result in the inner surface of the hook assembly to concurrently engage at least three different sides of the attachment bar of the attachment member.

[0053] Optionally, the hook extends around at least a majority of a circumference around the slot defined by the hook such that the clip is required to oriented at an acute angle relative to the attachment member before the attachment bar is received into the slot.

[0054] Variations and modifications of the foregoing are within the scope of the present invention. It is understood that the inventive subject matter disclosed and defined herein extends to all alternative combinations of two or more of the individual features mentioned or evident from the text and/or drawings. All of these different combinations constitute various alternative aspects of the inventive subject matter. The embodiments described herein explain the best modes known for practicing the inventive subject matter and will enable others of ordinary skill in the art to utilize the invention. The claims are to be construed to include alternative embodiments to the extent permitted by the prior art.

[0055] While various spatial and directional terms, such as top, bottom, lower, mid, lateral, horizontal, vertical, front and the like may be used to describe embodiments of the present disclosure, it is understood that such terms are merely used with respect to the orientations shown in the drawings. The orientations may be inverted, rotated, or otherwise changed, such that an upper portion is a lower portion, and vice versa, horizontal becomes vertical, and the like.

[0056] Variations and modifications of the foregoing are within the scope of the present disclosure. It is understood that the disclosure and defined herein extends to all alternative combinations of two or more of the individual features mentioned or evident from the text and/or drawings. All of these different combinations constitute various alternative aspects of the present disclosure. The embodiments described herein explain

the best modes known for practicing the disclosure and will enable others skilled in the art to utilize the disclosure. The claims are to be construed to include alternative embodiments to the extent permitted by the prior art.

[0057] Various features of the disclosure are set forth in the following claims.

WHAT IS CLAIMED IS:

1. An attachment clip assembly comprising:

a clip configured to be coupled with a first component, the clip including a hook that partially encircles a slot; and

an attachment member configured to be coupled with a second component, the attachment member including an elongated attachment bar shaped to fit inside the slot defined by the hook of the clip,

wherein the clip and the attachment member are configured to couple the first component with the second component by rotating one or more of the clip or the attachment member in a first direction relative to the other of the clip or attachment member, inserting the attachment bar of the attachment member into the slot defined by the hook of the clip, and then rotating the one or more of the clip or the attachment member in an opposite, second direction.

2. The attachment clip assembly of claim 1, wherein the attachment bar of the attachment member includes a top side, an opposite bottom side, and opposite lateral sides.

3. The attachment clip assembly of claim 2, wherein the top side of the attachment bar of the attachment member is a curved surface and the bottom side and lateral sides of the attachment bar are flat surfaces.

4. The attachment clip assembly of claim 2, wherein a separation distance between the lateral sides of the attachment bar is smaller than a separation distance between the top and bottom sides of the attachment bar.

5. The attachment clip assembly of claim 1, wherein an inner surface of the hook of the clip assembly extends around the slot by a circumference distance that is large enough to result in the inner surface of the hook assembly to concurrently engage at least three different sides of the attachment bar of the attachment member.

6. The attachment clip assembly of claim 1, wherein the hook extends around at least a majority of a circumference around the slot defined by the hook such that the clip

is required to oriented at an acute angle relative to the attachment member before the attachment bar is received into the slot.

7. The attachment clip assembly of claim 1, wherein the clip is coupled with a first portion of a bag, backpack, pocket, or luggage, and the attachment member is coupled with a second portion of the bag, backpack, pocket, or luggage.

8. An attachment clip assembly comprising:

a clip configured to be coupled with a first portion of an enclosure, the clip including a rigid hook; and

an attachment member configured to be coupled with a second portion of the enclosure, the attachment member including an elongated attachment bar,

wherein the clip and the attachment member are configured to couple the first portion of the enclosure with the second portion of the enclosure, the clip and the attachment member configured to couple with each other by rotating one or more of the clip or the attachment member, inserting the attachment bar of the attachment member into the hook of the clip, and then rotating the one or more of the clip or the attachment member in an opposite, second direction.

9. The attachment clip assembly of claim 8, wherein the attachment bar of the attachment member includes a top side, an opposite bottom side, and opposite lateral sides.

10. The attachment clip assembly of claim 9, wherein the top side of the attachment bar of the attachment member is a curved surface and the bottom side and lateral sides of the attachment bar are flat surfaces.

11. The attachment clip assembly of claim 9, wherein a separation distance between the lateral sides of the attachment bar is smaller than a separation distance between the top and bottom sides of the attachment bar.

12. The attachment clip assembly of claim 8, wherein an inner surface of the hook of the clip assembly extends around a circumference distance that is large enough to

result in the inner surface of the hook assembly to concurrently engage at least three different sides of the attachment bar of the attachment member.

13. The attachment clip assembly of claim 9, wherein the hook extends around at least a majority of a circumference defined by the hook such that the clip is required to oriented at an acute angle relative to the attachment member before the attachment bar is received into the hook.

14. The attachment clip assembly of claim 9, wherein the clip is coupled with the first portion of a bag, backpack, pocket, or luggage, and the attachment member is coupled with the second portion of the bag, backpack, pocket, or luggage.

15. An attachment clip assembly comprising:

a clip configured to be coupled with a first portion of a bag, the clip including a hook that partially encircles a slot; and

an attachment member configured to be coupled with a second portion of the bag, the attachment member including an elongated attachment bar shaped to fit inside the slot defined by the hook of the clip,

wherein the clip and the attachment member are configured to couple with each other to close the bag by rotating one or more of the clip or the attachment member in a first direction relative to the other of the clip or attachment member, inserting the attachment bar of the attachment member into the slot defined by the hook of the clip, and then rotating the one or more of the clip or the attachment member in an opposite, second direction.

16. The attachment clip assembly of claim 15, wherein the attachment bar of the attachment member includes a top side, an opposite bottom side, and opposite lateral sides.

17. The attachment clip assembly of claim 16, wherein the top side of the attachment bar of the attachment member is a curved surface and the bottom side and lateral sides of the attachment bar are flat surfaces.

18. The attachment clip assembly of claim 16, wherein a separation distance between the lateral sides of the attachment bar is smaller than a separation distance between the top and bottom sides of the attachment bar.

19. The attachment clip assembly of claim 15, wherein an inner surface of the hook of the clip assembly extends around the slot by a circumference distance that is large enough to result in the inner surface of the hook assembly to concurrently engage at least three different sides of the attachment bar of the attachment member.

20. The attachment clip assembly of claim 15, wherein the hook extends around at least a majority of a circumference around the slot defined by the hook such that the clip is required to oriented at an acute angle relative to the attachment member before the attachment bar is received into the slot.

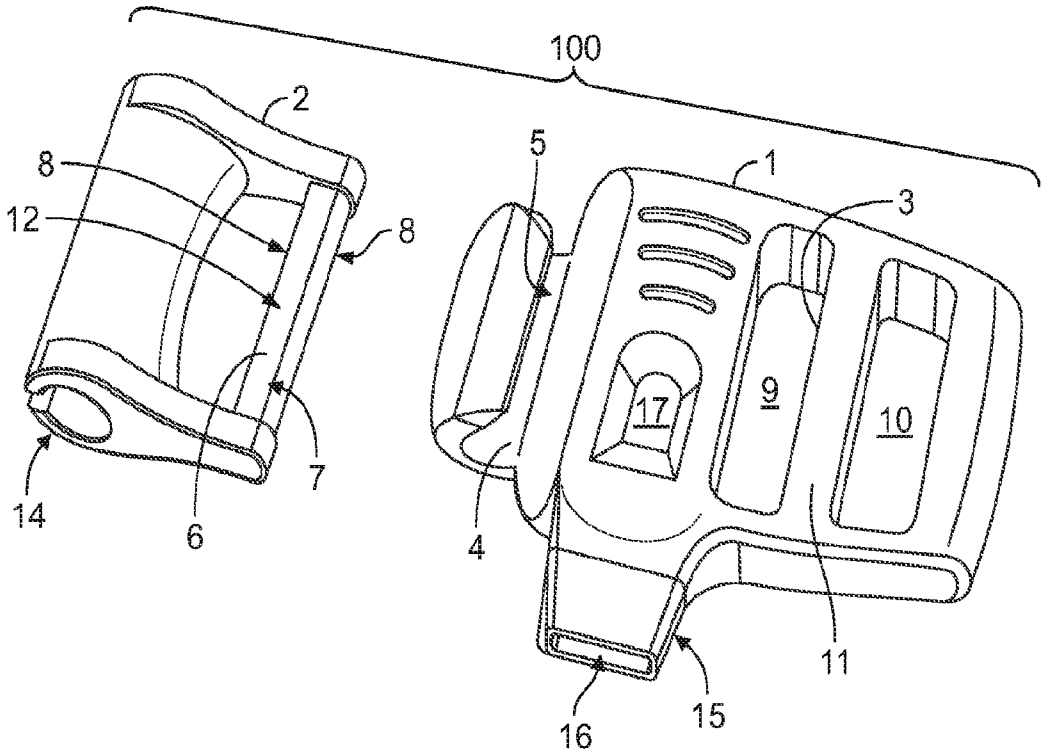

FIG. 1

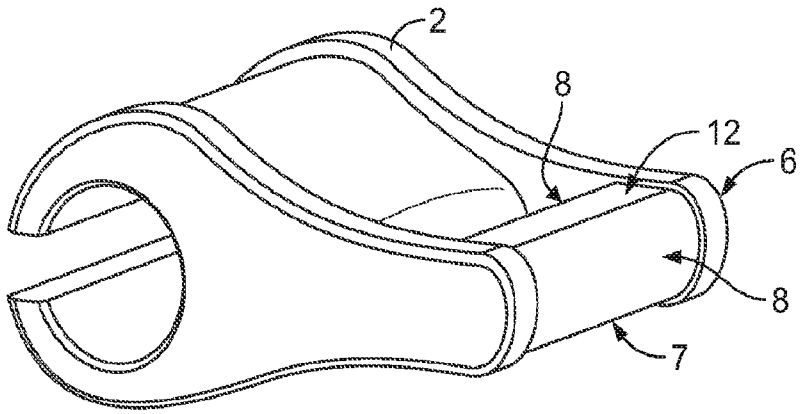

FIG. 2

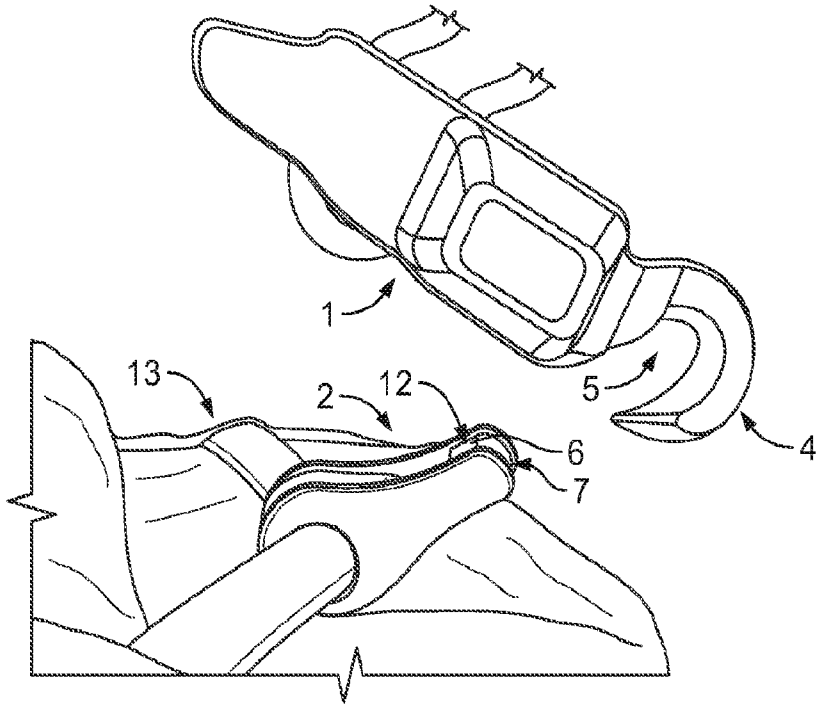

FIG. 3

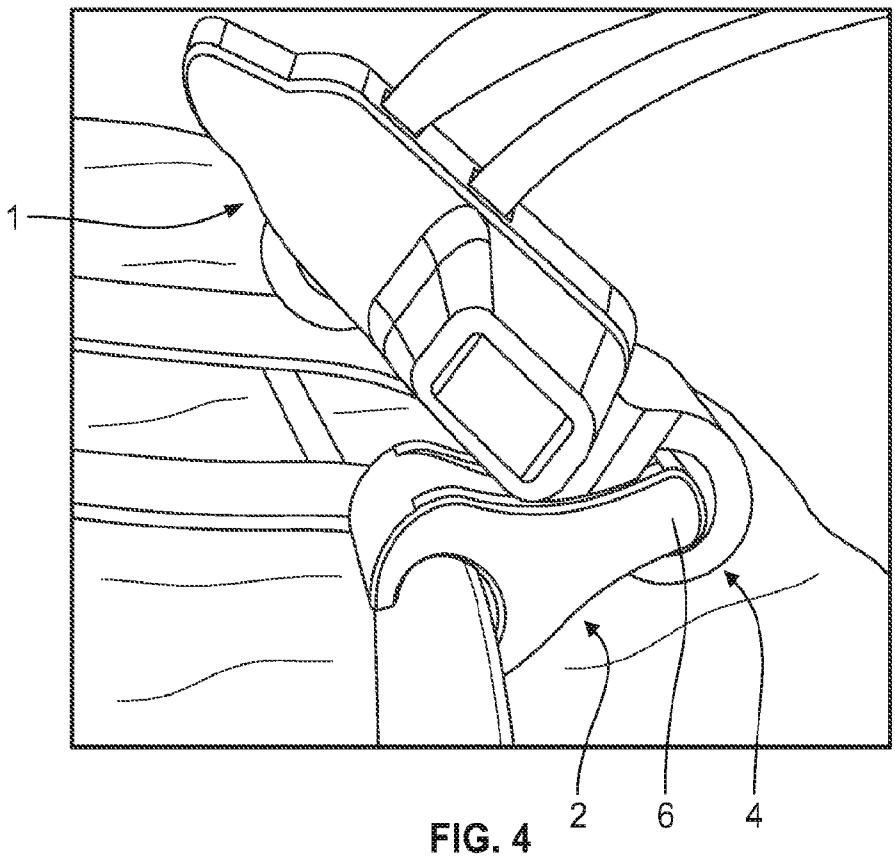

FIG. 4

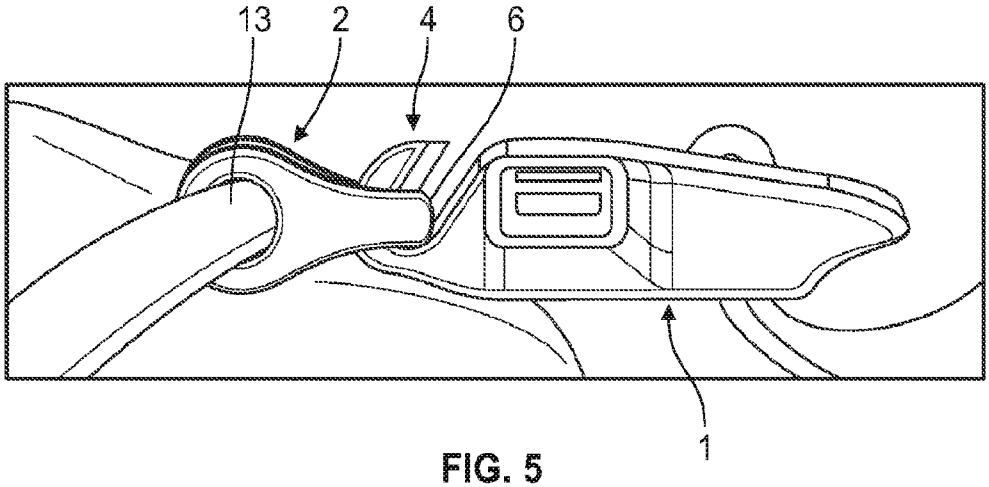

FIG. 5

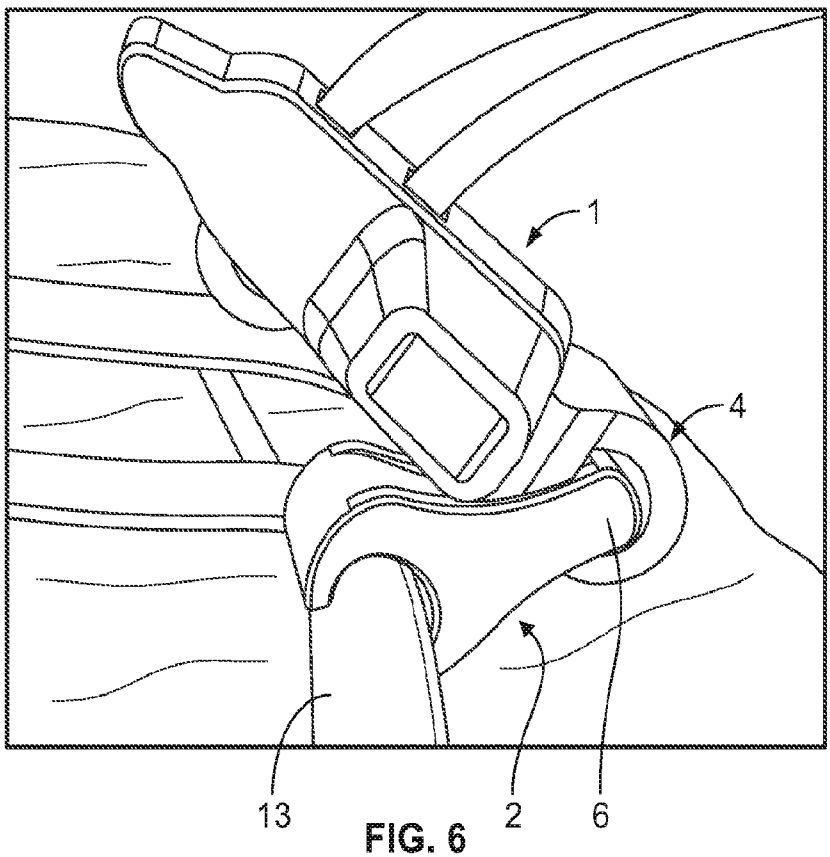

FIG. 6

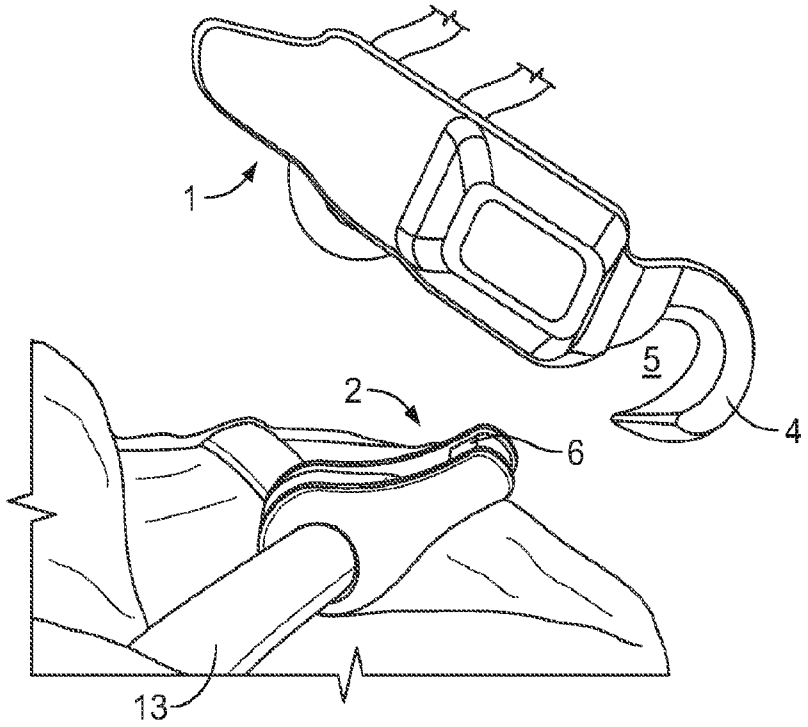

FIG. 7

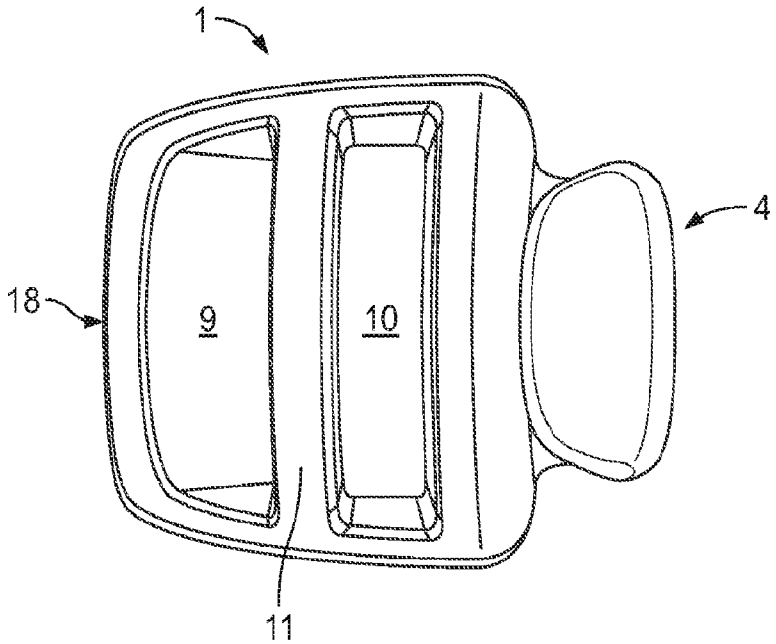

FIG. 8

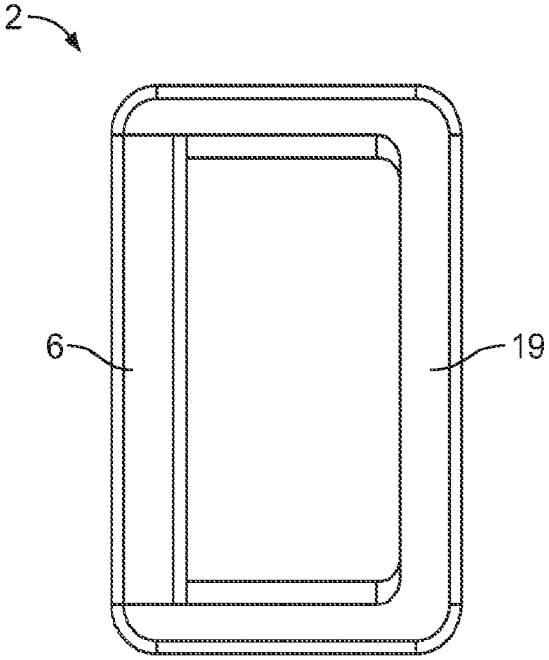

FIG. 9

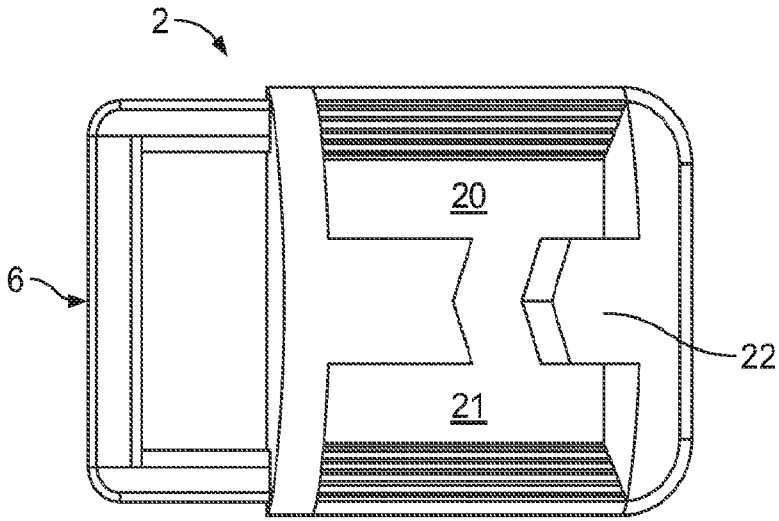

FIG. 10

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2017/068145

A. CLASSIFICATION OF SUBJECT MATTER
INV. A44B11/25
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A44B A44C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2012/012623 A1 (BERGKVIST HAAKAN [SE]) 19 January 2012 (2012-01-19) paragraph [0032] - paragraph [0033]; figures 1-4	1-20
X	US 2004/078943 A1 (HEDE JEAN-MARC [FR] ET AL) 29 April 2004 (2004-04-29) paragraph [0021] - paragraph [0045]; figures 1-4	1-20
A	US 2015/289598 A1 (HSIUNG TAO TSUN [TW]) 15 October 2015 (2015-10-15) claim 1; figures 1-4	1-20
A	CH 674 302 A5 (REPAPRESS AG) 31 May 1990 (1990-05-31) abstract; figures 1-3	1-20

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
29 March 2018	20/04/2018

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Simpson, Estelle

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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