

May 3, 1966

P. J. WOOD

3,249,284

INTERLOCKING MEANS FOR A PLURALITY OF PANELS

Filed April 17, 1964

2 Sheets-Sheet 1

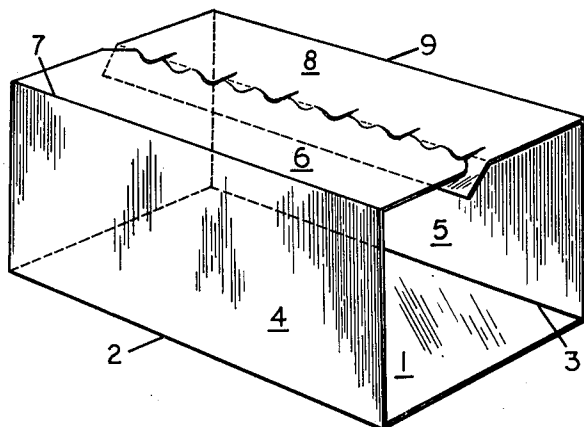


FIG. 1

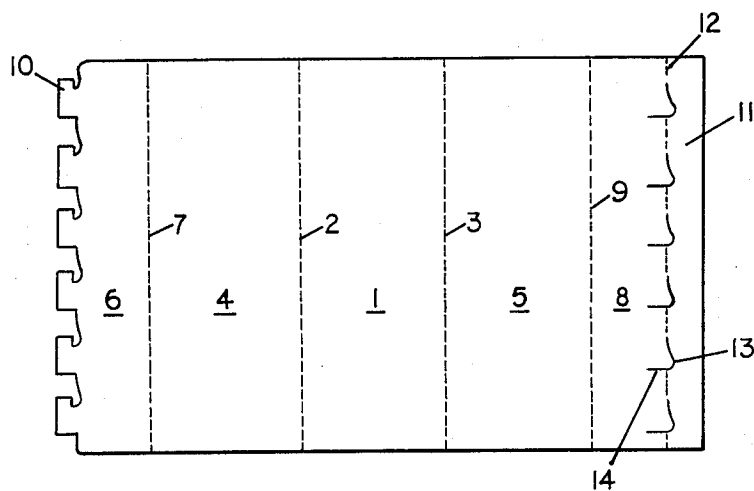


FIG. 2

INVENTOR.
PRENTICE J. WOOD
BY *Walter M. Rodgers*
ATTORNEY

May 3, 1966

P. J. WOOD

3,249,284

INTERLOCKING MEANS FOR A PLURALITY OF PANELS

Filed April 17, 1964

2 Sheets-Sheet 2

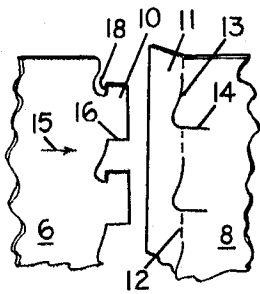


FIG. 3

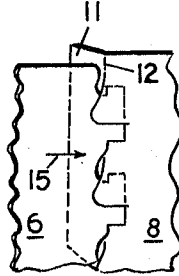


FIG. 4

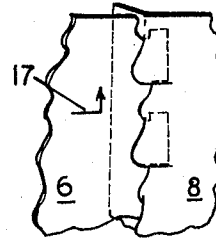


FIG. 5

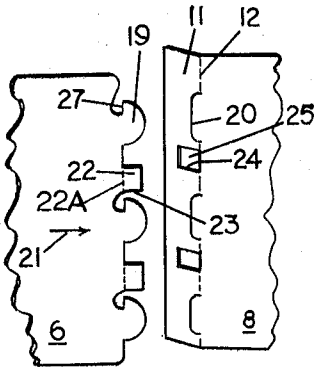


FIG. 6

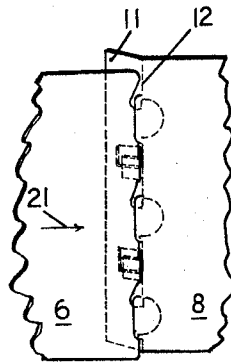


FIG. 7

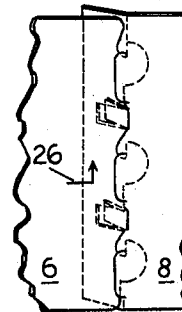


FIG. 8

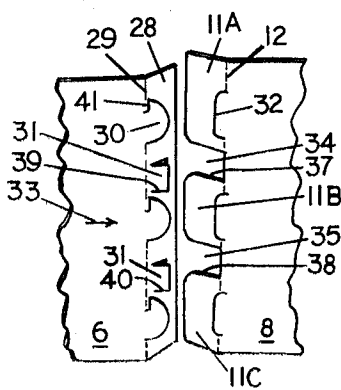


FIG. 9

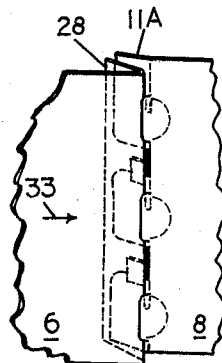


FIG. 10

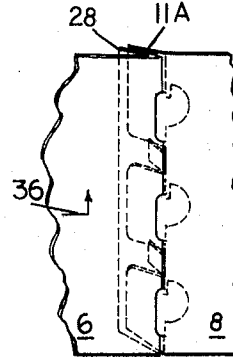


FIG. 11

INVENTOR.
PRENTICE J. WOOD

BY *Walter M. Rodgers*

ATTORNEY

1

3,249,284

INTERLOCKING MEANS FOR A PLURALITY OF PANELS

Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation, a corporation of Ohio
Filed Apr. 17, 1964, Ser. No. 360,577
3 Claims. (Cl. 229—40)

This invention relates to interlocking means for a plurality of panels and more particularly is directed to means for securing one edge of a yieldable panel to an adjacent complementary edge of an adjacent yieldable panel, the two panels being disposed in substantially coplanar relationship.

In articles constructed of paperboard, for example, it is customary to secure adjacent panels together by suitable means such as glue, locking tabs, and the like. Where the panels are secured by glue, the gluing operations require a certain amount of setting time and hence can pose a limitation on the speed of performance of a packaging operation.

In wrap-around type article carriers using locking tabs, the overlapping end edges are secured together by locking tabs formed in one end of the wrapper blank which are driven into and through complementary locking apertures formed in the other end of the blank. Such locking tabs ordinarily are driven by suitable machine elements into locking engagement with their cooperating locking apertures. In order that the locking tabs and their machine elements may move completely through the locking openings, it is customary to arrange the tabs and their associated openings so as to coincide with the empty space in a package group due to the shape of cylindrical articles customarily packaged by such locking tabs and apertures.

In one type of locking tab for article carriers and the like, a toe and heel type of lock is used. This type of lock is objectionable because of its tendency to unlock when subjected to stresses which but slightly exceed normal stress conditions. While this type of lock might be used in wrapper type packages wherein the primary packages are square in cross section or do not otherwise incorporate spaces therein, it is also objectionable because the lock cannot of necessity be used to provide a tight wrap-around package.

Another object of this invention is the provision of an improved wrapper type package which is particularly suitable for packaging primary packages of a wide variety of shapes and cross sectional configurations.

A principal object of this invention is to provide an unusually strong securing means for adjoining adjacent edges of two substantially coplanar panels and which effectively prevents substantial relative motion in the planes of the panels in any direction.

Still another object of this invention is to provide an improved interlocking means for wrap-around type article carriers which locking means utilizes locking hooks formed along the edges of one end of the wrapper to be secured in locking slots formed in the other end of the wrapper and by so doing to form a secure junction along the overlapping ends of the wrapper while eliminating the time required for the setting of glue.

Still another object of the invention is to provide an improved panel interlocking means which is specially adaptable for use as closure means for the end flaps of a tubular style carton or box as distinguished from a wrapper type package.

The invention in one form as applied to a pair of adjacent generally coplanar yieldable panels comprises a locking hook formed in one of the panels, a guide panel foldably joined to the other panel along a fold line, a locking slot formed in the other panel adjacent the fold

2

line and arranged to receive the locking hook when the one panel is moved in a direction generally normal to the fold line, said hook being movable into locking position within said slot in coordination with movement of said one panel in a direction generally parallel to the fold line following the initial movement thereof in a direction normal thereto, an abutment edge formed in the other panel and extending generally transverse to said locking slot, and a complementary abutment edge forming a part of said one panel, said abutment edges being positioned so that they do not engage each other until completion of the movement of said one panel into its locking position following movement thereof in a direction parallel to said locking slots.

For a better understanding of the invention, reference may be had to the following detailed description taken in conjunction with the accompanying drawings wherein FIG. 1 is a perspective view of a wrap-around type article carrier embodying the invention; FIG. 2 is a plan view of the blank from which the wrapper of FIG. 1 is formed; FIG. 3 is an enlarged fragmentary view of a portion of each end of the wrapper depicted in FIG. 2 and showing the securing elements before they are engaged with each other; FIG. 4 is a view similar to FIG. 3 and showing the locking operation after movement of the locking hooks into the locking slots in a direction generally normal to the direction of disposition of the locking slot; FIG. 5 is a view similar to FIGS. 3 and 4 but showing the locking operation complete, i.e., after the locking hooks have been moved in a direction parallel to the locking slots so as to complete the fastening operation; FIGS. 6, 7 and 8 are views corresponding to FIGS. 3, 4 and 5 of a modification of the arrangement depicted in FIGS. 1-5; and in which FIGS. 9, 10 and 11 correspond generally to FIGS. 3, 4 and 5 and which figures depict still another embodiment of the invention.

With reference to FIGS. 1 and 2, the numeral 1 is used generally to designate the main panel of the carrier which as depicted in FIG. 1 constitutes the bottom thereof. It will be understood that panel 1 could be the top or even a side of the wrapper. Foldably joined to main panel 1 along fold lines 2 and 3 respectively are the side panels 4 and 5. A panel 6 is foldably joined to panel 4 along fold line 7 while a similar panel 8 is foldably joined to panel 5 along fold line 9. Formed along the left hand edge of panel 6 as viewed in FIG. 2 are a plurality of locking hooks generally designated by the numeral 10. A guide panel 11 is foldably joined along an interrupted fold line 12 to the right hand edge of panel 8 as viewed in FIG. 2. Formed partially along the fold line 12 and extending to the right thereof and into the guide panel 11 are a plurality of locking slots generally designated by the numeral 13 each of which is interconnected respectively with a transverse abutment edge generally designated in FIG. 2 by the numeral 14. The locking hooks generally designated at 10 move into and form a secure locking engagement with the locking slots 13 and their associated abutment edges 14.

In order to form a lock using the locking hooks 10 and the locking slots 13 together with the associated abutment edges 14, a composite motion of panels 6 and 8 is utilized according to this invention. For instance, panels 6 and 8 are moved in a direction directly toward each other as represented by the arrow 15 in FIGS. 3 and 4 while the guide panel 11 is folded out of the plane of the panel 8. It will be understood that this folding movement of guide panel 11 exposes openings of substantial width in a direction normal to panel 8 thereby facilitating entry of the locking hooks 10 into their associated locking slots 13. From FIG. 3 it is apparent that the abutment edge 14 formed in panel 8 is offset somewhat from a comple-

3

mentary abutment edge 16 forming a part of locking hook 10. This fact is apparent also from FIG. 4 which depicts the parts in the positions which they occupy upon completion of the movement of panel 6 for example in a direction generally transverse to locking slots 13. After the parts are moved to the position depicted in FIG. 4, panel 6 is moved upwardly as shown in FIG. 5 and as indicated by the arrow 17 so as to cause the hook portion 18 of the locking hooks 10 to occupy positions immediately adjacent the fold line 12 and overlapping the end of the locking slots 13. The locking hooks 10 are maintained in this position by the engagement of each abutting surface 14 and of the complementary abutting surface 16. When completely locked the parts occupy the positions depicted in FIG. 5. It will be understood that the locking hooks 10 are folded slightly out of the plane of the panel 6 due to the presence of the panel 8. For this reason, the locking edge 14 is disposed at a slight angle relative to each locking edge 16. In this fashion and in accordance with one facet of the invention a secure locking operation is effected and maintained.

From the description thus far it will be understood that a lock formed according to this invention when used on a wrap-around article carrier does not require that the package be used in conjunction with primary packages of special or cylindrical shape and which for this reason form vacant spaces within the package group. Stated otherwise, the wrapper of this invention may be used in conjunction with primary packages which are square, rectangular, cylindrical or of some other cross sectional configuration, since no element of the lock or locking mechanism protrudes into the package during or after the forming of the lock joint. Of course it may be desirable to use the guide panel 11 as a divider between adjacent articles. If so this panel would be disposed between such articles.

While the arrangement shown in FIGS. 1-5 inclusive is deemed at the present time to constitute a preferred embodiment of the invention, the modification depicted in FIGS. 6, 7 and 8 is also believed to be of significant value. In the modification depicted in FIGS. 6-8 inclusive, locking hooks 19 are depicted and correspond to the locking hooks 10 described above. Locking slots 20 are utilized in the modification of FIGS. 6-8 and receive the locking hooks 19. As before panel 6 is moved toward the right as indicated in FIGS. 6 and 7 by the arrow 21 until the hooks 19 enter the locking slots 20. In FIGS. 6-8 separate abutment surfaces are utilized instead of the abutment edges 14 and 16 as described above. For example, a plurality of tabs 22 are formed on the edge of panel 6 and are interspersed between the locking hooks 19. These tabs 22 are provided with abutment edges 23 which engage abutment edges 24 each forming one edge of a plurality of openings 25. These tabs 22 are folded about fold line 22A and bear against guide panel 11 when the locking hooks 19 enter the locking slots 20 the tabs 22 enter their respective apertures 25 only after the panel 6 is moved in a direction parallel to the locking slot 20. Thus as depicted in FIG. 7 movement to the right of panel 6 is completed but the tabs 22 have not yet entered their cooperating openings 25. After movement in an upward direction as indicated in FIG. 8 by the arrow 26 is complete, the locking hooks 19 are in the engaged position and the abutment edges 23 of the tabs 22 are in firm engagement with the abutment edges 24 of the openings 25. Of course the locking edge 27 of each hook 19 is disposed so that it bears against the fold line 12 when the parts occupy the fully locked position depicted in FIG. 8.

The arrangements depicted in FIGS. 9-11 inclusive constitutes still another modification of the invention wherein auxiliary panel 28 is foldably joined along fold line 29 to the right hand edge of panel 6. Locking hooks 30 are formed in panel 28 and a plurality of tabs 31 are also formed in the panel 28. Formed along the left hand edge of panel 8 is a plurality of guide panels 11A,

4

11B and 11C which take the place of the single guide panel 11 described above. Locking slots 32 are formed in each of the guide panels 11A, 11B and 11C. Thus when panel 6 is moved toward the right relative to panel 8 as indicated by the arrow 33 the locking hooks 30 enter their respective locking slots 32. Simultaneously panel 28 is folded out of the plane of panel 6 while guide panels 11A, 11B and 11C are folded out of the plane of panel 8 as depicted in FIG. 9. After movement of panel 6 toward the right is completed, the parts occupy the positions depicted in FIG. 10. It will be observed that the locking hooks 30 have entered their associated locking slots 32 but the tabs 31 have not entered the spaces 34 and 35 between the tabs 11A, 11B and 11C. After upward movement of the panel 6 relative to panel 8 is effected as indicated in FIG. 11 by the arrow 36, the tabs 31 are moved into the spaces 34 and 35 respectively and the abutment edges 37 and 38 of the tabs 11B and 11C are firmly engaged by the complementary abutment edges 39 and 40 of the tabs 31. When in this locked position as depicted in FIG. 11 the hooked portion 41 of each hook 30 bears against the fold line 12 and a secure locking engagement between the panels 6 and 8 is effected.

Of course the guide panels 11 and 11A may form dividers for the arrangements depicted in FIGS. 6-11 as well as for the arrangements of FIGS. 1-5.

While certain views of the drawings depict a specific number of locking hooks and associated structure, it will be understood that the invention is not limited thereto and that a greater or lesser number of such items may be used in particular applications of the invention.

The advantages of the invention as described and explained above in connection with FIGS. 1-5 are also obtainable with the arrangements depicted in FIGS. 6-11 inclusive as will be readily apparent.

While particular versions of the invention have been shown and described, the invention is not limited thereto and it is intended in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

The embodiments of this invention in which an exclusive property or privilege is claimed are defined as follows:

1. An arrangement for interlocking adjacent edges of a pair of yieldable substantially coplanar panels, said arrangement comprising a plurality of L-shaped locking hooks formed along the edge of one of said panels and disposed in outwardly protruding exposed relation, a guide panel normally disposed in coplanar relation to the other panel and foldably joined to the other of said panels along a fold line generally parallel to the edge of said other panel, a plurality of locking slots formed in the other panel and in general coincidence with said fold line, each slot being arranged to receive one of said hooks in coordination with relative movement of said panels in a direction generally parallel to the planes thereof and generally normal to said fold line and in coordination with folding movement of said guide panel along said fold line and out of the plane of said other panel, said hooks being guided into their respective slots due to engagement with said guide panel and being movable into locking positions substantially simultaneously within their respective slots in coordination with relative movement of said panels in a direction generally parallel to said fold line and to the planes of said panels, a plurality of abutment edges formed in said one panel and positioned to engage the respective abutment edges in said other panel upon completion of the movement of said one panel into its locking position.

2. An arrangement according to claim 1 wherein said abutment edges in said other panel adjoin said locking slots to form substantially L-shaped slots respectively and are disposed in transverse relation thereto.

5

3. An arrangement according to claim 1 wherein said slots are curved and extend into said guide panel so that areas of substantial width are exposed to receive said locking hooks respectively when said guide panel is folded out of the plane of said other panel along said fold line.

2,911,096 11/1959 Andre ----- 206—65
3,073,505 1/1963 Ullger ----- 229—35

6

FOREIGN PATENTS

67,716 9/1948 Denmark.

References Cited by the Examiner

UNITED STATES PATENTS

2,154,475 4/1939 Shearer ----- 229—51

GEORGE O. RALSTON, *Primary Examiner.*