

April 17, 1934.

W. B. POWELL ET AL

1,955,310

BAG AND METHOD OF FORMING SAME

Filed May 16, 1931

2 Sheets-Sheet 1

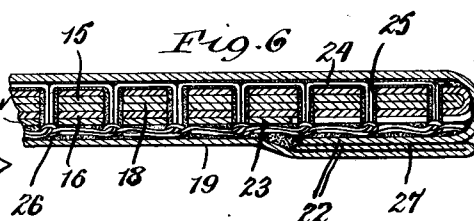
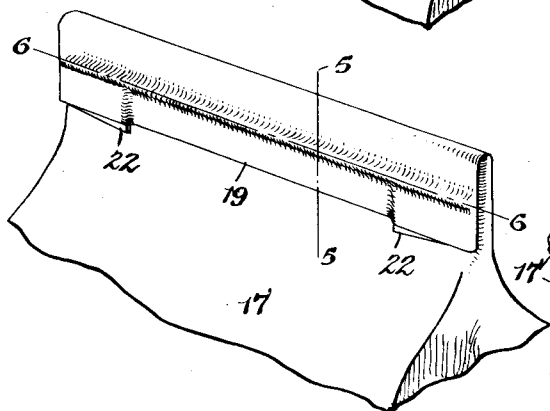
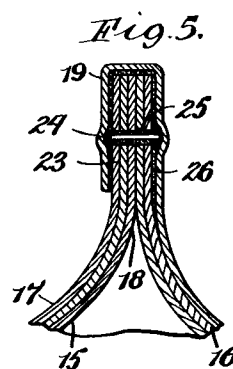
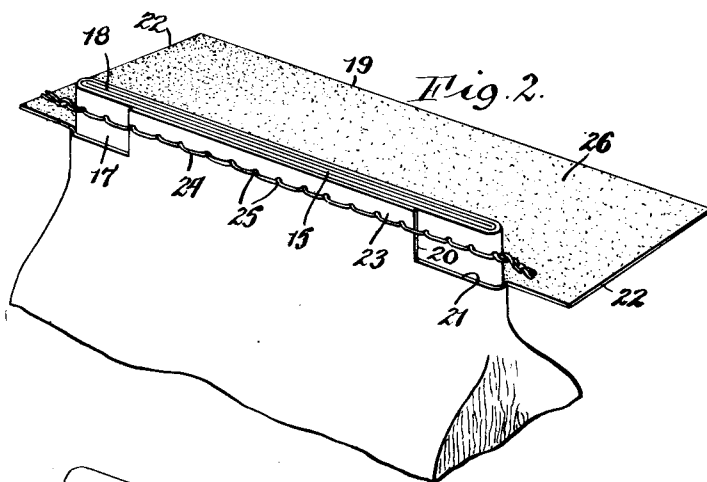
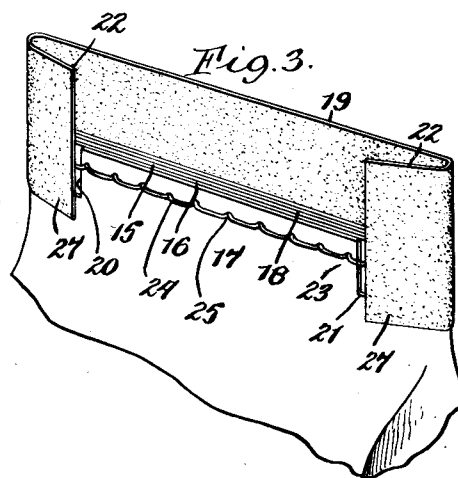
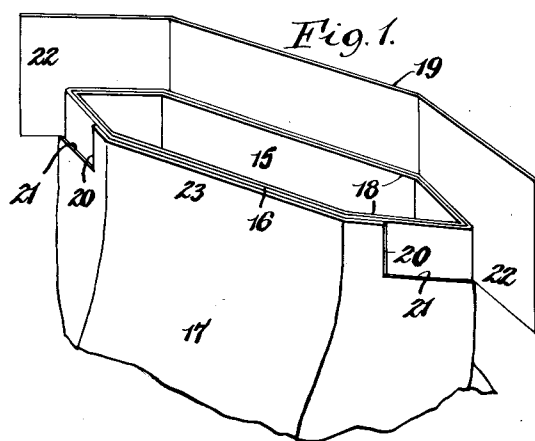


Fig. 4.

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April 17, 1934.

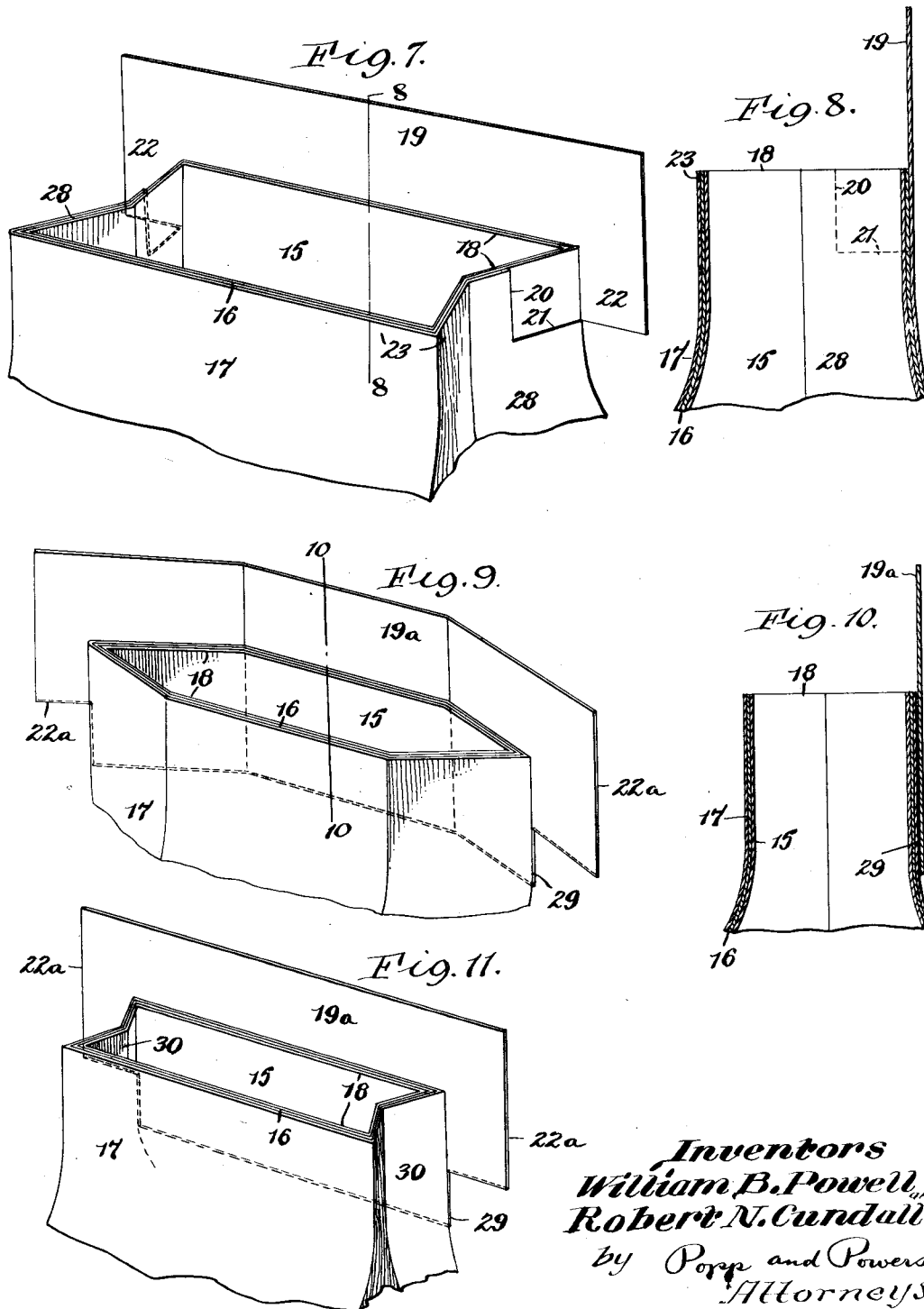
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

1,955,310

BAG AND METHOD OF FORMING SAME

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Application May 16, 1931, Serial No. 537,896

7 Claims. (Cl. 229—53)

This invention relates to a bag and method of sealing the same and more particularly to a multiple walled bag adapted to contain powdered materials, such as flour, sugar, lime, plaster, gypsum, fertilizers and the like, in which it is not only necessary to close the bag in such manner that the fastenings at the mouth of the bag will not break or loosen but also to provide a seal which prevents the leakage or sifting out of the contents when the bags are handled either when the bags are inverted or when they are set down and the material tends to blow out through the impact of setting the bags down.

In the development of open mouth paper bags for use in larger sized packages of powdered materials it has been found desirable to make them with the walls of a number of thicknesses of paper.

As there is a limit to the strength which can be obtained from a single thickness of paper the most effective way to provide the necessary strength for large bags has been found to provide a bag having a number of walls or in effect a single bag made of a number of bags set one within the other. This not only provides the requisite strength but also permits of employing a moisture resistant bag or wall as the outer wall which can be thin and inexpensive and not only protect the contents of the bag but also protect the inner walls or bags which can be made of a non-moisture resistant paper. While this development has produced bags of sufficient strength their use has been prevented from a more general application, particularly in the handling of fine, dusty materials, because of the difficulty in making them sift-proof at either end when the closure was made, and in the case of the larger sizes of bags the need of extra strength at the ends or place of closure.

This application is a companion to the co-pending applications of Robert N. Cundall Ser. Nos. 507,615 and 507,616, filed January 9, 1931 and the application of himself and William B. Powell, Ser. No. 507,874, filed January 10, 1931.

One of the principal objects of this invention is to provide a bag for finely powdered or dusty materials in which the ends of the bag are closed in such manner as to provide strong, durable and permanent closures and seal which is also sift-proof and entirely prevents the fine, dusty materials from sifting out through the closures.

Another purpose is to provide a bag which when closed is as strong at the ends or places of sealing as any other portion of the bag.

Another aim is to provide a bag of this character

in which there is no danger of the sealing material falling into the contents of the bag.

A further object is to provide such a bag and process of sealing the same which permits of sealing the bag by automatic processes, thereby avoiding all hand operations.

A still further aim is to provide a bag which is neat in appearance and can be provided with a sift-proof seal of the requisite strength at very low cost.

Another purpose is to provide such a bag which is effectively sealed against contamination thereby permitting its use in the shipment of foodstuffs and which is also pilfer-proof thereby permitting its use in the shipment of relatively valuable materials which are subject to pilfering.

Another object is to provide a bag which in particular is completely sealed at the corners of the mouth of the bag, at places offering the greatest difficulty in providing a completely sealed bag.

In the accompanying drawings:

Fig. 1 is a perspective view of a three ply bag having its mouth formed to be sealed in accordance with one form of the present invention.

Fig. 2 is a similar view showing the mouth of the bag sewed closed and glue applied to a part of the bag as the first step of the sealing operation.

Fig. 3 is a similar perspective view of the bag showing the next step in the sealing operation.

Fig. 4 is a similar perspective view of the bag showing the completed form of the sealed bag.

Figs. 5 and 6 are sections taken on the correspondingly numbered lines of Fig. 4.

Fig. 7 is a view similar to Fig. 1 showing the invention applied to a gusseted type of bag.

Fig. 8 is a section taken on line 8—8, Fig. 7.

Fig. 9 is a view similar to Fig. 1 showing a modification of the invention in which a separate strip is secured to the mouth of the bag for the purpose of sealing it.

Fig. 10 is a section taken on line 10—10, Fig. 9.

Fig. 11 is a view similar to Fig. 1 showing the form of the invention illustrated in Figs. 9 and 10 applied to a gusseted type of bag.

In the following description similar characters of reference indicate like parts in the several figures of the drawings.

One of the most effective ways of closing either end of a multiple walled bag containing dusty materials is by stitching the sides of the end of the bag together with cotton thread. Stitching through the sides of the mouth or end of the bag, however, has the effect of weakening the bag and dusty materials will leak through the top of the

bag between the stitches. Also in the stitching of the bag the stitching needle is, of course, larger than the cotton thread used in stitching and therefore the needle punches a larger hole through the walls of the bag than the thread fills and these large holes permit the dusty material to escape through the holes in the bag around the thread.

The most effective way that has been found to make a bag tight or sealed at the opening is by some form of gluing. Inasmuch, however, as the principal object of employing a multiple walled bag is to obtain the required strength it is obvious that in cases where great strength is needed unless some method of reinforcing this seal is obtained, it will not be so strong as the walls of the bag. The present invention therefore proposes to combine stitching and gluing in such manner that the stitching provides a closure of the necessary strength and the gluing not only seals the bag at the closure but also strengthens this stitching. While the invention proposes the use of stitching and gluing it will be apparent that in place of the stitching another form of fastening which extends through the wall of the bag could be employed, such as staples, and that while glue is preferable any adhesive or hardening plastic material can be employed, preferably one that is quite liquid at the time of application and will harden to a stiff, gummy condition, such a condition being preferable to a glue which becomes brittle.

The invention is shown as embodied in a three ply multiple walled bag having an inner wall 15, an outer wall 17 and an intermediate wall 16, although the invention can be embodied in a bag having any number of walls. Such a multiple walled bag is made in any suitable manner to provide a mouth 18 at its upper end which when furnished to the packer can be opened up and the materials deposited into the bag.

In the form of the invention shown in Figs. 1-6, the bag when furnished to the packer has its outer wall formed to provide an upstanding flap 19 which is longer than the width of the bag. This flap is formed by initially making the outer wall 17 of the bag higher or longer than the inner walls 15 and 16 thereof and by cutting two vertical slits 20 extending down from the mouth of the outer wall 17 on one side of the bag and near the ends thereof. From the bottom of these slits 20 the outer wall is slitted horizontally to each end of the bag as indicated at 21. This slitting of the outer wall provides the flap 19 which can be folded along the line below the mouth 18 of the bag and also is provided with end extensions 22 extending beyond the ends of the bag. The opposite short flap 23 of the bag is trimmed evenly with the mouth of the bag.

The packer receiving a bag so made opens up the mouth and fills the bag with the powdered or dusty materials which are to be shipped in the bag. He then folds down a flap 19 and its extensions 22 and runs the bag through a sewing machine and provides a row of stitches 24 at the mouth of the bag. These stitches extend through opposite sides of the inner wall 15, intermediate wall 16 and the short flap 23 at the mouth and since the needle of the sewing machine is necessarily larger than the size of the thread, the holes 25 through the walls of the bag are larger than the size of the thread so that unless some form of sealing is provided the materials will sift out through the holes 25 and also between the stitches 24 and out through the mouth of the bag. To avoid a coating of glue or other rubbery adhesive

26 is applied to the inner side of the flap 19 and its end extensions 22.

After the glue 26 is so applied the flap 19 is folded upwardly to its original upstanding position so that the glue 26 engages the corresponding side of the intermediate wall 16 and also the corresponding side of the stitching 24. After this is done the end extensions 22 are folded inwardly around the mouth of the bag as indicated in Fig. 3, their glued faces thereby engaging the opposite sides of the intermediate wall 16 and also the stitching 24.

A coating 27 of glue or rubbery adhesive is thereupon applied to the unglued side of the extensions 22 and the flap 19 and its extensions 22 are folded down over the mouth of the bag as best illustrated in Fig. 4. In so folding the facings 27 of glue on the extensions 22 are folded upon themselves and the exposed glued face 26 of the flap 19 is folded against the flap 23 and the corresponding exposed parts of the stitching 24. After the mouth of the bag is so closed the opposite sides of the mouth of the bag are passed through suitable rollers so that a tight and strong adhesion of the glue is obtained and the glue is so forced into the stitching 24 and enters the holes 25 formed by the needle of the sewing machine in stitching. In entering these holes 25 the glue fills the excess size of these holes and also passes between the stitches so as to provide a complete seal which entirely prevents the dusty materials from sifting past the stitching. This method of sealing the flap over the stitching also stiffens the stitching to a greater degree and effectively prevents any leakage or sifting of the materials through the stitching holes. The effect of gluing the strip over the stitching also tends to strengthen the stitching since if the stitching were to give way it would be necessary for the thread to be applied to the paper at the holes in the same manner as a knife. If the stitches were free to move when a strain was presented which would be greater than the paper could stand the paper would tear around the holes but by fastening the stitches by glue to the flap 19 or its extensions 22 it prevents them from moving and strengthens the bag closure. It will also be particularly noted that the corners or ends of the mouth of the bag are effectively and completely sealed, this being the most difficult place to obtain a reliable seal in bags of this character.

In the form of the invention shown in Figs. 7 and 8 the same method of forming, sewing and gluing a bag is shown as applicable to a gusseted bag. A gusseted bag is one which is provided with gussets 28 at its ends and in this form the vertical and horizontal slits 20 and 21 which form the flap 19 and its extensions 22 are formed in the gussets 28 instead of in the front wall as in the form of the invention shown in Figs. 1-6. In other respects the form of folding sewing and gluing the gusseted form of the bag shown in Figs. 7 and 8 is identical to that shown in Figs. 1-6.

Instead of initially providing the outer wall 17 of the bag to extend beyond the mouth of the bag and instead of providing the flap 19 and its extensions 22 by slitting the outer wall 16 of the bag it is apparent that the same result could be obtained by gluing a separate strip 19a to the outer wall 17 of the bag at one side, this being shown in Figs. 9 and 10. In this form the three walls 15, 16 and 17 of the bag are all of the same height and a separate flap 19a which is preferably T-shape in outline, is glued to the bag by a down-

ward extension 29. The strip 19 as in the other form of the invention, is provided with end extensions 22a and extend beyond the ends of the mouth of the bag. In making the bag the downward extension 29 is glued to one side of the bag a short distance below its mouth, and the bag is furnished to the packer in this condition. It is apparent that a bag so constructed is identical with the form of the invention shown in Figs. 1-6 so far as folding, sewing and sealing is concerned except that the stitches 24 instead of passing through the inner and intermediate walls 15 and 16 of the bag and only a part of the outer wall 17 pass through all the plies of the bag on both sides thereof.

The form of the invention shown in Fig. 11 shows the separate form of flap 19a applied to a gusseted type of bag, such a bag having gussets 30 at its ends. It is apparent that in this form of gusseted bag the folding, sewing and stitching of the bag is identical to the form shown in Figs. 9 and 10.

While it has been assumed in the foregoing description that the bag has been fabricated and that the invention is applied in closing and sealing the mouth of the bag, it is obvious that the invention could also be employed in closing and sealing the bottom of the bag during its manufacture and the invention therefore also comprehends this application.

It is apparent from the foregoing that all of the forms of the invention provide a bag in which the closure is strong and durable and equal in strength to any other portion of the bag; the bag is sealed so as to be sift-proof at this closure and particularly at the corners of the closed mouth of the bag; there is no danger of bits of glue breaking and falling into the contents of the bag so as to contaminate the contents; the seal is neat in appearance and the closing and sealing of the bag can be readily effected by automatic means. It will also be observed that the sealing not only seals the closure so as to prevent the sifting out of the dusty materials which the bag is designed to contain but also strengthens the closure. The seal for the bag also effectively prevents the contamination of the contents, thereby permitting foodstuffs to be shipped in the bags and the seal also renders the bag pilfer-proof so that relatively valuable powdered materials which are subject to pilfering can also be shipped.

While the bag has been shown and described with particular reference to a multiple walled bag it is apparent that the form of the invention shown in Figs. 9-11 can be embodied in a single walled bag and the invention therefore also comprehends this application.

We claim:

1. A bag of the character described, comprising a tubular body of flexible material having a mouth at at least one end, means for fastening together the opposite sides of said bag at its mouth to provide a closure, a sealing strip folded over the mouth of said bag, the ends of said strip being folded back under the first-mentioned fold of said strip and around the corners of said bag at its mouth and a hardening plastic material uniting said strip to the mouth of said bag, said adhesive sealing said mouth and also extending around the corners of said mouth to prevent leakage of the contents of the bag at said corners.

2. A bag of the character described, comprising a tubular body of flexible material having a mouth at at least one end, fastenings extending through the opposite sides of said bag at its mouth

to provide a closure, a sealing strip folded over the closed mouth of said bag and having its ends projecting beyond the mouth of said bag, each end of said strip being folded over upon itself and being also folded back under the first mentioned fold of said strip and around the corners of said bag at its mouth and a hardening plastic material uniting all contacting faces of said bag and strip and forming a seal for said closure and fastenings, and the corners of said mouth, said strip thereby being provided with imperforate corner folds and embracing the corners of said mouth and a straight fold embracing the central part of said mouth.

3. A multiple walled bag comprising a multiple walled tubular body made of flexible material and having a mouth at at least one end, and the outer wall at one side of said bag being extended to form a flap projecting beyond the mouth of the bag and said flap being formed with side extensions extending beyond the corners of said bag at its mouth, fastenings extending through the opposite sides of the inner wall of said bag at its mouth to form a closure, said flap being folded over the closed mouth of said bag, a layer of plastic material on the inner face of said folded over flap and the opposite sides of the bag at said fastenings, the extensions of said flap being folded back under the first mentioned fold of said flap and around the corners of said bag at its mouth and a hardening plastic material uniting the remaining contacting faces of said bag and flap and forming a seal for said closure.

4. The method of making a bag which consists in providing a tubular body made of flexible material and having a mouth at at least one end, and also having a strip at one end, the ends of which project beyond the corners of said mouth fastening together the opposite sides of the mouth of said bag, applying a hardening plastic material to unite said strip to the mouth of said bag, folding in the ends of said strip to embrace and adhere to the corners of the closed mouth, applying a hardening plastic material to the folded over ends of the strip and folding the strip and the folded over ends of the strip to embrace the mouth of the bag its full length whereby said strip is provided with an imperforate corner fold embracing the corners of said mouth and a straight fold embracing the central part of said mouth.

5. The method of making a multi-walled bag comprising a multi-walled tubular body made of flexible material and having a mouth at at least one end which consists in passing fastenings through opposite sides of the mouth of said bag to form a closure therefor, applying a strip and hardening plastic material to said bag at its mouth, folding in the ends of said strip to embrace the corners of the closed mouth, applying a hardening plastic material to the folded over ends of the bag and folding the strip and the folded over ends of the strip to embrace the mouth of the bag its full length whereby said strip is provided with an imperforate corner fold embracing the corners of said mouth and a straight fold embracing the central part of said mouth, said hardening plastic material forming a seal for said closure and also for the openings made by the penetration of said fastenings.

6. The method of making a multi-walled bag comprising a multi-walled tubular body made of flexible material and having a mouth at at least one end which consists in securing a strip to one side of said bag a substantial distance from said

mouth, said strip extending beyond said mouth and also beyond the ends of said mouth, passing fastenings through opposite sides of said bag at said mouth from corner to corner, folding back said strip and applying a hardening plastic material to the side thereof opposing said bag, folding in the ends of said strip to embrace the corners of said bag at the closed mouth, applying a hardening plastic material to the outside of the folded over ends of said strip and folding the strip and the folded over ends of the strip to embrace the mouth of the bag its full length, said hardening plastic material forming a seal for said closure and also for the openings made by the penetration of said fastenings.

7. The method of making a multi-walled bag comprising a multi-walled tubular body made of flexible material and having a mouth at at least one end and the outer wall of said bag being extended beyond said mouth which consists in slitting said outer wall from its open end and on one side and at two places to points a substantial distance inwardly from the mouth of said inner wall, flattening the flap formed by said slitting to extend beyond the mouth of said inner wall and beyond the corners thereof, passing fastenings through the opposite sides of said inner wall at its mouth to provide a closure therefor, applying a hardening plastic material to the side of said flap opposing the bag, folding in the ends of said strip to embrace the corners of the inner wall at its closed mouth, applying a hardening plastic material to the outside of the folded over ends of the flap and folding over the flap and its folded over ends to embrace the closed mouth of the inner wall its full length, said hardening plastic material forming a seal for said closure and also for the openings made by the penetration of said fastenings.

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