

Aug. 31, 1965

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3,203,621

RESEALABLE BAG-TOP CLOSURES

Filed April 12, 1963

2 Sheets-Sheet 1

Fig. 1A

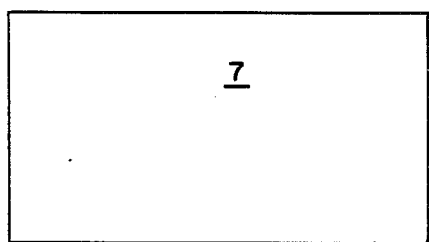


Fig. 1B

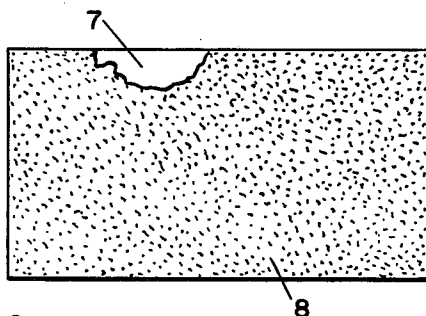


Fig. 1C

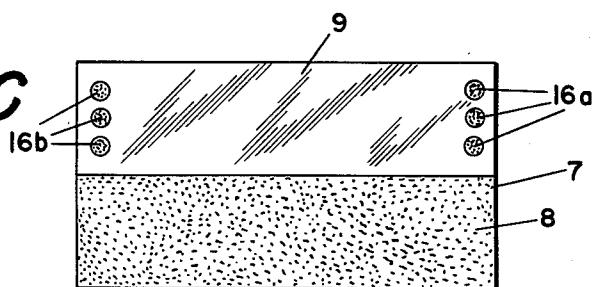


Fig. 1D

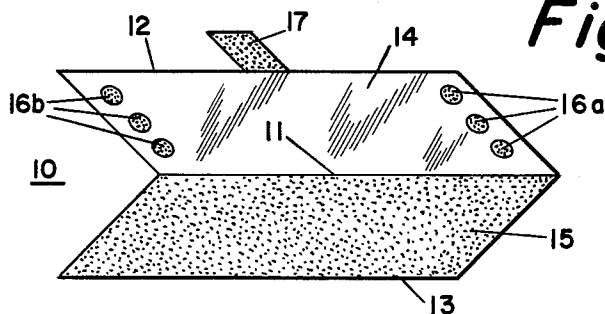
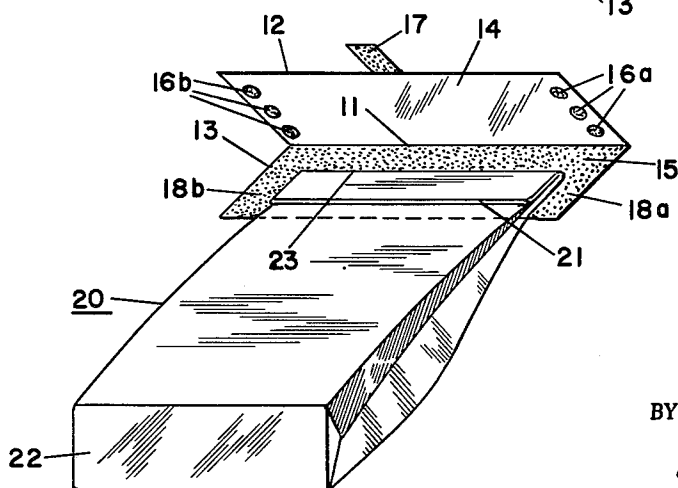


Fig. 2



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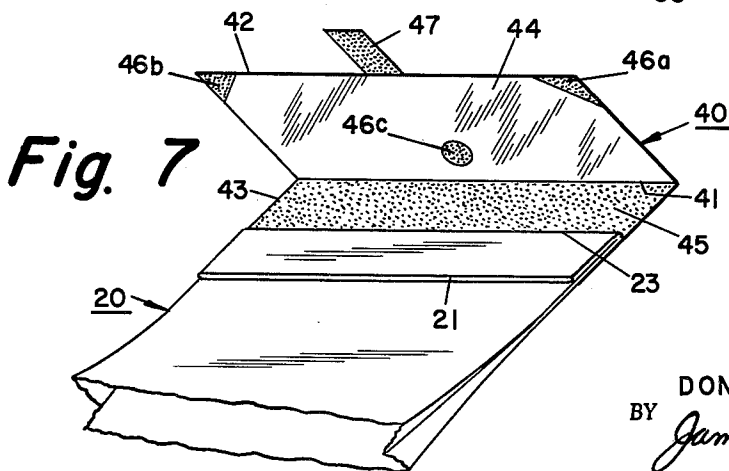
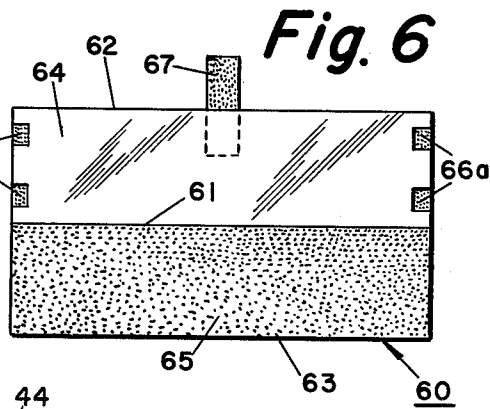
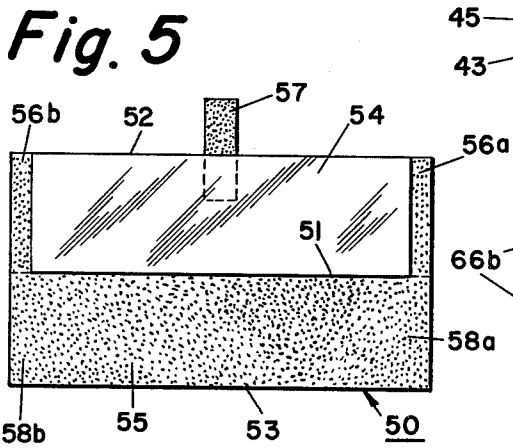
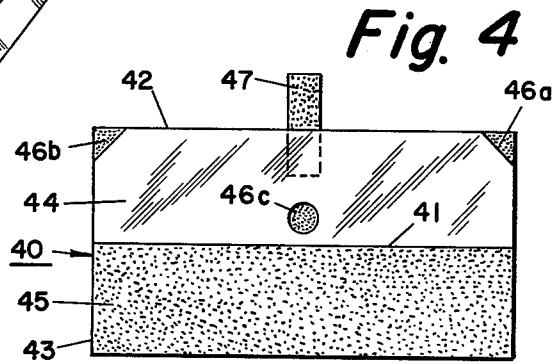
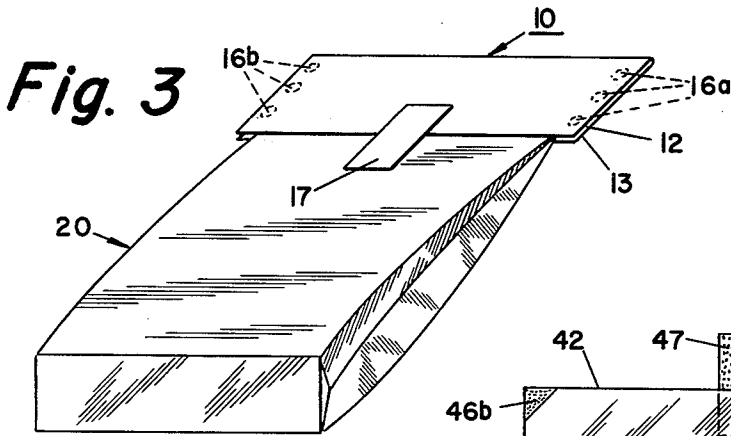
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RESEALABLE BAG-TOP CLOSURES

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2 Sheets-Sheet 2



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RESEALABLE BAG-TOP CLOSURES

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3 Claims. (Cl. 229-62)

This invention relates to closures for the tops of small- to medium-sized bags constructed of cellophane, paper, plastic sheet materials such as polyethylene, polypropylene, saran, and the like, and on occasion even cloth. More particularly, the invention relates to bag-top closures which are intended for closing and sealing bags of the type commonly employed in packaging products, such as certain foodstuffs, where it is desirable that the bag, after its initial opening, continue to function as a convenient storage receptacle for so long as any of the contents remain unconsumed. This invention is specifically directed to a new and improved bag-top closure which is useful for resealably closing and sealing bags of the foregoing types; to a method for making such a closure; and to the new and improved combination of a bag employing the resealable closure of the invention.

A conventional method for closing and sealing bags of the type here of interest is to make one or more folds in the top of the bag, and then to insert one or more metal staples through the compressed fold or folds, so as to hold the bag-top in the closed position. Another, and currently even more common method for closing and sealing such a bag is to employ a paper closure usually formed from a singly-folded, rectangular piece of paper, which slides and fits over the folded and compressed, formerly-open end of the bag, and which is then either stapled or fastened by means of an adhesive so as to remain in that position. The latter method enjoys a number of distinct advantages. For example, in that method, the paper closure conceals the somewhat rough and bulky folded bag top, thereby lending a more neat and attractive appearance to the bag. Furthermore, the closure adds strength to the bag top, so that the bag can be hung, for display purposes, for example from a peg, without danger of tearing the more readily-tearable bag construction material. Most importantly, the closure can also serve as a label for carrying the trademark, product description, price, advertising and other information relating to the bag's contents. It is to this type of bag-top closure that the present invention relates.

Paper-type, bag-top closures of the foregoing conventional type generally are made as follows: A wide and continuous roll of paper, often having a width as great as forty to fifty inches, is first slit into a number of continuous rolls of lesser widths, and then the latter are transversely cut into sheets of convenient size. These sheets are then printed with a repetitive pattern of the advertising or other printed matter which is to appear on the ultimate closures. The printed sheets are then cut into closures, which are then ready for application. Where the closures are to be applied to the bag-top by means of an adhesive composition, rather than by the use of staples, the adhesive is normally applied to the original, wide rolls of paper prior to the slitting and cutting steps. The adhesive is applied continuously and by any one of a number of convenient and conventional means. Thus, it is common to continuously apply the adhesive by means of rollers, brushes and the like, through which the paper continuously passes. The adhesive is applied to at least a substantial proportion of the surface of one side of the continuous roll of paper, and usually to the entire surface of that one side. For reasons related obviously to equipment and particularly

to a desired ultimate flexibility with respect to the size of the closures or other end products, the adhesive must be applied in the form of a coating which is continuous rather than interrupted, both longitudinally and transversely. Such practice is normally followed when a heat-sensitive, thermoplastic material is employed as the adhesive on the closures. In applying the finished closure, it is first folded, along a single, rectilinear crease and usually substantially over upon itself, and is then placed over the folded and compressed bag top where it is fastened in place by suitable means such as by staples or adhesive. Where an adhesive is employed and is of the heat-sensitive, thermoplastic type, heat of a suitable intensity is then applied to the closure in place, so as to fuse the adhesive to the bag and thus close and seal the bag.

Unfortunately, the above-described conventional methods and closures for closing and sealing bags have at least one very distinct disadvantage, namely, the closures are, almost of necessity, always destroyed when the bag is first opened, thereby precluding their use for the very desirable function of reclosing and resealing the bag. Thus, the paper closure, and usually also the bag top, normally must be torn apart in order to open the bag. This disadvantage is particularly aggravated in a closure employing a heat-sensitive, thermoplastic material as adhesive, as compared with the use of staples or water-soluble adhesive compositions. These disadvantages with prior closures and methods employing an adhesive, including those employing a heat-sensitive, thermoplastic adhesive composition, are completely overcome by the closures and method disclosed herein.

In view of the foregoing, one principal object of this invention is to provide a new, improved and resealable bag-top closure, which closure is capable of being readily opened without injury to itself or to the bag, so that after initial opening the bag can be resealed and reopened any number of times by continued use of the original closure. A further principal object of this invention is to provide a new and improved combination of a bag and bag-top closure, whereby the bag is adapted to repeated opening and closing by continued use of the original closure. Another principal object is to provide a method for making the new and improved bag-top closure of the invention, and for resealably closing bags by its use. These and other objects and benefits of the invention will be more readily apparent from a reading of the following detailed description of the invention in the light of the accompanying drawings.

FIGURES 1A through 1D illustrate, with respect to one specific embodiment, the general construction of the new and improved bag-top closures of this invention. FIGURE 2 illustrates the manner in which the closure of the invention is applied to a bag after the bag top has been folded, but prior to the actual fastening or sealing of the closure. FIGURE 3 illustrates a bag after its initial closing and sealing with the closure of the invention, and this figure also shows how the same bag would appear upon resealing with the original closure after having been initially opened. FIGURES 4, 5 and 6 illustrate other specific embodiments of the closure of the invention. FIGURE 7 illustrates one variation in the manner in which the closure of the invention is employed with a bag top.

The conventional bag-top closure which is employed in the practice of this invention comprises paper, of a size and shape suitably adapted to the bag to be closed and sealed, which has been folded along a single, rectilinear crease, usually substantially over upon itself, so as to form upper and lower flaps, or panels, which substantially overlie each other. The inside surfaces of these upper and lower panels are coated, substantially in their

entirety, with a thin coating of an adhesive composition, preferably a heat-sensitive and thermo-plastic adhesive material. As noted hereinabove, this coating is usually applied to the wide, continuous rolls of paper from which the closures are cut, but before such paper rolls are slit or cut. Adhesive compositions which are suitable for this use are generally well known in the art, and include water-soluble and heat-sensitive, thermoplastic materials. The invention is particularly beneficial when practiced in connection with closures employing a heat-sensitive, thermo-plastic adhesive composition. The latter type of adhesive composition commonly consists essentially of a transparent resinous material, such as an acrylic-type polymer or copolymer, which is in physical form suitable for application to paper as a continuous, thin coating. Such adhesive resinous materials can be so applied, for example, in the form of either a suspension, a dispersion, a solution or an emulsion in a suitable liquid medium, and also in the form of a hot melt of the resinous material.

In accordance with the practice of this invention, the adhesive coating on the inside surface of one of the two panels formed by the folding of the above-described closure is masked (i.e., rendered ineffective) in a pattern such that only one or a very limited number of small areas of the adhesive coating is left unmasked and, therefore, still effective as an adhesive. The design of the masking pattern, which determines the size, shape, number and location of the unmasked adhesive coating areas, is not particularly critical. Generally, it is dictated mainly by considerations reflecting what is necessary or desirable to accomplish a satisfactory resealable closing of the bag under the circumstances. Thus, it is possible in practicing the invention to employ a closure which, in width, is greater than, equal to, or less than the width of the bag to be closed and sealed. When a wider closure is employed, and is positioned so that it extends a little beyond the bag at each side, it is preferable, although not essential, to use a masking pattern such that the unmasked adhesive coating areas full outside of the ultimate position of the bag. In this manner, the unmasked area or areas of the masked panel overlies similarly-coated areas on the other panel and do not involve the bag itself. Where the closure to be used is in width either equal to or less than the width of the bag, it is important only that the masking pattern be such as to provide a satisfactory fastening which can be readily ruptured without tearing either the bag or the closure. This can be accomplished, in the latter situation, by reducing, to a practical minimum, the number and size of the unmasked areas in the pattern.

The masked areas, or areas of adhesive coating which are made ineffective, are rendered so by means of the patterned superimposition of a thin coating of a suitable masking agent. Any substance or composition which can be suitably applied in a pattern by convenient means, and which will cover and, under the circumstances, effectively mask the desired areas of the adhesive coating, can be used as the masking agent. For example, where an adhesive composition of the heat-sensitive, thermoplastic type is employed, the masking agent must be capable of withstanding the temperatures to which the closure is subjected during the heat-sealing operation. The use of so-called alkyd printing ink compositions has been found to be particularly satisfactory, even with adhesive compositions of the heat-sensitive, thermoplastic type, and accordingly they are preferred.

The alkyd-base printing ink compositions which have been found to be particularly suitable for use as the masking agent in the practice of this invention are fundamentally composed of a solid material, i.e., either a pigment or an extender, which is suspended in a liquid medium or vehicle. The latter also contains a so-called alkyd-type resin in small amount, which serves as a protective binder for the pigment or extender after its deposition. For a detailed description of printing ink compositions,

including those of the alkyd-base type, see Encyclopedia of Chemical Technology, edited by Kirk & Othmer, volume 11, pages 149-163 (Inter-Science, 1953). In practicing this invention, it is generally preferred to employ a printing ink composition in which the pigment or extender produces an essentially transparent product. Such pigments or extenders include, for example, alumina hydrates and aluminum silicates. The nature of the liquid constituent of the printing ink depends in large measure upon the particular drying mechanism which is intended or desired for the ink. Thus, in a printing ink system where it is desired or intended that the drying take place by oxidation, the liquid constituent or vehicle is selected so as to promote that particular mechanism. For example, one suitable masking agent for use in practicing this invention contains, as its liquid vehicle, an unmodified or suitably modified vegetable oil such as linseed oil, which is effective in promoting ink film drying, most likely by an oxidation mechanism.

The alkyd resins which are an essential constituent of the printing ink compositions preferably employed as the masking agent in the practice of this invention are obtained by the esterification of a polyfunctional organic acid or anhydride, or mixture thereof, such as phthalic acid, phthalic anhydride, succinic acid and/or maleic acid, with a polyfunctional alcohol such as glycerol or a glycol, to produce a long-chain resinous product of relatively high molecular weight. With particular combinations of reactants, such as glycerol and phthalic anhydride, branched-chain product resins are obtained, and these resins are convertible by heat into an infusible and insoluble form. It is this latter type of alkyd resin which is contemplated for use in practicing the present invention. Quite commonly, the simple product of such a reaction is further modified by the addition of other substances, such as drying oils. The drying oils are triglycerides of unsaturated monoacids such as linoleic acid, and when condensed with the relatively simple resin molecule, they normally impart to the latter the property of drying in air. Such modified alkyd resins are known as the oxygen-convertible type because, upon exposure to air at ordinary temperatures, they are converted to a hard, insoluble form. Upon heating, this type is also converted into an infusible form if prepared from suitable reactants, and this property renders them also suitable for use as the masking agent in practicing the invention. The alkyd resins, and particularly the modified alkyd resins, are quite commonly employed in the better grades of printing ink compositions, in order to provide tough, flexible resin films for the protection of the ink pigment after its deposition. For a detailed discussion of alkyd resins, their properties and manufacture, see Encyclopedia of Chemical Technology, edited by Kirk & Othmer, volume 1, pages 517-532 (Inter-Science, 1947).

A typical and commercially-available alkyd-base printing ink composition which can be employed as the masking agent in the practice of this invention is that manufactured and sold by McCutcheon Brothers & Quality, of Philadelphia, Pennsylvania, under the product designation, Alkyd Ink No. B-2697. This printing ink composition consists essentially of an approximately equal-weight mixture of: (1) an aluminum silicate, which serves as a substantially colorless body or filler substituting for a pigment; and (2) a linseed-oil-modified alkyd resin derived from isophthalic acid (i.e., m-phthalic acid) and glycerol, which serves as the liquid vehicle and as a protective film former for the deposited filler. This mixture can, and usually does, also contain a very small amount, less than 5%, of a dilute solution of a suitable manganese compound, which serves to promote the drying of the deposited ink film, probably by a combined mechanism of oxidation and polymerization.

The masking agent can be selectively applied, or superimposed, in the desired pattern on the adhesive coating of one panel of the closure by any convenient and suitable

means. Thus, it has been found satisfactory and convenient to apply the masking agent by means of conventional printing techniques, such as with the use of a printing plate and printing apparatus. In such manner, the size, shape, number, and location of the unmasked areas of adhesive coating on the masked panel can very readily be provided for as desired.

The bag-top closures which are subjected to masking in accordance with the practice of this invention can vary widely in size and shape, without rendering them unsuitable for use. Thus, such a closure can have a width greater than, equal to, or less than the width of the folded bag at the top. A preferred embodiment consists of a closure sufficiently wide so that, when in position, it extends somewhat beyond the folded bag top on each side. With such an over-size closure, it is also preferred that the remaining unmasked areas of the adhesive coating on the masked panel be at least two in number, small, and limited to the side portions of the closure which, in position, extend beyond the corresponding sides of the folded bag top. In this manner, when the bag top is folded and the closure placed in position, and sealed by heat or otherwise, one side of the folded bag top is caused to adhere to the unmasked panel by virtue of the overall unmasked adhesive coating thereon, but the masked panel is caused to adhere to the unmasked panel only at those areas where the coating has not been masked. When the bag is to be initially opened, the insertion of a finger underneath the masked panel at a point near the center, and slight pressure therefrom, permits a ready rupturing of the sealed, unmasked adhesive coating areas without damage to the closure or bag, so as to open the closure and permit the bag top to be unfolded. When the bag is to be reclosed, the bag top is again folded, and the still-intact closure is returned to a closed position, and maintained in that position by any suitable means such as a strip of pressure-sensitive, adhesive-coated, tape or label, applied between the masked panel and the bag. Such tape or label can be made from any suitable material, such as, for example, cellophane, paper, cloth or the like.

Similarly, when closures having a width equal to or less than the width of the folded bag top are employed, the number, size, shape and location of the unmasked areas of adhesive coating which are left on the masked panel are determined so as to permit a ready rupturing of the adhesive-to-bag and adhesive-to-adhesive bonds, without injury to the bag or closure. It is preferred to position the closure so that the masked, rather than the unmasked, panel is adjacent the side of the bag on which the folds are accumulated.

Referring now to the drawings, FIGURES 1A through 1D illustrate the general construction of the new and improved bag-top closure of the invention, as applied to one specific embodiment thereof. FIGURE 1A shows the uncoated piece of paper, or blank, 7, which constitutes the base element of the closures of the invention. FIGURE 1B shows the blank 7 substantially completely coated with a thin coating of a suitable adhesive composition 8, such as a heat-sensitive, thermoplastic composition. FIGURE 1C shows the same paper blank 7 coated substantially completely with adhesive coating 8, and partially masked with a suitable masking agent 9 in a pattern which leaves unmasked, and therefore still effective, only small, round adhesive-coated areas 16a and 16b. The latter areas are adjacent the sides of the closure and are located on what will ultimately form the masked panel thereof. In FIGURE 1D, the finished, complete closure 10 is shown, prior to its application to the bag top. This closure is shown as being folded along a single, rectilinear crease 11, so as to form masked panel 12 and unmasked panel 13. The inside surface 14 of masked panel 12, and the inside surface 15 of unmasked panel 13, are coated and are either masked or left unmasked, as described in connection with FIGURES 1B and 1C. A small piece of, for example, pressure-sensitive, adhesive-coated cellophane tape, 17, is

provided so that upon reclosing, the closure can be kept in the closed position. Other suitable means can also be employed, such as a paper label provided with a similar adhesive. It is to be clearly understood that the number, size, shape, and location of the unmasked adhesive-coated areas 16a and 16b can be varied insofar as is convenient and practical, but within the requirements for practicing the invention.

FIGURE 2 illustrates one manner of applying the closure of FIGURES 1A through 1D to a folded bag top prior to initial sealing. In FIGURE 2, cellophane bag 20 having bottom 22 and top 21 is closed by folding at 23 the top 21 down upon itself one or more times. The folded top 21 is shown after having been placed on the adhesive-coated, inside surface 15 of unmasked panel 13, in such a position as to leave portions 18a and 18b of the closure extending beyond the bag top on their respective sides. Masked panel 12, containing adhesive-coated inside surface 14 which has been masked and thereby rendered ineffective but for unmasked areas 16a and 16b, is then folded down upon folded bag top 21 by folding along crease 11. In the case of a heat-sensitive, thermoplastic adhesive, application of heat causes the cellophane bag top to tack-seal to itself and to the inside surface 15 of unmasked panel 13. This same application of heat also causes a sealing of the masked panel 12 to the unmasked panel 13, but only through unmasked areas 16a and 16b, as indicated in FIGURE 3. The sealed bag is readily opened by inserting a finger underneath masked panel 12 and, by slight pressure, causing sealed area 16a and 16b to be ruptured. The folded top 21 of cellophane bag 20 can then readily be unfolded for access to the contents. When it is desired to reclose the bag, bag top 21 is re-folded, and masked panel 12 of the closure 10 is reimposed on the folded bag top 21 and sealed by means such as the short strip of pressure-sensitive, adhesive-coated cellophane tape shown at 17. A paper label coated with a similar adhesive is also suitable. Such means for resealing are preferably supplied on the initially-sealed bag.

FIGURE 3 shows the bag in the sealed condition. The points at which the closure is initially sealed to itself are shown at 16a and 16b. After initial rupture of these adhesive bonds, the closure can be resealed through means 17 as described above.

FIGURES 4, 5 and 6 illustrate other specific embodiments of the closure of the invention which differ in their masking patterns. Thus, the closure 40 of FIGURE 4 consists of adhesive-coated and unmasked panel 43 having inside surface 45 which is separated by crease 41 from masked panel 42 having inside surface 44. The adhesive coating on surface 44 has been completely masked but for unmasked areas 46a, 46b and 46c. Means 47, consisting of, for example, a short piece of cellophane tape or a paper label coated with a pressure-sensitive adhesive composition, are supplied for resealing. FIGURE 7 shows application of the closure 40 of FIGURE 4 to a bag-top having a width equal to that of the closure.

FIGURE 5 illustrates a closure 50 having unmasked panel 53 with adhesive-coated but unmasked inside surface 55 separated by crease 51 from masked panel 52 having adhesive-coated inside surface 54. The latter surface, 54, has been completely masked but for unmasked areas 56a and 56b. These unmasked areas 56a and 56b overlie and seal to corresponding areas 58a and 58b on unmasked panel 53 when closure 50 is used to close and seal a bag top having a width somewhat less than that of the closure. Closure 50 is also provided with suitable resealing means 57.

FIGURE 6 illustrates a closure 60 having still another masking pattern. In closure 60, unmasked panel 63 having adhesive-coated but unmasked inside surface 65 is separated by crease 61 from masked panel 62 having adhesive-coated inside surface 64. Surface 64 has been completely masked but for small, unmasked areas 66a and 66b. Resealing means 67 are also provided.

In order to illustrate the preparation of one specific embodiment of this invention, a new and improved bag top closure in accordance with this invention was made by coating a substantial portion of one side of a continuous wide roll of paper with a heat-sensitive, thermoplastic adhesive composition. The composition so employed was an aqueous emulsion of an acrylic polymer in water. After adhesive coating, the wide roll was slit into more narrow rolls, and then transversely cut into pieces or sheets of suitable size, each comprising a number of closures. These sheets were then printed with the advertising or other message and with masking agent in the masking pattern illustrated in FIGURE 1C. After coating, slitting, transverse cutting, printing and pattern-masking, the closures are cut to finished size and are then ready for use. In this case, the closures were designed and made so as to be somewhat wider than the bag top to be closed and sealed, as shown in FIGURE 2.

The masking agent employed consisted of an alkyd printing ink composition which was commercially available, and which was obtained from McCutcheon Brothers & Quality, of Philadelphia, Pennsylvania, under the product designation, Alkyd Ink No. B-2697. This ink consisted essentially of an approximately equal-weight mixture of: (1) an aluminum silicate; and (2) a linseed-oil-modified alkyd resin prepared from isophthalic acid and glycerol. It further contained approximately 3% of a dilute solution of a suitable manganese drying agent.

In practicing this embodiment, the masking agent was applied by means of a printing technique, employing a suitably-prepared printing plate to apply the masking agent in the desired pattern. The closure was then folded longitudinally and substantially upon itself along a single rectilinear crease, so as to form the two panels referred to above.

The above described closure was employed to seal a cellophane bag, having a folded top of a width approximately $\frac{3}{8}$ inch less than the width of the closure by the application of sufficient heat to the closure in the intended position. In addition, a short strip of pressure-sensitive, adhesive-coated cellophane tape was affixed so as to bridge the bag and the masked panel of the closure.

While the new and improved closure of this invention has been particularly described with reference to a limited number of particular forms and masking patterns, it will be apparent from the foregoing description that such closures are inherently capable of being formed, made, masked and used in many different ways, all in full accord with the general teachings of this invention. It is to be explicitly understood that all such variations and

embodiments are contemplated as within the scope of this invention.

The invention claimed is:

1. Bag-top closure made of paper folded along a crease to form two panels, each of said panels having a substantial portion of its inside surface coated with an adhesive composition selected from the group consisting of a water-soluble adhesive composition and a heat-sensitive, thermoplastic adhesive composition, the adhesive coating on one of said panels being rendered ineffective except for a small area by a patterned application of a superimposed coating of a permanent masking agent.

2. Bag-top closure in accordance with claim 1, wherein said adhesive composition is a heat-sensitive and thermoplastic adhesive composition and said masking agent consists essentially of a printing ink composition containing a difficultly-fusible alkyd resin.

3. In combination, (A) a normally-open-top bag having its top compressed in a closed position; (B) a resealable bag-top closure made from paper folded substantially upon itself along a single crease to form two panels each having a substantial portion of its inside surface coated with a coating of a heat-sensitive, thermoplastic adhesive composition, the adhesive coating on the panel adjacent a fold of the bag top being rendered ineffective except for a small area by a patterned application of a superimposed coating of a permanent masking agent consisting essentially of a printing ink composition containing a difficultly-fusible alkyd resin; and (C) means for retaining the masked panel in a closed position after opening of the bag, said means consisting of an attached tab depending from the bottom edge of the masked panel and employing an adherent coating of a pressure-sensitive adhesive composition.

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