United States Patent

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[54] **LEVER TAB FOR EASY OPEN CONTAINER**
8 Claims, 6 Drawing Figs.

[52] U.S. Cl. 220/54
[51] Int. Cl. B65d 17/20
[50] Field of Search 220/54, 53, 48, 27; 215/46.5

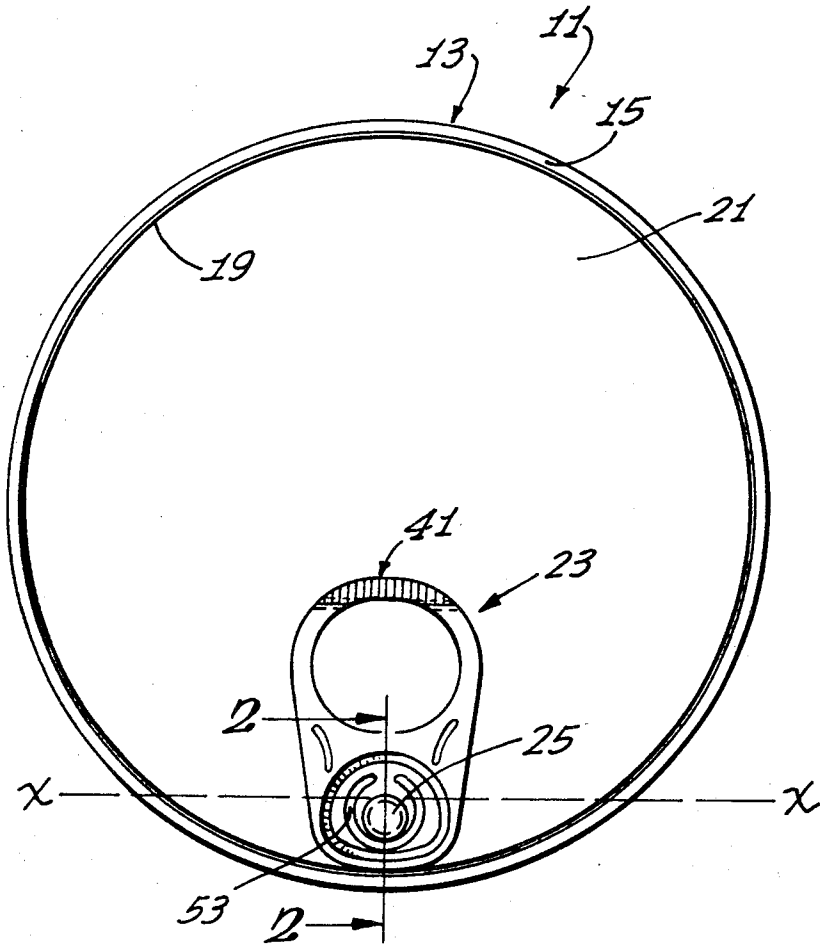
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ABSTRACT: This disclosure describes a sheet metal tab which includes a nose end and a lifting end and means for stiffening the tab longitudinally. The tab has a zone adjacent the nose end thereof for attachment to an easy opening container wall. The sheet material of the tab is severed along a path which extends at least partially around such zone and which permits the tab to pivot about a line rearwardly of such zone when the tab is affixed to a can end.



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Fig. 1

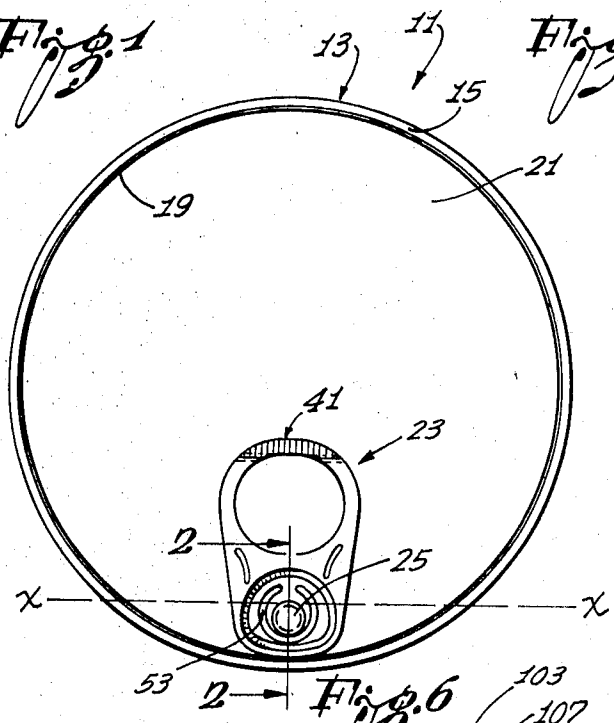


Fig. 2

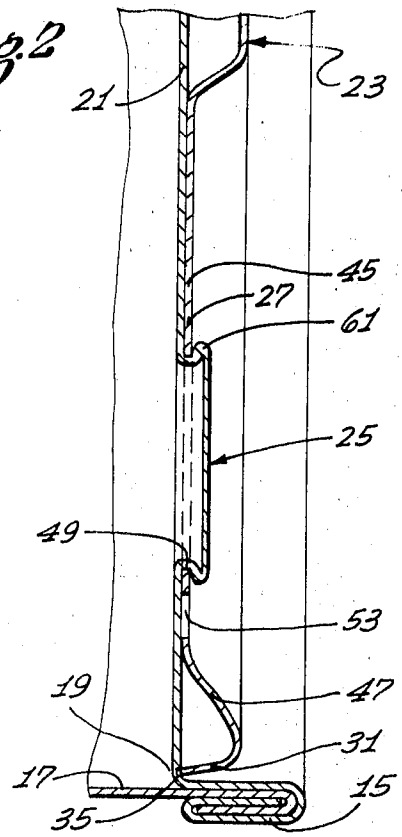


Fig. 6

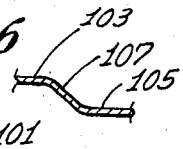


Fig. 4

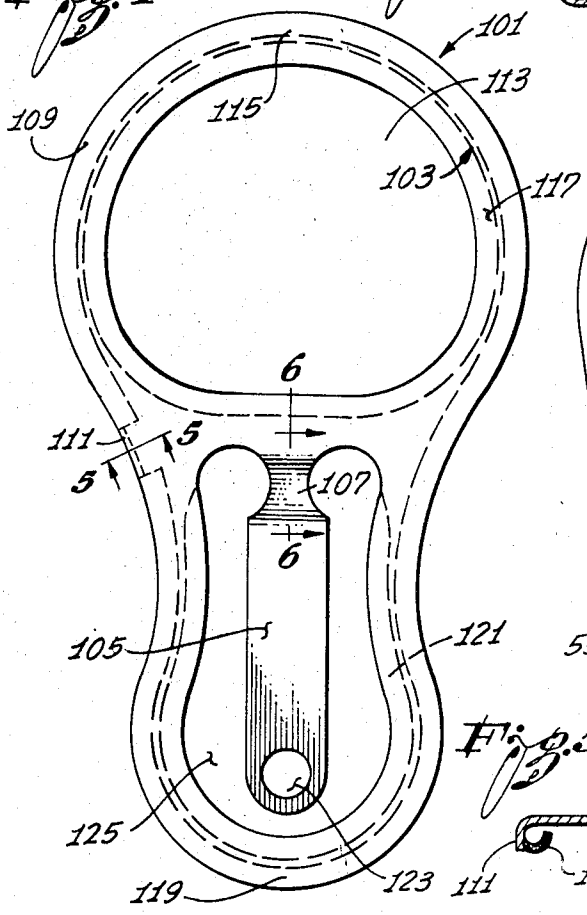


Fig. 3

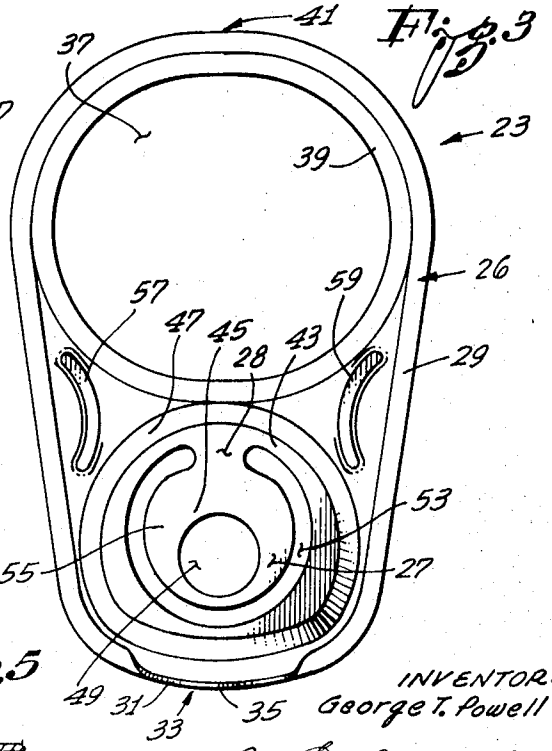


Fig. 5

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LEVER TAB FOR EASY OPEN CONTAINER

BACKGROUND OF THE INVENTION

An easy opening container typically includes a container wall having a score line therein defining a tear portion at least partially removable from the container wall and a tab attached to the tear portion to effect removal of the tear portion. There are two general types of tabs, namely, front opening and rear opening tabs. A front opening tab initiates severance of the tear portion from the container wall with the forward or nose end of the tab, and this is usually accomplished by depressing a section of the tear portion inwardly. A rear opening tab severs the tear portion from the container wall with a portion of the tab located rearwardly of the nose end, and this is usually accomplished by lifting action. The present invention provides a tab which is usable either as a front or rear opening tab but which is particularly adapted for use as front opening tab.

A front opening tab is often used, for example, in full panel pullouts in which the tear portion or panel is large relative to the container wall and may cover substantially all of the container wall. In this instance, the tab is secured to the panel adjacent the score line defining same with the nose of the tab overhanging a region of the score line. The panel is removed in a two step operation which includes lifting the rear or lifting end of the tab to force the nose end against the score line to rupture same and then exerting an outward pulling force on the tab to complete the panel removing operation.

A tab used on a full panel pullout should be easy to manipulate to thereby facilitate initial severance of the panel from the can end. The tab should not fail or tear out even when used on large container walls and large panels. Finally, the tab should rupture a relatively long arc of the container wall along the score line to thereby facilitate the second phase of the tab movement, i.e., the phase in which an outward pulling force is exerted on the tab to complete the panel removal operation.

In an effort to provide a tab which initiates severance relatively easily, it has been proposed to sever the tab along a generally C-shaped line which extends part way around the attaching rivet and which opens toward the nose end of the tab. This tab does facilitate initial severance of the panel in that it facilitates the lifting of the tab. However, this tab is subject to tearing out and structural failure adjacent the ends of the C-shaped line. In addition, this tab pivots about a pivot line which lies forwardly of the rivet and therefore it does not sever a wide are along the score line in response to pivotal movement of the tab. A completely rigid tab is difficult to manipulate and tends to fracture or tends to fracture the rear edge of the rivet.

SUMMARY OF THE INVENTION

The present invention provides a tab which is easily raised to initiate severance of the tear portion and which severs a relatively wide arc of the in response to the score line. In addition, the tab of the present invention is very strong and is not subject to the tear-out type structural failure experienced heretofore with tabs of the prior art.

A tab constructed in accordance with the teachings of this invention may be constructed of sheet material and may include a nose end, a lifting end and integral means for stiffening the tab longitudinally. The tab can be attached to a tear portion at a predetermined zone of the tab which lies closely adjacent the nose end of the tab. Such zone, in a preferred embodiment of this invention, is constituted by an aperture for receiving a rivet.

To provide the desired flexibility, the sheet material of the tab is severed along a predetermined path which extends part way around the zone and which permits the tab to pivot about a line rearwardly of such zone.

Preferably the path is generally C-shaped and opens toward the rear or handle end of the tab. With this construction, the tab provides flexiblity, resistance to tear-out failure and a wide initial rupture along the score line. The path may be in the form of a slit or slot. Although the sheet material is preferably severed in a blanking operation, the words "severed or cut" as used herein are not intended to imply a method limitation as to the manner in which the tab is formed with a slit or slot. The functioning of the tab is independent of the method used to form the slit or slot.

In a preferred form of the invention the tab includes a relatively stiff tab body which surrounds and is integrally connected to an attachment portion. The slot separates the tab body from the attachment portion except at the region where the tab body and the attachment portion are joined. The attachment portion is attached to the tear portion of the container wall.

Although the tab body is relatively longitudinally rigid, the lifting end thereof can be raised off of the container wall with relative ease because the attachment portion is easily bendable. This permits the user to get a finger beneath the lifting end of the tab to facilitate the application of force to the tab. In addition, it is believed that the bending of the attachment portion during raising of the lifting end of the tab reduces the stress on the rim of the aperture through which the rivet projects and reduces the stress on the rearward edge of the rivet bead. Thus, the tab of this invention reduces the likelihood of rivet failure. The length of the attachment portion can be varied to provide the degree of flexiblility desired with an elongated attachment portion being preferred.

The invention, both as to its organization and method of operation together with further features and advantages thereof may best be understood by reference to the following description taken in connection with the accompanying illustrative drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a top plan view of an easy opening container wall having a tab constructed in accordance with the teachings of this invention mounted thereon.

Fig. 2 is an enlarged fragmentary sectional view taken along lines 2–2 of FIG. 1.

FIG. 3 is an enlarged bottom plan view of the tab.

FIG. 4 is a top plan view of another form of tab constructed in accordance with the teachings of this invention.

FIGS. 5 and 6 are sectional views taken along lines 5–5 and 6–6, respectively, of FIG. 4 and illustrate details of construction of the tab.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawing, and in particular to FIG. 1 thereof, reference numeral 11 designates an easy opening container wall constructed in accordance with the teachings of this invention. The container wall 11 includes a can end 13 having a peripheral attaching flange 15 for attaching the can end 13 to a container body 17 (FIG. 2).

The can end 13 is constructed of sheet material such as aluminum alloy and has a line of weakness in the form of a score line 19 therein. The score line 19 defines a tear portion in the form of a panel 21 which is removable from the remainder of the can end 13. Although various configuration may be employed, in the embodiment illustrated, the can end 13 and the panel 21 are generally circular in plan and concentric with the score line 19. The score line 19 lies closely adjacent the attaching flange 15 so that the panel 21 covers substantially all of the area of the can end. A tab 23 is attached to the panel 21 by attachment means which, in the embodiment illustrated, is in the form of an attaching rivet 25 formed integrally with the sheet material of the panel.

The tab 23 generally includes a tab body 26 and a somewhat bendable attachment portion 27 integrally joined to the tab body 26 by a connecting region 28 of sheet material. The tab 23 is integrally constructed of a single piece of sheet material such as aluminum alloy. A peripheral portion of the sheet material of the tab body 26 is turned inwardly to define an outer reinforcing bead 29 which extends substantially continu-

ously around substantially all of the tab. The bead 29 is formed into a rupturing flange 31 at the forward, or nose, end 33 of the tab. The rupturing flange 31 defines a relatively sharp point 35 which lies generally along the longitudinal axis of the tab.

The tab body 26 is formed with a finger receiving opening 37. A region of the sheet material of the tab surrounding the opening 37 is deformed outwardly toward the bead 29 to form an inner reinforcing bead 39. Thus, a smooth surface of the bead 39 defines the opening 37. The end of the tab body 26 adjacent the opening 37 defines the rearward or lifting end 41 of the tab body.

A bathtub section 43 is formed integrally intermediate the opening 37 and the nose end 33 of the tab. The bathtub section 43 includes a bottom wall 45 and a sloping connecting wall 47 which surrounds the bottom wall 45 and which integrally joins the bottom wall to the remainder of the tab. The attachment portion 27 forms a portion of the bottom wall 45. An attachment zone in the form of a rivet receiving aperture 49 is formed in the attachment portion 27. In the embodiment illustrated, the aperture 49 is located along the longitudinal axis of the tab 23.

The bottom wall 45 has a slot 53 formed therein. The slot 53 is generally C-shaped and opens toward the lifting end 41 of the tab. The slot 53, in the embodiment illustrated, extends for more than 180 degrees around the aperture 49 and the attachment portion 27 and is symmetrical about the longitudinal axis of the tab. Stated differently, the slot 53 has a first portion that lies intermediate the aperture 49 and the nose end 33 and which is generally transverse to the longitudinal axis of the tab and second and third portions which extend respectively from said first portion generally toward the lifting end of the tab on opposite sides of the aperture 49. The attachment portion is defined by the slot 53 and by a line drawn between the ends of the slot 53.

Although the slot 53 has been defined with particularity, it will be understood that the slot need not be C-shaped as illustrated. Similarly, a slit may be utilized in lieu of a slot.

The tab body 26 also has a pair of reinforcing ribs 57 and 59 lying adjacent opposite portions of the outer bead 29. The ribs 57 and 59 further strengthen the tab body between the bathtub section 43 and the opening 37 against bending about a generally transverse axis.

The tab 23 can be attached to the panel 21 as shown in FIGS. 1 and 2 with the rivet 25 projecting through the aperture 49. The rivet 25 is headed to form a bed 61 to clampingly attach the tap 23 to the panel 21. With the tab 23 thus attached to the panel 21, the point 35 of the rupturing flange 31 overlies a region of the score line 19 as shown in FIG. 2. The tab 23 projects radially inwardly of the panel 21.

The tab can be operated by applying an upward lifting force to the lifting end 41 of the tab body 26 which tends to move the lifting end away from the panel 21. The tab body 26 is relatively longitudinally rigid. However, the attachment portion 27 and the connecting region 28 are relatively easily bendable and accordingly, the attachment portion 27 and the connecting region 28 flex to permit limited raising of the handle end 41 of the panel 21. Of course, the tab body 26 is quite rigid longitudinally and does not bend significantly during manipulation thereof.

Upon further lifting of the lifting end 41, sufficient force is applied to the rupturing flange 31 to sever the sheet material of the can end 13 along the score line 19 with the tab 23 and a segment of the panel 21 pivoting generally about line x–x (FIG. 1). The panel 21 can then be removed by exerting an outward pulling force on the tab 23.

The slot 53 and the attachment portion 27 provide the tab 23 with some flexibility in that they facilitate lifting of the lifting end 41 above the panel 21 to the extent that the user can get a finger between the lifting end and the panel. Without the slot 53 and the attachment portion 27, the tab 23 would be clamped so tightly against the panel 21 that even the initial elevation of the lifting end would be difficult. In addition it is believed that the flexing of the attachment portion reduces the stress on the rivet bead and the rim of the aperture 49 during pivotal movement of the tab 23.

Because the tab tends to pivot about the pivot line x–x which lies rearwardly of the aperture 49, a relatively long arc of the score line ruptured in response to pivotal movement of the tab 23. This makes the second phase of panel removal much easier.

All of these advantages are obtained without danger of the tab tearing adjacent the slot 53 during ordinary usage thereof. The forces applied to the tab 23 are such as not to promote rupture of the bottom wall 45.

FIG. 4 illustrates a modified tab 101 which is constructed in accordance with the teachings of this invention. The tab 101 can be used in the same manner described hereinabove with reference to the tab 23 and is preferably integrally constructed from a single piece of sheet material such as sheet aluminum.

The tab 101 generally includes a substantially longitudinally rigid tab body 103 and an elongated, bendable attachment portion 105 integrally joined to the tab body by a connecting region 107. The tab body 103 completely surrounds the attachment portion 105. The attachment portion 105 is considerably longer than the attachment portion 27 and is more easily bendable. The connecting portion 107 slopes between the tab body 103 and the attachment portion 105 as shown in FIG. 6.

A marginal portion of the sheet material of the tab 101 is turned inwardly to define an outer reinforcing bead 109 which extends continuously around the tab periphery except for an interruption of the bead by a flange 111. During fabrication, the tab 101 can be carried in a strip and when severed from the strip, the flange 111 is formed. Although a rupturing flange at the nose end of the tab 101 could be provided, in the embodiment illustrated, no such rupturing flange is provided.

The tab body 103 has a finger receiving opening 113 adjacent a lifting or handle end 115 of the tab. The sheet material surrounding the opening 113 forms an inner reinforcing bead 117. The end of the tab opposite the lifting end 115 defines a nose end 119. The tab body 103 is formed with a second inner reinforcing bead 121 which partially surrounds the attachment portion 105.

The attachment portion 105 is an elongated strip of sheet material which is bendable about an axis extending transverse to the longitudinal axis of the tab. The end of the attachment portion 105 adjacent the nose end 119 is formed with a rivet receiving aperture 123 which permits the tab 101 to be affixed to a tear portion such as the panel 21 by suitable means such as a rivet. The attachment portion 105 is defined in substantial part by a generally C-shaped or U-shaped slot 125 which surrounds a substantial portion of the attachment portion and of the aperture 123. The slot 125 opens toward the lifting end 115.

The operation of the tab 101 shown in FIG. 4 is substantially identical to the operation of the tab 23. However, because the attachment portion 105 is elongated, greater flexibility of the attachment portion is provided.

Although exemplary embodiments of the invention have been shown and described, many changes, modifications and substitutions may be made by one having ordinary skill in the art without necessarily departing from the spirit and scope of the invention.

I claim:

1. A tab of the type attachable to an easy opening container wall comprising:

a nose end and a lifting end, said tab being constructed of sheet material and including integral means for stiffening the tab longitudinally:

said tab having a zone adjacent the nose end thereof adapted for attachment to the easy opening container wall; and

the sheet material of said tab being severed along a generally C-shaped path which partially surrounds the zone and which opens generally toward the lifting end of

the tab, the severance of the sheet material along said path providing the tab with some flexibility while maintaining a high resistance to tearing of the sheet material adjacent said zone in use of the tab.

2. A tab as defined in claim 1 wherein the severance of the sheet material along the path forms a generally C-shaped slot.

3. A tab as defined in claim 1 wherein the path extends for at least 180° around said zone.

4. A tab of the type attachable to an easy opening container to at least partially remove a tear portion from the easy opening container, said tab comprising:

a nose end and a lifting end, said tab being constructed of sheet material and including integral means for stiffening the tab longitudinally;

said tab having a zone adjacent the nose end thereof adapted for attachment to the easy opening container; and

the sheet material of said tab being separated along a path which partially surrounds said zone, said path having a first portion which extends generally transverse to a reference line drawn between said ends of the tab and which lies intermediate said zone and the nose end of the tab, said tab having second and third nose end which extend from said first portion generally toward the handle end of the tab on opposite sides, respectively, of the zone.

5. A tab integrally constructed of sheet material and attachable to an easy opening container comprising:

a tab body and an attachment portion;

said tab body having a nose end and a lifting end, at least some of the sheet material of said tab body being deformed to stiffen the tab body against bending;

said tab body completely surrounding the attachment portion, said attachment portion being adjacent the nose end of the tab;

said attachment portion having a zone adapted for attachment to the easy opening container; and

a region of the sheet material of the tab intermediate said lifting end and said zone integrally joining said tab body

and said attachment portion with said attachment portion being breed of said tab body along a path extending from one location closely adjacent one end of said region part way around said zone to a second location closely adjacent the other end of said region.

6. A tab as defined in claim 5 wherein said path is at least generally symmetrical about the longitudinal axis of the tab.

7. A tab integrally constructed of sheet material and attachable to an easy opening container wall comprising:

a lifting end and a nose end, the sheet material at said nose end being adapted to apply a force to the easy opening container wall in response to lifting of the lifting end of the tab;

the sheet material of a peripheral region of the tab being turned inwardly to form an outer reinforcing bead extending for a substantial distance around the periphery of the tab to reinforce the tab against bending;

said tab having a finger receiving opening adjacent the lifting end thereof the sheet material immediately surrounding the finger receiving opening being turned outwardly to form an inner reinforcing bead extending for a substantial distance around said finger receiving opening;

a bathtub section of sheet material intermediate the finger receiving opening and the nose end of the tab, said bath tub section including a bottom wall and a sloping connecting wall integrally joining the bottom wall to the remainder of the tab, said sloping connecting wall extending at least substantially completely around the bottom wall; and

said bottom wall having a rivet receiving aperture formed therein, said bottom wall being cut along an arcuate path extending partially around said aperture and opening toward said finger receiving opening to provide some flexibility to the tab and for maintaining a high resistance to tearing of the sheet material of the tab adjacent said rivet receiving aperture.

8. A tab as defined in claim 5, wherein said attachment portion is elongated.