This invention relates to improvements for paper bags and closures therefor.

An object is to provide a paper bag either of the single wall or multiple wall type and either of the valve type or open end type, which bag is so constructed and provided with a closure that effectively seals the same against the loss of its contents. The particular type of bag here shown is adapted to be employed as a container for powdered materials and the closure here provided for the bag is adapted to retain its powdered contents against leakage or seepage from the bag.

An object of the invention is to provide in a bag of this type a closure which includes a line of stitching securing the side walls of the bag together and a closure strip secured in the manner here described over the end of the bag and sealing the end and perforations caused by the stitching against the loss of the contents of the bag.

Certain meritorious features are embodied in the particular type of closure strip and its particular combination with the stitching and in the arrangement of the adhesion of the strip to the walls of the bag and with respect to the line of stitching.

An important feature of the invention is included in the provision of reinforcement strips which cooperate with the closure strip and with the stitching to provide an effective closure for the end of the bag and to prevent tearing of the stitching through the side walls.

The closure or sealer strip is preferably adhesively secured to the reinforcement strip on one or both side walls of the bag, as the case may be, adjacent to the margin of the reinforcement strip and also to the side wall of the bag adjacent said margin of the reinforcement strip so that the line of adhesive overlies the margin of the reinforcement and secures the closure strip to the side wall of the bag below the margin of the reinforcement strip to prevent leakage of material from between the bag wall and the reinforcement strip.

Another object is to provide a closure strip sealing the end walls of the bag and the perforations caused by the stitching, which is so adhesively secured to the side walls of the bag and over the line of stitching as to effectively seal the same against leakage while providing sufficient flexibility to prevent rupture or breakage due to the adhesive. A modification illustrating one embodiment of this idea is shown wherein transverse lines of adhesive are extended over the end of the bag walls and secured to both side walls of the bag but wherein each transverse line of adhesive extends over the stitching on one side wall of the bag only. In this construction said transverse lines of adhesion are staggered and, while they effectively bulkhead or box off portions of the bag which are sealed against leakage, no single transverse line of adhesive extends over the stitching on both sides of the bag.

The reinforcement strip or strips, as the case may be, and the sealer strip terminate at the edges of the side walls and the stitched seam extends in a thread end that projects beyond the end of the side walls but is fastened down adjacent to or between said side walls to prevent unravelling of the same.

Other meritorious features and characteristics of the invention will appear from the following description, appended claims, and accompanying drawings, wherein:

Figs. 1, 2, and 3 illustrate one modification of my invention, Fig. 1 being an elevation of a bag embodying my invention with the closure strip partly broken away, Fig. 2 being a fragmentary elevation of the opposite side of the same bag, and Fig. 3 being a vertical fragmentary section through an end of the bag illustrated in Figs. 1 and 2.

Fig. 4 is an elevation of the reinforcement strip.

Fig. 5 is a fragmentary elevation of a bag end embodying my invention, portions of the side wall being broken away to show the construction, and illustrating the disposition of the end of the thread.

Fig. 6 is an elevation of one end of the bag illustrating a modified form of my invention.

Fig. 7 is a vertical sectional view through the bag and shown in Fig. 6.

Fig. 8 is a fragmentary elevation of an end of the bag embodying a second modified form of my invention.

Fig. 9 is a vertical sectional view through the bag end shown in Fig. 8.

Fig. 10 is an elevation of the adhesive side of the sealer strip.

Fig. 11 is an elevation of a modified form of sealer strip with respect to the application of the adhesive thereto.

My invention is adaptable for use with multiple wall bags of either the valve or open end type and it is adaptable for use on the single wall bag. In the drawings, for the sake of clearness, I have shown multiple wall bags having only two plies of material though it is common practice to provide five or six plies, and the invention is intended...
for use with such bags. In the drawings the bags illustrated are of the open end type, however valve structures are conventional to the trade and the invention is obviously adaptable for use with the bag of this character, as is shown in my copending application of even date herewith.

In the various figures of the drawings the bag is shown as having side walls sewed together at each end by a line of stitching 20. This stitched seam is plain on one side of the bag, as shown in Figs. 1 and 5, and terminates in a chain stitch on the opposite side of the bag, as shown in Figs. 2 and 3. In the bag structure shown in the drawings and particularly as shown in Figs. 1 and 5 the side walls are gusseted and the stitching extends entirely across the bag to seal the ends. Obviously one end of the bag will be completely finished and the bag will be filled, after which the other end will be similarly finished.

I provide a reinforcement strip, illustrated in Fig. 4 and specifically indicated as 22, which extends across one side of the bag in the stitching. In Figs. 1-5, inclusive, this reinforcement strip is shown as extending across that side wall of the bag underneath the plain stitching. In the construction shown in these figures of the drawings which is my preferred form, I provide in addition a sealer strip. This sealer strip is indicated as 24.

In Fig. 3 the sealer strip is shown as secured to that side wall of the bag opposite the side wall which carries the reinforcement strip by the same line of stitching. The sealer strip is further secured to such side wall of the bag by two spaced apart parallel longitudinally extending lines of adhesive 26 arranged above and below the line of stitching but not superimposing the stitching. The sealer strip is of a width which will permit it to be folded over the end of the bag and over the stitching and reinforcement strip on the opposite side wall of the bag, as is shown in Figs. 3 and 5 particularly.

The sealer strip has portions which carry adhesive arranged in a particular manner and this will appear from an inspection of Fig. 1 of the drawings. It will there be seen that that portion of the sealer strip which is folded over the bag has a longitudinal line of adhesive 28 adjoining and parallel to its margin and narrow spaced apart lines of adhesive 30 extending transversely of the strip. It will be seen that when the strip is folded over the end of the bag and over the reinforcement strip 22 the line of adhesive 28 which will extend across the bag below and adjacent to the line of stitching 20 and the narrow transverse lines of adhesive 30 will close the line of stitching and extend over the end of the bag and down along both side walls.

The sealer strip is of a width whereby it will extend beyond the margin of the reinforcement strip and down along the side wall of the bag and the line of adhesion 28 will seal the strip. Such line of adhesion also seals the margin of the reinforcement strip to the wall of the bag and prevents leakage of the contents at such point.

The reinforcement strip is preferably held to the bag merely by the stitching and is not adhesively fixed to the adjacent side wall. It may however be adhesively secured at the ends with adhesive lines 23 as shown in Fig. 4. The transverse lines of adhesive cooperating with the longitudinal lines of adhesive form boxed off portions which serve after the manner of a bulkhead to limit the spreading of any leakage which might occur at the perforations caused by the stitching.

Any leakage out of the perforations caused by the stitching is prevented by the bulkheading produced by the adhesive over the reinforcement strip and also below the margin of the reinforcement strip, and the lines 23 of adhesive at the ends of the reinforcement strip will seal the same at such point.

In the construction shown in Figs. 1-5 the reinforcement strip 22 is disposed on one side only of the bag, but in the construction shown in Figs. 8 and 9 reinforcement strips are arranged on both the side walls of the bag. In these constructions of Figs. 8 and 9 the reinforcement strips only are held down by the stitching except as held down by the adhesive which secures the sealer strip in the bag wall and is illustrated in Fig. 4, and the sealer strip is held over the end of the bag solely by adhesion. In these figures of the drawings the stitching is indicated by the same numeral 20 and the reinforcement strips by the numeral 22. The sealer strip is of the character shown in Fig. 10.

In this figure the sealer strip will be found to have a line of adhesive extending along and adjacent to each of its linear edges and transverse narrow lines of adhesive on the adhesive line at one edge to the adhesive line at the opposite edge and across both ends of the strip. The bag walls are sewed together through the two reinforcement strips 22 arranged on opposite sides of the bag. The sealer strip is then folded over the end of the bag as illustrated in Fig. 9 and adhered to both side walls and to the reinforcement strips on both sides of the bag. The transverse lines of adhesive on the sealer strip extend across the open end of the bag walls between the reinforcement strips.

In Figs. 6 and 7 a slightly modified form is shown. In these figures a reinforcement strip 22 is arranged on one side of the bag only, and that on the plain stitching side. The stitching does not extend through the sealer strip but the sealer strip is provided with the same kind of adhering material as illustrated in Figs. 8 and 9 and is folded over the end of the bag and adhesively secured in place as described in Figs. 8 and 9.

In the several constructions illustrated the reinforcement strips and sealer strips terminate at the edges of the side walls of the bag and the stitching extends therebeneoy in loose ends of thread which are folded back against one side wall and secured in place to prevent unravelling. A suitable method of securing the end of the stitching is to fold it into the gusset formed between the two side walls as illustrated in Fig. 5 where the end 21 of the stitching is shown so disposed. This end 21 is glued down to hold it in place. The stitching might be folded against one side wall underneath the sealer strip if so desired.

It is of course understood that staples or other securing means may be employed instead of the stitching here shown and wherever the term stitching is employed herein it is intended to also designate these alternative forms of fastening.

In Fig. 11 a modified form of sealer strip is shown. In this form of construction the sealer strip is provided with transverse lines of adhesive which are staggered.

In the construction shown in Fig. 11 a modified form of the sealer strip is illustrated wherein
the strip is provided on that portion which falls on either side of the bag with spaced apart parallel lines of adhesive, which may be indicated as 32 and 34, adapted to engage the side wall of the bag or the reinforcement strip 22, as the case may be, above and below the line of the stitching. The transverse lines of adhesive in this instance do not extend entirely across the width of the sealer strip as they do in certain other figures of the drawings but are arranged in a staggered form so that each transverse line of adhesive extends from the lowermost linear line of adhesive on one side wall of the bag to the uppermost linear line of adhesive on the opposite side wall of the bag. In this arrangement no single transverse line of adhesive would extend across the stitching on both side walls of the bag. Each transverse line of adhesive would extend across the stitching on one side of the bag and over the end of the bag to a linear line of adhesive on the opposite side wall which would serve to form bulkhead portions as heretofore described, but which would preserve the desired flexibility of the bag walls at the end by limiting the extent of the transverse lines of adhesive.

What I claim:
1. A paper bag having side walls secured together at one end by a line of stitching, a reinforcement strip extending across each side wall underneath said line of stitching and secured thereto by said stitching, a sealer strip folded over the end of the bag and adhesively secured to both side walls thereof by a longitudinal line of adhesive extending parallel to and below said line of stitching and further adhesively secured over the end of the bag and to both side walls over the stitching by spaced apart lines of adhesive extending transversely of said strip from its longitudinal line of adhesion on one side wall to the corresponding line of adhesion on the opposite side wall forming a succession of completely enclosed boxed off compartments wherein the stitching is free from adhesive.

4. A paper bag having side walls secured together at one end by a line of stitching, a sealer strip folded over the end of the bag and adhesively secured thereto by parallel spaced apart lines of adhesive arranged above and below the line of stitching on each side wall and by narrow transverse lines of adhesive extending across the line of stitching on each side wall between said spaced apart parallel lines of adhesive.

5. A paper bag having side walls secured together at one end by a line of stitching, a sealer strip folded over the end of the bag and adhesively secured thereto by parallel spaced apart lines of adhesive extending transversely of the strip over the end of the bag from the line of adhesive on one side wall below the stitching to the line of adhesive on the other side wall below the stitching.

2. A paper bag having side walls secured together at one end by a line of stitching, a reinforcing strip extending across one side wall of the bag underneath the line of stitching and secured thereto by said stitching, a sealer strip folded over the end of the bag and adhesively secured to both side walls of the bag by relatively narrow spaced apart lines of adhesive extending transversely of the strip over the end of the bag and over the line of stitching on both sides of the bag, said strip provided with a line of adhesion to each side of the bag parallel and spaced from the line of stitching and forming with the narrow transverse lines of adhesive boxed off portions completely enclosed wherein the stitching is free of adhesive.