

(No Model.)

J. ARKELL.
SOFT TIE PAPER BAG.

No. 405,068.

Patented June 11, 1889

FIG. 1.

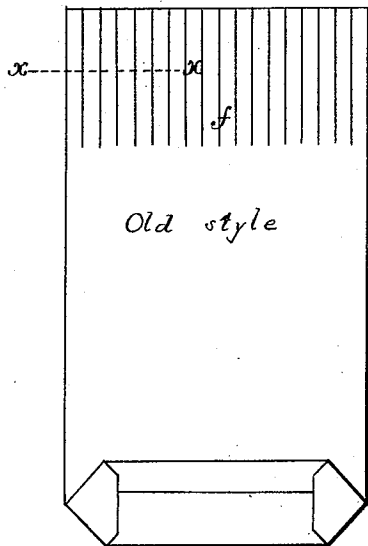


FIG. 3.

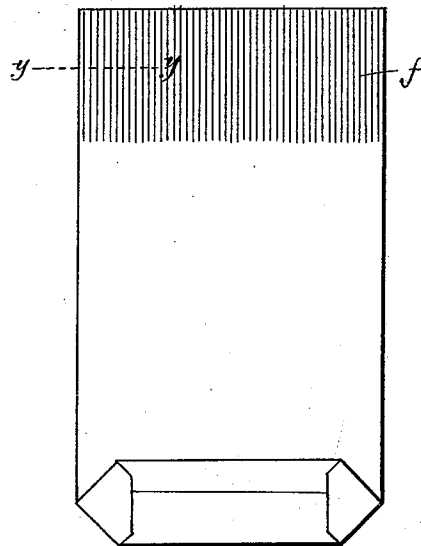


FIG. 2.

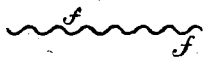


FIG. 4.

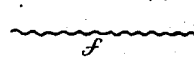
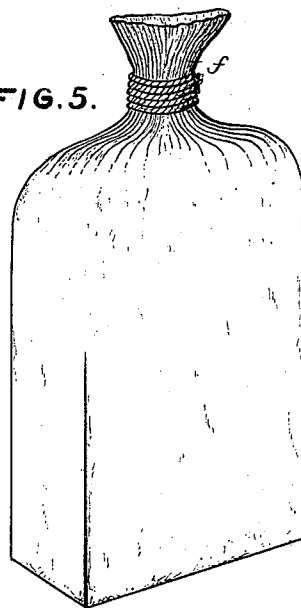


FIG. 5.



ATTEST.

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UNITED STATES PATENT OFFICE.

JAMES ARKELL, OF CANAJOHARIE, NEW YORK, ASSIGNOR TO SARAH HALL
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SOFT-TIE PAPER BAG.

SPECIFICATION forming part of Letters Patent No. 405,068, dated June 11, 1889.

Application filed February 27, 1889. Serial No. 301,370. (No model.)

To all whom it may concern:

Be it known that I, JAMES ARKELL, of Canajoharie, in the county of Montgomery and State of New York, have invented a new and
5 useful Improved Bag or Sack; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this application.

10 My present invention relates to the type of manufacture known in the art as the "soft-tie" paper bag or sack patented on the 6th day of June, 1865, No. 48,036, to Arkell and Smith, and has for its main object to improve
15 this kind of paper bag.

In what is known as the "soft-tie" paper bag the paper in the vicinity of the mouth or open end of the sack is deprived of its natural stiffness, and thus rendered capable of being more readily compacted or gathered together within the binding cord or string by which the mouth end or portion of the filled sack is tied up, after the same fashion in which
20 cotton or other textile fabric sacks are secured against escape of the contents; but in this kind of bag as heretofore made that portion of the paper thus rendered more pliable for the purpose mentioned has been softened by subjecting it to a crimping or fluting operation between rolls which operated to produce comparatively deep flutes or corrugations at the vicinity at which the paper has to be gathered together and bound around or tied up with the securing-string. It has been
25 customary, it is true, for many years in the manufacture of the soft-tie paper bag to have the crimping-rolls so made and the treatment of the paper by them such that the crimps or corrugations in the bag were of less depth at the vicinity of the ends nearer the body portion of the bag, or, in other words, were tapered off to nothing in depth at these ends; but the only object and effect of this peculiarity were to avoid any abrupt and injurious terminations
30 on the body portion of the bag of these crimps and to effect the gradual tapering off of the softened or readily collapsible portion of the bag into the stiff body portion of the latter.

I have discovered and have verified through
35 a course of tests and experiments that by

making a soft-tie paper bag with the crimped portion of the stock provided with a series of much finer corrugations than heretofore used, indentations about equal in depth to the thickness of the paper of which the bag may
55 be made, and that by subjecting the paper to a greater degree of pressure while being thus crimped than it is possible to subject the fabric to, without tearing it, while producing deeper flutes, a soft-tie device is produced
60 far superior to any heretofore made, and to provide for general use such better article is the main object of my invention, which to this end may be said to consist, essentially, in a soft-tie paper bag or sack having the
65 crimped portion of the article made with corrugations or indentations of a depth substantially equal to the thickness of the paper of which the bag may be made, all as will be hereinafter more fully explained, and as will
70 be more distinctly pointed out in the claim of this specification.

To enable those skilled in the art to which my improvement pertains to make and use soft-tie paper bags according to my invention,
75 I will now proceed to more fully explain the latter, referring by letters to the accompanying drawings, which form part of this specification, and in which I have shown my invention carried into effect in the precise manner
80 in which I have so far practiced it.

In the drawings, Figure 1 is a face view or elevation of a soft-tie bag in a flattened condition and made substantially as such bags have been made for years and are now sold in
85 the market. Fig. 2 is a detail section at *x x*, Fig. 1, but showing only one ply. Fig. 3 is a similar view of a flattened paper bag of the same size and made of the same paper, but having my improved soft-tie device. Fig. 4
90 is a detail section at *y y*, Fig. 3, showing only one ply. Fig. 5 is a perspective view of the bag seen at Fig. 3, but filled and tied up securely.

As will be seen by reference to Fig. 1, (and
95 as well understood by those skilled in the art,) the corrugations or crimps of the old-fashioned soft tie are of a depth equal to ten or more times the thickness of the paper, while those of my improved soft tie are made of a depth
100

preferably not greater than the thickness of the fabric.

In Figs. 3, 4, and 5 the crimps *f* are made as narrow as it may be practicable to form the corrugations by the action of rolls having their peripheries fluted lengthwise, and the corrugating action to which the paper is subjected is such as to exert much more pressure on the stock of the fabric than is possible in the case of making the old-fashioned kind of crimps, (seen at Fig. 1,) and hence instead of obtaining only the softening or crimping effects gained in the old-fashioned form of soft tie I gain the further advantage due to the breaking up of the combined pulp fiber and size of the fabric that results from this excessive creasing pressure on the paper, and this further advantage I gain without diminishing either the tensile strength or the toughness of the paper.

In making the old-fashioned soft tie the size or depth of the corrugations was such that it was practically impossible to run the stock through the fluting-rolls under very much compression of the fabric, since under much pressure (as will be easily understood) the paper, being gathered into so great an extent and being non-stretchable, would inevitably tear during its passage between the rolls; but in the making of the crimps of the character seen at Figs. 3, 4, and 5 the stock may be subjected to severe pressure, and thus the fiber and stiffening of the fabric may be more completely softened without any danger of tear-

ing the paper. Therefore in a practical point of view the soft tie shown at Figs. 3, 4, and 5, produced (as all such mechanical softening of the paper must be produced) by the passage of the fabric of the bag between fluted rollers under pressure, differs not merely in degree (or merely as to the size of its crimps) from the old-fashioned soft tie, but is different in kind, since by the severe pressure treatment (impossible in the case of deep corrugations) a different effect in the paper is produced and an improvement in the character or qualities of the manufactured article attained.

Having now so fully explained the character and advantages of my improvement that those skilled in the art can understand and practice my invention, what I claim as new, and desire to secure by Letters Patent, is—

The improved soft-tie paper bag hereinbefore described, the mouth end or portion of which has compressed corrugations or crimps of a depth about equal to the thickness of the paper, whereby said mouth end or portion is softened without detriment to the strength of the fabric, all substantially as hereinbefore set forth.

In witness whereof I have hereunto set my hand this 28th day of January, 1889.

JAMES ARKELL.

In presence of—

E. B. BURNAP,
JAS. D. McDIARMID.