

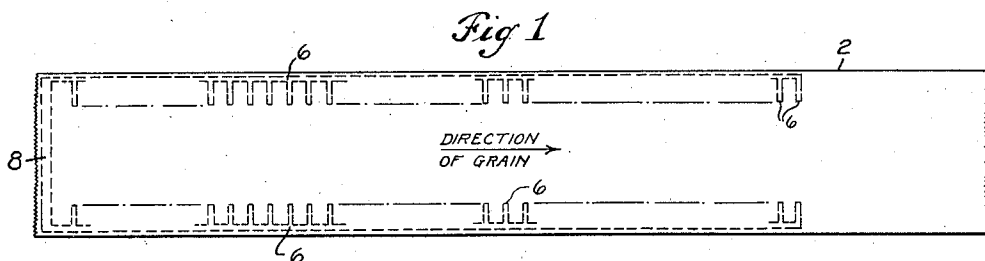
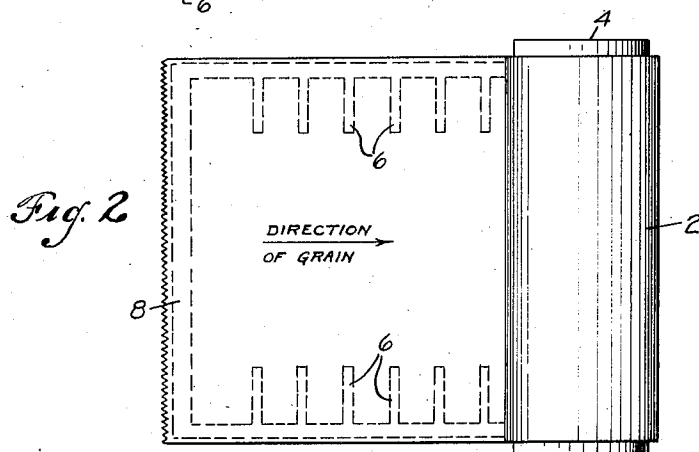
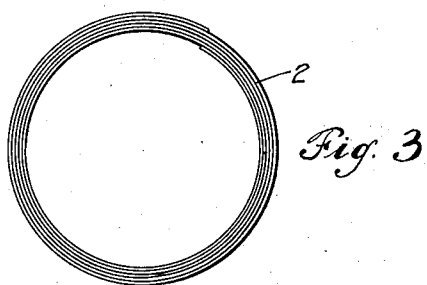
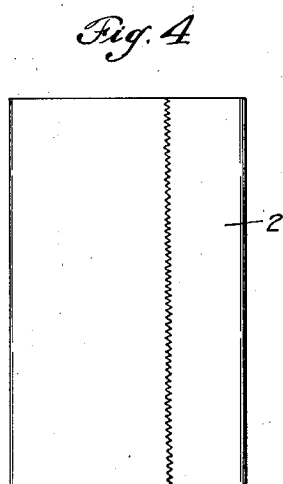
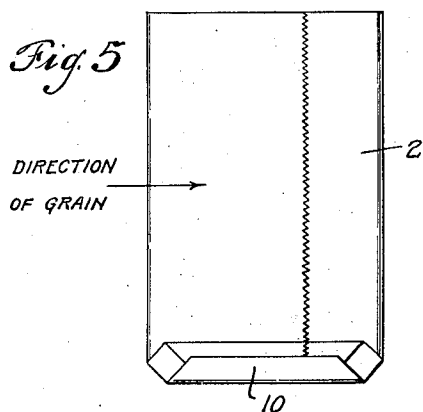
May 12, 1931.

B. ARKELL

1,805,067

MULTIPLY BAG AND METHOD OF PRODUCING THE SAME

Filed April 26, 1928



Bartlett Arkell INVENTOR.
BY *Bartlett Arkell*
ATTORNEYS.

UNITED STATES PATENT OFFICE

BARTLETT ARKELL, OF NEW YORK, N. Y.

MULTIPLY BAG AND METHOD OF PRODUCING THE SAME

Application filed April 26, 1928. Serial No. 272,915.

My invention relates to multi-ply bags, more particularly multi-ply bags for cement and other weighty substances, and further relates to a method of producing the same.

5 Workmen in handling filled bags of this type usually grab them by their ends and drop or toss them sidewise from one point to another, the impact of the bags in landing subjecting their sides to severe bursting
10 strains. In order for paper bags of this type at present in general commercial use to withstand such bursting strains effectively, it is necessary to make them of relatively heavy material for the number of plies employed
15 which, of course, is expensive. The several plies of these prior bags are formed of separate sheets or strips that are folded longitudinally one about the other with the longitudinal edges of each strip secured to-
20 gether. In manufacturing bags of this construction, it has been found practically impossible to fold the several plies in such a manner as to position the plies in sufficiently intimate contact throughout to cause them to
25 simultaneously and uniformly resist bursting strains during handling, the inner ply or plies being usually subjected to the greater strains. Because of this, it has been found that when such bags burst, the plies are usu-
30 ally broken one after the other from the inner ply to the outer ply.

Also, with bags thus constructed, as the plies are formed from strips that are folded longitudinally, the grain of the paper in the
35 completed bag tubes extends longitudinally thereof and, hence, the plies are capable of withstanding less lateral than longitudinal strains. It will be apparent, however, that the bursting strains to which the plies are
40 subjected during handling, as above described, are greater laterally than longitudinally of the bag.

An object of my invention is to provide a multi-ply bag of the character indicated
45 which, for the amount of material used, is less liable to break or burst while being handled in the usual manner than the bags heretofore produced.

Another object of my invention is to provide a novel and improved method of form-

ing a multi-ply bag of the character indicated.

In the preferred embodiment of my invention as illustrated in the drawings, a paper strip having the grain of the paper extend-
55 ing generally longitudinally thereof is tightly wound upon itself a plurality of times to form a bag tube with the outer end of the strip secured to the underlying portion thereof, and the marginal edges of adjacent con-
60 volutions secured together, one or both ends of the bag tube preferably being closed by a satchel type end. In thus forming the bag tube, the paper strip with adhesive previously applied is preferably tightly wound on
65 a cylindrical mandrel and before the adhesive becomes set the tube is removed from the mandrel and flattened, the adhesive at the edges of the strip securely holding the convolutions from unwinding during the re-
70 moval and flattening of the tube. By securing the convolutions together adjacent their edges while leaving their major portions substantially unsecured, the body of the bag is
75 of the necessary flexibility and the several plies are tightly and securely held in close contact throughout and thus are capable of uniformly resisting bursting strain. Also, by leaving substantially the entire central portion of the convolutions unsecured, the
80 central portions of the several plies may more or less freely tighten with respect to each other under the pressure of the contents of the bag, but in some instances it may be preferable in addition to securing the plies as
85 above described, to secure them at other points provided the necessary flexibility of the bag between its ends is maintained. By closing the bag tube by satchel type of folds, the satchel ends serve to cushion longitudi-
90 nal strains on the bag tube, which is a feature of considerable practical importance where the grain of the paper extends across instead of longitudinally of the bag tube.

It will be apparent that with the tube of a paper bag formed by winding a strip upon
95 itself, the grain of the paper of the completed tube will extend transversely thereof, and, hence, the bag will be capable of withstand-
100

ing the maximum amount of lateral bursting strain.

My improved bag is of simple construction and may be easily made; and it not only requires less material than the bags at present in general commercial use to obtain the desired strength, but also as there is no circumferential overlapping of the separate sheets as in the prior commercial bags, there is a substantial saving of material for the number of plies employed in forming the bag tube, since the plies are formed from a single continuous strip.

Referring to the accompanying drawings: Figure 1 is a plan view of a strip from which my improved bag may be formed;

Fig. 2 is a similar view, on an enlarged scale, but showing the strip partly wound on a drum or mandrel;

Fig. 3 is an end view, on an enlarged scale, of a strip thus wound;

Fig. 4 is a side view of a completed bag tube; and

Fig. 5 is a similar view of the completed bag.

My improved bag as illustrated in the drawings is a five ply paper bag that is particularly adapted for cement and other heavy substances. In forming this bag a paper strip 2, having the grain of the paper running in the direction of its length, is tightly wound on a suitable mandrel 4. Previously to the winding of the strip, however, glue is applied on its inner side along its longitudinal edge portions as indicated at 6, and also glue is applied along its outer end as indicated at 8, so that when the strip has been completely wound on the mandrel, the overlying edge portions and the outer end of the strip are firmly secured. After the strip has been thus wound, it is removed from the mandrel and immediately flattened to form a completed bag tube creased at its edges (Fig. 4). This flattening takes place while the adhesive is still moist and checks any tendency of the convolutions to unwind. The flattened tubes are permitted to dry in flattened shape. One or both ends of the bag tube may then be closed in the usual manner preferably by forming a satchel type closure as shown at 10 to form the completed bag.

With the bag tube thus formed from a continuous strip which is wound upon itself, it will be apparent that any bursting strain on the bag will be simultaneously and uniformly borne by the several plies, each ply being in close contact with the ply or plies adjacent thereto and reinforcing or being reinforced by an adjacent ply, and as the grain of the paper extends transversely of the bag where the greatest strength is required, the bag is of maximum strength for the amount of material employed.

It will also be apparent that the bag may be made with any desired number of plies,

and that my improved method of forming the bag may be carried out cheaply and expeditiously.

As will be evident to those skilled in the art, my invention permits various modifications without departing from the spirit thereof or the scope of the appended claims.

What I claim is:

1. The improvement in the method of manufacturing bags which comprises winding a paper strip upon itself a plurality of times so as to form a tube with the grain of the paper extending generally transversely of the tube, securing the outer end portion of the strip to the underlying portion thereof by adhesive, securing the adjacent plies of the tube together at points adjacent the ends of the tube by adhesive, the remaining portions of the plies being unsecured, flattening the tube, and permitting it to dry in flattened condition.

2. A multi-ply paper bag having the body portion thereof composed of a paper strip wound upon itself a plurality of times so as to form a tube with the grain of the paper extending generally transversely of the tube and with the portion of the strip adjacent its outer end secured to the underlying portion of the strip, the adjacent plies of the tube being secured together at points adjacent to the ends of the tube, and the longitudinal central portion of the strip being unsecured except at said outer end portion.

3. A bag having multi-ply side walls, comprising a single strip of paper wrapped in convolutions, the marginal edges of adjacent convolutions being secured together, with intermediate portions of adjacent convolutions in free sliding contact.

4. A bag having multi-ply side walls, comprising a single strip of paper wrapped in convolutions in the fibre direction of the paper web, the ends and marginal edges of said strip being secured to the portions of adjacent convolutions in contact therewith, adjacent convolutions throughout the central portions of said side walls being in free sliding contact.

5. A paper cylinder from which bags may be made, comprising inner and outer single ply cylinders and intermediate convolutions, said cylinders and convolutions comprising a single strip of stock, intermediate convolutions being in free sliding contact, the marginal edges of said cylinders and convolutions being secured together.

6. A bag having multi-ply side walls, comprising a single strip of paper wrapped in convolutions, the ends of said strip being secured to adjacent convolutions and the marginal edges of adjacent convolutions being secured together with intermediate portions of adjacent convolutions in free sliding contact, the ends of the side walls being folded

and secured to form top and bottom for said bag.

7. A multi-ply bag comprising a paper strip wound upon itself a plurality of times so as to form a tube with the grain of the paper extending generally transversely of the tube, the outer end of the strip being secured to the underlying portion of the strip, the marginal edges of adjacent convolutions being secured together by substantially continuous longitudinally extending strips of adhesive, and the major portions of adjacent convolutions being otherwise left unsecured, and a satchel type bottom on at least one of the ends of the tube.

8. A multi-ply bag comprising a paper strip wound upon itself a plurality of times so as to form a tube, the outer end of the strip being secured to the underlying portion of the strip, the marginal edges of adjacent convolutions being secured together by longitudinally extending narrow strips of adhesive, and the major portions of adjacent convolutions, being otherwise left unsecured.

9. The improvement in the method of manufacturing bags from a paper strip which comprises applying adhesive to one side of the strip along its longitudinal edges and across one end, winding the strip upon a cylindrical mandrel so as to form a multi-ply cylindrical tube with adjacent plies at the ends of the tube secured together and said end of the strip outermost and secured to the underlying ply by said adhesive, the major portions of adjacent plies being left unsecured, removing the tube from the mandrel, and flattening the tube before the adhesive becomes set.

In testimony whereof, I have signed my name to this specification this 24th day of April, 1928.

BARTLETT ARKELL.