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(54) TOOLING FOR FORMING PACKAGING FROM UNITARY BLANKS

WERKZEUG ZUM FORMEN VON VERPACKUNGEN AUS EINSTÜCKIGEN ZUSCHNITTEN

OUTILLAGE DE FRAPPE POUR FORMER DES ARTICLES D'EMBALLAGE A PARTIR
D'EBAUCHES UNITAIRES

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(56) References cited:
EP-A- 0 162 119 **BE-A- 547 082**
US-A- 3 114 298 **US-A- 5 312 035**
US-A- 5 313 767

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EP 1 036 006 B1

Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a device and method for forming packaging. More specifically, the present invention relates to tooling and a method of using the tooling to mold small self-standing packaging containers or sachets from unitary generally rectangular cardboard blanks.

[0002] Small disposable packaging containers or sachets are commonly used to provide consumer samples for assorted products, especially for fluidic products. The unitary blanks used to form the sachets are laminated with a moisture proof coating and, when molded, form a completely sealed and sterile environment. The sample products include lotions, perfumes, food products and other consumer goods which would benefit from small sealed unitary packaging. High quality cosmetics are marketed through the use of sachets emblazoned with trademarks and configured for particular trade dresses. Self standing sachets are used in the hotel and restaurant industry to provide consumer products in bathroom facilities, eliminating the need for storage baskets or the like. There is an ongoing need in the art to provide improved tooling for forming sachets in appealing self-standing shapes.

[0003] Various apparatus have been developed for the formation of packaging containers from unitary blanks including Belgian Patent No. BE 547 082, which is in accordance with the preambles of claims 1 and 11, and United States Patent No. 5,313,767. The previous apparatus contain sharp comers and edges which might damage unitary blanks during the forming of packaging containers or sachets. These previous apparatus formed sachets that rely on sharp folds and corners for support points and had difficulty forming curved or bowed support surfaces from unitary blanks. The present invention has been fashioned with rounded edges and curved surfaces to better form curved or bowed surfaces from unitary blanks. The curved surfaces of the present invention decrease the chances of puncturing unitary blanks and create more possibilities for the configuration of unitary blanks. The present invention may more easily form curved surfaces and integrate these surfaces with sharply angled surfaces to create containers that were previously very troublesome to form.

SUMMARY OF THE INVENTION

[0004] The present invention involves the use of tooling with curved surfaces and rounded edges to form packages or sachets from unitary generally rectangular cardboard blanks. An object of the present invention is to decrease the incidence of damaged packaging due to the sharp edges used on previous tooling. Another object of the invention is to increase the number of packaging shapes possible by forming curved surfaces in

packaging containers fashioned from the unitary blanks. These objects are achieved by the apparatus of claims 1 and 11, and by the use of the apparatus according to claim 8.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005]

FIG. 1 is a front bottom perspective of a sachet formed by the tooling of the present invention; FIG. 2A is a front elevation view of the first mandrel of the present invention; FIG. 2B is a front elevation view of the second mandrel of the present invention; FIG. 2C is a side elevation view of the first mandrel of the present invention; FIG. 2D is a side elevation view of the second mandrel of the present invention; FIG. 2E is a bottom view of the first mandrel of the present invention; FIG. 2F is a top view of the second mandrel of the present invention; FIG. 3 is a top view of one embodiment of the unitary blank used in the present invention; and FIG. 4 is an elevation view showing the forming of a package by the complementary mandrels of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0006] FIG. 1 is a bottom perspective view of the finished molded package or sachet 94 created by the improved tooling of the present invention and illustrates the base configuration 98. As can be seen by FIG. 1, the sachet base 98 assumes the general configuration of the forming surfaces 12 and 42 integral to mandrels 10 and 40, shown in FIGS. 2A-2F, from which it was molded. End triangular segments 74 are shown curving inwardly into the sachet structure from center segment 72 to create recesses 87. There is no exact line of delineation or border between triangular segments 74 and center segment 72, but rather a gradual succession as shown by curved edges 73. The curved edges 73 and gradual slope between triangular segments 74 and center segment 72 resist puncturing caused by previous tooling, as no abrupt fold or crease is created. The curved edges 73 also allow the sachet 94 to stand erect upon on its center segment 72 while being supported at opposite ends by the bottom of sealed side seams 92 created by the fusing of package sides 86 during the forming process, as shown in FIG. 4.

[0007] FIG. 2A is a front elevation view of the first mandrel of the present invention generally shown as 10. The mandrel 10 has a forming surface 12 that is convex in shape and located on its bottom end. The forming surface 12 is hemmed by a rounded perimeter edge 17

which defines the general exterior outline of the forming surface 12. A center segment 14 is bowed outward and defined by rounded edges 16. Bordering the center segment 14 are two triangular segments 18 that slope upward from the center segment 14 to complete the forming surface 12 of the first mandrel 10. The rounded edges 16 created a gradual succession between the center segment 14 and the triangular segments 18.

[0008] The lengthwise sides of the first mandrel 10, as shown in FIG. 1, have flat parallel center sections 20 defined by generally straight longitudinal edges 24 which extend for substantially the length of the first mandrel 10. Angled side sections 22 abut flat parallel sections 20 and converge to generally straight longitudinal end edges 26. This convergence of angled side sections 22 is consistent with the shape of the triangular segments 18 located on the forming surface 12 which defines the bottom ends of the angled side sections 22. A bore 30 is located on the top end 28 of the first mandrel 10 and is used for mounting the mandrel 10 to a positioning device such as a cylinder shaft, gear box shaft, solenoid shaft, motor shaft and other actuation devices known to persons of ordinary skill in the art

[0009] The complementary or second mandrel is shown in FIG. 2B generally as 40. The mandrel 40 has a forming surface 42 that is concave in shape and located on its top end. The forming surface 42 is bordered by a rounded perimeter edge 47 which defines the general exterior outline of the forming surface 42. A center segment 44 is bowed inward and defined by rounded edges 46. Bordering the center segment 44 are two triangular segments 48 that slope upward from the center segment 44 to complete the forming surface 42 of the second mandrel 40. As in the first mandrel 10 the rounded edges 46 created a gradual succession between the center segment 44 and the triangular segments 48.

[0010] The lengthwise sides of the second mandrel 40, as shown in FIG. 2B, have flat parallel center sections 50 defined by generally straight longitudinal edges 54 which extend for substantially the length of the first mandrel 40, and are similar to generally straight longitudinal edges 24 of the first mandrel 10. Angled side sections 52, similarly to angled side sections 22 of the first mandrel 10, abut flat parallel sections 50 and converge to generally straight longitudinal end edges 56. This convergence of angled side sections 22 is consistent with the shape of the triangular segments 48 located on the forming surface 42 which defines the top end of the angled side sections 52. A bore 60 is located on the bottom end 58 of the second mandrel 40 and is used for mounting the mandrel to a device such as a cylinder shaft, gear box shaft, solenoid shaft, motor shaft and other actuation devices known to persons of ordinary skill in the art.

[0011] The forming surface 42 of the second mandrel 40 is fashioned to be complementary to the forming surface 12 of the first mandrel 10, as shown in FIGS. 2A-2F. When forming surface 12 and forming surface 42 are

brought together, both surfaces should substantially adjoin throughout. This complementary function allows unitary blanks, when placed between the forming surfaces 12 and 42, to be generally supported throughout on the areas which contact the forming surfaces 12 and 42. By supporting the unitary blanks on both sides the final shape of the sachet is better determined and the occurrence of puncturing is decreased.

[0012] FIG. 2C is a side elevation view of the first mandrel 10 and helps to better illustrate how the angled side sections 22 converge to longitudinal end edges 26. Triangular sections 18 generally assume the planar cross section of angled side sections 22 at the forming surface 12 located at the bottom end of the first mandrel 10. Bowed center segment 14 curves to rounded edges 16 which faintly define one side of the triangular sections 18. FIG. 2D is a side elevation view of the complementary or second mandrel 40 and, similar to FIG. 2C, shows angled side sections 52 converging to longitudinal end edges 56.

[0013] Figure 2E is a bottom view of the first mandrel 10. In this view the horizontal planar features of the forming surface 12 are better illustrated. The center segment 14 is located between triangular segments 18 and bordered by rounded edges 16. Longitudinal end edges 26 are shown at the vertexes of triangular segments 18 as angled side sections 22 converge outwardly from flat parallel center sections 20.

[0014] Figure 2F is a top view of the second mandrel 40. In this view, similar to Figure 2E, the horizontal planar features of the forming surface 42 are better illustrated. The center segment 44 is located between triangular segments 48 and bordered by rounded edges 46. The center segment 44 and rounded edges 46 differ slightly from the rounded edges 16 of the first mandrel, as the arc of the center segment 44 and rounded edges 46 extend inwardly to the second mandrel 40 in a concave fashion. The degree of curvature for the rounded edges 46 is also less than the degree of curvature for the rounded edges 16. Longitudinal end edges 56 are shown at the vertexes of triangular segments 48 as angled side sections 52 converge outwardly from flat parallel center sections 50.

[0015] Figure 3 is a top view of one embodiment of the unitary blanks 70 used to form the packages or sachets. The unitary blank 70 may be composed of a relatively rigid sheet of paper coated or otherwise covered with a thermoplastic material. In other embodiments a suitable substantially thermoplastic or metallic unitary blank may also be used. Unitary blank 70 is generally rectangular in form with integral cap segments 71 located on either end. At the center of the unitary blank 70 is a bottom segment 80, defined by parallel creases 82, from which the final molded container will stand upright upon. The center segment 72 is located in this bottom segment 80. Bordering the center segment 72 are triangular segments 74. There is no exact line of delineation or border between triangular segments 74 and center

segment 72, but rather a gradual succession. When the bottom 80 is fully formed the triangular segments 74 will slope upward from the center segment 72. Finger creases 78 are positioned along lines A and A'. When the forming surfaces 12 and 42 sandwich the unitary blank, these finger creases 78 will create a curving point along lines A and A' to allow the center segment 72 to gradually curve upward to triangular segments 74. Opposing end triangle segments 85 will become upright and opposing end rectangular segments 88 will become upright and make contact with their opposite rectangular segments 88.

[0016] The formation of the container takes place when the two mandrels are brought together and sandwich the unitary blank 70, as shown in FIG. 4, by a package forming and filling machine. Such a machine is disclosed within the following U.S. patent, 5,313,767 entitled "Multiple Package Forming and Filling Machine" issued to Gentile on May 24, 1994 and is incorporated by reference herewithin. When the two opposing sides 86 of the unitary blank 70 are brought together by mandrels 10 and 40 in a forming die 96, the two opposing sides 86 will pivot upward about parallel creases 82, the triangular segments 74 will slope upward about finger creases 78 forming recesses, opposing end triangle segments 85 will become generally upright and opposing end rectangular segments 88 will become upright and make contact with their opposite rectangular segments 88. The die 96 will then heat and fold the blank unitary blank 70 along side creases 84 and, after the sachet is filled, close the top of the unitary blank 70 to seal the package in its molded form.

[0017] It is to be understood that the invention is not limited to the exact construction illustrated and described above, but that various changes and modifications may be made without departing from the scope of the invention as defined in the following claims.

Claims

1. An apparatus for the formation of packaging (94) from unitary blanks (70) comprising:

a first mandrel (10) having a convex end surface (12), said convex end surface (12) defining a first center segment (14) and a first pair of triangular segments (18) adjoining said center segment (14) on opposite sides of said first center segment (14) and separated from said center segment (14) by edges (16); and a second mandrel (40) having a concave end surface (42), said concave end surface (42) defining a second center segment (44) and a second pair of triangular segments (48) adjoining said center segment (44) on opposite sides of said second center segment (44) and separated from said center segment (44) by edges

(46), said convex end surface (12) and said concave end surface (42) being complementary, whereby when said convex end surface and said concave end surface (42) are brought into contact with one of said unitary blanks (70), the surfaces (12) and (42) form a substantially constant separation gap, whereby said first mandrel (10) and said second mandrel (40) engage one of said unitary blanks (70) such that said blank (70) is compressed between said first mandrel end surface (12) and said second mandrel end surface (42) to form said unitary blank (70) into said packaging (94), **characterized by** said first center segment (14) having a convex shape and said second center segment (44) having a concave shape, said edges (16, 46) of said first and second mandrels (10, 40) being rounded, wherein there is only a general delineation between said first and second center segments (14, 44) and said first and second plurality of triangular segments (18, 48).

2. The apparatus of claim 1 **characterized by** said first mandrel (10) being positioned above said second mandrel (40) and said first pair of triangular segments (18) sloping upward from said first center segment (14).
3. The apparatus of claim 1 **characterized by** said first mandrel (10) being positioned above said second mandrel (40) and said second pair of triangular segments (48) sloping upward from said second center segment (44).
4. The apparatus of claim 1 **characterized by** said first and second mandrels (10, 40) further including flat parallel center sections (20, 50) which extend for substantially the lengths of said first and second mandrels (10, 40) and define edges (24) of said first mandrel (10) first center segment (14) and of said second mandrel (40) second segment (44), and further include angled side sections (22, 52) which abut said flat parallel center sections (20, 50) converging generally to straight longitudinal end edges (26, 56).
5. The apparatus of claim 4 **characterized by** said straight longitudinal end edges (26, 56) being rounded.
6. The apparatus of claim 1 **characterized by** said first mandrel (10) and said second mandrel (40) including a connection surface (28, 58) defining bores (30, 60).
7. The apparatus of claim 1 **characterized by** said first mandrel (10) being adapted to have said blank (70) shaped around it.

8. The use of the apparatus of claim 1 whereby each of said unitary blanks (70) is comprised of a substantially rectangular sheet of cardboard having a heat sealable coating.

9. The use of claim 8 whereby said unitary blank (70) further comprises an integral cap (71).

10. The use of claim 9 whereby said unitary blank (70) further comprises.

a first set of creases (82) which define a segment (80) delineating the bottom of said unitary blank (70);

a second set of creases (76) within said bottom which define triangular segments (74);

a third set of creases (83, 84) which define end rectangular segments (88) that abut said triangular segments (74); and

wherein said unitary blank (70) is designed to be sandwiched between said first and second mandrels (10, 40) and folded along said creases to create a stable bottom section, whereby said packaging can stand upright.

11. An apparatus for the formation of packaging from unitary substantially rectangular blanks (70) in which the blank (70) is clamped between a first mandrel and a second mandrel in a region of the blank forming an end surface of the packaging and wherein said end surface allows said packaging to be self-standing **characterized by:**

said first mandrel (10) having a convex end surface (12), said convex end surface (12) having rounded edges (16) that define a center segment (14) which curves outwardly from said first mandrel (10), a pair of triangular segments (18) which abut said center segment (14) on opposite sides of said center segment (14), said rounded edges (16) providing only a general delineation creating a gradual succession between said convex center segment (14) and said triangular segments (18) and flat parallel center sides (20) defined by generally straight longitudinal edges (24) which abut angled side (22) that converge from said center segment (14) to generally straight longitudinal end edges (26) that extend for the length of said first mandrel (10); and

said second mandrel (40) having a concave end surface (42) complementary to said convex end surface (12), said concave end surface (42) having rounded edges (46) that define a center segment (44) which curves inwardly to said second mandrel (40), a pair of triangular segments (48) which abut said center segment (44)

on opposite sides of said center segment (44), said rounded edge (46) providing only a general delineation creating a gradual succession between said concave center segment (44) and said triangular segments (48) and flat parallel center sides (50) defined by generally straight longitudinal edges (54) which abut angled sides (56) that converge from said flat parallel center sides (50) to generally straight longitudinal end edges (56) that extend for the length of said second mandrel (40), whereby said first mandrel (10) and said second mandrel (40) engage one of said unitary blanks (70) such that said blank (70) is compressed between said first mandrel end surface (12) and said second mandrel end surface (42) to form said unitary blank (70) into said packaging.

20 Patentansprüche

1. Vorrichtung zum Herstellen einer Verpackung (94) aus einheitlichen Rohlingen (70), aufweisend:

Einen ersten Dorn (10) mit einer konvexen Endfläche (12), wobei die konvexe Endfläche (12) ein erstes zentrales Segment (14) und ein erstes Paar von dreieckigen Segmenten (18) festlegt, die auf gegenüberliegenden Seiten des ersten zentralen Segments (14) sich an das zentrale Segment (14) anschließen und von dem zentralen Segment (14) durch Ränder (16) getrennt sind, und

einen zweiten Dorn (40) mit einer konkaven Endfläche (42), wobei die konkave Endfläche (42) ein zweites zentrales Segment (44) und ein zweites Paar von dreieckigen Segmenten (48) festlegt, die auf gegenüberliegenden Seiten des zweiten zentralen Segments (44) sich an das zentrale Segment (44) anschließen und von dem zentralen Segment (44) durch Ränder (46) getrennt sind, wobei die konvexe Endfläche (12) und die konkave Endfläche (42) komplementär gebildet sind, wobei dann, wenn die konvexe Endfläche (12) und die konkave Endfläche (42) mit einem der einheitlichen Rohlinge (70) in Kontakt gebracht werden, die Oberflächen (12) und (42) einen im Wesentlichen konstanten Trennspace bilden, wobei der erste Dorn (10) und der zweite Dorn (40) mit einem der einheitlichen Rohlinge (70) derart in Eingriff gelangen, dass der Rohling (70) zwischen der ersten Dornendfläche (12) und der zweiten Dornendfläche (42) zusammengedrückt wird, um den einheitlichen Rohling (70) in die Verpackung (74) auszubilden, **dadurch gekennzeichnet, dass** das erste zentrale Segment (14) eine konvexe Form aufweist und das zwei-

- te zentrale Segment (44) eine konkave Form aufweist, dass die Ränder (16, 46) der ersten und zweiten Dorne (10, 40) verrundet sind, wobei zwischen den ersten und zweiten zentralen Segmenten (14, 44) und den ersten und zweiten der mehreren dreieckigen Segmente (18, 48) lediglich eine allgemeine Abgrenzung vorliegt.
2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der erste Dorn (10) über dem zweiten Dorn (40) zu liegen kommt und dass das erste Paar dreieckigen Segmente (18) ausgehend von dem ersten zentralen Segment (14) schrägt nach oben verläuft.
3. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der erste Dorn (10) über dem zweiten Dorn (40) zu liegen kommt und dass das zweite Paar der rechteckigen Segmente (48) ausgehend von dem zweiten zentralen Segment (44) schräg nach oben verläuft.
4. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die ersten und zweiten Dorne (10, 40) flache parallele zentrale Abschnitte (20, 50) aufweisen, die sich im Wesentlichen über die Längen der ersten und zweiten Dorne (10, 40) erstrecken und Ränder (24) des ersten zentralen Segmentes (14) des ersten Dorns (10) und des zweiten Segments (44) des zweiten Dorns (40) festlegen, wobei sie außerdem gewinkelte Seitenabschnitte (22, 52) aufweisen, die an den flachen parallelen zentralen Abschnitten (20, 50) anliegen, die im Wesentlichen in gerade Längsendränder (26, 56) konvergieren.
5. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** die geraden Längsendränder (26, 56) verrundet sind.
6. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der erste Dorn (10) und der zweite Dorn (40) eine Verbindungsfläche (28, 58) festlegen, die Bohrungen (30, 60) festlegt.
7. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der erste Dorn (10) dazu ausgelegt ist, den Rohling (70) um ihn geformt aufzunehmen.
8. Verwendung der Vorrichtung nach Anspruch 1, wobei jeder der einheitlichen Rohlinge (70) aus einem im Wesentlichen rechteckigen Kartonbogen mit wärmeabdichtbarer Beschichtung aufweist.
9. Verwendung nach Anspruch 8, wobei der einheitliche Rohling (70) außerdem eine integrale Kappe (71) aufweist.
10. Verwendung nach Anspruch 9, wobei der einheitliche Rohling (70) außerdem aufweist:
- Einen ersten Satz von Falzen (82), die ein Segment (80) festlegen, das den Boden des einheitlichen Rohlings (70) begrenzt, einen zweiten Satz von Falzen (76) in dem Boden, der dreieckige Segmente (74) festlegt, einen dritten Satz von Falzen (83, 84), die rechteckige Endsegmente (88) festlegen, die an den dreieckigen Segmenten (74) anliegen, und wobei der einheitliche Rohling (70)-dazu ausgelegt ist, sandwichartig zwischen den ersten und zweiten Dornen (10, 40) zu liegen zu kommen und entlang den Falzen gefaltet zu werden, um einen stabilen Bodenabschnitt zu bilden, wodurch die Verpackung aufrecht zu stehen vermag.
11. Vorrichtung zur Herstellung einer Verpackung aus einheitlichen, im Wesentlichen rechteckigen Rohlingen (70), wobei der Rohling (70) zwischen einem ersten Dorn und einem zweiten Dorn in einem Bereich des Rohlings festgeklemmt ist, der eine Endseite der Verpackung bildet, und wobei die Endseite es der Verpackung erlaubt, von selbst zu stehen, **dadurch gekennzeichnet, dass** der erste Dorn (10) eine konvexe Endseite bzw. -fläche (12) aufweist, wobei die konvexe Endfläche (12) verrundete Ränder (16) aufweist, die ein zentrales Segment (14) festlegen, das ausgehend von dem ersten Dorn (10) auswärts gekrümmt verläuft, ein Paar von dreieckigen Segmenten (18), die an dem zentralen Segment (14) auf gegenüberliegenden Seiten des zentralen Segments (14) anliegen, wobei die verrundeten Ränder (16) lediglich eine allgemeine Begrenzung bereit stellen unter Erzeugung eines allmählichen Übergangs zwischen dem konvexen zentralen Segment (14) und den dreieckigen Segmenten (18) und den flachen parallelen zentralen Seiten (20), die festgelegt sind durch allgemein gerade Längsränder (24), die an einer gewinkelten Seite (22) anliegen, die ausgehend vom zentralen Segment (14) auf im Wesentlichen gerade Längsendränder (26) konvergieren, die sich über die Länge des ersten Dorns (10) erstrecken, und der zweite Dorn (40) eine konkave Endfläche (42), komplementär zu der konvexen Endfläche (12) aufweist, wobei die konkave Endfläche (42) verrundete Ränder (46) aufweist, die ein zentrales Segment (44) festlegen, das zu dem zweiten Dorn (40) einwärts gekrümmt verläuft, ein Paar der dreieckigen Segmente (48), die an das zentrale Segment (44) auf gegenüberliegenden Seiten des zentralen Segments (44) anliegen, wobei die verrundeten Ränder (46) lediglich eine allgemeine Begrenzung bereit

stellen, die einen allmählichen Übergang zwischen dem konkaven zentralen Segment (44) und den dreieckigen Segmenten (48) und den flachen parallelen zentralen Seiten (50) erzeugen, die durch allgemein gerade Längsränder (54) festgelegt sind, die an gewinkelten Seiten (56) anliegen, die ausgehend von den flachen parallelen zentralen Seiten (50) in Richtung auf allgemein gerade Längsenränder (56) konvergieren, die sich über die Länge des zweiten Dorns (40) erstrecken, wodurch der erste Dorn (10) und der zweite Dorn (40) mit einem der einheitlichen Rohlinge (70) derart in Eingriff gelangen, dass der Rohling (70) zwischen der ersten Dornendfläche (12) und der zweiten Dornendfläche (42) zusammengedrückt wird, um den einheitlichen Rohling (70) in die Verpackung zu formen.

Revendications

1. Dispositif pour la formation d'emballage (94) à partir de découpes unitaires (70) comprenant :

un premier mandrin (10) comportant une surface d'extrémité convexe (12), ladite surface d'extrémité convexe (12) définissant un premier segment central (14) et une première paire de segments triangulaires (18) contigus audit segment central (14) sur des côtés opposés dudit premier segment central (14) et séparés dudit segment central (14) par des bords (16) ; et un deuxième mandrin (40) comportant une surface d'extrémité concave (42), ladite surface d'extrémité concave (42) définissant un deuxième segment central (44) et une deuxième paire de segments triangulaires (48) contigus audit segment central (44) sur des côtés opposés dudit deuxième segment central (44) et séparés dudit segment central (44) par des bords (46), ladite surface d'extrémité convexe (12) et ladite surface d'extrémité concave (42) étant complémentaires de telle manière que, lorsque ladite surface d'extrémité convexe et ladite surface d'extrémité concave (42) sont mises en contact avec l'une desdites découpes unitaires (70), les surfaces (12) et (42) forment un espace de séparation sensiblement constant, de telle manière que ledit premier mandrin (10) et ledit deuxième mandrin (40) se mettent en prise avec l'une desdites découpes unitaires (70) de telle sorte que ladite découpe (70) soit comprimée entre ladite surface d'extrémité (12) du premier mandrin et ladite surface d'extrémité (42) du deuxième mandrin afin de former ladite découpe unitaire (70) en ledit emballage (94), **caractérisé par** ledit premier segment central (14) ayant une forme convexe et ledit deuxième segment central (44) ayant une forme concave,

lesdits bords (16, 46) desdits premier et deuxième mandrins (10, 40) étant arrondis, dans lequel il existe uniquement une délimitation générale entre lesdits premier et deuxième segments centraux (14, 44) et lesdites première et deuxième pluralités de segments triangulaires (18, 48).

2. Dispositif selon la revendication 1, **caractérisé en ce que** le premier mandrin (10) est positionné au-dessus dudit deuxième mandrin (40) et ladite première paire de segments triangulaires (18) est inclinée vers le haut à partir dudit premier segment central (14).
3. Dispositif selon la revendication 1, **caractérisé en ce que** ledit premier mandrin (10) est positionné au-dessus dudit deuxième mandrin (40) et ladite deuxième paire de segments triangulaires (48) est inclinée vers le haut à partir dudit deuxième segment central (44).
4. Dispositif selon la revendication 1, **caractérisé en ce que** lesdits premier et deuxième mandrins (10, 40) comprennent, en outre, des sections centrales parallèles plates (20, 50) qui s'étendent sensiblement sur les longueurs desdits premier et deuxième mandrins (10, 40) et définissent des bords (24) dudit premier segment central (14) dudit premier mandrin (10) et dudit deuxième segment (44) dudit deuxième mandrin (40), et comprennent, en outre, des sections latérales inclinées (22, 52) qui sont contiguës auxdites sections centrales parallèles plates (20, 50) convergeant généralement vers des bords d'extrémité longitudinaux droits (26, 56).
5. Dispositif selon la revendication 4, **caractérisé en ce que** lesdits bords d'extrémité longitudinaux droits (26, 56) sont arrondis.
6. Dispositif selon la revendication 1, **caractérisé en ce que** ledit premier mandrin (10) et ledit deuxième mandrin (40) comprennent une surface de liaison (28, 58) définissant des alésages (30, 60).
7. Dispositif selon la revendication 1, **caractérisé en ce que** ledit premier mandrin (10) est adapté pour que ladite découpe (70) soit mise en forme autour de lui.
8. Utilisation du dispositif selon la revendication 1, de telle manière que chacune desdites découpes unitaires (70) soit composée d'une feuille de carton sensiblement rectangulaire comportant un revêtement thermoscellable.
9. Utilisation selon la revendication 8, de telle manière que ladite découpe unitaire (70) comprenne, en

autre, un capuchon d'un seul tenant (71).

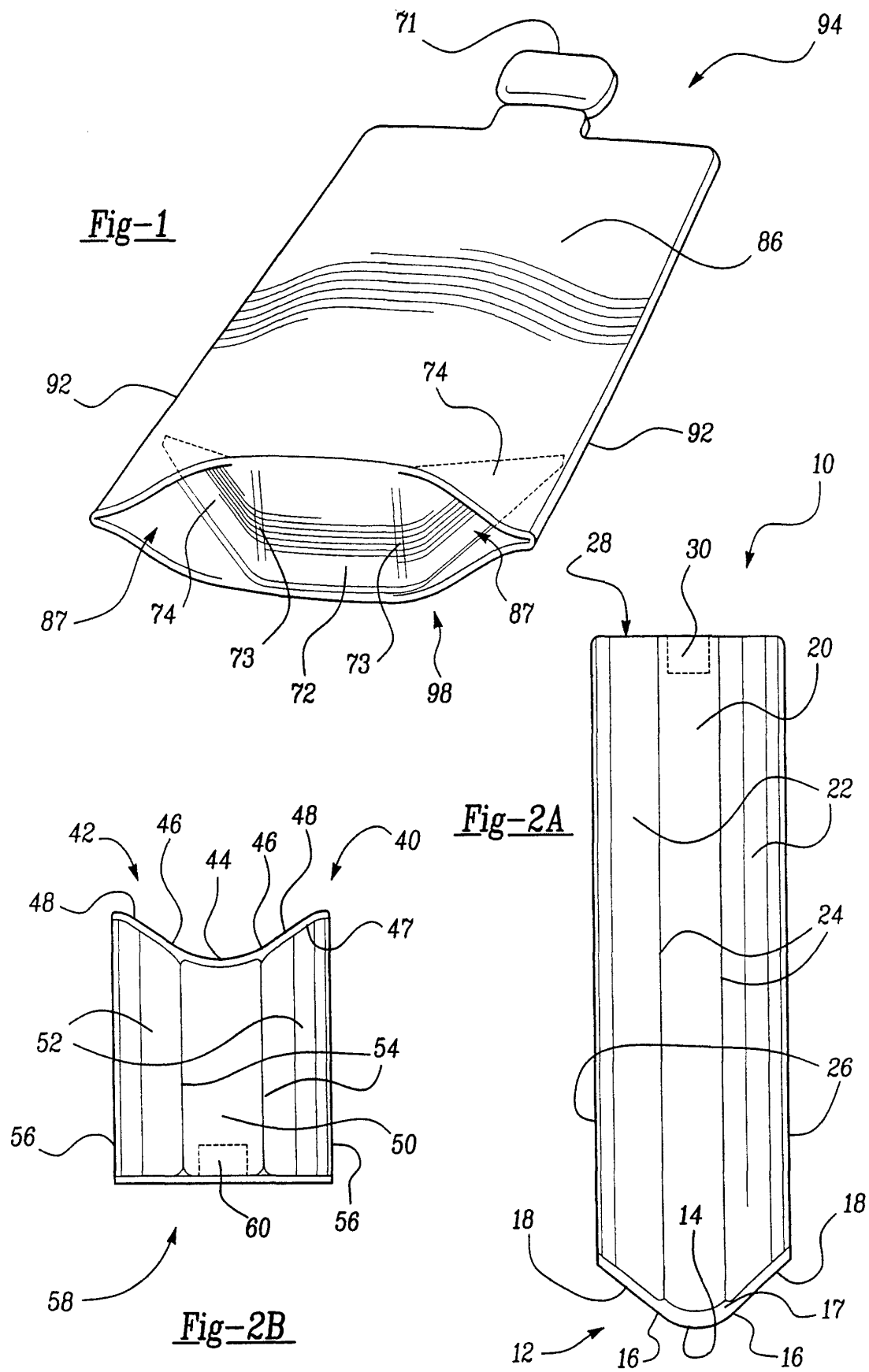
10. Utilisation selon la revendication 9, de telle manière que ladite découpe unitaire (70) comprenne en outre :

un premier ensemble de plis (82) qui définissent un segment (80) délimitant le fond de ladite découpe unitaire (70) ;
 un deuxième ensemble de plis (76) dans ledit fond qui définissent des segments triangulaires (74) ;
 un troisième ensemble de plis (83, 84) qui définissent des segments d'extrémité rectangulaires (88) qui sont contigus auxdits segments triangulaires (74) ; et
 dans laquelle ladite découpe unitaire (70) est conçue de manière à être intercalée entre lesdits premier et deuxième mandrin (10, 40) et pliée le long desdits plis afin de créer une section de fond stable, de telle manière que ledit emballage puisse tenir debout.

11. Dispositif pour la formation d'emballage à partir de découpes unitaires sensiblement rectangulaires (70), dans lequel la découpe (70) est serrée entre un premier mandrin et un deuxième mandrin dans une région de la découpe formant une surface d'extrémité de l'emballage, et dans lequel ladite surface d'extrémité permet audit emballage de tenir debout de manière autonome, **caractérisé par** :

ledit premier mandrin (10) comportant une surface d'extrémité convexe (12), ladite surface d'extrémité convexe (12) ayant des bords arrondis (16) qui définissent un segment central (14) qui est incurvé vers l'extérieur par rapport audit premier mandrin (10), une paire de segments triangulaires (18) qui sont contigus audit segment central (14) sur des côtés opposés dudit segment central (14), lesdits bords arrondis (16) réalisant uniquement une délimitation générale, créant une progression graduelle entre ledit segment central convexe (14) et lesdits segments triangulaires (18) et les côtés centraux parallèles plats (20) définis par les bords longitudinaux généralement droits (24) qui sont contigus au côté incliné (22) qui convergent à partir dudit segment central (14) vers les bords d'extrémité longitudinaux généralement droits (26) qui s'étendent sur la longueur dudit premier mandrin (10) ; et
 ledit deuxième mandrin (40) comportant une surface d'extrémité concave (42) complémentaire à ladite surface d'extrémité convexe (12), ladite surface d'extrémité concave (42) ayant des bords arrondis (46) qui définissent un segment central (44) qui est incurvé vers l'intérieur

par rapport audit deuxième mandrin (40), une paire de segments triangulaires (48) qui sont contigus audit segment central (44) sur des côtés opposés dudit segment central (44), lesdits bords arrondis (46) réalisant uniquement une délimitation générale, créant une progression graduelle entre ledit segment central concave (44) et lesdits segments triangulaires (48) et les côtés centraux parallèles plats (50) définis par les bords longitudinaux généralement droits (54) qui sont contigus aux côtés inclinés (56) qui convergent à partir desdits côtés centraux parallèles plats (50) vers les bords d'extrémité longitudinaux généralement droits (56) qui s'étendent sur la longueur dudit deuxième mandrin (40), de telle manière que ledit premier mandrin (10) et ledit deuxième mandrin (40) soient en prise avec l'une desdites découpes unitaires (70) de telle sorte que ladite découpe unitaire (70) soit comprimée entre ladite surface d'extrémité (12) du premier mandrin et ladite surface d'extrémité (42) du deuxième mandrin afin de former ladite découpe unitaire (70) en ledit emballage.



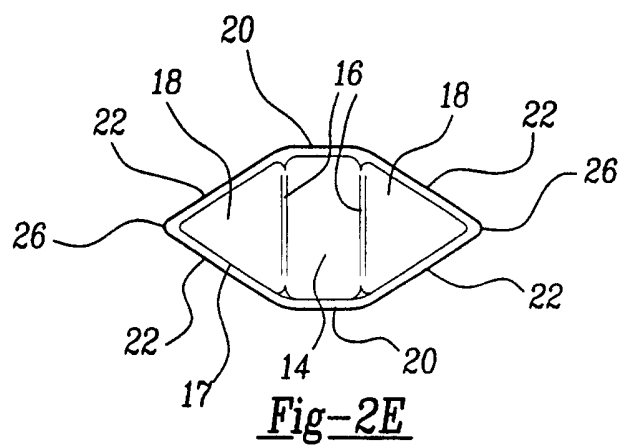
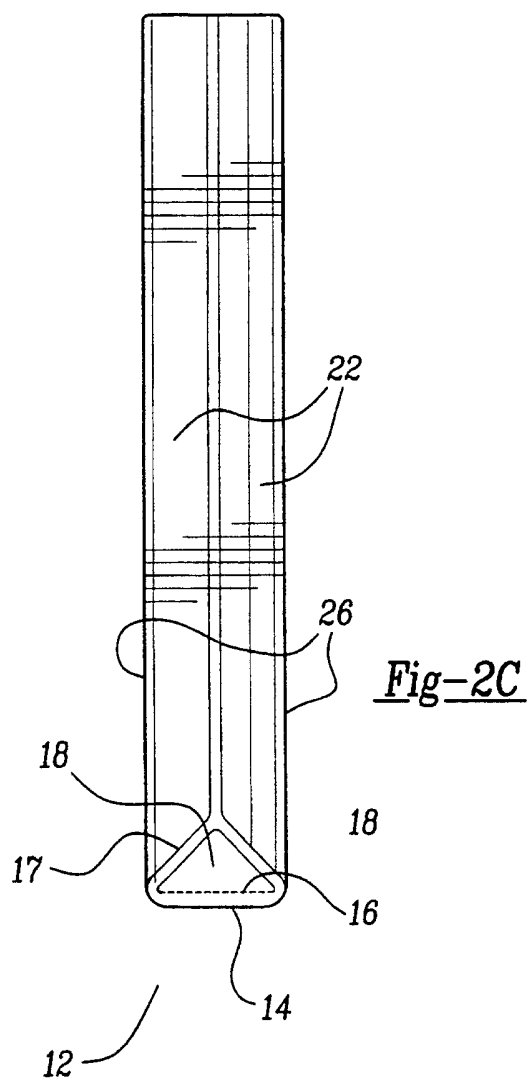
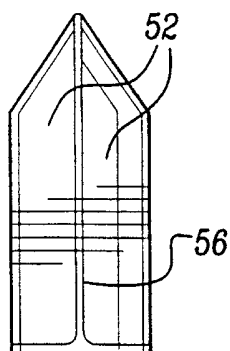
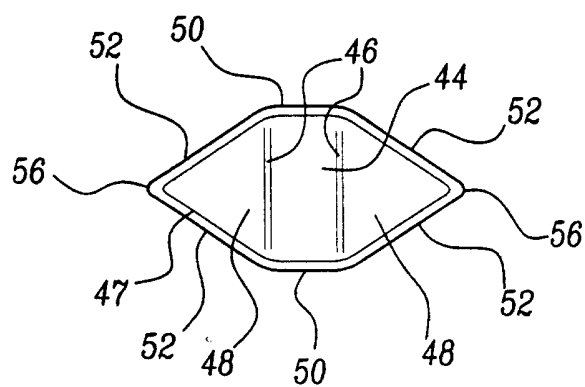


Fig-2F



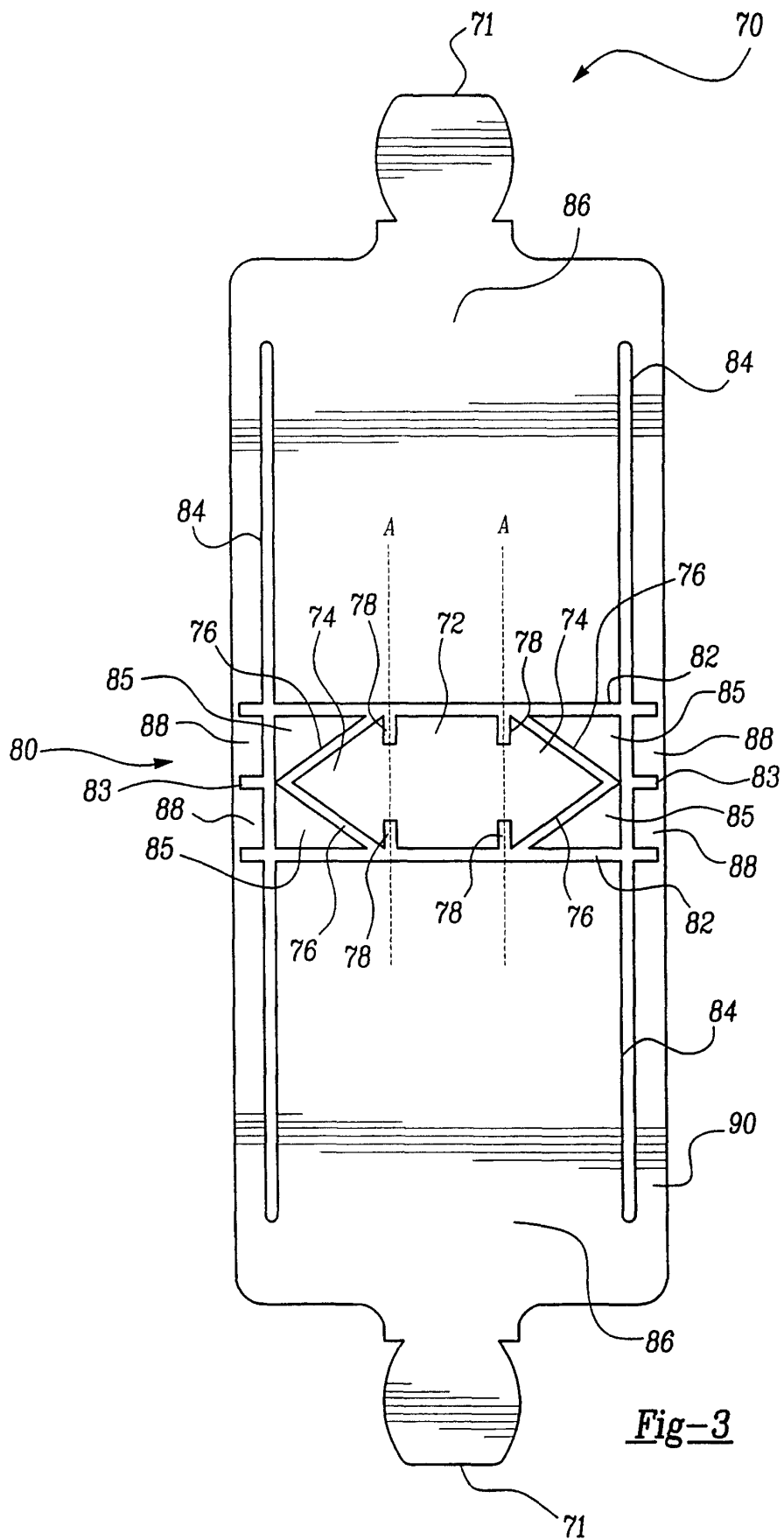


Fig-4

