June 29, 1965 D. WAINBERG 3,191,845

CONTAINERS

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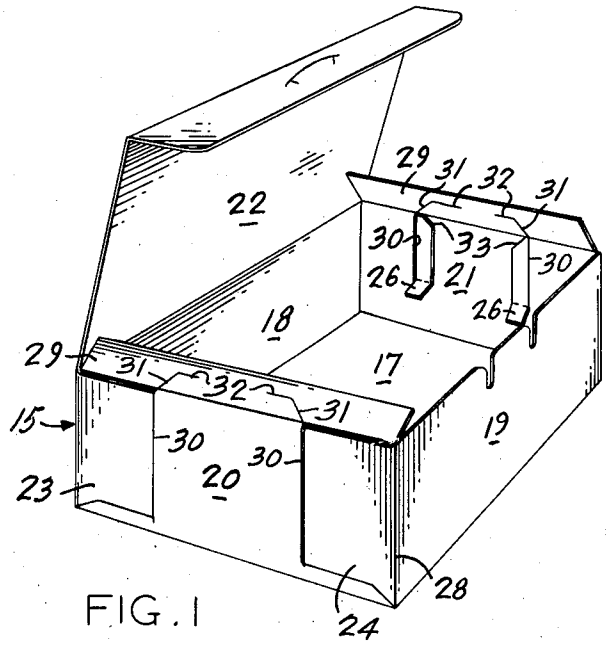


FIG. 1

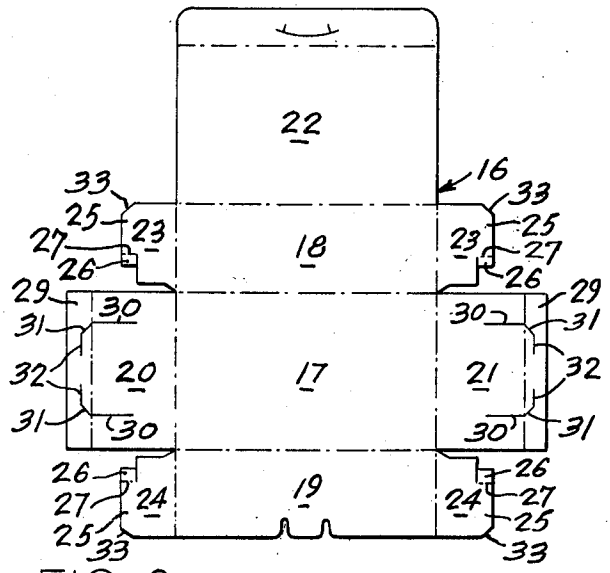


FIG. 2

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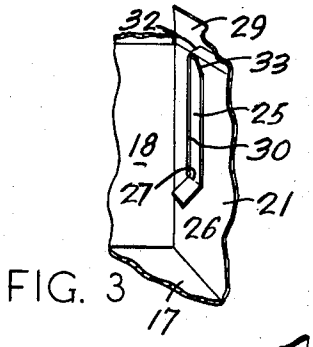


FIG. 3

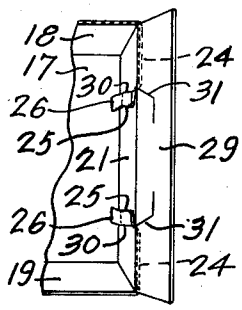


FIG. 4

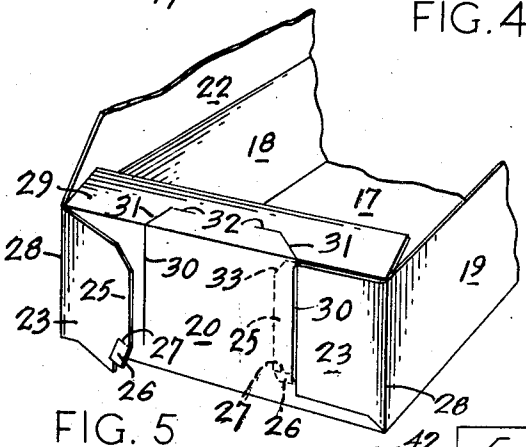


FIG. 5

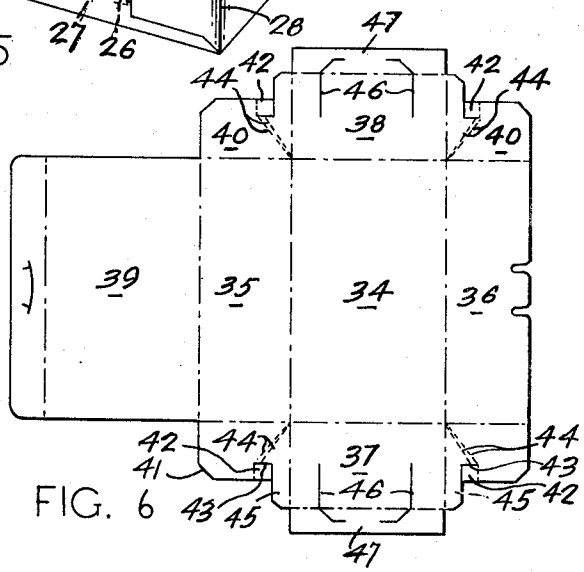


FIG. 6

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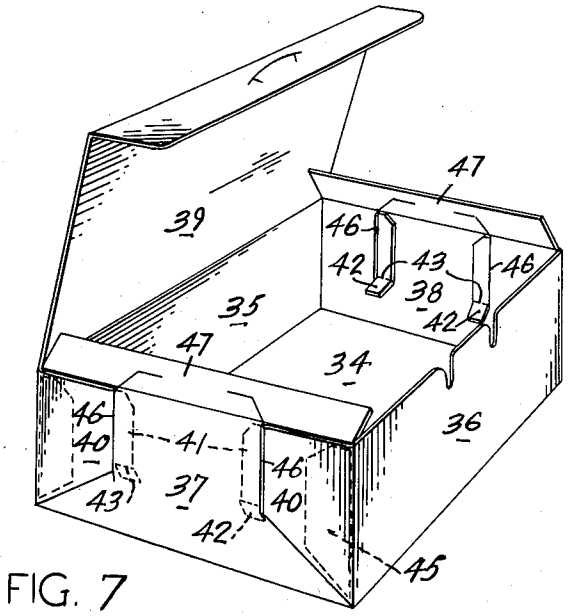


FIG. 7

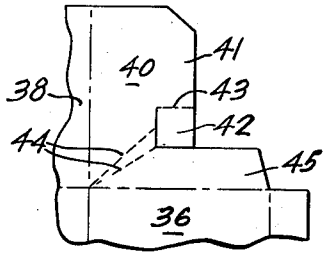


FIG. 8

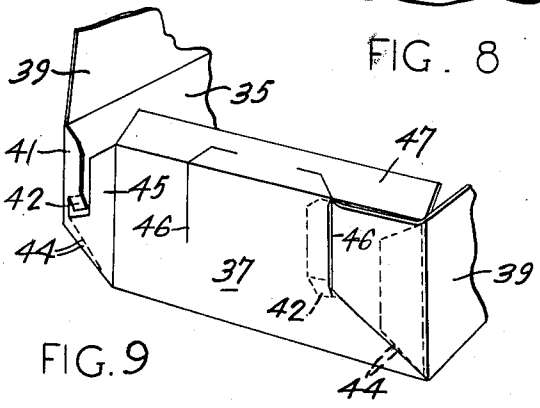


FIG. 9

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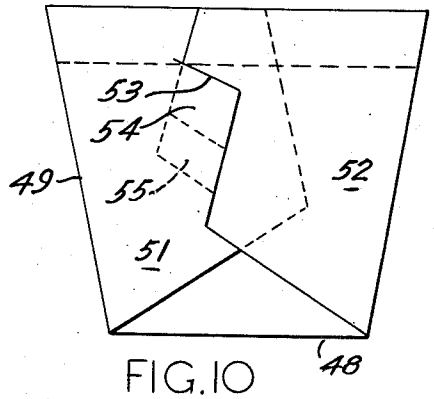


FIG. 10

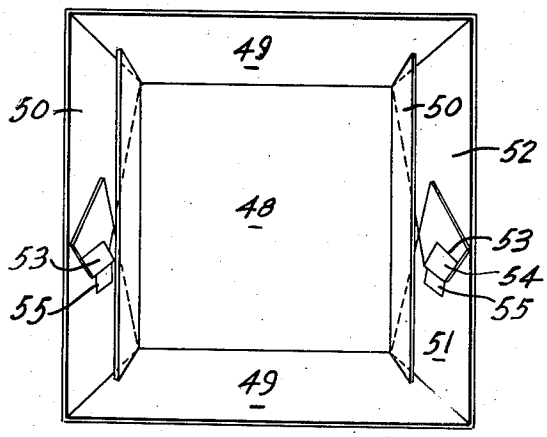


FIG. 11

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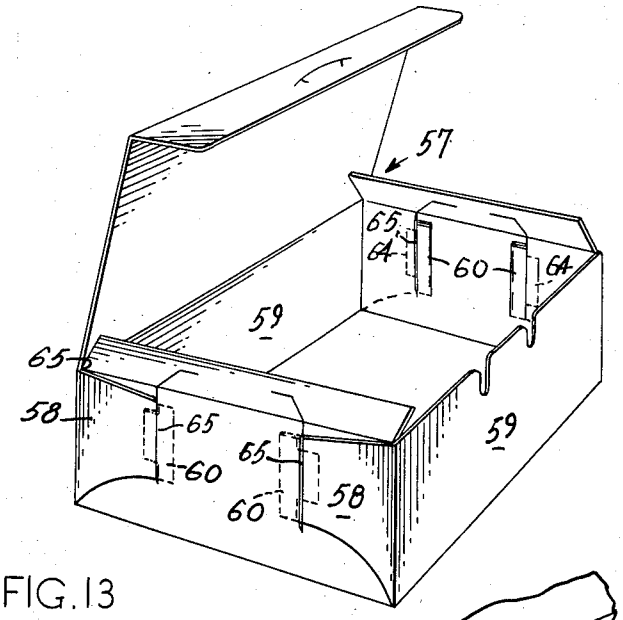


FIG. 13

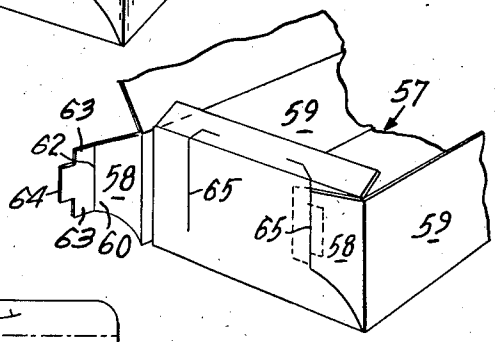


FIG. 14

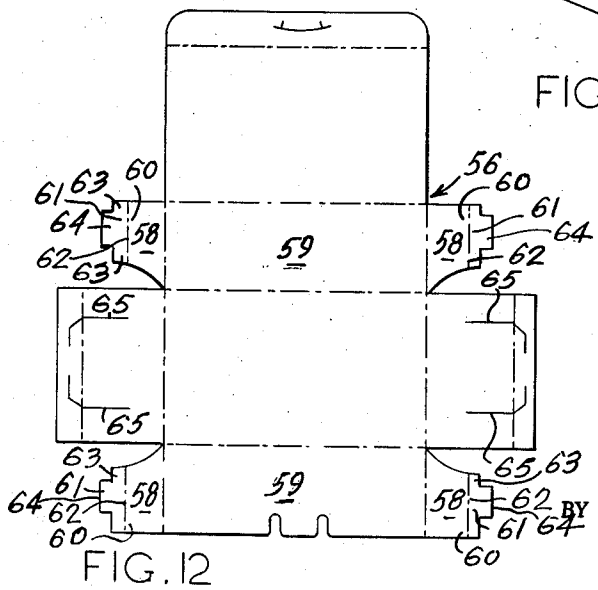


FIG. 12

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United States Patent Office 3,191,845 Patented June 29, 1965

3,191,845

CONTAINERS

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Filed May 13, 1963, Ser. No. 279,824
3 Claims. (Cl. 229—32)

The invention relates to improvements in containers as described in the present specification and illustrated in the accompanying drawings that form a part of the same.

The invention consists essentially of the novel features of construction as pointed out broadly and specifically in the claims for novelty following a description containing an explanation in detail of acceptable forms of the invention.

In the past, the manufacture of cartons and other containers have been constructed with many different types of interlocking flaps for connecting the end and side walls together and to form the necessary corners. This has been accomplished by the formation of slits either through the end walls or the side walls and the formation of hook-like members or projecting lugs emanating from locking flaps that form part of the end walls or the side walls, the slits or slots and the locking flaps being so shaped that when the container is being folded they will slidably engage with one another, and then by pulling the connecting walls outwardly the hook-like members will be brought out of alignment from the slotted portions and thereby presumbly be prevented from unlocking themselves or disengaging with the slits of the adjacent wall. In certain instances, special tools have been designed and used for effecting the hooking operations.

Although, to a certain extent, such containers are satisfactory and are widely used and are believed to be better than fastening the corners by adhesive, stapling and the like, they are inadequate, inasmuch as they are easily pulled apart and do not provide the necessary strength at the corners and proper rigidity and stiffness to the wall structure, consequently when contents are inserted in the container, the very weight of the contents therein and in the handling of the container will effect a force against the wall structure, thereby causing the walls to have the tendency of expanding, bulging or collapsing outwardly and thus causing a pull at the corners of the container, which in turn, will often cause the dislodgement of the hook members from their hooked positions with the slits or slots formed in the adjacent walls, and consequently result in the dislocation of the corners of the container, the collapsing of the walls, and the spilling or the possible destruction of the contents.

Furthermore such containers have weakened corners and walls that are more pliant to force and pressure due to their interlocking structures, and consequently are subjected to torsional twisting of the containers and infirmness of their wall structures.

It is therefore the purpose of this invention to eliminate such and other objectionable features that have been found in former containers and simultaneously to increase the strength of the wall structure and positive locking of their adjacent walls, as well as other features that will be discernible in the description together with the accompanying drawings.

Among the objects of the invention is to devise a container that will have the proper rigidity in both the longitudinal and lateral directions and thus minimize any torsional twisting of the container.

Another object of the invention is to devise a means whereby the weight of the contents of the container will have the force, thus created, proportionately distributed throughout the wall structure of the container and which is effected by the positive locking of the adjoining walls

of the structure together in such a way that practically no latitude is permitted of any freedom of movement in the transverse, vertical or off the vertical directions of the interlocking means that lock the adjacent walls together and form the corners for the containers.

Still a further object of the invention is to furnish a container with wall interlocking means that will assure a close upright abutment of the locked walls with the corner formations of the container for stiffening the container in all directions, and avoid the saggy look or distorted appearance of the container which is so often noticeable in containers in which the contents thereof have caused a force, pressure or a drag against or on the walls, and it may be further apparent when filled containers are placed on top of each other.

A further object of the invention is to construct a container from a blank, with the minimum waste of material, that will be easy to assemble either by mechanical or manual means and in which the walls will have integral self locking means for fastening the adjacent walls to one another.

A still further object of the invention is to make a container that will be capable of withstanding reasonable pressures from any direction and maintain its uniform configuration at all times when once assembled and in its locked position.

Another object of the invention is to devise a locking means for containers that will form an integral part thereof and which will be equally adaptable to be included in all types of container configurations and wherever adjacent walls are required to be joined together regardless of their size or shape.

Still a further object of the invention is to devise a container in which no adhesive or other securing means need be added either to the blank or in the assembly of the container for adding strength to the structure, as has been done in the past, but therein place effect the necessary strength and positive locking of the walls together, through the particular structure of the interlocking means and corner connections of the container and which form an integral part of the blank from which the container is assembled.

Other objects of the invention will be apparent from the description of the disclosures of the invention and the illustrations thereof.

In the drawings:

FIGURE 1 is a perspective view of the container illustrating the interlocking units in locked position to form the corners and joinders of the wall sections.

FIGURE 2 is a plan view of the blank from which the container is formed.

FIGURE 3 is an enlarged fragmentary view showing the position of the offset portion and locking lip of a locking flap when inserted through the slit of an adjacent wall and in self locking position.

FIGURE 4 is a fragmentary plan view of one end portion of the container and illustrating the interlocking of the locking flaps emanating from the side walls with an end wall.

FIGURE 5 is a fragmentary perspective view of one end of the container illustrating one locking flap before its locking position with the end wall and the other locking flap after its locking position with the end wall.

FIGURE 6 is a plan view of a blank for a modified form of container having corner leak proof locking flaps.

FIGURE 7 is a perspective view of the modified form of container as made from the blank illustrated in FIGURE 6.

FIGURE 8 is an enlarged fragmentary plan view of one corner of the blank as illustrated in FIGURE 6.

FIGURE 9 is a fragmentary perspective view of the

modified form of container as illustrated in FIGURE 7 and showing one leak proof locking flap before its locking position with the end wall and the other leak proof locking flap after its locking position with the end wall.

FIGURE 10 is another modified form of the invention illustrating the locking flaps interlocking with one another to form an outer wall for the container.

FIGURE 11 is a plan view of the modification of the container as illustrated in FIGURE 10.

FIGURE 12 is a plan view of a further modification of a pre-cut blank.

FIGURE 13 is a perspective view of the container formed from the pre-cut blank as illustrated in FIGURE 12.

FIGURE 14 is a fragmentary perspective view of one end of the container, as shown in FIGURE 13, and illustrating one locking flap before its locking position with the end wall and the other locking flap after it locked position with the end wall.

Like numerals of reference indicate corresponding parts in the various figures.

The present invention pertains to interlocking units for connecting and joining adjacent walls of a container so that they will positively lock to one another and at the same time add to the rigidity of the wall structure. This is accomplished by eliminating any play of the locking flaps when inserted in their respective slits, as occurs in other types of containers formed from pre-cut blanks and well known in the past art, with the consequent slackness or looseness to the abutting corner walls of the container.

This invention includes the formation of locking flaps that form integral extensions from certain of the walls of the container and are provided with integral bendable or foldable lips or flanges that are set at any desired angle or arranged in a vertical, off the vertical, horizontal or off the horizontal directions, all in accordance with design and style of container that is desired or required, and in accordance with the shape of the slits in which the locking lips or flanges, in their folded positions, are inserted for interlocking the walls together.

Referring to the drawings, the container, as indicated by numeral **15** and illustrated in FIGURES 1 to 5, is formed by the blank **16** and has the bottom wall **17**, the side walls **18** and **19**, the end walls **20** and **21**, and the top wall or cover **22**. The side walls **18** and **19** have the extension or locking flaps **23** and **24** and which are integral therewith, and are approximately of the same height.

Each of the locking flaps is formed with an offset or protruding portion **25** in its upper and lateral portion and from which projects downwardly the bendable locking lip or tongue **26** terminating short of the lower transverse edge of the locking flap. This locking lip is creased at **27**, where it projects from the offset or protruding portion, so that it may be folded inwardly to abut the inner face of the offset or protruding portion. The locking flap forms one part of the interlocking means and also a corner **28** of the container.

The end walls **20** and **21** have the transverse bendable flaps or flanges **29** extending along their top portions and have the vertical slits or slots **30** and **31** made in their upper portions and suitably spaced from their outer vertical edges and terminating considerably short from their joinder crease lines with the bottom wall. These slits or slots extend upwardly into the transverse flaps **29** at an offset angle to form the continuation of the approximate vertical slits into angular slits **32** in order to receive the chamfered edges **33** of the locking flaps **23** and **24**. This arrangement of the slits forms the other part of the interlocking means.

It will be noted that the length of the offset portion and locking lip of the locking flap is considerably longer than the length of the slit portion that is formed in the end wall, and this is for the purpose of allowing the locking lip to project within the end wall well beyond the lower termination of the slit in its extended positions.

When the upright walls are to be joined and locked together, the locking flaps of the side walls are folded inwardly and their respective locking lips are folded inwardly to abut the inner faces of the offset or protruding portions of the locking flaps. The bendable transverse flaps or flanges are placed in vertical alignment with the upright end walls so that each of the common slits formed in the transverse flaps will be in vertical alignment.

The folded locking flaps are simply directed into and through the common slits of the transverse flaps and the end walls by bringing the walls into an upright position, thus allowing the offset or protruding portions and the folded locking lips to enter and engage with the inner faces of the end walls. The locking lips are automatically released from their folded abutment with the offset portiones and unfold themselves of their own volition and pliancy, and as these locking lips extend below the lower extremities of the slits and the offset or protruding portions are in the contiguous back to back engagement with the inner faces of the end walls, there is positive interlocking of the side and end walls together with little or no lateral or vertical movement possible and consequently preventing any displacement of the locking units from their locked positions.

The material used for making the blanks for the containers are of course diversified such as, stiff cardboard, pasteboard, other pulp material, plastic, aluminum, composite materials and others that lend themselves to be made from a blank that may be foldable to form the required configurations of containers and the adaptability of the interlocking means.

A modified form of container is illustrated in FIGURES 7 to 9 and consists of the usual bottom wall **34**, side walls **35** and **36**, end walls **37** and **38**, and the top wall or cover **39**. The end walls and the side walls are integrally connected with one another by the corner locking flaps **40**, each locking flap having a protruding or offset portion **41** which is formed with an extension in the shape of a locking lip **42** which is creased at **43** from the protruding portion or offset that it may be bent rearwardly to abut the inner face of the protruding portion.

The inner or lower inner end of the locking flap, beyond the crease line of the locking lip, is provided with a plait or gore **44** which is integrally connected with the lateral flap **45** of the end wall. The end walls are both provided with the integral vertical lateral flaps **45** at the corners, which are formed with the integral locking flaps of the side walls. The end walls have similar shaped slits or slots **46** to those shown in FIGURES 1 to 6, and extend into the bendable flaps or flanges **47** for the purpose of receiving the protruding portions and locking lips of the locking flaps **40**, and thus complete the interlocking of the end and side walls, as previously described.

In this way leak proof corners are provided for the container, and this is accomplished through the coordination of the movements of the plaits or gores **44**, the vertical lateral flaps **45** and the locking flaps, when the protruding portions and the locking lips of the locking flaps are inserted in the slits of the end walls.

In this way the container is provided with reinforced leak proof corners and positive interlocking of the end and side walls.

Another application of the interlocking means for containers is illustrated in FIGURES 10 and 11. This container is formed of the bottom wall **48**, and the side walls **49** and the end walls **50**. The side walls are provided with lateral angular shaped locking flaps **51** and **52**, the lateral flaps **51** having angular shaped slits or slots **53**, such as in the formation of a right angle, and forming one portion of the interlocking means.

The other angular shaped locking flaps **52** have protruding or offset portions **54** and accompanying bendable

locking lips 55, similarly constructed as those previously described, and forming the other portions of the interlocking means.

The protruding portions and the accompanying locking lips of the locking flaps 52 are inserted in the slits of the locking flaps 51 and interlock therein, in a similar manner as hereinbefore described. In this type of construction, the interlocked flaps form outer end walls while the end walls 50 form the inner walls of the container.

In FIGURES 12, 13 and 14, another adaptation of the invention is shown, in which the angle and disposition of the locking lips of flanges of the locking flaps are arranged at a different angle to those already described.

The general structure of the pre-cut blank 56 and the container 57 that is formed therefrom is somewhat similar to that already described, with the exception that the locking flaps 58, that integrally extend outwardly from the side walls 59, have the protruding portions 60 provided with the integrally extending flanges or lips 61 that are foldable either inwardly or outwardly, as the case may be, at 62 from the protruding portions 60.

These extending bendable or foldable flanges or lips 61 have the locking shoulders 63 and the central tongues 64 and are adapted to be inserted, in their folded positions, in the slits 65 formed in the adjacent end walls, so that the shoulders will lock themselves with the edges of the slits and the tongue 64 will be located between the outer faces of the end walls and the inner faces of the locking flaps.

Furthermore it will be noted that when the side walls are in an upright position and the locking flaps are engaged with the end walls, the locking lips or flanges are arranged in vertical locking positions in the interlocking of the end and side walls together.

It must also be noted that the interlocking flaps and bendable locking lips are not necessarily confined to the side wall structure, but could form a part of the end wall structure, or the locking flaps themselves may be interlocked with one another to form a wall.

Furthermore, the exact location of the interlocking means for securement of the adjacent walls could be arranged from the top, the bottom, the central portions or the sides of the end walls or the side walls with only slight modifications or ramifications.

Since certain changes may be made in the above structures and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What I claim is:

1. In containers, a container formed of a bottom wall and upright walls, certain of said upright walls having locking slits therethrough, locking flaps articulating from the ends of certain of said upright walls, said locking flaps having outer upper corners and slitted and creased portions forming outer lower corners with the accompanying areas of the locking flaps incorporating the outer upper corners and the outer lower corners and having their outer edges in alignment juncture with the outer edges of said outer upper and lower corners, said outer lower corners adapted to be folded at their crease lines to be in back to back positions with said locking flaps for the insertion of said locking flaps into and through the locking slits formed in the adjacent walls and to interlock therewith and to complete the securement of the upright walls to one another.

2. In containers, a container formed of a bottom wall and upright walls, certain of said upright walls having locking slits extending therethrough, locking flaps articulating from the ends of certain of said other upright walls, each of said locking flaps having an outer upper corner and an outer lower portion which is vertically split and transversely creased to form an outer lower corner capable of being bent back for permitting the introduction of said locking flap into and through a slit formed in the adjacent upright wall, said outer lower portion being of an area smaller than the area of the locking flap incorporating the outer upper corner and the outer lower corner which is projected through the slit formed in the adjacent wall and to lock therewith and complete the formation of a corner of said container.

3. In containers, a container formed of a bottom wall, side walls and end walls, said end walls having slits extending therethrough, foldable locking flaps extending therethrough, foldable locking flaps projecting from the ends of said side walls and integral therewith, each of said locking flaps having a non-bendable outer upper corner and a bendable outer lower corner, the latter being formed by the vertical splitting and transverse creasing of the outer lower portion of said locking flap so as to form a locking lip out of said outer lower corner and of an area smaller than the area of the portion of the locking flap that is to be inserted into and through a slit formed in an adjacent upright wall and adapted to interlock therewith and complete a corner of said container.

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