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(54) **Carton for holding a plurality of articles**

(57) A carton and a blank for forming a carton for
holding a plurality of articles in a group. The carton com-
prises top (22), opposed side walls (18, 26) and a base
(12, 32), hingeably interconnected together to form a tu-
bular structure wherein at least one said side walls com-

prises a displaceable zone (66) arranged to protrude out
of the plane of the side wall to accommodate a portion
of an adjacent article. The displaceable zone comprises
a multiplicity of connected sections each occupying a
different plane to a next adjacent section.

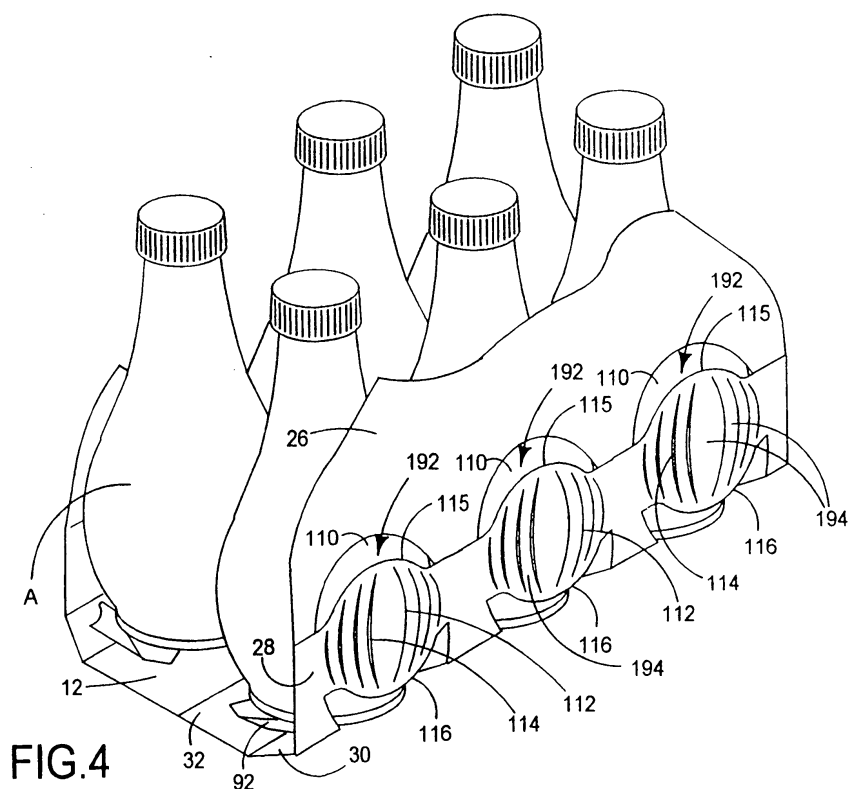


FIG.4

EP 1 232 957 A1

Description

[0001] This invention relates to a carton which is particularly but not only suitable for accommodating beverage containers such as cans and which incorporates a "strap-type" carrying handle which is automatically set up into a position of use as the carton is being closed after having been loaded.

[0002] Beverage cartons which include carrying handles and indeed, strap type carrying handles are known. For example, US 4,166,570 (Lazerand et al) discloses a packaging carton for beverage cans which a strap type handle. The handle strap has a central user portion exposed to view in a handle access aperture in top wall of the carton, extends across the top wall and has opposite ends which terminate in respective ones of a pair of end closure flaps which are hinged to the top wall. The handle strap is reinforced by a separate strip of reinforcing material, for example, a fibrous tape

[0003] In the present invention, a carton having a strap handle type is provided, the strap being reinforced by a separate strip formed from material at one end of the blank from which the carton is formed. The handle strap is connected to a handle and has a user portion exposed to view in a handle access aperture but is otherwise disposed internally of the carton.

[0004] The carton is set up as an open-ended sleeve for loading and is then end-loaded whereafter the carton is completed by closure of the end closure panel. The end closure panel closing has an effect on the disposition of the handle strap. As the top end closure panels are folded into their closing positions the handle strap becomes slack into a position ready for use. When the carton is lifted by the central user part of the handle strap, the strap bows upwardly and protrudes through the handle access aperture proud of the top wall. The load is transmitted from the handle strap to the top wall of the carton at each of the opposite ends of the handle access aperture and is distributed through the top wall.

[0005] A further problem has been identified regarding the packaging of shaped articles, for example pear shaped bottles, whereby known cartons do not support the articles sufficiently well to minimise movement of the articles within the carrier.

[0006] The present invention has sought to overcome or at mitigate the problems of the prior art.

[0007] One aspect of the invention provides a carton for beverage containers which carton includes a series of hinged panels forming a sleeve and end closure panels hinged to at least one associated hinge panel for closing, at least in part, the opposite ends of a sleeve, wherein the said carton includes handle means by which the carton can be carried, said handle means comprising a strap connected to opposed end panels having a user part which is in substantially co-planar relationship with said one hinged panel when in a stored condition, the strap being so connected at its opposite ends to said end closure panels as to provide a surplus of material

to enable said user part to be brought into a position of use.

[0008] A second aspect of the invention provides a carton for holding a plurality of articles in a group, which carton comprising top, opposed side walls and a base, hingedly interconnected together to form a tubular structure wherein at least one of the side walls comprises a displaceable zone arranged to protrude out of the plane of the side wall to accommodate a portion of an adjacent article. The displaceable zone comprises a multiplicity of connected sections each occupying a different plane to a next adjacent section. Preferably, the displaceable zone is shaped to conform to the shape of the article.

[0009] According to an optional feature of the second aspect of the invention the connected sections are provided by a series of pairs of arcuate cut lines.

[0010] According to a further optional feature of the second aspect of the invention the side wall further comprises a tab struck from a portion of the side wall in which the plurality of arcuate cut lines are formed to define the protruding portion and wherein the cut lines are arranged in a substantially vertical plane.

[0011] In some embodiments there further comprises at least one article retaining flap to be folded inwardly of a side panel to retain a lower portion of an article.

[0012] A third aspect of the invention provides a blank for forming a carton comprising a plurality of articles including a shaped body portion, for example a pear shaped bottle, which carton blank comprising a top, opposed side walls and a base hingedly interconnected together wherein the side wall comprises a plurality of cut lines arranged in a spaced relationship and adapted to receive the shaped body portion of said article when the carton is in the set up condition. Preferably the cut lines are arcuate.

[0013] According to an optional feature of the third aspect of the present invention the side wall further comprises a tab struck from a portion of the side wall in which the plurality of arcuate cut lines are formed to define the protruding portion and wherein the cut lines are arranged in a substantially parallel arrangement. There may further comprises at least one article retaining flap to be folded inwardly of a side panel to retain a lower portion of an article.

[0014] Exemplary embodiments of the invention will now be described by way of example, with reference to the following drawings in which:

FIGURE 1 is a plan view of a blank of a wrap round carton;

FIGURE 2 is a plan view of part of the carton illustrating the portion for receiving and retaining an article;

FIGURE 3a is a perspective view of the upper panels of the blank shown in Figure 1;

FIGURE 3b is a perspective view of the inner face of the upper panels of blank showing the end closure panels being formed;

FIGURE 4 illustrates the lower portion of the carton formed substantially from a blank illustrated in Figure 1; and

FIGURES 5a, b, c and d illustrate the upper portion of the carton shown in Figure 1 showing various views of the handle during its construction.

[0015] Referring to the drawings and in particular Figures 1 and 2 thereof, an article carrier is formed from a unitary blank 10 made from paper board or other suitable foldable sheet material, which can be adapted to accommodate the variety of articles, for example six bottles arranged in two rows of three bottles each. It is envisaged the carrier can be adapted to accommodate a different number of bottles according to user requirements. Turning to the carton blank 10 illustrated in Figure 1, this blank includes a first base panel 12, sloping heel panel 14, lower side panel 16, upper side panel 18, shoulder panel 20, top panel 22, second shoulder panel 24, second upper panel 26, second lower side panel 28, sloping heel panel 30, second base panel 32 hingeably connected one to the next in a longitudinal plane along fold lines 34, 36, 38, 40, 42, 44, 46, 48, 50 and 52 respectively.

[0016] For tightening the wrapper around a group of articles, tightening apertures 58 are formed in base panel 12 while a similar tightening aperture 60 are formed in second base panel 34. With the wrapper disposed about a group of articles and with the base panels 12 and 34 disposed in an overlapping relationship, machine elements enter the tightening apertures 58, 60 and move towards the other, so as to tighten the wrapper about the group of articles as is well known. After the wrapper is tightened, it is locked by means of locking tabs 62 which are driven through the apertures and defined by retaining tabs 64 respectively. The configurations of locking tabs and retaining tabs 62, 64 are well known and the locking operation is well understood.

[0017] Article support and retaining means 66 comprises a series of article engaging reinforcing flaps 68,70,72;74,76,78 struck from the respective sloping heel panels 14;30 and base panels 12,32. The article support and retaining means further comprises a series of article support panels 80,82,84;86,88,90 struck from respective lower side panels 14,28. Article support panels 80-90 and article engaging reinforcing flaps 68-78 are identical and therefore a detailed description of article support panel 80 and article engaging reinforcing flap 68 only are here included and described in greater detail by reference to Figure 2.

[0018] Thus, in this embodiment, the article engaging reinforcing flaps 68 comprises a pair of oppositely disposed flaps 92,94 foldably joined to sloping heel panel 14 along fold lines 96 and 98 respectively. Preferably, fold lines 96 and 98 are convergent in an upward direction. Flaps 92, 94 are also connected to base panel 12 along fold lines 100 and 102 respectively, being convergent towards the free end edge of base panel 12. Pref-

erably, fold lines 96;98 and 100; 102 intersect at interrupted fold line 34. A cut line 104 separates adjacent flaps 92,94 and optionally a further pair of fold lines 106,108 extend between the intersection of fold line 34 with fold lines 100,96;102,98 respectively and cut line 104.

[0019] The lower edges of flaps 92,94 define an edge of tightening aperture 58 and the upper edge of flaps 92,94 extend into an article heel receiving aperture 110, struck from part of the sloping heel panel 14 and extending into lower side panel 16. In the embodiment illustrated in Figure 2, the article heel receiving aperture 110 is interrupted by article support panel 80 interconnecting opposed sides edges of the interrupted lower side panel 16.

[0020] The article support panel 80 comprises a series of cut lines 112, 114 being preferably arcuate. Thus, each set of cut lines 112 and 113 are spaced on either side of a notional centre line extending from points intermediate upper and lower edges 115, 116 of the article support panel 80. In this embodiment, each set comprises four cut lines 112 and 114, although it is envisaged that there could be more cut lines to increase the protrusion or fewer cut lines to reduce it. Thus, articles of varying shapes and sizes can be packaged without departing from the scope of invention, by the addition or removal of cut lines 112, 114. In use, the cut lines 112, 114 define a displaceable zone, hereinafter described.

[0021] Turning again to the construction of the blank illustrated in Figure 1, the blank further comprises a pair of opposed ends closure (or "adpanels") panels 118, 120 hingeably connected to top panel along interrupted fold lines 122 and 124 respectively, positioned along the longitudinal edges of top panel 22. The construction at each end of the top panel and end closure panels 118, 120 is similar and therefore like parts at one end of the top panel are designated by reference numerals to like parts of the opposite end with the addition of suffix 'a'. The main portion 126 of end closure panel 122 spans and constitutes one end of the top panel as hinged to an adjacent part thereof along longitudinal fold line 122.

[0022] The end closure panel 118 also includes gusset panels 128 and 130 hingeably connected together along fold line 122 and extending outwardly from upper side panel 18 and shoulder panel 20. Gusset panel 128 is connected to shoulder panel 20 along fold line 132 extending from aperture 134 to intersect with fold line 40. As shown in Figure 1, cut line 136 defines the lower edge of gusset panel 128 extending outwardly from the intersection of fold lines 40 and 132. Gusset panel 130 is connected to main portion 126 by lateral fold line 138. Gusset panel 130 can be separated from main portion 126 by a corner arrangement. By way of example, the corner arrangement comprises a series of panel portions 140, 142 which are hingeably connected together by fold lines 144, 146 and to gusset panel 130 by fold line 138 to define a substantially curved corner.

[0023] Likewise, the opposing corner of the end clo-

sure panel 118 is constructed from the end closure panel 118 also includes gusset panels 148 and 150 hingeably connected together along fold line 122 and extending outwardly from upper side panel 26 and shoulder panel 24. Gusset panel 148 is connected to shoulder panel 24 along fold line 152 extending from aperture 154 to intersect with fold line 46. As shown in Figure 1, cut line 156 defines the lower edge of gusset panel 148 extending outwardly from the intersection of fold lines 46 and 152. Gusset panel 150 is connected to main portion 126 by lateral fold line 158. Gusset panel 150 can be separated from main portion 126 by a corner arrangement. By way of example, the corner arrangement comprises a series of panel portions 160, 162 which are hingeably connected together by fold lines 164, 166 and to gusset panel 150 by fold line 158 to define a substantially curved corner.

[0024] In one class of embodiments, a stabilizing (or bottle neck spacer) flap 168 shown in Figure 1 is struck from the blank partially in the top panel 22 and partially in the main portion of end closure panel 118 so that the flap 168 is hinged to those panels about fold lines 170, 172 respectively but otherwise cut out from the blank. Flap 168, preferably comprises a tread panel 174 and a riser panel 176, connected together along fold line 178, which panels are adapted during carton construction to define a step (or keel element).

[0025] The top panel 22 can further comprise a central user portion 180, frangibly connected to the top panel 22. In this embodiment, the central user portion 180 is substantially rectangular in shape and comprises a pair of support panels 182, 184 struck from and connected to the side edges of central user portion along fold lines 186, 188 respectively. Additionally, a handle strap 190, shown in the Figure 3a can be applied to the inner surface of the blank 10, being secured to the central user portion 180 and the opposed main portions 126, 126a of end closure panels by glue or other means known in the art. Preferably, the handle strap 190 is also glued to the tread panels 174, 174a of each step as shown in Figure 3a. It is further preferred the handle strap is formed from paper board, laminated paper board, fibrous tape or other suitable plastics material.

[0026] Turning to the construction of the carton, illustrated in Figures 3b, 4 and 5a,b,c,d, the blank requires a series of sequential folding and gluing operations which can be performed in a straight line machine so that the carton is not required to be rotated or inverted to complete its construction. The folding process is not limited to that described below and can be altered according to particular manufacturing requirements.

[0027] Thus, articles A are held together in two rows of three articles A and the carton blank is introduced to the articles A. In this embodiment the blank is introduced from above. The shoulder panels 20, 24 and side panels 16, 18, 26, 28 of the blank are then folded about fold lines 42 and 48 respectively such that side panels preferably taper downwardly and outwardly from top panel

24 and the end closure panels are constructed.

[0028] The end closure panels 118 and 120 are folded downwardly at each end of the sleeve formed by the wrap around folding action. At the same time, gusset panels 128, 130 and 148, 150 are folded inwardly about fold lines 132, 152 and 122 whereby gusset panels 128; 148 come into face to face relationship with shoulder panel 20 and 24 respectively. The panels are at the stage of construction shown in Figure 3b. Thereafter, the side panels 18, 26 continue to be folded such that the second gusset panels 130, 150 come into face to face contact with their respective first gusset panels 128, 148. During the aforementioned folding process the corner arrangements are also formed whereby panel portions 140, 160 are folded out of alignment with next adjacent panel portion 142, 162 to define a substantially curved corner portion, shown in Figure 3b.

[0029] Optionally, the faces of gusset flaps 128, 148 in contact with shoulder panels 20, 24 respectively may be secured together by means known in the art to hold the end closure panels in place. Additionally, or alternatively, first and second gusset panels 128, 130, 148, 150 may be secured together by glue or other means known in the art.

[0030] Each of the stabilising (or bottle neck spacer) flaps 168, 168a are formed with cut line 175, 177, 175a, 177a intermediate and substantially perpendicular to fold lines 170, 172, 170a, 172a about which flaps can fold in a toggle action to define a step 191 at each end of the top panel 22. This action can occur automatically upon folding the end closure panels which brings the flaps 191 into their operative position in which the flaps are displaced out of the plane of the top panel inwardly of the carton, as shown in Figure 3b. Optionally, cut lines 175, 177; 175a, 177 are shaped to define a shaped edge adapted to cooperate with a neck portion of an article. Once displaced the, or each, stabilizing flap 168, 168a is disposed between neck portions of adjacent end of articles within the package to assist in maintaining the articles in their correct upright positions within the package, particularly to prevent the bottles tipping inwardly whereas the end closure panels prevent the bottles toppling end wise of the package.

[0031] The article support and retaining means 66 is also formed whereby the article engaging flaps 68 to 78 are folded inwardly to define receiving faces as is well known, and base panels 12 and 34 are folded out of alignment with sloping heel panels 14 and 32 and lower side panels 16 and 30 respectively and the side panels and base are brought into contact with respective articles A, such that the lower portion of articles A protrude through apertures formed from the retaining means and are held in position thereto by flaps 92, 94 of retaining means, 66, shown in Figure 4. It will be appreciated that the articles support panels 80 to 90 are also moved out of alignment with lower side panel upon engagement with a portion of the article whereby a displaceable zone 192 is formed, which displaceable zone is arranged to

protrude outwardly of the plane of the side walls 16, 28 to accommodate a portion of an adjacent article. It will be seen from Figure 4, the displaceable zone 192 comprises a multiplicity of connected sections 194 each occupying a different plane to the next adjacent section. More particularly, the connected sections 194 are provided by the arcuate cut lines 112, 114 as shown in Figure 2 and 4.

[0032] Thereafter, base panels 12 and 34 are brought into overlapping relationship and connected together as hereinbefore described. Thus, the carton is in a set up and loaded condition.

[0033] The handle is formed by reference to Figures 5a and 5d. The central user portion 180 can be detached from the top panel 22 whereby at least a portion of the handle strap stands proud of the top panel, shown in Figure 5b. It will be seen from Figure 3b that the strap is so connected at the opposite ends of the end closure panels as to provide a surplus of material to enable the central user portion 180 to be brought into a position of use, shown in Figure 5c. The support panels 182, 184 are folded under the handle strap 190, such that the central user portion 180 is wrapped around the strap, the central user portion 180 provides a cushion for the strap, shown in Figure 5c. Further, the central user portion 180 is designed for ease of use. When the carrier is in use there is a tendency for the handle strap to draw the end closure panels 126, 126a and corner arrangements 139, 159 inwardly thereby to improve the integrity of the carton and providing a self tightening effect, shown in Figure 5d.

[0034] The present invention and its preferred embodiment relate to an article carrier which is shaped to provide satisfactory strength to hold articles securely but with a degree of flexibility so that load transfer to the handle is absorbed by the carrier. The shape of the blank minimises the amount of paper board required and the carrier can be applied to an array of articles by hand or automatic machinery. It is anticipated that the invention can be applied to a variety of carrier and is not limited to the wrap around type. For example the top panel 22, side panels 20, 24 and end closure panels 118, 120 of the aforementioned carton can be applied to a top gripping carton and likewise the article retaining and support means 66 can be applied to other carton types, without departing from the scope of the inventions.

Claims

1. A carton for holding a plurality of articles in a group, which carton comprising top (22), opposed side walls (18, 26) and a base (12, 32), hingeably interconnected together to form a tubular structure wherein at least one said side walls comprises a displaceable zone (66) arranged to protrude out of the plane of the side wall to accommodate a portion of an adjacent article and wherein said displaceable

zone comprises a multiplicity of connected sections each occupying a different plane to a next adjacent section.

2. A carton according to claim 1 wherein the displaceable zone is shaped to conform to the shape of the article.
3. A carton according to claim 1 or claim 2 wherein the connected sections are provided by a series of pairs of arcuate cut lines (112, 114).
4. A carton as claimed in any preceding claim wherein the side wall further comprises a tab (80, 82, 84; 86, 88, 90) struck from a portion of said side wall (18, 26) in which the plurality of arcuate cut lines (112, 114) are formed to define the protruding portion and wherein the cut lines are arranged in a substantially vertical plane.
5. A carton as claimed in any of claims 1 to 4 wherein there further comprises at least one article retaining flap to be folded inwardly of a side panel to retain a lower portion of an article.
6. A blank for forming a carton comprising a plurality of articles including a shaped body portion, for example a pear shaped bottle, which carton blank comprising a top (22), opposed side walls (18, 26) and a base (12, 32) hingeably interconnected together wherein the side wall comprises a plurality of cut lines (112, 114) arranged in a spaced relationship and adapted to receive the shaped body portion of said article when the carton is in the set up condition.
7. A blank as claimed in claim 6 wherein the cut lines are arcuate.
8. A blank as claimed in any of claims 6 to 7 wherein the side wall further comprises a tab (80, 82, 84; 86, 88, 90) struck from a portion of said side wall (18, 26) in which the plurality of arcuate cut lines (112, 114) are formed to define the protruding portion and wherein the cut lines are arranged in a substantially vertical plane.
9. A blank as claimed in any of claims 6 to 8 wherein there further comprises at least one article retaining flap to be folded inwardly of a side panel to retain a lower portion of an article.

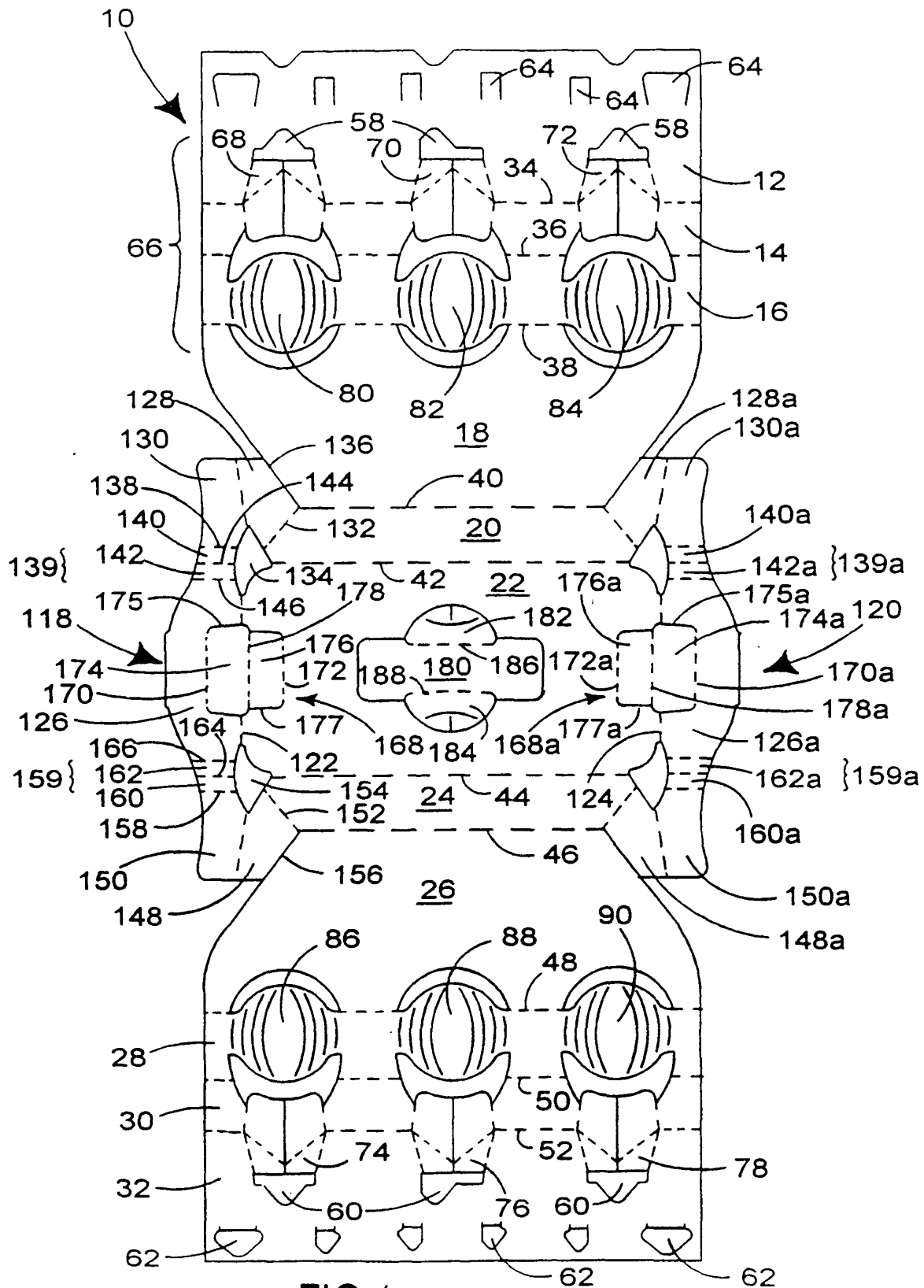


FIG.1

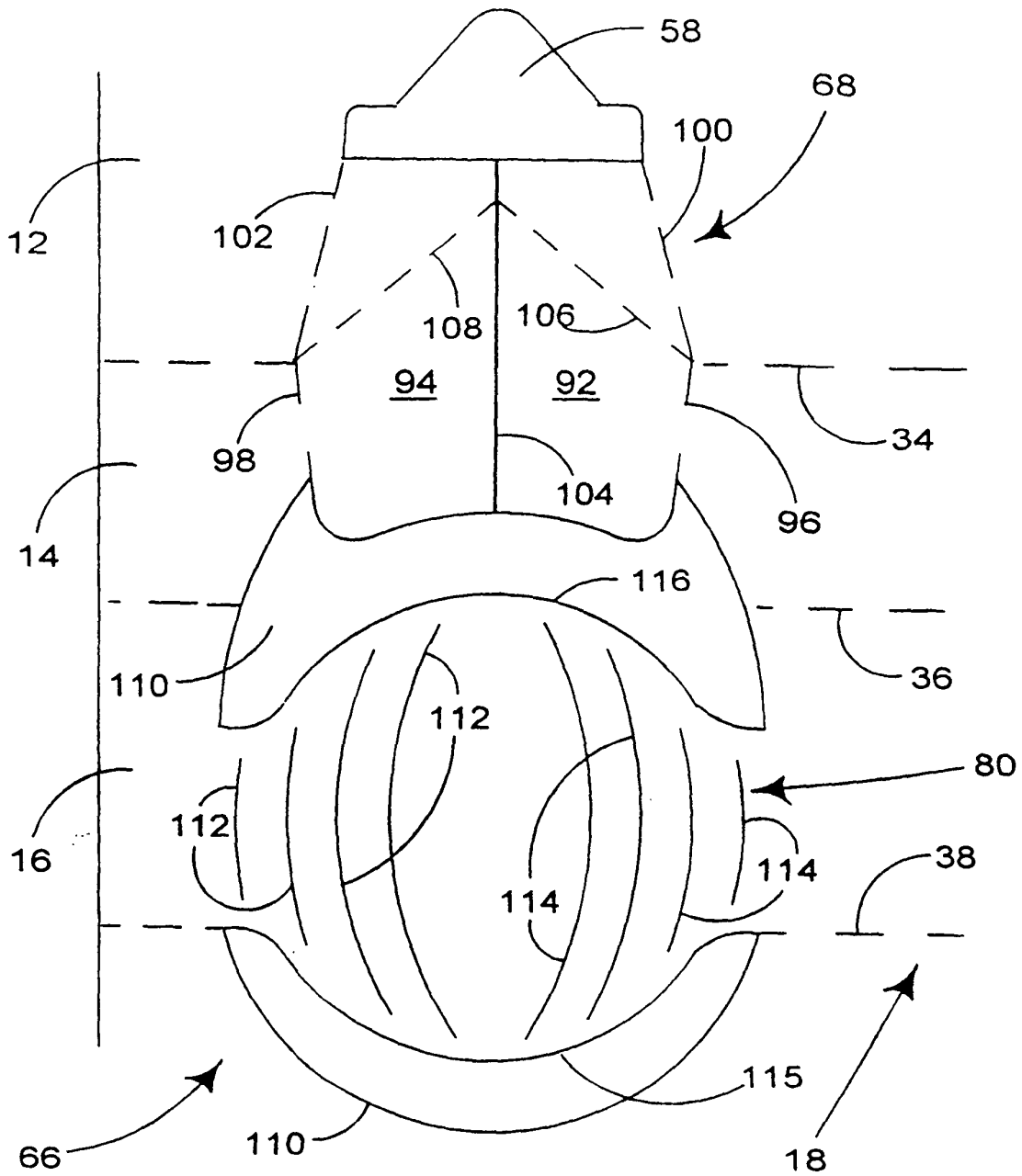
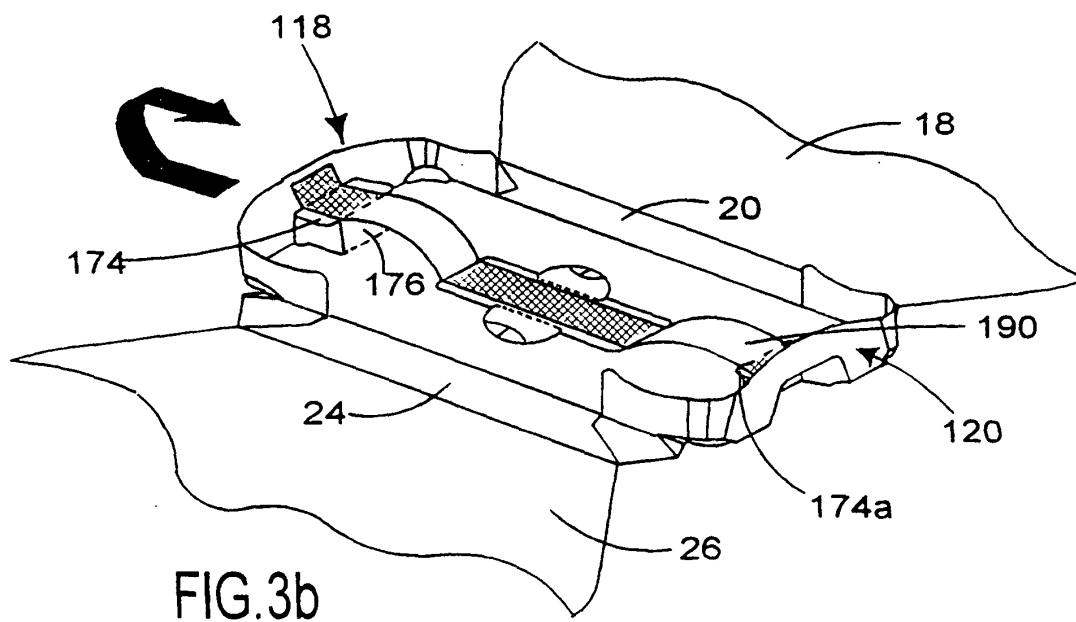
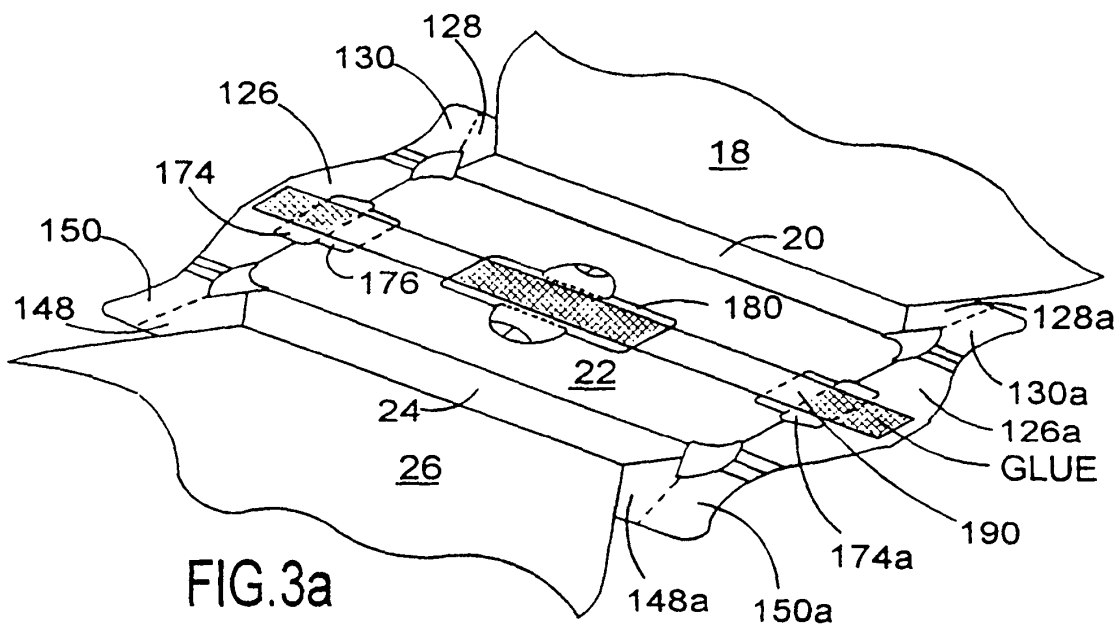


FIG.2



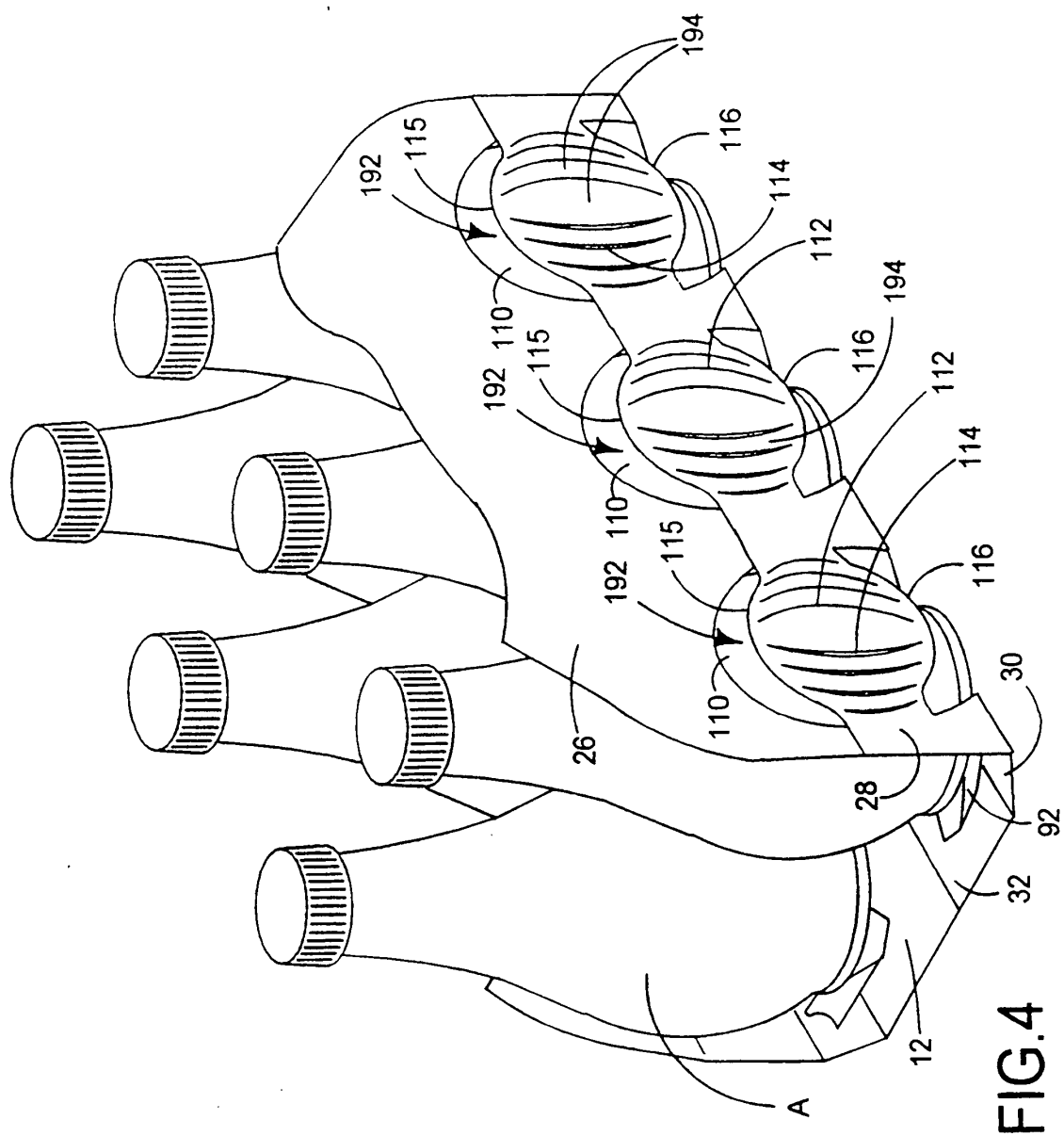
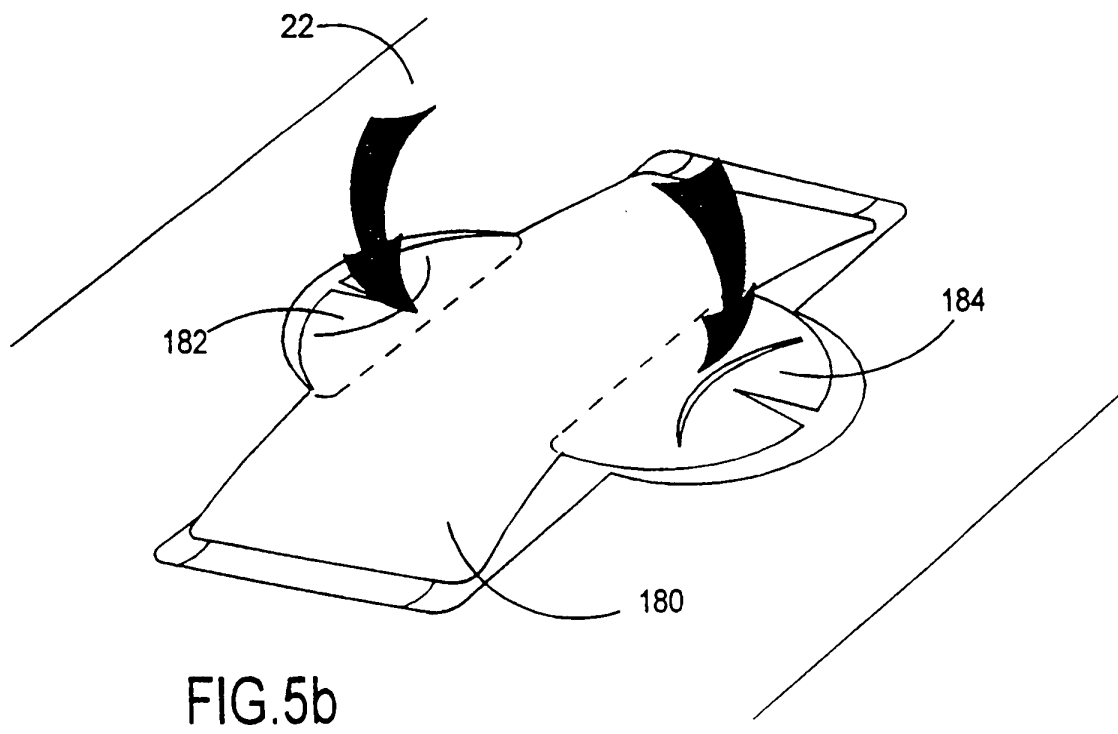
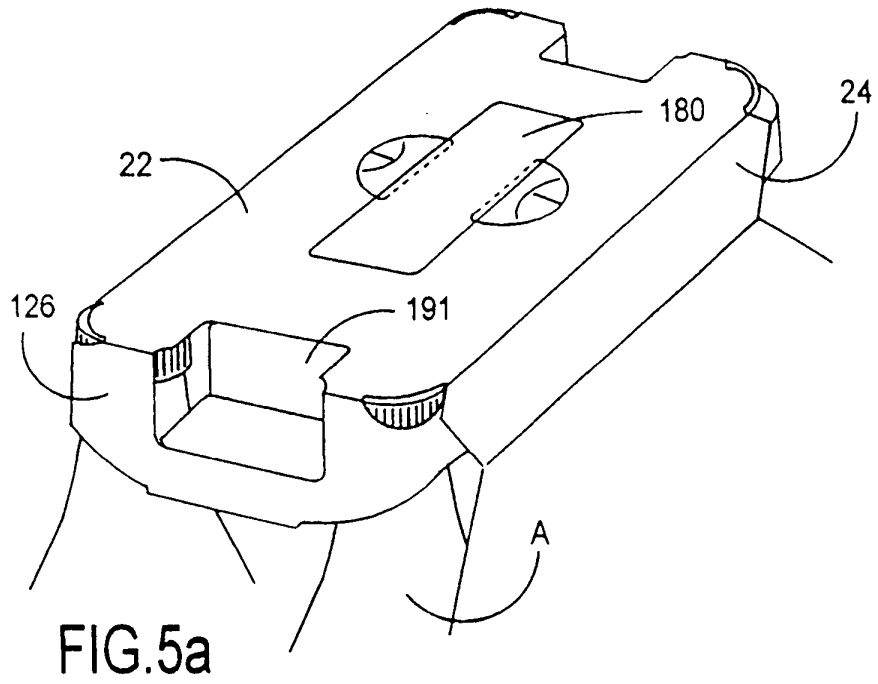
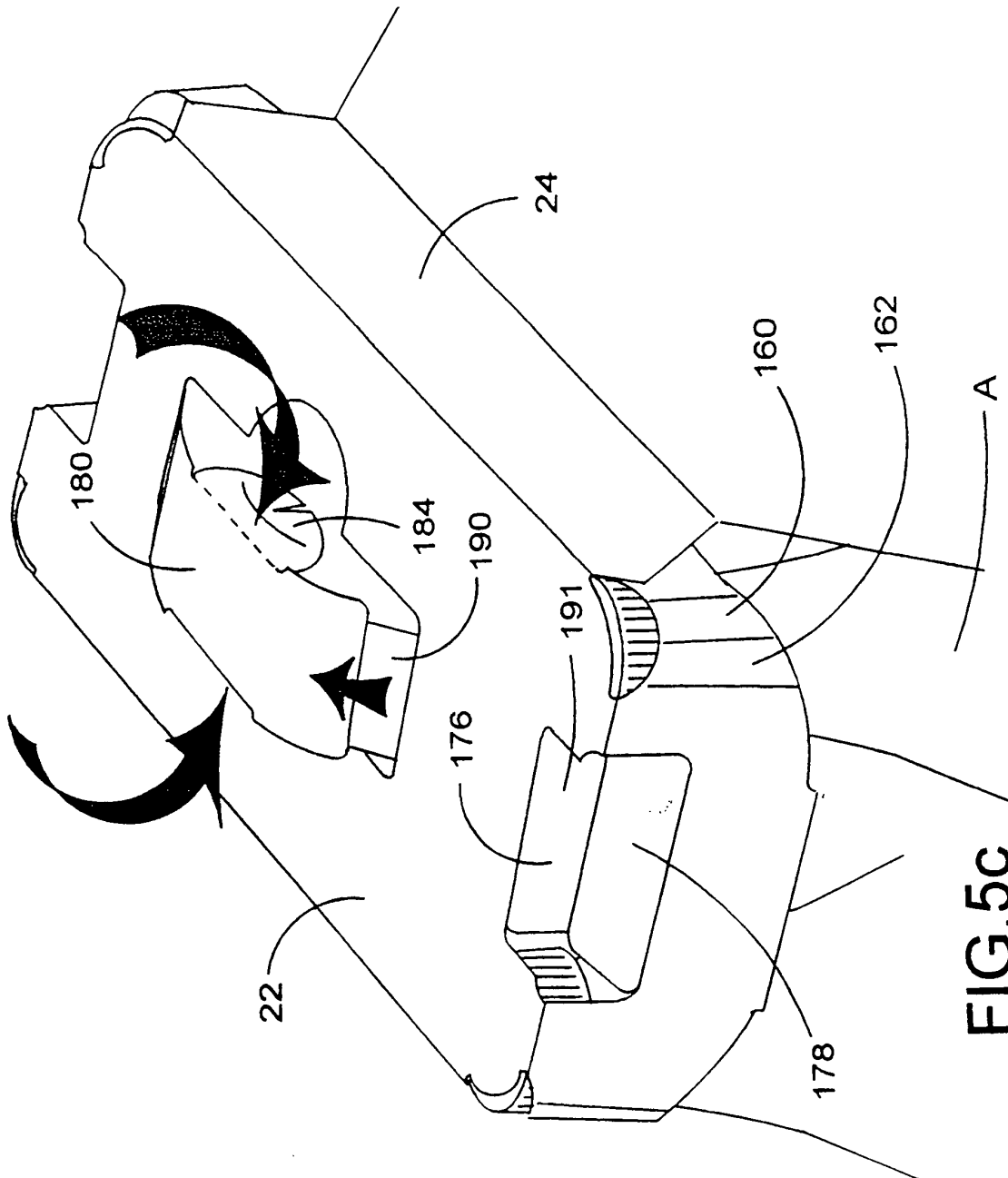
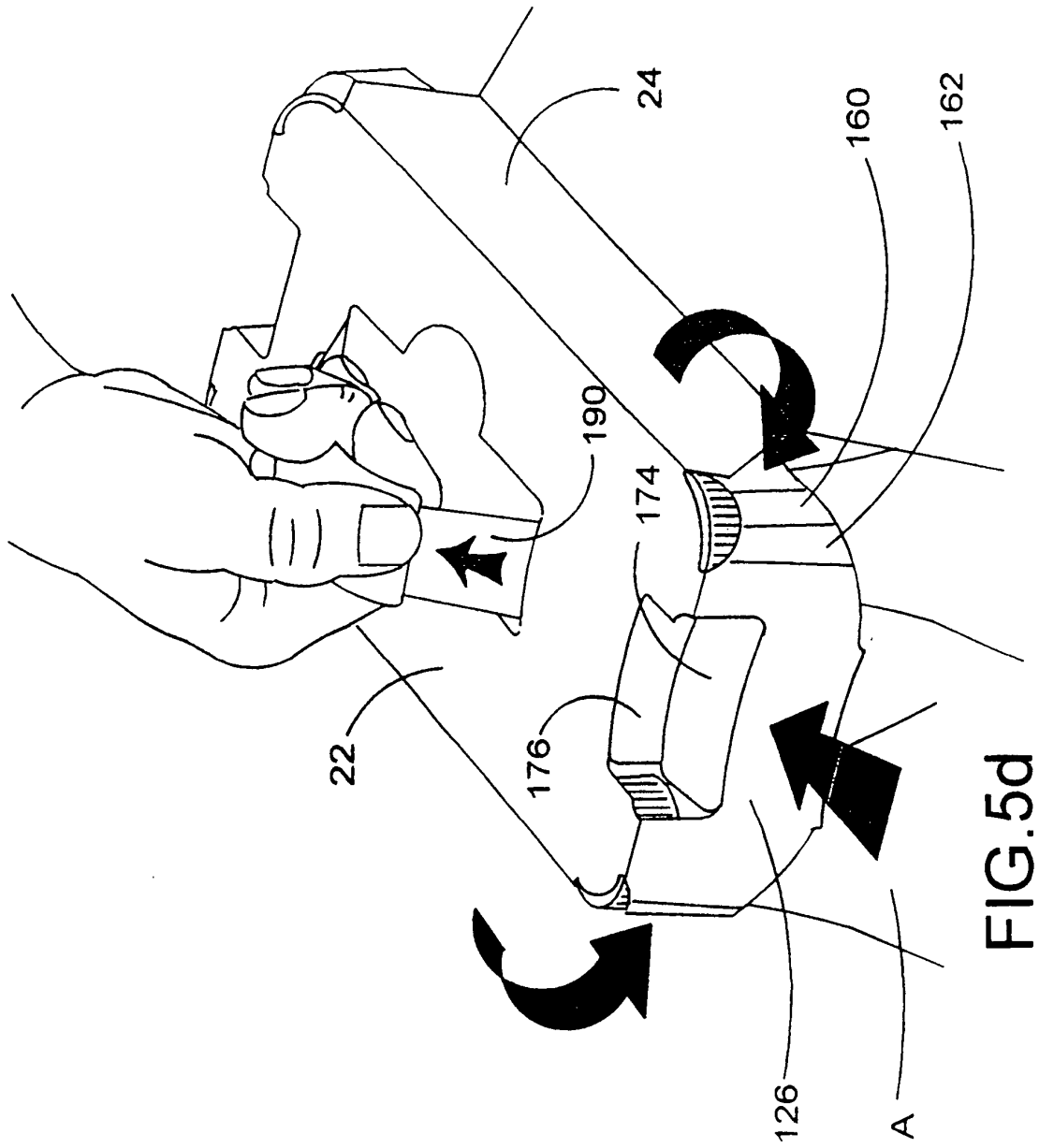


FIG. 4









European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 02 00 5869

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	GB 825 971 A (THE METAL BOX COMPANY) 23 December 1959 (1959-12-23) * column 2, line 119 - column 3, line 48 *	1,2,6	B65D71/00 B65D5/46
A	* figures 1-3 * ---	3,7	
A	FR 1 447 790 A (CATONNAGE-IMPRIMERIE VALLON ET MAYOUSSE) 29 July 1966 (1966-07-29) * page 2, left-hand column, line 38 - page 2, right-hand column, line 45 * * figures 1-3 * -----	1,6	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B65D
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 11 June 2002	Examiner Farizon, P
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 02 00 5869

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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11-06-2002

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GB 825971	A	23-12-1959	NONE	
FR 1447790	A	29-07-1966	NONE	

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