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71 Applicant: **Federal Paper Board Co. Inc., 75 Chestnut Ridge Road, Montvale New Jersey 07645 (US)**

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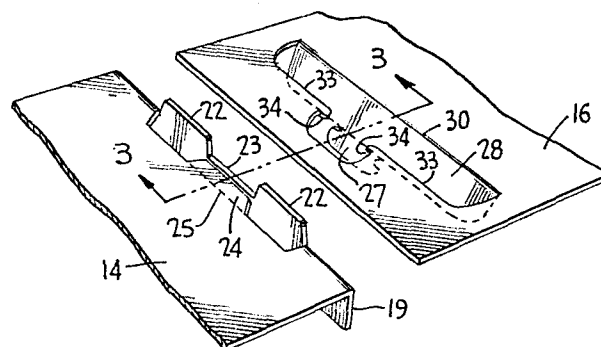
72 Inventor: **Ganz, Robert Henry, 8 Ridgecrest Road, Saddle River New Jersey 07458 (US)**
Inventor: **Manizza, Guelfo Antonio, 23 Cobble Place, Blauvelt New York 10913 (US)**

84 Designated Contracting States: **AT BE CH DE FR GB IT LI NL SE**

74 Representative: **Hallam, Arnold Vincent et al, E.N. LEWIS & TAYLOR 144 New Walk, Leicester LE1 7JA (GB)**

54 Carton closure interlock.

57 This relates to a closure interlock between closure panels of a carton of the wrap around type. The closure interlock provides for a primary locking tab on an outer one of the closure panels and a secondary locking tab on the inner one of the closure panels whereby a primary lock and a secondary lock may be formed generally in alignment longitudinally of the closure interlock thus providing for a savings of carton forming stock corresponding to the normal spacing of the primary lock and the secondary lock transversely of the general line of the closure interlock. The secondary locking tab passes through the outer closure panel and returns generally into the opening from which it is formed.



EP 0 092 396 A2

CARTON CLOSURE INTERLOCK

This invention relates in general to new and useful improvements in cartons of the wrap around type having a closure panel assembly defined by inner and outer closure panels, and more particularly to the closure interlock between the inner and outer closure panels.

For many years there has been in commercial use a closure interlock wherein the outer closure panel is provided with primary and secondary locking tabs which are engaged in sequence with primary and secondary locking shoulders formed on the inner closure panel. With this arrangement, the resultant primary lock and secondary lock are spaced from one another along the length of the closure interlock, thus requiring a greater than necessary overlap of the inner and outer closure panels.

In accordance with this invention, it is proposed to modify the closure interlock by placing the primary locking tab on the outer closure panel, in the customary manner, but so forming the inner closure panel so as to have the secondary locking tab formed thereon and carried by a flap which moves out of the plane of the inner closure panel so as to define primary locking shoulders on opposite sides of the position of the secondary locking tab for engagement by the primary locking tab. Thus the primary lock and secondary lock are placed substantially in alignment along the length of the closure interlock. This permits a savings of between one

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half inch and three quarter inch of the carton forming material, which savings is on the order of six percent or greater depending on the size of the items which are to be wrapped into a package
5 using the carton.

Specifically the invention relates to a closure interlock for a closure panel assembly of a carton of the wrap around type, said closure interlock comprising an inner closure panel and
10 outer closure panel each having a free edge, said inner closure panel having struck therefrom a secondary locking tab carried by a flap with said secondary locking tab facing said free edge of said inner closure panel, the displacement of said secondary
15 locking tab and said flap from said inner closure panel defining an opening in said inner closure panel, and said outer closure panel having a terminal flap portion in part defined by a fold line and in part by cut line means, said cut line means de-
20 fining a primary locking tab carried by said terminal edge flap portion and facing away from said outer closure panel free edge for locking behind said inner closure panel, said secondary locking tab extending first through said outer closure panel
25 and then through said opening in said inner closure panel.

Another feature of the invention is that the secondary locking tab is generally seated in that part of said opening in said inner closure
30 panel from which said secondary locking tab is formed.

Yet another feature of the invention is that said secondary locking shoulder underlies said primary locking tab a distance wherein said secondary locking tab may enter through said closure
35 panels at a shallow angle for movement beneath an

article being packaged in the carton.

Additionally there may be a separator tab hingedly carried by said secondary flap.

With the above and other objects in view
5 that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims, and the several views illustrated in the accompanying drawings.

10 Figure 1 is a bottom plan view of adjacent portions only of the inner and outer closure panels and shows the closure panels in spaced relation.

 Figure 2 is a fragmentary exploded perspective view showing adjacent edge portions only
15 of the closure panels of Figure 1 folded ready for interlocking engagement.

 Figure 3 is an enlarged fragmentary sectional view taken generally along the line 3-3 of Figure 2 and shows further the details of the folded
20 closure panel portions.

 Figure 4 is a sectional view similar to Figure 3 but wherein the closure panels have been brought into overlapping engagement and the primary locking tab has been engaged behind its associated
25 primary locking shoulder and serving to draw the closure panels into tight overlapping relation.

 Figure 5 is another sectional view similar to Figure 3 showing the primary locking tab fully engaged and the secondary locking tab being moved
30 through both the outer closure panel and the inner closure panel for engagement behind the secondary locking shoulder.

 Figure 6 is another sectional view similar to Figure 3 showing the details of the completed
35 closure interlock.

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Figure 7 is a perspective view of the lower portion of the closed carton and shows generally the details of the closure interlock.

Figure 8 is a plan view comparing the overall lengths of a conventional carton blank having primary and secondary locking tabs carried by the outer closure panel and a carton wherein the closure interlock is one wherein the primary locking tabs are carried by the outer closure panel and the secondary locking tabs are carried by the inner closure panel.

Figure 9 is an enlarged bottom plan view of closure panels incorporating a closure interlock in accordance with this invention.

Figure 10 is a perspective view showing the closure panels brought together and the primary locking tabs initially engaged with primary locking shoulders on the inner closure panel.

Figure 11 is an enlarged fragmentary vertical sectional view taken generally along the line 11-11 of Figure 10 and shows further the details of the partially formed closure interlock.

Figure 12 is a fragmentary sectional view similar to Figure 11 and shows the primary locking tabs in place and the secondary locking tabs in their initial phase of passing through the closure panels.

Figure 13 is another fragmentary sectional view similar to Figure 11 and shows the completed closure interlock.

Figure 14 is a fragmentary perspective view of the closure panel and assembly of the container and the details of the closure interlock.

Figure 15 is a bottom plan view similar to Figure 9 and shows a modified form of closure interlocks.

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Figure 16 is a fragmentary perspective view similar to Figure 10 and shows the initial engagement of the primary locking tabs with the inner closure panel.

5 Figure 17 is an enlarged fragmentary vertical sectional view taken generally along the line 17-17 of Figure 16 and shows further the details of the initial engagement of parts of the closure interlock.

10 Figure 18 is a vertical sectional view similar to Figure 17 and shows the primary locking tabs fully in place and the secondary locking tabs in an initial position moving through the closure panels.

15 Figure 19 is another sectional view similar to Figure 17 and shows the completed closure interlock.

Figure 20 is a fragmentary perspective view of the lower portion of a carton and shows the details of the closure panel assembly and the closure interlock.

Figure 21 is an exploded bottom view of two closure panels incorporating the closure interlock and separator tab.

25 Figure 22 is a sectional view through one of the closure interlocks showing the closure panels in partial overlapping relation, and the primary locking tab engaged behind the primary locking shoulder and the separator tab vertically extending
30 between two adjacent items in initial formation of the closure interlock.

Figure 23 is a sectional view similar to Figure 22 and shows the primary locking tab in its fully operative position and a secondary locking
35 tab initially entering into aligned openings in the

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closure panels.

Figure 24 is another sectional view similar to Figure 22 and shows the completed closure interlock.

5 Figure 25 is a fragmentary perspective view showing the closure panels fully interlocked including the details of two adjacent closure interlocks and their respective separator tabs.

Referring to the drawings in detail, it
10 will be seen that there is illustrated in Figure 7 the lower portion of a carton having a closure interlock in accordance with this invention, the carton being identified by the numeral 10. The carton 10 includes a pair of side panels 11 and 12 which are
15 connected together by a two piece closure panel assembly generally identified by the numeral 13. The closure panel assembly 13 includes an outer closure panel 14 connected to the lower edge of the side panel 11 along a fold line 15. The closure panel
20 assembly 13 also includes an inner closure panel 16 connected to the lower edge of the side panel 12 along a fold line 17. The closure panels 14 and 16 are interconnected by a closure interlock formed in accordance with this invention and generally identified by the numeral 18.

At this time it is pointed out that while the closure interlock 18 has universal application, it is particularly adapted for forming an interlock between closure panels of a carton intended to wrap
30 four items with the closure interlock 18 being centered between these four items.

Referring now to Figure 1, it will be seen that the closure panel 14 has formed along the free edge thereof a terminal flap portion 19 which is de-
35 fined in part by an interrupted fold line 20 and a

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cut line 21. The combination of the fold line 20 and the cut line 21 defines a pair of primary locking tabs 22 which are spaced along the length of the closure and which are separated by a secondary locking shoulder 23. These are best seen in Figure 2 wherein the terminal flap portion 19 is folded out of the plane of the panel 14 so that the primary locking tabs 22 are upstanding.

It is also to be noted that opposing the secondary locking shoulder 23 and between the primary locking tabs 22 is a further tab 24 which is connected to the closure panel 14 along a fold line 25. The purpose of the folding of the tab 24 will be described hereinafter.

The closure panel 16 has formed therein a cut line 26 which generally defines a secondary locking tab 27 which is carried by a secondary flap 28. The secondary flap 28 is connected to the closure panel 16 along a fold line 30. It is to be noted that the secondary locking tab 27 is connected to the flap 28 by a reduced width neck portion 31 and generally along a fold line 32.

Referring now particularly to Figure 2, it will be seen that when the secondary locking tab 27 and its associated flap 28 are struck from the panel 16, there is defined on the panel 16 a pair of primary locking shoulders 33, one on each side of the position of the secondary locking tab 27. There is also formed on the closure panel 16 facing in the opposite direction from the primary locking shoulders 33 two secondary locking shoulders 34.

In the formation of the closure interlock 18, the terminal flap portion 19 and the secondary locking tab and flap 28 are folded to the positions shown in Figure 2 prior to the overlapping of the closure panels 14 and 16. The adjacent edge portions

of the closure panels 14 and 16 are then brought into overlapping relation with the primary locking tabs 22 extending through the opening and the closure panel 16 defined by the displacement of the
5 secondary locking tab 27 and the locking flap 28 and are engaged behind the primary locking shoulders 33, as is shown in Figure 4. The primary locking tabs 22 thus interlocked behind the shoulders 33, the terminal flap portion 19 is folded up generally
10 through the opening in the inner closure panel 16 to the position illustrated in Figure 5 and the secondary locking tab 27 is folded or hinged relative to the flap 28 and inserted through the openings formed in the closure panels 14 and 16 with
15 the secondary locking tab 27 first engaging behind the secondary locking shoulder 23 and then behind the secondary locking shoulders 34, as is shown in Figure 5.

Further movement of the secondary locking
- 20 tab 27 and the associated flap 28 results in the completion of the closure interlock 18 with both the primary locking tabs 22 and the secondary locking tab 27 being disposed inwardly of the carton 10 and secured in place.

25 At this time it is to be noted that when the secondary locking tab 27 passes through the outer closure panel 14, it engages the flap 24 and it displaces the same to permit the secondary locking tab 27 to move into position through the outer clo-
30 sure panel 14.

Reference is now made to Figure 9 wherein there is illustrated an outer closure panel 50 and an inner closure panel 51 of a closure panel assembly 52 of a carton 53 of which the lower portion only is
35 shown in Figure 14.

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The closure panel 50 is provided with a combination of fold or hinge lines 54 and cut lines 55 to define along the free edge thereof a terminal flap portion 56 which carries a pair of primary locking tabs 57 which are spaced along the general length of the closure panel 50.

The inner closure panel 51 is provided with a fold or hinge line 58 generally parallel to its free edge and which in association with a cut line 60 defines a secondary flap 61 carrying a pair of secondary locking tabs 62. Each secondary locking tab 62 is hingedly connected to the secondary flap 61 along a hinge or fold line 63.

Further, each locking tab 62 is provided with a reduced width neck portion 64 generally defined by an elongated finger 65 which projects generally into the secondary locking tab 62. The fingers 65 are arranged in generally opposed relation.

When the secondary flap 61 and the secondary locking tab 62 are struck downwardly out of the plane of the inner closure panel 51, as is shown in Figure 11, a relatively large opening 66 is formed in the inner closure panel 51 and there is defined on the inner closure panel 51 primary locking shoulders 67 and on the fingers 65 secondary locking shoulders 68.

With the secondary locking tab 62 and the secondary flap 61 struck downwardly out of the inner closure panel 51 and the terminal flap portion 56 folded to a downward position, an initial interlock may be made by inserting the primary closure tab 57 through the opening 66 and behind the shoulders 67, as is shown in Figure 11. The terminal flap portion 56 may then be folded upwardly against the underside of the inner closure panel 51, as shown in Figure 12, after which the secondary locking tabs 62 may be

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hinged relative to the secondary flap 61 and advanced through the outer closure panel 50 to the right of the primary locking tabs 57 and through those portions of the inner closure panel 51 from which the secondary locking tabs have been struck, as is shown in Figure 12. It will be seen that the secondary locking shoulders 68 underlie the primary locking tabs 57 and are so positioned whereby the angle of entry of the secondary locking tabs 62 is relatively shallow so that the secondary locking tabs 62 may enter beneath overlying articles which are being formed into a package within the carton 53.

The movement of the secondary locking tab 62 into the interior of the carton continues until the secondary locking tabs 62 are totally within the carton and overlying the inner closure panel 51, as is shown in Figure 6. The closure interlock, generally identified by the numeral 70 is now complete.

Referring now to Figure 8, it will be seen that there is illustrated a carton of the wrap around type which is generally identified by the numeral 71 and includes an outer closure panel 72 and an inner closure panel 73 generally corresponding to the closure panels 50 and 51, respectively. The carton 71 is provided with two closure interlocks generally corresponding to the closure interlock 70 for interlocking the closure panels 72 and 73 in the manner illustrated in Figure 14.

In Figure 8 there is also illustrated a conventional type of wrap around carton generally identified by the numeral 74. It is to be understood that the carton 74 will be of the same overall size

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for forming a package of one or more items in the same manner as in the case of the carton 71. However, the carton 74 is provided with an outer closure panel 75 and an inner closure 76 with an entirely different type of closure interlock. The closure interlock of the carton 74 includes cutouts 77 in the inner closure panel 76 which define primary locking shoulders 78 spaced from secondary locking shoulders 80. In a like manner, the outer closure panel 75 is provided with one or more terminal flap portions 81 which carry primary locking tabs 82 and secondary locking tabs 83 for engagement with the locking shoulders 78 and 80, respectively.

It will be seen that the locking shoulders 78 and 80 are spaced a considerable distance transversely of the length of the closure panels 75, 76 whereas in accordance with the specific illustrations of Figures 9-14, the inner closure panel 73 of the carton 71 is provided with primary locking shoulders 84 and secondary locking shoulders 85 which are spaced closely together transversely of the length of the closure panels 72, 73. As a result, the overall length of the blank of the carton 71 is a length l_1 which is lesser than the length of the blank for the carton 74, l_2 by a distance l_3 . The distance l_3 is basically equal to the spacing between a locking shoulder 78 and a locking shoulder 80 less the spacing between a locking shoulder 84 and a locking shoulder 85. This distance will be on the order of one half inch to three quarters inch and depending on the overall length of the carton blank may constitute a saving of carton stock equal to six percent or greater.

Referring now to Figure 20, it will be seen that there is illustrated a modified carton 86 having a closure panel assembly defined by a slightly

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modified form of closure interlock 87. The closure panel assembly includes an inner closure panel 88 and outer closure panel 90.

The outer closure panel 90 has formed along the free edge thereof a terminal flap portion 91 which is defined by a combination of hinge lines 92 and cut lines 93 with the cut lines 93 defining along the terminal flap portion 91 primary locking tabs 94.

10 The inner closure panel 88 has in alignment with each of the primary closure tabs 94 a fold line 95 and a cooperating cut line 96 which define a secondary flap 97 carrying a secondary locking tab 98 with the secondary locking tab 98 being hingedly
15 connected to the secondary flap 97 along a hinge line 100.

Each of the secondary locking tabs 98 is provided with a narrow neck 101 defined by a pair of opposed fingers 102 generally projecting into the
20 secondary locking tab 98.

When each secondary locking tab and its associated flap 97 is struck downwardly out of the inner closure panel 88, there is formed in the closure panel 88 a relatively large opening 103. This
25 opening provides on opposite sides of the initial position of each secondary locking tab 98 a primary locking shoulder 104. Also, each finger 102 defines a secondary locking shoulder 105.

In forming the closure panel assembly of
30 Figure 20, the closure panels 88 and 90 are brought together with the closure panel 90 underlying the closure panel 88, as is generally shown in Figures 9 and 10. The primary closure tabs 94 are then passed through the openings 103 and engage behind
35 the primary locking shoulders 104. Then the terminal flap portion 91 is swung up to a position

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generally underlying the adjacent portion of the closure panel 88, as is shown in Figure 18. Next, each secondary locking tab 98 is hinged relative to its associated secondary flap 97 and is inserted
5 through aligned opening portions in the closure panels 88, 90, as is shown in Figure 18. It will be seen that the angle of entry of the secondary locking tabs 98 is relatively shallow as in the case of the secondary locking tabs 62 of the embodiment
10 of the invention illustrated in Figures 9-14.

The secondary locking tabs 98 are continued to be moved into the container until they assume the positions illustrated in Figure 19 overlying the adjacent portion of the inner closure panel 88
15 to complete closure interlock 87.

It is to be understood that because of the shallow angle of entry of the secondary locking tabs into the interior of the carton 86, the secondary locking tabs 98 may underlie articles which are being
20 formed into a package by the carton 86.

Referring now to Figure 25 in detail, it will be seen that there is illustrated an outer closure panel 120 and an inner closure panel 121 of a closure panel assembly 122 of a carton of the wrap
25 around type intended to have packaged therein items in two rows. The closure panels 120, 121 are secured together by a plurality of closure interlocks 123 which may be aligned with a set or pair of such items within the carton.

30 Each closure interlock 123 includes a primary locking tab 124 which is carried by a terminal flap portion 125 of the outer closure panel 120. The terminal flap portion 125 and each primary locking tab 124 carried thereby is defined by a
35 series of hinge or fold lines 126 and cut lines 127.

Each closure interlock also includes formed in the inner closure panel 121 by means of a hinge or fold line 128 and cut lines 130 and 131, a secondary locking tab 132, a secondary flap 133 and a separator tab 134. Each secondary locking tab 132 is joined to the secondary flap 133 along a hinge line 135 and includes a narrow neck portion 136 defined by a pair of opposed fingers 137 projecting thereinto.

10 When the secondary locking tab 132 and the secondary flap 133 are struck out of the inner closure panel 121, an opening 138 is formed with the boundaries of the opening 138 defining primary locking shoulders 140 and secondary locking shoulders
15 141.

It is also to be noted that the separator tab 134 is hingedly connected to the secondary flap 133 along a fold line 142.

Referring now to Figure 22, it will be
20 seen that the separator tabs 134 are struck from the inner closure panel 121 so as to assume a generally vertical position and pass between a pair of items 143 which are arranged in two adjacent rows. The illustrated items are bottles, but the items may
25 be any type.

At this time the secondary locking tab 132 and the secondary flap 133 have been struck from the inner closure panel 121 and depend therefrom. Further, the terminal flap portion 125 has
30 been folded downwardly about the fold line 126 and the primary locking tabs 124 have been locked behind the primary locking shoulders 140.

Referring now to Figure 23, it will be seen that the terminal flap portion 125 has been swung up
35 beneath the inner closure panel 121 and the primary locking tabs 124 have assumed their fully locked

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positions. Further, each secondary locking tab 132 has been folded relative to its associated secondary flap 133 and has entered into the aligned openings in the closure panels 120, 121 at a very
5 shallow angle.

Referring to Figure 24, it will be seen that in the completed closure interlock, the secondary locking tab 132 has moved to its fully interlocked position wherein the secondary flap 133 under-
10 lies the terminal flap portion 125, the secondary locking tab 132 underlies the primary locking tab 124, and the primary locking tab 132 is engaged behind the secondary locking shoulders 141. Further, the secondary locking tab 132 is at least partially
15 seated in that portion of the opening 138 in the inner closure panel 121 from which it was initially struck. The closure interlock 123 is now completed.

It is to be understood that while only two of the closure interlocks 123 have been speci-
20 ficially illustrated, the carton closure panel assembly 122 may be provided with as many of the closure interlocks 123 as there are items in a row within the carton.

Although only a preferred embodiment of
25 the closure interlock has been specifically illustrated and described herein, it is to be understood that minor variations may be made in the closure interlock without departing from the spirit and scope of the invention as defined by the appended
30 claims.

1. A closure interlock for a closure panel assembly of a carton of the wrap around type, said closure interlock comprising an inner closure panel and an outer closure panel each having a free edge, said inner closure panel having struck therefrom a secondary locking tab carried by a flap with said secondary locking tab facing said free edge of said inner closure panel, the displacement of said secondary locking tab and said flap from said inner closure panel defining an opening in said inner closure panel, and said outer closure panel having a terminal flap portion in part defined by a fold line and in part by cut line means, said cut line means defining a primary locking tab carried by said terminal edge flap portion and facing away from said outer closure panel free edge for locking behind said inner closure panel, said secondary locking tab extending first through said outer closure panel and then through said opening in said inner closure panel.

2. A closure interlock according to claim 1 wherein said opening in said inner closure panel has as a boundary thereof a primary locking shoulder, and said primary locking tab locking behind said primary locking shoulder.

3. A closure interlock according to claim 1, 1 or 2 wherein said secondary locking tab is generally seated in that part of said opening in said inner closure panel from which said secondary locking tab is formed.

4. A closure interlock according to claim 1, 2 or 3 wherein said cut line means also defines a secondary locking shoulder facing away from said outer closure panel free edge and having received therebehind said secondary locking tab.

5. A closure interlock according to any of claims 1-4 wherein said primary locking tab and said secondary locking shoulder are in general alignment along the length of said interlock whereby a primary
5 lock and a secondary lock are provided in general alignment thereby providing for a saving of carton stock.

6. A closure interlock according to claim 4 or claims 4 and 5 wherein said secondary locking tab is joined to said secondary flap by a narrow neck portion
10 defining two further secondary shoulder on said inner closure panel adjacent said primary locking shoulder and facing away from said primary locking shoulder.

7. A closure interlock according to claim 4, 6 or claims 4 and 5 wherein there are two of said primary
15 locking shoulders, one on each side of said primary locking tab, and there are two of said primary locking tabs, one on each side of said secondary locking shoulder.

8. A closure interlock according to any of claims 1 to 7 wherein said secondary locking tab is connected
20 to said secondary flap by a narrow neck portion defining a secondary shoulder on said inner closure panel and facing away from said primary locking shoulder, and said secondary locking tab being aligned with said primary locking tab transversely of the length of said closure
25 interlock.

9. A closure interlock according to claim 8 wherein said secondary locking tab engages behind said secondary locking shoulder.

10. A closure interlock according to claim 8 or 9
30 wherein said secondary locking shoulder underlies said primary locking tab a distance wherein said secondary locking tab may enter through said closure panels at a shallow angle for movement beneath an article being packaged in the carton.

11. A closure interlock according to any of claims 1 to 10 wherein said primary locking tab is a length generally equal to and less than the length of said secondary flap.

12. A closure interlock according to any of claims 5 to 11 wherein said narrow neck portion is defined by a single finger projecting generally into said secondary locking tab with said fingers being in opposed relation.

13. A closure interlock according to any of claims 1-12 together with a separator tab hingedly carried by said secondary flap.

14. A closure interlock according to claim 13 wherein said closure interlock is part of a closure panel assembly of a wrap around carton having packaged therein two rows of items, said separator tab being disposed between adjacent items in said two rows, and said locking tab underlies one of said items.

15. A closure interlock according to any of claims 1-14 wherein said secondary flap underlies said outer closure terminal flap portion and said secondary locking tab in part underlies said primary locking tab.

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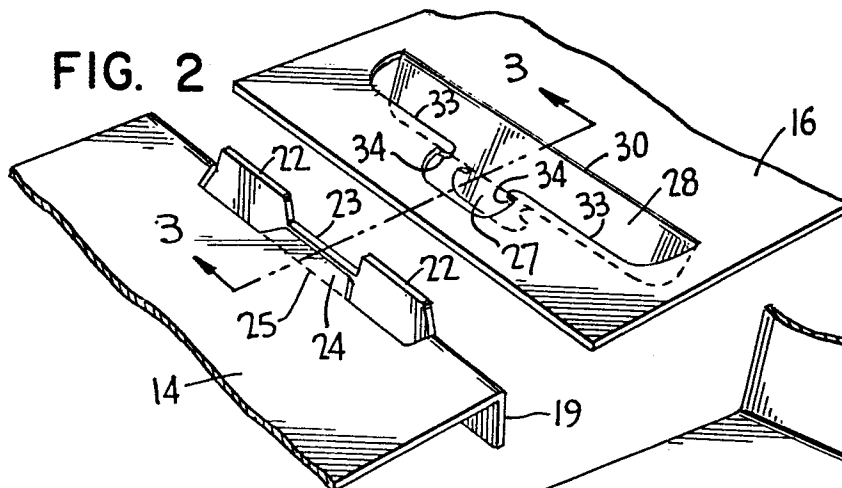
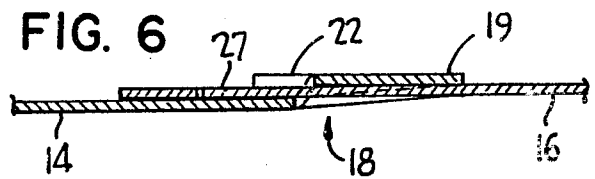
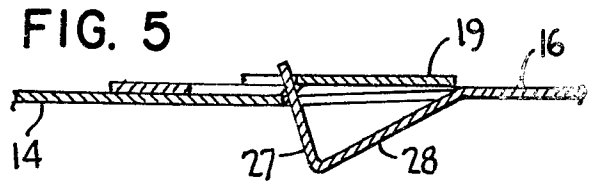
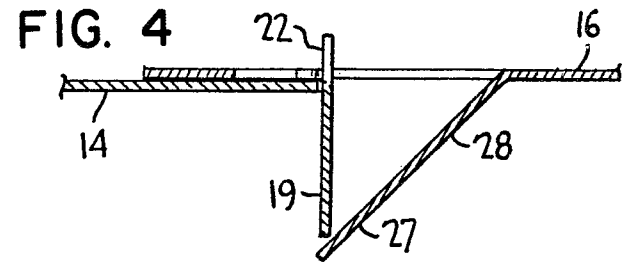
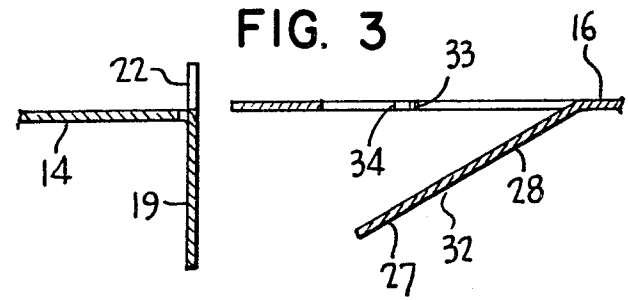
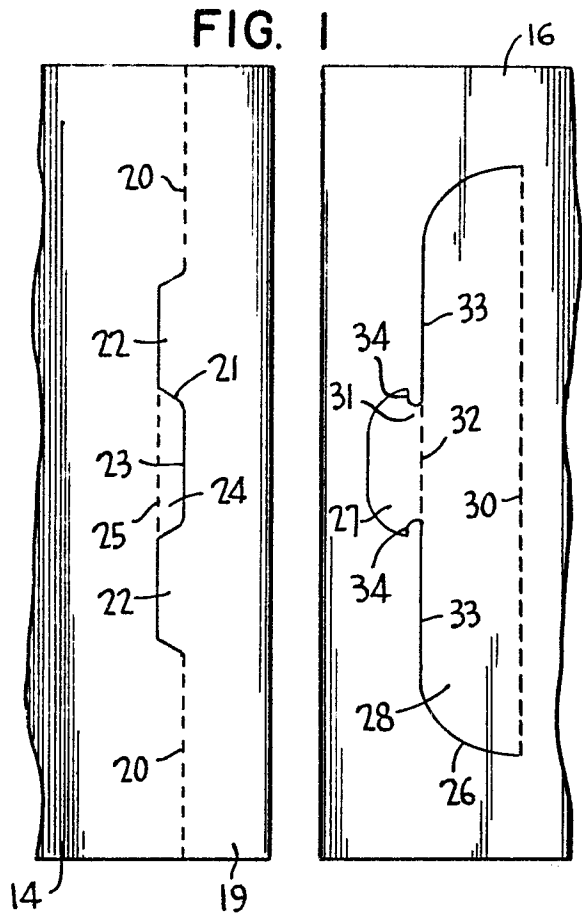
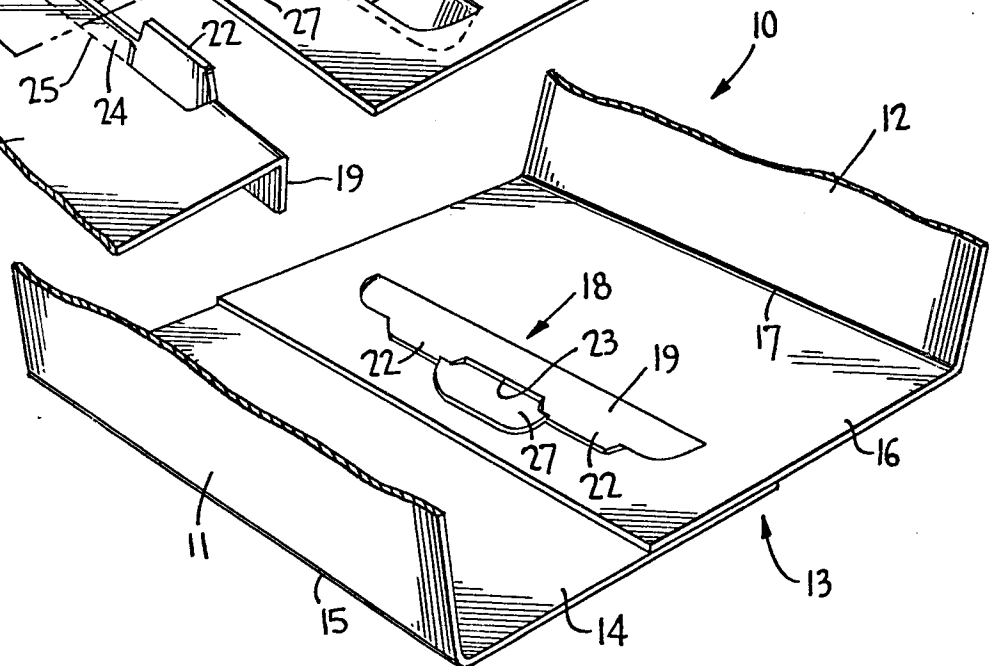


FIG. 7



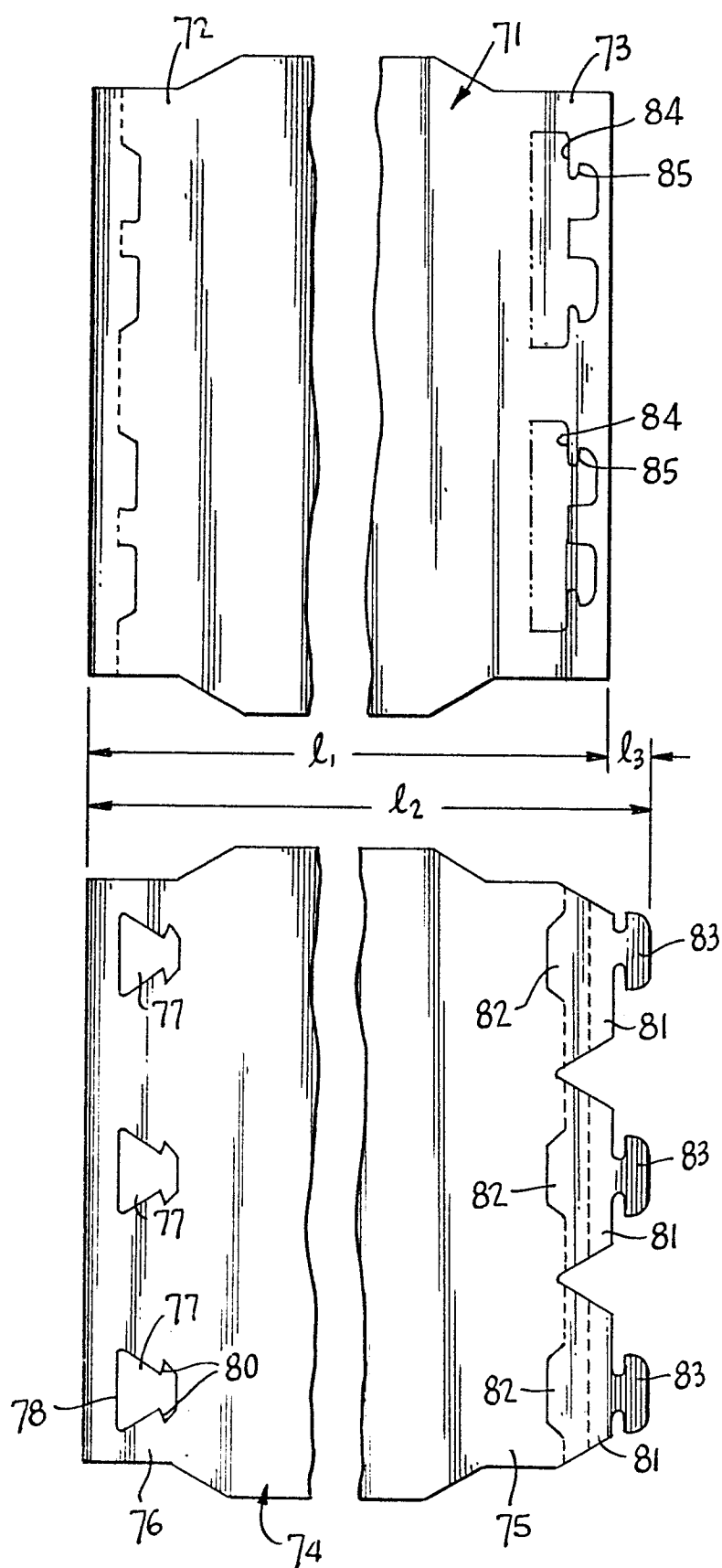


FIG. 9

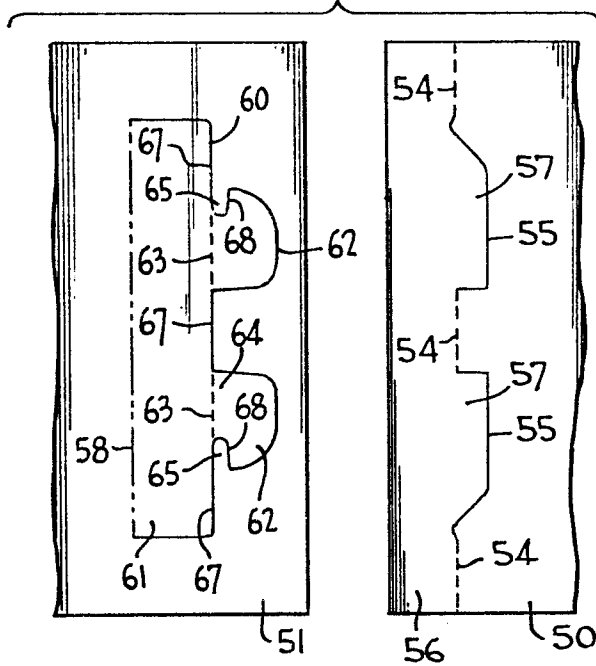


FIG. 11

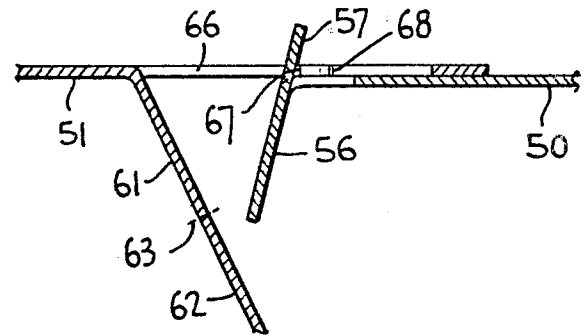


FIG. 12

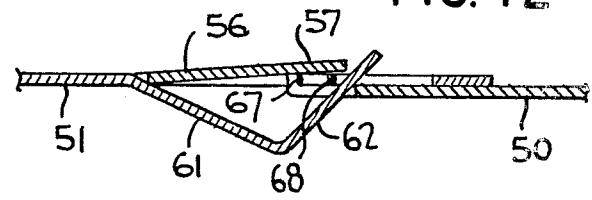


FIG. 13

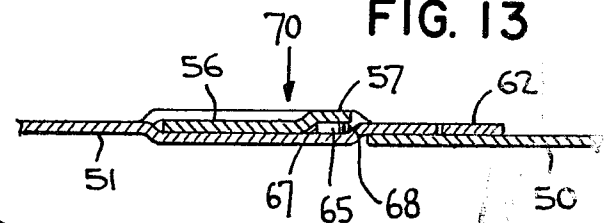


FIG. 10

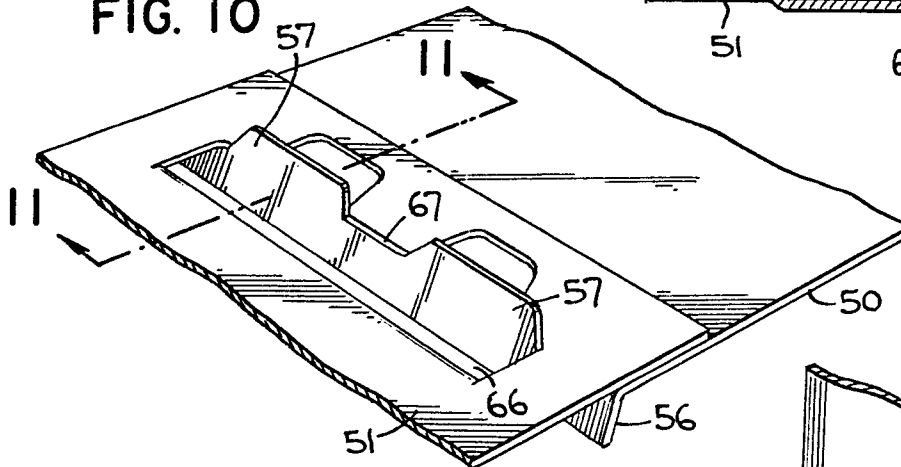


FIG. 14

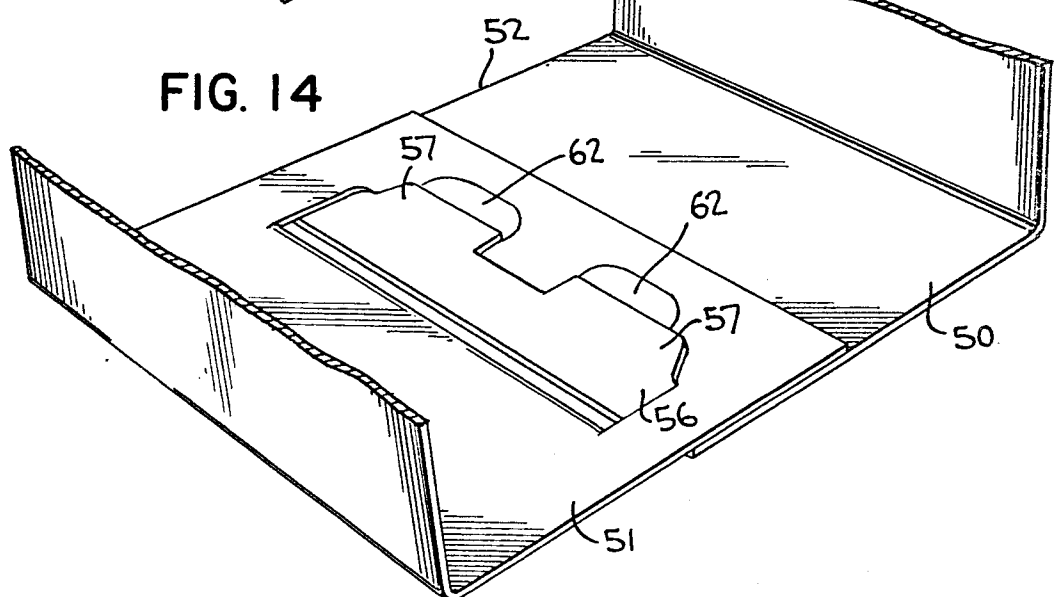


FIG. 15

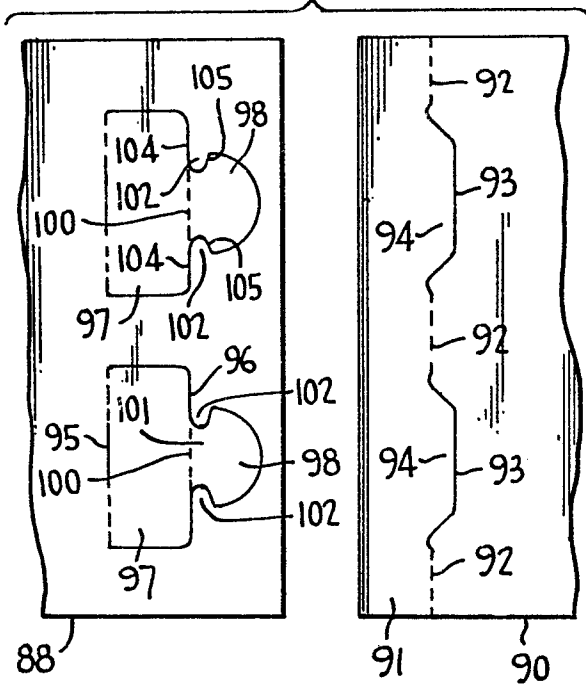


FIG. 17

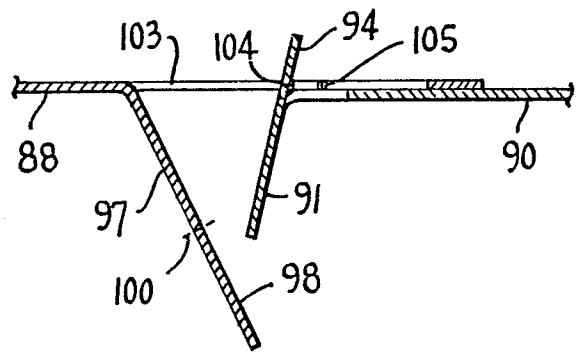


FIG. 18

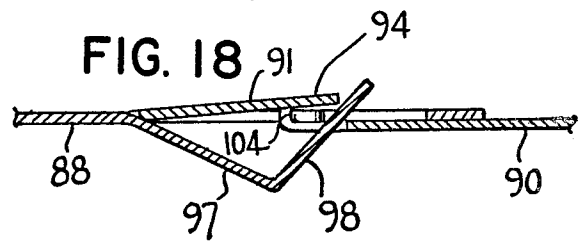


FIG. 19

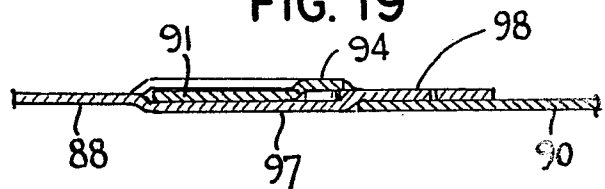


FIG. 16

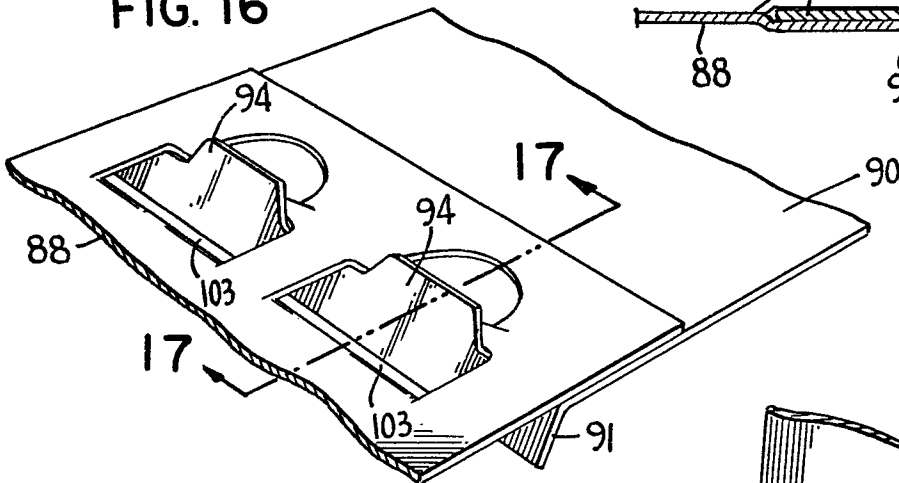


FIG. 20

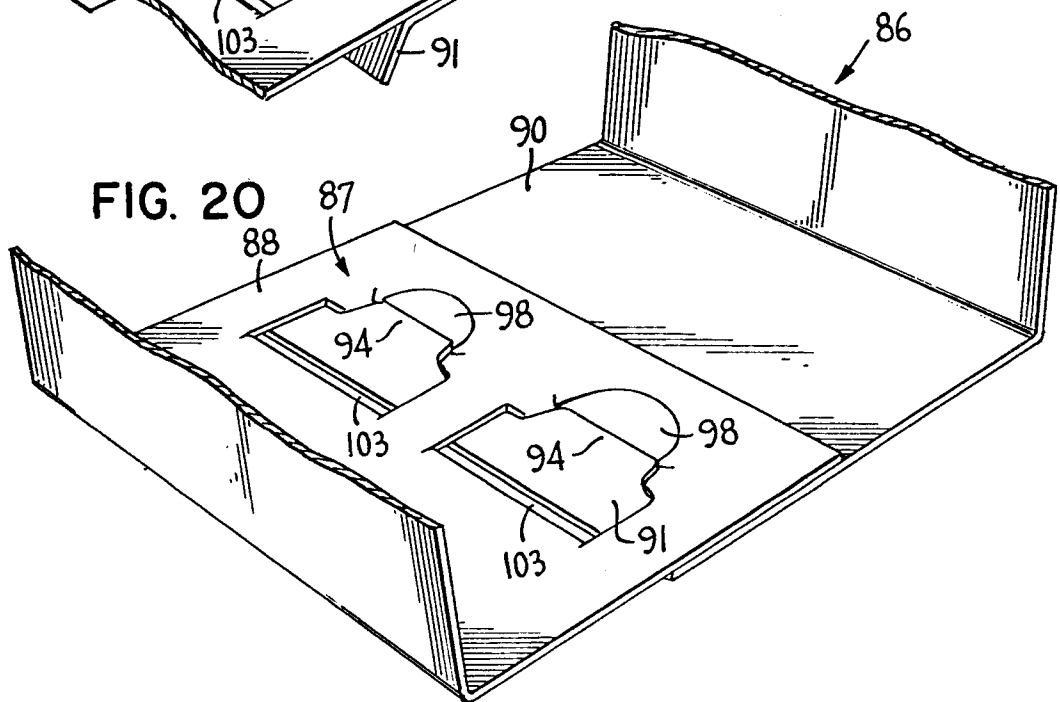


FIG. 21

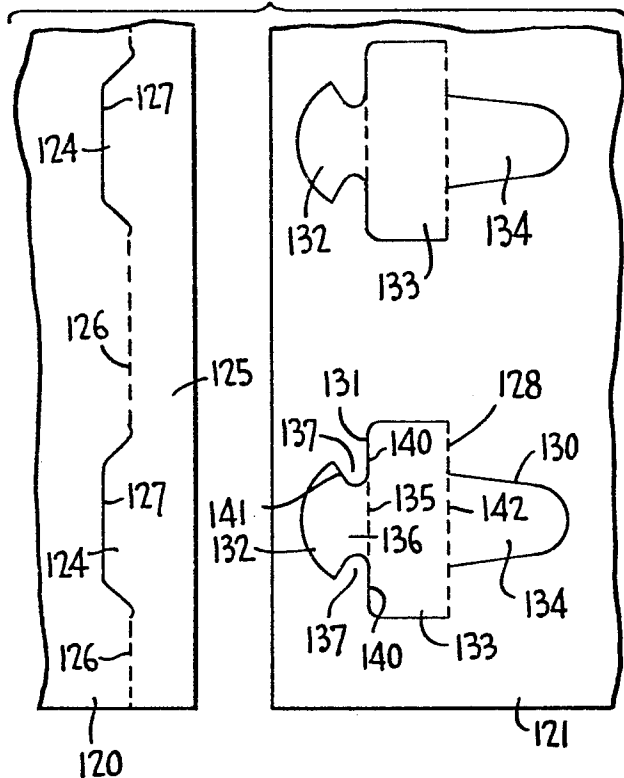


FIG. 22

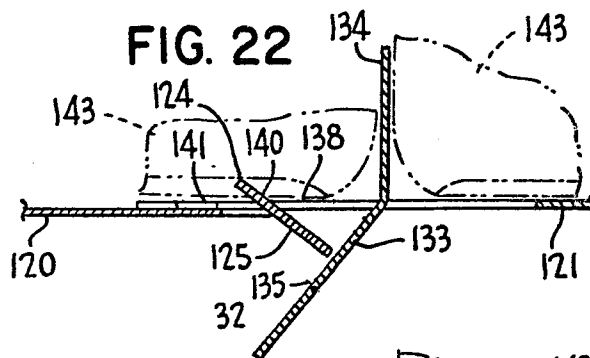


FIG. 23

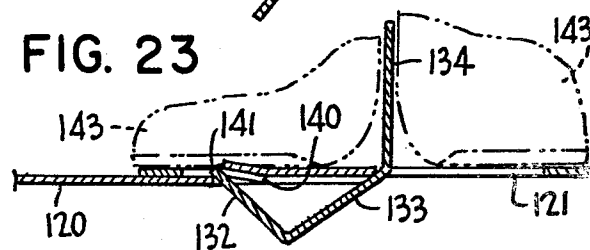


FIG. 24

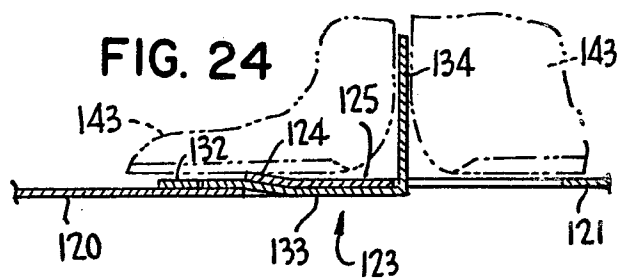


FIG. 25

