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(71) Applicant (for all designated States except US): **MEAD-WESTVACO PACKAGING SYSTEMS, LLC** [US/US]; IP Law Group - Patents, 501 South 5th Street, Richmond, VA 23219-0501 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **GIRARDIN, Edouard** [FR/FR]; 17 Route du Four a Chaux, F-36120 Ardenes (FR).

(74) Agents: **SUZUKI, Tsugihiko** et al.; MeadWestvaco Corporation, 501 South 5th Street, Richmond, VA 23219 (US).

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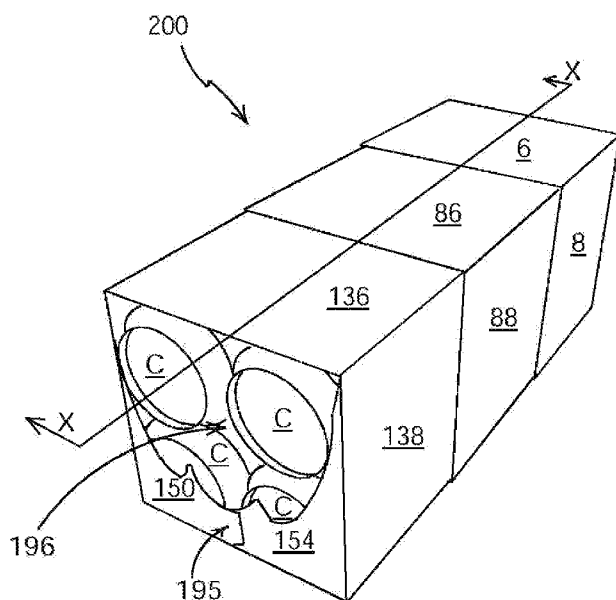


FIGURE 3

(57) Abstract: A carton (200) for packaging one or more articles (A) comprises a plurality of walls (2,4,6,8,82,84,86,88) defining a volume for receiving one or more articles (A) and an access feature that is at least partially detachable to create an opening through which one or more articles may be removed. The carton (200) is transformable in a telescopic manner to change the volume of the carton (200) such that the opening, once created, is not obstructed by any other portion of the carton due to transformation of the carton.

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CARTON, BLANK THEREFOR AND METHOD OF DISPENSING ARTICLES

FIELD OF THE INVENTION

The present invention relates to packaging for one or more articles; in particular, the invention relates to a carton and blank for forming the same and a method of packaging and dispensing articles. More specifically, though not exclusively, the invention relates to packaging that can be manipulated in a telescopic manner to change a volume thereof.

BACKGROUND OF THE INVENTION

In the field of packaging, it is often required to provide consumers with a carton for holding one or more articles. These articles may themselves be containers, such as cans, packets, sachets and the like, that hold primary products. In addition to physically containing these articles, the container is in some situations also required to act as a dispenser from which an end user may remove one or more of the articles. For example, a carton may be used as a dispenser for drinks cans in a refrigerator, from which carton an end user may remove one or more of the cans, leaving the carton and the remainder of its contents in the refrigerator.

Cartons are known that provide an opening means through which a portion of the carton's contents may be removed and that continue to hold the remainder of the contents of the carton together as a group. An example of such an opening means is a tear-open detachable portion.

A disadvantage that exists with such known cartons, however, is that they have fixed dimensions that are not readily variable in response to the removal of some portion of the carton's contents. As a result, such cartons continue to occupy the same volume regardless of the proportion of their internal volume that is usefully occupied by articles. It

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would be advantageous for the carton to be reducible in volume, thereby to minimise the storage space taken up by the carton after a portion of its contents has been removed.

SUMMARY OF INVENTION

The present invention seeks to overcome or at least mitigate the problems of the prior art.

A first aspect of the present invention provides a carton for packaging one or more articles, the carton comprising a plurality of walls defining a volume for receiving one or more articles, and an access feature that is at least partially detachable to create an opening through which said one or more articles may be removed, wherein the carton is transformable in a telescopic manner to change the volume of the carton such that the opening, once created, is not obstructed by any other portion of the carton due to transformation of the carton.

Preferably, the plurality of walls provide a generally tubular structure and a pair of opposed end walls, wherein the access feature is defined in one of the end walls of the carton and wherein transformation of the carton in a telescopic manner displaces the one of the end walls along a tubular axis of the tubular structure.

Preferably, the carton is transformable in a telescopic manner to take a maximum volume form, and is further transformable to take a minimum volume form, and wherein the opening is free of obstruction by any other portion of the carton as the carton so-transforming between the maximum volume form and the minimum volume form.

Preferably, through transformation of the carton, the access feature is moveable so as to be brought into juxtaposition with one or more articles disposed within the carton.

Optionally, the plurality of walls provide a first part and a second part movably connected together for sliding movement along the tubular axis, and wherein separation of the first and second parts is prevented by flaps, extending from each of those two parts, the flaps

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being disposed in face contacting relationship between overlapping portions of those two parts.

Optionally, one of the walls of the carton provides the access feature, and provides, after at least partial detachment of the access feature, a lower lip for abutting one or more articles disposed within the carton to prevent one or more articles from exiting the carton.

A second aspect of the present invention provides a telescoping carton comprising a slidable end unit defining an exit chamber for accommodating one or more ready-to-be-dispensed articles selected from the entire contents of the carton, the end unit having an access feature through which the one or more ready-to-be-dispensed articles are removable from the carton.

Preferably, the end unit forms a terminal one of a linear series of units, each slidable relative to its neighbours and each having a smaller lateral size relative to a preceding unit relative to one direction along the linear series, said end unit having the largest lateral size of the units of the linear series.

Alternatively, the end unit forms a terminal one of a linear series of units, each slidable relative to its neighbours and each having a smaller lateral size relative to a preceding unit relative to one direction along the linear series, said end unit having the smallest lateral size of the units of the linear series.

Preferably, each of the units of the linear series has at least a smaller dimension than the preceding unit in two axes, such that a first unit possessed of smaller lateral size than a second unit is nestable within the first unit.

A third aspect of the present invention provides a telescoping carton comprising a first part and a second part that are moveable relative to one another, the carton comprising a separation preventing mechanism comprising a first flap and a second flap that are engaged in a face-contacting relationship and disposed between the first and second component parts.

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A fourth aspect of the present invention provides a telescoping carton having a separation preventing mechanism provided by flaps that are hinged to at least three side walls of each component unit.

A fifth aspect of the present invention provides a blank comprising panels for forming the above carton.

A sixth aspect of the present invention provides a method of dispensing articles from a telescoping carton which comprises a linear series of telescoping parts, the method comprising filling the internal volume of each part with one or more articles, dispensing said one or more articles from an endmost part of the linear series such that empty space is defined between the articles contained in the carton and an end closure wall of the endmost part, and moving that endmost part toward an opposite endmost part of the linear series to remove the empty space.

A seventh aspect of the present invention provides a method of packaging and dispensing an article comprising: forming a first part of a carton; forming a second part of a carton; arranging the second part with the first part such that it can be manipulated telescopically with respect to the first part; loading the first and second part with one or more articles; deploying an access feature; removing a portion of said one or more articles; moving the first part telescopically with respect to the second part so as to reduce the volume and/or length of the carton by an amount substantially equal to the volume or length defined by the removed portion of said one or more articles.

BRIEF DESCRIPTION OF THE DRAWINGS

Exemplary embodiments of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 illustrates a plan view of a blank for forming a carton according to a preferred embodiment of the present invention;

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Figure 2 illustrates a side view of a carton formed from the blank of Figure 1;

Figure 2A illustrates a view of a first end of the carton of Figure 2;

Figure 2B illustrates a view of a second end of the carton of Figure 2;

Figure 3 illustrates the carton of Figure 2 disposed upon a side thereof opened for removal of articles contained therein;

Figure 4 illustrates the carton of Figure 3 after a portion of the articles contained therein have been removed and the carton has been reduced in volume;

Figure 5 illustrates the carton of Figure 4 after a portion of the articles contained therein have been removed and the carton has been further reduced in volume;

Figure 6 illustrates the carton of Figure 5 after it has been emptied of the articles contained therein;

Figure 7 illustrates a cross sectional view, through a line X-X, of the carton of Figure 3;

Figure 7A is an enlarged view of a portion of the cross sectional view of Figure 7;

Figure 8 illustrates a selection of exemplary embodiments of cartons according to the present invention, having different numbers of parts to one another;

Figure 9 illustrates a selection of exemplary embodiments of cartons according to the present invention, adapted for containing different numbers and/or configurations of articles to one another, wherein the articles within each carton are illustrated;

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Figure 10 illustrates a selection of embodiments of carton according to the present invention, having different geometries to one another; and

Figure 11A illustrates a view of a first end of a carton according to a further embodiment of the present invention; and

Figure 11B illustrates a view of a second end of the carton of Figure 11A with cut-away sections to emphasize the relative positioning of the parts of the carton within one another.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS OF THE PRESENT INVENTION

Specific embodiments of the invention will now be described. The embodiments are examples and as such do not represent an exhaustive record of all of the ways in which the invention could be implemented. The law does not require, and it would be prohibitive to describe and illustrate every possible variation and combination of the way in which the invention could be put into effect. The detailed description of each of the exemplary embodiments contains specific details in order to provide the reader with an understanding of the invention; however the invention may be implemented without these particular details.

The invention relates generally to cartons that are capable of being manipulated in a telescopic manner to change a total volume thereof. As a result, cartons according to the present invention may be enlarged or reduced in size as required. Two instances in which this may be useful are a) where it is desirable that a carton, part emptied of its contents, be reduced as far as possible in size to take up less space on a shelf; and b) a carton that is supplied in a compressed state, in which it takes up the minimum possible volume, before being extended to allow loading with additional articles. This has the benefit of reducing shipping and distribution costs and storage space required.

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A blank 1 for forming a carton 200 according to a preferred embodiment of the present invention is shown in Figure 1. The blank 1 comprises three parts: a first part 1A, a second part 1B and a third part 1C. Each of these parts is substantially similar and is described in turn below. Preferably, the three parts 1A, 1B, 1C of the blank 1 are formed as separate units yet are preferably cut from a single sheet of a material such as, amongst others, paperboard, cardboard and plastics or any other suitable foldable sheet material. For completeness, the blank 1 is described in detail below, though many of the specific details are optional and in no way limiting to the overall inventive concept. In the description, references to an "edge" of a panel is used in the sense of a boundary defining a periphery of that panel, and is not restricted to any particular manner of terminal or free edge. Many instances of edges below coincide with fold lines that define a boundary between two adjacent panels.

The first part 1A of the blank 1 comprises a first linear series of panels comprising a first bottom panel 2, a first side panel 4, a first top panel 6, a second side panel 8 and a first glue panel 9 each connected one to the next by respective fold lines 42, 44, 46, 48. Along a first edge of the first linear series of panels, the first bottom panel 2, first side panel 4, first top panel 6 and second side panel 8 are hinged respectively to a first 10, a second 12, a third 14 and a fourth 16 end closure panel, by respective fold lines 26, 28, 30, 32. Along a second edge of the first linear series of panels, opposite the aforesaid first edge, the first bottom panel 2, the first side panel 4, first top panel 6 and second side panel 8 are hinged respectively to a first 18, a second 20, a third 22 and a fourth 24 engagement panel, by respective fold lines 34, 36, 38, 40.

The first end closure panel 10 preferably comprises a first cut out 50 and a second cut out 52 for forming an optional composite handle structure described below. The first cut out 50 is defined by a cut line 54 that begins and terminates on a free edge of the first end closure panel 10 opposite the first bottom panel 2, which cut line 54 extends into the first end closure panel 10. The second cut out 52 is defined by a cut line 56 that also begins and terminates on that free edge of the first end closure panel 10 and that extends into the

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first end closure panel 10. The first 50 and second 52 cut outs are spaced from one another to define a first handle reinforcing portion 53 that extends to the free edge of the first end closure panel 10.

The first end closure panel 10 has side edges that extend, from terminal points of the fold line 26 connecting the first end closure panel 10 to the first bottom panel 2, to terminal points of the free edge of the first end closure panel 10. These side edges are preferably angled slightly toward one another such that the first end closure panel 10 tapers away from the first bottom panel 2 to aid folding of those edges past adjacent edges of the second 12 and fourth 16 end closure panels when the carton is being erected in the manner described below. This is an entirely optional feature.

The second end closure panel 12 comprises a first finger flap 58 and a second finger flap 62 between which extends an outer handle strap 61 for forming an optional composite handle structure described below. The first finger flap 58 is defined by a first cut line 60 and a fold line 63 hinging the first finger flap 58 to the outer handle strap 61. Extending from terminal ends of the fold line 63, through proximate terminal points of the first cut line 60, are angled cut lines 59A, 59B, that extend a short way beyond those terminal points of the first cut line 60, into the second end closure panel 12. This optional feature advantageously directs stress created by lifting the erected carton by the composite handle structure, described below, into the second end closure panel 12 to dissuade tearing.

The second finger flap 62 is defined by a second cut line 64 and a fold line 65 hinging the second finger flap 62 to the outer strap 61. Extending from terminal ends of this fold line 65, through proximate terminal points of the second cut line 64, are angled cut lines 69A, 69B, that extend a short way beyond those terminal points of the second cut line 64, into the second end closure panel 12. As with the first finger flap 58, this optional feature advantageously directs stress created by lifting the erected carton by the composite handle structure, described below, into the second end closure panel 12 to dissuade tearing.

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The third end closure panel 14 comprises a third cut out 66 and a fourth cut out 70 for forming an optional composite handle structure described below. The third cut out 66 is defined by a cut line 68 that begins and terminates on a free edge of the third end closure panel 14 opposite the first top end panel 6 and that extends into the third end closure panel 14. The fourth cut out 70 is defined by a cut line 72 that also begins and terminates on that free edge of the third end closure panel 14 and that extends into the third end closure panel 14. The third 66 and fourth 70 cut outs are spaced from one another to define a second handle reinforcing portion 67 that extends to the free edge of the third end closure panel 14. The third end closure panel 14 has side edges that extend, from terminal points of the fold line 30 connecting the third end closure panel 14 to the first top panel 6, to terminal points of the free edge of the third end closure panel 14. These side edges are preferably angled slightly toward one another such that the third end closure panel 14 tapers away from the first bottom panel 2 to aid folding of those edges past adjacent edges of the second 12 and fourth 16 end closure panels when the carton is being erected in the manner described below. This is an entirely optional feature.

The fourth end closure panel 16 comprises a third handle aperture 74 and a fourth handle aperture 78 for forming an optional composite handle structure described below. The third handle aperture 74 is defined by a third endless cut line 76. The fourth handle aperture 78 is defined by a fourth endless cut line 80. The third 74 and fourth 78 handle apertures are offset from one another, and defined therebetween is an inner handle strap 75.

The presence of the various cut outs and apertures described above are optional features for the formation of a composite handle panel. This composite handle panel is not a limiting feature of the blank 1. Where provided, the exact configuration of the parts of the composite handle panel may be changed without departing for the scope of the invention as defined by the claims.

The first engagement flap 18 is relatively narrow, and extends along the full length of the adjacent edge of the first bottom side panel 2. Preferably, the first engagement flap 18 has

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angled side edges that partially converge such that a terminal free edge of the first engagement flap 18 is narrower than the adjacent edge of the first bottom panel 2 to aid folding of these edges passed adjacent edges of adjacent panels of the blank as the blank 1 is erected, as described below. This is an entirely optional feature. The second 20, third 22 and fourth 24 engagement flaps are preferably identical to the first engagement flap 18, though they may have differing geometry and placement as required.

The second part 1B of the blank 1 comprises a second linear series of panels comprising a second bottom panel 82, a third side panel 84, a second top panel 86, a fourth side panel 88 and a second glue panel 89 connected one to the next by respective fold lines 122, 124, 126, 128. Each of the second bottom panel 82, third side panel 84, second top panel 86 and fourth side panel 88 are of smaller dimension than the corresponding first bottom panel 2, first side panel 4, first top panel 6 or second side panel 8. Along a first edge of the second linear series of panels the second bottom panel 82, third side panel 84, second top panel 86, and fourth side panel 88 are hinged respectively to a fifth 90, a sixth 92, a seventh 94 and an eighth 96 engagement flap by respective fold lines 106, 108, 110, 112. Along a second edge of the second linear series of panels, opposite the first edge thereof, the second bottom panel 82, third side panel 84, second top panel 86, and fourth side panel 88, are hinged respectively to a ninth 98, a tenth 100, an eleventh 102 and a twelfth 104 engagement panel by respective fold lines 114, 116, 118, 120. Each of these engagement panels are preferably identical to the first engagement panel 18 described above, though they may have differing geometry and placement as required.

The third part 1C of the blank 1 comprises a third linear series of panels comprising a third bottom panel 132, a fifth side panel 134, a third top panel 136, a sixth side panel 138 and third glue panel 139 connected one to the next by respective fold lines 172, 174, 176, 178. Each of the third bottom panel 132, fifth side panel 134, third top panel 136 and sixth side panel 138 are of smaller dimension than the corresponding second bottom panel 82, third side panel 84, second top panel 86 or fourth side panel 88. Along a first edge of the third linear series of panels, the third bottom panel 132, fifth side panel 134, third top panel 136

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and sixth side panel 138 are hinged respectively to a thirteenth 140, a fourteenth 142, a fifteenth 144 and a sixteenth 146 engagement panel by respective fold lines 156, 158, 160, 162. Along a second edge of the third linear series of panels, opposite the first edge thereof, the third bottom panel 132, fifth side panel 134, third top panel 136 and sixth side panel 138 are hinged respectively to a fifth 148, a sixth 150, a seventh 152 and an eighth 154 end closure panel by respective fold lines 164, 166, 168, 170.

The fifth end closure panel 148 is a narrow panel, similar to the first engagement panel 18, preferably having angled sides tapering toward one another such that a free edge of the fifth end closure panel 148 is narrower than the adjacent edge of the third bottom panel 132 to aid folding of those edges past adjacent edges of the sixth 150 and eighth 154 end closure panels when the carton is being erected in the manner described below. This is an entirely optional feature.

The sixth end closure panel 150 comprises a first detachable portion 180 and a second detachable portion 182. Both the first 180 and the second 182 detachable portions are defined between a first frangible line 184 and adjacent portions of a side and end edge of the sixth end closure panel 150. A second frangible line 194 separates the first 180 and second 182 detachable portions. The first frangible line 184 commences adjacent a corner of the third top panel 136 and curves inwardly of the sixth end closure panel 150 therefrom, turning back toward a terminal point of an adjacent side edge of the sixth end closure panel 150. A further portion 183 of the first frangible line 184 angles away from the starting point of the first frangible line 184 to curve down to a free edge of the sixth end closure panel 150. The second frangible line 194 optionally extends, from the starting point of the aforesaid further portion 183 of the first frangible line 184, directly towards a terminal free edge of the sixth end closure panel 150. The exact paths taken by the first 184 and second 194 frangible lines may be varied as required and are not limiting features of the present invention.

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The seventh end closure panel 152 is also a narrow panel, similar to the first engagement panel 18, and preferably having angled sides tapering toward one another such that a free edge of the seventh end closure panel 152 is narrower than the adjacent edge of the third top panel 136 to aid folding of those edges past adjacent edges of the sixth 150 and eighth 154 end closure panels when the carton is being erected in the manner described below. This is an entirely optional feature.

The eighth end closure panel 154 comprises a third detachable portion 186 and a fourth detachable portion 188 both of which are defined between a third frangible line 190 and adjacent portions of a side and end edge of the eighth end closure panel 154. A fourth frangible line 192 separates the third 186 and fourth 188 detachable portions. The third frangible line 190 begins adjacent a corner of the third top panel 136 and curves inwardly of the eighth end closure panel 154 before curving back toward a terminal point of an adjacent side edge of the eighth end closure panel 154. A further portion 189 of the third frangible line 190 then angles away from the starting point of the third frangible line 190 to curve down to a free terminal edge of the eighth end closure panel 154. The fourth frangible line 192 extends, from the starting point of the aforesaid further portion 189 of the third frangible line 189, directly towards a terminal free edge of eighth end closure panel 154.

Forming a carton 200 from the three parts 1A, 1B, 1C of the blank 1 is preferably performed as follows.

Each of the three parts 1A, 1B, 1C of the blank 1 are folded into flattened tubular configurations. This is optionally done simultaneously by folding all three parts 1A, 1B, 1C in unison, or may be performed sequentially by folding each of the three parts 1A, 1B, 1C in turn.

The second 8, fourth 88 and sixth 138 side panels are folded about their respective fold lines 46, 126, 138 over onto the first 6, second 86 and third 136 top panels respectively.

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This results in the first 9, second 89 and third 139 glue panels overlying portions of first 4, third 84 and fifth 134 side panels respectively. Adhesive is then applied to the upper surfaces of the first 9, second 89 and third 139 glue panels before the first 2, second 82 and third 132 bottom panels are folded about their respective fold lines 42, 122, 172 over the first 4, third 84 and fifth 134 side panels respectively. Thus the first 2, second 82 and third 132 bottom panels become secured to the first 9, second 89 and third 139 glue panels, thereby to create the completed flattened tubular configurations of each part 1A, 1B, 1C of the blank 1. These flattened tubular parts form, respectively, a first 200A, second 200B and third 200C part of a carton 200, as best shown in Figure 2.

The first part 200A is erected by folding the first 4 and second 8 side walls thereof about their respective fold lines 42, 48 to be perpendicular to the first bottom wall 2 of that first part 200A. The first 18, second 20, third 22 and fourth 24 engagement flaps are then folded inwardly, about their respective fold lines 34, 36, 38, 40, into superposition with adjacent portions of an inner surface of a respective one of the first bottom wall 2, first side wall 4, first top wall 6 and second side wall 8. The first 10, second 12, third 14 and fourth 16 end closure panels are left open pending loading of the completed carton 200 with articles A.

The second part 200B is erected by folding the third 84 and fourth 88 side walls thereof about their respective fold lines 122, 128 to be perpendicular to the second bottom wall 82 of that second part 200B. The fifth 90, sixth 92, seventh 94, and eighth 96 engagement flaps are then folded outwardly about their respective fold lines 106, 108, 110, 112 into superposition with adjacent portions of an outer surface of a respective one of the second bottom wall 82, third side wall 84, second top wall 86 and fourth side wall 88. The ninth 98, tenth 100, eleventh 102 and twelfth 104 engagement flaps are then folded inwardly about their respective fold lines 114, 116, 118, 120 into superposition with adjacent portions of an inner surface of a respective one of the second bottom wall 82, third side wall 84, second top wall 86 and fourth side wall 88.

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The third part 200C is erected by folding the fifth 134 and sixth 138 side walls thereof about their respective fold lines 172, 178 to be perpendicular to the third bottom wall 132 of that third part 200C. The thirteenth 140, fourteenth 142, fifteenth 144 and sixteenth 146 engagement flaps are then folded outwardly about respective fold lines 156, 158, 160, 162 into superposition with adjacent portions of an outer surface of a respective one of the third bottom wall 132, fifth side wall 134, third top wall 136 and sixth side wall 138. The fifth 148, sixth 150, seventh 152 and eighth 154 end closure panels are left open pending loading of the completed carton 200 with articles A.

So erected, the three parts 200A, 200B, 200C of the carton 200 each provide a tubular structure and are ready to be engaged with one another as follows.

The third part 200C, having smaller width and height than that of the second part 200B, is insertable into the second part 200B. The difference in width and height of the third part 200C relative to the second part 200B is at least sufficient such that the external width and height of the third part 200C is no greater than the internal width and height of the second part 200B. The third part 200C is inserted into the second part 200B sufficiently far to slide the outwardly facing surfaces of the thirteenth 140, fourteenth 142, fifteenth 144 and sixteenth 146 engagement flaps of the third part 200C over, and subsequently clear of, the inwardly facing surfaces of the ninth 98, tenth 100, eleventh 102 and twelfth 104 engagement flaps. Once the third part 200C is sufficiently inserted into the second part 200B, each of the above engagement flaps 98, 100, 102, 104, 140, 142, 144, 146 spring outwardly, away from the adjacent portions of the walls that they overlie, due to a natural tendency of the material from which the carton 200 is formed to return to a planar condition. As a result, each of these engagement flaps 98, 100, 102, 104, 140, 142, 144, 146 contact a juxtaposed surface of a respective one of the second bottom wall 82, third side wall 84, second top wall 86 and fourth side wall 88 of the second part 200B or third bottom wall 132, fifth side wall 134, third top wall 136 or sixth side wall 138 of the third part 200C. At this point the third part 200C may be withdrawn, as far as possible, from the second part 200B until the engagement flaps 98, 100, 102, 104 thereof within the third part

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200C and the engagement flaps 140, 142, 144, 146 of the third part 200C interlock with one another to prevent further separation of the second 200B and third 200C parts. This interlocking preferably takes the form of portions of the contacting engagement flaps coming into flat face contacting relationship with one another, each unable to hinged out of the path of the other by virtue of abutment with a contacting one of the walls of the part of the carton into which it is inserted, or around which it is disposed as the case may be.

The second part 200B, having width and height than that of the first part 200A is insertable into the first part 200A. The difference in the width and height of the second part 200B relative to that the first part 200A is at least sufficient such that the external width and height of the third part 200C is no greater than the internal width and height of the second part 200B. The second part 200B is inserted into the first part 200A sufficiently far to slide the outwardly facing surfaces of the fifth 90, sixth 92, seventh 94 and eighth 96 engagement flaps of the second part 200B over, and subsequently clear of the inwardly facing surfaces of the first 18, second 20, third 22 and fourth 24 engagement flaps of the first part 200A. Once the second part 200B is sufficiently inserted into the first part 200A, each of the above engagement flaps 18, 20, 22, 24, 90, 92, 94, 96 springs outwardly away from the adjacent portions of the walls that they overlie due to the aforementioned natural tendency of the material from which the carton 200 is formed to return to a planar state. As a result, each of these engagement flaps 18, 20, 22, 24, 90, 92, 94, 96 contact a juxtaposed surface of a respective one of the first bottom wall 2, first 4 side wall, first top wall 6 and second side wall 8 of the first part 200A or second bottom wall 82, third side wall 84, second top wall 86 or fourth side wall 88 of the second part 200B. At this point the second part 200B may be withdrawn, as far as possible, from the first part 200A until the engagement flaps 90, 92, 94, 96 thereof within the first part 200A and the engagement flaps 18, 20, 22, 24 of the first part 200A interlock with one another to prevent further separation of the first 200A and second 200B parts. As above, this interlocking of the engagement flaps preferably takes the form of a flat face contacting relationship.

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It will be appreciated that the difference in width and height of each part 100A, 200B, 200C relative to its neighboring parts 200A, 200B, 200C may be altered as long as it is sufficient to allow one of the neighbouring parts to nest within the other of the neighbouring parts. Preferably, the maximum difference in the width and height of any one part 200A, 200B, 200C relative to its neighbouring parts 200A, 200B, 200C is limited to be smaller than the width, relatively to a longitudinal axis, of the engagement flaps of that part and respective one of the engagement flaps of the neighbouring part. Advantageously, this prevents the engagement flaps from folding 90° or more away from the proximate surfaces of the walls of the panels to which they are hinged, and thereby prevents them from sliding passed the engagement flaps of the neighbouring part with which they are intended to interlock.

The assembled carton 200, in a tubular form, is thus arrived at, which carton 200 has a maximal interior volume by virtue of the minimal insertion of the first 200A, second 200B and third 200C within one another. The carton has a tubular axis L (as shown in Figure 2) that extends along a central longitudinal axis thereof, through each of the parts 200A, 200B, 200C thereof. At opposed ends of the carton 200, the respective end closure panels remain open to allow loading of the carton 200 with articles A. The three parts 200A, 200B, 200C are moveable relative to one another by sliding one part further into an adjacent part. In this way, the carton is extensible and compressible in the manner of a telescope, through the sliding and overlapping of adjacent sections, to result in corresponding variation of the total interior volume thereof. This telescopic transformation of the carton, in the form of extension and compression thereof, provides for the carton to be manipulable between a form having a maximum interior volume and a form having a minimum interior volume.

The open end of the first part 200A of the carton 200 is closable by folding the first 10 and third 14 end closure panels about their respective fold lines 26, 30, inwardly so as to be coplanar with one another. Adhesive is applied to the outwardly facing surfaces of the first 10 and third 14 end closure panels. The fourth end closure panel 16 is folded about its respective fold line 32 into coplanar contact with both the first 10 and third 14 end closure

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panels, to which it becomes secured by virtue of the adhesive therebetween. Adhesive is applied to at least a portion of the outwardly facing surface of the further end closure panel. The second end closure panel is then folded about its respective fold line 28 into coplanar contact with the fourth end closure panel 16, to which it becomes secured by virtue of the adhesive therebetween.

So disposed, the coplanar first 10 and third 14 end closure panels, along with the fourth end closure panel 16, provide reinforcing material for the outer handle strap 61 of the second end closure panel 12 in the form of first 53 and second 67 handle reinforcing portions and inner handle strap 75 respectively. The first 10, second 12, third 14 and fourth 16 end closure panels, so disposed, form a first composite end wall 197 of the carton 200, defined within which is a composite handle structure formed of the first 53 and second 67 handle reinforcing portions, inner handle strap 75 and outer handle strap 61, as best seen in Figure 2A.

The opposing end of the carton 200 is closable by folding the fifth 148 and seventh 152 end closure panels inwardly, about their respective fold lines 164, 168, into a coplanar position. Adhesive is applied to at least a portion of the outwardly facing surfaces of each of the fifth 148 and seventh 152 end closure panels before the sixth 150 and eighth 154 end closure panels are also folded inwardly, about their respective fold lines 166, 170, into coplanar contact with portions of the fifth 148 and seventh 152 end closure panels, to become secured thereto by virtue of the adhesive disposed therebetween. So-secured the fifth 148, sixth 150, seventh 152 and eighth 154 end closure panels form a second composite end wall 198 of the carton 200. In this second composite end wall, the first 180 and third 186 detachable portions are secured to one another to form a first composite detachable portion 191 and the second 182 and fourth 188 detachable portions are secured to one another to form a second composite detachable portion 193 of the carton 200. The first and second composite detachable portions are secured to one another by the second 194 and fourth 192 frangible lines that are aligned over a portion of their length

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where the sixth 150 and eighth 154 end closure panels overlap one another. Figure 2B best illustrates an end view of the closed end of the carton 200.

Loading of the carton 200 with articles may take place whilst both ends of the carton 200 are left open, or after one of those two ends has been closed in the manner above. A preferred configuration of articles A in the carton 200 is shown in Figure 7 which is a cross-sectional view of the carton of Figure 3 taken along line 'X-X'. The articles A are disposed upon their sides with longitudinal axes thereof parallel to a longitudinal axis of the carton 200. In this manner, a two tier arrangement of articles A consisting of a pair of articles A side-by-side in each tier, is disposed within each part 200A, 200B, 200C of the carton 200, to give a total of twelve articles A in the carton 200. The cross sectional view of Figure 7 also illustrates the inter-engagement of the engaging flaps of each part 200A, 200B, 200C of the carton 200, when the carton 200 is fully extended.

Subsequent to loading the carton 200, the remaining open end(s) thereof are closed in the manner described above to enclose those articles A within the carton 200, ready for transportation.

Users may lift the carton 200 by the aforesaid composite handle structure by folding the first 58 and second 62 finger flaps inwardly of the carton, folding them about their respective fold lines 63, 65. So folded, the first 60 and second 62 finger flaps leave apertures either side of the outer handle strap 61 through which users may insert their fingers to grip the composite handle structure. Once so-gripped, the carton 200 may be lifted in the manner best shown in Figure 2. The weight of the articles A is substantially disposed upon the opposing end of the third part 200C of the carton 200, the composite nature of which end serves to provide sufficient structural integrity to support this weight without tearing, the weight being transferred via the walls of the cartons 200 to the composite handle structure. Where each part 200A, 200B, 200C engages with an adjacent part 200A, 200B, 200C, the weight of the articles is transmitted to that adjacent part 200A, 200B, 200C by corresponding ones of the interlocking engagement panels

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thereof. Preferably, additional fold lines 55, 57 passing through a longitudinal centre line of the first 58 and second 62 finger flaps allows those finger flaps 58, 62 to deform more easily to fold around a thickness of the composite handle structure 77.

Removal of articles A by a user is achievable by disposing the carton 200 on the first 2, second, 82 and third 132 bottom walls thereof, and by detaching the second composite detachable portion 193 either by pulling it away from the carton 200 or by pushing it inwardly of the carton 200. In so-doing, a free edge of the first composite detachable portion 191 is provided along the now-broken second 194 and third 192 frangible lines. The first composite detachable portion 193 provides an access feature that is removable for to provide access to an interior of the carton 200. This free edge is grippable by the user such that the first composite detachable portion 193 may be pulled outwardly from the second composite end wall 198 of the carton 200, thereby commencing a tear that propagates through both the first 184 and the third 190 frangible lines toward side edges of the second composite end wall 198 of the carton 200. If so desired, the first composite detachable portion 191 may be severed completely from the carton 200 by tearing along the fold line 168 connecting the third end closure panel 152 to the third top wall 136, as best shown in Figure 3. Thus an opening 196 is formed in the second composite end panel of the carton 200, through which articles A disposed in the third part 200C of the carton 200 are immediately accessible for removal. A remaining portion of the second composite end wall 198 adjacent the third bottom wall 132 provide a lower lip 195 that serves to retain articles A in the lower tier, contacting that third bottom wall 132, from unintentional egress from the carton 200. This opening 196 is preferably free of obstruction by any other part of the carton 200, over the entire range of extension and compression of the carton achieved by manipulation the carton telescopically.

Once the first composite detachable portion 191 has been removed, a process of sequential removal of the articles A, and sequential reduction of the interior volume of the carton 200 may be undertaken, as shown in Figures 4, 5 and 6. This reduction of the interior volume is achieved by sliding the parts 200A, 200B, 200C of the carton 200 relative

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to one another, thereby transforming the carton 200 from a first form having a first interior volume, to a second form having a second interior volume.

Starting from a fully loaded carton 200, as shown in Figure 3, the user may remove the four articles contained within the third part 200C thereof, through the aforesaid opening 196. Once these articles have been so-removed, the third part 200C of the carton is empty, and the distance between the opening 196 and the remaining articles A contained in the second part 200B is disadvantageous to easy removal thereof from the carton 200.

It is made possible, by virtue of the sliding engagement of the three parts 200A, 200B, 200C of the carton 200 with one another, for the third part 200C to be moved, preferably by sliding, into the interior volume of the second part 200B, thereby to advantageously reduce the distance between the opening 196 and the remaining articles A in the carton 200. Preferably, the opening 196 is brought into juxtaposition with the remaining articles A. This is advantageous in that it leads to an overall reduction in the volume of the carton 200.

Moving the third part 200C inside the second part 200B requires interposing the third bottom wall 132 between the articles A contained in the second part 200B and the second bottom wall 82. It is preferable, therefore, that at least one of the first 200A and second 200B parts of the carton 200 are retained in position as the third part 200C is pushed inwardly of the carton 200, to prevent the entire carton 200 from sliding. The resulting carton 200, wherein the third part 200C is nested within the second part 200B, is shown in Figure 4, with direction D1 shown as an arrow, which direction D1 indicates the direction of movement of the third part 200C into the second part 200B. Maximum insertion of the third part 200C into the second part 200B is achieved when the second composite end wall 198 comes to abut the proximate ends of the articles A contained in the second part 200B.

Removal of articles A originally disposed within second part 200B from the carton 200 is thus facilitated, as the user reaches through the opening 196 to remove the articles A

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which are now disposed upon the third bottom wall 132 of the third part 200C inside an interior volume of the second part 200B. Once this has been completed, the third part 200C will again be empty, and the carton 200 is ready for the second 200B and third 200C parts to be moved within an interior volume of the first part 200A, as best shown in Figure 5.

Moving the second 200B and third 200C parts of the carton 200 within the interior volume of the first part 200A requires that both the third 132 and second 82 bottom walls become interposed beneath the articles A disposed upon the first bottom wall 2. It is preferable, therefore, that the first part 200A of the carton is retained in position as the second part 200B is pushed inwardly of the carton 200, to prevent the entire carton 200 from sliding. The resulting carton 200, wherein the second 200B and third 200C parts are nested within the first part 200A, is shown in Figure 5, with direction D2 shown as an arrow, which direction D2 indicates the direction of movement of the second 200B and third 200C parts into the first part 200A. Maximum insertion of the second 200B and third 200C parts into the third part 200C is achieved when the walls 82, 84, 86, 88, 132, 134, 136, 138 come to abut an inner surface of the first composite end wall 197 of the carton 200. The carton 200 is now compressed to its minimum volume. The articles A are now disposed once again on the third bottom wall 132 of the third part 200C of the carton 200 are thus accessible for removal via the opening 196. Once this final group of articles A has been removed, the carton 200 is rendered empty, as best shown in Figure 6.

From the above it will be understood that the third part 200C provides an exit chamber through which the articles A contained in the carton 200 pass as they are removed, which exit chamber is moveable so as to be brought around a selection of those articles prior to removal.

As can be seen from Figures 1, 5 and 6, the walls 82, 84, 86, 88 forming the top, bottom and sides of the second part 200B of the carton 200 have the same length as the walls 132, 134, 136, 138 forming the top, bottom and sides of the third part 200C of the carton

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200. This length is greater than the corresponding length of the walls 2, 4, 6, 8 forming the top, bottom and sides of the first part 200A, as is best illustrated in Figures 5 and 6 wherein there is shown the extension of the aforementioned walls 82, 84, 86, 88, 132, 134, 136, 138 of the second 200B and third 200C parts of the carton 200, beyond the aforementioned walls 2, 4, 6, 8 of the first part 200A of the carton 200, when the second 200B and third 200C parts are fully inserted into the first part 200A.

It is contemplated that other embodiments of carton may be formed within the scope of the invention. For example, it is contemplated that an alternative embodiment of carton may be comprised of a greater or lesser number of parts such as, for example, the cartons 201, 202, 203, 204 shown in Figure 8. These cartons 201, 202, 203, 204 possess two, four and five parts respectively. There is no upper limit to the number of parts of which the carton may be formed.

It is further contemplated that the carton may have a different geometry to that of the preferred embodiment, to accommodate alternative numbers and/or orientations of articles loaded therein, examples of which are given in Figure 9 in which the articles are shown within the walls of the cartons. For example, it is contemplated that the cartons 204, 208, 212 may be shaped and sized to accommodate triple, double or single tiers of articles in endwise upstanding orientation upon the bottom walls thereof, respectively, each tier comprising a single column. As a consequence, such cartons 204, 208, 212 may be thinner than the carton 200 described above. It is also contemplated that cartons 205, 209, 213 may be shaped and sized to accommodate triple, double and single tiers of articles respectively, with each tier comprised of dual columns of articles side by side, each article in endwise upstanding orientation. Additional cartons 206, 210, 214 are contemplated that accommodate triple, double and single tiers of articles respectively, each tier comprising dual columns of articles disposed upon their sides with longitudinal axes thereof parallel to a longitudinal axis of the corresponding carton 206, 210, 214. Also contemplated are cartons 207, 211, 215 sized to accommodate triple, double and single tiers of articles respectively, each tier composed of a single column of articles disposed

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upon their sides such that longitudinal axes thereof are perpendicular to a longitudinal axis of the corresponding carton 207, 211, 215.

It is still further contemplated that in other embodiments, the cartons 216, 217, 218, 219, 220 could have different cross-sectional geometries compared to the carton 200 described above. For example, such cartons 216, 217, 218, 219, 220 could have rectangular, triangular, diamond, hexagonal, or trapezoidal transverse cross section (taken at right angles to a longitudinal axis of the carton in question). Circular, ellipsoidal and irregularly curved cross sections of carton are also contemplated, which cartons would preferably comprise a series of relatively narrow engagement flaps to aid folding thereof and to avoid those engagement flaps, once folded, being overly strongly retained in flat surface contacting relationship with the walls of the carton such that there is sufficient angle between those portions of the carton wall and the engagement flaps to allow for the above-described interlocking between engagement flaps of different parts of the carton.

It is contemplated that the above-described carton 200 may be altered such that the composite handle structure 77 and the first 191 and second 193 composite detachable portions are swapped with one another such that the first composite end wall 197 comprises the resultant opening 196 and the first part 200A is the first part, therefore, to be emptied of articles A. In such an embodiment reduction of the volume of the carton does not require interposition of a bottom wall of an empty part of the carton between the articles and the bottom wall of that part of the carton upon which they are originally disposed, as the empty part of the carton instead fits around an outer surface of the adjacent part. Such an embodiment of a carton 300 is shown in Figures 11A and 11B wherein like reference numerals have been used to denote like features. As can be seen, the first composite end wall 497 is formed in the largest end of the carton 300 and the handle structure 377 formed in the smallest end. Small cut-away sections are shown in Figure 11B to emphasize that way in which the dispensing end of the carton 300 is the larger of the series of parts.

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It is also contemplated that the length of the walls forming the top, bottom and sides of each part of the carton may be varied to that described in the preferred embodiment. For example, each of those walls may have the same length, or any one or more parts may have walls of differing length to each of the other parts of the carton.

Reference to adhesive above includes contemplation of, amongst others, chemical adhesive substances, mechanical fasteners, thermal or vibration welding, or interlocking detent/aperture arrangements.

In an alternative embodiment (not shown), it is contemplated that one or more of the parts comprises a protrusion that is receivable in a complementary aperture formed in an adjacent portion of and adjacent part to prevent separation thereof. As the two parts are drawn away from one another in a given direction, the protrusion is received in the aperture to prevent further relative movement in that direction. The protrusion may be provided by a folded panel of the part in question, preferably wherein that folded panel is restricted from hinging to allow the folded panel to lie in the same plane as the adjacent wall of that part, and thereby to cease to protrude into the aperture. Alternatively, the protrusion may be a molded component that may be pressed into a part formed of paperboard or the like, or injection or vacuum molded into a part formed from plastics. It could be that the parts of the carton are formed from different materials to the protrusions and/or apertures, for instance the carton may be formed from paperboard whilst the protrusion and/or the receiving aperture are provided in plastics.

It is contemplated that an alternative embodiment of the present invention may comprise fewer engagement flaps at the engaging ends of the various parts of the carton. For instance, rather than having an engaging flap hinged to each of the top, bottom and side walls, there may be an engagement flap provided hinged to one, two or three of those walls. Similarly, where the geometry of the parts is not square as in the preferred embodiment an engaging flap may be provided for each wall, or fewer than each wall thereof.

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It will be recognised that as used herein, directional references such as "top", "bottom", "front", "back", "end", "side", "inner", "outer", "upper" and "lower" do not limit the respective panels to such orientation, but merely serve to distinguish these panels from one another. Any reference to hinged connection should not be construed as necessarily referring to a single fold line only; indeed it is envisaged that hinged connection can be formed from one or more of the following, a short slit, a frangible line or a fold line without departing from the scope of the invention.

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CLAIMS

1. A carton for packaging one or more articles, the carton comprising a plurality of walls defining a volume for receiving one or more articles, and an access feature that is at least partially detachable to create an opening through which one or more articles may be removed, wherein the carton is transformable in a telescopic manner to change the volume of the carton such that the opening, once created, is not obstructed by any other portion of the carton due to transformation of the carton.
2. The carton according to claim 1, wherein the plurality of walls provide a generally tubular structure and a pair of opposed end walls, wherein the access feature is defined in one of the end walls of the carton and wherein transformation of the carton in the telescopic manner displaces the one of the end walls along a tubular axis of the tubular structure.
3. The carton as claimed in claim 1 or claim 2, wherein the carton is transformable in the telescopic manner to take a maximum volume form, the carton is further transformable in the telescopic manner to take a minimum volume form, and wherein the opening is free of obstruction by any other portion of the carton as the carton so-transforming between the maximum volume form and the minimum volume form.
4. The carton as claimed in claim 2, wherein, through transformation of the carton, the access feature is moveable so as to be brought into juxtaposition with one or more articles disposed within the carton.
5. The carton as claimed in claim 1, wherein the plurality of walls provide a first part and a second part movably connected together for sliding movement along the tubular axis, and wherein separation of the first and second parts is prevented by flaps, extending from each of those two parts, the flaps being disposed in face contacting relationship between overlapping portions of those two parts.

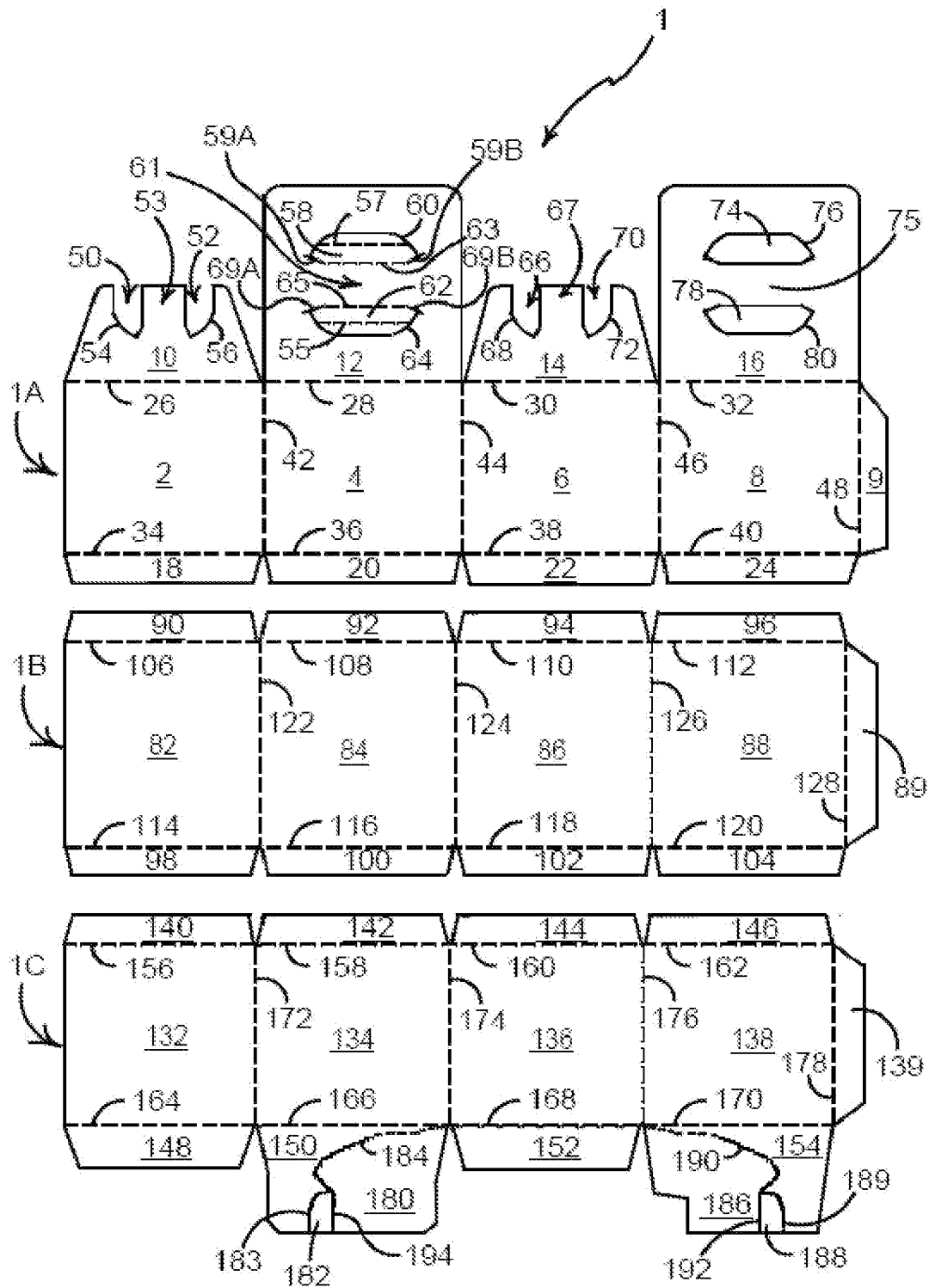
- 27 -

6. The carton as claimed in any one of claims 1 to 5, wherein one of the plurality of walls of the carton provides the access feature, and provides, after at least partial detachment of the access feature, a lower lip for abutting one or more articles disposed within the carton to prevent one or more articles from exiting the carton.
7. A telescoping carton comprising a slidable end unit defining an exit chamber for accommodating one or more ready-to-be-dispensed articles selected from the entire contents of the carton, the end unit having an access feature through which the one or more ready-to-be-dispensed articles are removable from the carton.
8. The telescoping carton as claimed in claim 7, wherein the end unit forms a terminal one of a linear series of units, each slidable relative to its neighbours and each having a smaller lateral size relative to a preceding unit relative to one direction along the linear series, the end unit having the largest lateral size of the units of the linear series.
9. The telescoping carton as claimed in claim 7, wherein the end unit forms a terminal one of a linear series of units, each slidable relative to its neighbours and each having a smaller lateral size relative to a preceding unit relative to one direction along the linear series, the end unit having the smallest lateral size of the units of the linear series.
10. The telescoping carton as claimed in claim 8 or claim 9, wherein each of the units of the linear series has at least a smaller dimension than the preceding unit in two axes, such that a first unit possessing a smaller lateral size than a second unit is nestable within the first unit.
11. A telescoping carton comprising a first part and a second part that are moveable relative to one another, the carton comprising a separation preventing mechanism comprising a first flap and a second flap that are engaged in a face-contacting relationship and disposed between the first and second component parts.

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12. A telescoping carton having a separation preventing mechanism provided by flaps that are hinged to at least three side walls of each component unit.
13. A blank comprising panels for forming a carton as claimed in claims 1 to 12.
14. A method of dispensing articles from a telescoping carton having a linear series of telescoping parts, the method comprising filling the internal volume of each of the telescoping parts with one or more articles, dispensing the one or more articles from an endmost one of the telescoping parts of the linear series such that an empty space is defined between the articles remaining in the carton and an end closure wall of the endmost part, and moving that endmost part toward an opposite endmost part of the linear series to remove the empty space.
15. A method of packaging and dispensing an article comprising:
- forming a first part of a carton;
 - forming a second part of a carton;
 - arranging the second part with the first part such that the first part can be manipulated telescopically with respect to the second part;
 - loading the first and second part with one or more articles;
 - deploying an access feature;
 - removing a portion of the one or more articles;
 - moving the first part telescopically with respect to the second part so as to reduce the volume and/or length of the carton by an amount substantially equal to the volume or length defined by the removed portion of the one or more articles.

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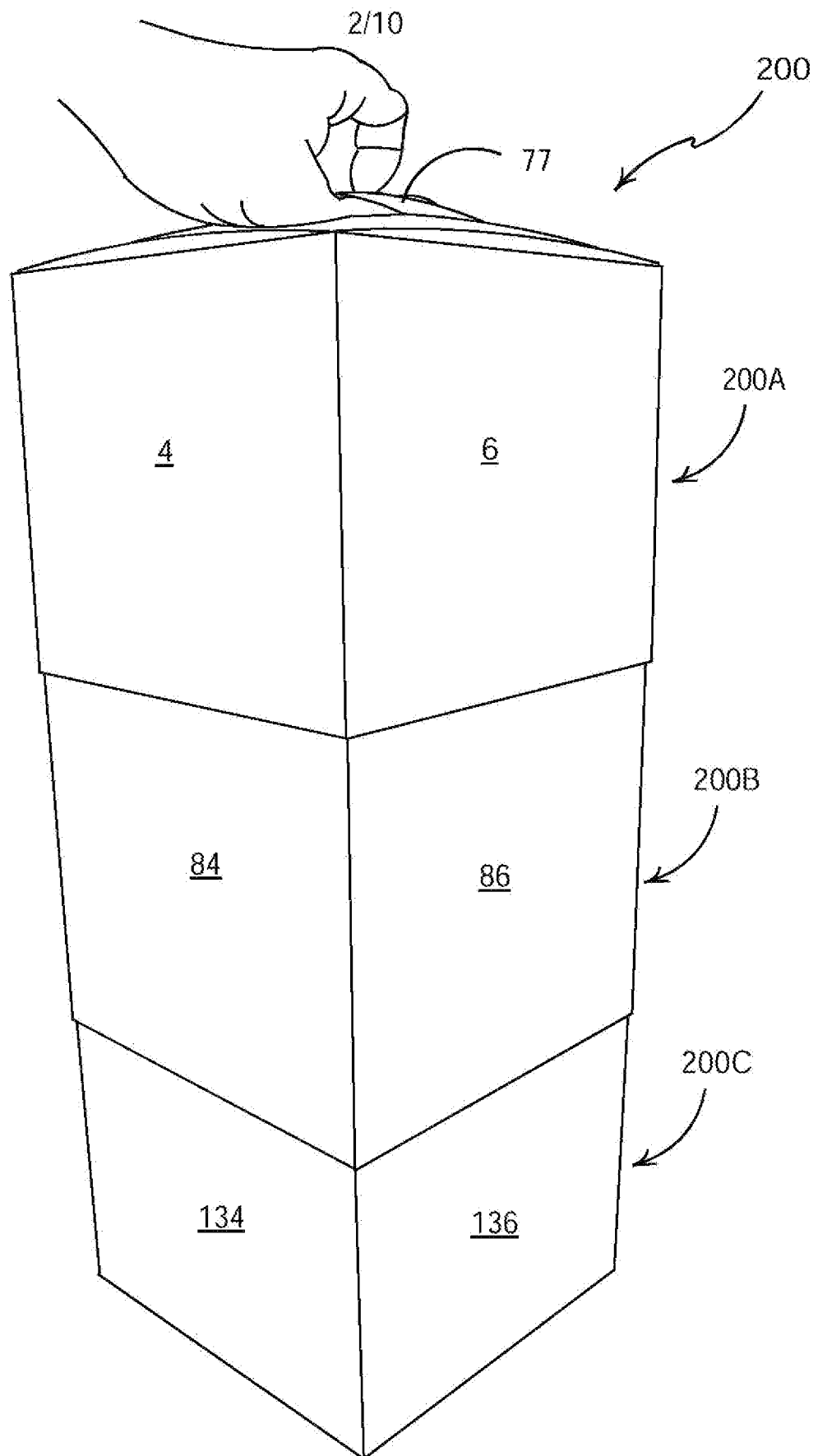


FIGURE 2

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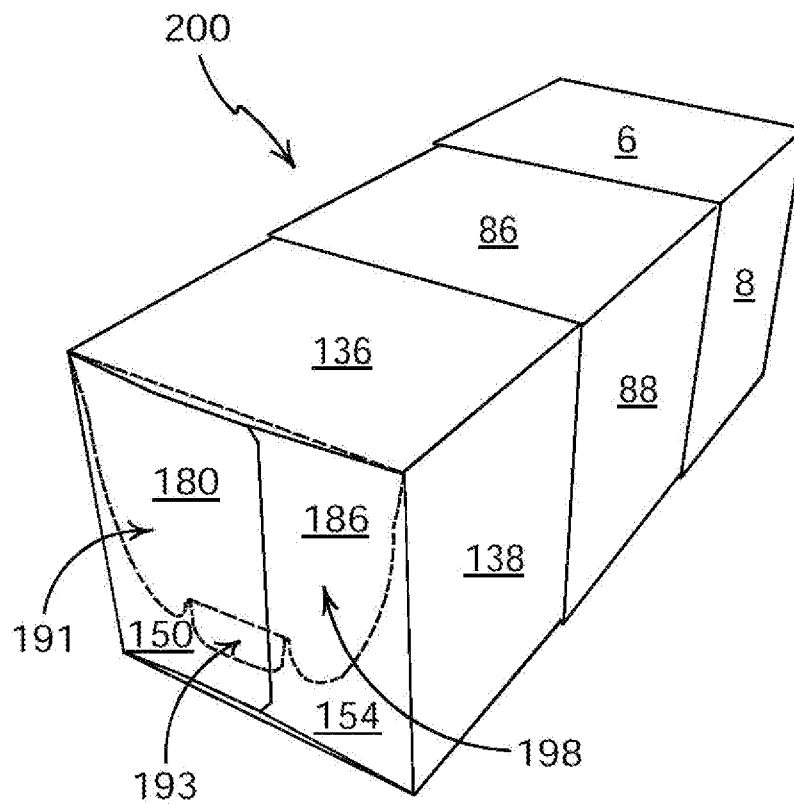
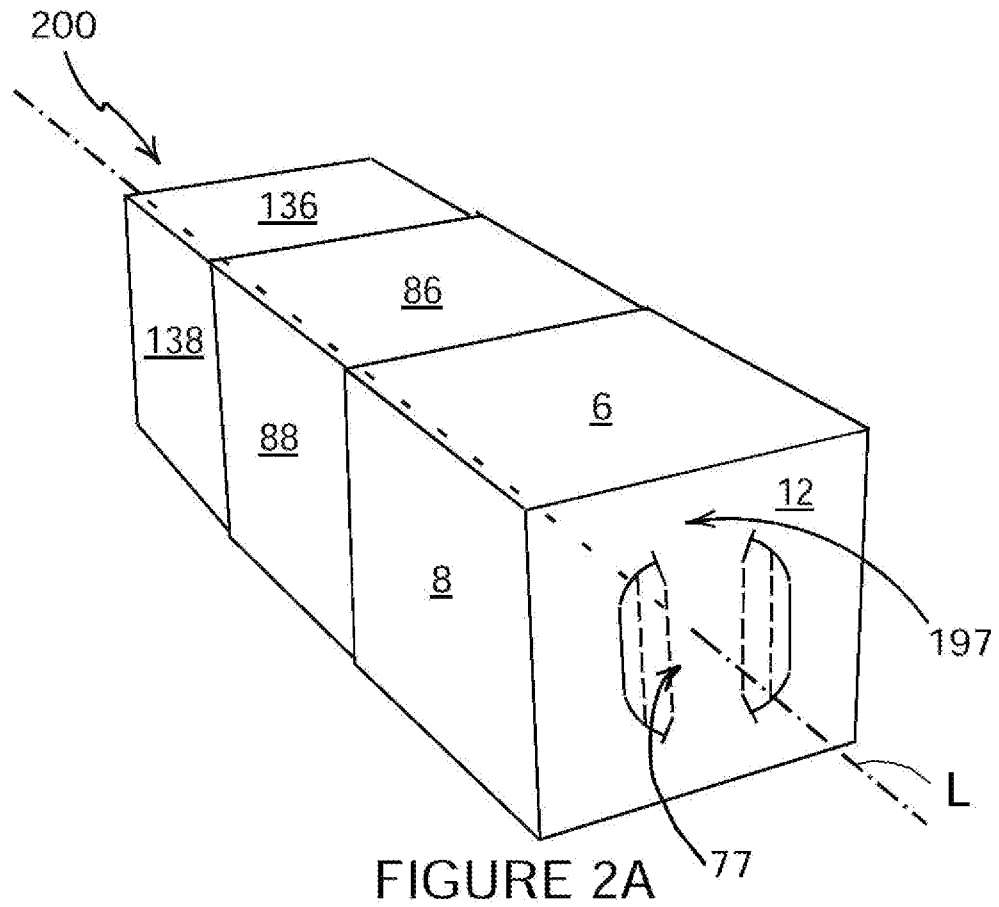


FIGURE 2B

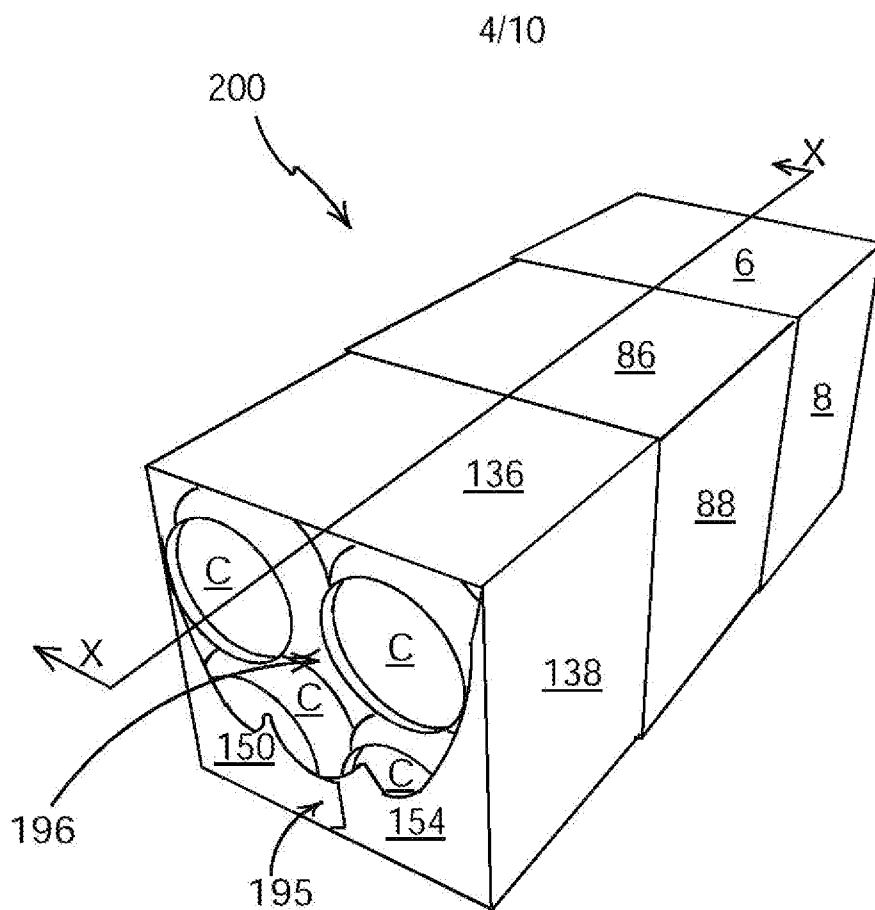


FIGURE 3

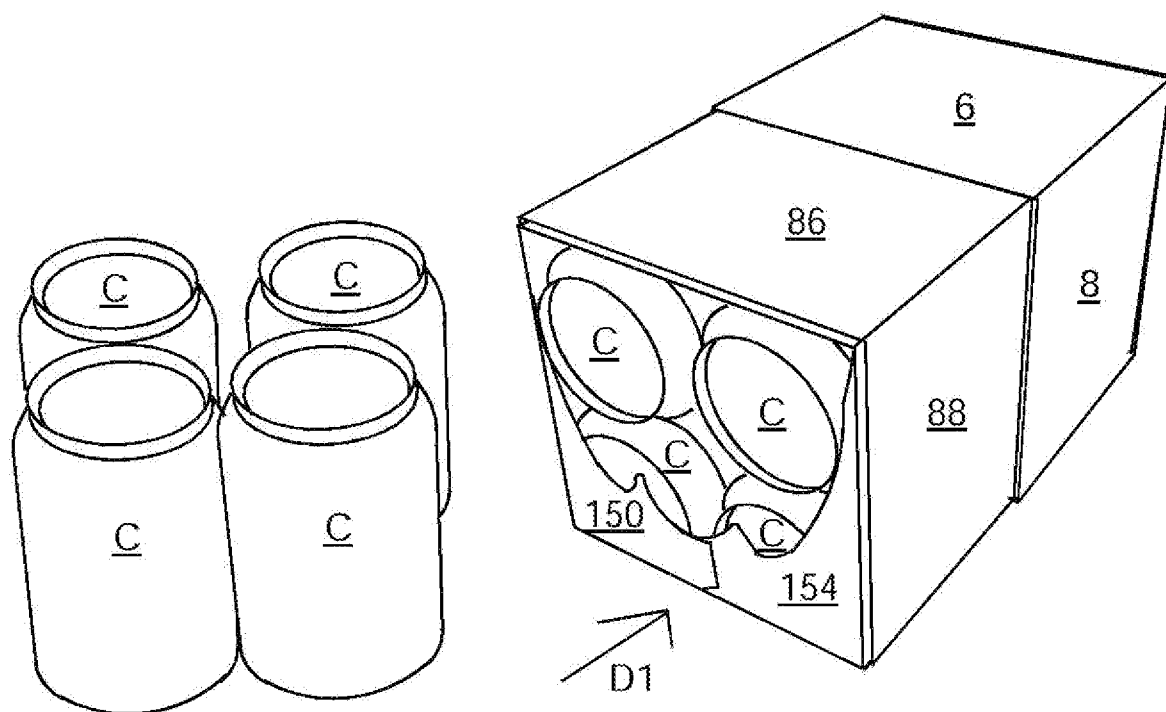


FIGURE 4

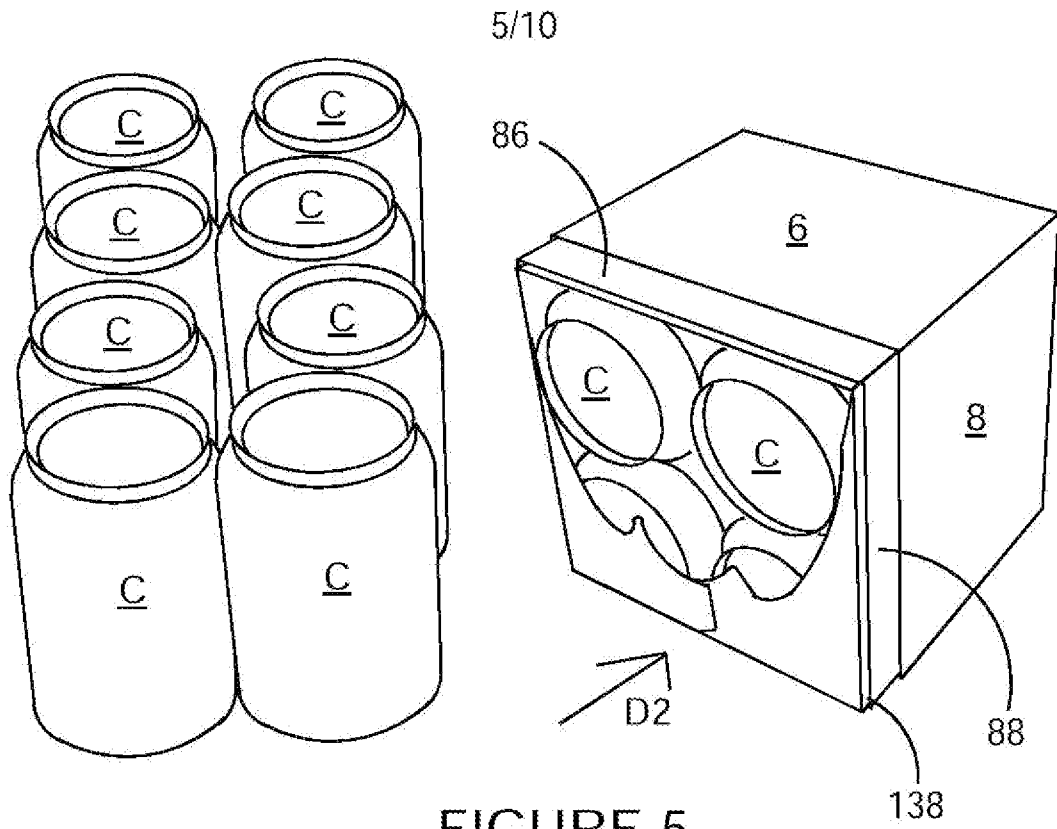


FIGURE 5

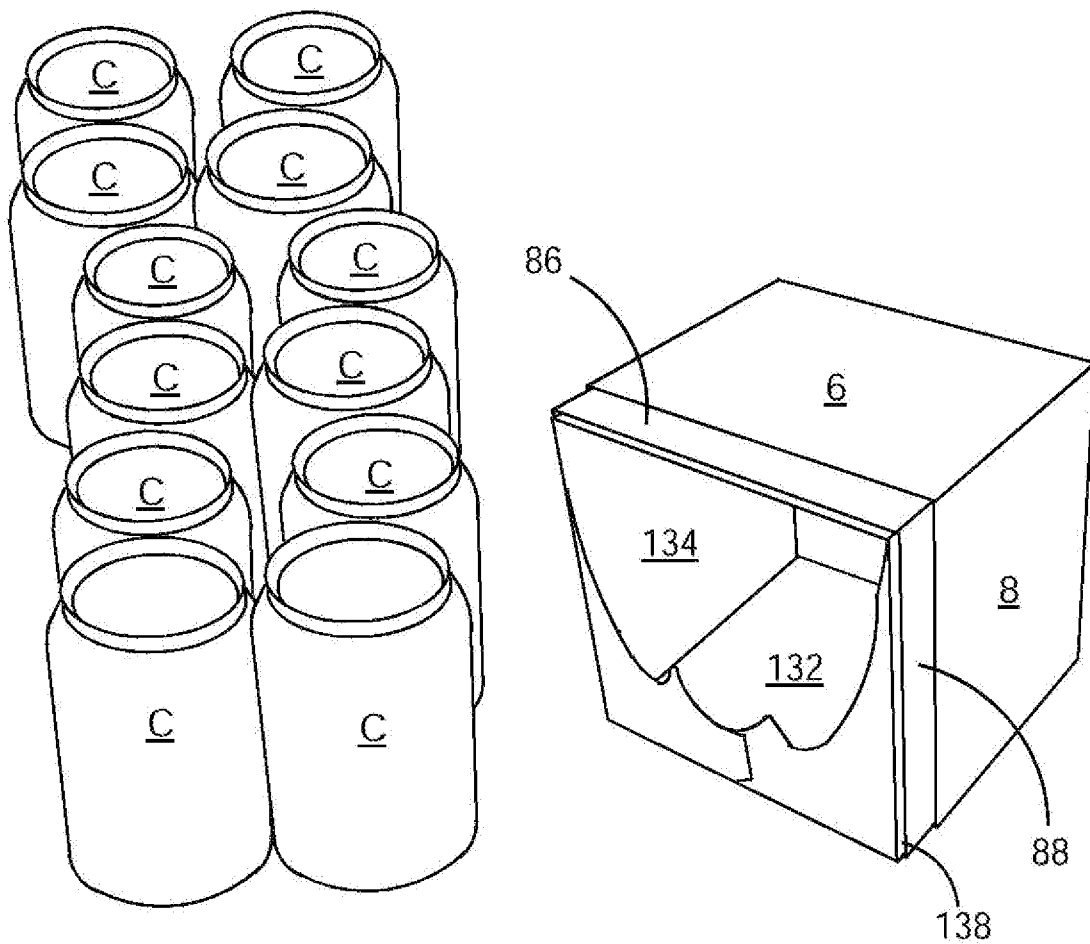


FIGURE 6

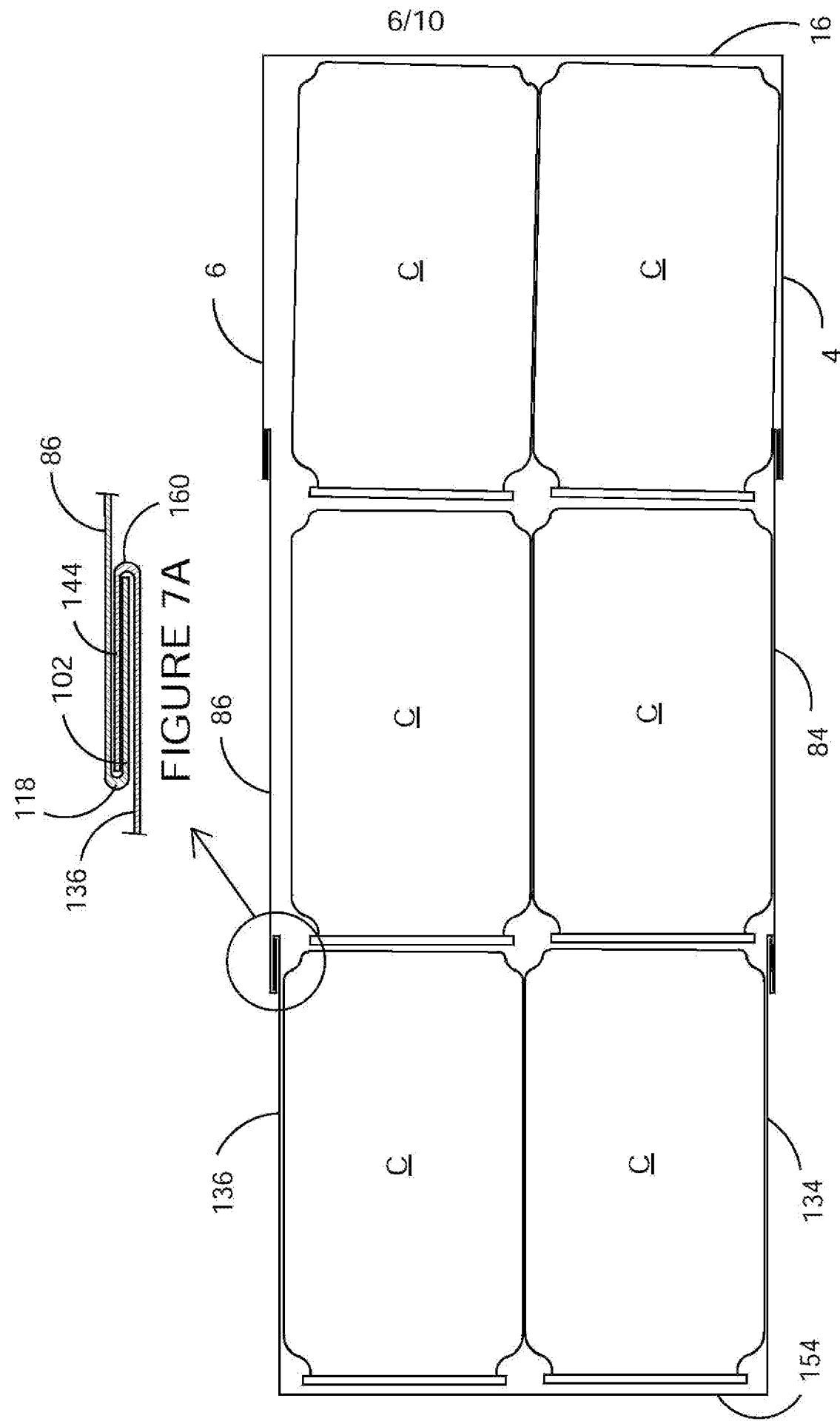


FIGURE 7

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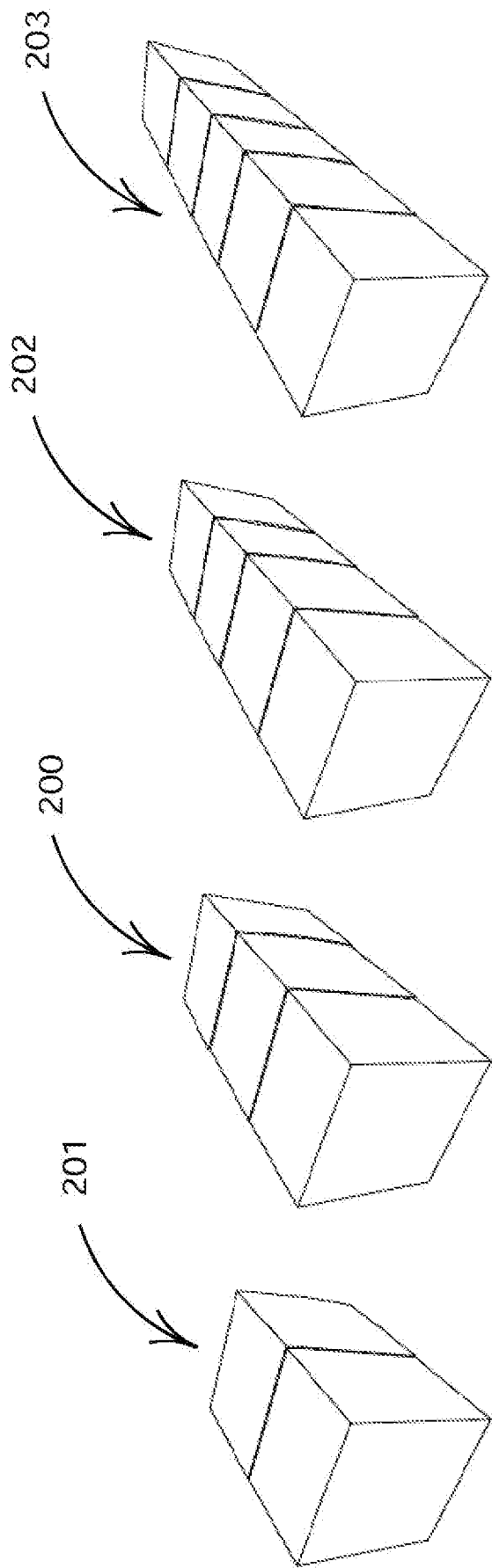


FIGURE 8

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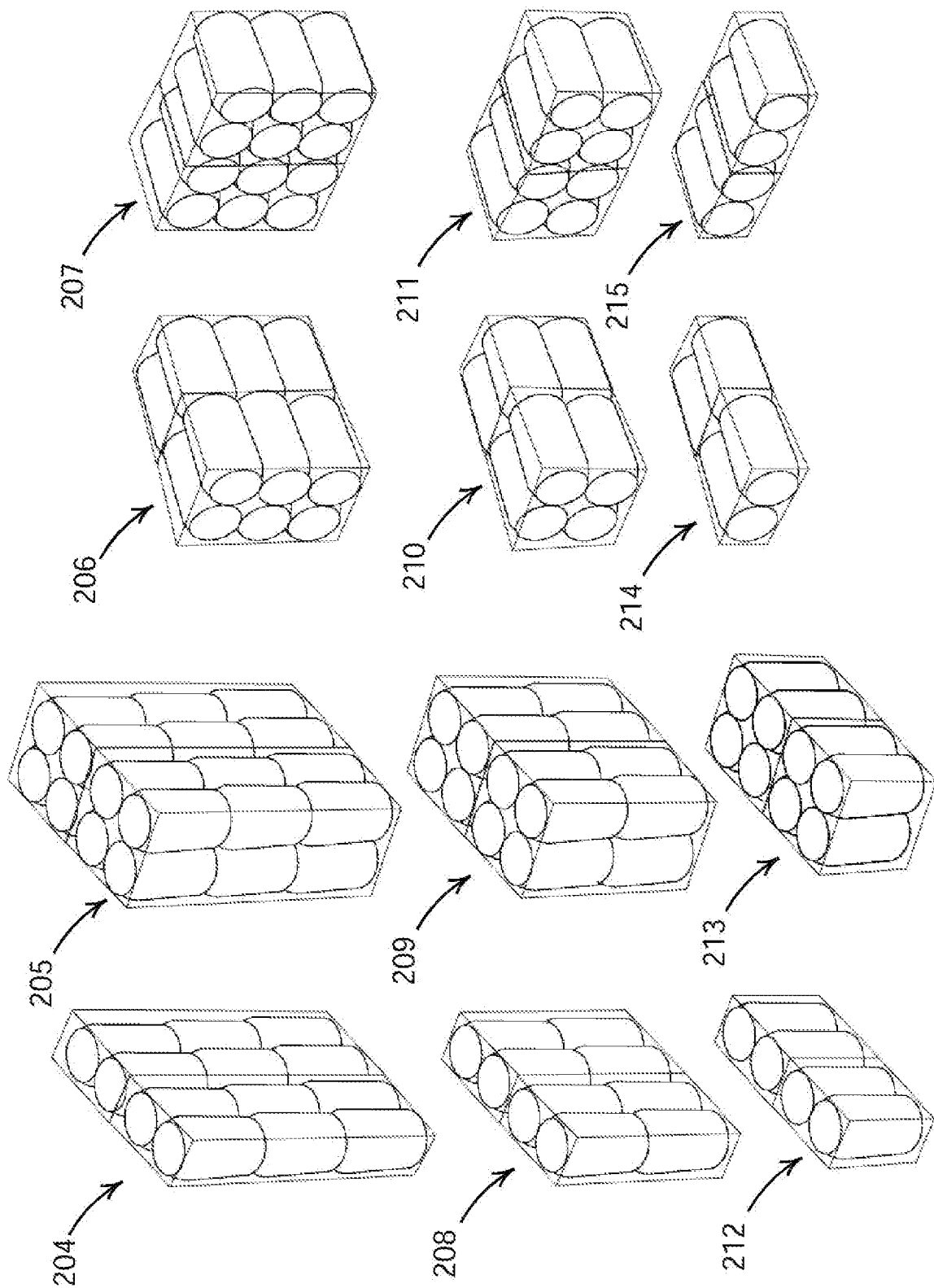


FIGURE 9

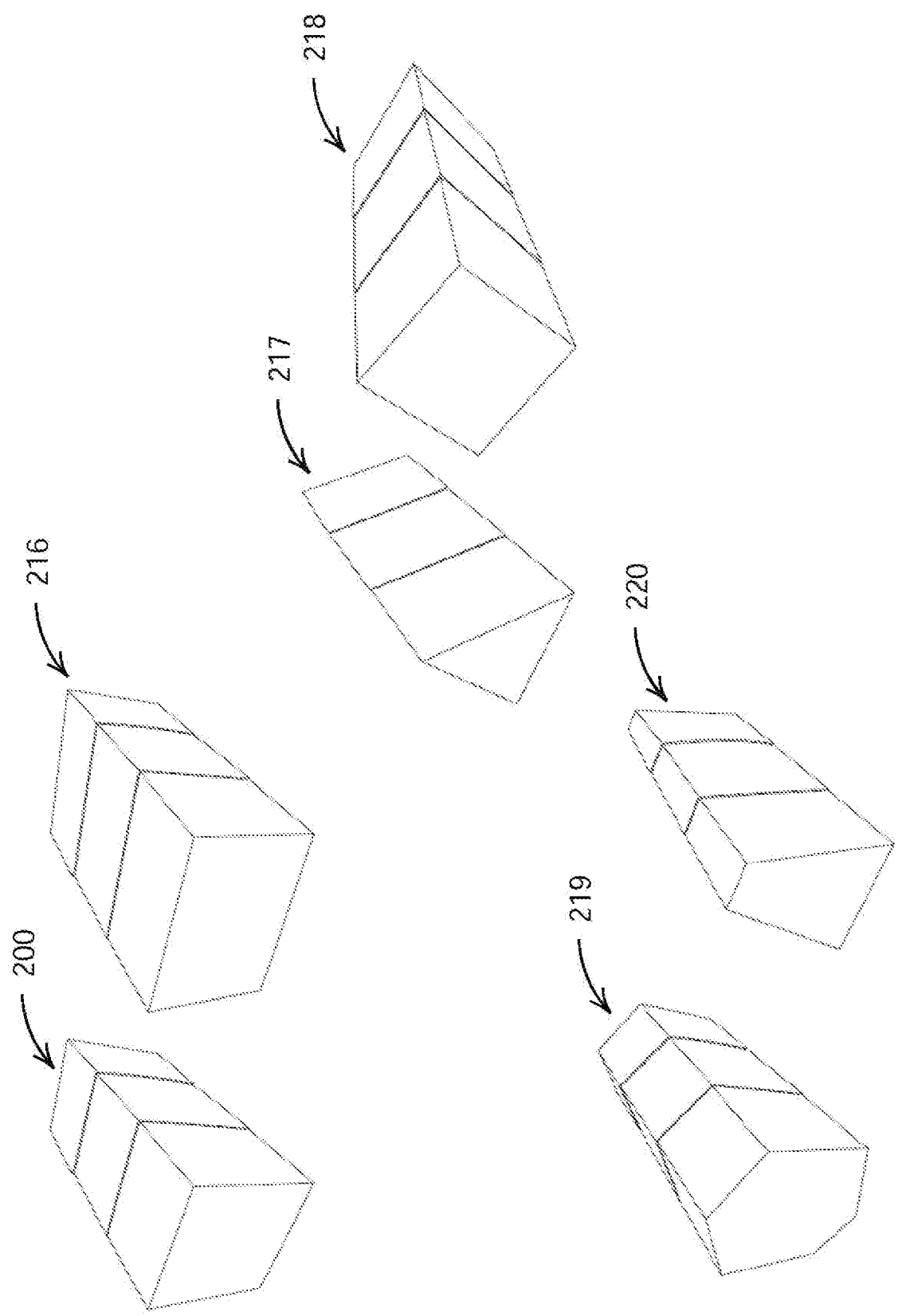


FIGURE 10

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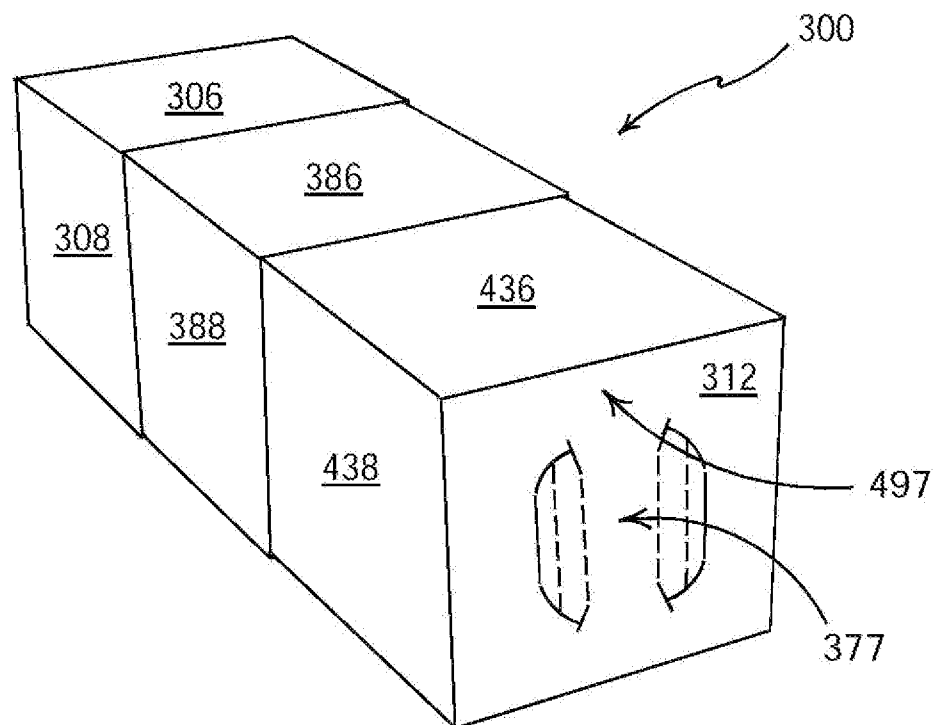


FIGURE 11A

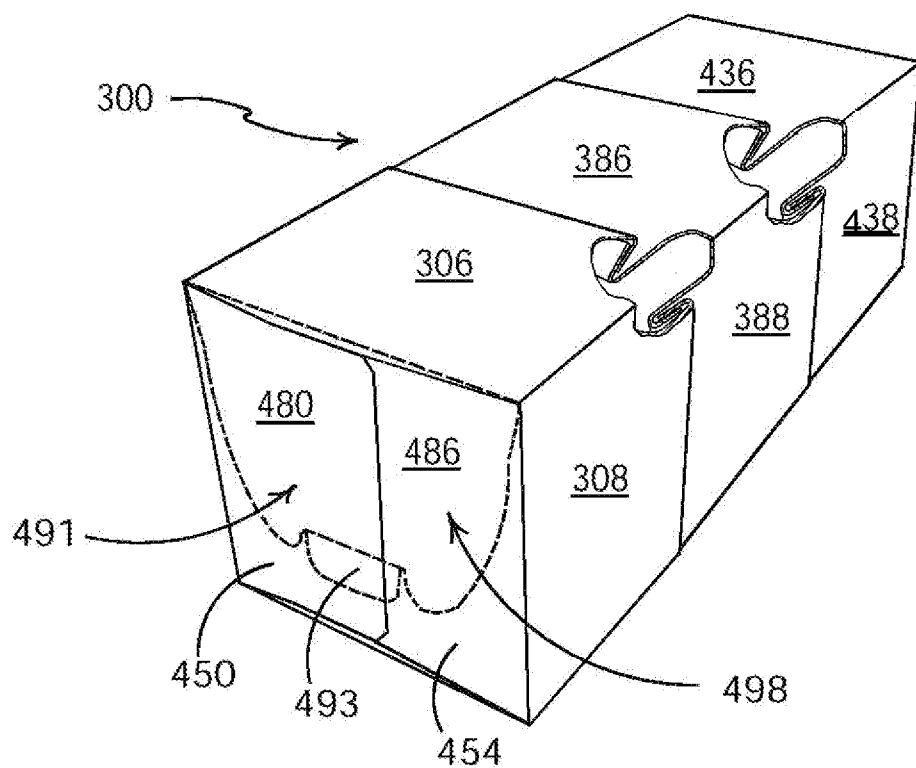


FIGURE 11B

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2011/046878

A. CLASSIFICATION OF SUBJECT MATTER

INV. B65D5/00 B65D5/54 B65D5/68 B65D5/02
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 833 710 A (WILLIAM W CLELAND LTD; ARTHUR ARIA BUCHMAN) 27 April 1960 (1960-04-27)	7-15
Y	the whole document ----- -/--	5



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

22 September 2011

Date of mailing of the international search report

30/09/2011

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Sundell, Olli

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2011/046878

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/150801 A1 (TIPPEY DAROLD D [US]) 14 July 2005 (2005-07-14)	1-4,6,7, 13-15
Y	page 2, left-hand column, line 3 - line 6; figures 1-4 page 2, left-hand column, line 12 - line 17 page 2, left-hand column, line 21 - line 24 page 2, left-hand column, line 58 page 4, right-hand column, line 7 - line 11 page 4, right-hand column, line 22 - line 29 page 4, right-hand column, line 33 - line 34 page 4, right-hand column, line 48 -----	5

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2011/046878

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 833710	A	27-04-1960	NONE
US 2005150801	A1	14-07-2005	WO 2005070772 A1
			04-08-2005