Aug. 4, 1970 D. J. PAINTER 3,522,906

CARTON INNER FLAP SUPPORT

Filed Dec. 20, 1968

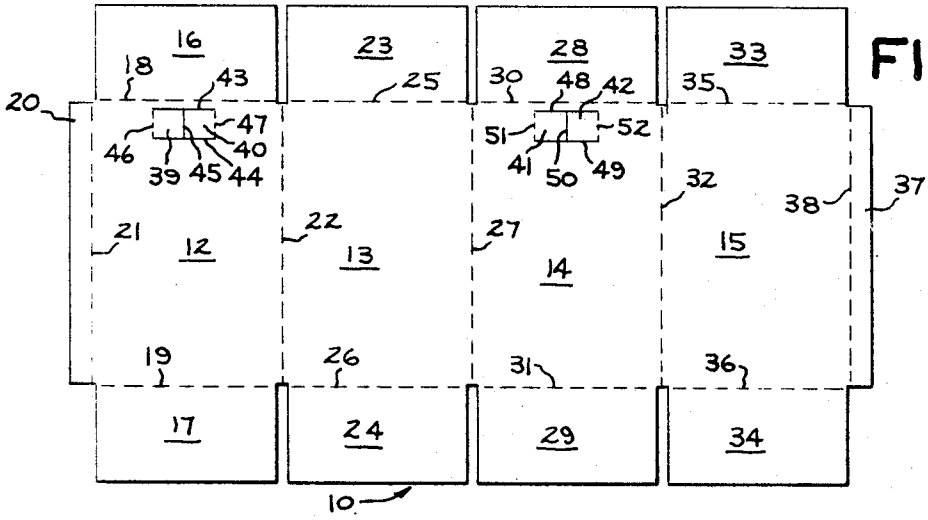


FIG.1

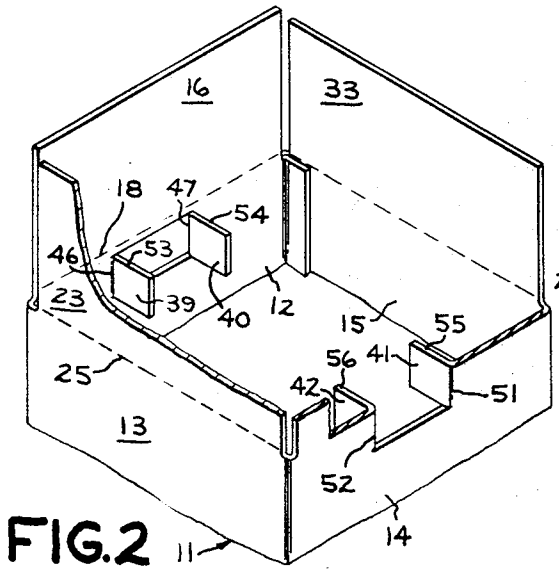


FIG.2

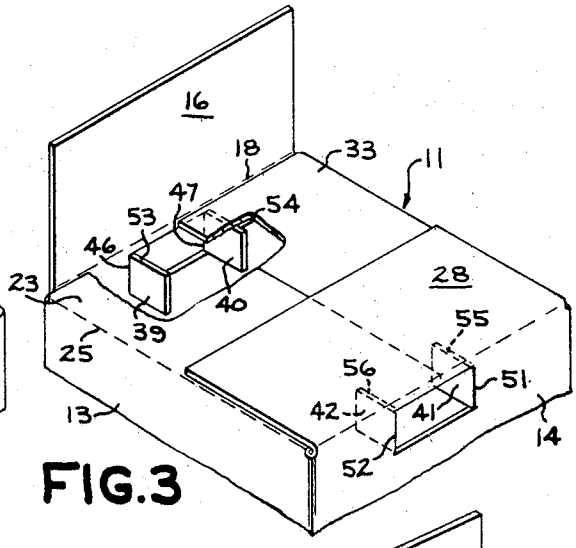


FIG.3

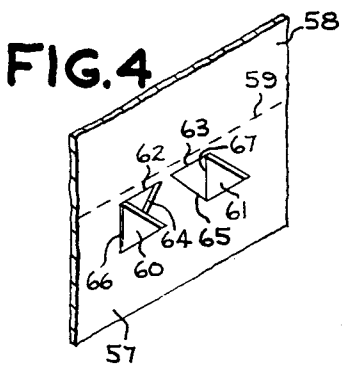


FIG.4

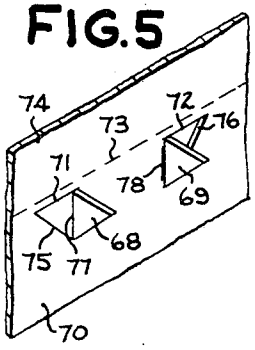


FIG.5

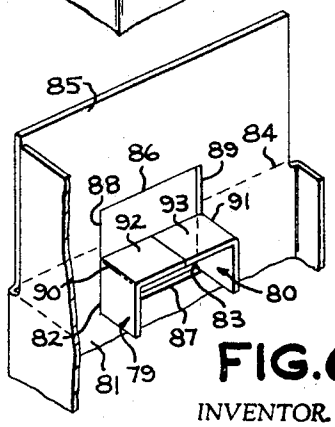


FIG.6

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CARTON INNER FLAP SUPPORT

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ABSTRACT OF THE DISCLOSURE

Tabs formed integrally with the side walls of a carton are turned inwardly to support the inner closure flaps during bonding to the outer closure flaps. Each of the tabs is folded inwardly along a score line perpendicular to the score line between its integral side wall and integral outer closure flap. In one embodiment, wherein the tabs are cut from the carton sides alone, the tabs may be of right polygonal configuration. In another embodiment, wherein the tabs are cut from both the carton side walls and integral flaps, the tabs may have an upper portion which is folded downwardly to provide the configuration of an inverted L-shaped support.

BACKGROUND OF THE INVENTION

This invention relates generally to an improved support for the inner flap of a carton, and deals particularly with a container structure in which the inner closure flaps are supported during bonding to the outer closure flaps.

It has long been a problem in the sealing of corrugated paperboard containers and the like, that the inner closure flaps tend to deflect inwardly into the container during bonding to the outer closure flaps. This problem is aggravated when the carton contains a yieldable material or is not completely filled in the upper region as may be the case when protective corner packing materials are provided. Almost universally, the bonding operation requires the application of pressure to the outer flaps which may be transmitted to the inner flaps further augmenting their collapse into the interior of the container.

A number of prior art solutions to this problem have met with reasonable success when used in conjunction with small cartons of thin paperboard construction. For the most part, such prior art solutions have taken the form of inwardly extending tab sections cut exclusively from one or more of the carton closure flaps. Such supporting tab configurations, however, have not been found to provide sufficient support for the bonding pressures employed in sealing the heavy paperboard containers used to ship major home appliances and the like. Furthermore, many prior art constructions do not allow for the thickness of the paperboard used in major appliance cartons and in this respect are poorly adapted for such use.

It is therefore an object of my invention to provide an improved inner closure flap support formed integrally with the side walls of a carton.

It is a further object to provide such a support which is so oriented with respect to the carton side wall that it provides a more rigid and positive support for the inner closure flap to minimize deflection into the interior of the carton.

It is a further object to provide such a support which is particularly adapted for use in connection with cartons of the size and type commonly used in connection with major appliances.

SUMMARY OF THE INVENTION

Briefly stated, in accordance with one aspect of the present invention, there is provided an inner closure flap

support for use in conjunction with a carton having a pair of end walls, a pair of side walls, an outer closure flap formed integral with each of the end walls, an outer closure flap formed integral with each of the side walls, each of the walls having a score line formed adjacent its associated integral closure flap whereby each of the inner closure flaps may be folded inwardly and each of the outer closure flaps may be folded inwardly to overlie the inwardly folded inner closure flaps. The inner closure flap support comprises at least two tabs formed integrally with each of the side walls and extending inwardly therefrom. At least one of the inwardly extending tabs is positioned to extend beneath one of the inwardly folded inner closure flaps. Similarly, at least one of the inwardly extending tabs is positioned to extend beneath the other of the inwardly folded inner closure flaps. Each of the tabs is folded inwardly from its side wall along a score line perpendicular to the score line between its side wall and integral outer closure flap.

BRIEF DESCRIPTION OF THE DRAWING

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention, it is believed the invention will be better understood from the following description of the preferred embodiment taken in connection with the accompanying drawing, in which:

FIG. 1 is a plan view of a blank which is used in constructing one form of container in accordance with the present invention;

FIG. 2 is a partial perspective view of a partially closed container which is constructed from the blank shown in FIG. 1;

FIG. 3 is a partial perspective view of the embodiment of FIG. 1 with three of the four closure flaps folded inwardly; and

FIGS. 4, 5 and 6 are partial perspective views, similar to FIG. 2, showing alternate embodiments of my invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawing, and initially to FIG. 1 thereof, there is illustrated a corrugated cardboard blank **10**, from which a container **11** is constructed as shown in FIG. 2. The blank **10** is substantially rectangular and includes a first side wall **12**, a first end wall **13**, a second side wall **14** and a second end wall **15**.

The side wall **12** is provided with outer closure flaps **16** and **17** integral therewith and hingedly attached thereto along longitudinal edge portions thereof defined by longitudinally extending fold lines **18** and **19**. The side wall **12** may also be provided with a closure tab **20** integral therewith and attached thereto along a transversely extending fold line **21**. The first end wall **13** is integral with side wall **12** and attached thereto along a transversely extending fold line **22**. The end wall **13** is also provided with inner closure flaps **23** and **24** integral therewith and hingedly attached thereto along longitudinally extending fold lines **25** and **26**.

The second side wall **14** is integral with end wall **13** and attached thereto along a transversely extending fold line **27**. The side wall **14** is also provided with outer closure flaps **28** and **29** integral therewith and hingedly attached thereto along longitudinally extending fold lines **30** and **31**. The second end wall **15** is integral with side wall **14** and attached thereto along a transversely extending fold line **32**. The end wall **15** is also provided with inner closure flaps **33** and **34** integral therewith and hingedly attached thereto along longitudinally extending fold lines **35** and **36**. Completing the blank, it will be seen

that a closure tab 37 is formed integral with end wall 15 and is attached thereto along a transversely extending fold line 38.

When constructing the container 11 from the blank 10, the blank is folded along the transverse fold lines 22, 27 and 32 such that substantially right angles are formed between walls 12 and 13, 13 and 14, 14 and 15, and 12 and 15. With the blank in the folded position just described, the closure tabs 20 and 37 are folded about transverse fold lines 21 and 38, respectively, such that tab 37 overlies a portion of side wall 12 on the exterior thereof, and tab 20 overlies a portion of end wall 15 on the interior thereof. The tabs 20 and 37 are then secured to walls 15 and 12 respectively, as by suitable adhesive or staples or the like, or a combination thereof. The partially constructed container 11 is then sealed at its lower end as is conventionally done by folding inwardly inner closure flaps 24 and 34 subsequently folding inwardly the outer closure flaps 17 and 29. Conventional stapling or bonding machinery may be used to secure flaps 17 and 29 to flaps 24 and 34, it being recognized that as the upper carton end is still open, access may be had to the interior of the lower end for supporting the inner flaps for bonding to the outer flaps as may be required. It will be readily apparent that closure tab 20 may be eliminated in such applications as may be found to be appropriate. As is commonly done to facilitate carton assembly, all the aforementioned fold lines are scored during the formation of blank 10.

Referring now more particularly to FIGS. 2 and 3, in conjunction with FIG. 1, there is illustrated one embodiment of the inner closure flap support of my invention. As was previously mentioned, it is desirable to provide a means to support the inner closure flaps 23 and 33 whereby they may be bonded to outer closure flaps 16 and 28 without collapsing inwardly into the container. For this purpose I provide tabs 39 and 40 integral with side wall 12, and tabs 41 and 42 integral with side wall 14. Tabs 39 and 40 are formed from side wall 12 by two parallel, spaced apart slits 43 and 44, and a single slit 45 perpendicular to slits 43 and 44 extending therebetween to define an I-shaped incision. Tabs 39 and 40 are hingedly attached to side wall 12 along transverse score lines 46 and 47 which are perpendicular to slits 43 and 44, and also perpendicular to scored fold line 18 between side wall 12 and outer closure flap 16. Slit 43 may be spaced downwardly from scored fold line 18 by substantially the thickness of inner closure flaps 23 and 33.

In similar fashion to tabs 39 and 40, tabs 41 and 42 are formed by an I-shaped incision including three slits, 48, 49 and 50 and score lines 51 and 52, wherein score lines 51 and 52 are perpendicular to scored fold line 30, and slit 48 is spaced downwardly from score line 30 by substantially the thickness of inner closure flaps 23 and 33.

As may best be seen in FIG. 2, tabs 39, 40, 41 and 42 are folded inwardly about score lines 46, 47, 51 and 52, respectively. In their inwardly folded positions, tabs 39 and 42 will underlie or extend beneath inner closure flap 23 when folded inwardly, and tabs 40 and 41 will underlie or extend beneath inner closure flap 33 when folded inwardly. Tabs 39, 40, 41 and 42 present supporting surfaces 53, 54, 55 and 56, respectively, which are perpendicular to the side walls from which they extend and are parallel to the inner closure flap supported thereby when the inner closure flaps are folded inwardly. Since, in the preferred form of the present invention, supporting surfaces 53, 54, 55 and 56 are spaced downwardly from scored fold lines 18 and 30 by substantially the thickness of the inner closure flaps 23 and 33, the inner closure flaps form a substantially planar surface which does not extend upwardly in the region of the tabs beyond a height that will hinder the inward folding of outer closure flaps 16 and 28.

With the tabs 39, 40, 41 and 42 folded inwardly as described, inner closure flaps 23 and 33 are folded inwardly and outer closure flaps 16 and 28 are folded inwardly to overlie the inwardly folded inner closure flaps as shown in FIG. 3, whereupon flaps 23 and 33 may be bonded to flaps 16 and 28 by suitable means. Such bonding will normally include application of glue or cement to the lower surface of flaps 16 and 28, or to the upper surface of flaps 23 and 33, and then the application of pressure to flaps 16 and 28 to bring the flaps together to assure good bonding by the glue.

It is a feature of the preferred embodiments of my invention that the score lines 46, 47, 51 and 52 be perpendicular to their associated scored fold lines 18 and 30, and that the supporting surfaces 53, 54, 55 and 56 be parallel to scored fold lines 18 and 30. By this arrangement, the inwardly extending tabs 39, 40, 41 and 42 support inner closure flaps 23 and 33 for continuous distances equal to the lengths of the supporting surfaces 53, 54, 55 and 56, and provide a support so oriented with respect to the side walls that a more rigid and positive means is presented to prevent the inner closure flaps from deflecting significantly into the interior of container 11. It will be recognized that such a relative arrangement of supporting surfaces 53, 54, 55 and 56 and score lines 46, 47, 51 and 52, results in the formation of right angles therebetween on tabs 39, 40, 41 and 42 respectively. As the edges of the tabs comprise straight lines, and two of the edges join to form a right angle, the tabs may be said to be right polygonal in configuration.

Alternate embodiments of my device which also employ right polygonal tab formations are shown in FIGS. 4, 5 and 6. In FIG. 4, a portion of a typical side wall 57 is shown having an outer closure flap 58 integral therewith and attached thereto along a scored fold line 59. Also formed integral with side wall 57 are tabs 60 and 61 defined by slits 62 and 63 parallel to and spaced downwardly from scored fold line 59, diagonal slits 64 and 65, and score lines 66 and 67 formed perpendicular to scored fold line 59. With tabs 60 and 61 folded inwardly along score lines 66 and 67, substantially the same supporting structure is provided for inner closure flaps as with the embodiment of FIGS. 1, 2 and 3.

FIG. 5 is simply a reversal of the arrangement of the tabs of FIG. 4, wherein tabs 68 and 69 are formed integral with a side wall 70. The tabs are defined by slits 71 and 72 which are parallel to and spaced downwardly from scored fold line 73 between side wall 70 and closure flap 74, diagonal slits 75 and 76, and score lines 77 and 78 which are perpendicular to scored fold line 73.

In the previous embodiments of my invention, it will be recognized that the inwardly extending support tabs have been formed exclusively from the side walls of a carton. Such restrictive formation has the advantage of simplicity while simultaneously providing a support means which is so oriented with respect to the carton side wall that it provides a rigid and positive support for the inner closure flaps to minimize deflection of the inner closure flaps into the interior of the carton. Furthermore, by limiting the carton incision to the area of the side walls, and by spacing the uppermost incisions or slits downwardly from the upper corner of the sealed container, a smooth and unbroken corner line and top surface are presented for shipment. The embodiments of FIGS. 4 and 5 may be more suitable for use in containers wherein the contents enclosed therein are taller toward the center of the carton than near the edges thereof, while the embodiment of FIGS. 1, 2 and 3 may be appropriately used in other applications wherein the additional lateral support provided the tab by making it rectangular rather than triangular is required.

In such applications, however, as may not require smooth carton corners and top surfaces, and wherein additional tab strength is required, the embodiment of FIG. 6, or a variation thereof, may prove beneficial. In this em-

bodiment, tabs 79 and 80 are formed integral with a side wall 81, and attached thereto along score lines 82 and 83 which are formed perpendicular to scored fold line 84 between side wall 81 and integral outer closure flap 85. In the manner of the tabs of FIG. 1, tabs 79 and 80 are defined by slits 86 and 87 formed parallel to scored fold line 84 and by a third slit (not shown) extending therebetween and perpendicular thereto. In contradistinction to the arrangement of FIG. 1, however, slit 86 is spaced upwardly rather than downwardly from line 84 so as to extend into the closure flap 85. Completing the perimeter of flaps 79 and 80 are slits 88 and 89 which extend upwardly from score lines 82 and 83 to intersect slit 86. The slits 88 and 89 extend downwardly a distance substantially equal to the thickness of the inner closure flaps below the fold line 84. Connecting with the points of juncture of slits 88 and 89, and score lines 82 and 83, and extending parallel to fold line 84 are score lines 90 and 91. In operation, tabs 79 and 80 are folded inwardly in the manner of the aforedescribed tab embodiments, but further require the downward folding of upper tab portions 92 and 93 along score lines 90 and 91, whereby the upper tab portions form a surface parallel to fold line 84 and spaced downwardly therefrom by substantially the thickness of the inner closure flaps. By this arrangement, upper tab portions 92 and 93 provide added lateral stability for tabs 79 and 80.

From the foregoing description it should now be apparent that the present invention provides an inner closure flap support which is simple in design, inexpensive to form, and which is so oriented with respect to the carton side wall that it provides a rigid and positive support for the inner closure flaps to minimize deflection of the inner closure flaps into the interior of the container. It will be obvious to those skilled in the art that a variety of possible variations of the embodiment of FIG. 6, as well as those of previous figures may be made by employing other tab configurations folded inwardly along a line perpendicular to the scored fold line between the side wall and integral closure flap. In this regard, certain aspects of the invention are not limited to the particular details of construction of the examples illustrated, and it is contemplated that other variations, modifications or applications will occur to those skilled in the art. It is therefore intended to cover such variations, modifications and applications as do not depart from the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a carton having a pair of end walls, a pair of side walls, an inner closure flap formed integral with each of the end walls, an outer closure flap formed integral with each of the side walls, each of the walls having a score line formed adjacent its associated integral closure flap whereby each of the inner closure flaps may be folded inwardly and each of the outer closure flaps may be folded inwardly to overlie the inwardly folded inner closure flaps, the improvement of an inner closure flap support for supporting the inner closure flaps for bonding to the outer closure flaps, comprising:

at least two tabs formed integrally with each of the side walls and extending inwardly therefrom;

at least one of said inwardly extending tabs formed integrally with each of the side walls being positioned to extend beneath one of the inwardly folded inner closure flaps;

at least one of said inwardly extending tabs formed integrally with each of the side walls being positioned to extend beneath the other of the inwardly folded inner closure flaps;

each of said tabs being folded inwardly from its side wall along a score line perpendicular to the score line between its side wall and integral outer closure flap.

2. The inner closure flap support of claim 1 wherein said tabs each present a supporting surface perpendicular to its supporting side wall and parallel to the inwardly folded inner closure flap supported thereby.

3. The inner closure flap support of claim 2 wherein said supporting surface of each of said tabs is spaced downwardly from the score line between its supporting side wall and its associated integral closure flap.

4. The inner closure flap support of claim 3 wherein the distance said supporting surface is spaced downwardly substantially equals the thickness of the inner closure flap supported by said supporting surface.

5. The inner closure flap support of claim 1 wherein each of said tabs assume the configuration of a right polygon having one side parallel to the score line between its supporting side wall and its associated integral closure flap.

6. The inner closure flap support of claim 5 wherein said polygon is a triangle.

7. The inner closure flap support of claim 5 wherein said polygon is a rectangle.

8. In a carton blank having a pair of end walls, a pair of side walls, an inner closure flap formed integral with each of the end walls, an outer closure flap formed integral with each of the side walls, and each of the walls having a score line formed adjacent its associated integral closure flap, the improvement of an inner closure flap support comprising:

at least two tabs formed integrally with each of the side walls;

each of said tabs being defined by a tab score line perpendicular to the score line between its side wall and integral outer closure flap, and one or more slits extending in closed fashion from one end of said tab score line to the other end of said tab score line,

whereby each of said tabs may be folded inwardly to extend beneath one of the inwardly folded inner closure flaps when the carton blank is assembled and to thereby support the inner closure flaps for bonding to the outer closure flaps.

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DAVID M. BOCKENEK, Primary Examiner

U.S. Cl. X.R.

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