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Herz

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[54] **PROFILED CLOSING MEMBERS WITH SLIDE**

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[51] **Int. Cl.** **A44b 19/24,** B65d 33/24

[58] **Field of Search** ..... 150/3; 24/201 C; 229/69; 156/251

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Attorney, Agent, or Firm—Hill, Sherman, Meroni, Gross & Simpson

[57] **ABSTRACT**

A method of making bags and the bags resulting therefrom wherein the bags have a top edge and first and second side edges and interlocking rib and groove element at the top edge with a slider straddling the top edge and the slider having a back and downwardly projecting sides with the sides being closer together at a closing end of the slider which extends toward the first edge of the bag and being wider apart at the opening end of the slider which extends toward the second edge of the bag and with a finger between the sides at the opening end and the bag having heat seals joining the rib and groove elements and the heat seal being wider at the first edge than the second edge and being of a width at least equal to the length of the slider from its closing end to the finger so that the slider will remain fully on the bag at the end of its travel when opening the bag.

10 Claims, 5 Drawing Figures

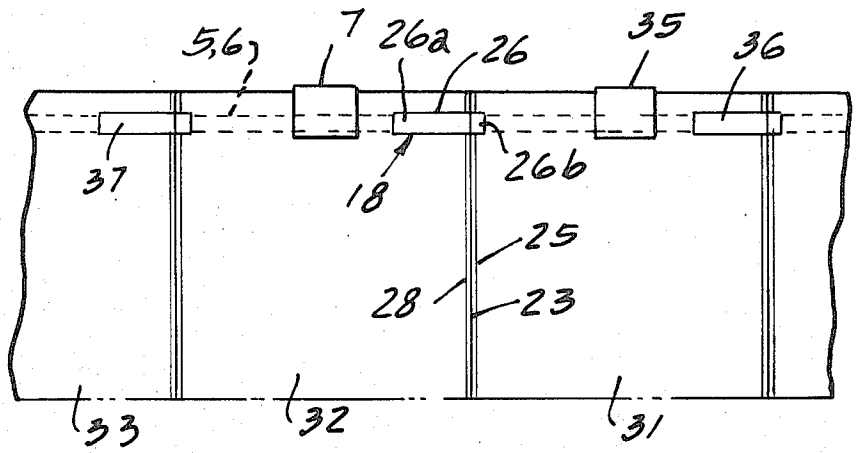


Fig. 1

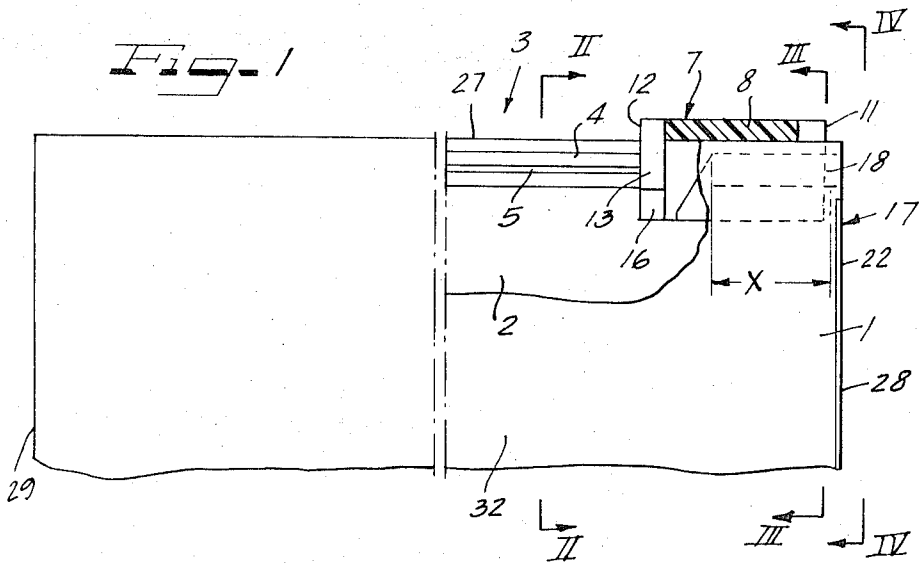


Fig. 2

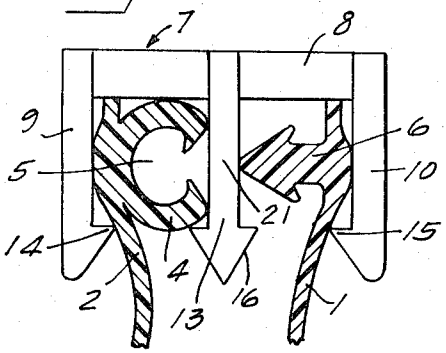
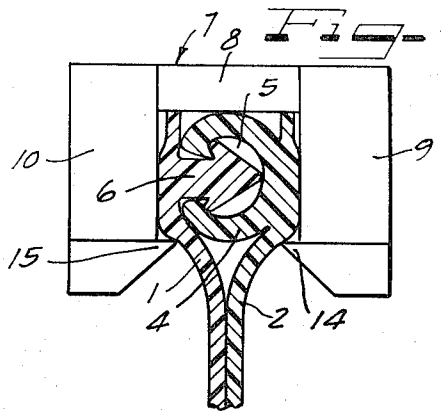


Fig. 3



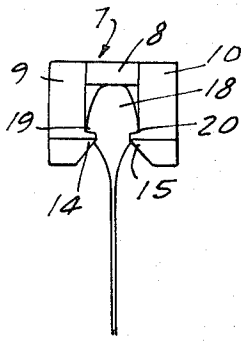


Fig. 4

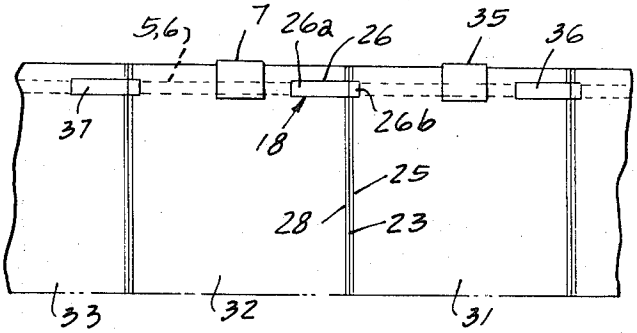


Fig. 5

PROFILED CLOSING MEMBERS WITH SLIDE

BACKGROUND OF THE INVENTION

The invention relates to improvements in fasteners for plastic bags or the like wherein the fasteners include releasably interlocking rib and groove elements with a slider for opening or closing the rib and groove elements. More particularly, the invention relates to an improved structure which limits the travel of the slider in its movement in an opening direction so that it does not wedge or stick and does not come off the end of the fastener strips.

In plastic fasteners for bags such as the type with which the present invention is concerned, releasably interlocking rib and groove elements extend along the top of the bag from a first edge to a second edge. The rib and groove elements are on the inside facing surfaces of the sheets of the bag and a straddling slider moves along the top of the bag. The straddling slider has a back and sides which extend along the outside of the rib and groove elements, and the sides are closer together at a closing end of the slider so that the rib and groove elements are pressed into interlocking relationship as the slider moves from the first to the second edge of the bag. At the opening end of the slider, the sides are further apart and a finger extends down between the slides for separating the interlocking rib and groove elements as the slider is moved from the second to the first edge of the bag.

When the bag is opened, the only thing to stop the slider in structures heretofore available is the seam at the edge of the bag, and when the slider finger comes into contact with it, most of the slider body is already off of the bag and, therefore, can easily be twisted off. If not twisted off, it may wedge or jam or become cocked or twisted so that it is not easy to start it and move it back in the direction to close the bag.

It is accordingly an object of the present invention to provide an improved structure wherein the slider is stopped in a position so that it remains fully on the bag at one edge and cannot be twisted off and does not wedge or jam, but can easily be again pushed in its closing direction.

Another object of the invention is to provide an improved method for manufacturing a series of bags providing bag structures of the type above described wherein structures are made by a minimum of steps for rapid and efficient manufacture resulting in a reduction of cost.

Other objects and advantages will become apparent from the teaching of the principles of the invention from which equivalent structures and methods will be become apparent to those versed in the art, as disclosed in the specification, claims and drawings, in which:

DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view of bags constructed and manufactured in accordance with the principles of the present invention;

FIG. 2 is a vertical sectional view taken substantially along line II—II of FIG. 1;

FIG. 3 is a vertical sectional view taken substantially along line III—III of FIG. 1;

FIG. 4 is a fragmentary end elevational view taken substantially along line IV—IV of FIG. 1; and

FIG. 5 is an elevational view illustrating steps in the method of making bags in accordance with the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

As illustrated in FIGS. 1 through 3, the structure includes flexible plastic bags formed of plastic sheets 1 and 2. These sheets form a bag 3 which has a top edge 27, and a first side edge 28 and a second side edge 29.

Along the top edge of the bag are fastener means which include flexible rib and groove elements with the rib 6 being sized and shaped to be releasably interlockable in the groove 5 of a groove element 4.

The rib and groove elements are formed of plastic as are the sheets 1 and 2 which form the walls of the bag, and in one form these elements may all be formed in a single extrusion method by being extruded from a plastic die. While the rib and groove elements are shown as being integral with the sheets, it will be understood that the features of the invention will also apply to separate closure strips which have rib and groove elements and which are attached to sheets.

When the rib and groove elements are pressed together by the application of a lateral pressure, they interlock as shown in their relative positions of FIG. 3. When they are forcibly pulled apart as by applying a separating pressure between them, they separate as illustrated in FIG. 2.

For joining or separating the rib and groove elements which closes or opens the top of the bag 3, a straddling slider 7 is positioned at the top edge of the bag. The slider has a back 8 which slides along the top edge and sides 9 and 10 mounted on the back that extend downwardly along the outer surfaces of the rib and groove elements.

The slider has a closing end 11 and an opening end 12 with the closing end extending toward the first edge 28 and the opening end extending toward the second edge 29.

At the closing end 11 of the slider, the sides 9 and 10, as shown in FIG. 3, are sufficiently close together so that they press the rib and groove elements into interlocking position. This will occur as the slider is moved in a closing direction from the first edge 28 to the second edge 29.

At the opening end 12 of the slider, a separating finger 13 is mounted on the back 8 and extends down between the sides 9 and 10. The finger forces the rib and groove elements apart to open the top of the bag, and the sides 9 and 10 are wider spaced at the opening end to permit this separation of the rib and groove elements.

Means are provided for holding the slider 7 in its straddling position at the top edge of the bag. One of these means are shown by the upwardly facing shoulders 14 and 15 at the lower edges of the side walls. These shoulders are locked beneath the bulges formed on the outer surfaces of the sheets 1 and 2 by the rib and groove elements 4 and 5. The slider is also held onto the top of the bag by shoulders formed by an enlarged head 16 at the lower end of the separating finger 13. These shoulders lock beneath the rib and groove element and also thus lock the slider in its straddling position onto the top edge of the bag.

As will be observed from the drawings and the foregoing description, the slider will be held onto the top

edge of the bag in all positions. However, if the slider could be pulled off of the end of the bag, such as moving too far to the right toward the first edge **28** in FIG. **1**, it could twist upwardly and wedge or jam or be lifted fully off of the top edge of the sheets. To prevent this, a stop **18** is provided which is engaged by the separating finger **13** as the slider is moved to the edge of the bag to limit the travel of the slider to traveling no further than the position shown in FIG. **1**. The stop **18** is preferably in the form of a cross-seal joining the rib and groove elements which prevents them from separating. The stop may be provided by a seal created by ultrasonic welding or by the application of a heated instrument to join the rib and groove elements, but an important feature of its construction is its location. That is, it extends inwardly from the first edge **28** a distance shown at X which is at least the length of the slider from its closing end **11** to the inner surface **21** of the separating finger **13**.

In the manufacture of the bags as shown in FIG. **2**, the bags are formed from a front sheet which becomes the front wall **1** of the bag and a continuation of said front sheet that is folded under itself to become the rear wall **2** of the bag **32** of FIG. **1**. These sheets are continuous and have at their top edge the fastener means comprised of the rib and groove elements **5** and **6**. To form bags cross-seals are made which form the side edges of the bags. As shown in FIG. **5**, the bags have their cross-seals made so as to form a first side edge **28** of the bag **32** and a second side edge **25** of the bag **31**. Individual bags are severed from each other along line **23**. The cross-sealing and severing is accomplished either in a single operation by using a hot wire that seals and cuts or in two operations by the application of a broader heated sealing bar which is then cut through its center by a knife. At the top of the bag, prior to the cross-seal, the stop **18** is formed such as by ultrasonic sealing. The provision of a stop is provided for successive bags as shown by the sealed areas **26** and **36**. Stop **26** extends a greater distance into the second bag **32** than into the first bag **31**. That is, the portion **26*b*** of the seal **26** is narrower than the portion **26*a***. Portion **26*b*** provides the stop for the slider **35** at the end of its travel when it closes the bag **31**. Portion **26*a*** provides the stop for the slider **7** at the end of its travel when it opens the bag **32**. Thus, in a single manufacturing operation correctly sized stops are made for both the first and second bags **31** and **32** by virtue of the selective positioning of the overall area **26**.

The slide **7** is formed of suitable material such as being molded from relatively hard plastic. The slide may be positioned by various methods such as by having its walls forcibly separated and pushed into its straddling position over the top of the bag. While the method of FIG. **5** shows the simultaneous manufacturing of a number of bags, the end seals at the first and second edges of the bag can be placed on the bags at a separate time. The bonding or welding of the edges of the bags and the formation of the stop can be formed by various types of equipment and can utilize the method of ultrasonic welding with the aid of electrodes or heads, one type of which is known to the art as "sonotrode."

I claim as my invention:

1. A reclosable fastener structure for releasably joining the top edges at the opening of a bag or the like comprising in combination,

a pair of flexible plastic sheets having a top edge and first and second side edges with separable fastener means at the top edge having releasably interlocking rib and groove elements on the facing surfaces thereof,

a straddling slider for joining or releasing the separable fasteners having a back for moving along the top edges of the fasteners with sides projecting from the back and extending from an opening end of the slider to a closing end,

said sides being spaced wider apart at the opening to permit separation of the rib and groove elements and being spaced sufficiently close together at the closing end to press the rib and groove elements into interlocking relationship as the slider is moved in a fastener closing direction toward the second edge of the sheets,

a separating finger on the slider extending between the sides at said opening end for separating the rib and groove element as the slider is moved in a fastener opening direction toward the first edge of the sheets,

and means permanently joining said rib and groove elements at the first edge a distance in from the edge at least equal to the length of the slider from the closing end to said finger so that the finger engages said joining means when the slider is moved to the first edge and complete slider remains on the fastener means,

and means on the slider interengaging the fastener preventing the slider from being lifted off of the top edge of the fastner while the slider straddles the fastener.

2. A reclosable fastener structure for releasably joining the top edges at the opening of a bag or the like constructed in accordance with claim **1** wherein said joining means is a heat seal connecting the rib and groove elements.

3. A reclosable fastener structure for releasably joining the top edges at the opening of a bag or the like constructed in accordance with claim **2** wherein the heat seal extends in from the first edge equal to the length of the slider from the closing end to said finger.

4. A reclosable fastener structure for releasably joining the top edges at the opening of a bag or the like constructed in accordance with claim **1** and including means at the lower edges of said slides interengaging with the sheets for holding the slider onto the top edges of the sheets.

5. A reclosable fastener structure for releasably joining the top edges at the opening of a bag or the like constructed in accordance with claim **1** wherein said finger includes means interengaging with the fastener means for preventing the slider from being lifted off of the edge of the sheets.

6. A reclosable fastener structure for releasably joining the top edges at the opening of a bag or the like constructed in accordance with claim **1** and including means permanently joining the rib and groove elements at said first and second edges with the means at said second edge being narrower than the means at said first edge.

7. A reclosable fastener structure for releasably joining the top edges at the opening of a bag or the like constructed in accordance with claim **1** wherein said top sheet edges continue to form the sides of a bag.

8. A reclosable fastener structure for releasably joining the top edges at the opening of the top of a bag or the like comprising,

first and second pairs of flexible plastic sheets each pair having a top edge and first and second side edges with the second edge of the first pair being adjacent the first edge of the second pair of sheets and the sheets having separable fastener means at the top edge with releasably interlocking rib and groove elements on the facing surfaces thereof,

a straddling slider for each pair of sheets for joining and releasing the top edges with the slider having a back for sliding along the top edges and sides projecting therefrom and extending from an opening end of the slider to a closing end,

the sides of said slider being spaced wider apart at the opening end to permit separation of the rib and groove elements and being spaced sufficiently close together at the closing end to press the rib and groove elements into interlocking relationship as the slider is moved from the first to the second edge of the sheets,

a separating finger on the slider extending between the sides at said opening end for separating the rib and groove elements as the slider is moved toward the first edge of the sheets, heat seal means joining two sheets of each pair to each other at the second top edge of the first pair and the first top edge of the second pair with said seal extending further into said second pair of sheets than into said first pair of sheets and extending into said second pair of sheets a sufficient distance to stop the slider so that its closing end remains on the sheets,

and the first pair of sheets being joined to each other by a cross-seam along their second edge and the second pair of sheets being joined to each other by a cross-seam along their first edge with said cross seams being adjacent each other and the pairs of sheets being separated by being severed from each other.

9. A reclosable fastener structure for releasably joining the top edges at the opening of the top of a bag or the like constructed in accordance with claim 8 wherein said first pair of sheets are joined to each other by a cross-seam which comprises a wire seal along their second edge with said wire seal simultaneously also forming the seal along the first edge of the second pair of sheets with the pairs of sheets being separable by severing the first pair of sheets from the second pair of sheets.

10. The method of forming a plurality of bags from pairs of superimposed sheets having a top edge with fastener means extending therealong including releasably interlocking rib and groove elements on the facing surfaces thereof and including straddling sliders for each bag formed from said sheets with the sliders having a back for sliding along the top edges with sides projecting therefrom and extending from an opening end of the slider to a closing end with the sides being spaced wider apart at the opening end to permit separation of the rib and groove elements and being sufficiently close together at the closing end to press the rib and groove elements into interlocking relationship, and the slider including a separating finger between the sides at the opening end for separating the rib and groove elements as the slider is moved in a fastener opening direction, the method comprising,

forming a top end seal between the rib and groove elements with the seal extending into one bag a less distance than into an adjacent bag with the sliders positioned on the bags so that the closing end of the sliders face the wider seals so that the fingers of the slider engage the front of said seals and the sliders are held onto the bag as they move to the far end of their travel in separating the rib and groove elements,

and thereafter forming a seal across the sheets between bags and severing the bags from each other.

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