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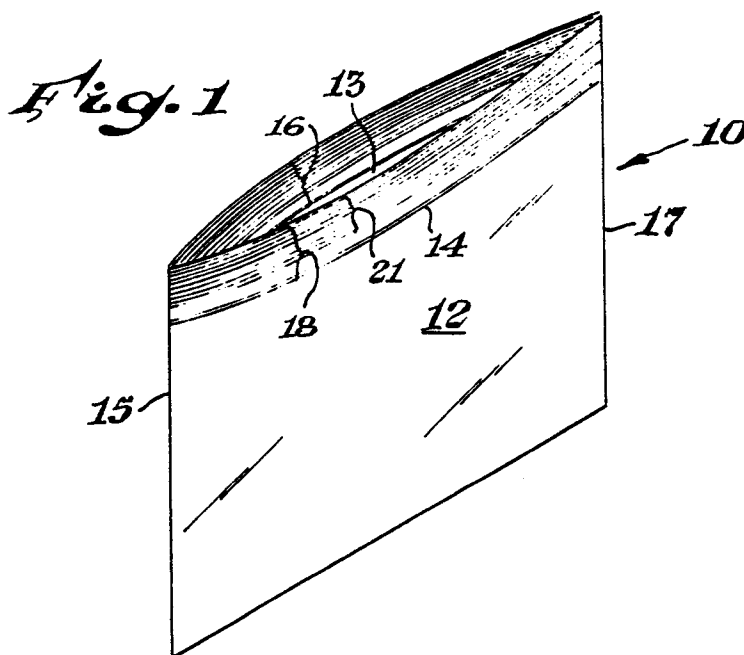
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(54) **Reclosable container with grip strip.**

(57) A plurality of small ridges located in a strip across the lip of a reclosable plastic bag providing a wide ridged surface area to permit ready gripping of the lip of the bag when opening the bag and separating the reclosable feature.



RECLOSABLE CONTAINER WITH GRIP STRIP

In reclosable plastic bags or other containers, particularly those containing a zipper type reclosable closure such as taught in U.S.-A-4,263,079, the container usually carries lips located above the reclosable closure feature, which lips are required to be grasped between the thumb and a finger, for example, and pulled to open the closure. Some degree of force is necessary to open the closure, which is relatively secure to avoid accidental opening. Since such bags are often found in the kitchen, it is not uncommon for one's fingers to be greasy. Since lips of such bags are commonly formed from smooth films such as those formed of polyolefin resin, the ease with which the lips of the bag can be grasped and kept hold of while pulling during opening can be easily negated when the fingers are greasy. Attempts to solve the lip grasping problem have generally included one, two or three large ribs, which are close to the same size as the closure elements themselves, such as illustrated in U.S. -A-4,363,345, for example. Such large ribs are purported to improve gripping of the container lips by the user during the opening and loading of the container. However, use of large ribs has been found to cause some forming complications because of their size, in that undulations can occur during extrusion. Such large ribs have also been found in many instances not to be as comfortable to the user as they might be, some effort is required on the part of the user to locate the large ribs and such large ribs require considerable amount of resin material to form especially if more than one or two of them are employed.

Applicants have found that a far more desirable, improved arrangement is where the size and the number of protuberances are in between those that are merely employed for roughening a surface as a spacing means for nonblocking and those ribs which are large and small in number, such as previously designed to aid in gripping of lips of reclosable plastic bags.

The present invention is an improvement to reclosable plastic containers, such as bags, ensuring ease of grasping of the lips of bags both from a location and securing standpoint, the improvement simultaneously leading to ease of manufacture of such containers containing such improved grasping feature, hereinafter called grip strips. This improvement is accomplished by modifying the lip of a reclosable bag by including on opposed surfaces thereof a plurality of generally parallel small ridges in order to provide a large area of ridged surface to grip the top or lip of the bag when opening or filling the bag. It has also been found that when a larger number of ridges are used, the ridges can be

considerably smaller than when a single rib is employed and still produce an improved gripping surface. It has further been found that a plurality of small ridges are easier to produce than fewer large ribs. Small ridges require less modification to the die when added to the film by extrusion. In addition, small ridges can be produced by other techniques than extrusion such as by embossing, and a plurality of such small ridges can also provide reinforcement for the lip of the bag. It has been discovered that a series of generally parallel ridges presenting a gripping edge or edges and being about 0.002 to 0.009 (preferably 0.003 to 0.005) inches (0.05 to 0.23, preferably 0.08 to 0.13 mm) in height and spaced at a density of about 7 to 24 - (preferably 12 to 16) ridges per lineal inch (2.54 cm) of film in the region above the reclosable feature would provide the advantages of this invention.

The invention is further illustrated by the following drawings wherein;

Figure 1 is a perspective view of a reclosable bag with improved grip strips of this invention;

Figure 2 is a side elevational view of the bag of Figure 1 partially broken away to show a grip strip on the inside of one lip;

Figure 3 is a partial plan view of an extrusion die employed for extruding the ridges forming the grip strip on a lip of the bag shown in Figure 1;

Figure 4 is an enlarged fragmentary plan view of the lower edge of the die plate shown in Figure 3;

Figure 5 is an enlarged cross-sectional view of a grip lip having a single ridge as typically employed in the prior art;

Figure 6 is a view like Figure 5 only showing a grip strip with a plurality of ridges formed in accordance with the principles of the present invention and manufactured using the die plate of Figure 3;

Figure 7A -7E is a cross-sectional view of various embodiments of grip strips of the present invention showing some variation in ridge spacing, shape and size; and

Figure 8D shows an enlarged cross-section of the ridge of 7D, and Figure 8E being an enlarged cross-section of the ridge of Figure 7E.

Referring more particularly to Figure 1, there is shown a container or bag 10 having opposed side walls 12 and 13, reclosable fastener elements 14, opposed lips 16 and 18, each opposed lip containing grip strips 20 and 21 respectively, which grip strips provide for improved ease of opening and holding the bag for filling. Figure 2 is a view like Figure 1 showing through a broken away section

the inside of side 13 of the bag 10 with its lip 16 and grip strip 20, the latter comprising a plurality of elongated generally parallel ridges 22 extending from substantially one edge 15 of the bag to the other edge 17 as a strip or band across lip 16 above reclosable fastener 18. Ridges 24 are preferably substantially continuous along their length.

Bag 10 can be formed in a process such as shown and described in U.S. -A-4,515,647, with the cut-away 30 of a die 29 for grip strip ridges 22 being located to the outside of the extrusion openings 31 of each profile extrusion such as shown in fragmentary Figure 3. Cut-away 30 in the front or lower edge of the die 29 form teeth-like die projections 32 being shown in somewhat exaggerated detail for clarity. The cut-aways 30 which form the ridges 22 of grip strip 20 for example, are shown to be of a triangular configuration so as to provide ridges 22 with a generally triangular configuration, as shown in Figure 6, for example and described in more detail later.

In greatly enlarged Figure 4 a land 34 between cut-aways 30 is purposely not as great as the spacing "x" between the peaks 25 of adjacent ridges 22. Again, as seen in the grip strip 20 in Figure 6, as compared to the cut-aways 30 in die 29, because of the draw down occurring in the extrusion process, the land area 34 (Figure 4) between cut-aways 30, which form ridges 22, is greatly extended to the distance roughly shown as about "x" minus the width "w" of one ridge 22 (Figure 6). Not only is the spacing between the ridges 22 effected by the draw-down in the extrusion process, but also the particular shape of each of the ridges 22 as disclosed hereinafter. The cut-away openings 30 can take various configurations approaching a rectangle, all the way to a saw tooth type opening, such as a right triangular configuration or take the shape of an equilateral triangle. Preferably a shape is desired which can present at least an edge to be engaged by a finger or a thumb when gripping the lip to open the bag containing a grip strip 20, such as shown in gripping edge 41 of ridge 22 in Figure 8D or gripping edges 42 of ridge 43 in Figure 8E, which edges are shown slightly rounded because some rounding occurs in draw-down during the extrusion process.

Figure 5 illustrates a grip lip 36 of the prior art which has a film thickness "t" of about two to three thousandths of an inch (0.05 to 0.08 mm), and a grip lip height "h" of from two to five hundredths of an inch (0.5 to 1.3 mm). There generally are only one or two such ribs 36 on a grip lip.

In the grip strip cross-section shown in Figure 6, the film thickness "t" can be about the same as that in Figure 5, that is about two to three thousandths of an inch thick (0.05 to 0.08 mm), but the ridges are only about two to nine thousandths of an

inch (0.05 to 0.23 mm) tall and they are spaced at a density of about 12 to 16 ridges per lineal inch - (2.54 cm) of film across the grip strips width w, which in the illustration shown in Figure 6 gives a spacing x of about 0.06 to 0.08 inches (1.5 to 2.0 mm) from tip 23 to tip 23 of adjacent ridges 22.

Various modifications of this invention are shown in Figure 7A -7E, for example, all on about the same scale (50 times actual size) as that used for Figures 5 and 6, the various ridge heights and ridge spacing. While all of these embodiments are operable (the embodiments of Figures 7B through 7E were actually made), if there was a preference it would be for the embodiment of Figure 7D. The number (7) for Figure 7A, (12) for Figure 7B, (24) for Figure 7C, (16) for 7D, and (20) for 7E gives the number of ridges 22 or ridges 43 per inch (2.54 cm) of film being about 7 to 24 (preferably 12 to 16), 16 ribs per inch (2.54 cm) of film and with ridges from 0.002 to 0.009 inches (0.05 to 0.23 mm) tall preferably 0.003 to 0.005 inches (0.08 to 0.13 mm) tall. If one goes much below 0.002 inches (0.05 mm) in height ridges became difficult to feel. While a higher ridge may be easier to feel, it requires more material to form and is more difficult to form, as explained earlier.

It has been found that using a plurality of much smaller ridges 22 as shown in grip strip 24 of Figure 6, that no more material need be used than used with a single grip strip on a bag lip such as shown in Figure 5, and yet several advantages are obtained over such a configuration. For one it was found that it was easier to match the flow velocity of the grip strip area with that of the film during extrusion when a series of small ridges are used and that this essentially eliminated undulation extrusion problems of the kind that are experienced when trying to match the velocity of a single relatively large grip lip rib, such as rib 36, to that of the flat film being coextruded therewith. Another advantage of using a plurality of small ridges is that there was provided uniform gripping essentially over the entire lip. Not only does a grip strip according to this invention provide a better feel, but it is more foolproof because one can grip the lip anywhere and find more than one ridge upon which to engage fingers for pulling zippers or other reclosable elements apart or holding the bag even with greasy fingers. In one survey taken, for example when comparing the grip strip of the present invention, with the prior art with a single large rib on each bag lip of those surveyed with dry hands only 29 percent preferred the prior art grip lip as against 63 percent for the grip strip of this invention, while 8 percent thought that they were about equally effective. With greasy hands, the numbers were 25 percent, 72 percent and 3 percent, respectively showing an overwhelming preference for the grip

strip of this invention, especially with greasy hands where the test is the most severe.

Claims

1. A reclosable container having closure elements in an upper lip portion of the container, opposing side walls with closure elements positioned on the opposed side walls, sections of the lip portion above the closure elements each containing a grip strip, characterized in that the grip strip comprises three or more ridges extending substantially along the length thereof, each of the ridges being generally parallel to one another and of a height no greater than (0.009 inches) 0.23 mm and no less than (0.002 inches) 0.05 mm.

2. Container of Claim 1 wherein the number of ridges are from 7 to 24 per (lineal inch) 2.54 cm across the width of the grip strip.

3. Container of Claim 2 wherein the ridges have a height of from (0.003 to 0.005") 0.08 to 0.13 mm.

4. Container of Claim 3, wherein the number of ridges is from 12 to 16 per (lineal inch) 2.54 cm across the width of said grip strip.

5. Container of Claim 1, wherein each of the ridges presents an edge effective to be grippingly engaged by a finger or thumb.

6. A method of forming a reclosable container with gripping ridges formed in a grip strip on opposed lips of the container, characterized by forming three or more cut-away sections on an extrusion die adapted to form ridges on film coextruded adjacent said ridges, spacing the cutouts a distance so that the ridges are spaced so as to have at least seven ridges per (lineal inch) 2.54 cm in the width of the grip strip, shaping the cut-aways so as to present a gripping edge on the ridges, and drawing down the grip strip so as to maintain generally the gripping edge, and maintaining at least seven ridges per (lineal inch) 2.54 cm of grip strip.

7. Method of Claim 6, wherein the draw-down and amount of cut-away are effected so that the height of the ridges in the resulting container is no greater than (0.009 inches) 0.23 mm and no less than (0.002 inches) 0.05 mm.

8. Method of Claim 6, wherein there are from 12 to 16 cut-aways provided on the die.

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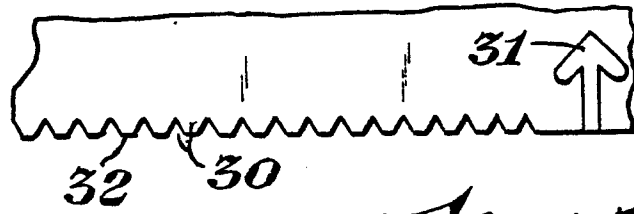
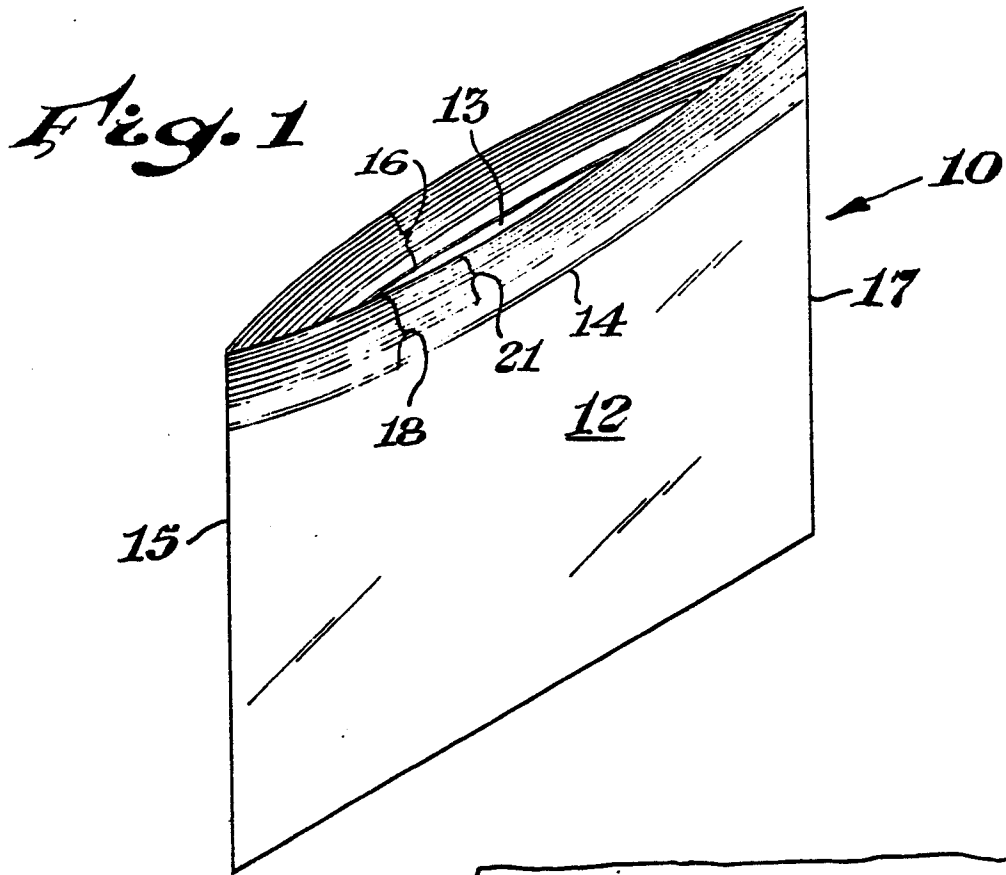


Fig. 3

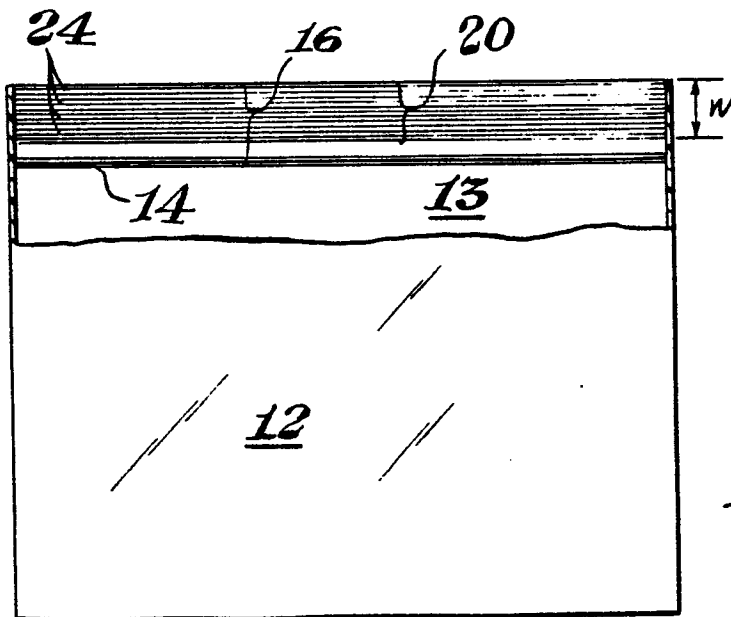


Fig. 2

