

United States Patent

[11] 3,576,054

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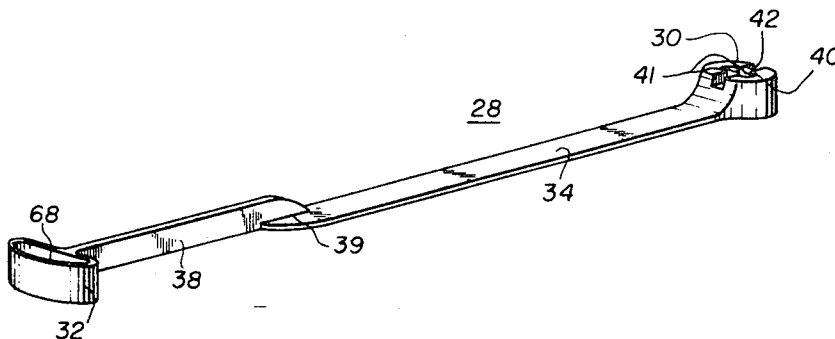
[54] **BUNDLING STRAP**
21 Claims, 18 Drawing Figs.

[52] U.S. Cl. 24/16,
128/346
[51] Int. Cl. B65d 63/00,
A61b 17/08
[50] Field of Search 24/16 (PB),
30.5 (PB), 17 (A); 128/346

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ABSTRACT: A bundling strap comprised of a dual-section body extending from a dual-aperture head and terminating in a tail extension. One head aperture permits one section of the strap body to be readily received therein after the strap has been looped around the articles to be bundled. The remaining section of the body may then be received by and drawn through the other head aperture contoured to readily accept the remaining body section while providing sufficient restraining force against the strap body engaged therein to maintain the strap in the desired loop configuration. The strap body may be conveniently placed within the appropriate head aperture and drawn therethrough by means of the tail extension. Locking means may be provided within the appropriate head aperture to provide maximum resistance to the attempted withdrawal of the strap body from the head aperture after engagement therein.



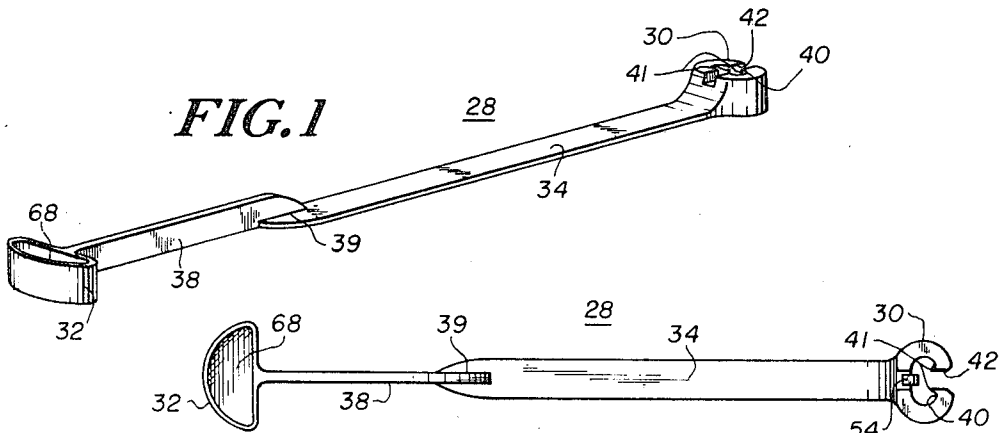


FIG. 2

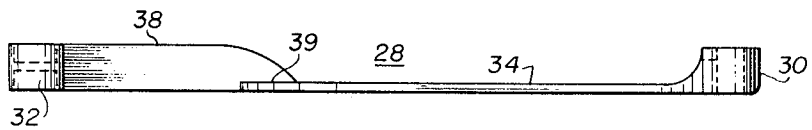


FIG. 3

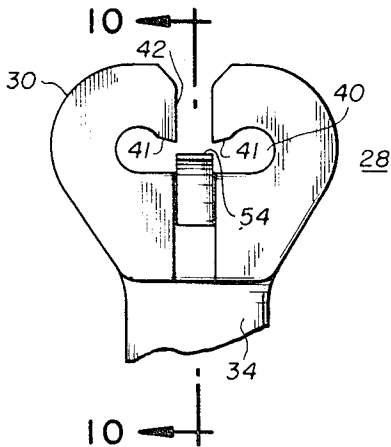


FIG. 4

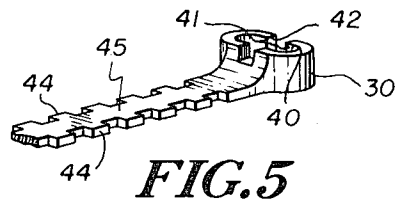


FIG. 5

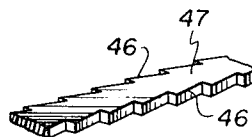


FIG. 6

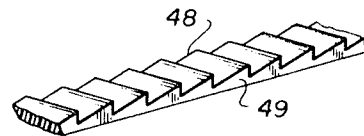


FIG. 7

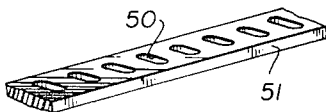


FIG. 8

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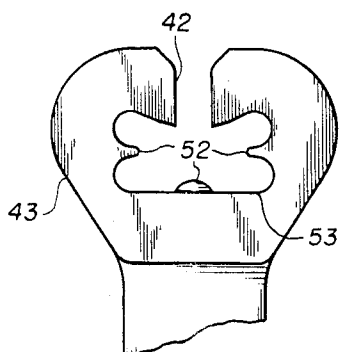


FIG. 9

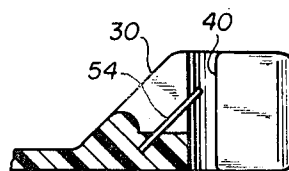


FIG. 10

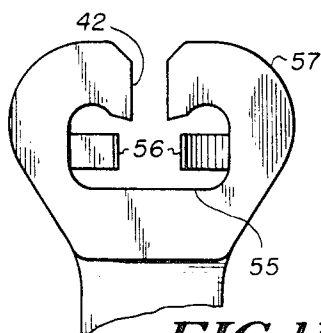


FIG. 11

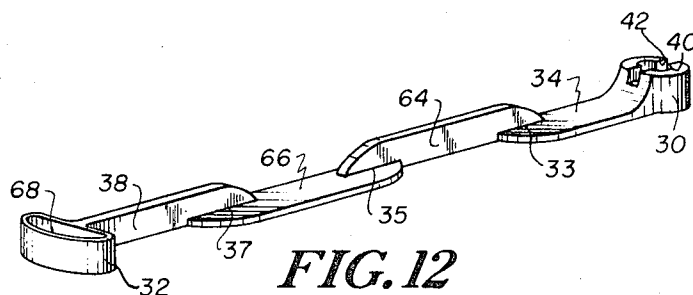


FIG. 12

FIG. 13

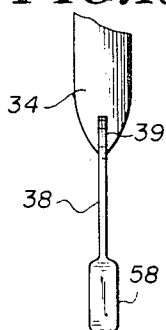


FIG. 15

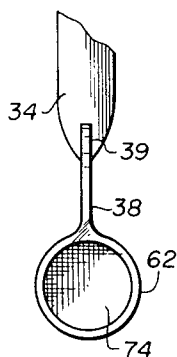


FIG. 17

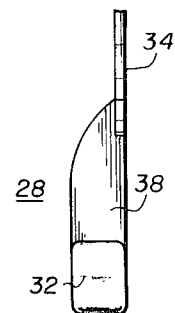


FIG. 14

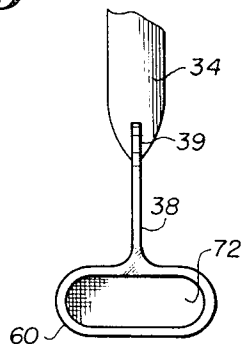


FIG. 16

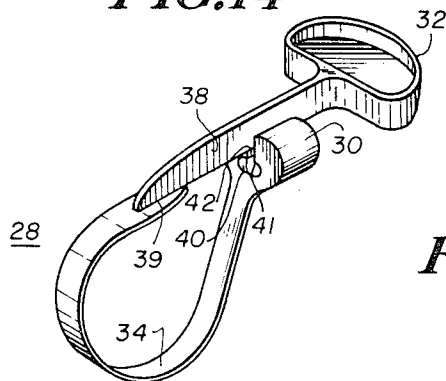
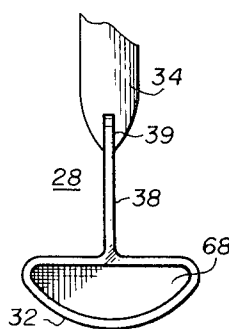


FIG. 18

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BUNDLING STRAP

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention is directed to the field of bundling one or more articles to form a convenient, more easily handled unit. Similarly, the device may be used as an umbilical cord clamp providing a rapid, easily manipulated means for clamping the umbilical cord during the postpartum period.

2. Description of the Prior Art

In prior art U.S. Design Pat. Ser. No. Des. 204,262 for Bundling Strap, by George Geisinger, issued on Apr. 5, 1966, and assigned to the assignee of the instant invention, there is disclosed and shown a bundling strap of the top entry type. In such strap, as shown in FIG. 4 of the above-cited patent, the necked-down, reduced cross section, tail end portion, after same has been looped around one or more articles to be bundled, is engaged in the aperture provided in the head of the strap, the closure around the bundle being completed by grasping the extended tail end portion and drawing the remainder of the strap body through the appropriate aperture. In order to maintain reasonably secure engagement of the strap body within the main head aperture, the top entry head aperture must be confined to a relatively narrow width. The tail end portion of the strap must then be necked down proportionately to permit proper engagement with the top entry head aperture, resulting in a weakened area susceptible to failure upon the application of the force required at the tail end portion of the strap to effect a proper closure of the strap. Additionally, the sole means of restraining the strap body within the appropriate aperture after engagement therein is a metallic tongue coupled to the inner surface of the main head aperture opposite the top entry head aperture, the free end of the tongue protruding into the main head aperture resulting in a restriction thereof. The pressure exerted by the metallic tongue against the underside of the strap body after engagement of the strap within the main head aperture results in a deformation of the strap adjacent to the area of contact between the tongue and the strap, whereby that portion of the strap so deformed is forced into the open area formed by the communication of the top entry head aperture with the main head aperture, and away from the metallic tongue. Since no provision is made in the device to prevent such deformation, the effectiveness of the locking means is thereby reduced which may result in the strap body disengaging from the main head aperture prematurely.

SUMMARY OF THE INVENTION

The present invention overcomes the difficulties noted above with respect to prior art devices as exemplified by the above-cited patent by providing an improved bundling strap of the top entry type which is structurally stronger and which increases the pullout strength achieved by such devices. Firstly, the body portion of the strap has a first portion extending from the head portion of the strap a predetermined length. A further strap body portion, having at least the same cross-sectional area as the first portion, is axially oriented with respect to the first portion and coupled thereto at a first end thereof. The second end of the further portion of the strap body may terminate in a tail extension adapted to provide a convenient means for engaging the further end of the body portion within the appropriate head aperture for proper insertion therein. Additionally, the second end of the further strap body portion may be coupled to yet another body portion coplanar with the first portion and similarly axially oriented with respect to the further strap body portion. A plurality of such first and further body portions may be serially coupled in like manner, terminating in a tail extension as hereinbefore described. As a result of the further body portion having at least the same cross-sectional area as the first portion, a substantially uniform strength is maintained along the length of the strap body, thereby reducing the possibility of failure of the tail end portion of the strap during the insertion and locking operation.

A first transverse aperture in the head portion of the bundling strap is contoured to restrict the opening of the aperture and prevent the first body portion of the strap from being freely withdrawn after insertion and engagement therein.

Further, ridges may be provided along the edge of the first portion of the body strap wherein increased locking strength may be attained by the engagement between the contoured surfaces of the first transverse aperture and the ridges, upon the insertion of the strap body within the first transverse aperture. Additionally, the surface of the strap body may be serrated or perforated to facilitate similar engagement with the contoured surfaces of the first transverse aperture.

Protrusions, extending inward from the inner aperture defining surface of the first transverse aperture, may be added to provide additional locking engagement of the strap body within the first transverse aperture after insertion therein. A metallic tongue having a free end extending into the first transverse aperture from a position adjacent the lower aperture defining surface of the aperture may be added to provide further locking action between the strap body and the head portion.

A second transverse aperture communicates with, and extends outward from, the first transverse aperture, providing a top entry means of engagement of the further portion of the strap body within the head portion of the strap. The width of the second transverse aperture is dimensionally restricted to substantially the thickness of the axially oriented further portion of the strap body whereby the maximum aperture defining surface of the first transverse aperture is available for locking engagement of the strap body within the first transverse aperture after insertion therein. It is therefore an object of this invention to provide an improved article-bundling strap of the top entry type.

It is still another object of this invention to provide an improved article-bundling strap of the top entry type having a further body portion of the strap axially oriented with respect to a first body portion to permit top entry receipt of the strap body within the head portion during the placement of the strap about a plurality of articles to be bundled.

It is still another object of this invention to provide an improved article-bundling strap of the top entry type having a contoured first transverse aperture in the head portion adapted to restrict the opening of the aperture, thereby preventing the free withdrawal of the strap body from the head portion after insertion therein.

It is still another object of this invention to provide an improved article-bundling strap of the top entry type having a tail portion extending from a further portion of the strap body which will provide a convenient means for engaging the strap body within the appropriate transverse aperture in the head portion and tightening the strap about a plurality of articles to be bundled.

It is still another object of this invention to provide an improved article-bundling strap of the top entry type in which a further body portion has at least the same cross-sectional area as a first body portion to increase the overall strength of the body portion of the strap.

It is yet another object of this invention to provide an improved article-bundling strap having a serrated or perforated first body portion surface to increase the pullout strength of the overall strap.

It is yet another object of this invention to provide an improved article-bundling strap having a ridged edge along a first body portion to increase the pullout of the overall strap.

It is yet another object of this invention to provide an improved article-bundling strap having protrusions extending inwardly from an inner aperture defining surface of a first transverse aperture to restrict the opening thereof, increasing the pullout strength of the overall strap.

It is yet another object of this invention to provide an improved article-bundling strap of the top entry type having a metallic tongue mounted adjacent an aperture-defining surface of a first transverse aperture and extending into the aperture, providing additional restraint of the strap body

within the first transverse aperture, after insertion of the strap body therein.

It is yet another object of this invention to provide an improved article-bundling strap of the top entry type having a plurality of further body portions coupled to, and axially oriented with respect to, a plurality of first body portions, providing additional engagement positions of the further body portions of the strap within the appropriate head aperture during the closure operation.

Other objects and features of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of example, the principles of the invention, and the best modes which have been contemplated for carrying them out.

BRIEF DESCRIPTION OF THE DRAWINGS

In the Drawings:

FIG. 1 is a perspective view of a bundling strap constructed in accordance with the concepts of the invention.

FIG. 2 is a top plan view of the bundling strap of FIG. 1.

FIG. 3 is a side elevation of the bundling strap of FIG. 1.

FIG. 4 is a top plan view of the head portion of the bundling strap of FIG. 1.

FIG. 5 is a perspective view of the head portion and a part of the body portion of a bundling strap constructed in accordance with a second embodiment of the invention.

FIG. 6 is a perspective view of a portion of the strap body constructed in accordance with a further embodiment of the invention.

FIG. 7 is a perspective view of a portion of the strap body constructed in accordance with another embodiment of the invention.

FIG. 8 is a perspective view of a portion of the strap body constructed in accordance with yet another embodiment of the invention.

FIG. 9 is a top plan view of the head portion of a bundling strap constructed in accordance with a second embodiment thereof.

FIG. 10 is a side elevation, in section, of the bundling strap of FIG. 4 taken along the lines 11-11.

FIG. 11 is a top plan view of the head portion of a bundling strap constructed in accordance with yet another embodiment thereof.

FIG. 12 is a perspective view of a further embodiment of a bundling strap constructed in accordance with the concepts of the invention.

FIG. 13 is a top plan view of the tail portion of a bundling strap constructed in accordance with a second embodiment thereof.

FIG. 14 is a top plan view of the tail portion of a bundling strap constructed in accordance with a further embodiment thereof.

FIG. 15 is a top plan view of a the tail portion of a bundling strap constructed in accordance with yet another embodiment thereof.

FIG. 16 is a top plan view of the tail portion of a bundling strap constructed in accordance with an additional embodiment thereof.

FIG. 17 is a side view of the tail portion of the bundling strap of FIG. 16.

FIG. 18 is a perspective view of the bundling strap of FIG. 1 illustrating the closure of the strap with the body portion initially engaged within the head portion.

Similar elements will be given similar reference characters in each of the respective FIGS.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning now to FIGS. 1, 2, 3, 4, 10, 16, 17, and 18, there is shown a first embodiment of an article-bundling strap 28 constructed in accordance with the concepts of the invention. Article-bundling strap 28 has a head portion 30, a tail portion 32, a first body portion 34 extending from the head portion

30, and a further body portion 38 coupled to the first body portion 34 and terminating in the tail portion 32. A first transverse aperture 40 passes through the head member 30 and is adapted to receive the first body portion 34 therethrough when the strap is tightened about a plurality of articles to be bundled. A contoured upper surface 41 of the first transverse aperture 40 is provided to partially restrict the opening of the first transverse aperture 40 thereby preventing the free withdrawal of the first body portion 34 after engagement therein. A second transverse aperture 42 in the head portion 30 communicates with the first transverse aperture 40 at the contoured upper surface 41. In practice, the first body portion 34 is looped about the articles to be bundled, the further body portion 38 of the strap 28 is initially engaged within the second transverse aperture 42, and drawn through by means of the tail portion 32, permitting the first body portion 34 to enter the first transverse aperture 40 in proper relation thereto, the contoured upper surface 41 of the first transverse aperture 40 providing sufficient restraining force against the first body portion 34 engaged therein to maintain the strap 28 in the desired looped configuration. The excess first body portion 32, extending from the head portion 30 after the closure and tightening operation, may be removed at or near the head portion 30, if desired. The necked-down tail end portion of the bundling strap shown in the prior art device cited above has a cross-sectional area substantially less than that of the main body portion, resulting in a weakened section susceptible to rupture or breakage upon the application of sufficient force on the tail end portion to effectuate a proper closure and tightening of the strap about the articles being bundled therein. As can be seen from FIGS. 2 and 3, the further body portion 38 of the instant invention has a cross-sectional area at least equal to that of the first body portion 34, and is coupled thereto along a transitional region 39 also at least equal to the cross-sectional area of the first body portion 34. As a result, the stresses exerted on the strap 28 during the tightening and closure operation are substantially evenly distributed between the first body portion 34 and the further body portion 38, thereby virtually eliminating the possibility of failure of the strap in the manner indicated with respect to the prior art device cited above.

As can be seen from FIGS. 4 and 10, a metallic tongue 54, mounted within, and partially blocking, the first transverse aperture 40 and opposite the contoured upper surface 41 provides additional locking action to prevent the withdrawal of the first body portion 34 from the first transverse aperture 40 after engagement therein. As is better seen in the sectional view of FIG. 10, a free end of the metallic tongue 54 extends inwardly within the first transverse aperture 40 in a generally angular manner, sloping away from the entry end thereof. As the first body portion 34 of the strap 28 is drawn through the first transverse aperture 40 during the closure and tightening operation, the free end of the metallic tongue 54 is deflected downward exerting an upward pressure against the underside of the first body portion 34. Upon the attempted removal of the first body portion 28 from the first transverse aperture 40 the deflected free end of the metallic tongue 54 is caused to bite into and grasp the first body portion 34 therein forcing the first body portion against the upper contoured surface preventing its withdrawal from the first transverse aperture 40. Since the width of the second transverse aperture 42 may be restricted to approximately the thickness of the further body portion 38 to insure proper engagement of the further body portion 38 therein, the deformation of the first body portion 34 into the second transverse aperture 42 under the influence of the pressure of the metallic tongue 54 against the underside of the first body portion 34 during, and subsequent to, the closure and tightening operation is thereby limited, resulting in a more secure restraint of the first body portion 34 within the first transverse aperture 40.

Turning now to FIGS. 5 and 6, a further embodiment of an article-bundling strap first body portion is shown. In FIG. 5 the edges 44 of the first body portion 45 are substantially

rectangularly ridged wherein increased locking strength may be attained by the engagement between the upper contoured surface 41 of the first transverse aperture 40 and the ridged edges 44. In FIG. 6, the edges 46 of the first body portion 47 are ridged in a generally sawtooth manner to attain a similar increase in locking strength.

Turning now to FIG. 7, a further embodiment of an article-bundling strap first body portion is shown. The first body portion 49 is provided with serrations 48 adapted to be engaged by the upper contoured surface 41 of the first transverse aperture 40 in the head portion 30, thereby increasing the locking engagement of the first body portion 49 within the first transverse aperture 40.

Referring now to FIG. 8, yet another embodiment of an article-bundling strap first body portion is shown. The first body portion 51 is provided with perforations 50 to increase the locking strength between the first body portion 51 and the head portion 30 in a manner similar to that described with respect to the article-bundling strap of FIG. 7.

Turning now to FIGS. 9 and 11, further modifications of an article-bundling strap head portion are shown. In FIG. 9, protrusions 52 extending inwardly from an inner surface of a first transverse aperture 53 may be added to a head portion 43 as shown. The protrusions are adapted to engage the ridged edges of the first body portions 45 and 47 of FIGS. 5 and 6 respectively within the first transverse aperture 53 after the first body portion has been drawn therethrough, thereby providing additional restraint of the strap body within the head portion 43 upon the attempted withdrawal of the strap body therefrom. In FIG. 11 a metallic tongue 56 mounted adjacent each of the two inner side surfaces of a first transverse aperture 55 and extending into the aperture will provide a restraint similar to that described with respect to the head portion 43 of FIG. 9.

Referring now to FIGS. 16 and 17, the tail portion 32 of the article-bundling strap 28 is shown in greater detail. In FIG. 16 the tail portion 32 extends outwardly from the further body portion 38 in a generally semicircular shape. A webbed section 68 is axially centrally located within the semicircular circumferential shape of the tail portion 32, providing additional strength thereto.

Referring now to FIGS. 13, 14 and 15, further modifications of an article-bundling strap tail portion are shown. In FIG. 14 the tail portion 60 extends outwardly from the further body portion 38 in a generally elliptical shape. A webbed section 72, axially centrally located within the elliptical circumferential shape of the tail portion 60, provides additional strength thereto in a manner similar to that described with respect to FIG. 17. In FIG. 15 the extended tail portion 62 has a generally circular shape within which a webbed section 74 is axially centrally located with respect thereto, providing additional strength to the tail portion in a manner similar to that described with respect to FIGS. 14 and 16. In FIG. 13 the tail portion 58 is an enlargement of the further body portion 38 and is coplanar with and extends longitudinally therefrom. If desired, the web sections of the tail portion may be omitted permitting the strap to be hung from a suitable device by means of the tail portion.

Turning now to FIG. 12, a further embodiment of an article-bundling strap body portion is shown. At least one further intermediate body portion 64 coplanar with the further body portion 38, and at least one first intermediate body portion 66 coplanar with the first body portion 34 are coupled together and extend between the first and further body portions 34 and 38 respectively, the first body portion 34 being coupled to the further intermediate body portion 64 along the transition region 33, and the further body portion 38 being coupled to the first intermediate body portion 66 along the transition region 37. The first and further intermediate body portions 66 and 64 respectively are coupled together along a transition region 35. The addition of a plurality of the first and further intermediate body portions 66 and 64 respectively permits top entry engagement of the strap within the head portion 30 at

selective points, thereby avoiding the necessity of having to draw a lengthy first body portion 34 through the first transverse aperture 40 in the event that a relatively long strap is to be looped and tightened about a relatively small diameter.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

I claim:

1. A bundling strap for engaging articles in a looped fashion comprising: a head portion; a tail portion; and a body portion therebetween; said head portion having a first transverse aperture therethrough; there being a second transverse aperture communicating with said first transverse aperture; said body portion having a first portion extending a predetermined length from said head portion in a first plane; at least one further portion of said body portion coupled to said first body portion, the plane of said further portion axially oriented with respect to said first plane; said second transverse aperture adapted to receive therein said further portion of said body portion; said first transverse aperture having an upper aperture-defining surface and a lower aperture-defining surface; said second transverse aperture communicating with said first transverse aperture at said upper surface; said first transverse aperture adapted to receive said first portion of said body portion; whereby said bundling strap may be looped about articles by engaging said further portion of said body portion within said second transverse aperture and drawing said first portion of said body portion through said first transverse aperture to a desired tightness around said articles.

2. A bundling strap, as defined in claim 1, wherein said tail portion extends generally outward from said further portion of said body portion; said tail portion adapted to provide for the insertion of said body portion within said head portion and the drawing of said body portion therethrough.

3. A bundling strap, as defined in claim 1, wherein said upper surface of said first transverse aperture is contoured to partially restrict the opening of said first transverse aperture whereby said first portion of said body portion is prevented from being freely withdrawn from said first transverse aperture after engagement therein.

4. A bundling strap, as defined in claim 3, wherein at least one edge of said first portion of said body portion has a plurality of substantially regular ridges along said edge; said contoured upper surface of said first transverse aperture adapted to prevent the withdrawal of said first portion of said body portion from said first transverse aperture by engaging at least one of said ridges upon the insertion of said first portion of said body portion within said first transverse aperture.

5. A bundling strap, as defined in claim 3, wherein at least one surface of said first portion of said body portion is substantially regularly serrated; said contoured surface of said first transverse aperture adapted to prevent the withdrawal of said first portion of said body portion from said first transverse aperture by engaging at least one of said serrations upon the insertion of said first portion of said body portion within said first transverse aperture.

6. A bundling strap, as defined in claim 3, wherein said first portion of said body portion has a plurality of perforations substantially regularly spaced along said first portion; said contoured surface of said first transverse aperture adapted to prevent the withdrawal of said first portion of said body portion from said first transverse aperture by engaging at least one of said perforations upon the insertion of said first portion of said body portion within said first transverse aperture.

7. A bundling strap, as defined in claim 1, wherein said further portion of said body portion has at least the same cross-sectional area as said first portion of said body portion.

8. A bundling strap, as defined in claim 1, wherein said axial orientation of the plane of the further portion of said body portion is substantially perpendicular to the plane of said first portion of said body portion.

9. A bundling strap, as defined in claim 1, wherein said first transverse aperture of said head portion has at least one

protrusion extending generally inwardly from an inner surface of said first transverse aperture.

10. A bundling strap, as defined in claim 9, wherein at least one edge of said first portion of said body portion has a plurality of substantially regular ridges along said edge; said protrusions within said first transverse aperture adapted to prevent the withdrawal of said first portion of said body portion from said first transverse aperture by engaging at least one of said ridges upon the insertion of said first portion of said body portion within said first transverse aperture.

11. A bundling strap, as defined in claim 9, wherein at least one surface of said first portion of said body portion is substantially regularly serrated; said protrusions within said first transverse aperture adapted to prevent the withdrawal of said first portion of said body portion from said first transverse aperture by engaging at least one of said serrations upon the insertion of said first portion of said body portion within said first transverse aperture.

12. A bundling strap, as defined in claim 9, wherein said first portion of said body portion has a plurality of perforations substantially regularly spaced along said first portion; said protrusions within said first transverse aperture adapted to prevent the withdrawal of said first portion of said body portion from said first transverse aperture by engaging at least one of said perforations upon the insertion of said first portion of said body portion within said first transverse aperture.

13. A bundling strap, as defined in claim 1, having locking means mounted within said first transverse aperture; said

locking means having a free end extending into said aperture to engage said first portion of said body portion positioned within said first transverse aperture thereby preventing the attempted withdrawal of said first body portion therefrom.

14. A bundling strap, as defined in claim 13, wherein said locking means is a metallic tongue mounted adjacent said lower aperture defining surface of said first transverse aperture.

15. A bundling strap, as defined in claim 14, wherein said tail portion has at least one recess therein.

16. A bundling strap, as defined in claim 14, wherein said tail portion is substantially coplanar with and extends generally outwardly from said further portion of said body portion.

17. A bundling strap, as defined in claim 14, wherein said tail portion is substantially elliptical.

18. A bundling strap, as defined in claim 14, wherein said tail portion is substantially round.

19. A bundling strap, as defined in claim 13, wherein said locking means are two metallic tongues mounted within said first transverse aperture, and on opposite sides thereof.

20. A bundling strap, as defined in claim 1, wherein said body portion has one first portion and one further portion.

21. A bundling strap, as defined in claim 1, wherein said tail portion is an enlargement of said further portion of said body portion.

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