Dec. 6, 1966 C. W. SCHILD 3,289,890

CAN OPENER AND DISPENSER

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Fig. 1.

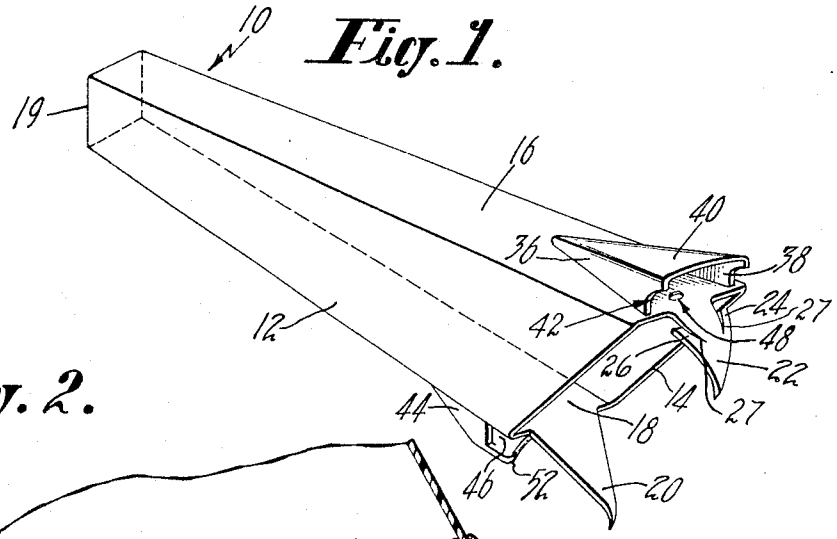
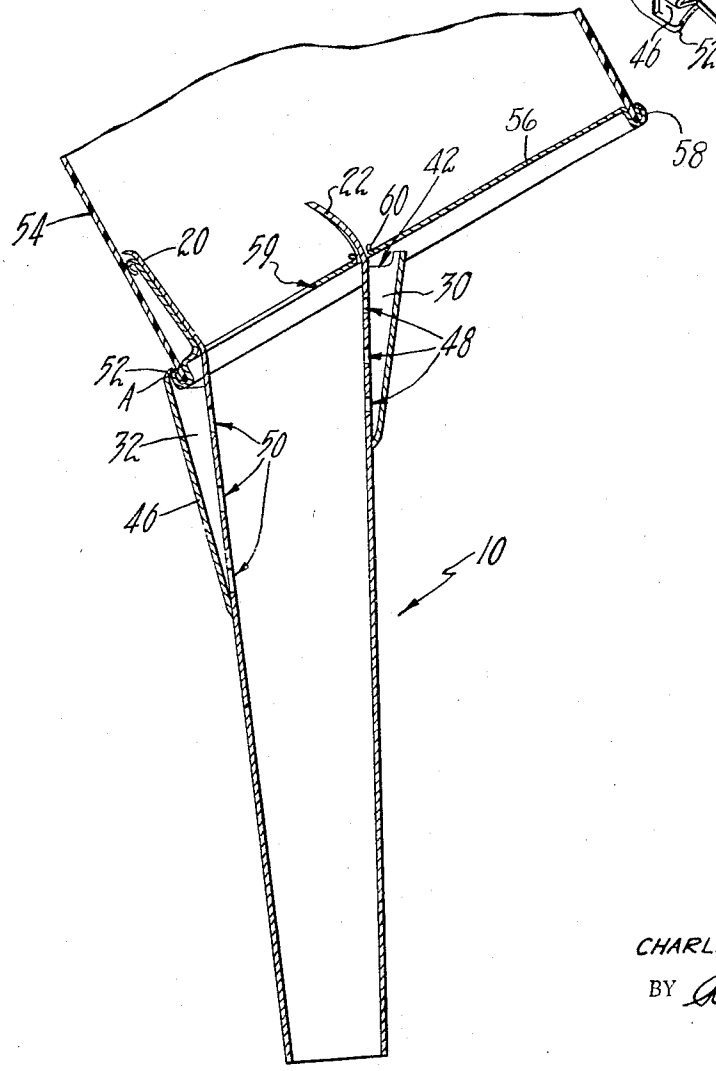


Fig. 2.



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Fig. 3.

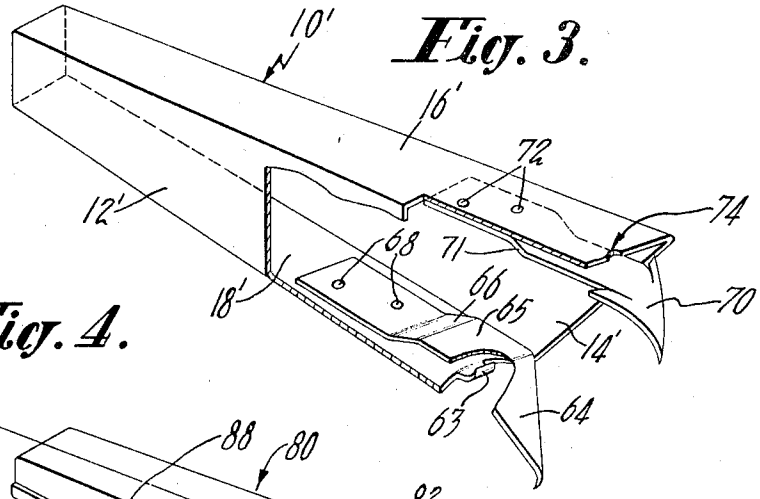


Fig. 4.

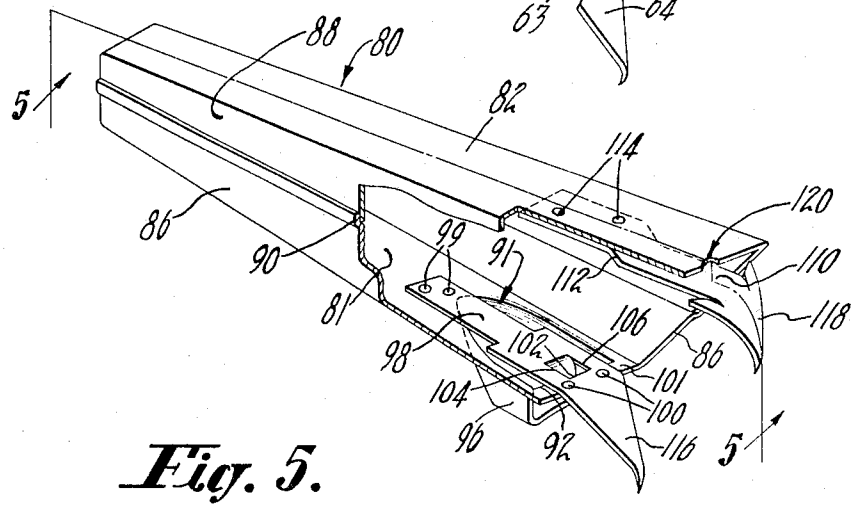
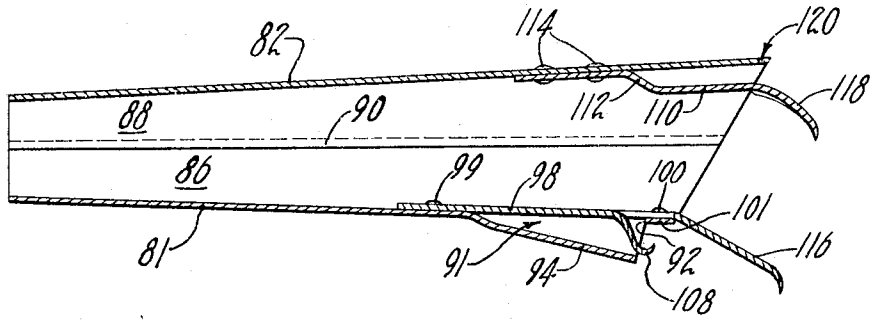


Fig. 5.



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CAN OPENER AND DISPENSER

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6 Claims. (Cl. 222—85)

The present invention relates to a fulcruming, punch-type can opener with an integral dispensing spout and, in particular, to such an opener having means to provide adequate venting during dispensing of a product therethrough and for alleviating drippage of the product during dispensing.

The prior art discloses a number of punch-type can openers having a dispensing spout integral therewith and a can seam engaging hook adjacent one end of the spout whereby the opener may be fulcrumed or levered about the can end seam to pierce and be retained on the end wall of the can so that the product, most usually liquid, may be dispensed or poured through the hole formed in the can wall and thence through the opener spout into a desired place of deposit. However, a serious problem with such openers is that upon tilting of the can so pierced and having the opener-dispenser attached, the liquid contents of the can have a tendency to leak through any space between the can end and the adjacent end of the spout and thence drip in an undesired manner. The prior art suggests eliminating this leakage problem by providing such spout end with a resilient gasket.

Since the opener itself is made of metal, utilization of such a gasket increases the expense of the opener in that it requires a separate material added in a separate operation. Further, if the gasket is completely successful in eliminating leakage a problem in venting the interior of the container for efficient dispensing is often created; whereas if adequate venting is provided the end result of leakage-prevention often suffers.

It is therefore an object of the present invention to provide a one-piece fulcruming, punch-type can opener having an integral dispensing spout which obviates the above mentioned problems.

Another object is to provide an opener-dispenser of the character described wherein undesirable leakage or drippage is alleviated when used to open a can and dispense the contents therefrom.

Yet another object is to provide an opener-dispenser of the character described wherein substantially no undesirable dripping occurs during the dispensing of a liquid therethrough and at the same time the interior of a container from which the liquid is being dispensed is adequately vented.

Still a further object is to provide an opener-dispenser of the character described which requires no separate gasketing to alleviate drippage or leakage problems during its dispensing function.

Still another object is to provide an opener-dispenser of the character described which is simple and inexpensive to manufacture and efficient in operation.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

The above objects are accomplished by providing an elongated hollow tube having at one end a pouring opening and at its opposite end a can engaging opening. Integral with the tube adjacent the can engaging opening are a relatively large, pointed can punch and, at the opposite side of the opening, a smaller retaining spear, the punch adapted to initially pierce the can wall and make a dispensing opening therein and the spear to pass through the can wall to retain or lock the device on the can wall during dispensing and in some cases provide a vent opening. Also integral with or as part of the tube on one side thereof adjacent the punch is a compartment or pocket communicating with the interior of the tube, which pocket is adapted to collect seepage or drippage escaping from between the device and the opened can wall and drain such seepage back into the dispensing tube. To permit securement on and levering around the end seam of the can during initial piercing of the can wall, a hook is provided adjacent the punch and pocket.

Referring to the drawings:

FIG. 1 is a perspective view of the preferred embodiment of the container opening and pouring attachment of the instant invention;

FIG. 2 is a fragmentary sectional view of a container body and the container attachment, illustrating the relative positions of the attachment and the container body during dispensing of the container contents;

FIG. 3 is a perspective view of a modified container opening and pouring attachment, with parts broken away;

FIG. 4 is a perspective view of another modification of the instant invention, with parts broken away; and

FIG. 5 is a vertical sectional view taken substantially along lines 5—5 of FIG. 4.

As a preferred or exemplary embodiment of the instant invention, FIGS. 1 and 2 show a container opening and pouring device through which fluid is dispensed from a container by elongated, hollow tube or spout, generally designated **10**. The spout **10** is formed, as illustrated in FIG. 1, by two vertical walls **12** and **14** and two horizontal walls **16** and **18**, each wall being equally inclined from the axis of the spout **10** to form a pouring spout of decreasing cross-sectional area which terminates, at its smaller end, to form a discharge opening **19**. The spout **10** may be fabricated in two halves from a flat blank which halves are subsequently welded together along a longitudinal seam. This embodiment, as well as the subsequently described modifications thereof, may be fabricated from any suitable materials and if deemed desirable other cross-sectional and longitudinal configurations of the spout may be employed, e.g. round or elliptical and curved. While the operation of the instant device does not require seals between the spout **10** and a container, such well-known seals may be employed if desired.

The wide extremities of the horizontal walls **16** and **18** form respectively a large V-shaped cutting member or punch **20** and a relatively small punch and retaining spear **22**. As shown in FIG. 2, the punch **20** curves away from the long axis of the spout with an additional curvature at its tip to effect the initial severance of the container end wall with minimum effort.

As best illustrated in FIG. 2, the retaining spear **22** curves generally in the same direction as the punch **20**. It is preferred that the curvature of the spear **22** be such that it conforms to the arc of a circle having its center

at the fulcrum point A of the device. Such a construction permits the spear **22** to pass through the can end readily without lateral pushing or pulling of the metal of the can end thus minimizing the size of the hole made by the spear **22**. The spear **22** is also curved in a transverse direction with its barb-like, transverse extremities turned outwardly to form locking ears **24** and **26**. Slits **27** may be formed in the spear **22** to facilitate forming the outwardly turned locking ears **24**, **26**. When the spear **22** passes through a can end, the metal of the can end thereof springs back slightly, due to the usual elasticity of the metal, enabling the locking ears **24**, **26** to engage therebeneath and retain the device on the can.

A portion of the exterior surface of the opposed walls **16** and **18** form respectively one wall of compartments or pockets **30** and **32** each having its open end adjacent the spear **22** and the punch **20** respectively. As best illustrated in FIG. 1, the pocket **30** adjacent the spear **22** is formed by two V-shaped side walls **36** and **38** and an upper V-shaped wall **40** located therebetween. To provide an air passage to supply air to the interior of the container, the wide extremities of the two vertical walls are provided with recesses **42**. The opposite pocket **32** adjacent the punch **20** is formed by two side walls **44** (only one shown) and a bridging wall **46**. The pockets **30** and **32** are made integral with the spout in a suitable manner, such as in the instant embodiment by welding; and are respectively placed in communication with the interior of the spout **10** by passages **48** and **50** extending through the portion of the walls **16** and **18** respectively within the pockets.

The forward extremity of the wall **46** adjacent the punch **20** is formed to provide a hook **52** for engagement with the end seam of a can which hook serves as a fulcrum about which to pivot the device to its operative position on a container. To maximize the grip of the hook **52** on the container end seam, the inside curvature of the hook approximates the peripheral curvature of the tubular body of the container. The employment of such a curved hook is particularly advantageously employed when the instant container attachment is utilized to open a container having a plastic body wall.

The instant container opening and pouring attachment is particularly designed to open and drain the contents of a container of the type shown in FIG. 2. This container comprises a cylindrical body **54** and sheet metal end closure **56** attached thereto by an end seam **58**. To open such a container, the opener-dispenser device is grasped by the spout **10**, positioned radially over the container with the hook **52** under the seam **58** and pivoted to the position illustrated in FIG. 2 using the elongated spout **10** as a lever. During initial pivoting of the device, the curved leading edge of the punch **20** punctures the end closure **56**. Continued pivotal movement causes continued cutting of the metal of the closure by the punch **20** to produce a drain passage **59**.

Towards or at the completion of the formation of the drain passage **59**, the spear **22** passes through the metal of the can end **56** enabling its ears **24**, **26** to engage beneath the end as mentioned previously. When so positioned, the device is firmly, but releasably, anchored to the container by compressibly gripping the container between the fulcrum hook **52** and the spear **22** with the drain passage **59** in adjacent alignment with the large open end of the spout **10**. Depending upon the length of the punch **20**, the spear **22** may pierce a new hole of its own in the can end **56**, or it may pass through the can end at the apex of the drain hole **59**. A newly pierced hole by the spear **22** such as **60** provides additional venting to the interior of the container.

To dispense a product, most usually a liquid, from the container, the container with the device anchored to the end wall is rotated to approximately a vertical disposition and the product is drained by gravity through the drain passage **59** and the spout **10**. As the container is being emptied, air is directed to the interior of the container to replace the volume of fluid discharged and thereby maintain a container pressure which approximates atmospheric pressure. The air is directed to the interior of the container, for this purpose, by the recesses **42** which form a passage with the end closure **56**. A supply of venting air is thereby accumulated in the compartment **30** from which the air is directed to the interior of the container by vent passage **60** formed in the end closure **56**. Thus the recesses **42** and the compartment **30** form a channel through which air is supplied to the vent passage **60** and/or to the drain passage **59** through the holes **48**.

The compartment or pocket **32** is the means by which undesirable drippage of the container contents is alleviated. When the can with the device attached thereto is tilted past the horizontal to dispense the product, the lowest part of the can, particularly with cans having a circular cross-section, is the end seam portion adjacent the pocket **32**. As best seen in FIG. 2, the open end or mouth of the pocket **32** extends beyond or outside this low point of the end seam. Thus any seepage or escape of liquid product from between the can end **56** and the open end of the spout **10** surrounding the drain passage **59** will flow by gravity to the end seam low point; and thence drip or run into the pocket **32** acting, in effect, as a funnel; and from the pocket **32**, through the drain-back holes **50**, into the spout **10**. Should there be any tendency of the product to leak through the aperture surrounding the spear **22**, the pocket **30** will function in a like manner. By this means undesirable drippage during liquid product dispensing is markedly alleviated if not obviated without the necessity of a fluid-tight gasket between the device and the can end with its concurrent inhibition of proper venting.

A further modification of the instant invention is illustrated in FIG. 3. A tubular spout **10'** is formed, as previously discussed and illustrated with reference to FIGS. 1 and 2, by two vertical walls **12'** and **14'** and two horizontal walls **16'** and **18'**. The wide extremity of the lower horizontal wall **18'** is curved to form a hook **63**. The punch and spear, in this embodiment, are formed separately from but are rigidly secured to the spout **10'**.

A punch **64**, similar in all respects to the punch **20**, has a flat extension **65** disposed within the larger open end of the spout and spaced from the wall **18'** thereof. The extension **65** merges with an inclined section **66** which in turn merges with a flat section **67** which is fixed to the wall **18'** by a suitable means such as rivets **68** or spot welds. A spear **70** is similarly attached to the upper horizontal wall **16'** by rivets **72** and displaced from this wall by an inclined section **71**. The cutting portions of the punch **64** and the spear **70** are identical in both their configurations and relative positions from the fulcrum hook **63** as are the punch **20** and the spear **22**, specifically discussed with reference to the preferred embodiment shown in FIGS. 1 and 2. An air supply to the interior of the spout is provided, during the dispensing of a container by a recess **74** located at the wide extremity of the upper horizontal wall **16'**.

To open and dispense the contents of a container, the attachment is pivoted on a doubleseam in the manner previously discussed with reference to FIGS. 1 and 2. After the attachment is pivoted, the punch **64** and spear **70** are located within the container at the locations specifically discussed above with reference to the punch **20** and spear **22** of the preferred embodiment. When the attachment and the container are located in the position illustrated in FIG. 2, air is supplied to the interior of the container by a channel formed by the recess **74** and the container end closure and thence through the hole made by the spear **70** and/or by the punch **64**. In the instant embodiment, the spout itself, between the punch extension **65** and the portion of the spout wall **18'** adjacent the hook **63**, forms a funnel-like compartment or pocket similar to the pocket **32**.

A second modification of the instant invention is illustrated in FIGS. 4 and 5. A hollow tubular spout **80**, of rectangular cross-section, is fabricated from a blank by forming therewith a horizontal wall **81** with vertical part walls **86** on either side thereof and a horizontal wall **82** with vertical part walls **88** on each side and joining the adjacent longitudinal edges of the vertical part walls **86** and **88** by a weld **90**. To form a pocket or compartment **91** from the tubular spout **80**, the lower horizontal wall **81** is transversely cut at **92** and the adjacent section of the horizontal wall is subjected to a drawing operation, before or after the weld **90** is formed, in which an inclined wall **94**, a first vertical wall **96** and a similar wall (not shown) are formed. These vertical walls cooperate with the outside surface of a longitudinally extending punch support member **98** to form the funnel-like, drain-back pocket **91**. The punch support member **98** is attached to the horizontal wall **81** by rivets **99** and by rivets **100** to a bridge-like portion **101** of the wall **81** disposed in front of the pocket **91**. A fulcrum hook **108** is formed from the support member **98** by severing the support member along lines **102**, **104** and **106**. The portion of the support member **98** located between these lines is curved downwardly and outwardly to form the fulcrum hook **108**.

A second support member **110** is provided with an inclined wall **112** to position the support away from the peripheral wall of the spout **80**. This support is attached to the upper horizontal wall **82** by rivets or spot welds **114**. The outer extremities of each support member **98** and **110** is provided respectively with punch **116** and a spear **118**. The punch **116** and the spear **118** are identical in their construction and operation to the punch **20** and the spear **22** specifically discussed with reference to the embodiment shown in FIGS. 1 and 2. To supply air to the interior of the spout **80**, during dispensing, the wide extremity of the horizontal wall **82** is provided with a recess **120**.

To place the instant container opening and pouring attachment in its operative position, the attachment is rotated on a container seam at the hook **108** to position the attachment on a container in the manner illustrated in FIG. 2. The cutting operation and the relative positions of the cutting members are specifically discussed above with reference to the embodiment shown in FIGS. 1 and 2. When the container and the container attachment are located in the position illustrated in FIG. 2, vent air is supplied to the interior of the container by a channel formed by the recess **120** and the adjacent surface of the end closure and by the adjacent surfaces of the support member **110** and the wall **82**. The pocket **91** is similar in function and structure to the pocket **32** with the drain-back being around the edges of the support member **98**.

It is to be understood that it is not essential to the instant invention to provide special apertures or passages for the entrance of venting air into the interior of the spout. Venting air ingress may result merely from a loose engagement of the periphery of the spout end adjacent the punch and spear with the can end. With such a construction, the spears **70** or **118** need not be spaced from the adjacent wall of the spout nor would the pocket **30** be essential, these elements being present to insure positive, efficient venting. This is particularly true if no added resilient gasket is used on the device.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description and it will be apparent that various changes may be made in the form, construction and arrangement of parts, without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the forms hereinbefore described being merely exemplary embodiments thereof; and that modifications within the purview of the invention resulting from combinations of elements from the embodiments specifically described will be apparent to those skilled in the art.

I claim:

1. A container opening and pouring attachment adapted to open a container end closure attached to a tubular container body by a seam, comprising:

an open ended hollow tubular spout having a container contacting means at one end and pouring means at the opposite end;

fulcruming means for positioning, aligning and pivoting said attachment on said container seam, said fulcruming means being the only portion of the container contacting end of said spout lying outside the periphery of said container seam when said attachment is in pouring position on said container;

a curved relatively flat V-shaped closure cutting member located adjacent said fulcruming means and adapted to sever a drain passage within said end closure as said attachment is pivoted;

and a substantially planar spear-shaped combined punching and retaining element having barbed outwardly turned locking ears, said element being smaller than said closure cutting member, located on said container contacting means end opposite to and having substantially the same orientation as said closure cutting member at said container contacting end of said spout, said element adapted to puncture said closure and releasably secure said attachment thereto upon complete pivoting of said spout.

2. A container attachment as set forth in claim **1** wherein a compartment is disposed on the outside wall of said spout adjacent said V-shaped closure cutting member, said compartment lying between said fulcruming means and said V-shaped closure cutting member and having passage means in a wall of the compartment communicating with the interior of said spout thereby being adapted to collect drippage from said drain passage and guide said drippage to said spout interior during pouring, thus preventing spilling from the container during pouring.

3. A container attachment as set forth in claim **1** wherein said cutting member and said punch and retaining element are separate members rigidly secured to said tubular spout.

4. A container opening and pouring attachment adapted to open a container end closure attached to a tubular container body by a seam comprising:

an open-ended, hollow tubular spout having a container-contacting extremity and an opposed pouring extremity;

a curved fulcrum hook for pivoting the attachment on the container seam;

a V-shaped substantially planar container-cutting member located adjacent the fulcrum hook and adapted to sever a drain passage within the end closure as the attachment is pivoted;

a spear-shaped container punching member having outwardly turned locking ears located radially inwardly of the V-shaped cutting member and adapted to puncture said end closure and releasably secure said attachment to said closure upon complete pivoting thereof; and

a compartment having passage means in the wall of the compartment in communication with the interior of said spout adjacent said V-shaped cutting member adapted to collect and return drippage from said drain passage to said spout interior during pouring.

5. A container attachment as set forth in claim **4** wherein the spear-shaped punching member is oriented towards the longitudinal axis of the tubular spout to effect the formation of a small vent hole approximating the maximum cross-sectional area of the spear-shaped cutting element.

6. The container attachment set forth in claim 4 having additionally a second compartment having passage means in the wall of the compartment in communication with the interior of said spout adjacent said spear-shaped punching member to permit efficient venting of the interior of said container during pouring.

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