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(54) HIGH STRENGTH SLIDER END STOP

(75) Inventor: **Per Bentsen**, Suffern, NY (US)

Correspondence Address:
DAY PITNEY LLP
ACCOUNT: ILLINOIS TOOL WORKS INC.
7 TIMES SQUARE
NEW YORK, NY 10036-7311 (US)

(73) Assignee: **ILLINOIS TOOL WORKS INC.**

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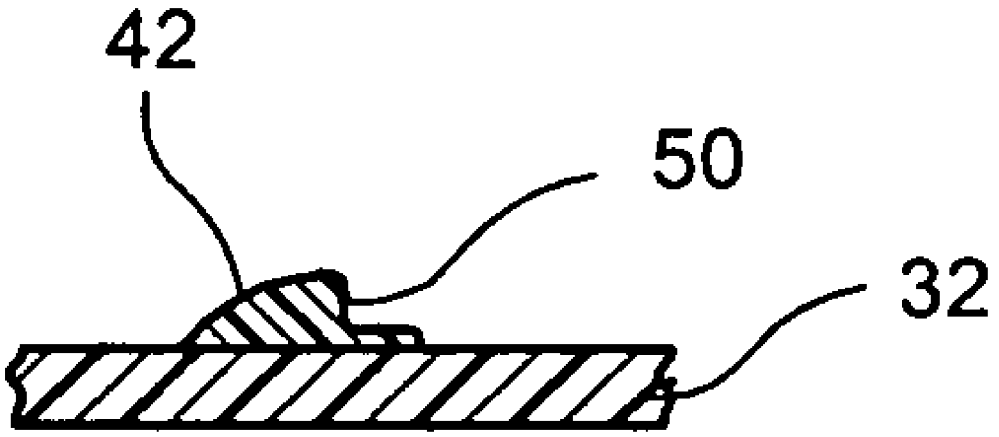
(57) **ABSTRACT**

A zipper for a reclosable bag is disclosed, wherein the end stops of the zipper are formed with a dot of hot glue or adhesive. These end stops are designed to limit the range of travel of the slider and prevent the slider from being removed from the zipper. Additionally, a vertical wall facing the slider is formed to prevent the slider from riding over the end stop.



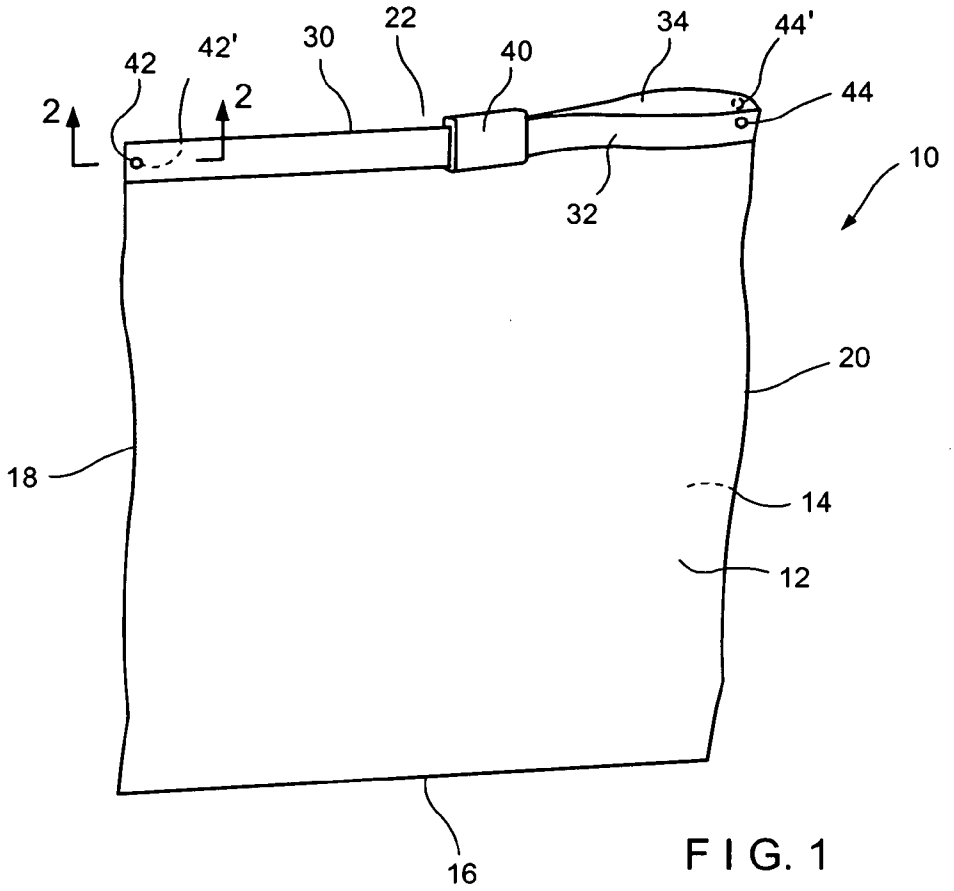


FIG. 1

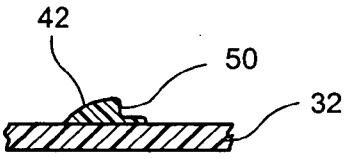


FIG. 2

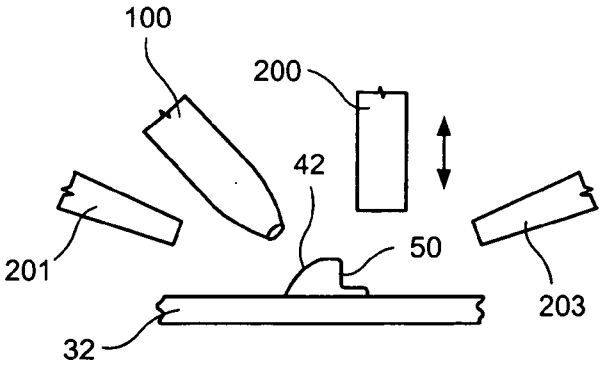


FIG. 3

HIGH STRENGTH SLIDER END STOP

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to the use of hot glue or similar adhesive to form an end stop with a vertical face for a slider on the zipper of a reclosable bag.

[0003] 2. Description of the Prior Art

[0004] In the prior art of slider-operated zippers for reclosable bags, it is well known to form end stops on the zippers to limit the extent of travel of the slider. This prevents the slider from being moved beyond the end of the zipper and removed from the zipper. The end stops can be formed by the methods disclosed in U.S. Pat. No. 6,569,368 entitled "Method for Manufacturing a Plastic Zipper with End Stops", issued on May 27, 2003 to Machacek or U.S. Pat. No. 6,470,551 entitled "Method of Making a Fastener Arrangement with Notches at Spaced Preseals", issued on Oct. 29, 2002 to Provan et al. These methods have proven satisfactory for their intended purposes in many ways. However, these involve relatively complex molding systems, sometimes using polymers similar to those used to form the zipper components or the web of the walls of the reclosable bag. U.S. Pat. No. 6,846,107 entitled "Glue Drop End Stops for Zippered Bag", issued on Jan. 25, 2005 to Sweeney et al., discloses end stops formed from ultra-violet light curable glue. The resulting end stops have a rounded shape which can allow the legs of the slider to spread, so that the slider rides over the end stop.

OBJECTS AND SUMMARY OF THE INVENTION

[0005] It is therefore an object of the present invention to provide a simplified method and apparatus for forming end stops for the zipper of a reclosable bag.

[0006] It is therefore a further object of the present invention to provide an economic method and apparatus for forming end stops for the zipper of a reclosable bag.

[0007] It is therefore a still further object of the present invention to provide a method and apparatus for forming end stops for the zipper of a reclosable bag, wherein the slider has a reduced or eliminated tendency to run over the end stop.

[0008] These and other objects are achieved by providing a drop of adhesive, such as hot glue, onto the location where an end stop is sought to be formed. The glue is initially sufficiently heated to be dispensed, and then subsequently cools to form a high strength end stop. Additionally, a vertical (that is, perpendicular to the zipper) wall is formed in the glue drop thereby preventing the slider from riding over the end stop. This configuration typically and preferably results in an end stop which can withstand a force of at least twenty pounds as the slider is pushed against the end stop.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Further objects and advantages of the invention will become apparent from the following description and from the accompanying drawings, wherein:

[0010] FIG. **1** is a perspective view of a reclosable bag, including a zipper with an end stop formed from a dot of hot glue or similar adhesive.

[0011] FIG. **2** is a first cross-sectional view of the end stop formed from a dot of hot glue or similar adhesive.

[0012] FIG. **3** is a second cross-sectional view of the end stop formed from a dot of hot glue or similar adhesive, with a somewhat increased height as compared to FIG. **2**. Additionally, FIG. **3** shows a simple apparatus for dispensing the hot glue drop and for forming the vertical wall in the resulting end stop.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] Referring now to the drawings in detail wherein like numerals indicate like elements throughout the several views, one sees that FIG. **1** is a perspective view of reclosable bag **10**. Reclosable bag is formed from a front panel **12** sealed to a rear panel **14** along bottom seal **16** and side seals **18**, **20**. A mouth **22** is formed between the upper surfaces of front and rear panels **12**, **14**. A reclosable zipper **30** is used to selectively open and close the mouth **22**. Reclosable zipper **30** includes first profile **32** sealed downwardly adjacent from the upper surface of front panel **12** and second profile **34** sealed downwardly adjacent from the upper surface of rear panel **14**. Likewise, a slider **40** is used to selectively open and close the zipper **30**, when moved in a first direction, by separating the first profile **32** from the second profile **34** and, when moved in a second direction (opposite to the first direction), by joining or interlocking the first profile **32** to the second profile **34**. The structure of zipper profiles **32**, **34** and sliders **40** is well known to those skilled in the art, particularly after review of the present disclosure.

[0014] In order to limit the range of motion of the slider **40** thereby preventing slider **40** from being removed from the reclosable bag **10**, end stops **42**, **44** are formed proximate to the ends of first profile **32**. End stops **42**, **44**, as shown in FIG. **2** are formed by a drop of hot glue, such as hot melt adhesive, as dispensed from a tipped dispenser **100**, as shown FIG. **3**. The hot glue subsequently cools to form the end stops **42**, **44**. An alternative embodiment places the end stops on the top of the zipper as shown by elements **42'**, **44'** in FIG. **1**.

[0015] End stops **42**, **44** have a vertical (that is, perpendicular to first profile **32**) wall **50** to face the slider **40** and prevent the slider **40** from spreading and running over the end stop **42** or **44**. Vertical wall **50** can be formed, typically prior to the cooling of the hot glue, with reciprocating blunt end **200**, preferably chilled or with a stick resistant surface, such as polytetrafluoroethylene, as shown in FIG. **3**. In a variation of this embodiment, conventional room temperature glue is used and reciprocating element **200** includes a blade or grinding element to form the vertical wall after the glue has dried or cured. In a further embodiment of this invention, reciprocating element **200** is replaced by blowers **201**, **203** which blow air (or other gas) against the side of the end stop **42**, **44** opposite to that where the vertical wall is sought to be formed. This air or gas stream causes the formation of a vertical wall much in the same way that wind causes waves in the ocean. Of course, two blowers **201**, **203** are required as the vertical walls **42**, **44** of a single zipper

face in opposite directions. As it is envisioned that these end stops **42**, **44** will be formed on an assembly line type configuration (that is, with the zipper moving) either before or after being sealed to the panels **12**, **14** to form reclosable bag **10**, tipped dispenser **100** and reciprocating blunt end **200** may be at successive stations along a line.

[**0016**] Additionally, the end stops **42**, **44** can be formed on one or both of the profiles **32**, **34**.

[**0017**] Thus the several aforementioned objects and advantages are most effectively attained. Although preferred embodiments of the invention have been disclosed and described in detail herein, it should be understood that this invention is in no sense limited thereby and its scope is to be determined by that of the appended claims.

What is claimed is:

1. A zipper for a reclosable bag including:

a first profile;

a second profile;

a slider which, when moved in a first direction along said first and second profiles, separates said first profile from said second profile and, when moved in a second direction opposite to said first direction, interlocks said first profile to said second profile;

end stops for restricting movement of said slider, said end stops formed on said first profile by depositing glue on said first profile, said end stops having a wall substantially perpendicular to said first and second profiles facing said slider.

2. The zipper of claim 1 wherein each of said end stops is formed from a dot of hot glue.

3. The zipper of claim 2 wherein said end stops are formed proximate to ends of said first profile.

4. The zipper of claim 2 wherein said end stops are formed proximate to ends of said first profile and said second profile.

5. The zipper of claim 4 wherein said walls are formed by a reciprocating blunt end.

6. The zipper of claim 5 wherein said reciprocating blunt end includes a stick resistant surface.

7. The zipper of claim 6 wherein said stick resistant surface includes polytetrafluoroethylene.

8. The zipper of claim 1 wherein said walls are formed by a blade.

9. The zipper of claim 1 wherein said walls are formed by a grinding element.

10. The zipper of claim 1 wherein a gas stream is impinged against said end stops to form said walls.

11. The zipper of claim 1 wherein said endstops are formed on top of said first profile.

12. A zipper for a reclosable bag including:

a first profile;

a second profile;

a slider which, when moved in a first direction along said first and second profiles, separates said first profile from said second profile and, when moved in a second direction opposite to said first direction, interlocks said first profile to said second profile;

end stops formed from glue for restricting movement of said slider, said end stops having a wall facing said slider.

13. The zipper of claim 12 wherein each of said end stops is formed from a dot of hot glue.

14. The zipper of claim 13 wherein said end stops are formed proximate to ends of said first profile.

15. The zipper of claim 13 wherein said end stops are formed proximate to ends of said first profile and said second profile.

16. The zipper of claim 15 wherein said walls are formed by a reciprocating blunt end.

17. The zipper of claim 12 wherein said walls are formed by a blade.

18. The zipper of claim 12 wherein said walls are formed by a grinding element.

19. The zipper of claim 12 wherein a gas stream is impinged against said end stops to form said walls.

20. The zipper of claim 12 wherein said end stops are formed on top of said zipper.

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