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(71) Applicant: **3M Innovative Properties Company**
Saint Paul, MN 55133-3427 (US)

(72) Inventors:
• **Thompson, Craig Donald**
Saint Paul, MN Minnesota 55133-3427 (US)
• **Pan, Angela Lilun**
Saint Paul, MN Minnesota 55133-3427 (US)
• **Kirschoffer, Jon Arthur**
Saint Paul, MN Minnesota 55133-3427 (US)
• **Eller, Michelle Agnes**
Saint Paul, MN Minnesota 55133-3427 (US)

(74) Representative: **De Clercq & Partners**
Edgard Gevaertdreef 10a
9830 Sint-Martens-Latem (BE)

(54) **Adjustable securing device with buckle**

(57) An adjustable securing device includes a strap having opposed first and second major surfaces wherein at least one of the first and second major surfaces includes a fastener, and a buckle attached to the strap, wherein the buckle includes a body containing a slot for receiving the strap, and wherein the buckle includes a buckle fastener arranged for refastenable mating engagement with the strap fastener.

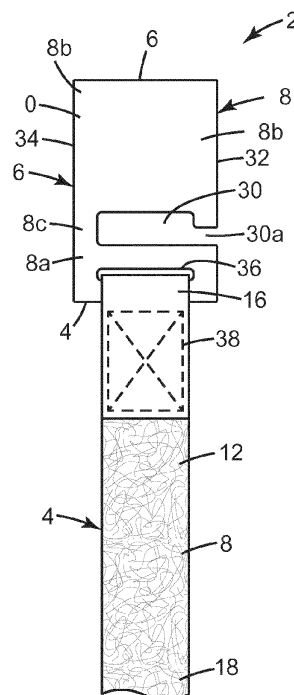


Fig. 2

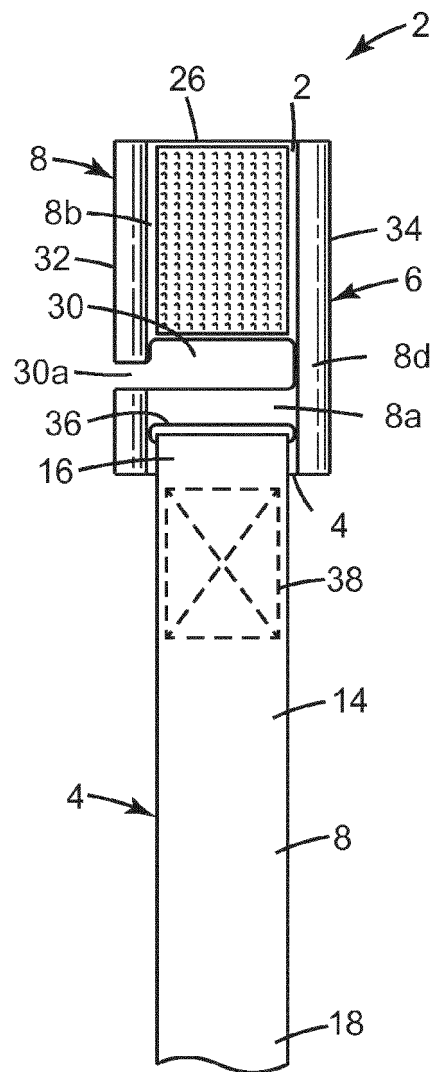


Fig. 3

Description

Background

[0001] The present invention relates generally to bundling, fastening, or securing devices and, more particularly, to adjustable strap-like securing devices.

[0002] Ropes, straps, and cords are known for securing and bundling items. Straps, such as tie-down straps, and elastic cords, such as bungee cords, are often used to secure or bundle items such as luggage, cargo, or equipment during transport. Such straps and cords are also used to secure or close items such as tarps, clothing, backpacks, duffel bags, chin straps for helmets, pet collars, or to bundle items such as sleeping bags, yoga mats, extension cords, yard tools or camping gear. To allow the length of a strap to be adjusted, the strap may be provided with a so called "ladder-lock" through which the strap is threaded. In addition, to allow the ends of a strap to be quickly connected and released, a strap may be provided with a buckle, such as a side release buckle. Similarly, the ends of bungee cords may be provided with hooks, snaps or clips to allow the ends of the cords to be quickly connected and disconnected from each other or an anchoring surface.

[0003] Strap and cord devices are also known in the prior art. U.S. Patent No. 4,149,540 (Hasslinger) for example, discloses a separable fastening device adapted to encompass at least one member in gripped relation having a first flexible strap having on one surface a plurality of upstanding hook-and-loop type engaging elements, a second strap having on a surface opposite the first surface, a plurality of mating upstanding hook-and-loop type engaging element, with means being provided to connect the first and second straps, and retaining means connected to the free end of the first strap, the retaining means defining an opening configured to receive the free end of the second strap. U.S. Patent No. 6,345,418 (Bertrand, et. al.) discloses a rope hook comprising a length of tubular fabric webbing into which a pair of loops has been formed. U.S. Patent No. 6,014,794 (McCoy) discloses a reinforced bungee cord tie down for securing cargo without becoming over-stretched. And U.S. Patent No. 6,546,604 (Galkiewicz, et. al.) discloses a self mating mechanical fastener comprising a base sheet and a multiplicity of parallel, narrowly spaced, elastically deformable ribs projecting from the base sheet.

Summary

[0004] Existing straps and cords suffer from numerous drawbacks and shortcomings. For example, straps with conventional buckles, such as ladder-lock buckles and side release buckles, are difficult to thread and adjust, can pinch user's fingers, have a limited range of adjustability, and tend to slip and, therefore, not hold securely. In addition, existing straps and cords are complicated and expensive to make, and are prone to wear and tear

and, thus, are prone to premature failure. Bungee cords have a limited range of adjustability, recoil violently after being stretched and released, lose their elasticity over time, and - because of their elasticity - do not hold securely. The need exists for an adjustable strap device that is versatile, holds securely, is easy to make, and is easy to use.

[0005] In one embodiment, the present disclosure provides a securing device comprising a strap having opposed first and second major surfaces and first and second ends, wherein at least one of the first and second major surfaces includes a fastener, and a buckle attached to the strap, wherein the buckle includes a body containing an opening for receiving the strap, and wherein the buckle includes a buckle fastener arranged for re-fastenable mating engagement with the strap fastener.

[0006] In a more specific aspect, the body may include a first portion and a second portion spaced from the first portion, thereby defining an opening between the first portion and the second portion. In another aspect, the body may further include at least one neck portion extending between the first portion and the second portion.

[0007] In one embodiment, the buckle has first and second major surfaces, and the first and second major surfaces may be coplanar. In another aspect, the buckle first body portion and second body portion may be generally coplanar. In another embodiment, the buckle may have a generally thin, flat, plate-like configuration. In another embodiment, the buckle may have a curved configuration.

[0008] In one embodiment, the opening for adjustably receiving the strap may be bound on all sides, and the strap may be connected with the buckle by threading the strap through the opening. The opening is generally configured to slidably and removably receive the strap to allow the length and position of the strap to be readily adjusted. In a specific aspect, the buckle includes first and second sides, and the opening may extend from one side, thereby forming a slot having a mouth, whereby the strap may be inserted laterally into the slot via the mouth.

[0009] In other aspects, the buckle may include a reinforcing rib portion extending along a side of the buckle opposite the opening, and/or the first portion may contain a second opening, wherein a first end of the strap may be secured to the buckle first portion via the second opening.

[0010] In other aspects of specific embodiment, the buckle fastener may be arranged on a surface of the buckle second body portion, the strap fastener may comprise a plurality of fastening elements, the buckle fastener may comprise a plurality of fastening elements, and the buckle fastener may comprise a patch of fastening elements having an area of at least about 1 cm² and no greater than about 25 cm², and a length of at least about 1 cm and no greater than about 8 centimeters as measured along the longitudinal length of the strap.

[0011] In one embodiment, the buckle fastener may be adhesively bonded to the buckle second body portion. In

other embodiments, the strap fastener may form a first attachment surface, and the buckle fastener may form a second attachment surface. In a specific embodiment, the strap first major surface may be provided with loop material, and the first major surface of the buckle second body portion may be provided with hook material. In another embodiment, strap fastening elements and the buckle fastening elements may be self-mating.

[0012] In another embodiment, the second body portion may be arranged at an angle relative to the first body portion. The first body portion and the second body portion may form an angle of about 45 degrees to about 180 degrees. In addition, the strap and the second body portion may form an angle of between about 0 degrees and about 135 degrees. In one embodiment, the first body portion may be configured to be mounted on a surface such that when the first body portion is mounted on a surface, the second body portion extends outwardly away from the mounting surface.

[0013] In other embodiments, the buckle may include a foot portion extending from the first body portion. The foot portion may extend outwardly from the first body portion in the same direction as the second body portion. The foot portion may extend outwardly from an end of the first body portion opposite the second body portion at an angle of about 90 degrees, thereby forming a ledge. The foot portion may include an opening, and one end of the strap may be secured to the foot portion via the opening. In various embodiments, the buckle may include a reinforcing side wall portion extending between the first body portion and the second body portion.

[0014] In one aspect of the invention, the strap second major surface may be substantially free of fasteners, and the buckle second major surface may be substantially free of fasteners. Fastening elements may be provided on substantially all of the first major surface of the strap first major surface, and/or

fastening elements may be provided on substantially all of the first major surface of the second body portion of the buckle.

[0015] In various embodiments, the strap may be threaded through the second opening of the first body portion of the buckle and looped back onto itself and secured to itself, thereby connecting the strap with the first body portion of the buckle.

[0016] Advantages of certain embodiments of the securing device and buckle described herein include that the device is versatile, it can be mounted on a surface, it is durable, easy to make and use, it is highly adjustable, and it holds strongly and securely while using fewer fasteners and/or less attachment material than previously known straps.

Brief Description of the Drawings

[0017] The present invention will be further described with reference to the accompanying drawings, in which:

FIG. 1 is an exploded view of a securing device according to an embodiment of the invention.

FIG. 2 is a top plan view of a securing device according to an embodiment of the invention.

FIG. 3 is a bottom plan view of the securing device of Fig. 2.

FIG. 4 is a perspective view of a buckle according to an alternate embodiment of the invention.

FIG. 5 is a perspective view of a buckle according to another embodiment of the invention.

FIG. 6 is a side plan view of the embodiment of FIG. 5 except including a strap and mounted to a surface.

Detailed Description

[0018] Referring now to the drawings, wherein like reference numerals refer to like or corresponding parts throughout the several views, FIGS. 1-3, show a securing device 2 including a strap 4 and a buckle 6. The strap 4 and buckle 6 include fasteners 8, 10, respectively, arranged for refastenable mating engagement, thereby to allow the strap 4 to be repeatably connected and disconnected from the buckle 6. The strap 4 includes opposed first and second major surfaces 12, 14, respectively, and first and second ends 16, 18, respectively, and the buckle 6 includes first and second major surfaces 20, 22, respectively, and first and second ends 24, 26, respectively. In the illustrated embodiment, the first end 16 of the strap 4 is fixedly connected with the first end 24 of the buckle 6.

[0019] The buckle 6 comprises the buckle fastener 10 and a body 28. The body 28 comprises a first portion 28a, and a second portion 28b spaced from the first portion 28a, thereby defining an opening 30 between the first portion 28a and the second portion 28b. In the illustrated embodiment, the body 28 includes a neck portion 28c extending between the first portion 28a and the second portion 28b, whereby the opening 30 is a slot open at one end and, thereby, configured to slidably and removably receive the strap 4 from the side without threading the strap 4 through the opening 30. That is, the buckle 6 includes first and second sides 32, 34, respectively, and the opening 30 extends from the first side 32 toward the second side 34 of the buckle 6 between the first and second portions 28a, 28b, and in the direction of the neck portion 28c, thereby forming a slot 30 having a mouth 30a, whereby the strap 4 can be inserted laterally into the slot 30 via the mouth 30a. It will be recognized that in another embodiment, the opening 30 may be bound on all sides, whereby the strap 4 is connected with the buckle 6 by threading the strap 4 through the opening 30.

[0020] In the embodiment illustrated in FIGS. 1-3, the first and second major surfaces 20, 22 of buckle 6 are generally coplanar, and the first and second portions 28a, 28b of the body 28 are generally coplanar. That is, the buckle 6 has a generally thin, flat, plate-like configuration. It will be recognized that in other embodiments the buckle 6 may be curved.

[0021] In the illustrated embodiment, the buckle 6 further comprises a reinforcing rib portion 28d that extends along the second side 34 of the buckle 6 adjacent the neck portion 28c. It will be recognized that the reinforcing rib portion 28d need not extend along the entire length of the second side 34 of the buckle 6 to perform the desired function of providing additional strength. That is, the reinforcing rib portion 28d may extend along the second side 34 only along the neck portion 28c and a portion of the first and second body portions 28a, 28b.

[0022] In the illustrated embodiment, the first body portion 28a contains a second opening 36, and the first end 16 of the strap 4 is secured to the first body portion 28a of the buckle 6 via the second opening 36. More specifically, the first end 16 of the strap 4 is threaded through the opening 36 contained in the first body portion 28a of the buckle 6 and looped back onto itself, and secured to itself. The strap 4 may be secured to itself using known fasteners such as, for example, adhesive, a rivet or stitching 38, thereby providing a generally fixed connection between the first end 16 of the strap 4 and the first body portion 28a of the buckle 6.

[0023] The strap and buckle fasteners 8, 10 may be, for example, an adhesive, such as non-tacky adhesive, a permanent or repositionable adhesive, or a mechanical fastener including snaps, clips, hooks, buttons, hook-and-loop fasteners, self mating mechanical fasteners, and the like. In the illustrated embodiment, the strap fastener 8 is arranged on the first major surface 12 of the strap 4, and the buckle fastener 10 is arranged on the first major surface 20 of the second body portion 28b of the buckle 6. The buckle fastener 10 may be, for example, adhesively bonded to the first major surface 20 of the second body portion 28b of the buckle 6, and the strap fastener 8 may be adhesively bonded or sewn to the strap 4. Alternatively, the strap fastener 8 may be formed as part of the strap 4 itself. That is, the strap fastener 8, such as a loop material, may be woven and incorporated directly into the strap 4 itself. In the illustrated embodiment, the strap fastener 8 and buckle fastener 10 comprises a plurality of fastening elements that form an attachment surface or patch of fastening elements.

[0024] In the illustrated embodiment, the plurality of fastening elements forming the buckle fastener 10 are provided on substantially all of the first major surface 20 of the second body portion 28b of the buckle 6. Depending on the intended end use application and the amount of holding force desired, the patch of fastening elements provided on the buckle 6 that form the buckle fastener 10 may cover a surface area of at least about 1 square centimeters (cm²), at least about 2 cm² or at least about 3 cm², and may cover a surface area of no greater than about 20 cm², no greater than about 25 cm² or no greater than about 30 cm². One advantage of the present invention is that it does not require a large amount of fastening elements on the buckle 6. For example, in various embodiments, buckle fastener 10 may have a length of no greater than about 8 centimeters (cm), no greater than

about 5 cm, no greater than about 2.5 cm, no greater than about 2 cm, or no greater than about 1 cm as measured along the longitudinal length of the strap 4.

[0025] In the illustrated embodiment, the first major surface 20 of the buckle 6 second body portion 28b is provided with hook material, and the first major surface 12 of the strap 4 is provided with loop material, thereby providing a hook-and-loop type mating surface between the buckle 6 and the strap 4. In another embodiment, the positions of the hook-and-loop material may be reversed. That is, hook material may be provided on the strap 4, and loop material may be provided on the buckle 6. Other mechanical fasteners such as self-mating reclosable mechanical fasteners may also be used. Such fasteners are described in, for example, U.S. Patent No. 5,077,870 (Melbye et. al.), the entire contents of which are hereby incorporated by reference.

[0026] The buckle 6 may be formed of a variety of materials. The particular material selected is not significant to the invention hereof, so long as it provides the requisite strength and desired function. Suitable materials include, for example, wood, metal, or a rigid synthetic plastic material.

[0027] Referring generally to FIGS. 4 and 5, wherein functionally similar features to those in FIGS. 1-3 are referred to with like reference numerals incremented by 100, there is shown a bracket or buckle 106 having a body 128 wherein the second body portion 128b of the buckle 106 is arranged at an angle relative to the first body portion 128a of the buckle 106. To allow the details of the buckle 106 to be seen more clearly, a strap is not shown in FIGS. 4 and 5.

[0028] Referring more specifically to the embodiment illustrated in FIG. 4, there is shown a buckle 106 including a body member 128 and a buckle fastener 110. The body 128 includes a first body portion 128a, a second body portion 128b, and a reinforcing side wall portion 128e. The first body portion 128a contains an opening 136 which is used to secure a strap to the buckle 106, and the buckle 106 contains a slot 130 for adjustably receiving a strap (not shown in FIG. 4).

[0029] Referring more specifically to the embodiment illustrated in FIG. 5, there is shown a buckle 106 including a body member 128 and a buckle fastener member 110. The body 128 includes a first body portion 128a, a second body portion 128b, a reinforcing side wall portion 128e, and a foot portion 128f that extends from an end of the first body 128a portion in the same direction as the second body portion 128b. In the illustrated embodiment, the foot portion 128f extends outwardly from an end of the first body portion 128a opposite the second body portion 128b at an angle of about 90 degrees, thereby forming a ledge that can be used to support items prior to the items being secured or bundled with a strap. The foot portion 128f contains an opening 136 that is used to secure a strap to the buckle 106. That is, a strap is secured to the foot portion 128f via the opening 136.

[0030] Referring to FIG. 6, there is shown a securing

device 102 mounted on a mounting surface 50. The securing device 102 includes a bracket or buckle 106 and a strap 104. In the illustrated embodiment, the first body portion 128a and the second body portion 128b form an angle α that can range from 0 to about 170 degrees. That is, when the securing device 102 is mounted on a mounting surface 50 and the first body portion 128a is mounted flush on the mounting surface 50, the second body portion 128b extends outwardly away from the mounting surface to allow enough room so the strap 104 can be maneuvered and secured to the buckle fastener 110. It has been found that smaller angles α may provide increased holding strength. Thus, angles α ranging less than 135 degrees, less than 90 degrees, or less than 45 degrees are desirable. In addition, when the strap 104 is secured to the buckle 106 via the buckle fastener 110 by arranging the strap 104 in the slot 130 and attaching the strap fastener 108 to the buckle fastener 110, the strap 104 and the first body portion 128a form an angle β of between about 0 degrees and about 135 degrees.

[0031] The buckle 106 may be mounted to the mounting surface 50 in a conventional manner using, for example, glue, a hot melt adhesive, a permanent pressure sensitive adhesive, or a stretch removable adhesive, such as Command adhesive strips available from 3M Company, St. Paul, Minnesota. Alternatively, the buckle 106 may be secured to the mounting surface 50 through openings 52 provided in the first body portion 128 using mechanical fasteners 54 such as nails or screws.

[0032] In each of the embodiments described herein, the length of the strap 4 is not significant to the invention hereof, as long as it provides the desired function of being able to bundle or secure one or more items for a given end use application. The strap 4 may have a length of, for example, at least about 8 inches, at least about 12 inches, or at least about 16 inches. In addition, the material used to form the strap 4 is not significant to the invention as long as it provides the desired properties, such as strength and/or flexibility, for a given end use application. Suitable materials include, for example, cotton, nylon, polypropylene, polyester, and combinations thereof.

[0033] In accordance with an advantage of the embodiments described herein, the second major surface 14 of the strap 4 may be substantially free of fasteners elements. That is, in contrast to known straps that require interlocking fasteners on substantially all of both opposed major surfaces of the strap to allow for the desired degree of holding strength and adjustability, the embodiments described herein may include fasteners on only one major surface of the strap. That is, one major surface of the strap may be substantially free of fasteners. Rather than provide the second, or mating, fastener on the opposed major surface of the strap, the second, or mating fastener, is provided on the buckle. In addition, the surface area covered by the fastener on the buckle is significantly less than the surface area of the fastener provided on the strap. Surprising, it has been found that even when the

second, or mating fastener or fastening elements are provided only on the buckle, and the surface area covered by fasteners on the buckle is significantly less than the surface area covered by fasteners on the strap, full adjustability and strong holding power can be maintained. Another benefit of providing the mating fastening elements on the buckle is that significantly less fastening material is needed to form the fastener or mating surface, and, hence, the overall cost of the raw materials used to produce the securing device is reduced. It will be recognized that the second major surface 22 of the buckle 6 may be substantially free of fastening elements.

[0034] Depending on the desired extent of adjustability, the strap fastener 8 may be provided on only a portion of the first major surface 12 of the strap 4 or, if maximum adjustability is desired, on substantially all of the first major surface of the strap first major surface 12.

[0035] Persons of ordinary skill in the art may appreciate that various changes and modifications may be made to the invention described above without deviating from the inventive concept. For example, in one aspect, it will be recognized that a strap, while useful in forming a securing device, it is not a required element of the invention. That is, a buckle according to the present invention may be initially provided without a strap, and straps having various properties or characteristics such as, for example, different lengths, colors, or strengths, may be provided separately. Thus, the scope of the present invention should not be limited to the structures described in this application, but only by the structures described by the language of the claims and the equivalents of those structures.

Claims

1. A securing device, comprising:

- (a) a strap having opposed first and second major surfaces and first and second ends, wherein at least one of the first and second major surfaces includes a fastener; and
- (b) a buckle attached to the strap, wherein the buckle includes a body containing an opening for receiving the strap, and wherein the buckle includes a buckle fastener arranged for refastenable mating engagement with the strap fastener.

2. A securing device as defined in claim 1, wherein the body includes a first body portion, and a second body portion spaced from the first body portion, thereby defining an opening between the first body portion and the second body portion.

3. A securing device as defined in claim 2, wherein the buckle first body portion and second body portion are generally coplanar.

4. A securing device as defined in claim 1, wherein the buckle includes first and second sides, and wherein the opening extends from one side, thereby forming a slot having a mouth, whereby the strap can be inserted laterally into the slot via the mouth. 5
5. A securing device as defined in claim 1, wherein the buckle further comprises a reinforcing rib portion extending along a side of the buckle opposite the mouth. 10
6. A securing device as defined in claim 2, wherein the first body portion contains a second opening, and further wherein a first end of the strap is secured to the buckle first portion via the second opening. 15
7. A securing device as defined in claim 1, wherein the strap fastener comprises a plurality of fastening elements. 20
8. A securing device as defined in claim 1, wherein the buckle fastener comprises a plurality of fastening elements.
9. A securing device as defined in claim 2, wherein the second body portion is arranged at an angle to the first body portion. 25
10. A securing device as defined in claim 9, wherein the buckle further comprises a foot portion extending from the first body portion in the same direction as the second body portion. 30
11. A securing device as defined in claim 9, wherein the buckle includes a reinforcing side wall portion extending between the first body portion and the second body portion. 35

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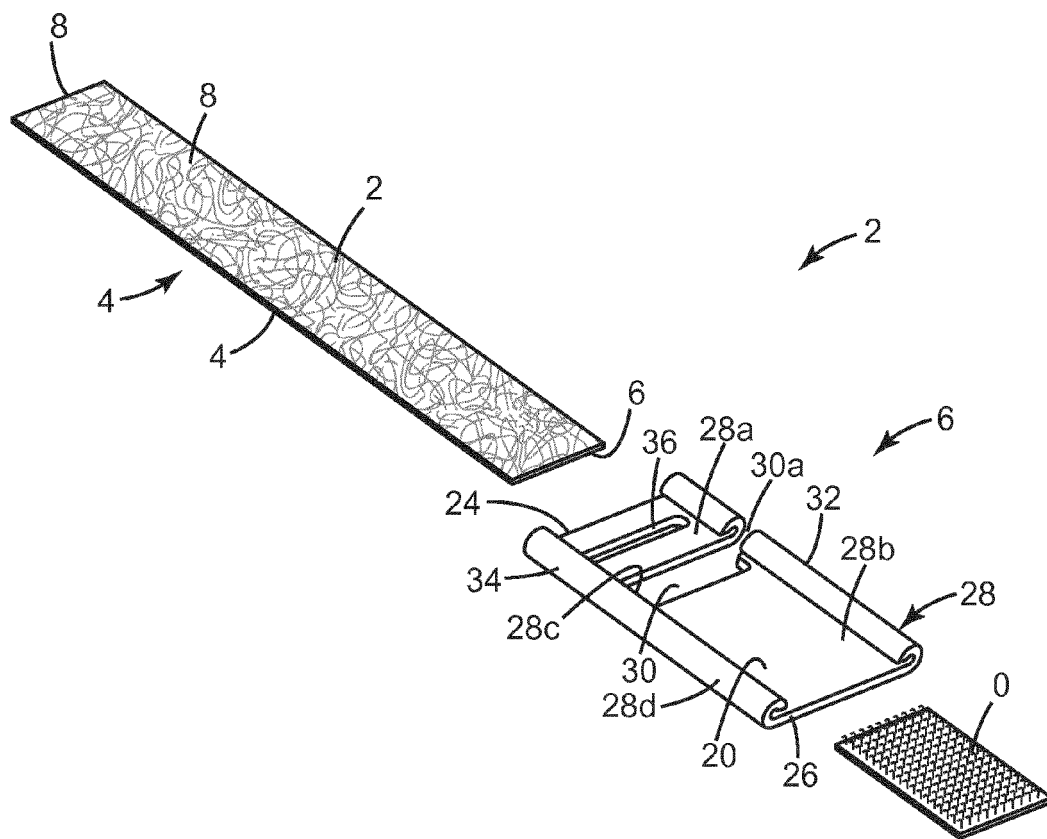


Fig. 1

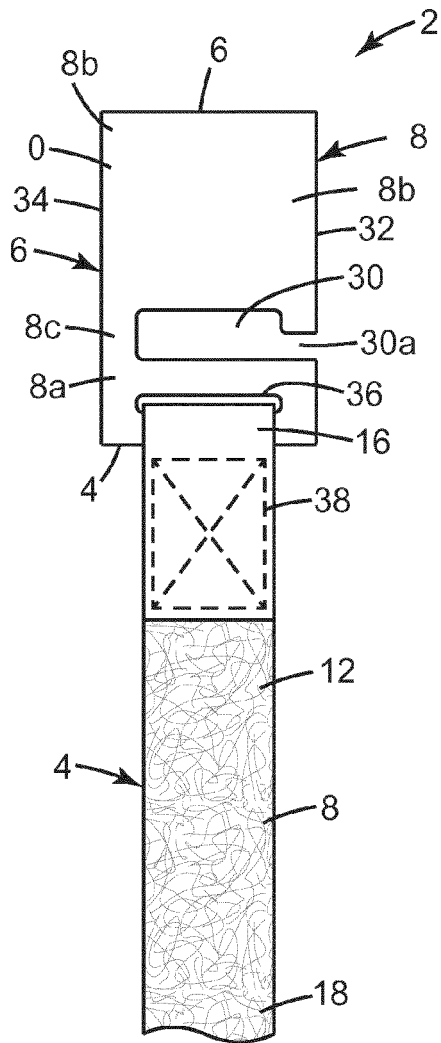


Fig. 2

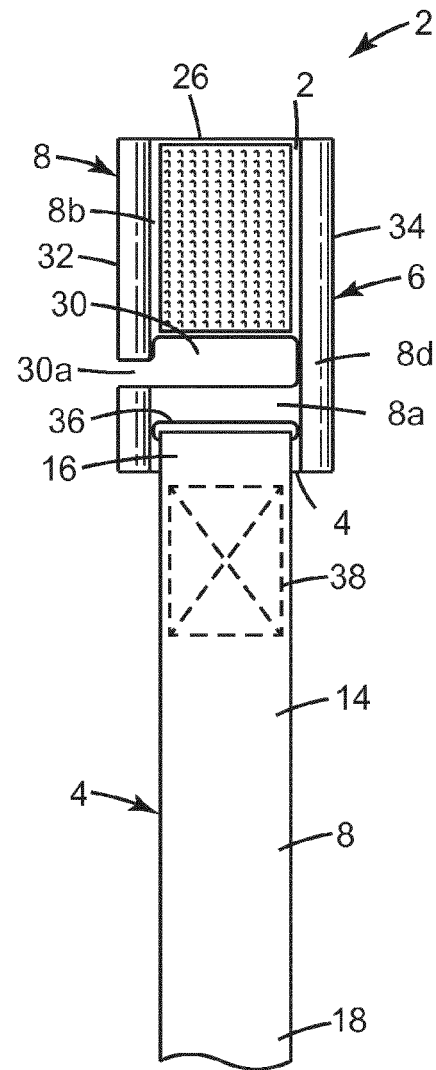


Fig. 3

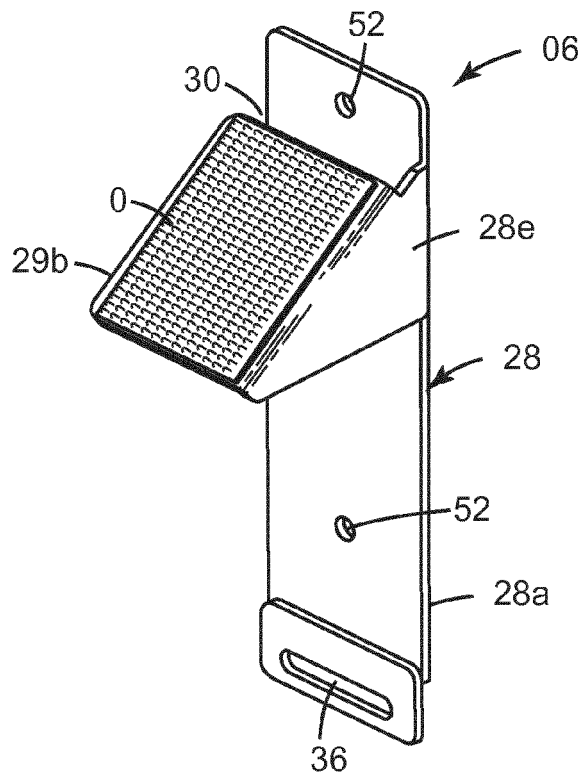


Fig. 4

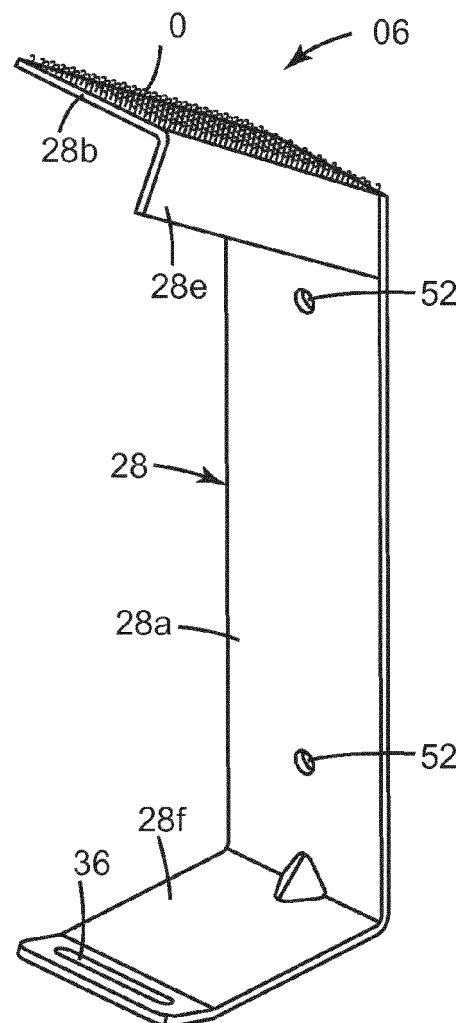


Fig. 5

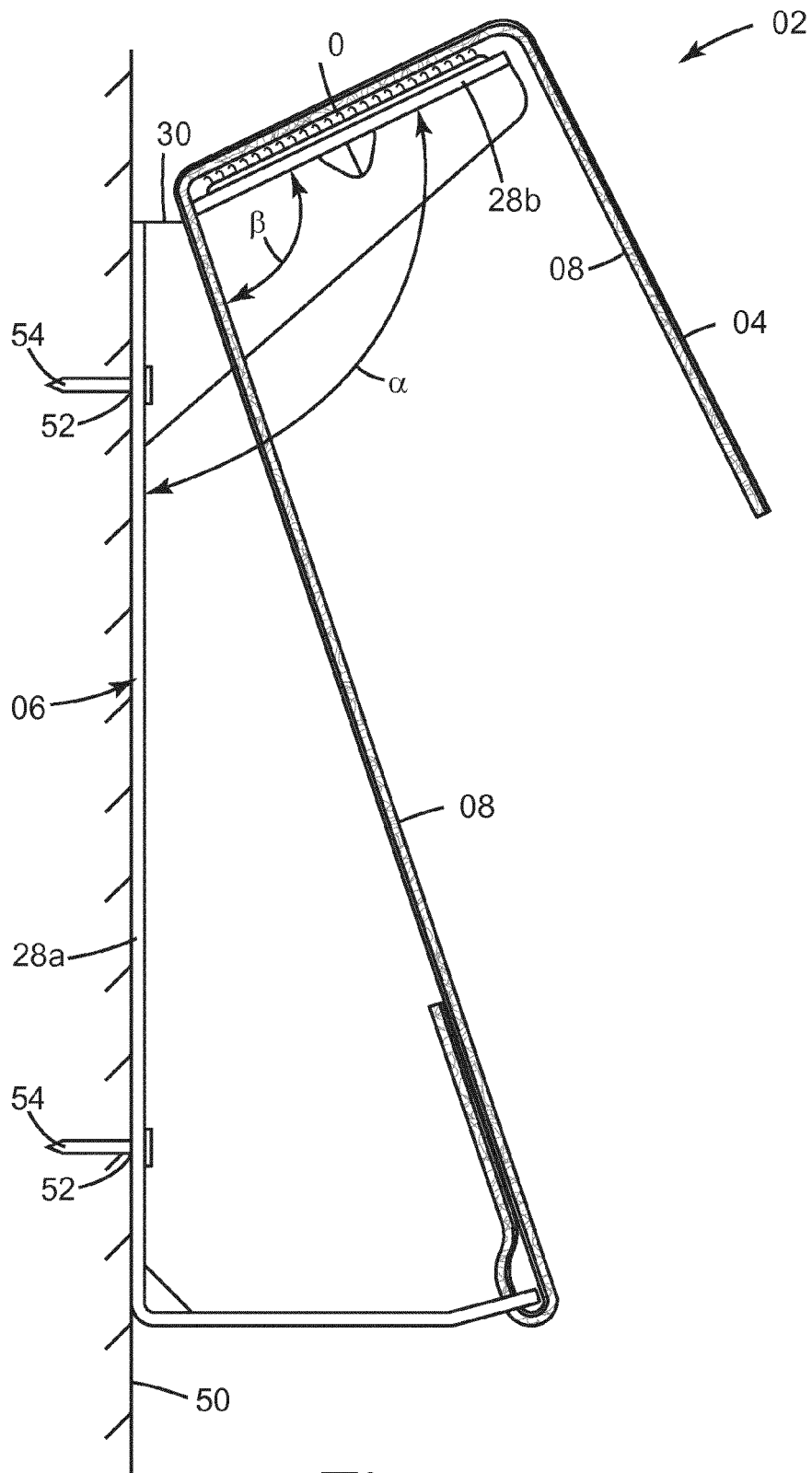


Fig. 6



EUROPEAN SEARCH REPORT

 Application Number
 EP 14 15 7174

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 956 784 A1 (YKK CORP [JP]) 17 November 1999 (1999-11-17)	1-4,6-8	INV. B65D63/16
Y	* paragraph [0015] - paragraph [0017]; figure 2 * * paragraph [0021] - paragraph [0022]; figure 8 *	5	
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Y	* column 5, line 7 - line 65; figures 5, 11 *	11	
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B65D F16L A44B
Place of search		Date of completion of the search	Examiner
The Hague		2 June 2014	Bridault, Alain
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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

EP 14 15 7174

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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