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HOUSEHOLD BAG CONSTRUCTION

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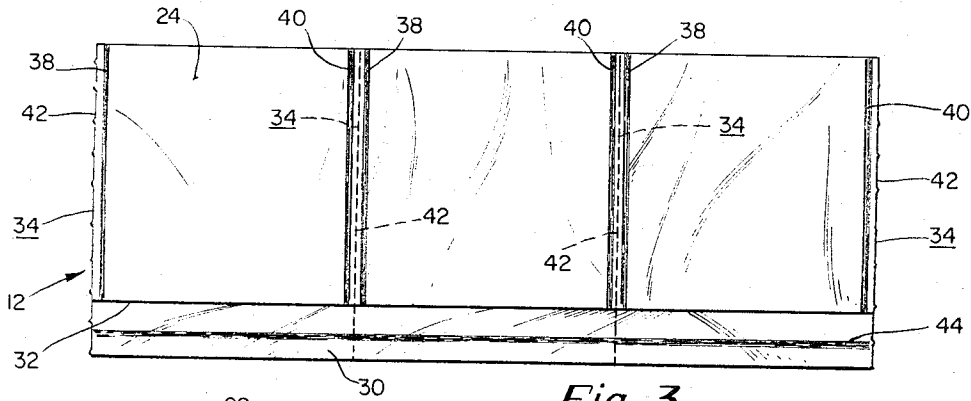


Fig. 3

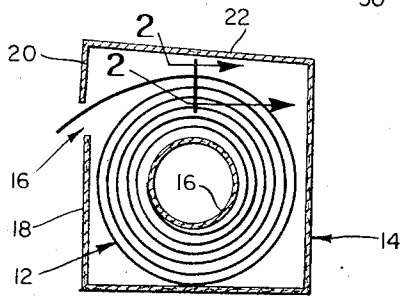


Fig. 1

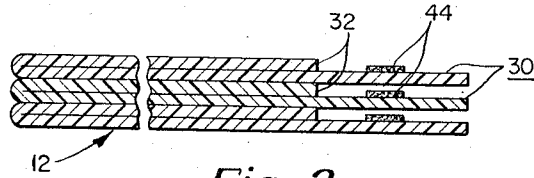


Fig. 2

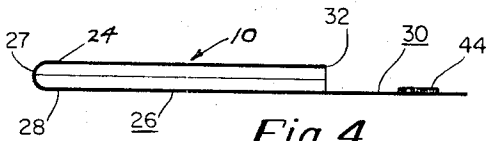


Fig. 4

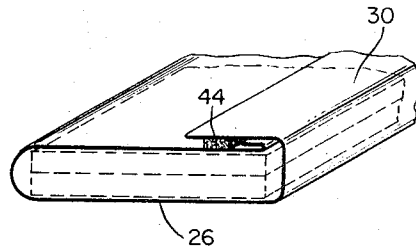


Fig. 5

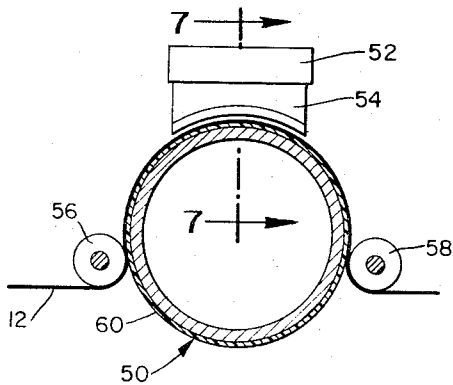


Fig. 6

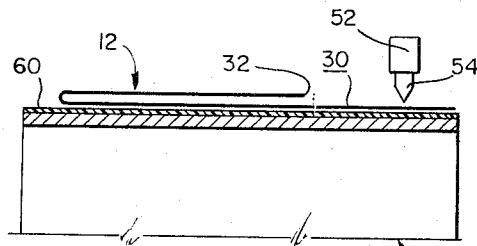


Fig. 7

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HOUSEHOLD BAG CONSTRUCTION

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ABSTRACT OF THE DISCLOSURE

This invention is directed to a household bag construction, comprising a sealable household bag formed of a body section and a closure flap having an oxidized surface area over which a pressure-sensitive adhesive is located, whereby the adhesive will selectively prefer to adhere to said oxidized area after its normally unattached face has been adhered to another surface.

This invention relates to an improved sealable plastic household bag construction, and more particularly to a plastic household bag having adhesive closure means which provide improved handling characteristics during use.

Plastic household bags provide an inexpensive and convenient means for packaging articles of food such as sandwiches, cookies, raw fruits and vegetables and the like for storage. In order to seal these bags to preserve the freshness of the contents, and to prevent escape of the contents, these bags are often provided with closure means. These closure means may be mechanical means which are integral with the bag, such as an intussusceptible end closure envelope construction, may be mechanical means which are separate from the bag, such as a wire for twisting around an end of the bag, or may comprise a pressure-sensitive adhesive deposited on an end closure flap. Of these, the latter construction has the advantages of efficacy of operation and minimal cost of production; however, prior art pressure-sensitive adhesive constructions have had the short-comings of adhering to super-imposed bags during storage, and of adhesive separation from the end flap of the bag during repeated usage or when inadvertently placed in contact with a surface such as Formica, wood, metal or the like.

The instant invention overcomes the foregoing advantages of the prior art by providing an oxidized surface on the closure flap of a plastic bag, to which surface the pressure-sensitive adhesive is deposited, and by maintaining a relationship of bag wall thickness to adhesive strip thickness such that the adhesive is kept out of substantial contact with a superimposed bag in a dispensing carton.

It is therefore an object of this invention to provide an improved sealable plastic bag construction in which a pressure-sensitive adhesive layer deposited on and end closure flap will not separate from such closure flap.

It is another object of this invention to provide a plastic bag construction whereby the unadhered face of an adhesive strip on the end closure flap of a plastic bag will not adhere to a superimposed bag in a dispensing container.

It is a further object of this invention to provide a reclosable plastic bag construction whereby all of the adhesive on the end closure flap of the bag will remain attached thereto after closing and reopening the bag, whether the bag be closed and reopened once or several times.

A concomitant object of this invention is to provide a plastic sandwich bag which is easily dispensed from a roll dispenser without adhering to superimposed bags and

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which has an effective closure which is operative for multiple closings and openings of the bag.

Other objects and attendant advantages of this invention will be readily appreciated as this invention becomes better understood by reference to the following detailed description, when considered in connection with the accompanying drawings in which like reference numerals designate like parts throughout the figures thereof and wherein:

FIG. 1 is a cross-sectional view of a dispenser containing a roll of household bags;

FIG. 2 is a partial sectional view taken along line 2—2 of FIG. 1 showing a pair of superimposed bags in accordance with this invention;

FIG. 3 is a top plan view of a sheet of separate bags constructed according to this invention;

FIG. 4 is a side elevational view of a bag made according to this invention, in use;

FIG. 5 is a partial perspective view of a household bag according to this invention, in use;

FIG. 6 is a diagrammatic representation in side elevation and partial section of a corona-discharger apparatus producing a bag in accordance with this invention; and

FIG. 7 is a partial cross-sectional view taken along line 7—7 of FIG. 6.

As seen in FIGURES 1 and 3, a plurality of plastic bags 10, joined in separable side-by-side relationship, are wound on a cardboard spool or core 16. The roll of bags 12 is packaged in a dispensing carton 14 for dispensing through dispensing opening 16 formed by front wall 18 of the carton and the lip 20 of carton top 22. Both carton 14 and core 16 are formed of conventional cardboard stock and can be of any one of several well-known constructions.

The individual bags 10 are formed of unitary sheets of heat sealable plastic material which is folded over to form top sheet 24 and bottom sheet 26 connected by end face 27. The bottom sheet 26 has a bag-forming portion 28 and an end flap or closure flap 30 which extends about one or two inches beyond the free edge 32 of top face 24. Side walls 34 and 36 of bag 10 are formed by heat seals 38 and 40, as best seen in FIGURE 3, and adjacent bags on a roll 12 are separable by tearing the bags along the score lines 42 which are located between the respective heat seal areas.

The end flap 30 of each plastic bag has a transverse strip 44 of pressure-sensitive adhesive extending across its upper face and adapting the flap 30 to be fastened to top face 24 of the bag to confine and protect the contents of the bag. As seen in FIGURE 5, a sandwich or other household item is inserted in the pocket between bottom face 26 and top face 24 of the bag and end face 30 is folded over top face 24 and is adhesively secured thereto by pressure-sensitive adhesive strip 44, to contain and protect the sandwich.

In the manufacture of the bag, a planar sheet of plastic film is folded over a guide to superimpose top face 24 over bottom face 26. The folded sheet is heat-sealed with bar-type seals at 38 and 40 to form the bags 10 having three closed edges and one open edge. The strip 12 of integral bags is scored with score lines 42 between the heat seal areas 38 and 40 to enable individual bags to be separable by tearing. The thus-formed strip 12 of separable bags is passed over a metal drum 50 which has a corona-discharge unit 52 mounted in vertical alignment therewith. The drum 50 has a surface coating 60 of dielectric material adhered thereto. The corona-discharge unit 52 comprises a metal conductor which has an arcuate knife edge electrode 54 which conforms to the contour of the drum and which overlies the section of the closure flap to be treated. The strip 12 of formed, connected bags is passed over the electrically conductive drum 50 and

maintained in contact therewith at its apogee. A generator (not shown) applies a high voltage to the electrode 54 and the high-voltage charge on the electrode jumps the air gap between the electrode and the strip 12 of bags as it passes over drum 50. Guide rolls 56 and 58 guide the bag strip 12 so that it passes closely over the top of drum 50 in the area below the corona-discharge unit. The gap voltage generated in the air space between the electrode and the bag strip ionizes the ambient proximate thereto. The ionized ozone thus formed acts as an oxidizing agent, and oxidizes a strip across the upper closure flap on the surface beneath the electrode. In the practice of this invention, by way of example, a voltage of 500 volts is applied to the knife-edge electrode, an electrode gap (air gap) of $\frac{1}{16}$ inch and an electrode gap length of $3\frac{1}{16}$ inches are maintained. A typical sheet velocity for the bag strip 12 is 500 feet per minute. Corona-discharge units are commercially available and the particular apparatus involved form no part of this invention. The foregoing corona-discharge treatment will oxidize a strip slightly more than $\frac{1}{4}$ inch wide on the bag closure flap 30. A $\frac{1}{4}$ inch strip of pressure-sensitive adhesive is continually applied to the oxidized area by means of a suitable transfer roll (not shown) of conventional design. The adhesive is dried and heat set by passing the sheet of coated bags through an oven at 150° F., and the bags are then packaged in roll form 12 in a dispensing container 14, again utilizing suitable conventional equipment for this packaging.

When the strip of bags 12 is wound on core 16 a certain amount of tension is applied thereto, particularly to those bags closest to the core. Since the adhesive strip 44 is pressure-sensitive, prior art bag construction would cause the adhesive on one bag to cling to the underface 26 of a superimposed bag on the roll, thereby making the bags difficult to dispense. Furthermore, with prior art constructions some of the adhesive such as might cling to the underface of a superimposed bag would have an equal preference to adhere to the underface of that superimposed bag, and would, in fact, so adhere. This would make the remaining adhesive in the strip 44 less efficient, and the adhesive clinging to the underface of a superimposed bag would make the bag inconvenient to handle because of the tendency of its underface to adhere to the hand of a person handling it or to some other surface.

It has been found that by forming the bags from a plastic film having a thickness in range of from 0.4 mil to 6 mils and by applying the adhesive in a thickness in the range from 0.1 mil to 0.35 mil, and maintain a film thickness to adhesive thickness ratio of at least 3:1, the space between the top face of a bag and the adhesive surface prevents adherence of superimposed bags under the tensile forces to which such roll bags are subjected, since the upper face of the bag will space the superimposed bag from the adhesive. It has been determined that the ratio of the length of the upper face of the bag to the length of the closure flap should preferably be in the range from about 4:1 to about 10:1 to accomplish this result.

Furthermore, by oxidizing only that portion of the closure flap surface to which the adhesive is applied, the adhesive selectively prefers to cling to the oxidized surface of the closure flap. Therefore, if the adhesive is pressed against an unoxidized bag surface, as when superimposed bags are pressed together, or when a flap adhered to the top face 24 of a bag the adhesive will cling only to the oxidized surface of the end flap when the adhered members are separated. This eliminates the inconvenience attendant to the adhesion of adhesive to other surfaces of the bag or to other relatively unoxidized surfaces such as glass, Formica, metal and the like to which the adhesive might accidentally cling when the bag is handled. Furthermore, since all adhesive returns to the end flap when the end flap is removed from an adhered surface the bag may be reused often and still retain the ability to form a strong, complete closure.

It is important, when corona treating the bags according to this invention, that care be taken to prevent "strike-through," which is an excessive corona-discharge of such magnitude that oxidation of the bag extends through the film so that the upper and lower faces of the end flap are approximately equally oxidized. In that event the adhesive will not have a preference for either face of the flap and the disadvantages of prior art constructions would be present. Therefore, in manufacturing the bags, care must be taken to regulate gap voltage, gap length and rate of feed of bags, so as to prevent this "strike-through."

The oxidation of the closure flap has been described above as being effected by corona-discharge. However, the oxidation can be accomplished by other well-known means such as by exposing the surface to be oxidized to a highly oxidizing flame; again, regardless of the oxidizing technique used, care must be taken to prevent "strike-through."

In the practice of this invention the oxidized portion of the closure flap should be at least $\frac{1}{4}$ inch from the bag opening, since oxidation of the film proximate the opening facilitates "blocking" of the film, i.e., undesired adhesion between layers of plastic film. The spacing which is maintained between the closure flap of each bag and the underface of the superimposed bag on a dispensing roll, according to this invention, also serves to eliminate any possible "blocking," between the closure flap and the underface of the superimposed bag.

In manufacturing plastic bags of the instant type, polyethylene is the material of choice, because it is relatively inexpensive, readily heat sealable material and since it will not readily cling to itself. Other materials which may be used for the bag are cellulose acetate, polyvinyl chloride, polyvinyl acetate, polyvinylidene chloride and polypropylene, although the foregoing are intended to be representative only, but not limiting. As suitable adhesive materials, any pressure-sensitive adhesives can be used, such as an acrylic base adhesive sold by Interchemical Company and known as adhesive number 4043, acetate adhesives, rubber base adhesives and vinylidene chloride adhesives, all of which are also representative only and not intended to be limiting. These adhesives would preferably include an opacifying pigment, such as titanium dioxide, so that the adhesive strip on a bag is readily distinguishable.

During the corona treatment of the bag a static charge may be built up on the surface of the bag film proximate the edge of the electrode. This static charge may make the bag difficult to open and may cause the bag to snap shut too readily. Therefore, a commercial static eliminator such as a Simco static eliminator is preferably used to remove the static charge and prevent the attendant problems.

Various modifications are contemplated and may obviously be resorted to by those skilled in the art without departing from the spirit and scope of this invention as hereinafter defined in the appended claims, as only a preferred embodiment has been disclosed. By way of example, an adhesive may be used to secure the sides of the bags in lieu of the heat seals shown.

I claim:

1. A sealable household bag comprising: an upper sheet having a top edge, a bottom edge and two sides, a lower sheet having a top edge, a bottom edge and two sides, means sealingly securing said bottom edges and sides of said upper and lower sheets to form an open-topped bag capable of receiving small household articles, said top edge of said lower sheet extending at least one inch beyond the top edge of said upper sheet to define a closure flap, the upper face of said closure flap having an oxidized strip transverse thereto and spaced from the top edge of said upper sheet, and a thin, uniform pressure-sensitive adhesive film located over a majority of said oxidized area, whereby said adhesive will selectively prefer to remain adhered to said oxidized area when said closure flap is removed from a surface to which it has been adhesively secured, said sheets each having a thick-

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ness in the range from about 0.4 mil to about 6 mils, and said film having a thickness in the range from about 0.1 mil to about 0.35 mil.

2. A sealable household bag, adapted to be dispensed from a package containing a roll of such bags separably joined in side-by-side relationship, comprising: a unitary sheet of thin plastic material having a thickness in the range from about 0.4 mil to about 6 mils and including a top face and a bottom face which are unitary at their common base, means sealingly securing said faces at their sides whereby said sheet defines an open-topped bag, said bottom face extending beyond the upper edge of said top face to define a closure flap, the material of said closure flap including a narrow section of a highly oxidized nature transverse to the upper surface thereof and spaced at least one-quarter inch from said top face, and a continuous, uniform adhesive strip of pressure-sensitive material located over a majority of said oxidized section and having a thickness in the range of from about 0.1 mil to about 0.35 mil.

3. An article as set forth in claim 2 wherein the ratio of the length of said top face to the length of said closure flap is in the range from about 4:1 to about 10:1.

4. An article as set forth in claim 2 wherein the ratio of the sheet thickness to the adhesive strip thickness is at least 3:1.

5. An article as set forth in claim 1 wherein said sheets are of polyethylene material.

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