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R. N. CUNDALL

2,020,301

BAG AND METHOD OF FORMING SAME

Filed Jan. 9, 1931

Fig. 1.

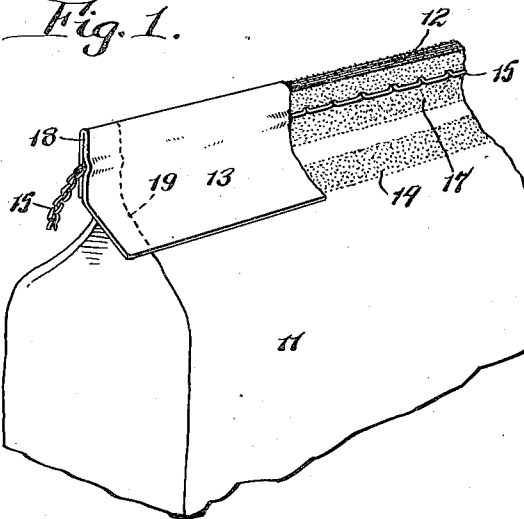


Fig. 2.

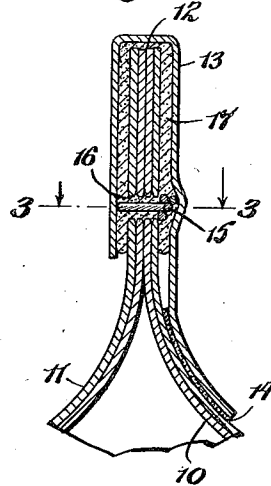


Fig. 3.

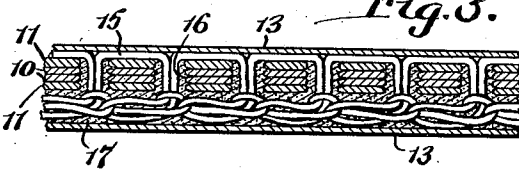


Fig. 4.

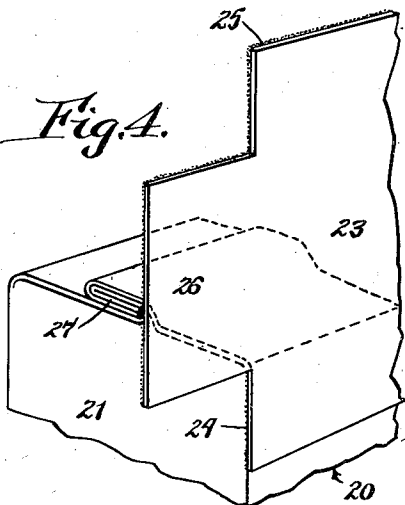
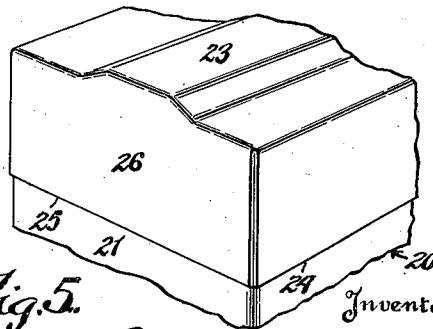


Fig. 5.



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UNITED STATES PATENT OFFICE

2,020,301

BAG AND METHOD OF FORMING SAME

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mesne assignments, to Bagpak, Inc., a corpora-
tion of Delaware

Application January 9, 1931, Serial No. 507,616

9 Claims. (Cl. 229—62)

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 or setting the bag 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 or plies 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 protects the contents of the bag but also protects 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 the mouth when the closure was made, and in the case of the larger sizes of bags the need of extra strength at the mouth or place of closure.

This application is a companion to my application Ser. No. 507,615, filed January 9, 1931; and the application of myself 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 mouth of the bag is closed in such manner as to provide a strong, durable and permanent closure and seal which is also sift-proof and entirely prevents the fine, dusty materials from sifting out through the closure.

Another purpose is to provide a bag which

when closed is as strong as the mouth or place 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 which permits of the sealing of the bag to be provided by automatic processes and avoid 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 food-stuffs and which is also pilferproof thereby permitting its use in the shipment of relatively valuable materials which are subject to pilfering.

In the accompanying drawing:

Fig. 1 is a fragmentary perspective view of the top of a multiple walled bag closed and sealed in accordance with the preferred form of my invention.

Fig. 2 is a vertical section.

Fig. 3 is a horizontal section taken on line 3—3, Fig. 2.

Fig. 4 is a perspective view of a further modified form of my invention showing the sealing about to be effected.

Fig. 5 is a view similar to Fig. 4 showing the sealing of the bag as completed.

In the following description it has been assumed that the bag is already fabricated and the invention is embodied in the closing and sealing of the mouth of the bag. It will be apparent, however, that the invention can also be applied in closing and sealing the bottom of the bag during its manufacture.

One of the most effective ways of closing a multiple walled bag containing dusty materials is by stitching the sides of the mouth of the bag together with cotton thread. Stitching through the sides of the mouth 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 as 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 the 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 walls of the bag could be employed, such as staples, and the term "stitching" is intended to designate metallic as well as non-metallic stitches; also 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 multiple walled bag having an inner wall 10 and an outer wall 11 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 12 at its upper end which when furnished to the packer can be opened up and the materials deposited in the bag. When furnished to the packer the bag has glued thereto a strip of paper 13, this strip being at least as long as half the circumference of the mouth and being preferably somewhat longer than this. This strip is glued to the bag as indicated at 14 in such manner that it is secured at one side to the outer wall 11 of the bag and its other or free edge can be folded over the mouth of the bag when the opposite sides of the bag are brought together as indicated in Fig. 1.

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 runs the bag through a sewing machine and provides a row of stitches 15 at the mouth of the bag. These stitches 15 extend through the walls of the bag at the mouth and since the needle of the sewing machine is necessarily larger than the size of the thread, the holes 16 through the walls of the bag are also larger than the size of the thread so that unless some form of sealing is provided the materials will sift out through these holes 16 and also between the stitches and out through the mouth of the bag. To avoid this a coating of glue or other rubbery adhesive 17 is applied to the bag at its closure. This coating of glue 17 can be either applied to the opposite outer sides of the walls of the bag at its mouth so as to cover the stitching 15 and also the top of the bag or it can be applied to the corresponding face of the free side of the sealing strip 13. In either case the sealing strip 13 is folded over the sewn mouth of the bag and its opposite sides rolled together so that the sealing strip 13 extends around the mouth of the bag and completely encloses the stitches 15 as well as the mouth of the bag and is secured to the mouth of the bag by the layer of glue 17. In

rolling the strip 13 down the glue 17 is forced into the stitching 15 and enters the hole 16 formed by the needle of the sewing machine in stitching. In entering these holes the glue fills in 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. The strip 13 is preferably made somewhat longer than half the circumference of the bag at its mouth so that when glue 10 is applied to this strip and the strip is rolled to provide a seal for the mouth of the bag the ends of this strip project beyond the ends of the mouth of the bag as indicated at 18 so as to insure the mouth of the bag being completely sealed. It is apparent, however, that the strip 13 need not have this excess length but could be of such length as to extend the full length of the mouth of the bag only as indicated by the dotted lines 19 in Fig. 1. It is apparent that in this form of the invention the strip which is used for sealing the closure up is pasted or glued to the bag at the time the bag is made. This makes the bag easier to handle by automatic methods in its sealing. By making the strip slightly longer than the width of the bag at its mouth it is possible to seal the ends of this strip very tightly together preventing any possibility of sifting of the materials through the corners of the bag. This method of sealing the strip 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. It is also apparent that the application of the strip after stitching makes a package which is neat in appearance since by covering the stitching the bag presents a smooth and unbroken surface to the eye. 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 outer strip 13 it prevents them from moving and thus strengthens the bag closure.

In the form of the invention shown in Figs. 4 and 5 another method of closing and sealing a bag is provided. In this form the bag 20 is of the gusseted type although it is obvious that the other forms of the invention could be embodied in a gusseted type of bag. In such a form the bag is rectangular in horizontal section and has end walls or gussets 21. In this form the plies of material at the mouth of the bag are folded or rolled over one another to provide a closure as indicated at 27. In so closing the bag, glue can be applied to effect a strong and durable closure. When the bag is made a cruciform strip 23 is glued by one of its arms to one side of the bag at its mouth as indicated at 24 in the same manner as the strip 13 in the preferred embodiment of the invention, shown in Figs. 1-3. When the bag is closed a layer of glue 25 is applied to the corresponding face of the free end or arm of the strip 23 and to the tabs or arms 26 at the ends of the strip. The strip 23 is then folded over the top of the bag so as to seal it to the top and opposite side wall of the bag and the tabs 26 at the ends of the strip are then folded down and adhere to the ends of the closure 27 and also to the gussets 21 of the bag. By this means the strip 23 forms a cap for the upper end of the bag 75

which prevents dusty materials from filtering through the closure.

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 present invention, particularly the preferred form shown in Figs. 1-3, provide a bag in which the closure is strong and durable and equal to any other portion of the bag; the bag is sealed so as to be sift-proof at this closure; 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 filtering 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 and the seal also renders the bag pilferproof 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 some features of the invention can be embodied in a single walled bag and the invention therefore also comprehends this application.

I claim as my invention:

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 walls of said bag at its mouth to provide a closure, a cruciform sealing strip, a hardening plastic material securing the central part of said sealing strip to said closure and forming a seal therefor and additional hardening plastic material securing two arms of said sealing strip to opposite sides of said bag and the other two arms to the sides of said bag at the ends of the mouth of said bag.

2. A bag of the character described, comprising a tubular body of flexible material having a mouth at at least one end, the mouth of said bag being folded over to provide a closure, a cruciform sealing strip, a hardening plastic material securing the central part of said sealing strip to said closure and forming a seal therefor and additional hardening plastic material securing two arms of said sealing strip to opposite sides of said bag and the other two arms to the sides of said bag at the ends of the mouth of said bag.

3. The method of making a bag composed of a tubular body of flexible material and having a mouth at at least one end, which consists in attaching adhesively to one side of the bag adjacent its mouth a cruciform sealing strip by one arm of said strip so that the other arms extend beyond the mouth of said bag, fastening together the opposite sides of said bag at its mouth to effect a closure of the bag, and securing the remaining arms of said cruciform strip adhesively to said bag whereby the arm opposite said attached arm is secured to the opposite side of the bag and the other arms are secured to the sides of the bag

at the ends of said mouth and seal the ends of said closure.

4. A bag of the character described, comprising a tubular body of flexible material having a mouth at at least one end, the walls of said bag at said mouth being folded over to provide a closure and prevent bulk leakage of the material and an imperforate sealing strip secured adhesively to the exterior wall of said bag lengthwise of the fold on opposite sides of said fold and embracing and being also secured adhesively to said fold its full length to hold said fold tightly folded and prevent the loss of material from said bag and the ends of said strip being also adhesively secured to the opposite ends of said fold to seal said ends against the leakage of material.

5. The method of making and closing a bag comprising a tubular body element made of flexible material and having a mouth at at least one end, which consists in first adhesively attaching one longitudinal edge of a sealing strip element of flexible material to one side of said body at a place adjacent to but spaced from its mouth and parallel with said mouth and at least coextensive therewith in such manner that the free edge of said sealing strip is supported plially with relation to the mouth parts of the bag to permit closing operations upon said parts and is also adapted to extend beyond, and to be folded over the mouth of said bag to seal said closure, and the steps of closing said mouth, applying a hardening plastic material to at least one of said elements on the side thereof facing said other element, and folding said sealing ply element over said closed mouth and upon the opposite wall of said bag, and sealing it thereupon to complete the closure of said bag, said hardening plastic material holding said strip tightly in engagement with said closure.

6. The method of making a bag composed of a tubular body made of flexible material and having a mouth at at least one end which consists in first adhesively attaching one longitudinal leg of an elongated cruciform sealing strip to one side of said body at a place adjacent to but spaced from its mouth in such manner that the opposite longitudinal leg of said sealing strip projects beyond said mouth and is arranged parallel therewith, thereafter closing the mouth of said bag and applying a hardening plastic material to the other legs of said cruciform sealing strip on the sides thereof facing said mouth and to the other walls of said bag, said hardening plastic material holding said sealing strip in tight engagement with said closure.

7. As an article of manufacture, a bag composed of a tubular body made of flexible material and having a mouth at at least one end and a sealing strip adhesively secured to one side of said bag at a place adjacent to but spaced from said mouth said strip being arranged parallel with said mouth and having a free edge supported plially with relation to the mouth parts to permit closing operations upon said parts, said sealing strip being adapted to extend beyond said mouth and to be folded and secured thereover.

8. A bag composed of a tubular body made of flexible material and having a mouth at at least one end, closed by a line of stitches, and a sealing strip of flexible material arranged parallel and at least coextensive with said mouth and folded and secured adhesively thereover, said strip covering also said line of stitches at both sides of the bag, and having an independent adhesive securement to one side of said bag at a region parallel with, but spaced from said stitching, and more

remote from the mouth of the bag than said stitching.

9. As an article of manufacture, a bag composed of a tubular body made of flexible material and having a mouth at at least one end and a
5 sealing strip secured to one side of said bag at a place adjacent to but spaced from said mouth,

said strip being arranged parallel with said mouth and having a free edge supported plially with relation to the mouth part to permit closing operations upon said parts, said sealing strip being adapted to extend beyond said mouth and to be
5 folded and secured adhesively thereover.

ROBERT N. CUNDALL.