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(72) Inventors:
• **Le Bras, Philippe**
36000 Chateauroux (FR)
• **Daniel, Jean-Yves**
36000 Chateauroux (FR)

(30) Priority: **15.02.2007 GB 0702966**

(74) Representative: **Baldwin, Mark**
Coulson & Associates
1st Floor Suite
5 Newbold Road
Rugby
Warwickshire CV21 2LQ (GB)

(71) Applicant: **MeadWestvaco Packaging Systems LLC**
Glen Allen, VA 23060 (US)

(54) **Composite packaging and blank therefor**

(57) A composite package (110) containing at least two adjacently disposed articles (A), wherein an upper flange portion (116) of each article protrudes beyond the extent of a base of each article and provides a point of

abutment or connection (114) between the two articles. The package comprises a sheet of material wrapped around the articles and an insert (120) having a spacer structure (140) disposed between the articles for maintaining a minimum distance between the articles.

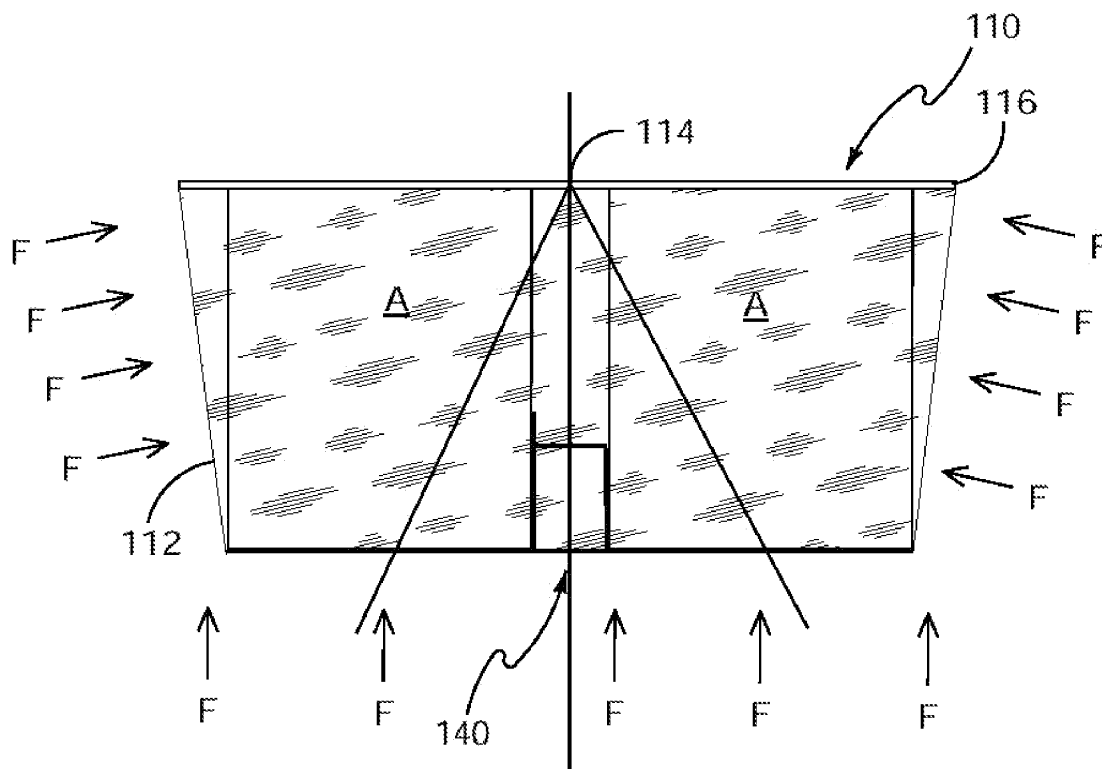


FIGURE 4

Description

Field of Invention

[0001] The present invention relates to the field of packaging in particular the field of multiple packaging and more particularly, but not exclusively, to packages comprising a combination of materials such as paperboard and shrink wrap material, hereafter referred to as a composite package.

Background of Invention

[0002] It is convenient for customers and retailers, for retailers to be able to sell products in multiples of articles packaged together for convenience, marketing and security reasons.

[0003] It is known to wrap multiple articles together using shrink wrap packaging to encourage a group of articles to maintain a tight formation.

[0004] It is also known to wrap articles with a tubular structure of paperboard or similar foldable material to maintain the articles in a contained structured fashion.

[0005] It is also known to provide packages for multiple packaging of products, US 4,094,406 to Zietzschmann illustrates one such example. The package disclosed by US '406, is provided for packaging a group of substantially cylindrical articles, the package comprises an elastically stretchable film layer coupled to which are a first and second paperboard strip. The film and paperboard strips are wrapped around the package, the paperboard strips form a composite base having side panels which extend partially up the sides of the package, to provide structural support to the wrapped package.

[0006] Another known packaging system is described in US 3, 687,282 to Owen, the package comprises a group of substantially cylindrical articles having necks over which a paperboard panel having apertures is placed such that the neck of each article is received in one of the apertures. Thermoplastic film is applied to the sides and base of the article group. The film overlapping the paperboard panel completes the package construction.

[0007] It is also known from US 3,302,784, to provide a package comprising a group of articles in which there is a top panel provided with grasping or carrying means. The top panel is secured to the article group by a heat shrunk enclosure band. Additionally, the top panel comprises cuts for forming slots which engage with flange portions of the packaged articles such that the top panel grips portions of the articles for transportation.

[0008] It is desirable to provide a package for holding and securing multiple articles that has sufficient structural rigidity whilst at the same time being materially economic.

[0009] The present invention seeks to avoid to overcome or at least mitigate some of the problems of the prior art by providing a package of articles wherein a shrink wrap type outer is reinforced by a keel structure

inner made of a second material such as paperboard. The keel type structure is provided to maintain the packaged articles in a preferred and/or organised configuration.

Summary of Invention

[0010] According to a first aspect, the invention provides a composite package containing at least two adjacently disposed articles, wherein an upper flange portion of each article protrudes beyond the extent of a base of each article and provides a point of abutment or connection between the two articles, wherein the package comprises a sheet of material wrapped around the articles and an insert having a spacer structure disposed between the articles for maintaining a minimum distance between the bases of said articles.

[0011] Preferably, the sheet of material forms a wrapper which applies a compressive force to the articles and wherein the spacer structure is structured such that it resists the compressive force restricting movement of the articles towards one another.

[0012] Preferably, the spacer structure comprises a keel structure having a first upright panel and a connection panel and wherein there further comprises a second upright panel, the first and second upright panels engage with a respective one of said at least one pair of articles and said connection panel provides a brace therebetween.

[0013] Optionally, said insert comprises a base panel and said spacer structure is integrally formed within the base panel.

[0014] Optionally, the base panel of the insert extends from a gap between a pair of adjacent articles in said group to the outer extremity of one of said pair of adjacent articles.

[0015] Preferably, the sheet material forms a tubular structure which has an axis disposed parallel to a tubular axis of a tube defined by the spacer structure.

[0016] Preferably, the sheet material forms a tubular structure which has an axis which is disposed perpendicular to a tubular axis of a tube defined by the spacer structure.

[0017] Preferably, the sheet material is a polymeric material and said insert is formed of a more rigid material.

[0018] Preferably, the sheet material is tightenable around the plurality of articles by application of heat to the sheet material whereby generating the or a compressive force.

[0019] According to a further aspect of the present invention there is provided a package containing a plurality of articles, wherein a portion of at least one side of the article protrudes beyond the remainder of the side of the article for creating a point of abutment or connection between two articles when placed adjacent one another, the package further comprises a sheet of material wrapped around the plurality of articles, and an insert having a spacer structure for maintaining a minimum dis-

tance between the articles.

[0020] The present invention seeks to provide a stable package for articles which when placed in side by side relationship with one another have a tendency to pivot about a fulcrum point when encouraged towards one another.

[0021] Preferably, the sheet of material forms a wrapper which applies a compressive force to the plurality of articles and wherein the spacer means resists the compressive force preventing movement of the articles towards one another.

[0022] Preferably, the spacer means comprises a keel structure having a first upright panel and a connection panel. Preferably, the spacer structure further comprises a second upright panel and wherein the first and second upright panels engage with a respective one of said at least one pair of articles.

[0023] Preferably, said insert comprises a base panel. Preferably, the insert comprises at least one side panel. Preferably, the package comprises a top panel. Preferably, the plurality of articles preformed into a group and the or a base panel under lays a part of the article group. Preferably, the base panel extends from a gap between a pair of adjacent articles in said group to or towards the outer extremity of one of said pair of adjacent articles.

[0024] Preferably, the sheet material forms a tubular structure which has tubular axis which is disposed parallel to a tubular axis of a tube defined by the keel structure.

[0025] Alternatively, the sheet material forms a tubular structure which has an axis which is disposed perpendicular to a tubular axis of a tube defined by the keel structure.

[0026] Preferably, the sheet material is a polymeric material. Preferably, the sheet material is tightenable around the plurality of articles by application of heat to the sheet material whereby generating the or a compressive force.

[0027] Preferably, the sheet material is transparent. Preferably, the articles comprise a flange. Preferably, the articles are joined to an at least on adjacent article by their respective flanges. Preferably, the articles are tapered. Preferably, the articles are frusto-conical.

[0028] According to a further aspect of the invention there is provided a composite package comprising a group of articles wherein spaces exist between adjacent articles grouped together in abutment, spacer means to maintain said spaces between adjacent articles and a flexible, preferably transparent, wrapper material for surrounding the group of articles.

[0029] According to yet a further aspect of the invention there is provided a carton comprising a top panel for covering a group of articles hinged to a side panel and a base panel, hinged to the side panel which is shorter than the top panel, wherein the top panel has a transverse dimension L and the base panel has a transverse dimension 0.6L or less. Preferably, the base panel has a transverse dimension of 0.5L.

[0030] According to a fourth aspect of the present invention there is provided a carton consisting of a top panel for covering a group of articles hinged to a side panel and a base panel, hinged to the side panel which is shorter than the top panel. Preferably, the base panel comprises a spacer means at a free edge opposing the hinged edge.

Brief Description of the Drawings

[0031] Exemplary embodiments of the present invention will now be described with reference to and in conjunction with the accompanying drawings in which:

FIGURE 1 is a schematic illustration of an end view of a package of the prior art;

FIGURE 2 illustrates a plan view of a blank for forming a first part of a package according to a first embodiment of the present invention;

FIGURE 3 illustrates a schematic end view of a package incorporating the blank of Figure 2;

FIGURE 4 illustrates a second schematic end view of a package incorporating the blank of Figure 2;

FIGURE 5 illustrates a perspective view of a base and side of a package similar to that shown in Figure 4;

FIGURE 6 illustrates a perspective view from the top and side of the package of Figure 4;

FIGURE 7 illustrates a plan view of a blank for forming part of package according to a second embodiment of the present invention;

FIGURE 8 illustrates a perspective view of the base side and one end of a package incorporating the blank of Figure 7;

FIGURE 9 illustrates a perspective view of the top, end and side of the package illustrated in Figure 8;

FIGURE 10 illustrates a schematic end view of the blank of Figure 7 incorporated into a dual layer package;

FIGURE 11 illustrates a perspective view of the side, end and base of a package similar to that shown in Figure 10;

FIGURE 12 illustrates a perspective view from above of the package of Figure 11;

FIGURE 13 illustrates a plan view of a blank for forming part of a package according to a third embodiment

ment of the present invention;

FIGURE 14 illustrates a schematic end view of a package incorporating the blank of Figure 13;

FIGURE 15 illustrates a perspective view of the base, side and end of a package incorporating the blank of Figure 13;

FIGURE 16 illustrates a schematic end view of a dual layer package incorporating the blank of Figure 13;

FIGURE 17 illustrates a plan view of a blank for forming part of a package according to a fourth embodiment of the present invention;

FIGURE 18 illustrates a schematic end view of a package incorporating the blank of Figure 17;

FIGURE 19 illustrates a top, side and end perspective view from above a package similar to that of Figure 18;

FIGURE 20 illustrates a plan view of a blank for forming part of a package according to a fifth embodiment of the present invention;

FIGURE 20b illustrates an alternative embodiment of the blank of Figure 20 incorporating a tear feature in the top panel;

FIGURE 21 illustrates a schematic end view of a package incorporating the blank of Figure 20;

FIGURE 22 illustrates a plan view of a blank for forming part of a package according to a sixth embodiment of the present invention;

FIGURE 23 illustrates a schematic end view of a package incorporating a blank of Figure 22;

FIGURE 24 illustrates a plan view of a blank for forming part of a package according to a seventh embodiment of the present invention;

FIGURE 25 illustrates a perspective view of the blank of Figure 24 in a partial stage of assembly;

FIGURE 26 illustrates a perspective view of the blank of Figure 24 in a further stage of assembly;

FIGURE 27 illustrates a partial plan view of a blank for forming part of a package incorporating a keel structure according to an eighth embodiment of the present invention;

FIGURE 28 illustrates a perspective view of an assembled keel structure formed from the blank shown

in Figure 27;

FIGURE 29 illustrates a plan view of a blank comprising a keel structure according to a ninth embodiment of the present invention;

FIGURE 30 illustrates a plan view of a blank comprising a keel structure according to a tenth embodiment of the present invention;

FIGURE 31 illustrates a plan view of a blank incorporating a keel structure according to an eleventh embodiment of the present invention;

FIGURE 32 illustrates a plan view of a blank incorporating a keel structure according to a twelfth embodiment of the present invention;

FIGURE 33 illustrates a perspective view of a package incorporating the keel structure of Figure 31 with a portion of the package cut away for illustrative purposes;

FIGURE 34 illustrates a side view of a package incorporating the keel structure of Figure 35 and

FIGURE 35 illustrates a plan view of a blank incorporating a keel structure according to a thirteenth embodiment of the present invention.

Detailed Description of the Exemplary Embodiments

[0032] Figure 1 illustrates schematically a package 10 of the prior art. In Figure 1, an end view of the package 10 which comprises a group of articles A is shown. The articles A comprise a flange 16 about their upper periphery. The articles A are coupled to one another along a frangible connection 14, disposed between the articles.

[0033] A sheet of material 12, such as shrink wrap plastic, or other polymeric material has been wrapped about the group of articles to form a tubular arrangement having an axis perpendicular to the plane of the paper.

[0034] The sheet of material 12 upon being shrunk, for example by application of heat, around the group of articles A, applies a compressive force F to the group of articles A. The effect of this compressive force F is that the articles A are caused to pivot about the frangible connection 14 such that the tops, of adjacent articles are disposed at an angular relationship to one another.

[0035] Because of this compressive force F, the group of articles A is put under stress and the frangible connection 14 becomes susceptible to breaking and failure of the package 10 in holding the articles A in a grouped organised configuration can occur. Also damage to the articles A can occur. The present invention seeks to overcome or at least mitigate these and other problems of the prior art. With reference to the accompanying drawings, exemplary embodiments of the present invention will now

be described.

[0036] Firstly, with reference to Figure 2 there is a blank 120 for forming a package 110 illustrated in Figures 3 to 6.

[0037] Blank 120 comprises a base panel 122 in which a keel structure 140 is formed. Keel structure 140 comprises a first upright panel 128 defined in part by a substantially U shaped cut line 134 and in part by fold line 125. A second upright panel 124 disposed adjacent the first upright panel 128, is defined in part by a portion of fold line 125 and in part by a second fold line 123. Second upright panel 124 is further defined in part by portion of cut lines 130 and 132. Cut lines 130 and 132 are spaced apart and arranged such that second upright panel 124 is trapezoidal in shape.

[0038] A connecting panel 126 is struck from first upright panel 128. Connecting panel 126 is formed in part by said aforementioned portion of fold line 125 (and thereby adjoined to second upright panel 124); by third fold line 127 and by further portions of cut lines 130 and 132. Connecting panel 126 is also substantially trapezoidal in shape.

[0039] Turning now to Figure 3, keel structure 140 is schematically illustrated after it has been folded out of the plane of base panel 122, such that a tubular structure is formed in a gap 117 between lower portions of adjacent articles A. Gap 117 is created by the presence of flange portions 116. Although it is envisaged that the present invention may be used with articles having tapered sides such as frustoconical articles, it is envisaged that articles having other suitable, shapes can be held by the packages herein described.

[0040] To form a package of assembled articles, articles A, are placed upon the base panel 122 with the keel structure disposed in the gap 117. Shrink wrap type material is then wrapped around the article group and base panel 122 to form a composite package. Packages 110 preferably are constructed by first erecting the keel structure 140 in the gap 117 between adjacent articles A and then by applying the shrink wrap type material. However it is envisaged that the construction process may differ from that herein described.

[0041] It can be seen in Figure 4 that when shrink wrap material 112 is applied to the package 110, the shrink wrap material 112 again applies a compressive force F to the articles A. The keel structure 140 however provides support to the base of the articles A to resist against the compressive force F. In this way the package 110 maintains its shape, leaving the tops and bases of each article A in substantially the same plane as the base of the shrink wrap type material 112. The keel structure 140 provides a spacer structure which prevents the pivoting seen in the prior art and maintains a minimum distance between adjacent articles, because the articles A are restricted from pivoting about the frangible connection 114. The articles A of the package 110 of the present invention are less likely to separate from one another due to undesirable breaking of the frangible connection 114 when the shrink wrap material 112 is applied, and/or during trans-

portation.

[0042] Figure 5 shows the base of a package 110 in which it can be clearly seen that the keel structure 140 has been assembled in the gap 117 between adjacent articles A. Portions of the bases of two of the articles in the two by two array of articles A are visible through the aperture 150 formed in the base as a consequence of assembling the keel structure.

[0043] The keel structure 140 forms a tubular structure having an axis (not shown) which is parallel to the axis A_x formed by the tubular structure created by the shrink wrap material 112. The shrink wrap material 112 applies a compressive force F in directions substantially perpendicular to axis A_x and the keel structure 140 provides structural rigidity to the package.

[0044] Turning now to Figure 6 there is shown a perspective view from above of the package 110. It can be seen that the keel structure 140 maintains the bases of the articles in a spaced apart relationship.

[0045] Further exemplary embodiments of the present invention will now be described wherein like reference numerals have, where possible, been used for like features of the first embodiment albeit with the addition of the prefix "2", "3", "4" and so forth to distinguish between embodiments.

[0046] Since the subsequent embodiments share similar features and principle of operation to the first embodiment, to avoid repetition, only certain differences will be described in detail.

[0047] Figure 7 illustrates a second embodiment of the present invention, in which it can be seen that two keel structures 240 have been formed in base panel 222 of blank 220. Blank 220 can be used to package a two by four array of eight articles A as shown in Figure 8. Figure 8 illustrates a perspective view of the base of a package 210 in which each keel structure 240 provides support to four surrounding articles A of the article group.

[0048] Figure 9 illustrates the package 210 of the second embodiment from above showing that the bases of the articles A are maintained in a spaced apart relationship by each of the keel structures 240.

[0049] Figure 10 illustrates an alternative package 211 using the blank 220 in which a dual-layer-stack of articles are placed upon the base panel 222. A first layer of articles A₁, are placed on base panel 222 with keel structure 240 placed in gap 217. A second layer of articles A₂ are placed on the top of the first layer of articles A₁. Shrink wrap 212 is applied around both layers of articles A₁ and A₂ as shown in Figure 11.

[0050] The flanges 216 of the first layer of articles A₁ prevent compressive forces of the shrink wrap type material 212 from displacing the articles in the upper layer A₂. In an alternative embodiment an insert is placed between the first A₁ and second A₂ layers. The keel structures 240 maintain the spaced apart relationship of the bases of the first layer of articles A₁ as can be seen by reference to Figure 12.

[0051] Referring now to Figure 13, there is shown a

third embodiment of the present invention. Blank 320 comprises a base panel 322 side panels 334 and 336 hinged along fold lines 333 and 336 respectively to opposed edges of base panel 322. Keel structure 340 is formed in base panel 322 substantially the same as hereinbefore described.

[0052] Turning now to Figure 14, it can be seen that Articles A have been packaged onto base panel 322 keel structure 340 has been erected and placed into the gap 317 between adjacent articles A. Side panels 334 and 336 have been folded about the sides of the article group.

[0053] Shrink wrap type material 312 is applied to the assembled article group and paperboard insert 310, as can be seen in Figure 15. Side panels 334 and 336 offer protection to the sides of the article group and/or additional structural rigidity. Furthermore, they may be printed for advertising or display purposes.

[0054] Figure 16 shows an alternative package 311 comprising the blank 320 of Figure 13 in which a dual layer package has been created by placing a second layer of articles A2 over that of the first layer of articles A₁. The flanges 316 of the first layer of articles A₁, prevent the shrink wrap material 312 (not shown) from displacing the upper layer of articles A2.

[0055] Referring now to Figure 17, there is shown a blank 420 for forming a package of a fourth embodiment. Blank 420 comprises a base panel 422 to opposed sides of which are hinged lower side panels 434b and 436b along fold lines 433 and 435 respectively.

[0056] Upper side panels 434a and 436a are hinged to lower side panels 434b and 436b along fold lines 437 and 439 respectively. A pair of keel structures 440 are struck from the base panel 422. Turning now to Figures 18 and 19, it can be seen that two layers of articles, A1, A2 have been placed on base panel 422, keel structures 440 have been inserted into the gap 417 between articles A1 of the lower layer of articles.

[0057] Lower side panels 434b and 436b have been folded about the sides of the lower layer of articles A1 whilst the upper side panels 434a and 436a have been folded about the sides of the upper layer of articles A2. The upper and lower side panels 443a, 436a, 434b, 436b provide protection to both layers of articles A1 and A2 and provide the package 410 with display means for advertising and promotional purposes. The fold lines 437 and 439 are dimensioned and arranged to coincide with the upper periphery of the first layer of articles A1 such that the upper and lower side panels 434b, 436b, 434a, 436a fold about fold lines 437 and 439 at a position where the flanges 416 meet fold lines 437, 439.

[0058] Referring now to Figure 20 there is shown a blank 520 of a fifth embodiment for forming a package 510 illustrated schematically in Figure 21.

[0059] Blank 520 comprises a base panel 522, base panel 522 is provided to underlay half of the articles A in the article group, as can be seen in Figure 21. A side panel 534 is coupled to base panel 522 by fold line 533. A top panel 542 is coupled to side panel 534 along fold

line 541. Top panel 542 substantially covers all of the top of the article group.

[0060] Keel structure 540 is struck in part from base panel 522, such that second upright panel 524 is struck in its entirety from base panel 522. First upright panel 528 is hinged to base panel 522 along fold line 525. Connection panel 526 is struck from first upright panel 528 and is coupled to second upright panel 524 by fold line 525. In the assembled package 510 keel structure 540 is erected between the articles A in gap 517.

[0061] Side panel 534 is folded about the side of the article group. Top panel 542 is folded to cover the top of the article group.

[0062] Side and top panels 534, 542 offer protection to the article group and provide a surface for printing graphics or other display information.

[0063] Shrink wrap type material 512 is then applied to form a tubular structure which has an axis which is substantially parallel to the axis formed by the structure of the keel structure 540. In this way the keel structure 540 resists inward displacement of the articles A which would otherwise result as a consequence of the compression applied by the shrink wrap material.

[0064] Figure 20b illustrates an alternative embodiment in which there is provided a tear feature 570 in top panel 542. Top panel 542 comprises a tear feature 570 which separates the top panel 542 into two parts 542a and 542b. Tear feature 570 comprises a tear strip 572 defined in part by tear lines 574a and 574b. Tear lines 574a and 574b comprises a series of skewed U shaped cut lines 573.

[0065] One end of tear strip 572 is defined by a trapezoidal portion 576, defined by a pair of tear initiation lines 578a and 578b. Tear feature 570 may be deployed by pulling trapezoidal portion 576 and tearing the tear strip 572 away from the top panel 542. In doing so a user may easily gain access to the contents of the package, once upper portions of the shrink wrap material (not shown) have been removed. It is envisaged that other tear features could be incorporated into top panel 542 and/or any of the other panels to facilitate accessing of the articles A.

[0066] In yet a further embodiment shown in Figures 22 and 23, the blank 620 comprises a base panel 622 having a pair of keel structures each of which is substantially the same as the keel structure 540 described in respect of the fifth embodiment above and therefore not further described. The base panel 622 is coupled to a lower side panel 634b along a fold line 633 to which is coupled an upper side panel 634a along a fold line 637. A top panel 642 is coupled to upper side panel 634a along fold line 641.

[0067] Top panel 622 comprises a pair of finger engagement tabs 660 formed by curved cut lines 662a and 662b disposed at opposite ends of cut line 664, such that a portion between curved cut lines 662a, 662b and lines 664 defines, in part, a pair of tabs 666a, 666b wherein the tabs 666a, 666b are adapted to be folded about no-

tional lines disposed between the extremities of curved lines 662a, 662b. Blank 620 can be assembled along with a group of articles A to form the package 670 shown schematically in Figure 23.

[0068] To form the package 610, two layers of articles A1 and A2 are placed in a stack upon base panel 622. Keel structure 640 is erected in the gap 617 between adjacent Articles A1 of the lower layer.

[0069] Lower side panel 634b is folded about the sides of the lower layer of articles A1 whilst the upper side panel 634a is folded about the sides of the upper layer of articles A2.

[0070] Fold line 637 is dimensioned and arranged to coincide with flange 616 of the lower layer of articles A1. The top panel 642 is then folded to cover the top of the upper layer of articles A2.

[0071] Shrink wrap type material 612 (not shown) is then applied to complete the package 610. The shrink wrap forms a tubular structure having an axis parallel to the axis of the tubular structure formed by the keel structure 640.

[0072] Figure 24 illustrates a blank according to a seventh embodiment of the present invention in which an alternative keel structure 740 is shown. Base panel 722 is coupled to side panels 734 and 736 along fold lines 733 and 735 respectively.

[0073] Apertures 799 are optionally formed in part in base panel 722 and in part in side panels 734, 736. Apertures 799 receive portions of articles around which blank 710 is assembled.

[0074] Keel structure 740 is formed from first upright panel 728 and second upright panel 724 coupled by connecting panel 726. In this embodiment connecting panel 726 is orientated to be perpendicular to the base panel 722.

[0075] As can be seen by reference to Figure 25 and 26, first and second upright panels 728, 724 are folded to be approximately perpendicular to connection panel 728, such that they extend across the aperture 750 formed from displacing panels 728, 726 and 724 out of the plane of base panel 722.

[0076] In the embodiment shown in Figures 24 to 26 there is provided one keel structure for each pair of articles in a two by four array. It is envisaged that the keel structure of this embodiment may be used in conjunction with any or each of the features of any of the other embodiment herein described.

[0077] Figures 27 and 28 show a keel structure 840 according to an eighth embodiment of the present invention. Figure 27 illustrates a plan view of a partial blank 820 for forming a package 810.

[0078] Keel structure 840 comprises first upright panel 828 coupled to connecting panel 826 by curved nick portions 881 disposed at either end of curved cut line 827. Nick portions 881 are disposed between curved cut line 827 and cut lines 830. A first upright cut line 880 is disposed substantially perpendicularly relative to a portion of the curved cut line 827 such that the curved line 827

and upright cut line 880 intersect.

[0079] Connecting panel 826 is coupled to second upright panel 824 by a similar arrangement of cut lines 825a, nick portions 883 and second upright cut line 882 which is a mirror image of that connecting first upright panel 828 to connection panel 826. Second upright panel 824 is hinged to a main carton panel 822 along fold line or score line 823 spaced from cut lines 830.

[0080] In an assembled form, (see Figure 28), the curved cut lines 827, 825a and upright cut lines 880, 882 provided a keel structure which is shaped and structured such that it can be deformed to bend partially around a curved article (not shown).

[0081] In a package using the keel structure 840 it is envisaged that the keel structure 840 would be placed between a pair of articles rather than between four articles. In this way the upright panels can be deformed to accommodate an article disposed adjacent to them. In an alternative embodiment, the keel structure is shaped to fit between other numbers and shapes of articles.

[0082] Figure 29 shows a blank 920 for forming a keel structure 940 according to a ninth embodiment. Keel structure 940 comprises a first aperture 997 struck in part from first upright panel 928 and in part from connecting panel 926. A second aperture 998 is struck in part from connecting panel 926 and in part from second upright panel 924. Apertures 997 and 998 are substantially elliptical in shape. When keel structure 940 is assembled, apertures 997 and 998 allow the first and second upright panels 928, 924 respectively to deform in a similar manner to that shown in Figure 28, whereby accommodating a curved article. Again it is preferred that the arrangement be employed between a pair of articles.

[0083] Figure 30 shows a blank 1020 for forming a keel structure 1040 according to a tenth embodiment of the present invention. The fold line 1025a adjoining connecting panel 1026 to second upright panel 1024 is offset from the fold line 1025 connecting the first upright panel 1028 to the base panel 1022.

[0084] This arrangement allows a keel structure to be formed in which the second upright panel 1024 is taller than the connecting panel 1026 is wide. The distance between fold line 1027 and fold line 1025 is substantially equal to the distance between fold line 1025a and fold line 1023.

[0085] In arranging the keel structure 1040 in this way the keel structure 1040 can be formed in between small gaps between articles, whilst maintaining the depth of penetration of the keel structure 1040 into the article group.

[0086] Figure 31 shows a blank 1120 for forming a package having a keel structure according to a twelfth embodiment of the present invention. Base panel 1122 is coupled to side panel 1134 along fold line 1133. Side panel 1134 is hinged along fold line 1141 to top panel 1142.

[0087] Base panel 1122 comprises a keel structure 1140. The keel structure comprises first upright panel

1124 and second and third upright panels 1124a, 1124b which couple spacer panel 1126 to base panel 1122 via hinge lines 1123 and 1125. Keel structure 1140 further comprises minor coupling panels 1144 which also couple spacer panel 1126 to base panel 1122 via hinge lines 1123a and 1125a disposed either side thereof. Spacer panel 1126 comprises recessed positions 1146 along a free edge for mating with articles in an article group.

[0088] Curved cut lines 1148 provide a curved edge 1147 (see Figure 33) between spacer panel 1126 and side panel 1134 when the keel structure 1140 is assembled. Curved edge 1147 is provided to mate with articles placed between side panel 1134 and spacer panel 1126.

[0089] As can be seen from Figure 33, in which portions of the top and side panels 1142, 1134 have been removed for illustrative purposes, the keel structure 1140 is intended to be placed between two rows of articles to prevent the articles from being compressed towards one another at their respective bases.

[0090] Tabs 1190 (not visible in Figure 33) are formed which, in the assembled package, partially underlay the articles A which mate with recessed portions 1146.

[0091] Figure 32 illustrates a thirteenth embodiment of the present invention in which the shape and configuration of the location of minor coupling panels 1244 has been moved towards the fold line 1233 between the base panel 1222 and side panel 1234. In arranging the keel structure 1240 in this manner larger tabs 1290 are formed which can underlay articles mating with recessed portions 1246.

[0092] Figure 34 illustrates a side view of a package 1420 formed from the blank 1410 of Figure 35 which forms a keel structure 1440 according to a fourteenth embodiment of the present invention.

[0093] Keel structure 1440 in this embodiment forms a tubular structure with the remainder of the blank 1410 which requires its axis to be orientated at 90° to the axis of the tubular structure formed by the shrink wrap type material (not shown). In Figure 34 the axis of the tubular structure of the shrink wrap type material is parallel to the plane of the paper.

[0094] Keel structure 1440 comprises a first upright panel 1424 hinged to base panel 1422. A spacer panel 1426 is hinged along fold line 1425 to upright panel 1424 and also to side panel 1434 or, 1436 respectively. In this embodiment both the upright panel 1424 and the spacer panel 1426 act against the articles A, to prevent them being brought into closer proximity to one another.

[0095] Shrink wrap type material is wrapped around the article group and insert such that it forms a tubular structure the tubular structure has a tubular axis by A_x (not shown).

[0096] The compressive force exerted by the shrink wrap type material (not shown) is directed into the plane of the paper. It is not required to use a spacer means between the gap 1417 between the articles A to resist this force. However, a compressive force acting in the direction into the paper, acts on further articles A (not

shown) disposed on an opposing side of the keel structure 1440 and this compressive force is resisted by the keel structure 1440, such that the two by two array of articles (only two can be seen in the view as illustrated) are supported by the keel structure.

[0097] Any directional references used in the above description are incorporated for clarity only and are not intended to be limiting. It will therefore be recognised that as used herein, that terms such as "top", "base", "side", "end", "inner", "outer", "upper" and "lower" with respect to the panels of the carton or carton blank are relative terms and that the carton formed from the blank may be reoriented as necessary or as desired. Any reference to a hinged or foldable connection should not be construed as necessarily referring to a single fold line only: indeed, it is envisaged that a hinged or foldable connection can be formed from one or more of the following, a score line, a frangible line or a fold line, without departing from the scope of the present invention.

[0098] It is also envisaged that material other than paperboard may be used for the foldable insert for example, cardboard.

[0099] Furthermore, the features described herein can be used in various combinations not all explicitly disclose herein but nevertheless envisaged as falling within the scope of the present invention. For example the number of keel structures provided is in other embodiments determined by the number of articles; the provision of one or more side panels and/or pairs of upper and lower side panels and/or top panel is entirely optional and can be combined in a variety of combinations with the various types of keel structure shown in forming a composite package. Further it is envisaged in other embodiments that combinations of different types of keel structure may be incorporated into a single paperboard (or other suitable foldable sheet material) blank.

[0100] Indeed it is also envisaged that apertures 799 will be used in conjunction with other types of keel structure and may be incorporated into others of the blanks shown.

Claims

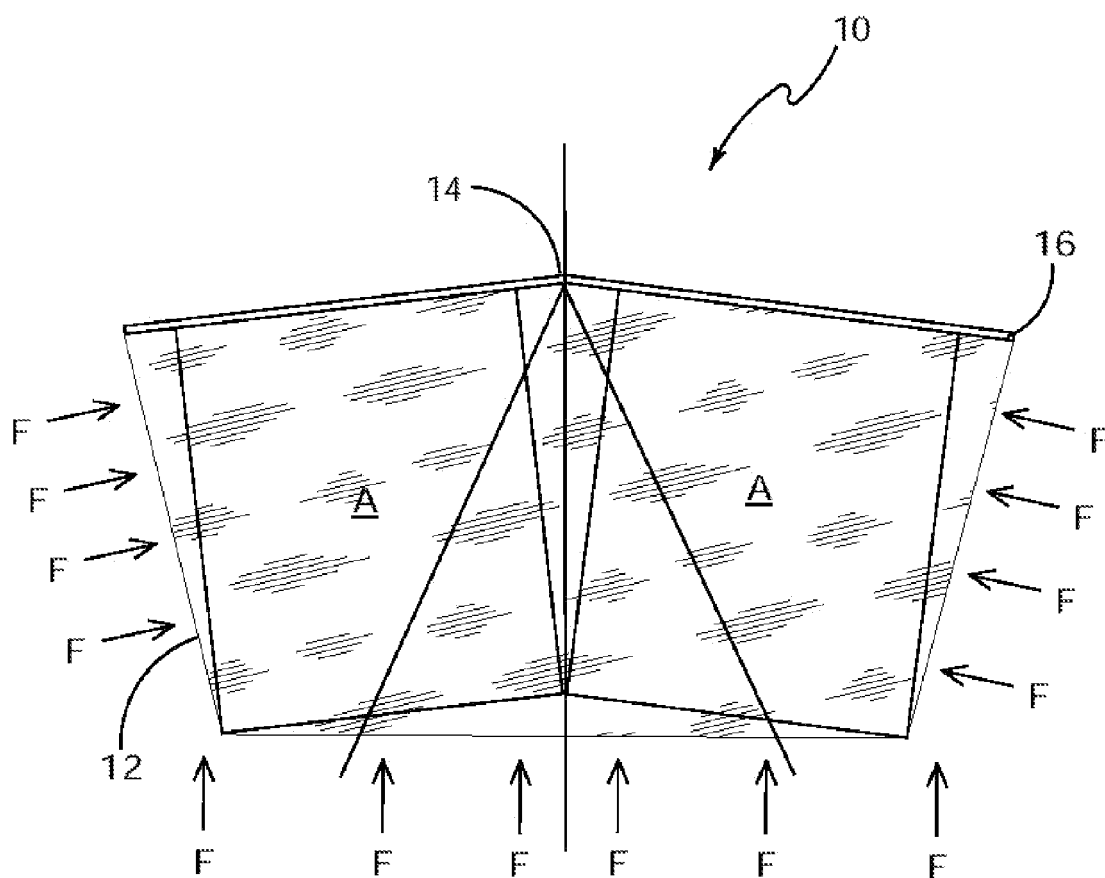
1. A composite package containing at least two adjacently disposed articles, wherein an upper flange portion of each article protrudes beyond the extent of a base of each article and provides a point of abutment or connection between the two articles, wherein the package comprises a sheet of material wrapped around the articles and an insert having a spacer structure disposed between the articles for maintaining a minimum distance between the bases of said articles.
2. A package according to claim 1 wherein the sheet of material forms a wrapper which applies a compressive force to the articles and wherein the spacer

structure is structured such that it resists the compressive force restricting movement of the articles towards one another.

3. A package according to claim 1 or claim 2 wherein the spacer structure comprises a keel structure having a pair of first and second upright panels and a connection panel each of the first and second upright panels engages a respective one of said at least two adjacently disposed articles, and said connection panel provides a brace between the first and second upright panels. 5
10
4. A package according to any of claims 1 to 3 wherein said insert comprises a base panel and said spacer structure is integrally formed within the base panel. 15
5. A package according to any of the preceding claims, wherein the base panel of the insert extends from a gap between a pair of adjacent articles in said group to the outer extremity of one of said pair of adjacent articles. 20
6. A package according to any of the preceding claims wherein the sheet material forms a tubular structure which has an axis disposed parallel to a tubular axis of a tube defined by the spacer structure. 25
7. A package according to any of claims 1 to 5 wherein the sheet material forms a tubular structure which has an axis which is disposed perpendicular to a tubular axis of a tube defined by the spacer structure. 30
8. A package according to any of claims 1 to 6 wherein the sheet material is a polymeric material and said insert is formed of a more rigid material. 35
9. A package according to any of the preceding claims wherein the sheet material is tightenable around the plurality of articles by application of heat to the sheet material whereby generating the or a compressive force. 40
10. An insert for use in a package according to any of the preceding claims. 45
11. A package substantially as herein before described with reference to and/or as illustrated by figures 2-35 of the accompanying drawings. 50

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PRIOR ART
FIGURE 1

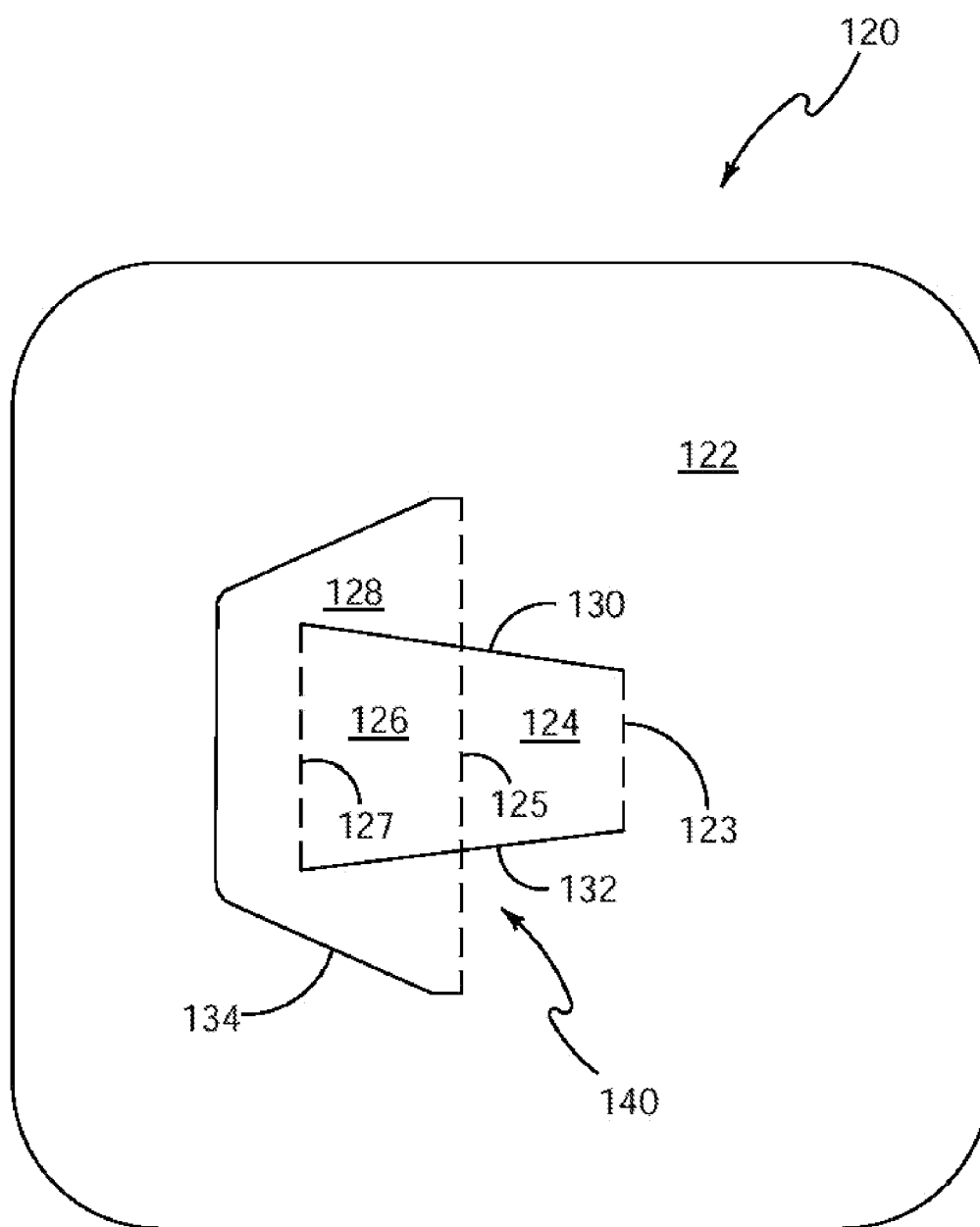


FIGURE 2

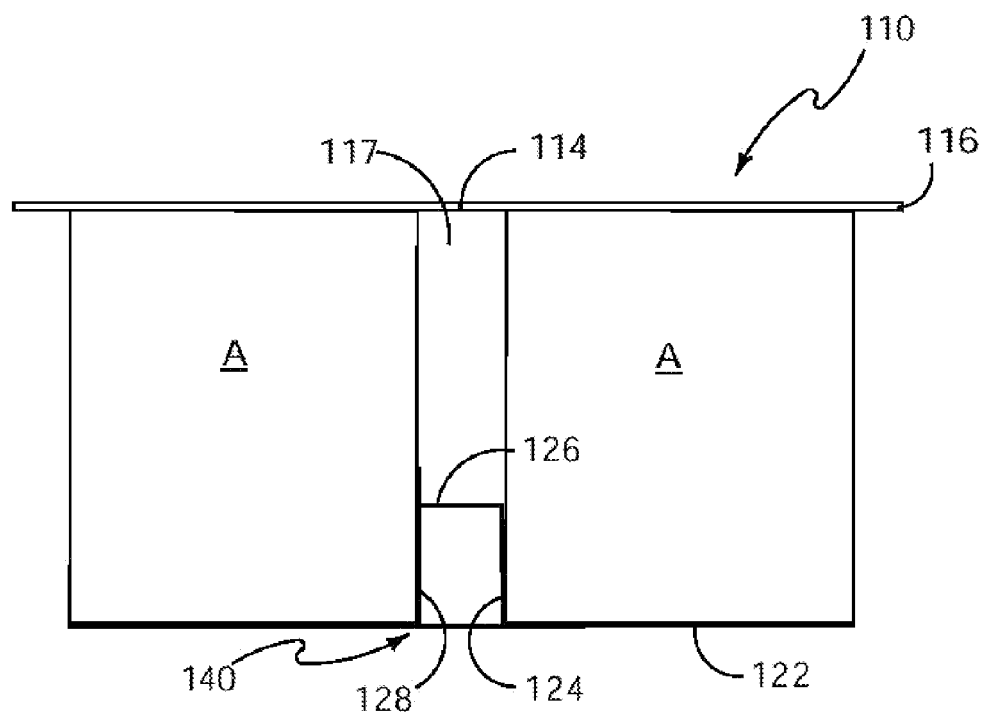


FIGURE 3

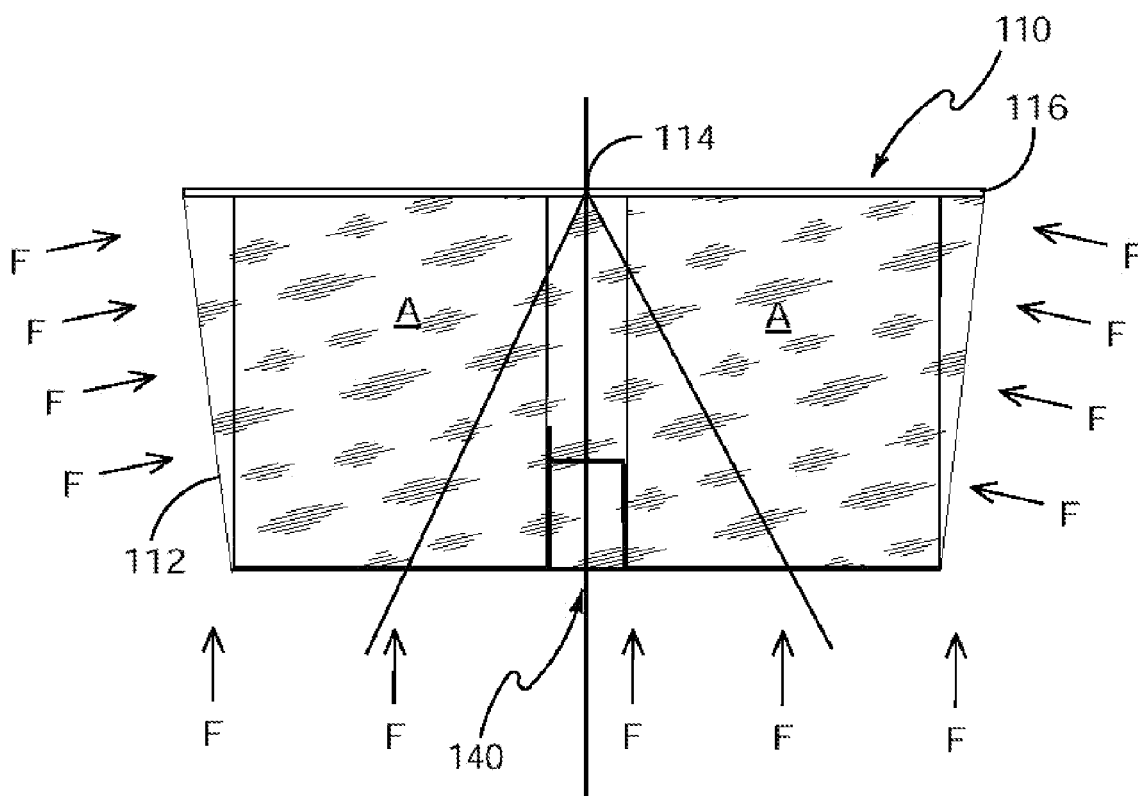


FIGURE 4

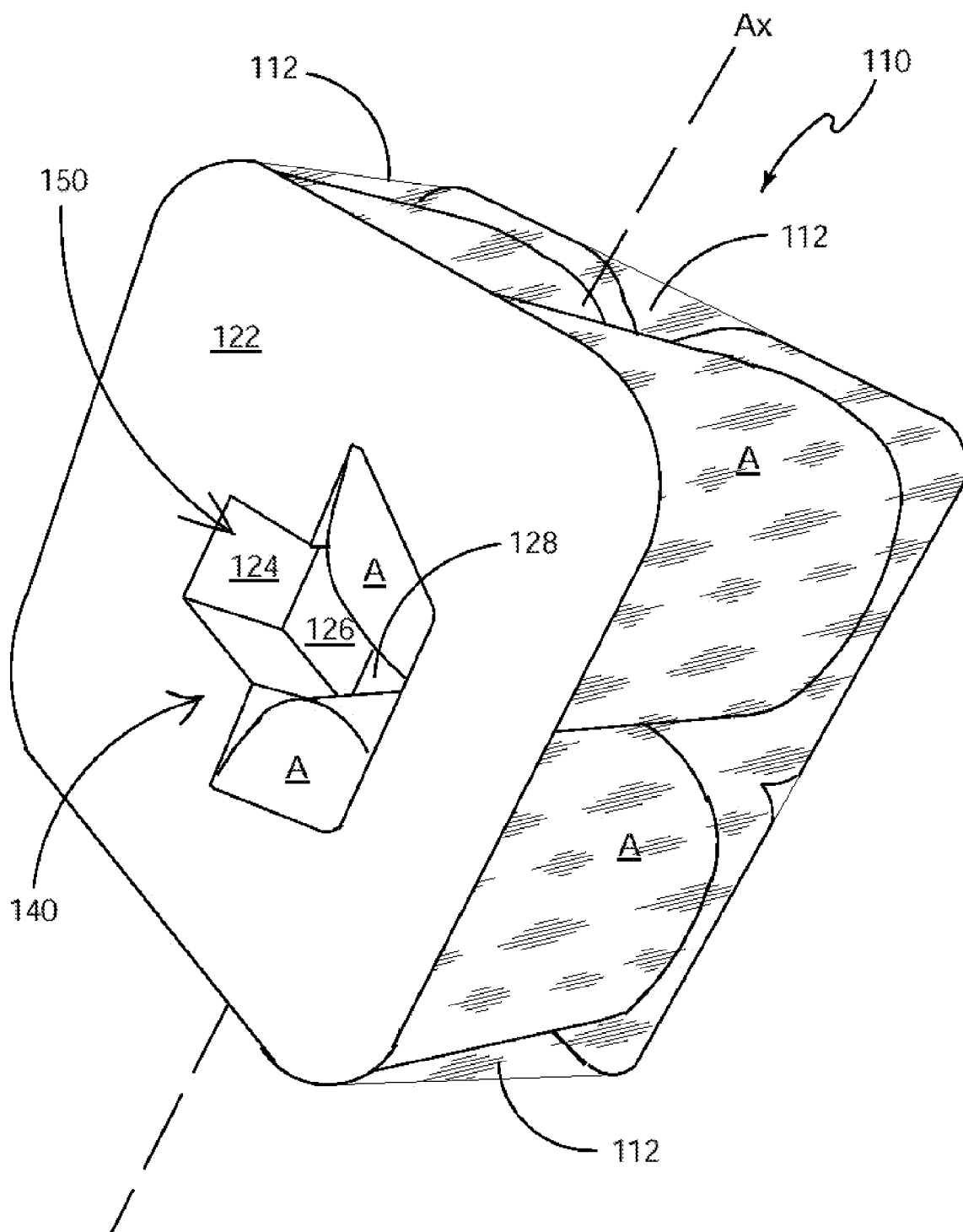


FIGURE 5

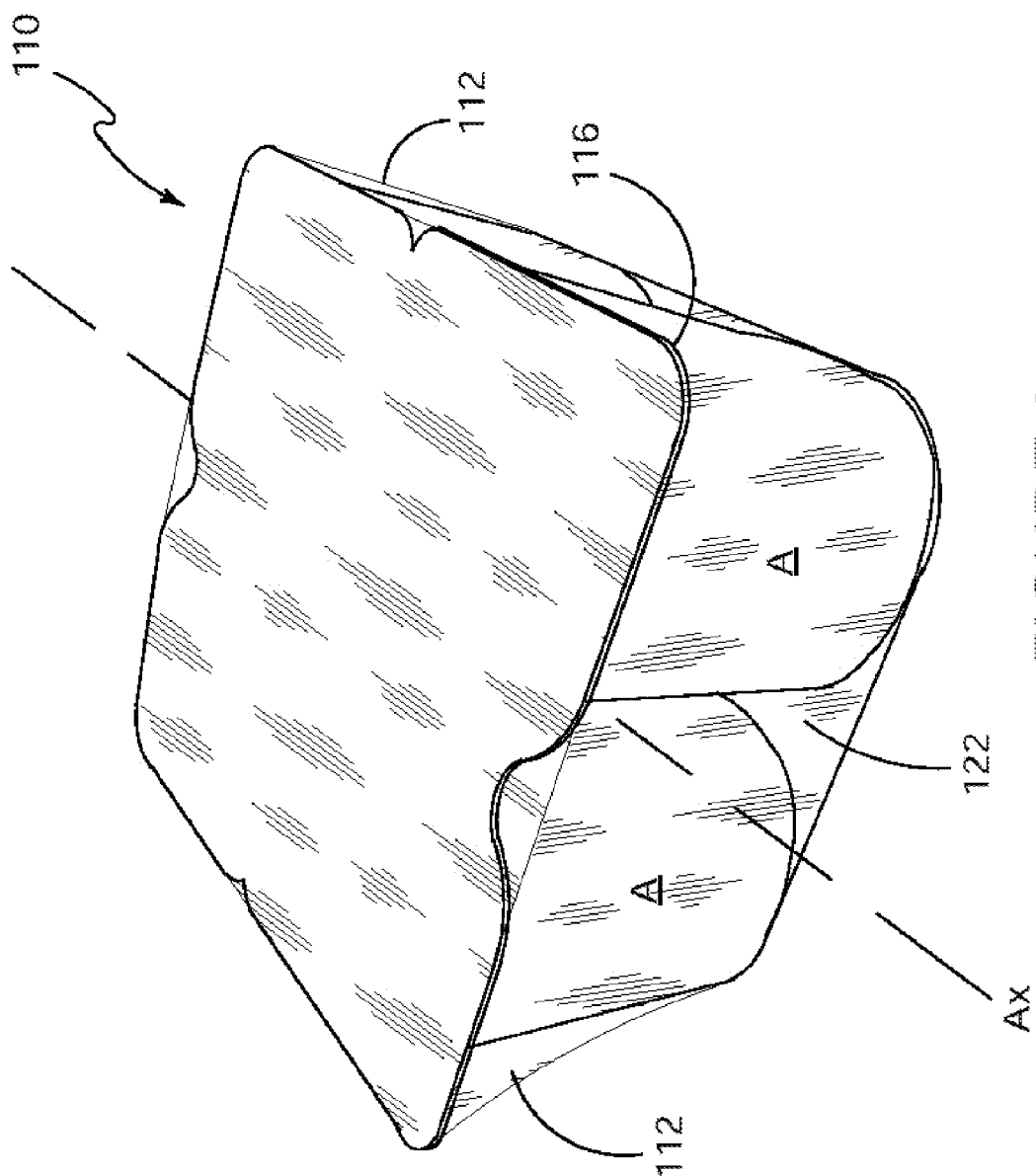


FIGURE 6

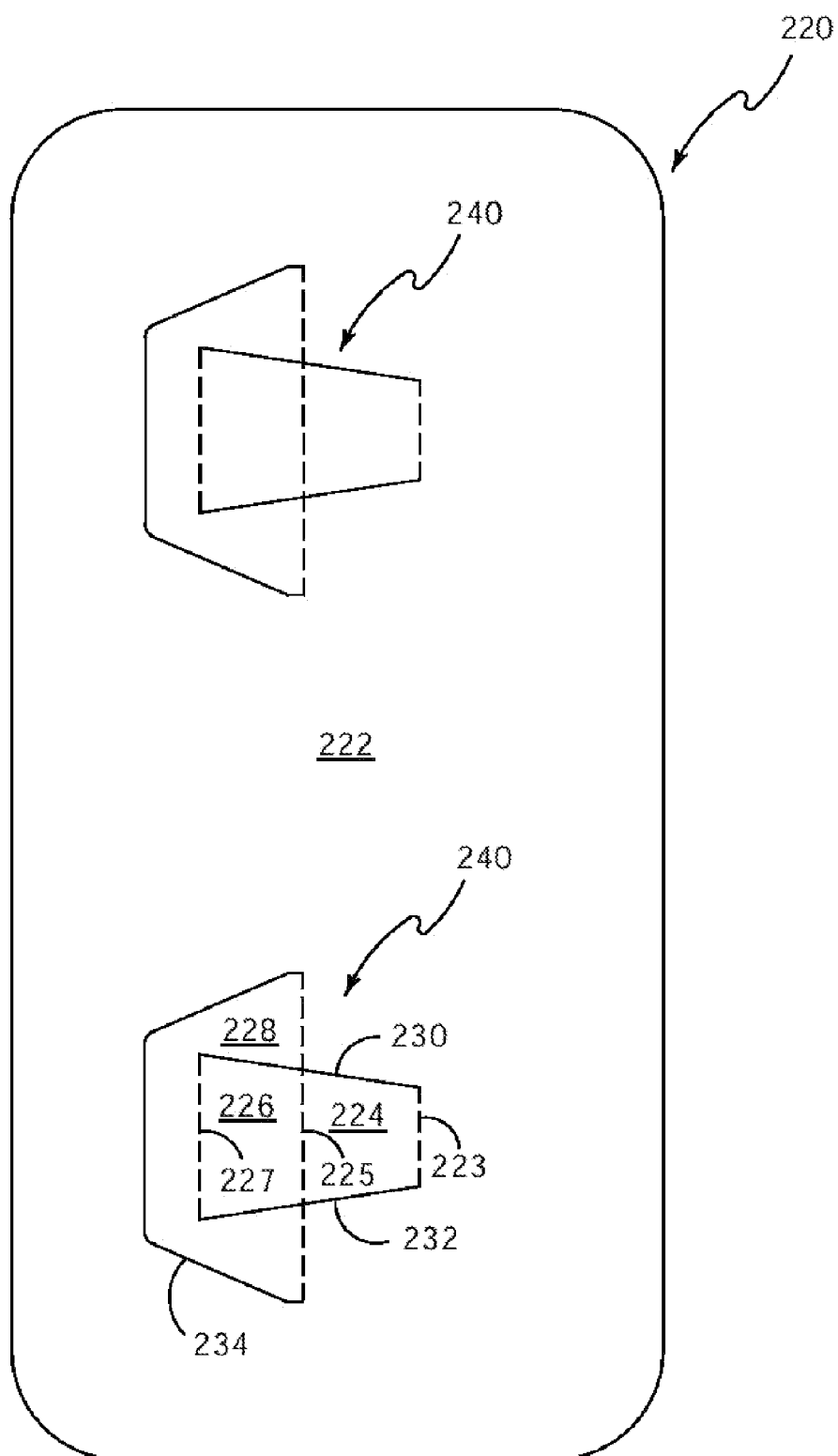


FIGURE 7

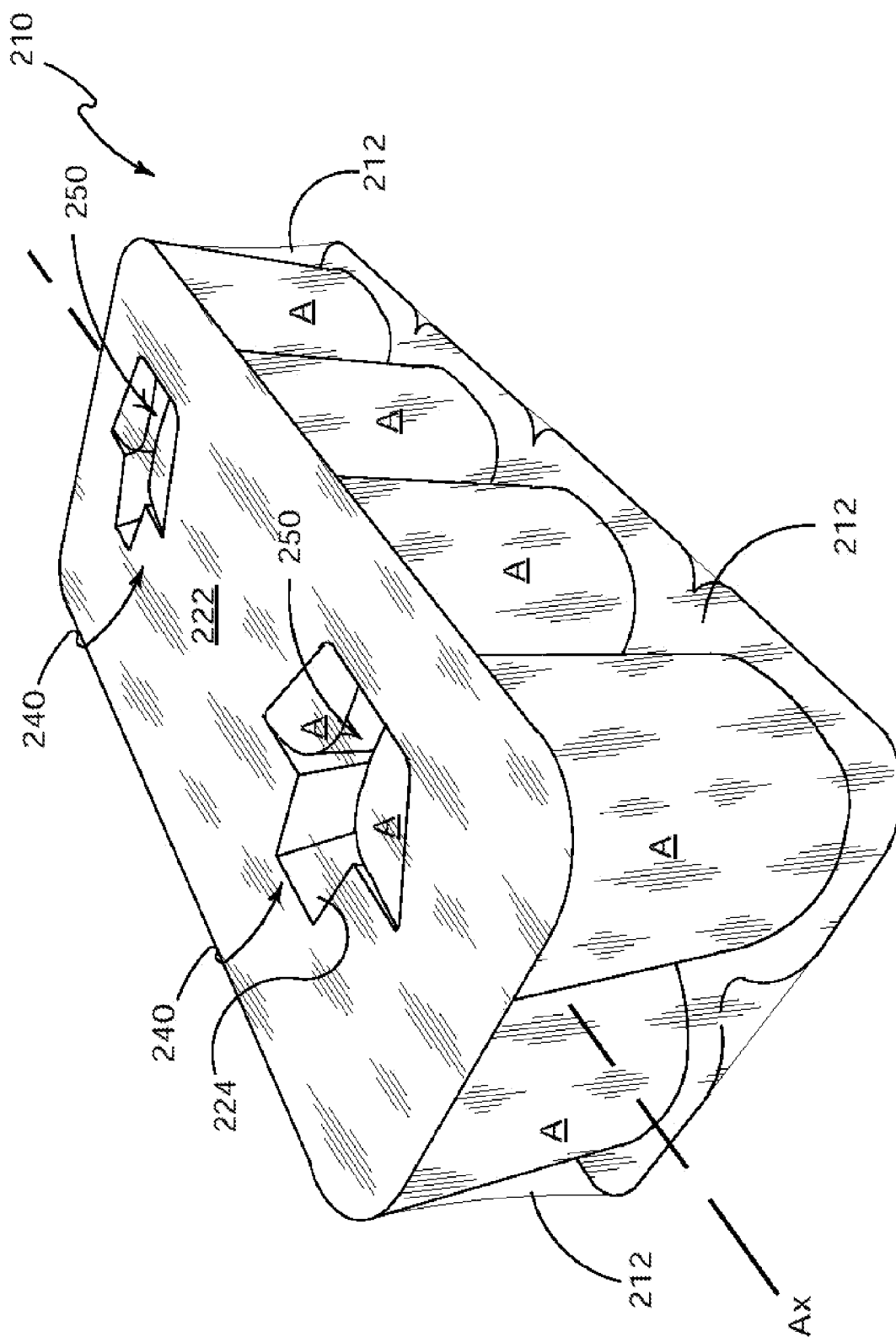


FIGURE 8

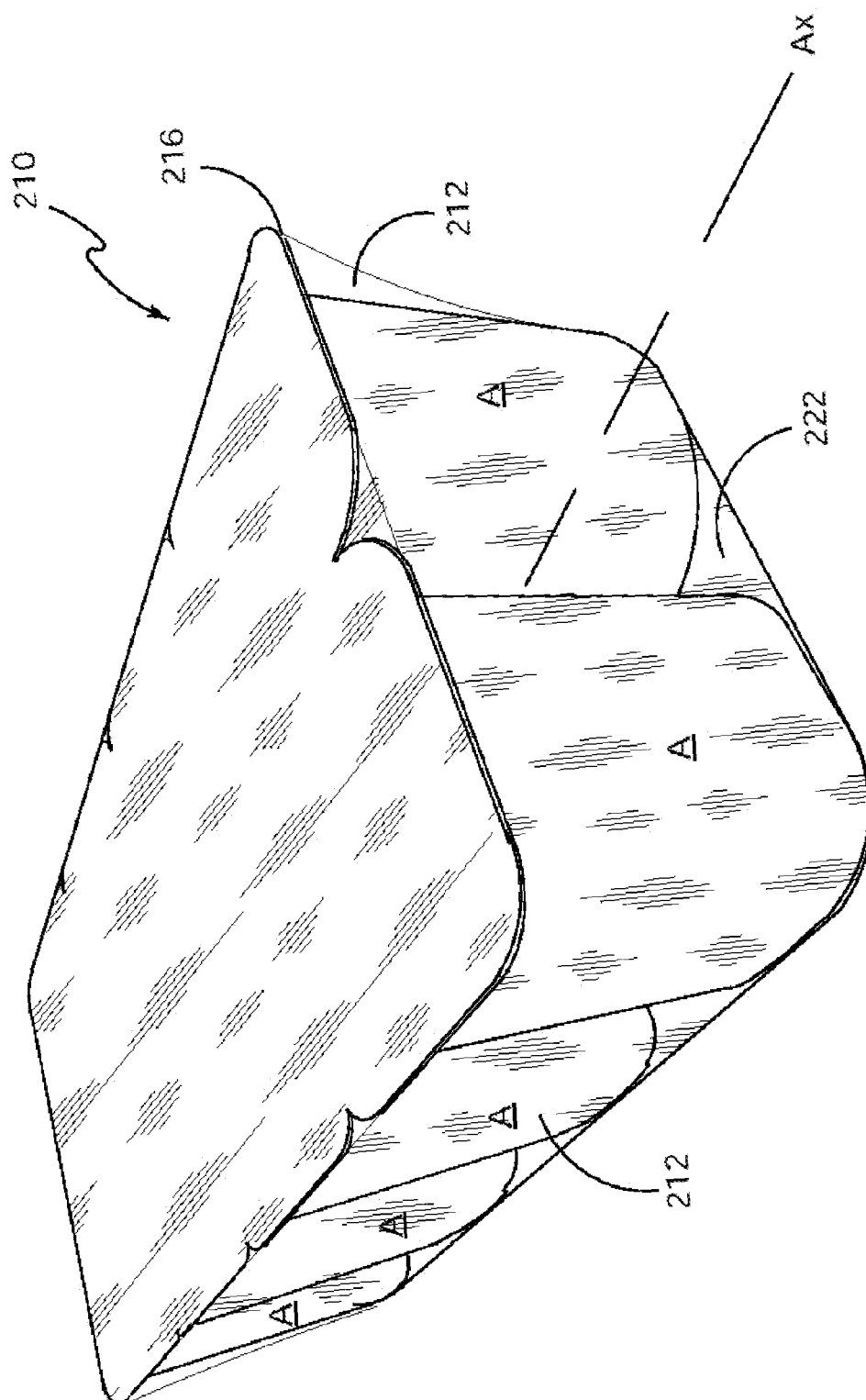


FIGURE 9

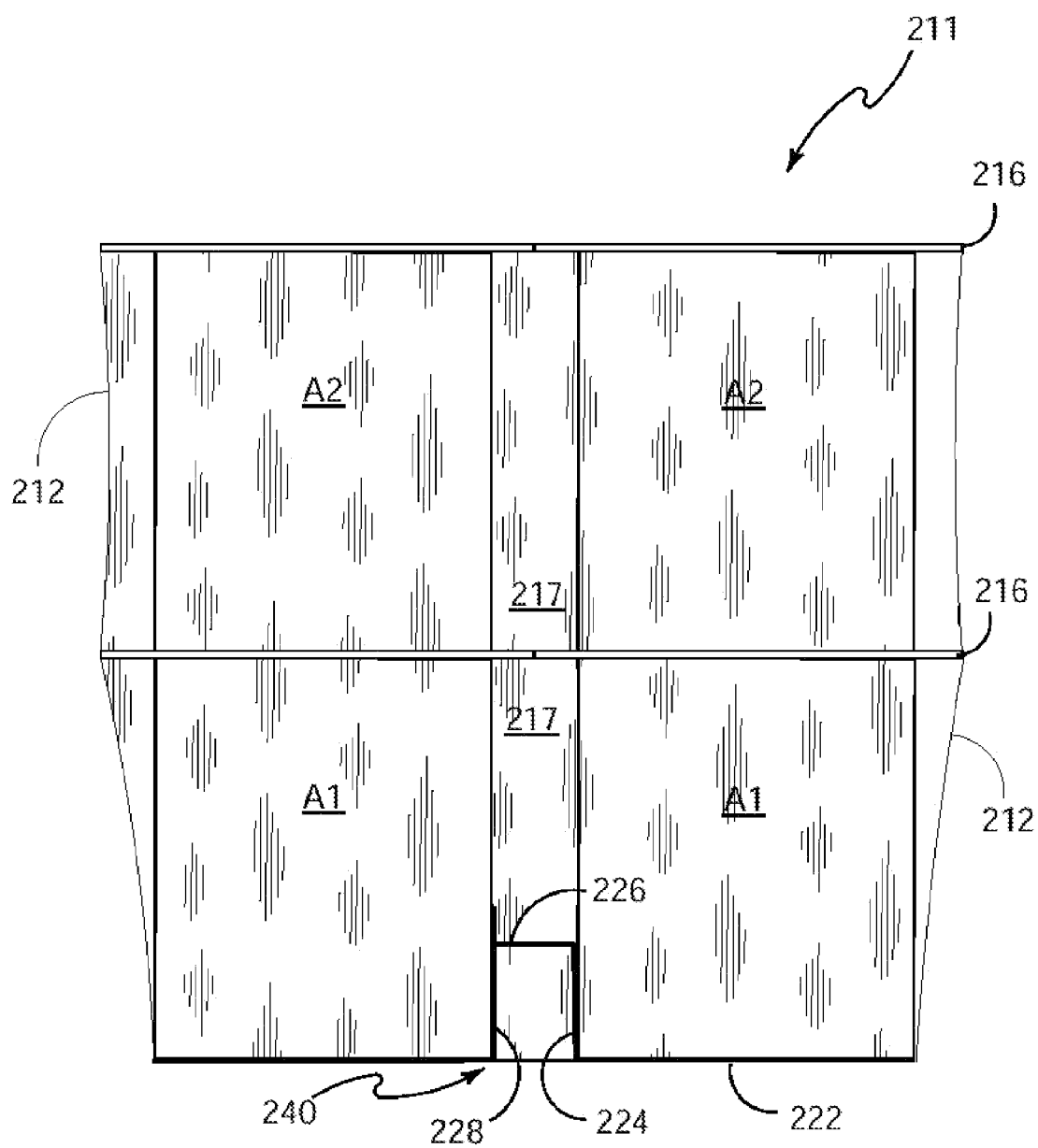
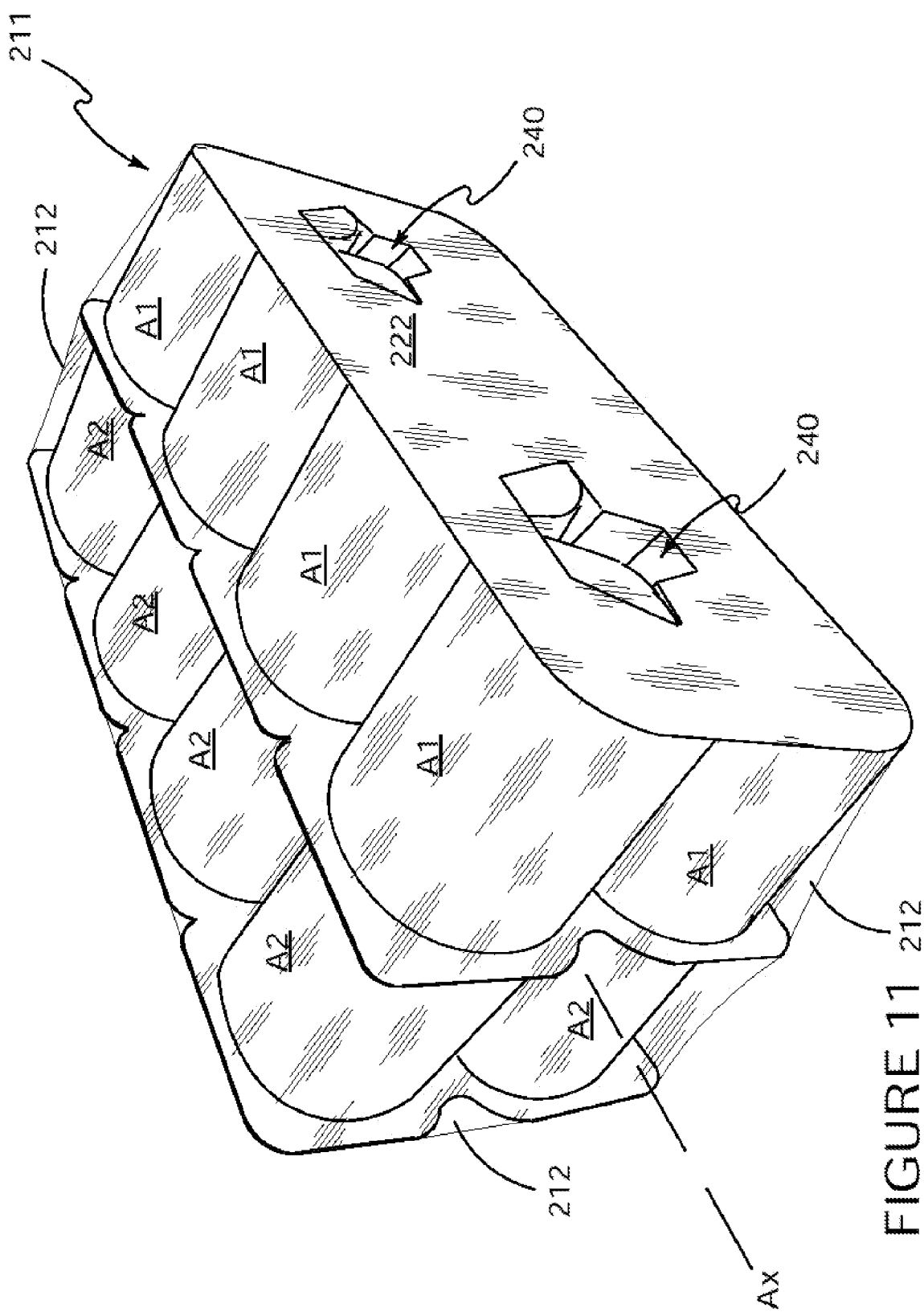


FIGURE 10



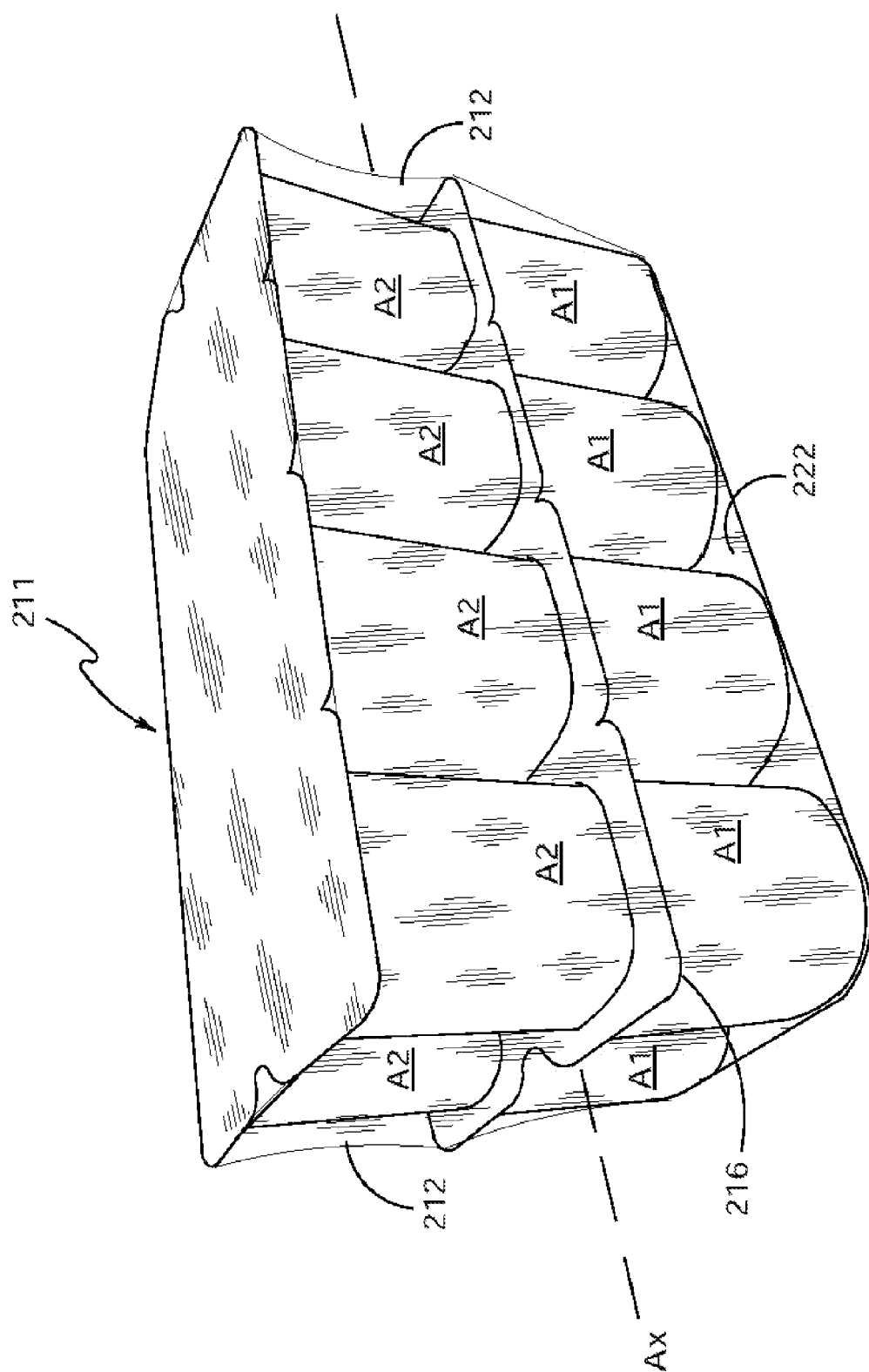


FIGURE 12

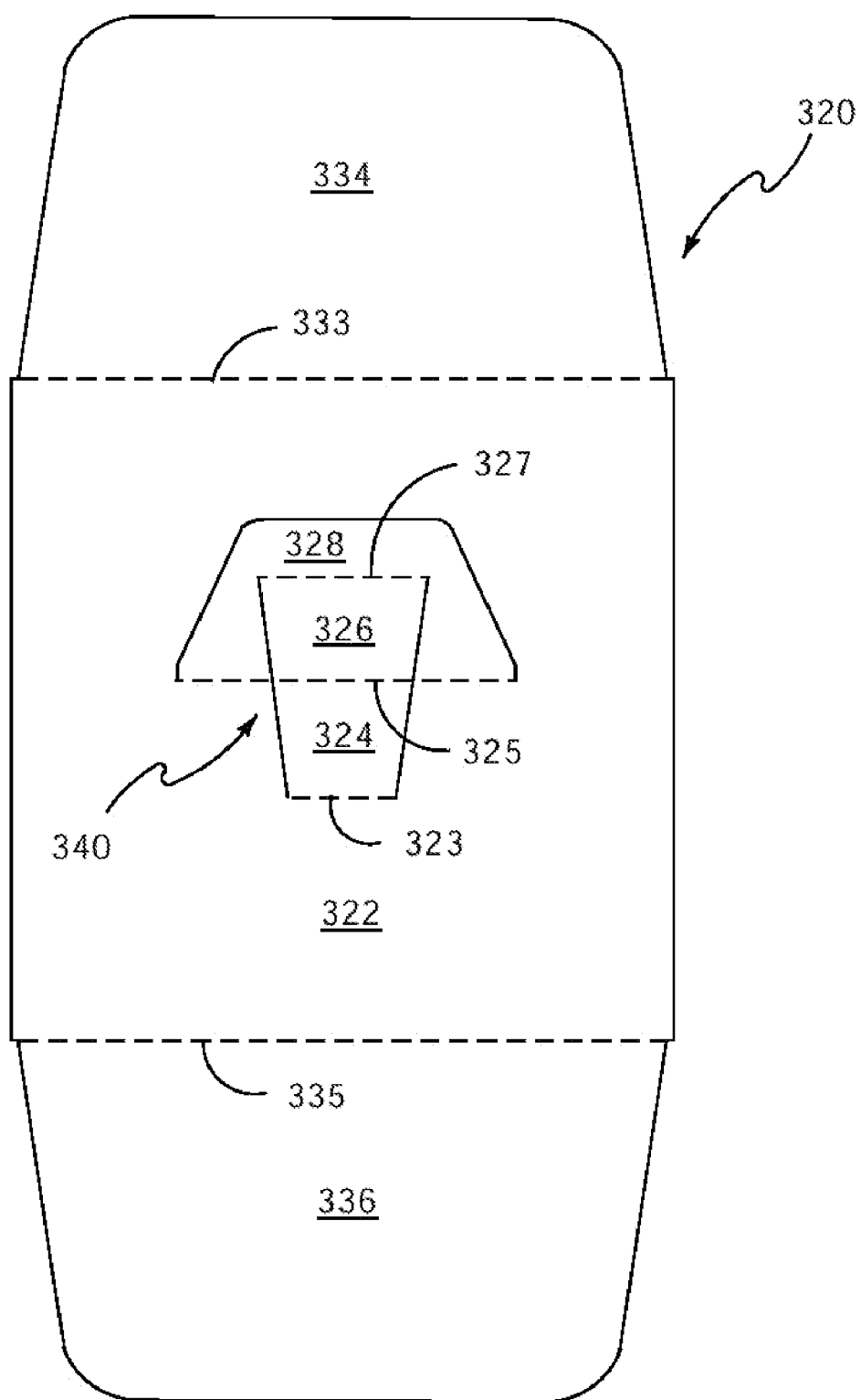


FIGURE 13

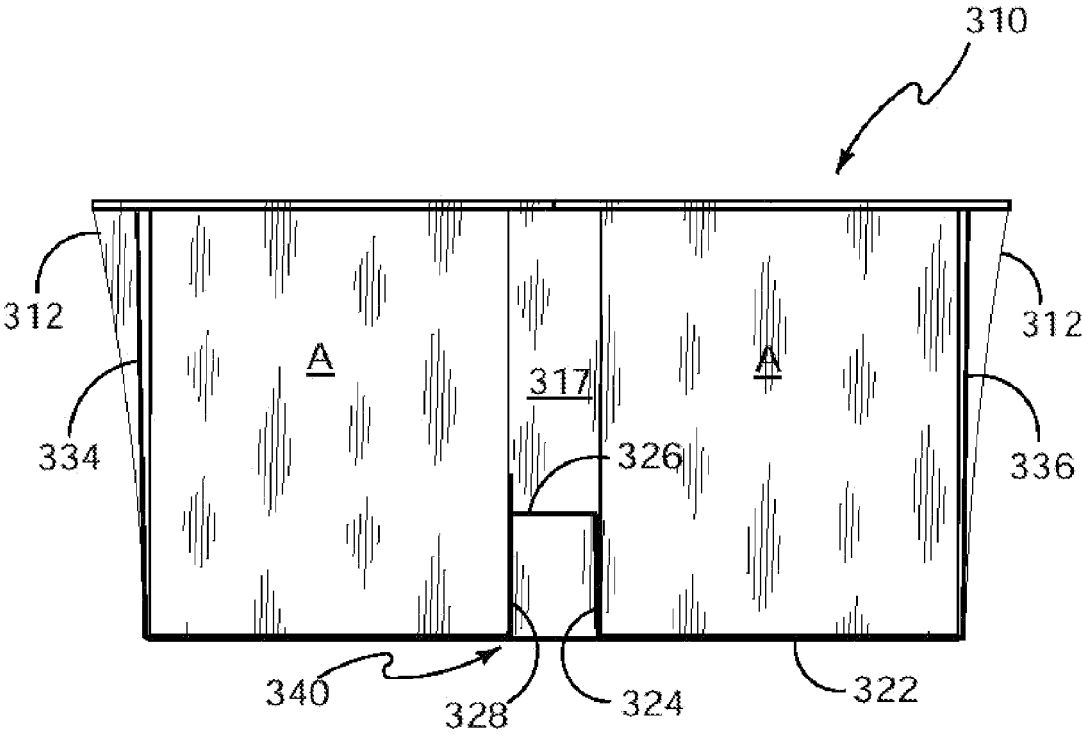


FIGURE 14

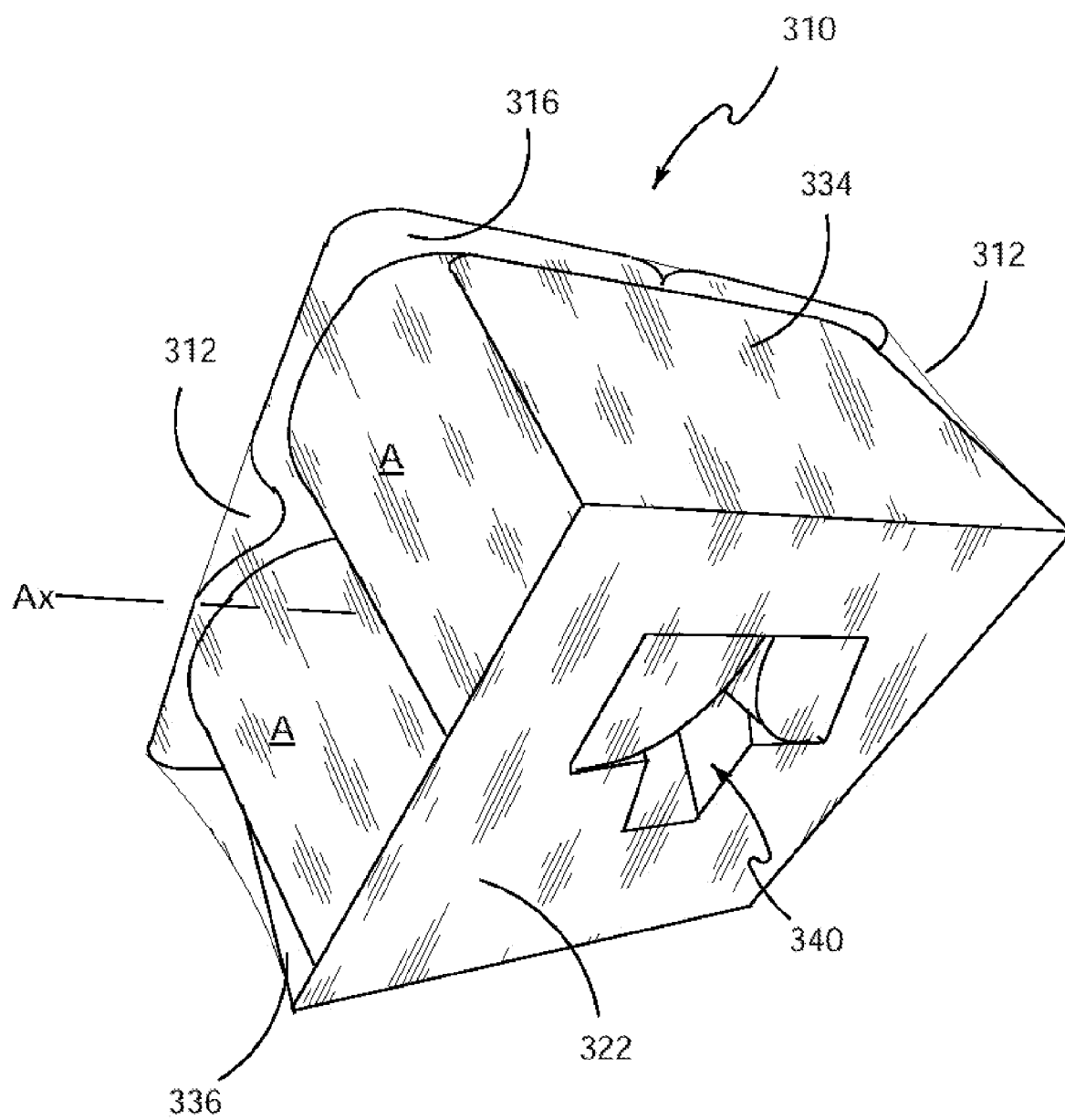


FIGURE 15

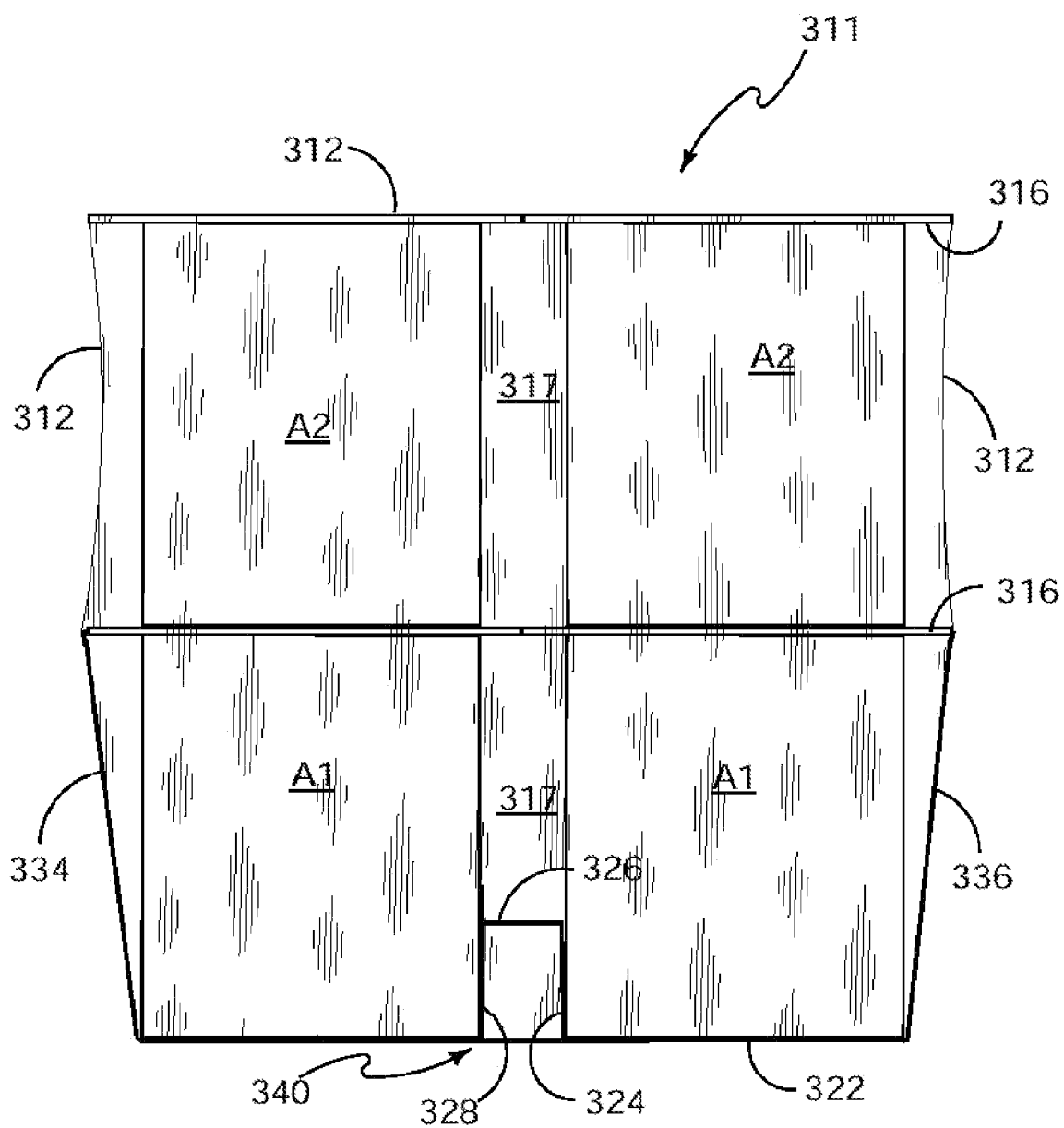


FIGURE 16

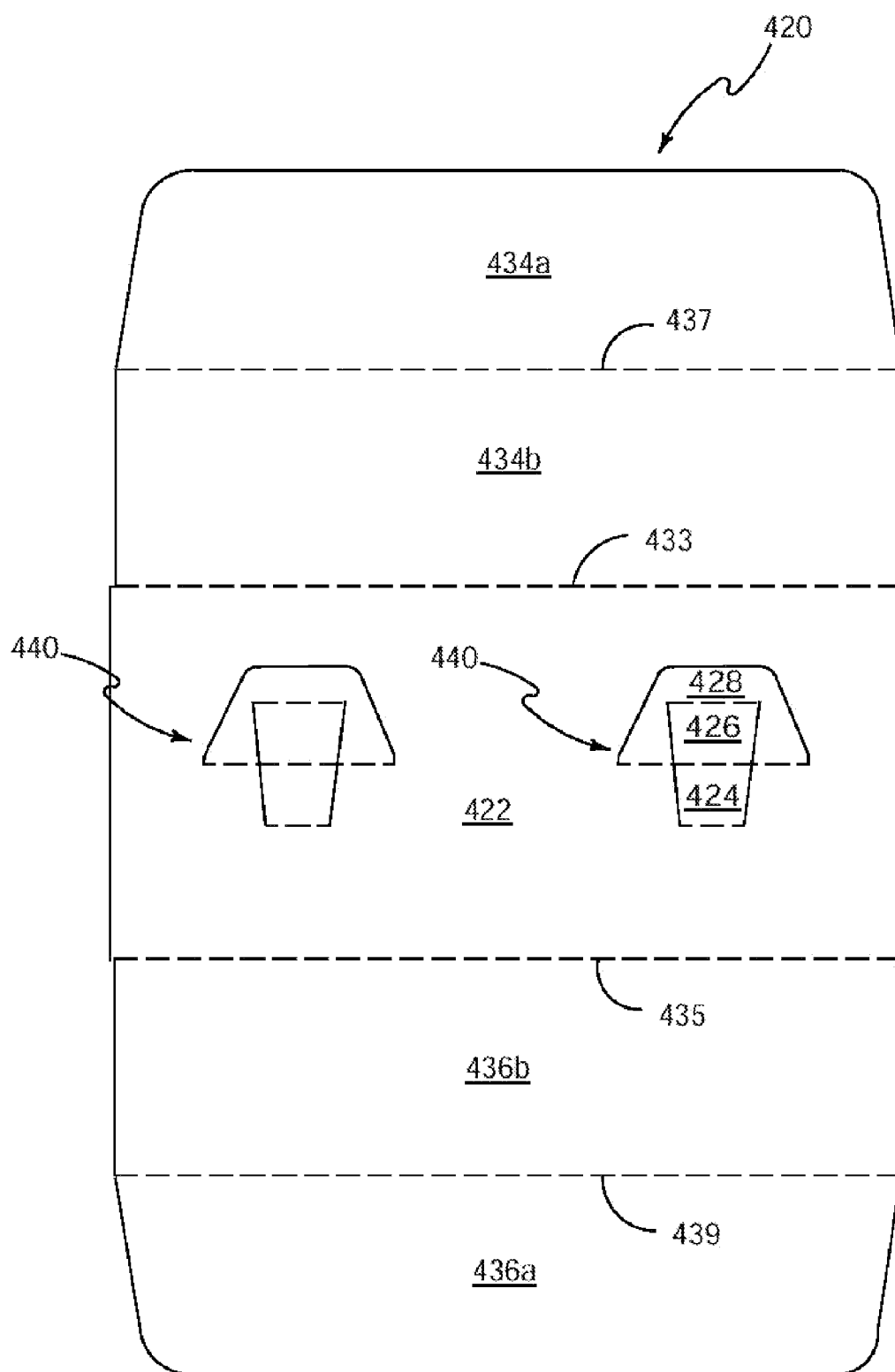


FIGURE 17

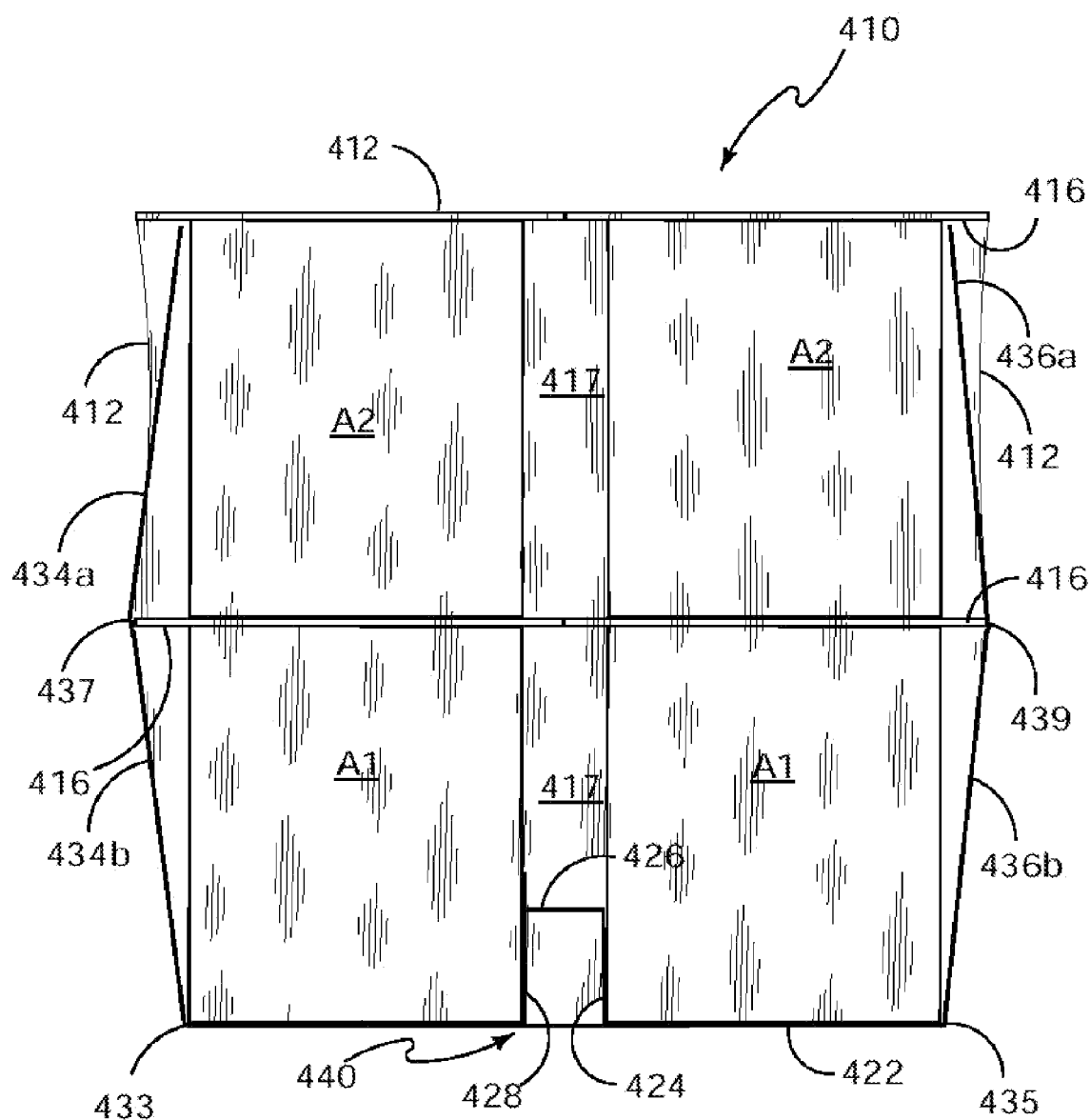
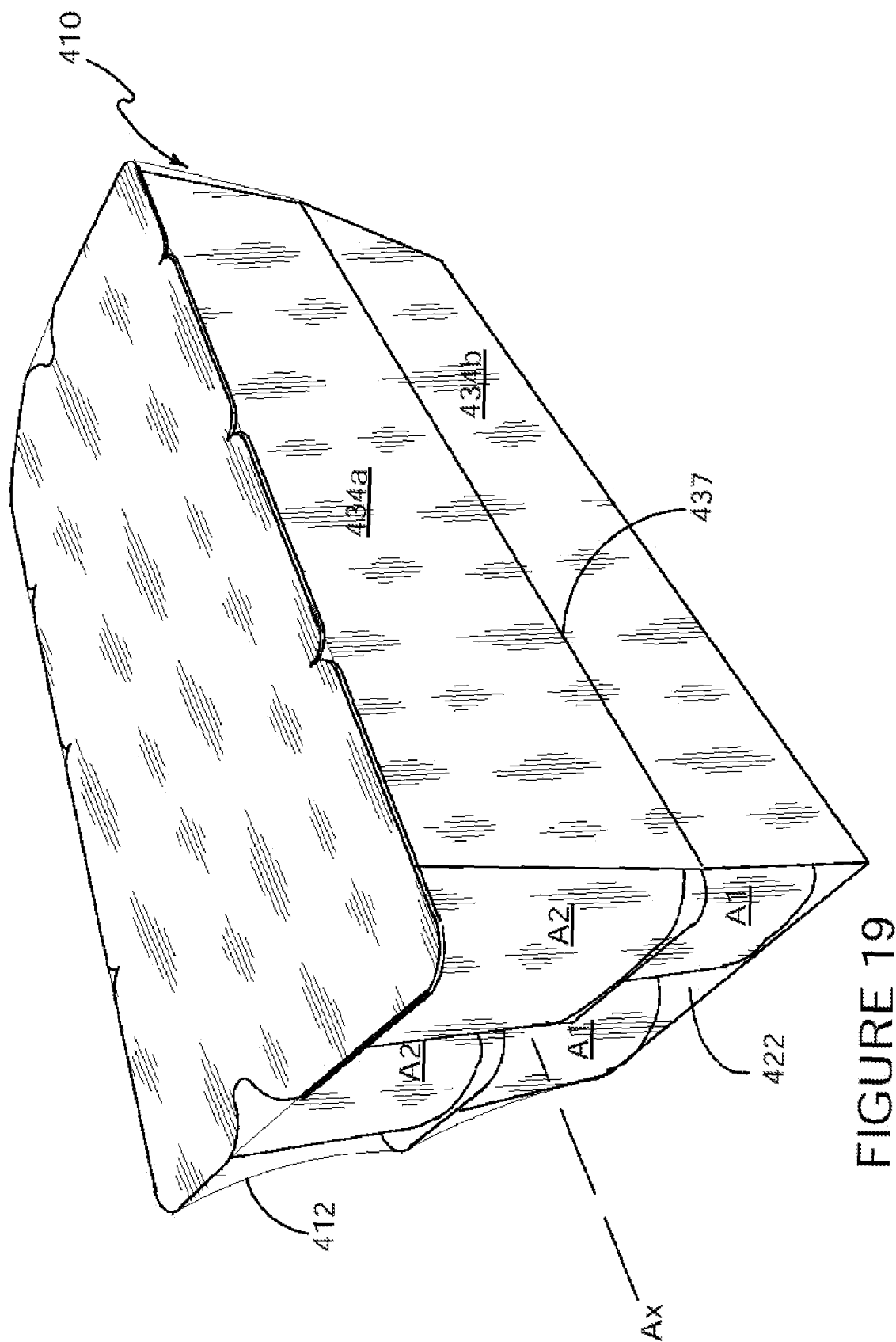


FIGURE 18



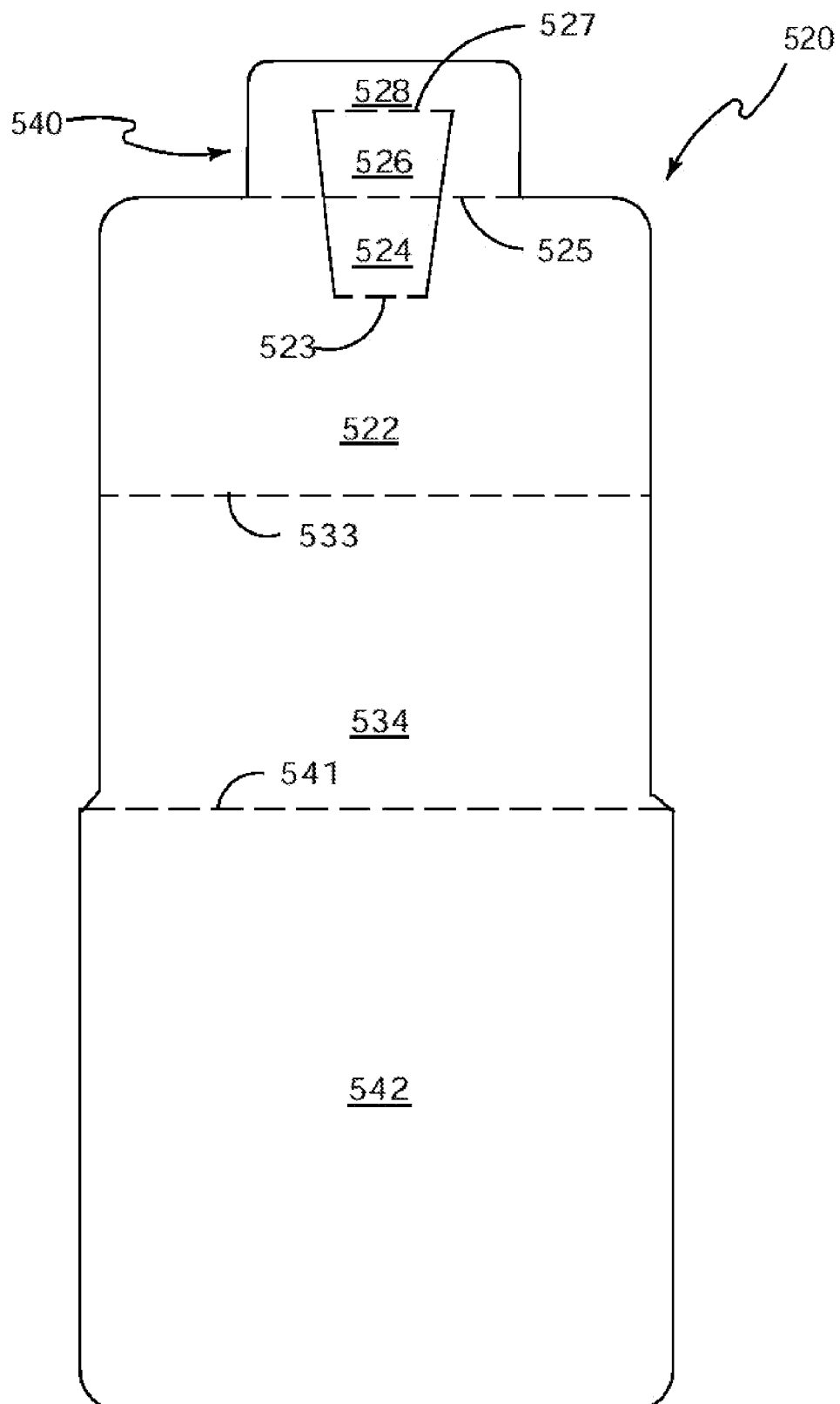


FIGURE 20

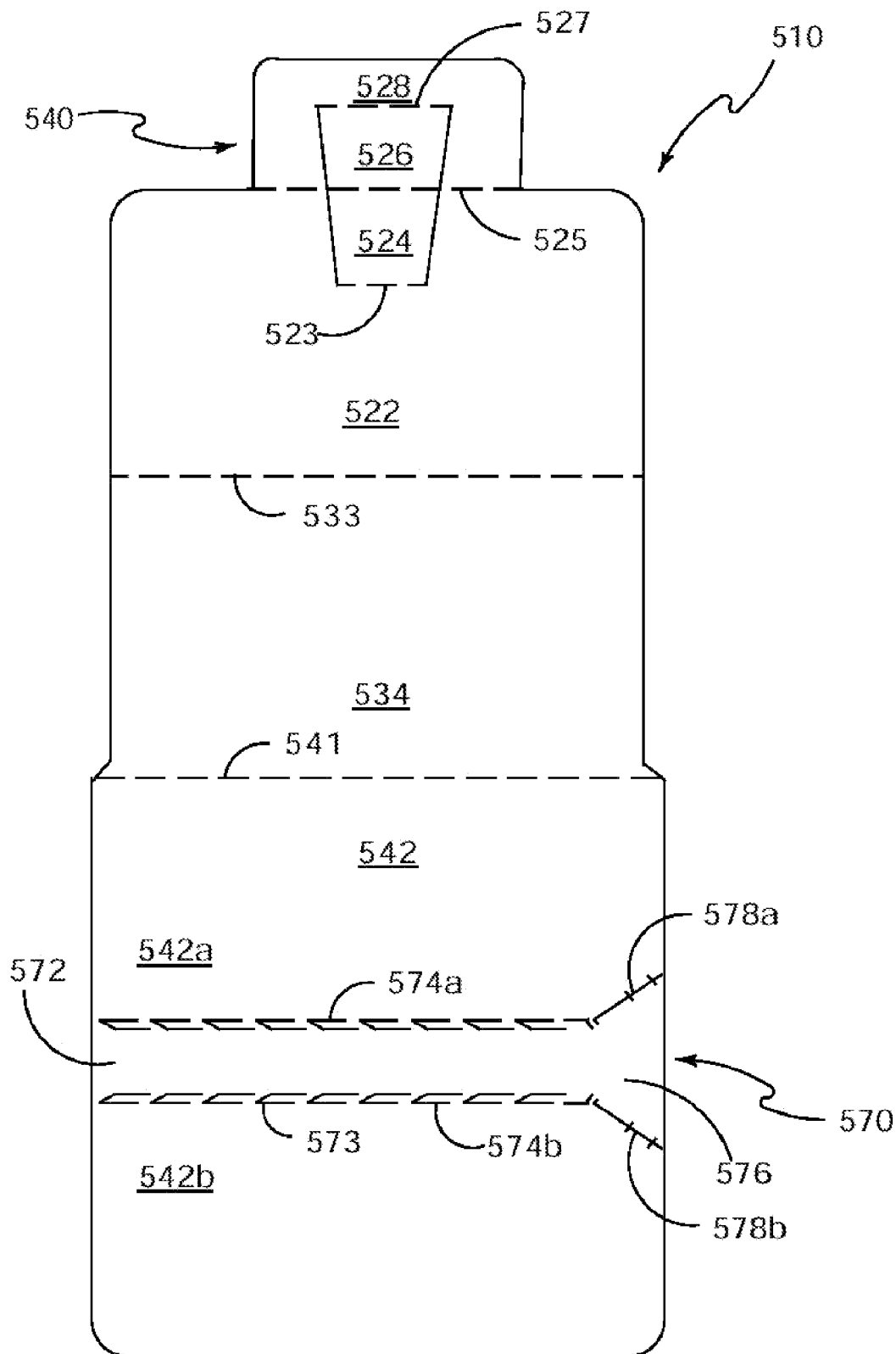


FIGURE 20b

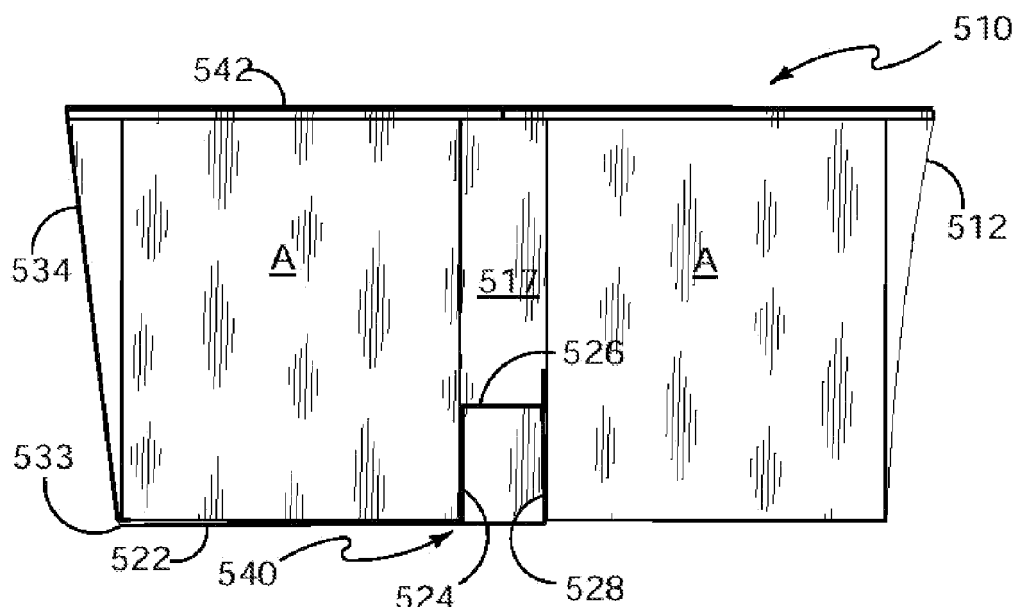


FIGURE 21

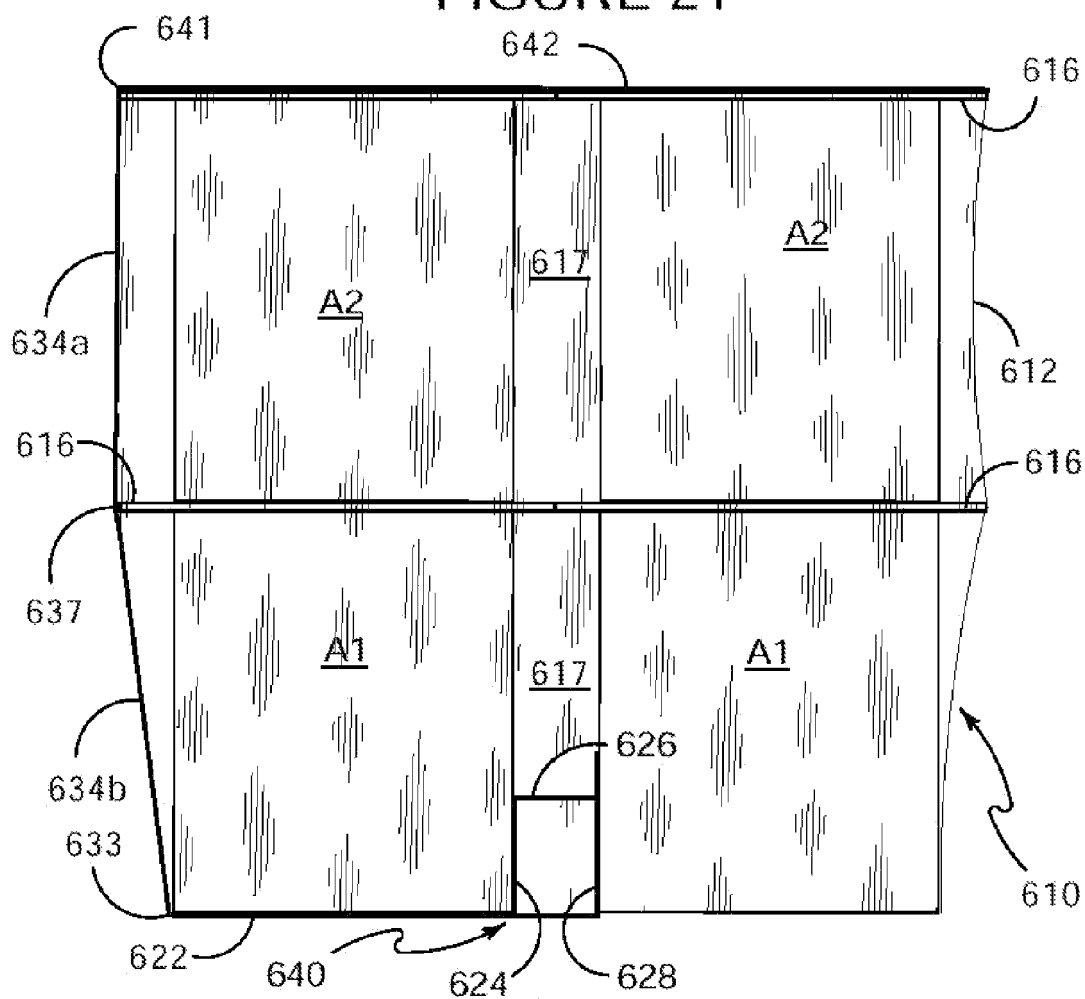


FIGURE 23

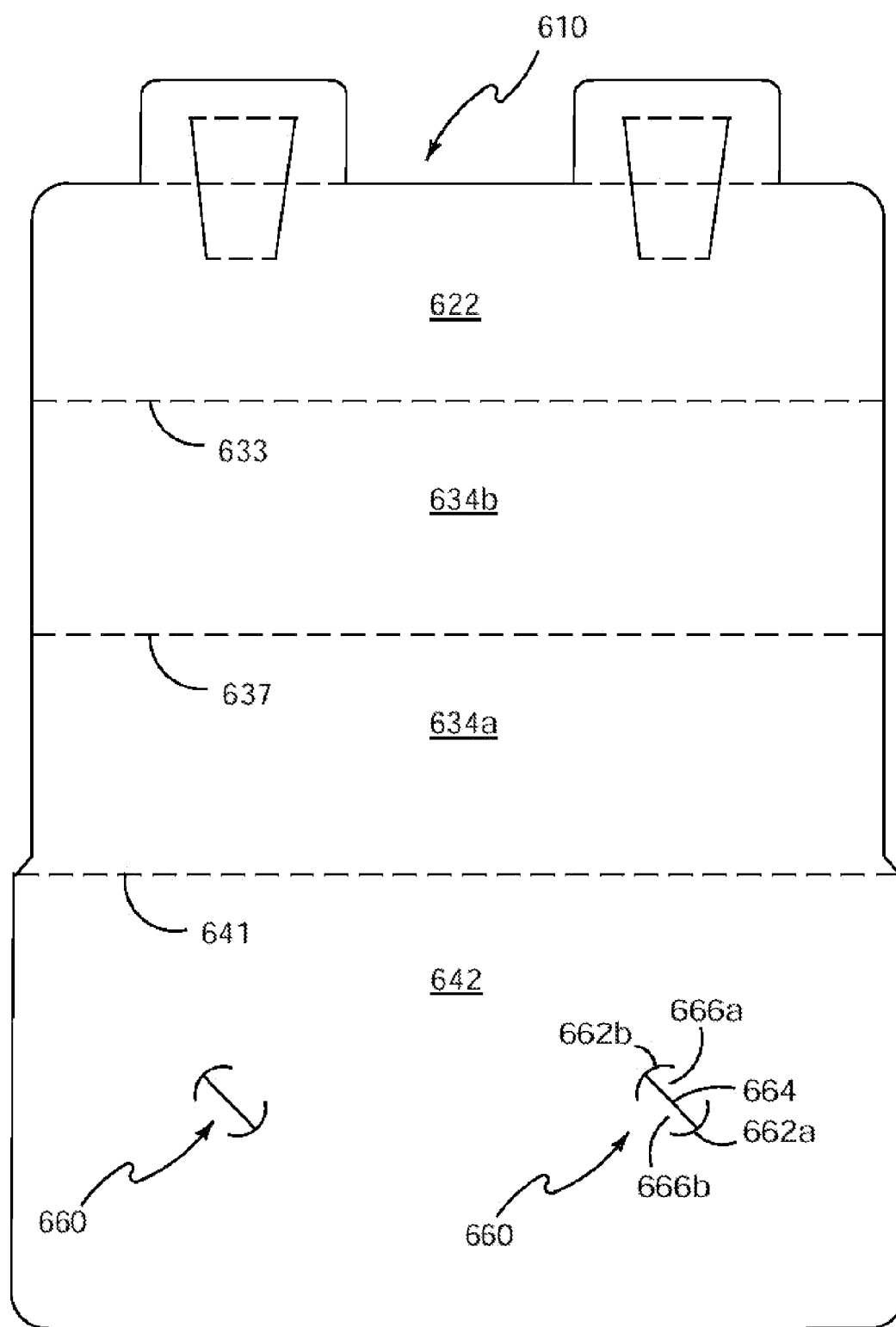


FIGURE 22

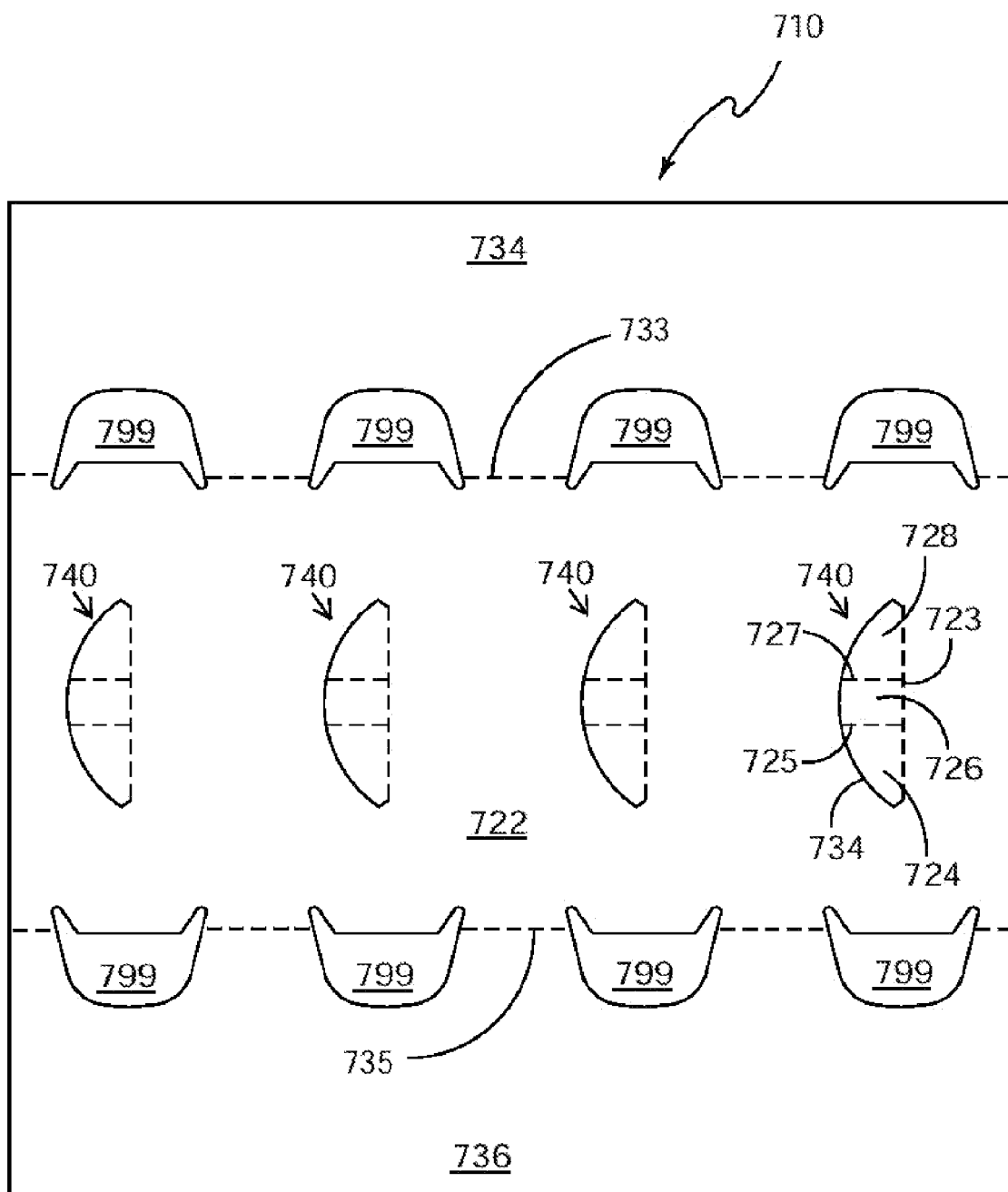


FIGURE 24

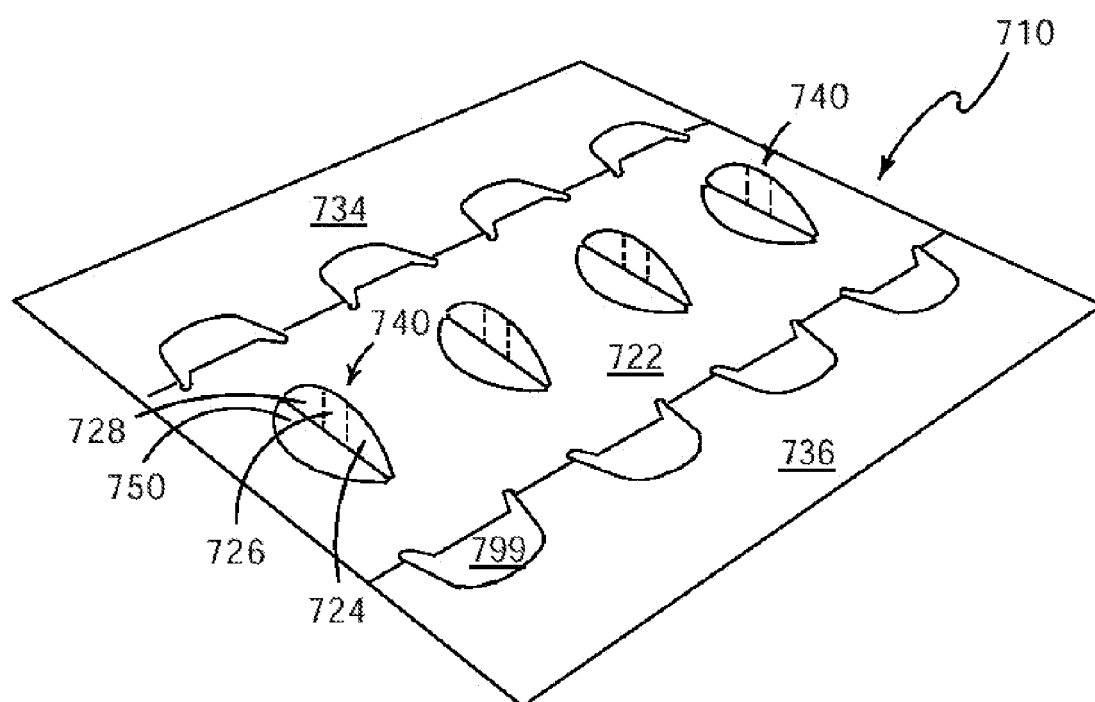


FIGURE 25

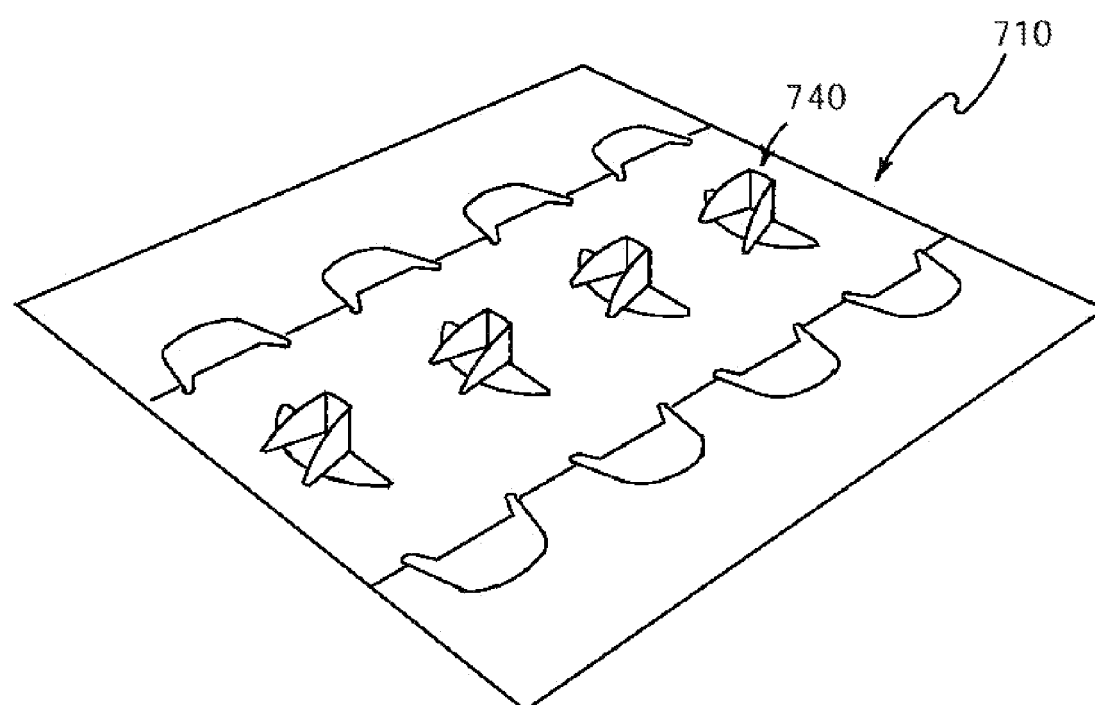


FIGURE 26

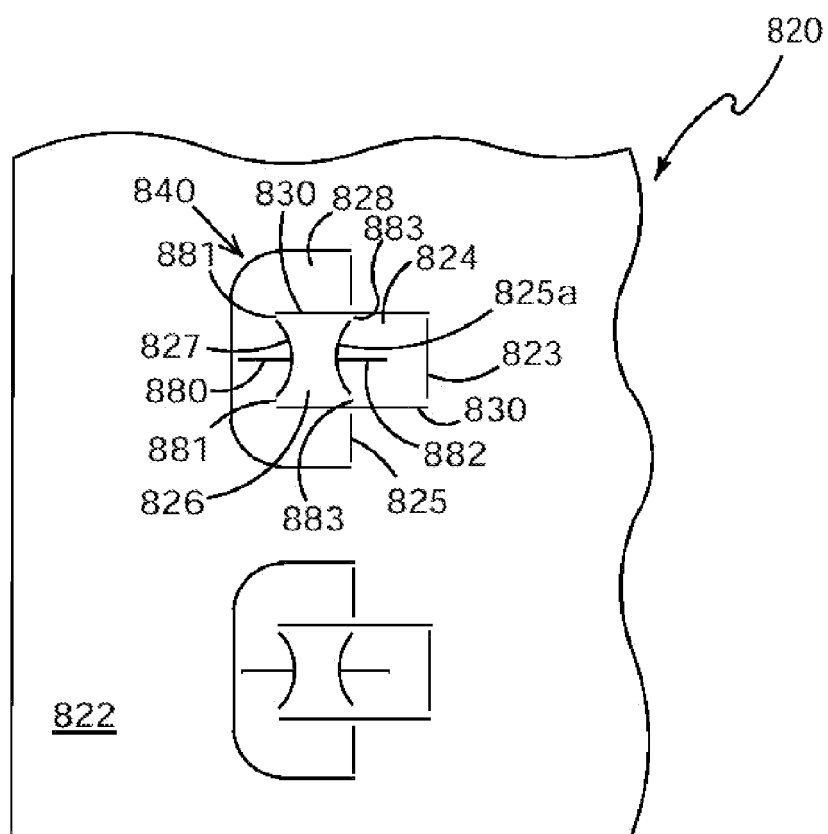


FIGURE 27

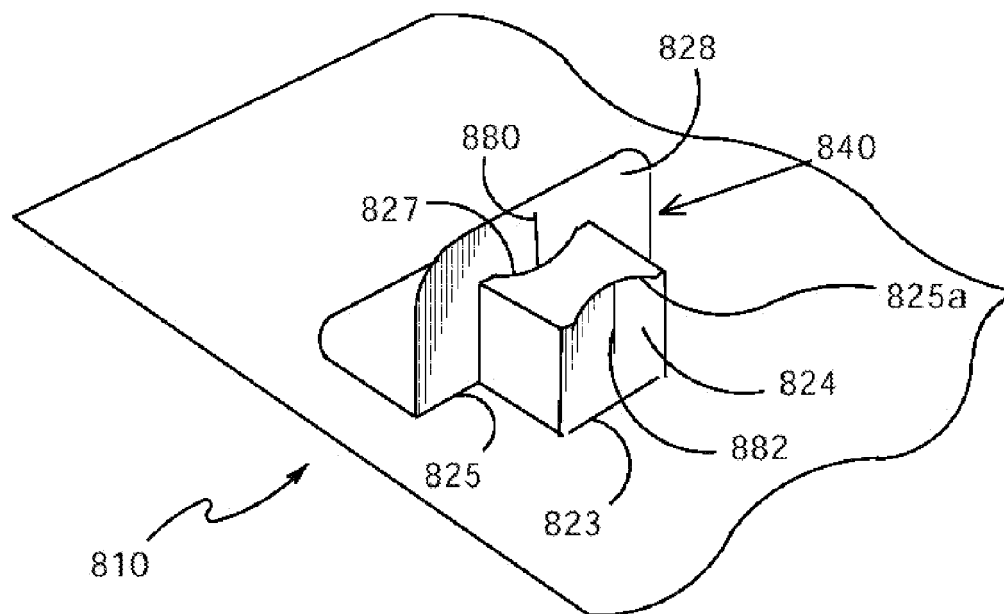


FIGURE 28

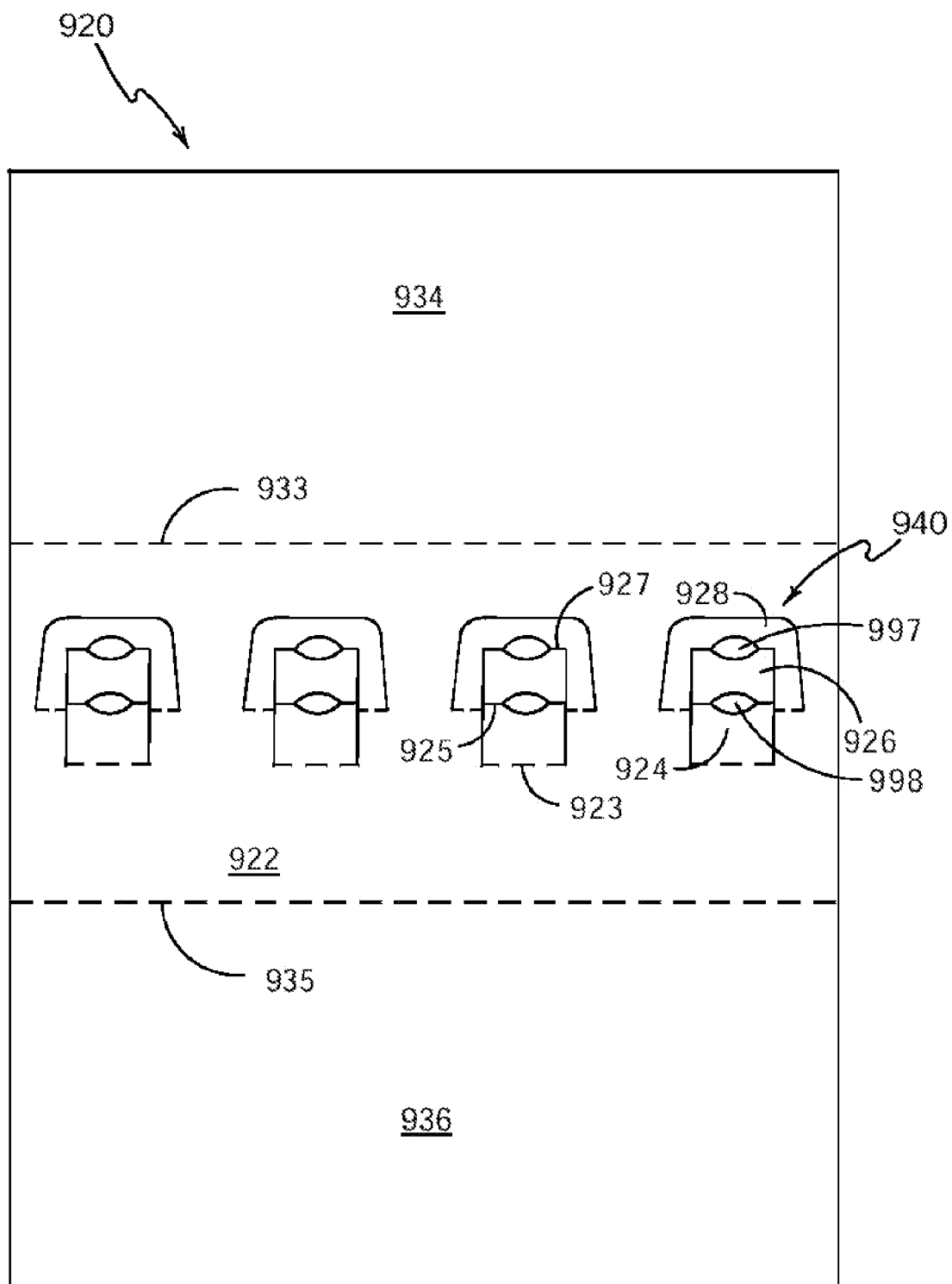


FIGURE 29

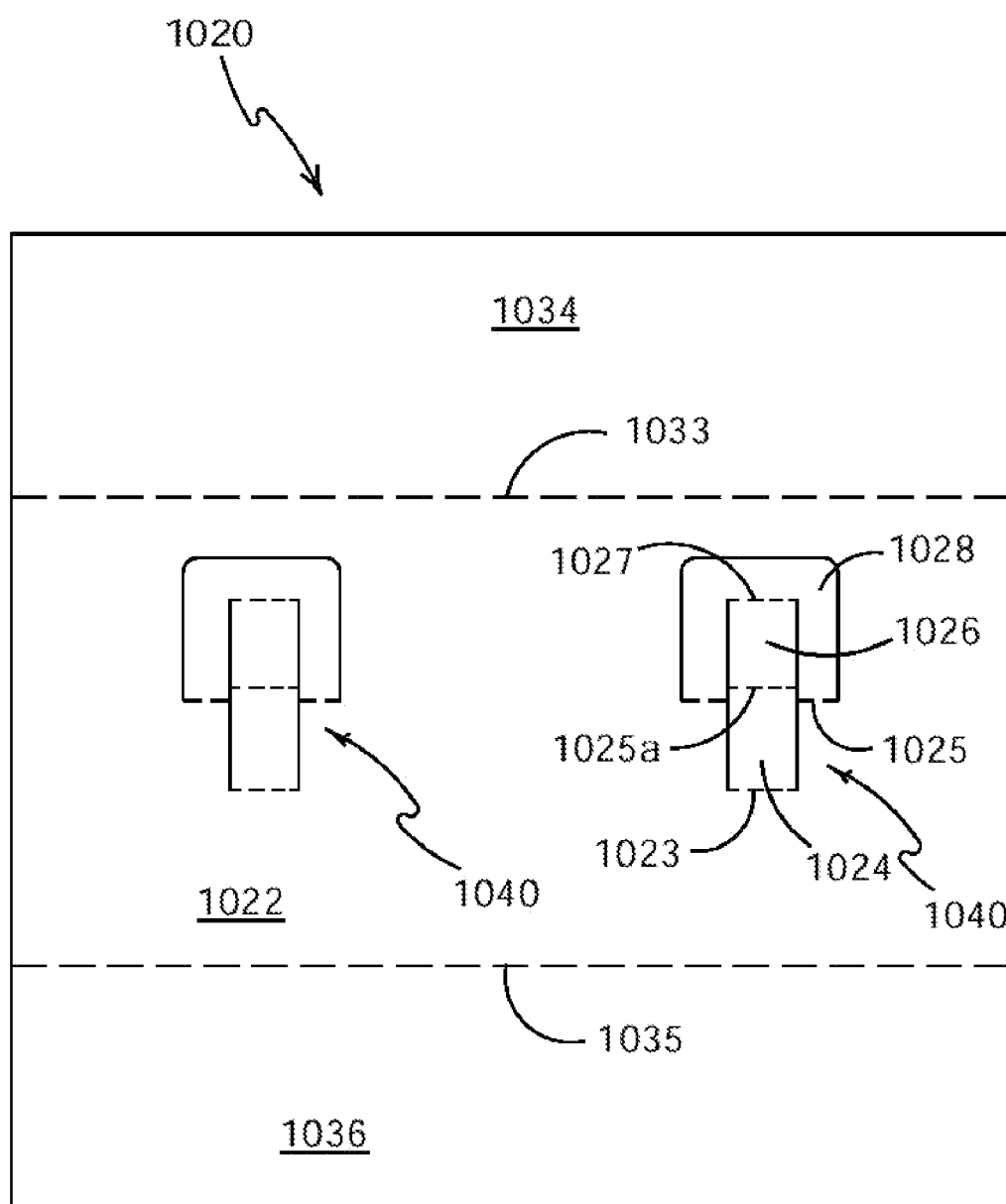


FIGURE 30

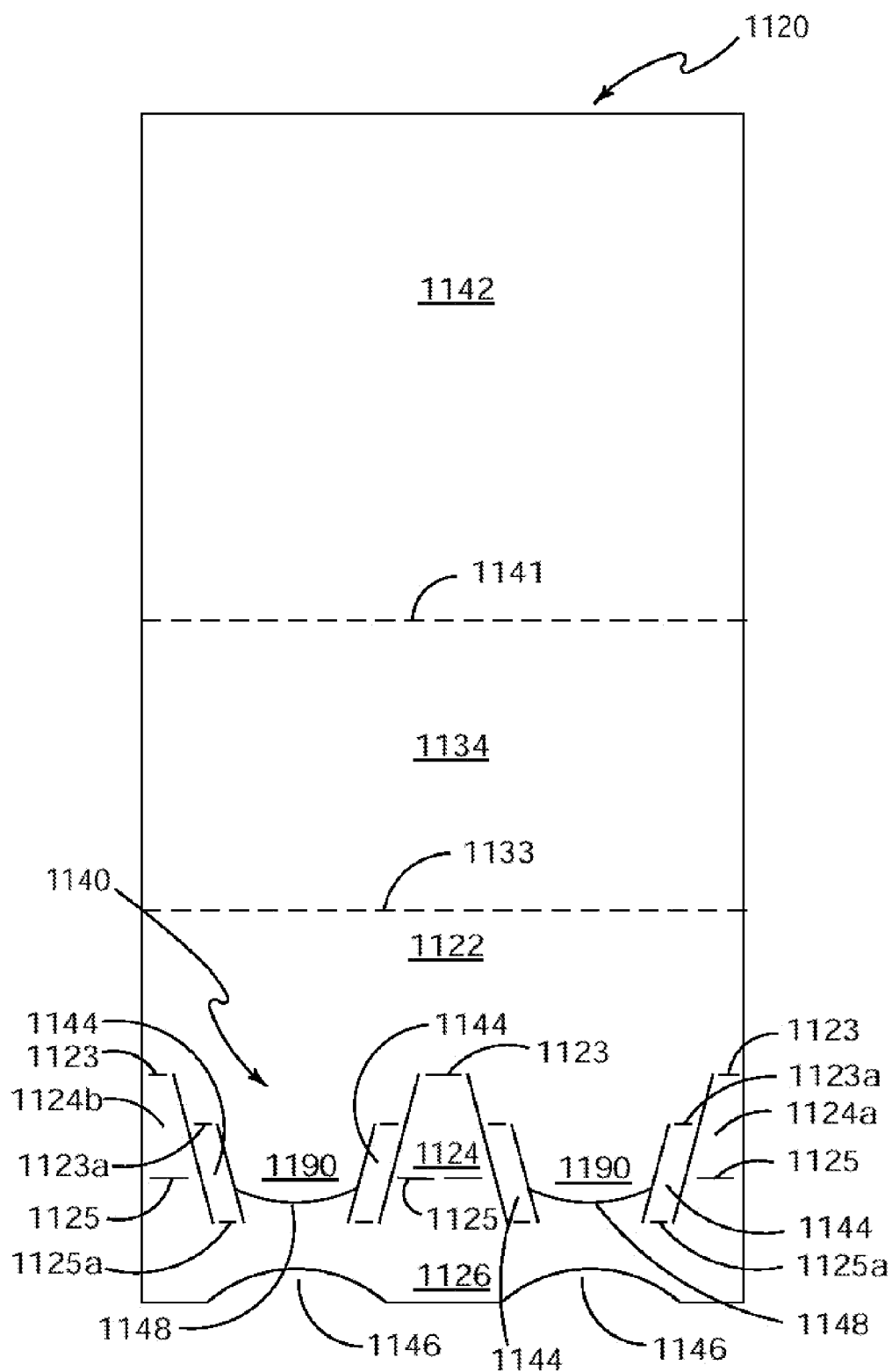


FIGURE 31

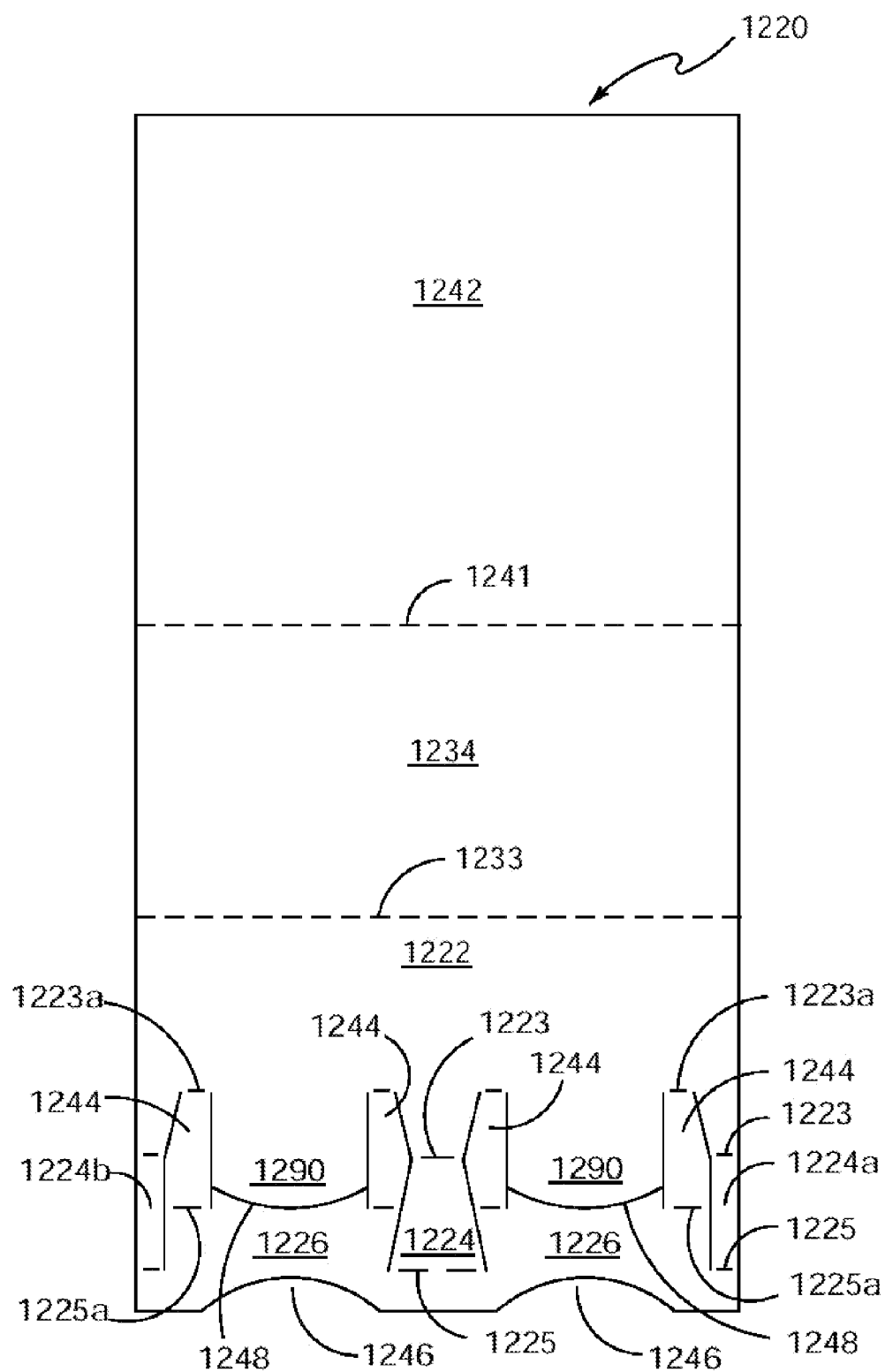


FIGURE 32

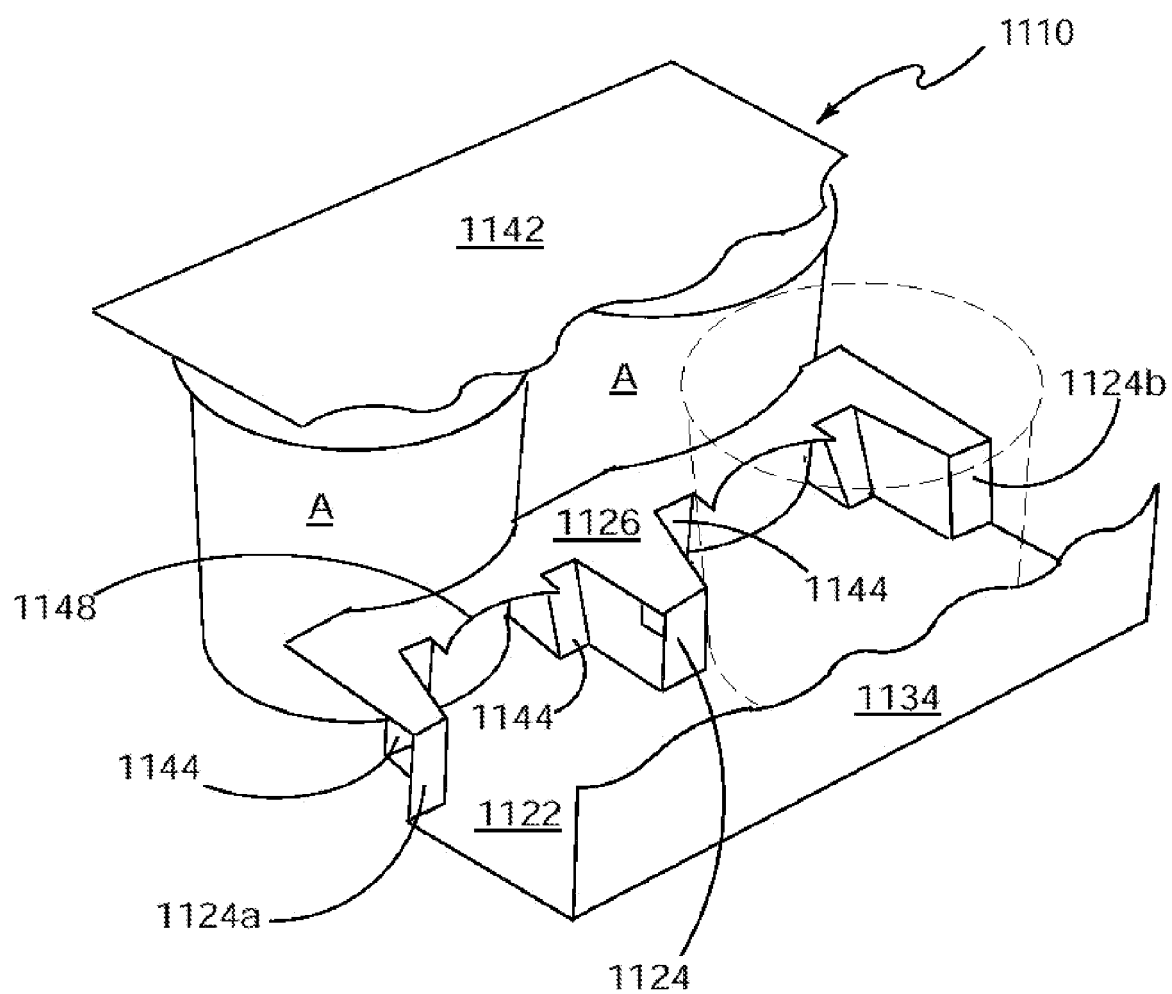


FIGURE 33

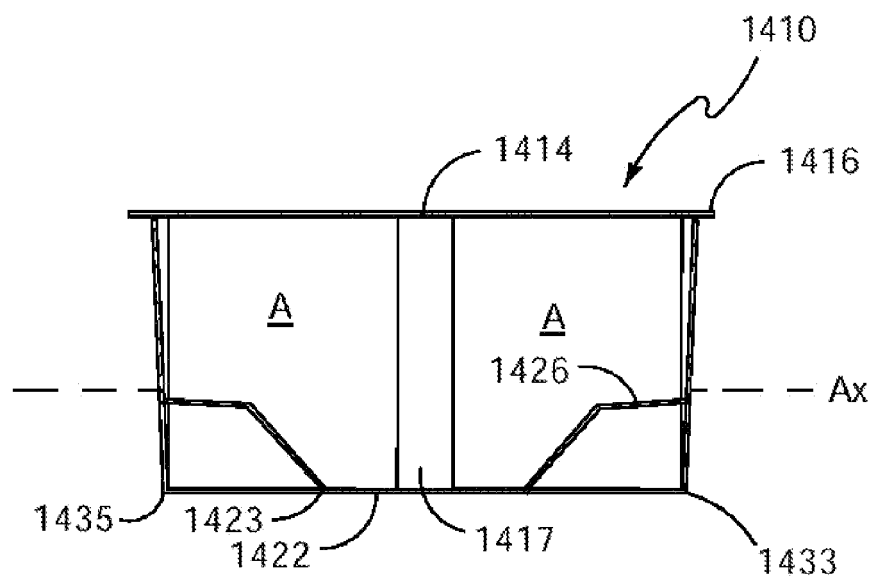


FIGURE 34

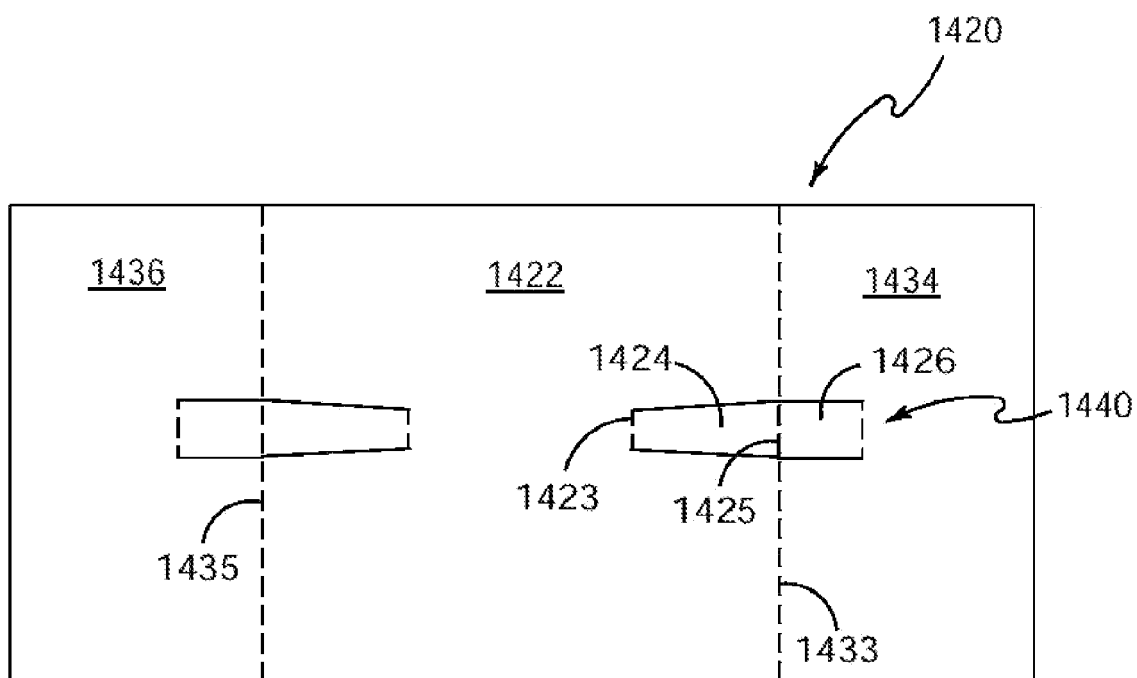


FIGURE 35

REFERENCES CITED IN THE DESCRIPTION

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- US 3302784 A [0007]
- US 3687282 A, Owen [0006]