

April 17, 1945.

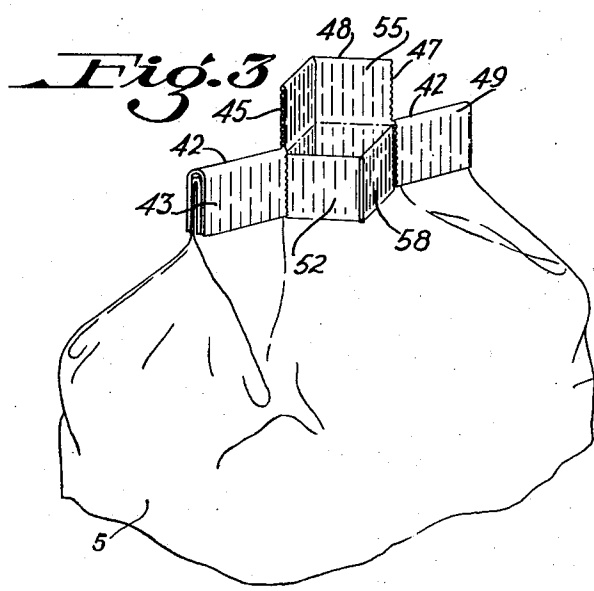
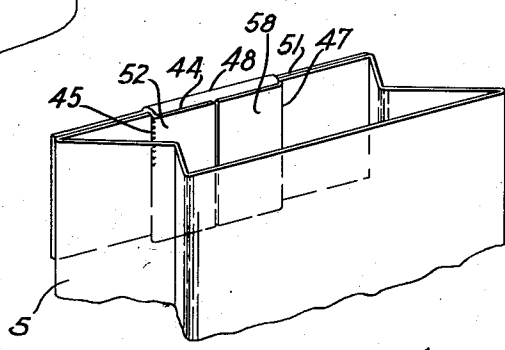
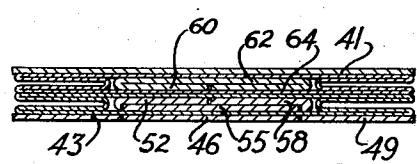
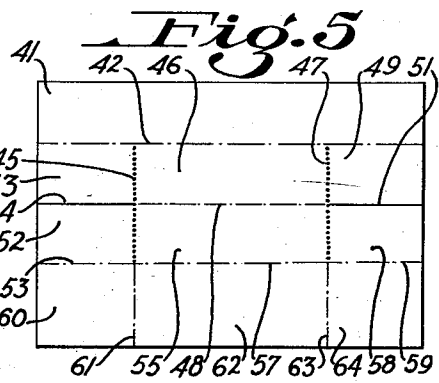
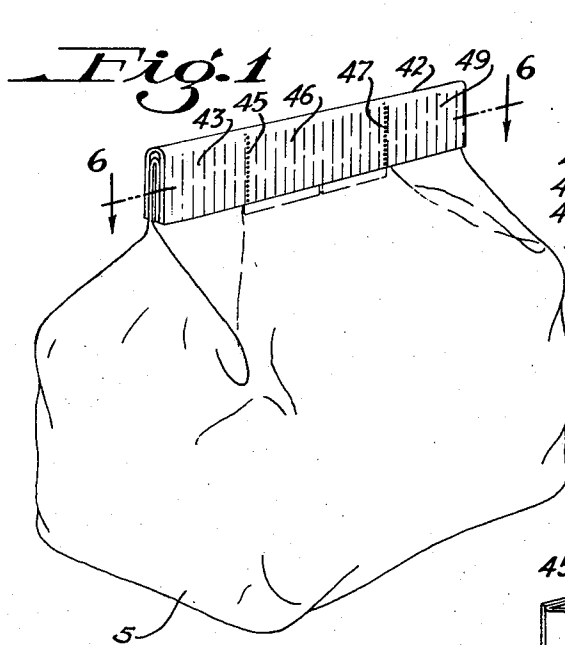
P. S. COGHILL

2,373,744

BAG CLOSURE

Filed Oct. 25, 1941

6 Sheets-Sheet 1



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BAG CLOSURE

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6 Sheets-Sheet 2

Fig. 7

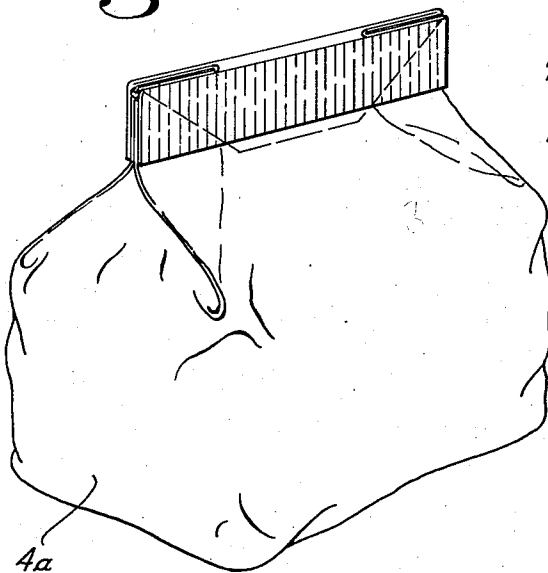


Fig. 10

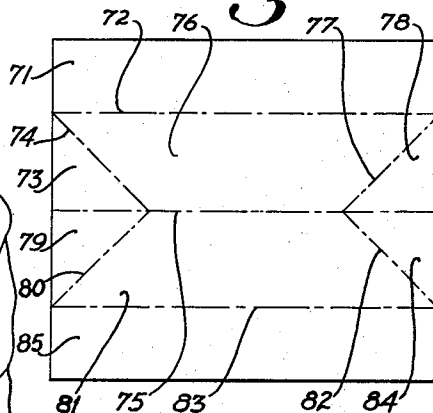


Fig. 11

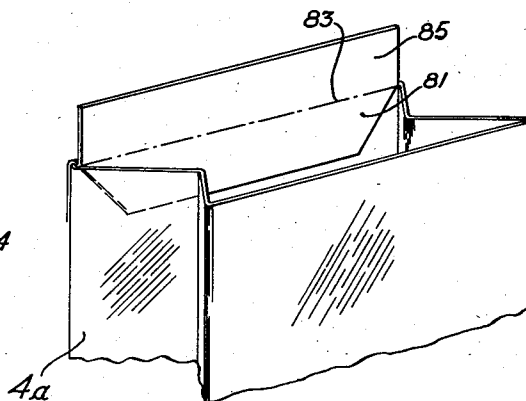
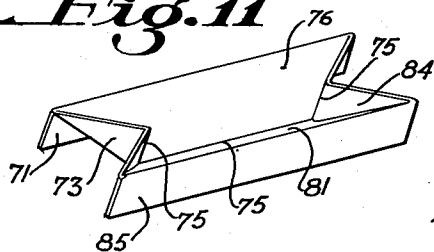
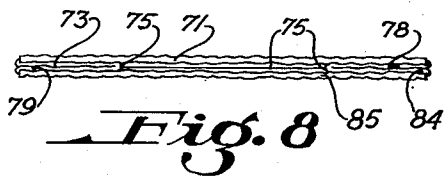


Fig. 9



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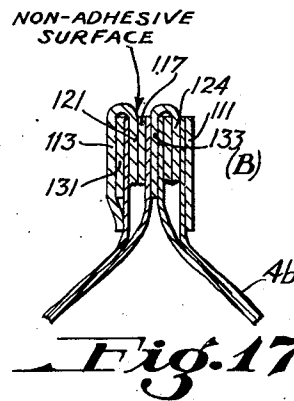
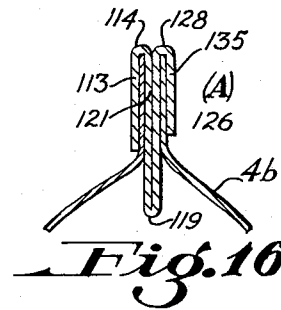
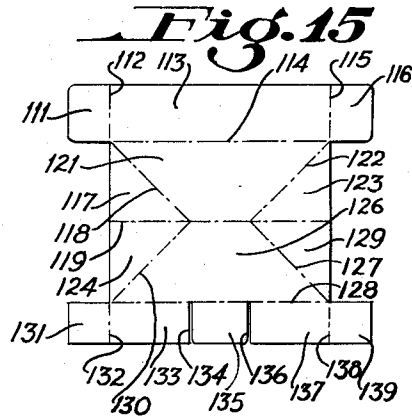
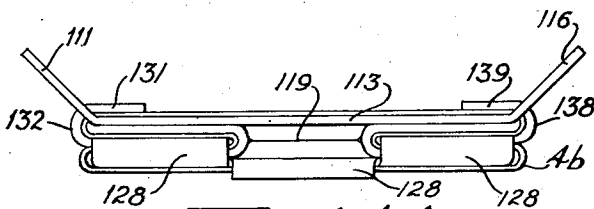
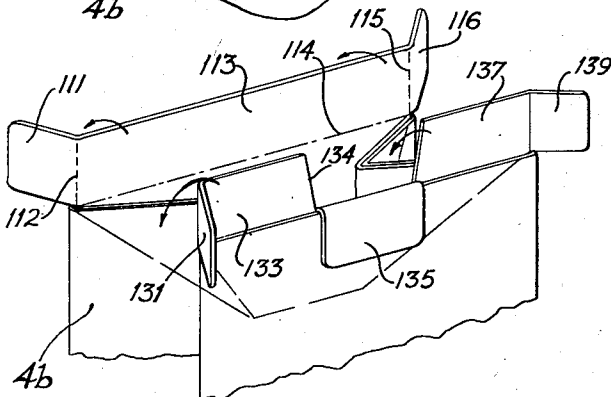
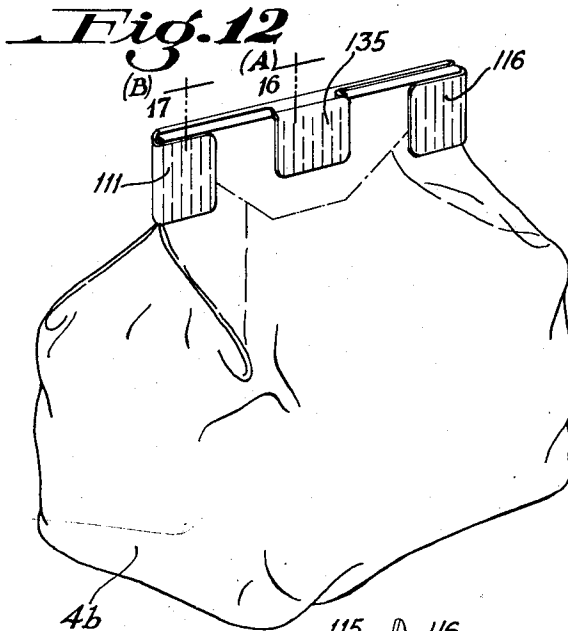
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2,373,744

BAG CLOSURE

Filed Oct. 25, 1941

6 Sheets-Sheet 3



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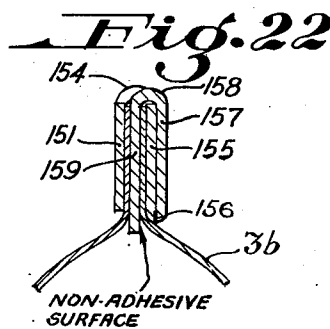
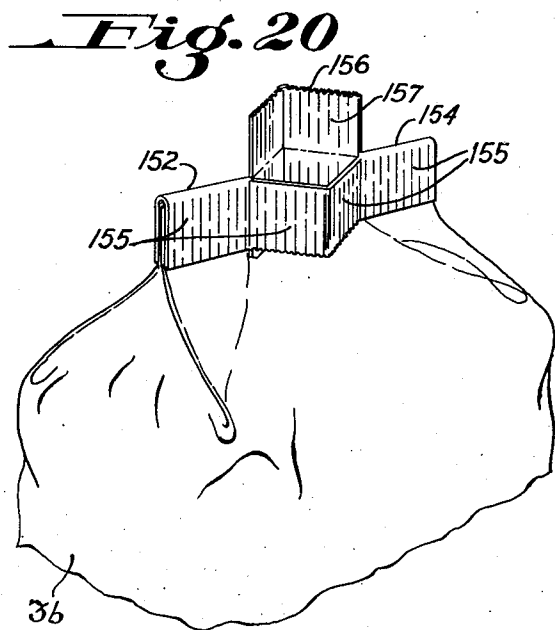
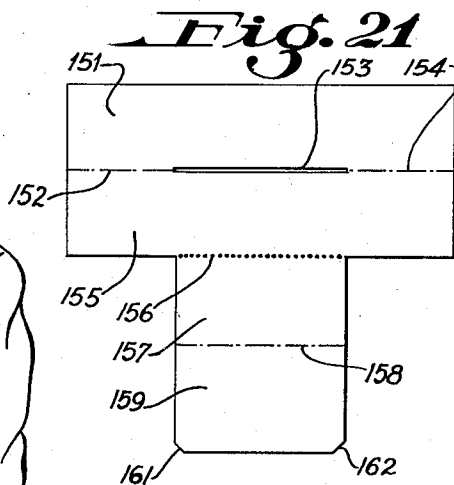
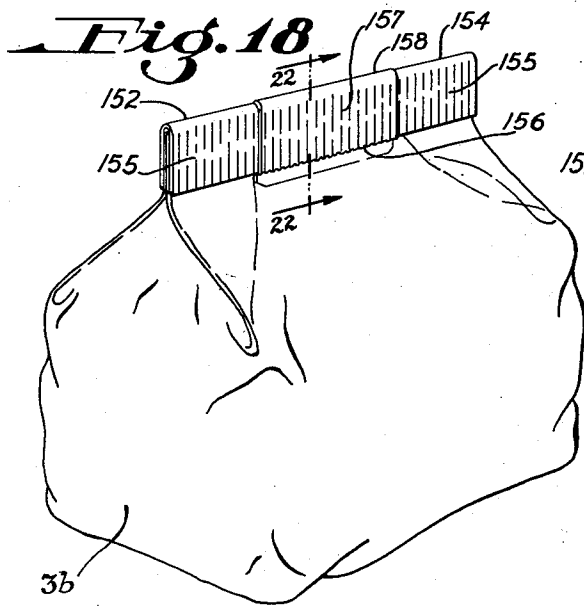
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2,373,744

BAG CLOSURE

Filed Oct. 25, 1941

6 Sheets-Sheet 4



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BAG CLOSURE

Filed Oct. 25, 1941

6 Sheets-Sheet 5

Fig. 23

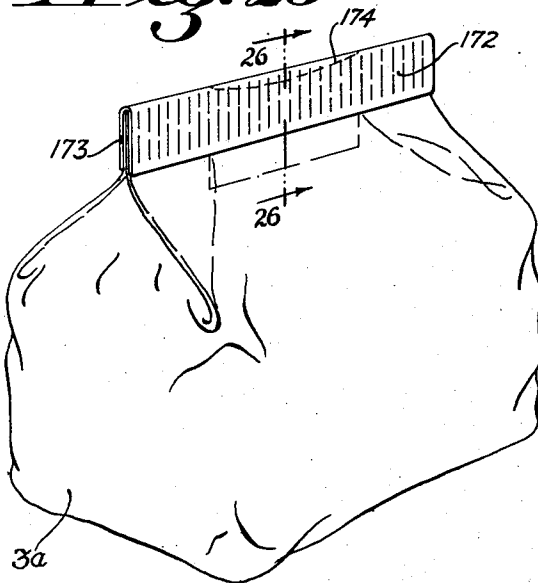


Fig. 26

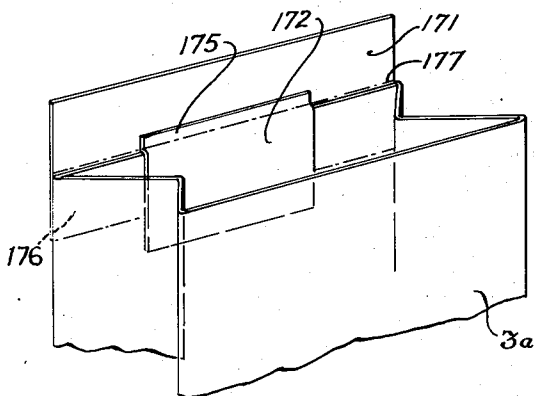
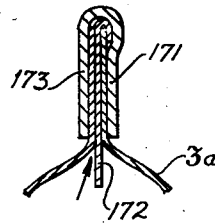


Fig. 25



Fig. 24

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BAG CLOSURE

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6 Sheets-Sheet 6

Fig. 27

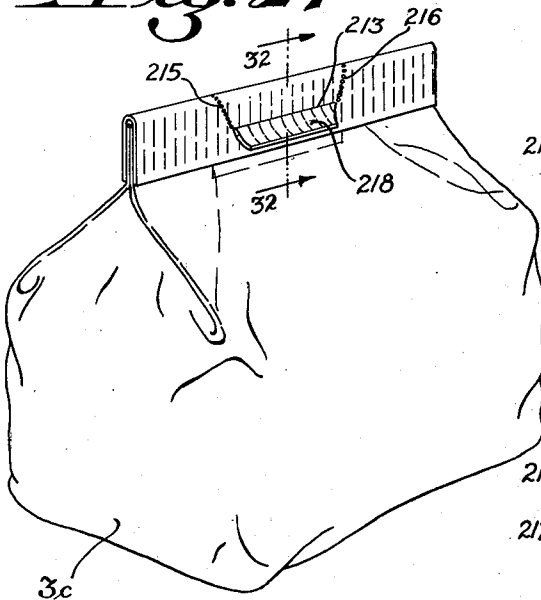


Fig. 30

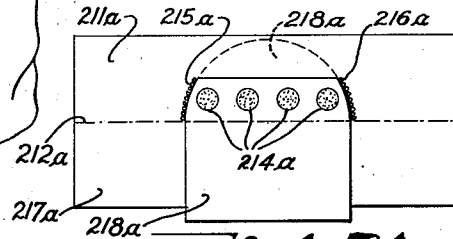
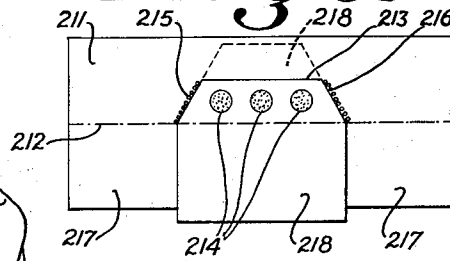


Fig. 31

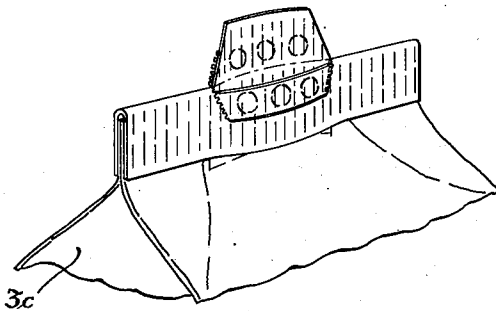


Fig. 28

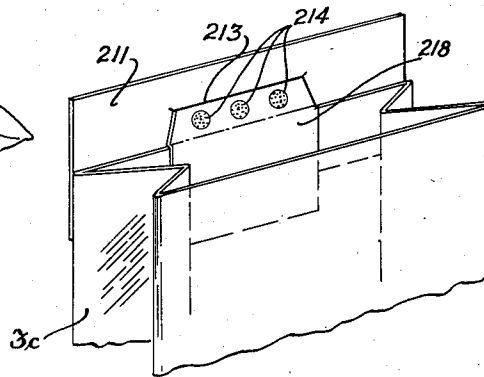


Fig. 29

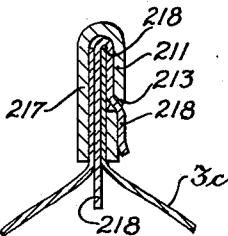


Fig. 32

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UNITED STATES PATENT OFFICE

2,373,744

BAG CLOSURE

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mington, Del., a corporation of Delaware

Application October 25, 1941, Serial No. 416,505

4 Claims. (Cl. 93—35)

This invention relates to packages, especially the closing and opening of bags and like containers. More particularly it appertains to devices to be associated with the end sections or folds of bags made of transparent regenerated cellulose film and the like, for securely closing and facilitating the easy opening and dispensing of the contents thereof.

The primary object of this invention was to improve bag closing, opening and dispensing arrangements. Other objects were to provide for the easy opening, without destruction or weakening, of bags; to provide pouring spouts and chutes for powdered products and other free-flowing products; to close bags containing powdered and other free-flowing materials in a leak-proof manner by inexpensive and easily applied means; and to provide for adequate reclosure of the opened bags. Still further objects were to provide tabs, and sections simulating tabs, adapted for pulling open pouring apertures; to provide a cut opening in the bags; to prevent by providing reinforcement, the tearing or splitting of bags after a cut opening has been made; to provide a device which reenforces a bag closure in such a way that the said closure can be cut to form a pouring opening without weakening the bag; and to provide a device which reenforces a sealed bag mouth closure in such a way that the said closure can be pulled apart with the fingers to form a pouring spout without weakening the bag and without complete opening of the bag mouth. A general advance in the art, and other objects which will appear hereinafter, are also contemplated.

It has now been found that enclosing within, or inter-folding with, the mouth of a bag with a simple blank described in detail hereinafter, overcomes the common objections heretofore encountered when flowable products such as beans, flour, sugar, rice and the like were packaged in transparent wraps. The present invention provides an improved bag and related container opening arrangement which permits easy opening, allows the contents to be dispensed in a controlled stream, can be adequately reclosed, and forestalls wrapper splitting and untimely spills and leakage of flowable products, packed in clear sheeting.

How the foregoing objects and related ends are accomplished will be apparent from the following exposition, in which are disclosed the principle and divers embodiments of the invention, including the best mode contemplated for carrying out the same. The written description is amplified by the accompanying drawings, in which:

Figure 1 is a perspective view of a bag with its

mouth folded together and fastened with a closure device of this invention;

Figure 2 is a top plan view of the closed and sealed bag mouth illustrated in Figure 1;

Figure 3 is a fragmentary perspective view similar to Figure 1, showing a bag with a pouring spout and chute formed by opening the closure of Figure 1 in a predetermined manner;

Figure 4 is a fragmentary perspective view showing the relation between the bag mouth and the closure device at one stage in the closing operation;

Figure 5 is a plan view of the blank illustrated in the preceding figures;

Figure 6 is a sectional plan view on the line 6—6 of Figure 1;

Figure 7 is a perspective view of a bag with its mouth folded together and fastened with a modified form of closure device of this invention;

Figure 8 is a top plan view of the closed bag mouth illustrated in Figure 7;

Figure 9 is a fragmentary perspective view showing the relation between the bag mouth and the closure device of Figure 7 at an intermediate stage in the closing operation;

Figure 10 is a plan view of the blank illustrated in Figures 7, 9, and 11;

Figure 11 is a perspective view of the blank of Figure 10 in partially folded condition;

Figure 12 is a perspective view of a bag with its mouth folded together and fastened with a modified form of the closure device of Figures 7 and 10, which has been especially adapted for bags of non-heat sealable material;

Figure 13 is a fragmentary perspective view showing the relation between the bag mouth and the closure device of Figures 12 and 15 at an intermediate stage in the bag closing operation;

Figure 14 is a top plan view with parts exaggerated in dimensions for purposes of clarity, of the closure of Figure 12 prior to the last steps in the closing operation;

Figure 15 is a plan view of the blank illustrated in Figures 12, 13, and 14;

Figure 16 is a sectional elevation view on the line A—16 in Figure 12;

Figure 17 is a sectional elevation view on the line B—17 in Figure 12;

Figure 18 is a perspective view of a bag with its mouth folded together and sealed with a modified form of closure blank of this invention;

Figure 19 is a top plan view of the sealed bag mouth illustrated in Figure 18;

Figure 20 is a fragmentary perspective view similar to Figure 18, showing a bag with a pour-

ing spout and chute formed by lifting the tab-like overlapped portion of the closure blank of Figure 18 in an intended manner;

Figure 21 is a plan view of the blank illustrated in Figures 18 and 20;

Figure 22 is a sectional elevation view on the line 22—22 of Figure 18;

Figure 23 is a perspective view of a bag with its mouth folded together and sealed with a modified form of closure blank of this invention;

Figure 24 is a top plan view of the closed sealed bag mouth shown in Figure 23;

Figure 25 is a fragmentary perspective view showing the manner of placing the closure blank of Figure 23 in the bag mouth preliminary to the closing operation;

Figure 26 is a sectional elevation view on the line 26—26 of Figure 23;

Figure 27 is a perspective view of a bag with its mouth folded together and sealed with a modified form of closure blank of this invention;

Figure 28 is a fragmentary perspective view similar to Figure 27, showing a bag with a pouring spout and chute formed by opening the closure of Figure 27 in an intended manner;

Figure 29 is a fragmentary perspective view showing the manner of placing the closure blank of Figure 27 in the bag mouth preliminary to the closing operation;

Figures 30 and 31 are plan views of the blank illustrated in Figure 27 and a closely allied modification thereof, respectively; and

Figure 32 is a sectional elevation view taken along the line 32—32 of Figure 27.

Referring now to page 1 of the drawings, comprising Figures 1 through 6, there is illustrated in Figure 5 a paper closure blank comprising sections 41, 43, 46, 49, 52, 55, 58, 60, 62 and 64 delineated by the edges of the blank, scored lines 42, 48, 53, 57, 59, 61 and 63, cuts 44 and 51, and perforated lines 45 and 47.

To close a bag with this blank, the blank is folded along the line formed by folding line 48 and cuts 44 and 51. Sections 52 and 60 are then folded back against sections 55 and 62 along perforated line 45 and scored line 61. In a similar manner sections 58 and 64 are folded about lines 47 and 63 against the same central portion. The resulting blank arrangement, which is U-shaped in cross-section, is then slipped over one edge of the bag to be closed in the manner shown in Figure 4. After this the bag mouth is pressed closed against the sections 52 and 60, 58 and 64. The blank with the contiguous and adjacent bag mouth portions is then folded along the scored line 42 which overlies the lines 53, 57 and 59, and the resulting assembly heat sealed to complete the closing operation. As a result, the closed bag shown in Figure 1 is produced.

The folding operation which precedes the step of clamping the bag and die cut paper form in the jaws or related portions of the heat sealing apparatus may be carried out by hand or by the apparatus itself, where the proper type is available.

The blank 5 is treated on one side so that it seals to the bag material, which is a heat sealable type, during the heating operation. The side of the blank so treated is that to which the lead lines from the numerals 52 and 58 point in Figure 4. When the bag is opened, a pouring spout is formed between the surfaces which join at the cut edge indicated by the lead line from the numeral 44 in Figure 4.

To open the bag of Figure 1, a finger- or

thumb-nail is inserted under the edge of the closure blank directly beneath the numeral 46 in Figure 1, and the portion of the blank between the perforated lines 45 and 47 lifted with sufficient force to tear the blank and under-lying sealed in portion of the bag material along the said perforated lines 45 and 47. By grasping the overlapped sections 41, 43, 52 and 60 between the thumb and fore-finger of one hand and the corresponding sections 41, 49, 58 and 64 with the thumb and fore-finger of the other hand and pressing them toward each other, a pouring spout and chute is formed as shown in Figure 3. The surfaces on which the lead lines from the numerals 52, 58 and 55 terminate in Figure 3 are on the previously mentioned untreated, that is, the non-heat sealable, side of the blank. It is believed clear from a consideration of Figure 3 that the blank extends down into the mouth of the bag a sufficient distance to prevent the portion of the bag mouth surrounding the pouring spout from sealing to each other. For completeness it may be pointed out that the extension chute or trough is formed by the section 55 which has been sealed to the section 46 by means of the intermediate layer of bag material.

The bag 5 is preferably made of transparent heat sealable sheet wrapping material such as moisture-resistant regenerated cellulose, low substituted methyl cellulose, organic solvent soluble ethyl cellulose, cellulose acetate (56% combined acetic acid), rubber hydrochloride, water soluble and insoluble polyvinyl compound film, etc.

Moisture-resistant heat sealing sheet wrapping material is well known in the art, and there is no need to burden this specification with a recital of its manufacture, properties, etc., other than to state that typical products are described in U. S. A. Patents 1,997,583 (Hitt), 2,046,492 (Snyder), 2,060,906 (Snyder), 2,064,292 (Charch), 2,077,396 (Charch and Hershberger), 2,077,399 (Collins and Larson), 2,077,400 (Collins), 2,079,379 (Mitchell), 2,123,883 (Ellsworth), 2,147,180 (Ubben), 2,159,152 (Hershberger) and 2,209,965 (Finzel).

Since the closure is air-tight, the invention is especially applicable to bags of moistureproof material capable of being heat sealed. Other related sheet material involving paper, metal foil, cloth and the like as the base sheet, may be used when desired.

The blank, as indicated above, is of a character which can be readily torn with the fingers, for example, a 50 to 60 pound stock, one side of which has a smooth clay coating to enable the blank to be heat sealed to the bag material, and the other side of which is plain or treated, as may be desired, but which is of such a character that it does not heat seal to itself or the bag material. The heat sealable side of the blank may have a resinous heat sealable (or equivalent) coating, for example, that described in U. S. A. Patent 2,174,885, of October 3, 1939.

The modified form of bag closure illustrated on page 2, comprising Figures 7 through 11 and page 3, comprising Figures 12 through 17, is designed to be opened by puncturing the blank with a knife or related instrumentality. The blank shown on page 2 of the drawing is designed for use with containers made of heat sealable material, and the blank illustrated on page 3 of the drawings is designed for use with bags made of non-heat sealable material.

Referring now to Figure 10, there is illustrated a blank comprising sections 71, 73, 76, 78, 79, 81,

84 and 85, the boundaries of which comprise the edges of the blank and the scored folding lines 72, 74, 75, 77, 80, 82 and 83. The manner in which this blank is folded is illustrated in Figure 11. The manner of applying this blank to a bag mouth is shown in Figure 9.

To close a bag with this closure device, the blank is folded along the fold lines 72 and 75. The sections 73 and 79, and 78 and 84 are then pulled inwardly in the manner employed in forming gussets, and the blank slipped over one side of the bag mouth, thereby positioning the bag material between the sections 71 and 76. The bag mouth is then closed by pressing the other side against the section 81, and the section 85 folded down about the outside of the bag. This assemblage is then passed through heat sealing means, whereby the bag is firmly closed as shown in Figure 7. Since one side (the under side in Figure 11) of the blank is treated or coated with a thermoplastic cement to cause it to seal to the heat sealable material of which the bag is made and to itself, a leak-proof closure results. If the paper form is so proportioned that the gussets of the bag can be positioned in the fold which embraces the numeral 73 in Figure 11, ordinary clay coated stock (which does not seal to itself but does seal to the coated regenerated cellulose film) can be used in making the blank. The untreated side of the blank does not adhere to itself, so the trough portion illustrated in Figure 11 can be spread apart when desired. The general appearance of the closed bag, when viewed from above, is shown in Figure 8.

To open the bag, the aforementioned trough portion is spread by means of a finger-nail, or the like, and the horizontal portion of the scored line 75 cut with a knife. Access to the contents of the bag is thereby obtained, and said contents can be dispensed by pressing the ends of the closure toward the center to cause a bulging of the mouth portion of the bag and associated blank sections.

As will be obvious, the bag may be reclosed by simply pressing the opened bag mouth into its original closed position.

A somewhat more complicated sealing arrangement with this type of closure device is necessary when the bag is made of non-heat sealable material. Here the blank is gummed or treated on one side with an equivalent heat responsive adhesive to cause it to adhere to the bag material. The blank shown in Figure 15 comprises sections 111, 113, 116, 117, 121, 123, 124, 126, 129, 131, 133, 135, 137 and 139 outlined by the edges of the blank, scored lines 112, 114, 115, 118, 119, 122, 127, 128, 130, 132 and 138, and slits 134 and 136.

The first steps in the application of this blank to the bag in the closure operation are somewhat similar to those described in connection with the blank of Figure 10. In this instance the blank is folded along the scored line 119, and gusset portions are formed by pulling the sections 117 and 124, and 123 and 129 inwardly to cause the blank to fold along lines 118 and 130, and 122 and 127. The blank in this condition is inserted in the mouth of a bag in the manner shown in Figure 13. The sections 133 and 137 are then folded along the line 128 toward the center of the bag, into the bag gussets which lie outside the aforementioned gussets in the blank. The mouth of the bag is then pressed together, and the tabs comprising the sections 131 and 139 folded around the outside of the bag where it overlies the section 121 to produce the arrange-

ment shown in Figure 14. Thereafter the blank is folded along line 114 to bring the section 113 into contact with the outside of the bag mouth overlying the sections 131 and 139. The sections 111 and 116 are then folded around the bag mouth to overlie the bag where it covers the section 126. The section 135 is at this time, or at some prior stage in the closing operation, folded downwardly to overlie the same side of the bag mouth. This assemblage is then passed between heat sealing irons, or equivalent apparatus, to cause the treated surface of the blank to seal to the bag. The resulting closure has the same general characteristics as the closure of Figure 7, and is opened and reclosed in the manner previously described.

Still another modification of the invention is shown on page 4 of the drawings, comprising Figures 18 through 22. This closure blank, as shown in Figure 21, comprises a tongue and slit arrangement in which the tongue is made up of sections 157 and 159 separated by a scored folding line 158. For convenience in inserting this tongue in the slit 153, the corners of the section 159 are chamfered, as indicated at 161 and 162. On opposite ends, and constituting an extension of the line of the slit 153, are scored lines 152 and 154. This line separates sections 151 and 155. A perforated line 156 separates the section 157 from the main body of the blank.

In using this blank, it is folded along the perforated line 156, and the section 159 passed through the slit 153. The sections 151 and 155 are then folded toward each other into V-shape with the projecting portion 159 of the blank between the sides of the V, and the blank in this condition placed over a partially closed bag mouth with the tongue inside the bag and the sections 151 and 155 outside the bag, the bag mouth and the overlying and underlying portions of the blank pressed together, and the assemblage subjected to a heat sealing operation to produce the closed bag shown in Figure 18. Since section 157 of the tongue is on the outside of the section 155, a top view of the bag closure has the appearance illustrated in Figure 19.

This blank is employed with bags and related containers of heat sealable material, and in order to produce adequate adherence thereto, one side is treated with clay or equivalent material, as described above. The outside of the blank is not of a heat sealable character, and as a result, the section 157 does not adhere to the section 155. This condition is taken advantage of in opening the bag. A pointed instrument, such as a knife, is inserted between these two non-adhering sections, and the blank severed along the perforated line 156. The tab constituting the section 157 is then grasped between the thumb and fingers and lifted, thereby opening the bag along the cut 153. The tongue section remains secured in the bag mouth, because that surface of the section 159 contacting the inside of the bag adjacent to the section 151 is secured to the inside of the bag by the heat sealing operation.

To form a pouring spout and trough, the overlapped sections 155 and 151 are grasped with the thumbs and fingers on opposite sides of the cut 153, and the ends of the cut pressed toward the center. An opposite motion pulls the sides of the mouth of the bag back together, and adequate reclosure is obtained by folding the section 157 back into its original closed position.

The closure device with the tongue inside the bag mouth is also disclosed on page 5 of the

drawings comprising Figures 23 through 26. The blank in this case comprises sections 171 and 176, separated by scored line 177 along which is secured, by gluing or equivalent means, a tongue 172. The numeral 175 indicates the section of the tongue which is secured to the section 171. This blank is placed in a bag in the manner previously described, that is, with the tongue inside the bag mouth, after which the mouth of the bag is pressed together and, with the sections 171 and 176 outside the bag mouth, subjected to a heat seal operation. The printed line 174, shown in Figure 23, is a guide line for cutting with scissors or similar instrument, for opening the bag. When the sealed bag mouth has been cut along this line, a pouring spout similar to that shown in Figure 20, except for the absence of the attached chute, is formed by pressing the portions of the blank on the sides of the bag toward the center.

The tongue 172 can be made either of a non-heat sealable material or of a material heat sealable on one side only. The latter modification is preferred, because it keeps the tongue against the side of the bag when the contents are being dispensed. There is a tendency for this section to move out into the stream of material flowing through the bag opening if it is not secured to the side of the bag. The main body of the blank is heat sealable on the side which comes into contact with the outside of the heat sealable bag material.

Still another modification of the invention, embodying some of the features of the blank of Figure 21 and some of the features of the blank of Figure 25, is illustrated on page 6 of the drawings, comprising Figures 27 through 32. The blank of this last modification is illustrated in Figure 30. It comprises sections 211 and 217 separated by folding line 212. Section 211 has a slit at 213 and perforated lines at 215 and 216. A tongue 218 is positioned in the slit 213 and presealed to the heat sealable surface of the main body of the blank. The tongue 218 has a number of perforations 214 for a purpose to be described later. A modification of this blank, in which the shape of the tongue is different, is shown in Figure 31. The corresponding sections are 211a and 217a. The central scored line of the last modification is shown at 212a, and there are perforated lines 215a and 216a, and cut-outs 214a. In the interest of brevity only the application of the blank of Figure 30 in the bag closing operation will be described.

The blank is positioned on the bag mouth with the tongue on the inside, and the bag closed in the manner previously described. The inside of the main body of the blank is a surface adapted to be heat sealed to the bag material. It follows that where this surface is exposed through the cut-outs 214, the section 211 will heat seal through the tongue 218 to the outside of the bag in the closing operation. After the heat sealing is complete, the closed bag has the appearance shown in Figure 27. That portion of the tongue 218 shown in dotted lines in Figure 30, provides a loose flap on the outside of the closure which can be grasped with the thumb and fingers for opening the bag.

The bag is opened by pulling up the exposed portion of the tongue 218 with sufficient force to tear the main portion of the blank along the lines 215 and 216, and to pull that portion of the section 211 between these perforated lines loose

from the bag mouth where it has been secured by means of that surface which contacts the bag mouth through the holes 214. A pouring spout and trough are formed when the ends of the closure device are pressed toward the center, as indicated in Figure 28. Adequate reclosure of the bag is obtained by flattening out the bag mouth and folding the uplifted tab or trough section back into its original closed position.

The stock from which the closure blanks are manufactured is described in connection with the closure device shown on page 1 of the drawings. The manner of surfacing this stock with clay, gum, and other materials to provide heat sealability, is conventional, is not a part of this specification, and need not be discussed in detail herein.

It will be apparent to those skilled in the art that the blanks can be pre-applied to the bags to facilitate the filling, closing and related handling operations, and that the manner of such pre-application will depend upon the type of closing, for example, hand or automatic machine, involved.

Materials for the manufacture of the bag are disclosed in connection with the description of Figures 1 through 6. In those instances where the container material need not be heat sealable, a still wider variety of sheet products is available, for example, other types of moisture-resistant regenerated cellulosic sheet, such as that described in U. S. A. Patents No. 1,737,187 (Charch & Prindle), 2,042,589 (Charch & Hershberger), 2,166,366 (Meigs), 2,201,747 (Staudt) and 2,205,210 (Latour).

For convenience, square type bags have been illustrated in the drawings and described in the preceding portion of the specification. The invention is broader, since in many instances other types of containers, such as mandrel and flat type bags, and overlaps, may be used in a manner used similar thereto.

The present invention makes bag packages and the like more attractive and useful to consumers, since it obviates the principal disadvantages heretofore encountered. In the past the opening of a securely closed bag usually meant the destroying of the top, with the result that the bag was so weakened that it split, spilling the contents or becoming unserviceable immediately, or within a very short time thereafter. In the present invention either the bag mouth is not mutilated, or else the mutilated portions are securely supported by strongly adhered blank sections, and in any case, the integrity of the container is preserved. As a result, the consumer demand for securely fastened containers which can be easily opened without necessitating the immediate transfer of the unused contents to another receptacle for storage, has been supplied.

As many apparently widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that this invention is not limited to the specific embodiments thereof except as defined in the appended claims.

I claim:

1. The method of closing the open mouth of a bag, or like container, composed of a heat sealable material which comprises positioning a closure member having at least two legs over the mouth of said bag with one of said legs projecting within the mouth of said bag, said inwardly projecting leg having a width less than

the length of the mouth of said bag and heat sealing to each other the opposite sides of the mouth of said bag which contact each other adjacent said inwardly projecting leg, said inwardly projecting leg preventing a heat seal across the entire mouth of said bag and providing an opening into said bag upon severing said closure adjacent said leg.

2. The method of closing the open mouth of a bag, or like container, composed of a heat sealable material which comprises positioning a closure member having at least two legs over the mouth of said bag with one of said legs projecting within the mouth of said bag, said inwardly projecting leg having a width less than the length of the mouth of said bag, one side of said leg being heat sealable to said bag, and heat sealing to each other the opposite sides of the mouth of said bag which contact each other adjacent said inwardly projecting leg, said inwardly projecting leg preventing a heat seal across the entire mouth of said bag and providing an opening into said bag upon severing said closure adjacent said leg.

3. The method of closing the open mouth of a bag, or like container, composed of a heat sealable material which comprises positioning a

three-legged closure member over the mouth of said bag with the internal leg of said closure member within the mouth of said bag, said internal leg having a width less than the length of the mouth of said bag, and heat sealing to each other the opposite sides of the mouth of said bag which contact each other adjacent said internal leg, said internal leg preventing a heat seal across the entire mouth of said bag and providing an opening into said bag upon severing said closure adjacent said leg.

4. The method of closing the open mouth of a bag, or like container, composed of a heat sealable material which comprises positioning a three-legged closure member over the mouth of said bag with the internal leg of said closure member within the mouth of said bag, said internal leg having a width less than the length of the mouth of said bag, one side of said internal leg being heat sealable to said bag, and heat sealing to each other the opposite sides of the mouth of said bag which contact each other adjacent said internal leg, said internal leg preventing a heat seal across the entire mouth of said bag and providing an opening into the said bag upon severing said closure adjacent said leg.

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