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(54) **POUCH HAVING EXPANDED POLYMER EDGES**

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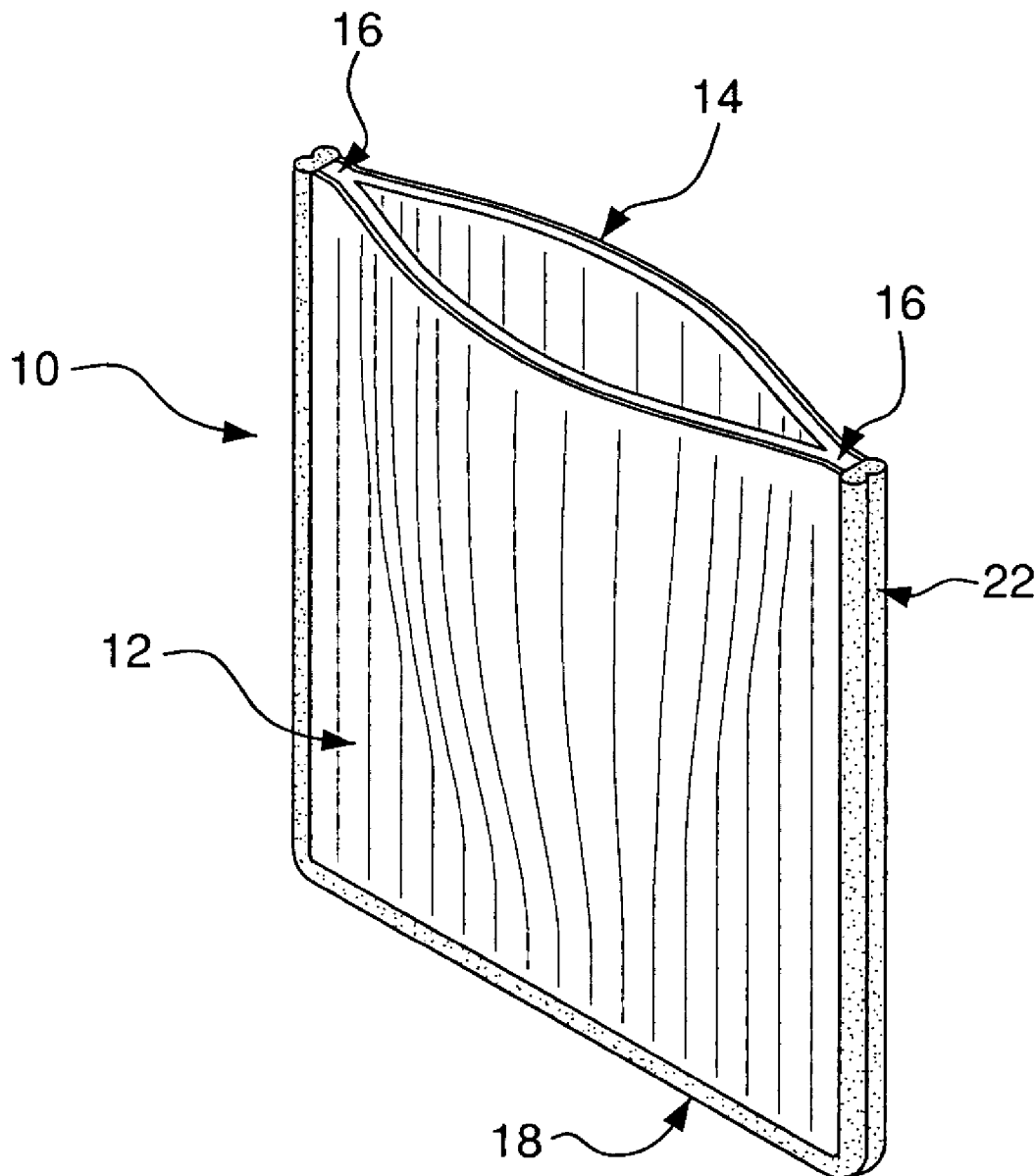
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(57) **ABSTRACT**

A heat sealed pouch with tactile friendly edges is provided from the expansion of an expandable polymer, triggered either during the heat sealing process or subsequent to the heat sealing process. The pouch consists of two adjacent panels which are sealed along at least one edge.

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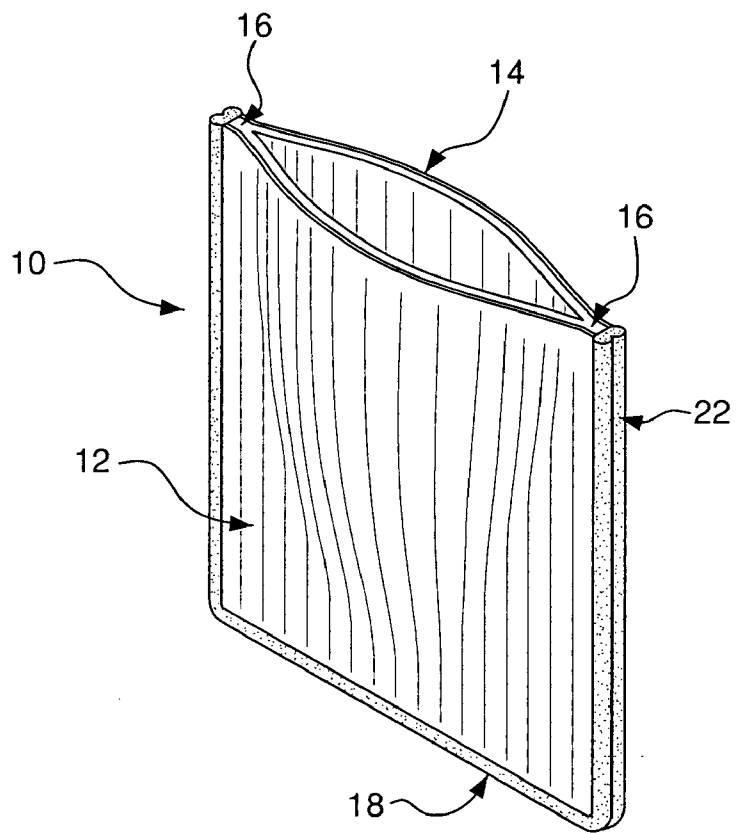


FIG. 1

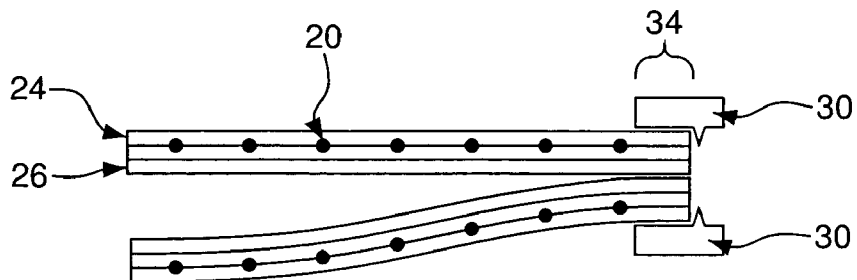


FIG. 2

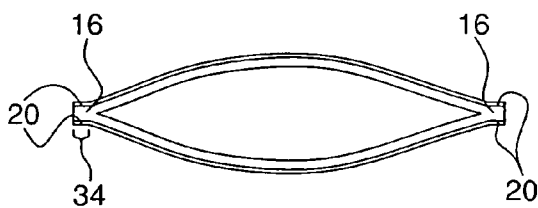


FIG. 3A

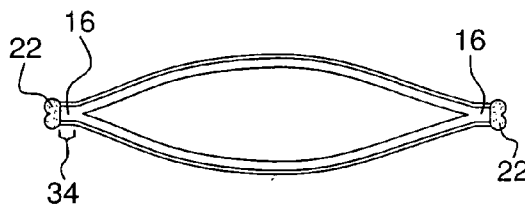


FIG. 3B

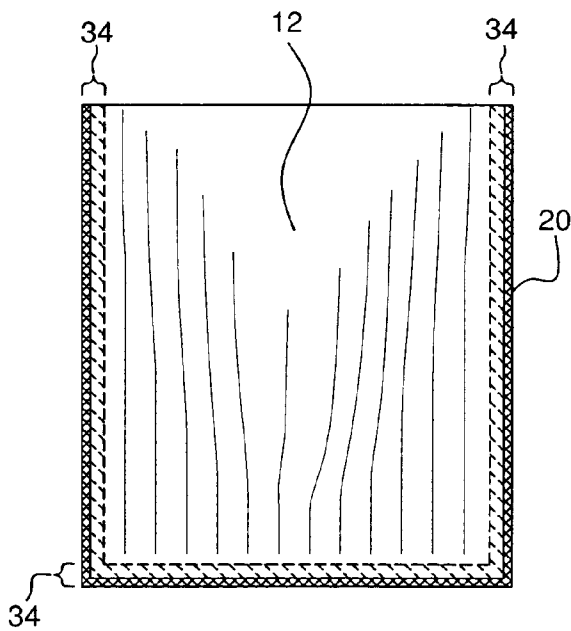


FIG. 4A

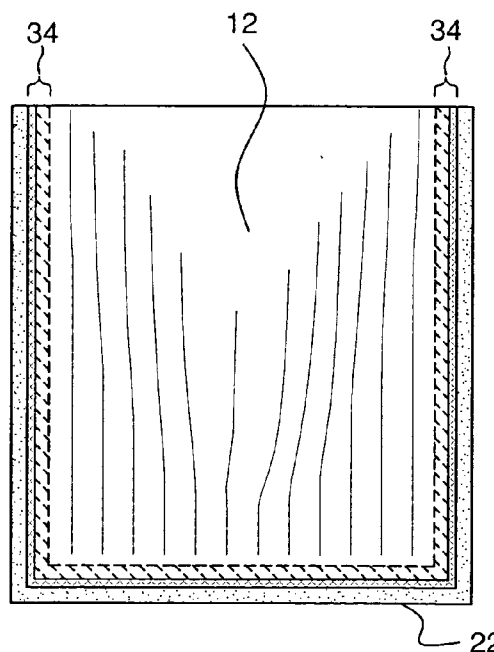


FIG. 4B

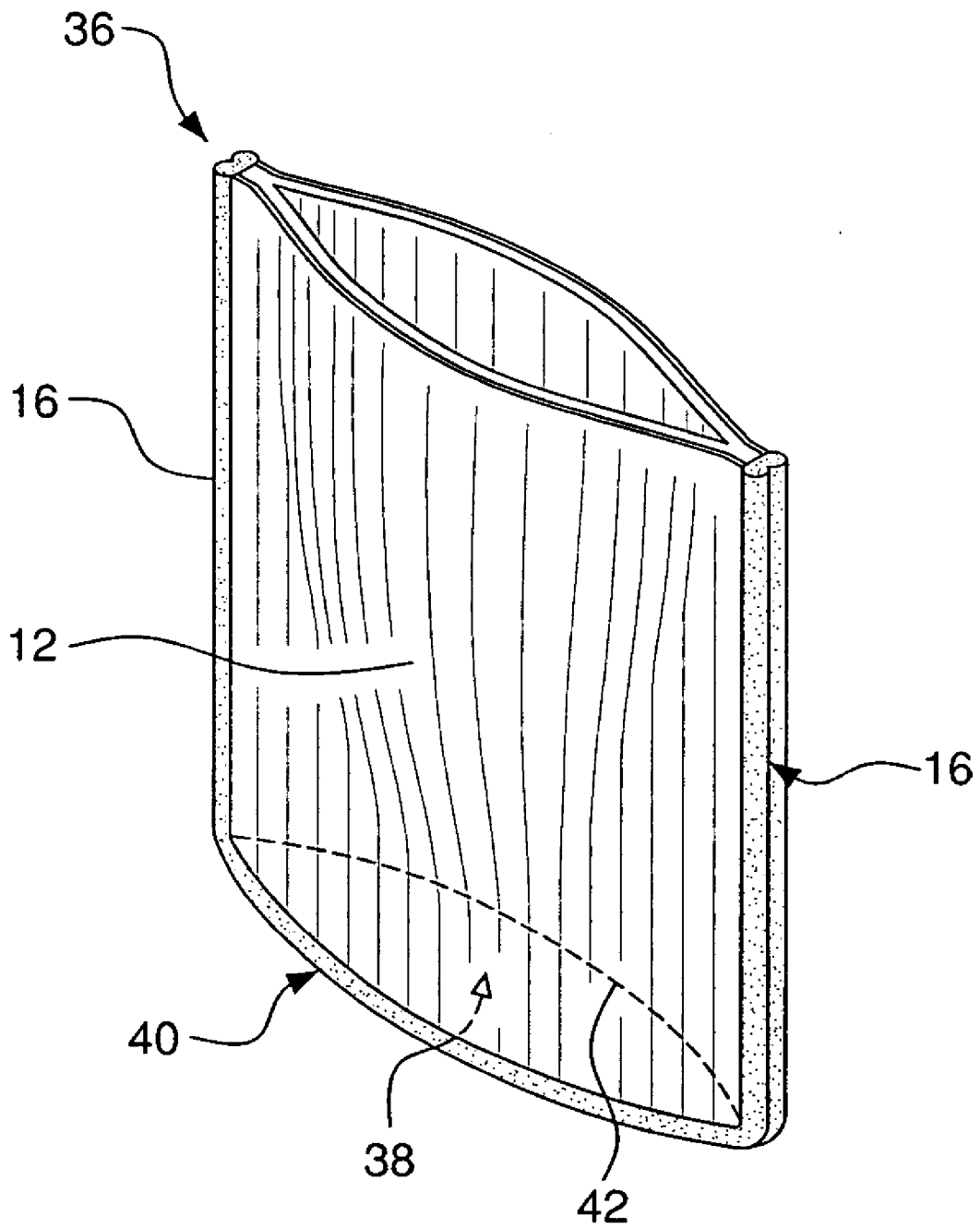


FIG. 5

## POUCH HAVING EXPANDED POLYMER EDGES

### FIELD OF THE INVENTION

[0001] The present invention relates generally to flexible packaging in the form of pouches and methods of making pouches. Specifically the invention relates to flexible pouches with an improved edge configuration.

### BACKGROUND OF THE INVENTION

[0002] Flexible pouch type packaging is typically created by heat sealing two adjacent plies of thermoplastic material along an outer perimeter edge.

[0003] Using current heat sealing technology, flexible pouches are sometimes formed having relatively sharp edges. The edges may particularly be sharp when the pouch construction includes heavy-gauge oriented polymers and/or foil. Sharp edges may make the pouches difficult to handle for the manufacturer as well as the consumer. In some situations, the manufacturer is required to package the pouches within secondary packaging to prevent the edges from cutting or scaring other packages during shipment. The application of this secondary packaging is time consuming and adds cost, as well as may reduce the number of pouches that can be shipped in a given package.

[0004] There are a number of known methods of heat sealing pouch seams. U.S. Pat. No. 3,256,527 to Struden discloses a manner of heat sealing of a seam by passing the material between heated jaws having a planar surface for contacting the layers. The resulting seam is a flat, fin-type seam of two layers. U.S. Pat. No. 4,868,025 to Strzelewicz discloses a manner of heat sealing a seam by passing the material between jaws specially designed to produce a zone of fused materials, forming a seamed edge on the bag.

[0005] It is also known to use heat activated puff ink in a variety of contexts. U.S. Pat. No. 4,448,320 to Kapolis discloses a closure for a rigid container (e.g., a jar) that utilizes a liner formed of plastisol that expands when cured. The plastisol bead is indicated to aid in retaining the closure of the container. U.S. Pat. No. 5,873,641 to Spinelli discloses puff ink on a flat, non-woven textile mat. The puff ink provides graphics and a non-skid surface. U.S. Pat. No. 5,133,088 to Dunlap discloses a sock having puff ink applied thereon, that provides a non-skid surface.

### SUMMARY OF THE INVENTION

[0006] The present invention relates in general to a flexible pouch of the type having two adjacent panels, with each panel comprises a single layer or a plurality of layers laminated together. An expandable polymer is positioned between two of the layers, adjacent the edges.

[0007] The expandable polymer, as contemplated by the present invention, is a specifically triggered, such as by heat, radio frequency or the like, meaning that the polymer does not expand on its own. Preferably, the expandable polymer is a heat-activated puff ink. One potential form of trigger is the activation of microspheres in the polymer, which cause the polymer to expand. The expandable polymer may be applied to the pouch layers as part of the printing process for the layers.

[0008] The pouch may be formed in any number of configurations. One possible form includes two adjacent

panels and a bottom gusset, wherein the two panels and the bottom gusset may comprise a plurality of laminate layers. In this pouch embodiment, the expandable polymer may be positioned between two of the plurality of layers adjacent the edges in both side panels, in one of the side panels and the bottom gusset, or in both side panels and the bottom gusset. The two side panels, or the one side panel and the bottom gusset, are heat sealed together along at least one edge. In the preferred embodiment, the heat sealing activates the expandable polymer, causing the polymer to expand outwardly along the edge of the panels and/or gusset. The outwardly expansion of the polymer forms a bead of tactile friendly material.

[0009] It is contemplated that the expandable polymer may be a material that does not expand during the heat sealing operation. The polymer material extrudes outwardly after the heat sealing by using a specific trigger other than heat, such as by the application, electron beams or micro-waves.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0010] For the purpose of the illustrating the invention there is shown in the drawings various forms which are presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities particularly shown.

[0011] **FIG. 1** is a top perspective view of a pouch with a bead formed along the edges by an expanded polymer material.

[0012] **FIG. 2** is a partial cross section of the two adjacent multi-layered laminate panels with expandable polymer positioned between two of the layers.

[0013] **FIG. 3A** is a top plan view of two pouch panels after being heat sealed and prior to the expansion of the polymer.

[0014] **FIG. 3B** is a top plan view of the pouch in **FIG. 3A** after the polymer has expanded, creating a bead along the edges.

[0015] **FIG. 4A** is an elevation view of a heat sealed pouch prior to the expansion of the polymer.

[0016] **FIG. 4B** is an elevation view of the pouch showing the expanded polymer having created a bead along the edges of the pouch.

### DETAILED DESCRIPTION OF THE INVENTION

[0017] With reference to the drawings, where like numerals identify like elements, there is shown in **FIG. 1** a pouch in accordance with the present invention, which is generally identified by the numeral **10**. The pouch **10** is formed by the joining a front panel **12** and back panel **14** along two edge seams **16** and along one bottom edge seam **18**. As illustrated, an expandable polymer **20** has formed a bead **22** along the joined edges **16, 18** of the pouch. This bead of expanded polymer **22** covers the outer edges of the pouch and provides a relatively soft edge.

[0018] As shown in **FIG. 2**, the polymer **20** in its unexpanded state is positioned along the edges of the pouch panels **12, 14**, between two laminate layers **24, 26**. In the

preferred embodiment, the polymer **20** comprises plastisol based, heat-activated puff ink, which is printed in register with the graphics on one of the panels during normal printing process (e.g. by a flexographic or gravure process). Each panel may be formed of a single layer or may be made from any number of laminate layers **28**. As shown in **FIG. 2**, the laminate layers **24, 26, 28** may comprise heavy gauge polymers, such as polyethylene terephthalate or foils. The polymer **20** during its expansion is extruded outwardly from between the layers, when the edges of the pouch are heat sealed by sealing jaws **30**. The sealing jaws **30** are preferably chamfered along the outer edge of the pouch so as to assist in the extrusion of the polymer **20** in an outward direction during the expansion.

[0019] **FIG. 3A** shows a pouch with heat sealed side edges **16** and the polymer **20** remaining in the unexpanded state between two of the laminate layers **24, 26**, both on the front **12** and back **14** panels. **FIG. 3B** shows a pouch with an expanded polymer bead **22** positioned along the heat sealed edges **32** of the pouch. The expansion of polymer **20** in this embodiment is not triggered by the heat sealing process; rather, the expansion is triggered by an alternate means, such as by electron beam, microwave, etc.

[0020] **FIG. 4A** shows the pouch in cross section, wherein the front panel **12** is the heat sealed **34** around three side edges. In this figure, the polymer **20** remains in the laminate layers after the heat sealing, since expansion is triggered by something other than heat. A cross section of the pouch with the polymer in the expanded condition, triggered by heat, electron beam, microwave, or the like, is shown in **FIG. 4B**.

[0021] **FIG. 5** shows an alternate pouch form **36** having a front panel **12**, a back panel **14** and a bottom gusset **38**. The front panel **12** and back panel **14** are joined along two edge seams **16**. The bottom gusset is joined to the front panel and the back panel along edge seams **40, 42**. A bead of expandable polymer **22** is formed along the heat sealed edges of the pouch **16, 40, 42**.

[0022] The expanded polymer as contemplated by the present invention may define tactile friendly surfaces. The preferred construction of a puff ink as the expandable polymer creates this quality. However, other features of the invention will be understood by those in the art upon review of the present specification.

[0023] It will be appreciated by those skilled in the art, that the present invention may be practiced in various alternate forms and configurations. The previously detailed description of the preferred embodiments are presented for purposes of clarity of understanding only, and no unnecessary limitations should be implied there from.

What is claimed is:

1. A pouch comprising:
  - a front layer and a back layer;
  - an expandable polymer positioned between the two layers; and
  - a seam joining together at least one edge of the two layers;
  - the expandable polymer in an expanded state forming a bead along the seam.
2. The pouch of claim 1 wherein the expandable polymer bead is formed along three seams.

3. The pouch of claim 1 wherein the expandable polymer is a heat activated polymer.

4. The pouch of claim 3 wherein the expandable polymer is a plastisol based ink.

5. The pouch of claim 3 wherein the expandable polymer is a heat activated puff ink.

6. The pouch in claim 1 wherein the expandable polymer is triggered to expand by radio frequency.

7. The pouch of claim 1 further comprising a gusset panel secured to the front and rear layers to form a gusseted stand-up pouch.

8. A pouch comprising:

- a front panel, a back panel and a bottom gusset;

- the front panel, the back panel and the bottom gusset each having a plurality of laminate layers;

- an expandable polymer positioned between two of the laminate layers in at least one of the panels and the bottom gusset, or in both the front panel and the back panel;

- a seam joining together at least one edge of the front panel with at least one edge of the back panel, a seam joining together at least one edge of the front panel with at least one edge of the bottom gusset, or a seam joining together at least one edge of the back panel with at least one edge of the bottom gusset; and

- the expandable polymer in an expanded state forming a bead along the joined seam.

9. The pouch of claim 8 wherein the expandable polymer is a heat activated polymer.

10. The pouch of claim 9 wherein the expandable polymer is a plastisol based ink.

11. The pouch of claim 9 wherein the expandable polymer is a heat activated puff ink.

12. The pouch in claim 8 wherein the expandable polymer is triggered to expand by the application of electron beams, microwaves, or the like.

13. A multi-layered stand-up pouch comprising:

- a pair of opposed side wall panels joined to each other about the periphery thereof;

- an expandable polymer in an expanded state forming a bead along the joined periphery.

14. The pouch of claim 13 wherein expandable polymer is a heat activated polymer.

15. The pouch of claim 13 wherein the expandable polymer is a plastisol based ink.

16. The pouch of claim 13 wherein the expandable polymer is a heat activated puff ink.

17. A method of making a heat sealed pouch, comprising the steps of:

- positioning the expandable polymer between two pouch panel layers;

- placing the front panel and the back panel together into a sealing jaws;

- the sealing jaws heat sealing the front panel and back panel together along at least one edge; and

activating and expanding the expandable polymer outwardly along the at least one edge.

**18.** The method of claim 17 wherein the sealing jaws are chamfered on the outer edge to direct the expandable polymer outwardly during heat sealing and heat activation.

**19.** The pouch of claim 17 wherein the expandable polymer is a plastisol based ink.

**20.** The pouch of claim 17 wherein the expandable polymer is a heat activated puff ink.

**21.** A method of claim 17 wherein the expandable polymer is triggered to expand by electron beams, microwaves, or the like.

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