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(54) **PACK STRAP**

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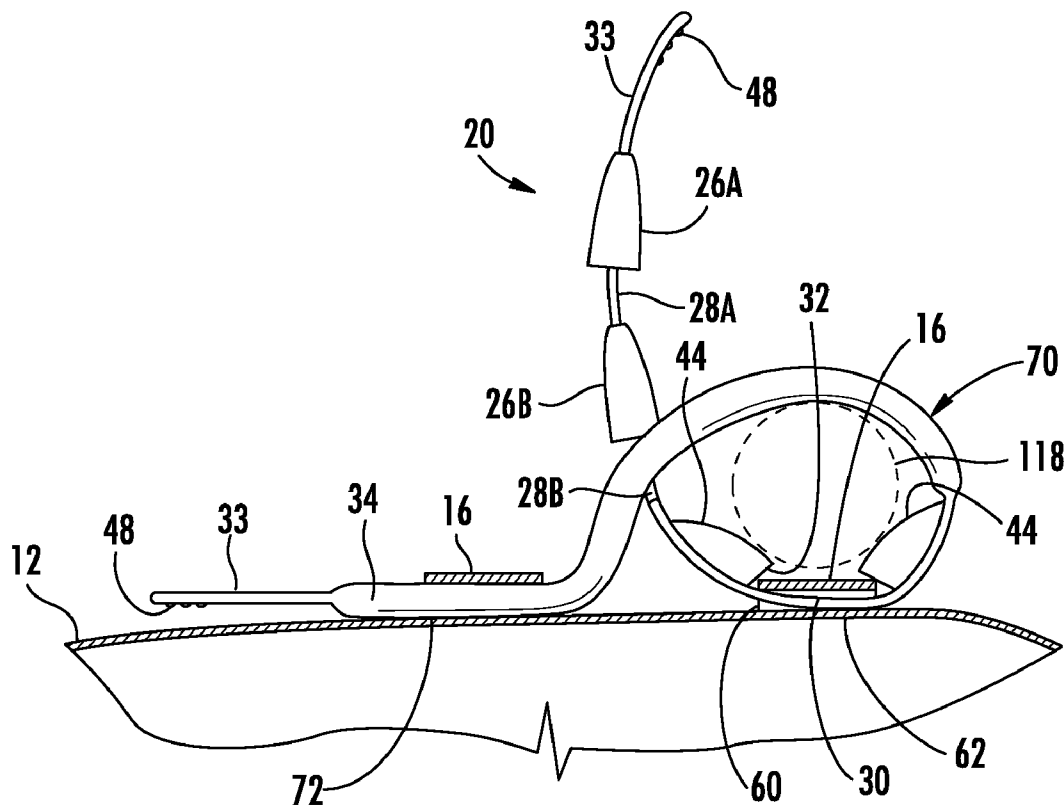
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(57) **ABSTRACT**

A pack strap is used to secure an article to pack clothing using strap webbing of the pack clothing. In one implementation, the pack strap includes a channel that receives the strap webbing and opposite connectable ends. In one implementation, the pack strap includes a series of apertures and a series of heads facilitating ratcheting down of a size of a loop for securing the article.

**Related U.S. Application Data**

(60) Provisional application No. 61/430,163, filed on Jan. 5, 2011.



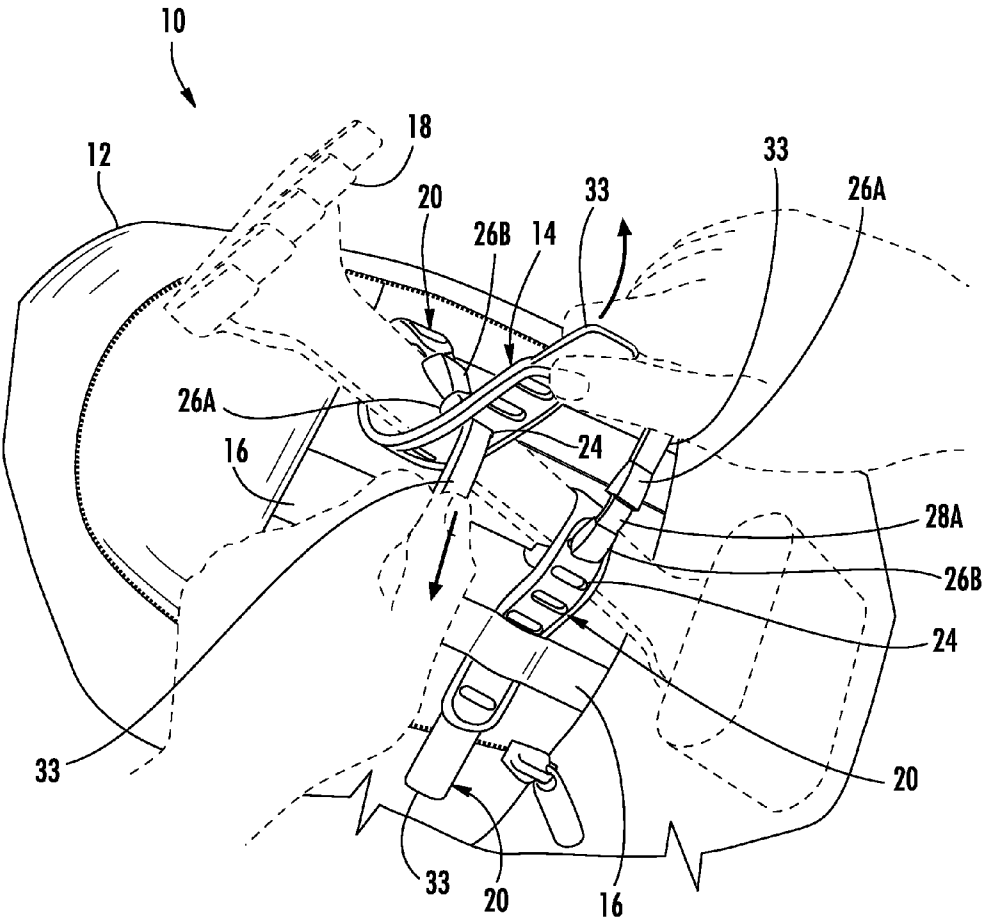
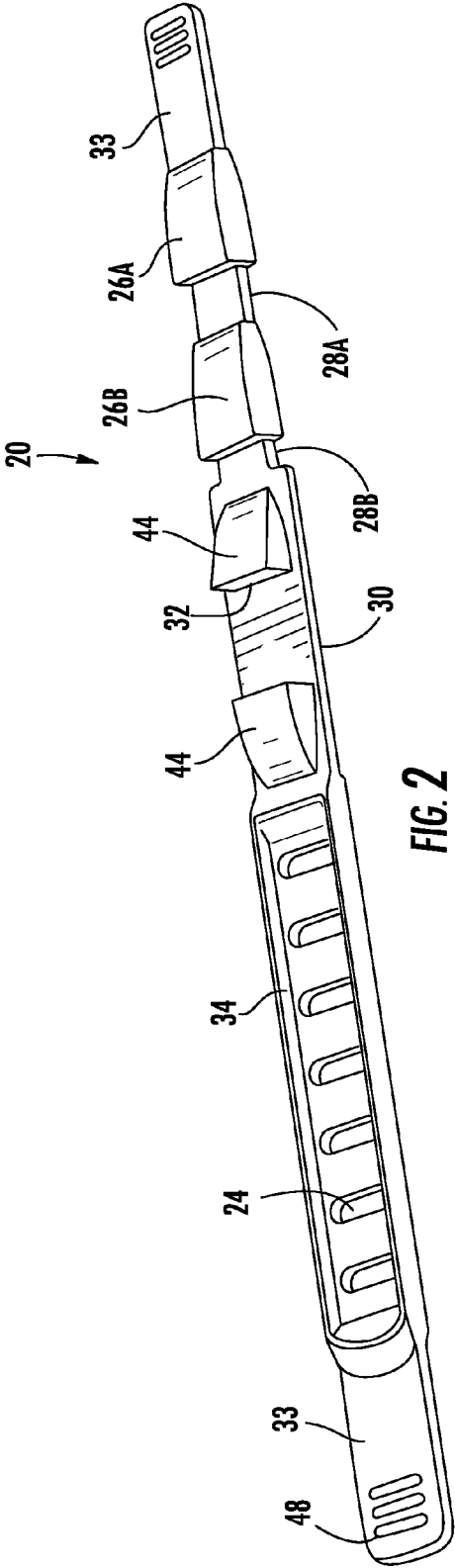


FIG. 1



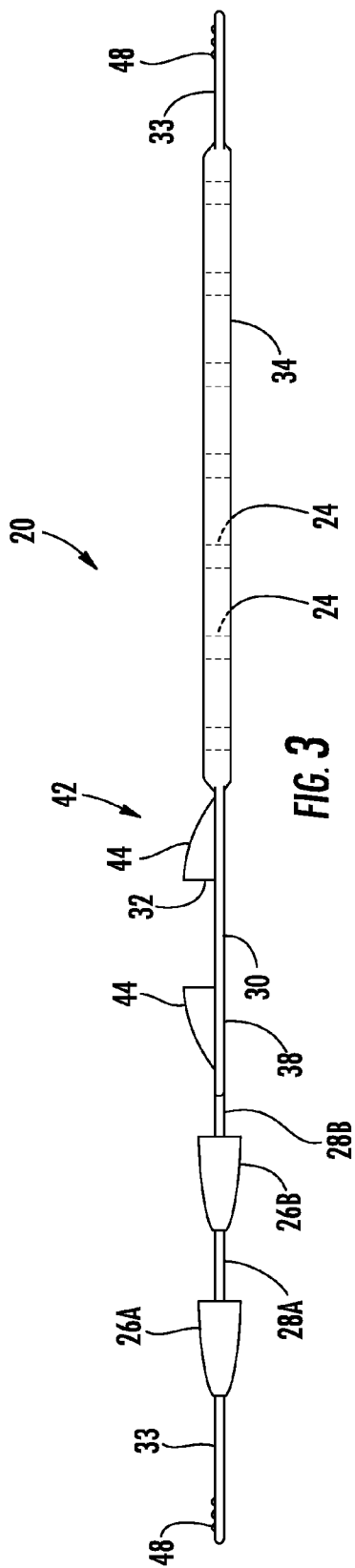
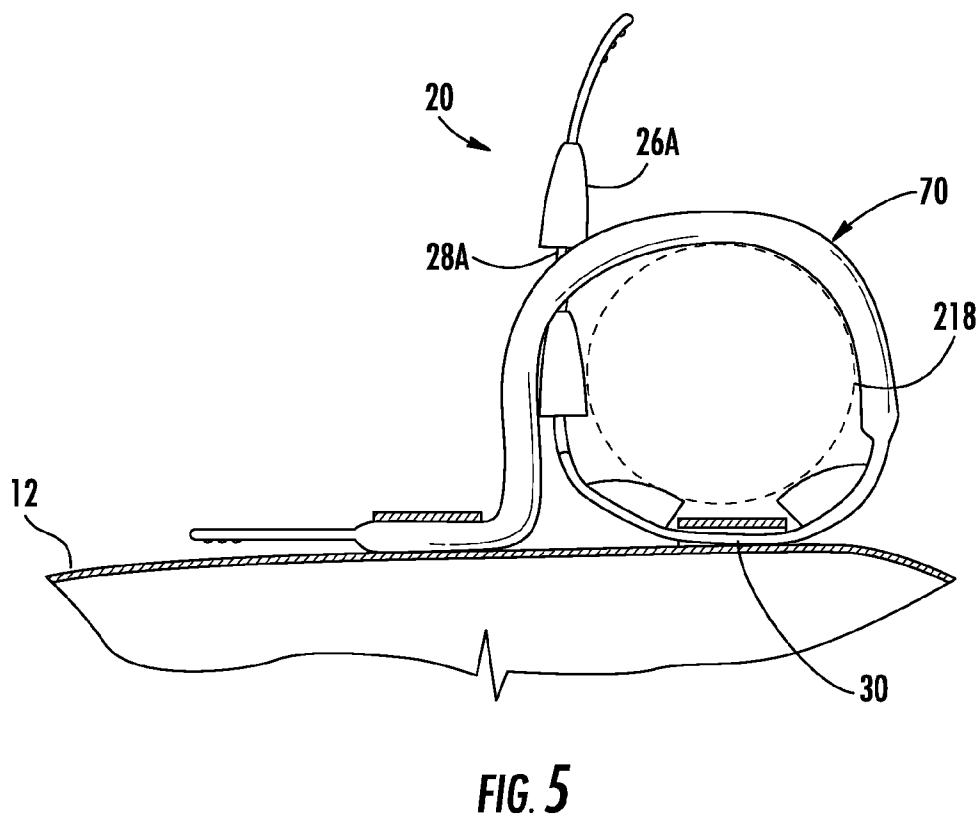
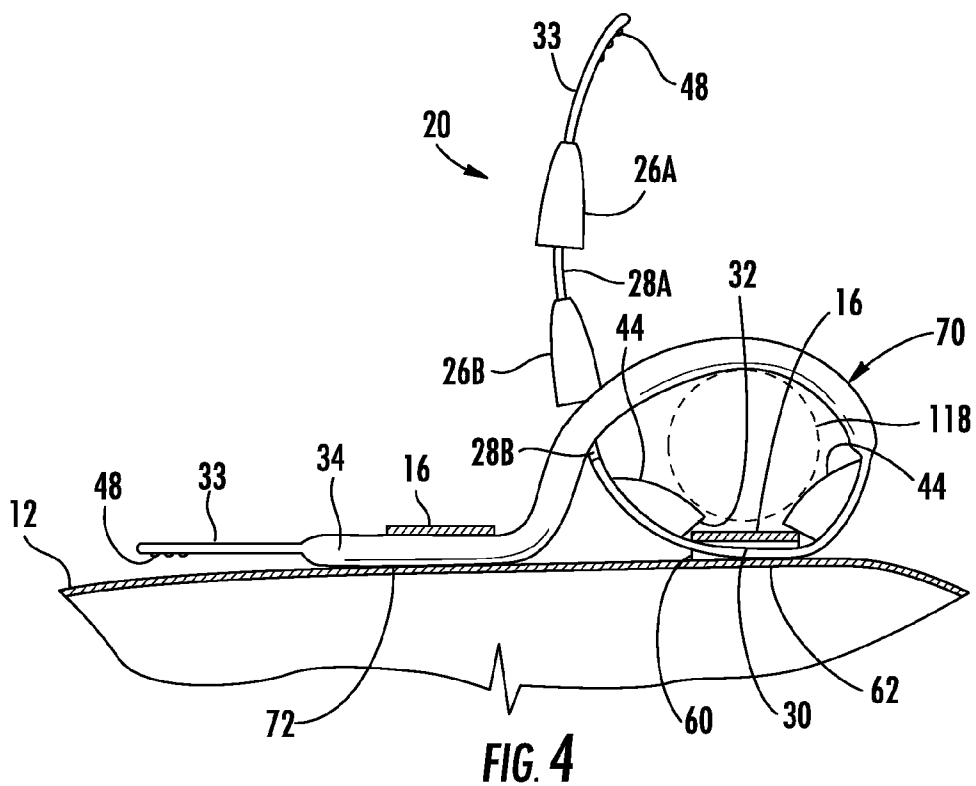


FIG. 3



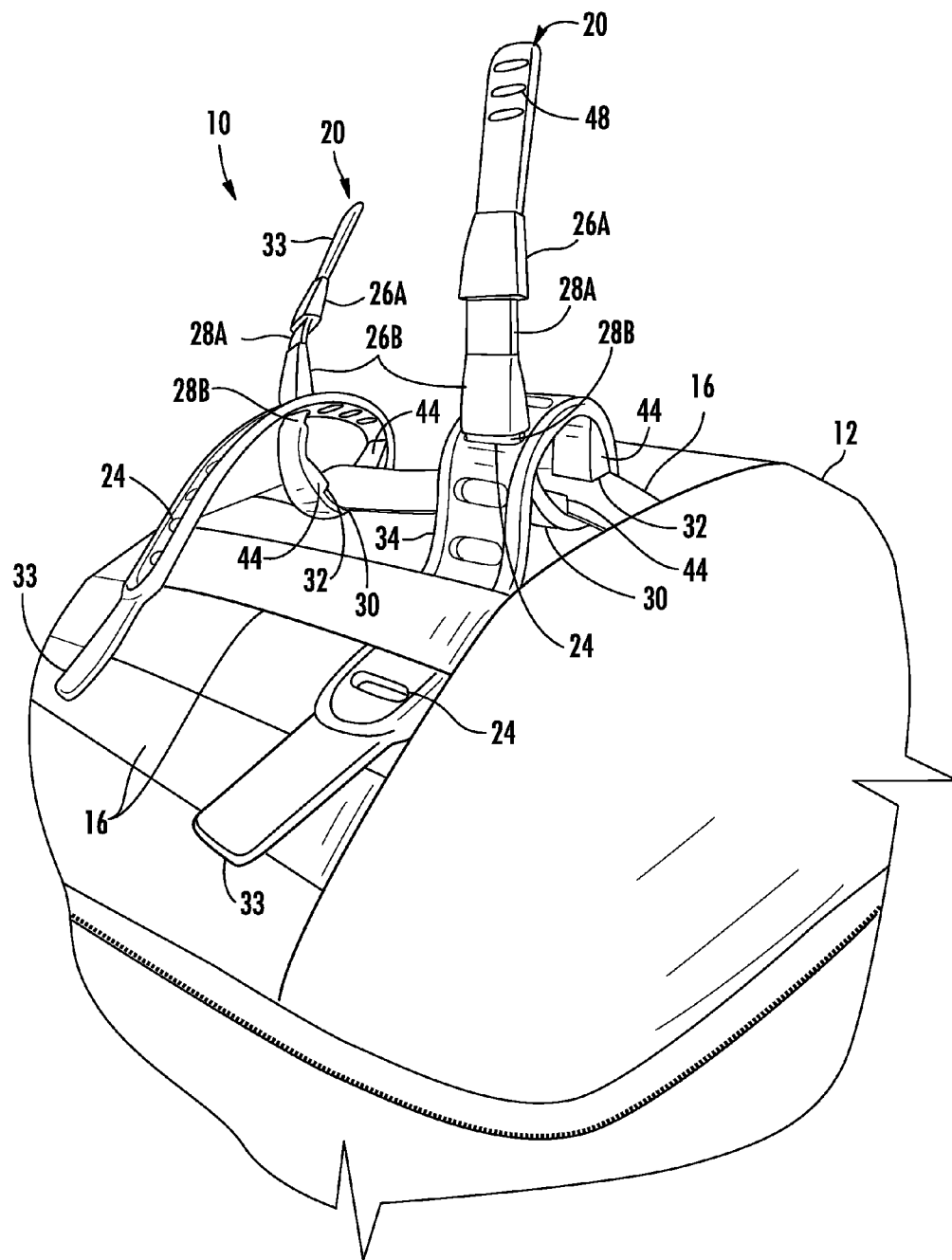


FIG. 6

## PACK STRAP

### CROSS-REFERENCE TO RELATED PATENT APPLICATIONS

**[0001]** The present application claims priority under 35 USC 119 from co-pending U.S. provisional patent application Ser. No. 61/430,163 filed on Jan. 5, 2010 by Michael M. Arajakis and entitled PACK STRAP, the full disclosure of which is hereby incorporated by reference.

### BACKGROUND

**[0002]** In many circumstances, it may be desirable to attach and retain various articles to a backpack, vest or other clothing having webbing straps. One existing method is referred to as a MOLLE system (MODular Lightweight Load-carrying Equipment). The system's modularity is derived from the use of PALS (Pouch Attachment Ladder System) webbing, rows of heavy-duty nylon stitched onto a vest or backpack as to allow for attachment of various MOLLE-compatible pouches and accessories.

**[0003]** Example modes of attachment in the MOLLE arena include: "Natick Snap", "malice" clip and "Weave and Tuck" type modes. Natick snap uses a polyethylene reinforced webbing strap with the 'pushthedot' snap for security. "Malice" clip is a polymer developed by Tactical Tailor as an alternative to the Natick Snap concept, which interweaves like the Natick Snap but terminates in a semi-permanent closure that requires a screwdriver/flat tipped object to disengage. The "Weave & Tuck" mode interweaves a strap, wherein the end of the interwoven strap is tucked into an item's backing after attachment to a vest or pack (Paraclete's SofStrap and Spec Ops Brand's hybrid attachment).

**[0004]** Many existing systems are complex, less resistant to outdoor elements, difficult to use and are sometimes unreliable.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0005]** FIG. 1 is a perspective view of an example pack system securing an example article to an example piece of pack apparel.

**[0006]** FIG. 2 is a perspective view of an example pack attachment strap of the system of FIG. 1.

**[0007]** FIG. 3 is a side elevational view of the pack attachment strap of FIG. 2.

**[0008]** FIG. 4 is a side elevational view of the pack attachment strap of FIG. 2 securing a first article to the apparel of FIG. 1, with portions of the apparel shown in section.

**[0009]** FIG. 5 is a side elevational view of the pack attachment strap of FIG. 2 securing a second article to the apparel of FIG. 1, with portions of the apparel shown in section.

**[0010]** FIG. 6 is a perspective view of the pack attachment system of FIG. 1 with the example article omitted for purposes of illustration.

### DETAILED DESCRIPTION OF THE EXAMPLE EMBODIMENTS

**[0011]** FIG. 1 is a perspective view of an example pack system 10. Pack system 10 comprises pack apparel 12 and pack attachment system 14. Pack apparel 12 comprises gear or other clothing articles that are worn by a person and which include webbing straps for attachment of other equipment. For purposes of this disclosure, the term "pack apparel" means any article of clothing or clothing accessory, such as a

vest, backpack and the like which includes webbing straps for the attachment of articles. Such webbing straps are typically intermittently sewn to a panel of the pack apparel to form a series of spaced passages. In the example illustrated, pack apparel 12 comprises a backpack having webbing straps 16.

**[0012]** Pack attachment system 14 facilitates securement of equipment or articles, such as article 18, to pack apparel 12 using webbing straps 16. As will be described hereafter, pack attachment system 14 facilitates the attachment of articles to pack apparel 12 in a reliable, less complex and easy-to-use fashion.

**[0013]** In the example illustrated in FIG. 1, pack attachment system 14 comprises a pair of pack attachment straps or pack straps 20 securing article 18 to 2 distinct points to webbing straps 16. In other implementations, pack attachment system 14 may comprise a single pack attachment strap 20 or even more than to pack attachment straps 20. As shown by FIG. 1, each pack attachment strap 20 forms a loop which encircles both a portion of the particular webbing straps 16 and a portion of the article 18 to secure and hold the article 18 against pack apparel 12.

**[0014]** FIGS. 2 and 3 illustrate an individual pack attachment strap 20 in more detail. Pack attachment strap 20 comprises an elongate strap integrally formed as a single unitary body out of one or more flexible and elastomeric materials. In one embodiment, strap 20 has a thickness (as measured at location about apertures 24) of about 0.09 inches. In other implementations, strap 20 may have other thicknesses. In one embodiment, strap 20 is formed from a material having a medium stretch with a durometer of Shore A 40-Shore A50. In other implementations, strap 20 may have other combinations of thicknesses and durometers. Pack attachment strap 20 extends through webbing straps 16 of apparel 12 and has an opposite end portions which are releasably connectable to one another so as to form a closed loop about the article 18 being held against and coupled to apparel 12. In one implementation, strap 20 is formed from a non-absorbent elastomeric material resistant to weather elements, such as a rubber-like material, such as rubber, a synthetic rubber or one or more polymers.

**[0015]** As shown by FIG. 2, attachment strap 20 comprises apertures 24, heads 26A, 26B (collectively referred to as heads 26), necks 28A, 28B (collectively referred to as neck 28), central portion 30, channel 32 and pull tabs 33. Apertures 24 comprise openings extending through strap 20 which are shaped and sized to allow either of heads 26 to pass through (as the material of strap 20 about apertures 24 and/or the material of heads 26 compress or flex), whereby one of necks 28 may be captured within one of apertures 24.

**[0016]** Apertures 24 spaced apart from one another along strap 20 to enable strap 20 to form differently sized loops for wrapping about differently sized articles 18. In one embodiment, apertures 24 have a center-to-center pitch of between 0.3 inches and 1.5 inches, and nominally 0.50 inches. In the example illustrated, apertures 24 each comprise an elongate slot or slit, inhibiting accidental withdrawal of neck 28. In other examples, apertures 24 may have other shapes.

**[0017]** In the example illustrated, apertures 24 are formed in a channel or trough 34. Trough 34 extends on an outer side of strap 20 and facilitates insertion of heads 26 through apertures 24 by guiding heads 26 into apertures 24. Trough 34 further inhibits rotation of heads 26 when within trough 34 to maintain strap 20 in a flat relationship against article 18. The walls of trough 34 further strengthen those outer edge por-

tions of strap 20 along apertures 24. In other implementations, trough 34 may be omitted.

[0018] Heads 26 comprise structures along strap 20 on an opposite side of a central portion 30 as compared to apertures 24. Heads 24 are sized so as to have a cross-sectional area greater than a cross-sectional area of each of apertures 24 or to have a shape to similar to that of each of apertures 24 such that heads 26 may be inserted through apertures 24 to position one of necks 28 in the apertures 24. In one implementation, the materials about apertures 24 are resiliently flexible, deforming to allow passage of heads 26 therethrough (referred to as snapping of the head 26 through an aperture 24). After a head 26 is passed through aperture 24, the material about aperture 24 is resiliently returned to its original shape about one of necks 28, inhibiting inadvertent or unintentional reverse movement of head 26 back through the aperture 24. In another implementation, the material of head 26 or the structure of head 26 may be resiliently deformable or resiliently collapsible. For example, the material of head 26 may be formed from elastomeric rubber or polymer which deformed in shape to allow head 26 passed through an aperture 24. In another implementation, portions of head 26 may have a hollow interior facilitating a changing of the shape of heads 26 during passage through apertures 24. In some implementations, both apertures 24 and heads 26 may be configured to deform, collapse or otherwise change shape, temporarily, as heads 26 are passed through apertures 24.

[0019] In the particular implementation illustrated, each of head 26 is wedge-shaped, having a narrower cross-section proximate to the closest end of strap 20 and a wider cross-section or base distal the closest end of strap 20. As a result, each of heads 26 may be more easily passed through a selected one of apertures 24 while secure the retaining the adjacent neck 28 within the select aperture 24 once inserted. In other implementations, heads 26 may have other shapes. In yet some implementations, other connection mechanisms may be utilized in lieu of heads 26 and apertures 24, such as hooks, hook and loop fastening arrangements and the like.

[0020] In the example illustrated, strap 20 comprises at least two heads 26A and 26B spaced apart from one another by neck 28A. As a result, heads 26 further allow size adjustment of the loop formed by strap 20 when such heads 26 are ratcheted or tightened down about article 18 even after the outermost head 26A has been passed through one of apertures 24. This ratcheting down of strap 20 enhances the ability of strap 20 to grip and hold article 20. Because strap 20 is formed from elastomeric or resilient soft material, such as rubber or rubber-like material and because the multiple heads 26 allow such ratcheting, an article, such as article 18, may be securely retained with a reduced likelihood of noise generation. In other implementations, more than two heads 26 may be provided. In some implementations, a single head 26 may alternatively be provided.

[0021] Necks 28 comprise portions of strap 20 adjacent to heads 26 which are narrower than heads 26 while being sized and shaped to be received within apertures 24. In the example illustrated, neck 28A has a different axial length as compared to neck 28B. As a result, strap 20 offers different degrees of tolerance or moveability. In other words, aperture 24 may slide a first axial distance when receiving neck 28A while being able to slide a second smaller axial distance when receiving neck 28B. In other implementations, this relationship may be reversed. In some implementations, the axial length of each of necks 28 may be the same.

[0022] Central portion 30 comprises that portion of strap 20 extending between the series of apertures 24 and the single head 26 of the series of heads 26. Central portion 30 is bendable or flexible so as to be insertable through webbing strap 16. As shown by FIG. 3, central portion 30 has a uniform flat backside 38, enhancing the ability of central portion 30 to lie flush and flat against pack apparel 12 behind one of webbing straps 16. Central portion 30 has a thickness less than that of heads 26 and that of trough 34, enhancing the ability of central portion 32 naturally flex or pivot at its opposite ends. In other implementations, central portion 30 may have other configurations.

[0023] Channel 32 comprises a structure formed on a front or outer side 42 of strap 20 that is configured to receive webbing strap 16 and contain or face opposite side edges of webbing strap 16. Channel 32 assists in retaining strap 20 in place, inhibiting inadvertent withdrawal of strap 20 from behind webbing strap 16 and inhibiting rotation of the loop formed by strap 20. As a result, strap 24 is securely held in place as article 18 is positioned against strap 20 prior to the connection of opposite end portions of strap 20 and as opposite ends of strap 20 are brought together for connection (insertion of head 26 through an aperture 24 in the example illustrated), facilitating more controlled and faster securement of article 18. By further inhibiting rotation of the loop formed by strap 20, articles 18 are less likely to shift or move and potentially contact other articles which might damage either of such articles or which may generate undesirable noise.

[0024] In the example illustrated, Channel 32 is formed by a pair of opposing projections 44. In the example illustrated, projections 44 comprise mutually facing wedges or ramps projecting from side 42 of central portion 30. As a result, projections 44 facilitate one-way insertion of a webbing strap into channel 32 wherein webbing strap 16 may ride up such ramp surfaces until falling into channel 32. In other implementations, projections 44 may comprise bumps or other shapes.

[0025] In the example illustrated, such projections 44 are integrally formed as part of a single unitary body with strap 20. In other implementations, projections 44 may be welded, bonded, fastened or adhered to central portion 30. In other implementations, central portion 30 may have an enhanced thickness, with a notch or cut out in such thickness to provide channel 32.

[0026] Pull tabs 33 extend at opposite end portions of strap 20 and provide surfaces by which a person may manually grasp such ends of strap 22 in his or her thumb and index finger. Pull tabs 33 allow person to hold one end of strap 20, while the other end of strap 20 is pulled to pass one or more heads 26 through a selected one of apertures 24. In the example illustrated, pull tabs 33 further include grip enhancing structures 48 (shown as raised ribs). In other implementations, other grip enhancing structures may be provided such as dimples, serrations, grooves, rough textured surfaces and the like. In other implementations, one or both of pull tabs 33 may be omitted or may have other configurations.

[0027] FIGS. 4, 5 and 6 illustrate operation of strap 20. FIG. 4 illustrates the use of strap 20 to secure an article 118 having a first cross-sectional dimension. As shown by FIG. 4, one end of strap 20 is fed or threaded through passage 60 formed by webbing strap 16 and an opposite panel 62 of apparel 12 until central portion 30 underlies webbing strap 16 and webbing strap 16 is located within channel 32. During such insertion,



those portions of strap 16 having a thickness greater than passage 60 may compress or deform. For example, in one implementation, projections 44 may have hollow interiors allowing them to compress. In another example, projections 44 may resiliently deform or flex. In some implementations, webbing strap 16 is itself resiliently flexible, being formed from an elastic fabric, wherein webbing strap 16 stretches and resiliently flexes during such insertion. Upon insertion, channel 32 retains webbing strap 16 in place, inhibiting slippage of strap 20 during the remaining securement of article 118 to apparel 12.

[0028] Once strap 16 has been located within channel 32, article 118 is placed on top of strap 20. In one implementation, article 118 is placed in alignment with webbing straps 16 between projections 44. As shown by FIG. 4, projections 44 contact and engage opposite side portions of article 118 to further assist in retaining article 118 in place. Because projections 44 are soft and compressible or flexible, projections 44 reduce potential scratching or other damage to article 118 while also facilitating a better grip upon article 118 to inhibit undesired movement and to reduce noise.

[0029] Once article 118 is been located against strap 20, pull tabs 33 may be grasped to wrap end portions of strap 20 about article 118 and to pull at least one of heads 26 through a selected one of apertures 24 to connect the opposite end portions to form the closed loop 70 about article 118. Depending upon how tight of a grip is desired, a person may select one of the multiple apertures 24 to appropriately size loop 70. Once an aperture 24 has been selected, head 26A is pulled through the selected aperture 24 until neck 28A is located within the selected aperture 24. If the resulting size of loop 70 is not sufficiently small or does not provide a sufficiently tight grip about article 118, the neck successive head 26B is pulled through the selected aperture 24 until neck 28 is positioned across and within the selected aperture 24 to the state shown in FIG. 4. As a result, the size of loop 70 may be ratcheted down until an adequate grip of article 118 is achieved. In the final position, webbing strap 116 is further captured within channel 32 by projections 44. In the example illustrated, the remaining tail of strap 20 including unused apertures 24 may be inserted through a passage 72 of a neck successive webbing strap 16. In other implementations, the tucking of this tail may be omitted.

[0030] FIG. 5 illustrates the same strap 20 securing a larger article 218 with respect to pack apparel 12. As shown by FIG. 5, in such circumstances, only the first head 26A need be passed through a selected one of apertures 24 to position neck 28 within the selected aperture 24 (shown in FIGS. 2 and 3). In circumstances where an even larger or smaller article is to be retained, other apertures 24 may use in combination with one of heads 26 to provide the desired size for loop 70 of strap 20.

[0031] FIG. 6 illustrates pack system 10 showing FIG. 1 without article 18 to better illustrate each of straps 20 in use. In the example illustrated, central portion 30 of each of straps 20 is positioned within a corresponding one of passages 60 provided by a same webbing strap 16. Webbing strap 16 is retained relative to strap 20 within each of channels 32 provided by projections 44. Each of straps 20 is pulled through a selected one of apertures 24 to position its neck 28B across the selected aperture 24 to appropriately grip the one or more articles about which straps 20 are wrapped. As shown by FIG. 6, the tails of straps 20 may be inserted through the passages provided by an adjacent webbing strap 16. Although pack

system 10 is illustrated as including two straps 20 on a single webbing strap 16, in other implementations, pack system 10 may include a single strap 20 or more than two straps 20 secured about a single webbing strap 16. In some implementations, pack system 10 may employ multiple straps 20 wrapping about multiple different webbing straps 16, but wrapped about the same article. As a result, pack attachment straps 20 facilitates securement of multiple sized and shaped articles in various fashions. At the same time, such straps 20 are compact, reliable, and relatively easy and intuitive to use.

[0032] Although the present disclosure has been described with reference to example embodiments, workers skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the claimed subject matter. For example, although different example embodiments may have been described as including one or more features providing one or more benefits, it is contemplated that the described features may be interchanged with one another or alternatively be combined with one another in the described example embodiments or in other alternative embodiments. Because the technology of the present disclosure is relatively complex, not all changes in the technology are foreseeable. The present disclosure described with reference to the example embodiments and set forth in the following claims is manifestly intended to be as broad as possible. For example, unless specifically otherwise noted, the claims reciting a single particular element also encompass a plurality of such particular elements.

What is claimed is:

1. An apparatus comprising:
  - an elongate elastomeric strap comprising:
    - a series of spaced apertures;
    - a first head sized to snap through a selected one of the apertures with a first adjacent smaller neck portion received within the selected one of the apertures to form a first article retaining loop; and
    - a channel between the series of spaced apertures and the first head, the channel being sized to receive a webbing strap of pack clothing.
2. The apparatus of claim 1 further comprising a second head, the second head sized to snap through the selected one of the apertures with a second adjacent neck portion received within the selected one of the apertures to ratchet the strap to form a second article retaining loop smaller than the first article retaining loop.
3. The apparatus of claim 1 further comprising a pull tab on each end of the strap.
4. The apparatus of claim 1, wherein the series of spaced apertures comprise a series of spaced slots.
5. The apparatus of claim 1, wherein the strap has a flat back face opposite the channel.
6. The apparatus of claim 1, wherein the strap is integrally formed as a single unitary body.
7. The apparatus of claim 6, wherein the strap is formed from rubber.
8. The apparatus of claim 1 further comprising a backpack having a webbing strap received within the channel, wherein the first neck portion is received within a selected one of the apertures to form the first article retaining loop.
9. An apparatus comprising:
  - an elongate elastomeric strap comprising:
    - a series of spaced apertures;
    - a first head sized to snap through a selected one of the apertures with a first adjacent smaller neck portion

received within the selected one of the apertures to form a first article retaining loop; and  
 a second head sized to snap through the selected one of the apertures with a second adjacent smaller neck portion received within the selected one of the apertures to form a second article retaining loop smaller than the first article retaining loop.

10. The apparatus of claim 9 further comprising a pull tab on each end of the strap.

11. The apparatus of claim 9, wherein the series of spaced apertures comprise a series of spaced slots.

12. The apparatus of claim 9, wherein the strap has a flat back face opposite the channel.

13. The apparatus of claim 9, wherein the strap is integrally formed as a single unitary body.

14. The apparatus of claim 13, wherein the strap is formed from rubber.

15. The apparatus of claim 9 further comprising a backpack having a webbing strap received within the channel, wherein the first neck portion is received within a selected one of the apertures to form the first article retaining loop.

16. A method comprising:  
 inserting a pack strap through a webbing strap of a pack clothing;  
 retaining the webbing strap of the pack clothing within a channel of the pack strap;  
 positioning an article against the pack strap;

connecting end portions on opposite sides of the channel to form a loop about the article to retain the article against the pack clothing.

17. The method of claim 16 wherein the step of connecting the end portions comprises passing an enlarged head of the strap through one of a series of apertures in the strap to capture a neck portion adjacent the enlarged head within said one of the series of apertures.

18. The method of claim 17 further comprising passing a second enlarged head of the strap through said one of the series of apertures in the strap to capture a second neck portion adjacent in second enlarged head within said one of the series of apertures to form a smaller loop about the article to retain article against the pack clothing.

19. The method of claim 16 further comprising:  
 inserting a second pack strap through a second webbing strap of the pack clothing;  
 retaining the second webbing strap of the pack clothing within a second channel of the second pack strap;  
 positioning the article against the second pack strap;  
 connecting end portions of the second pack strap on opposite sides of the second channel to form a second loop about the article to retain the article against the pack clothing.

20. The method of claim 19, wherein the strap is integrally formed as a single unitary body.

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