

J. ARKELL.
PAPER-BAG MACHINE.

No. 184,127.

Patented Nov. 7, 1876.

Fig. 1.

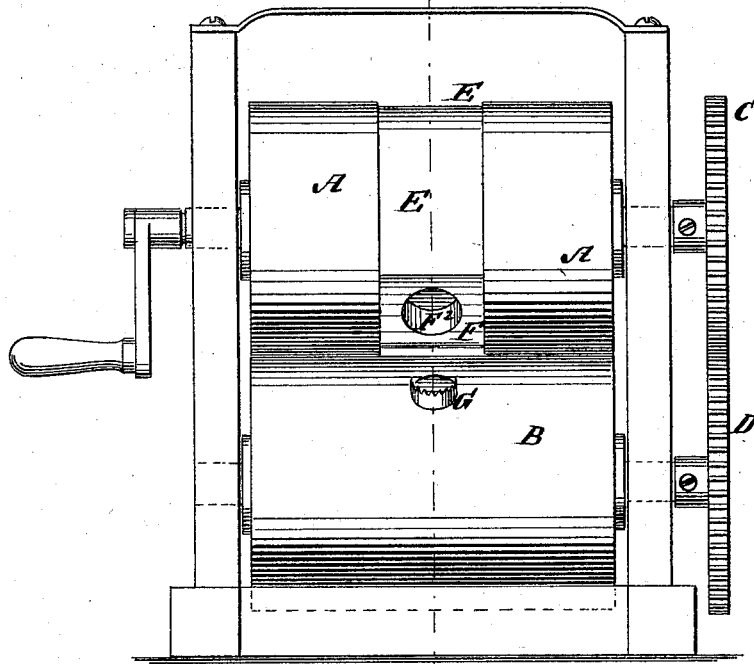
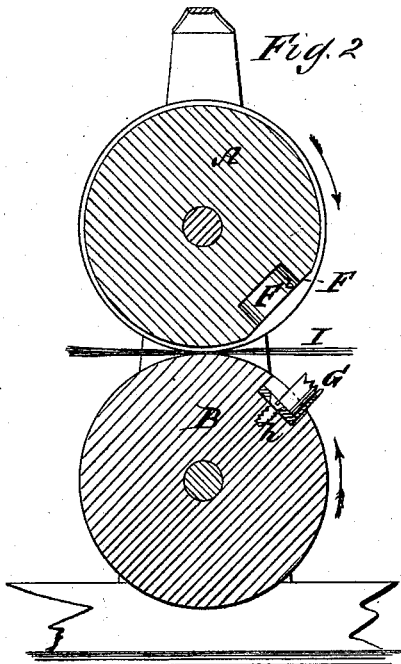
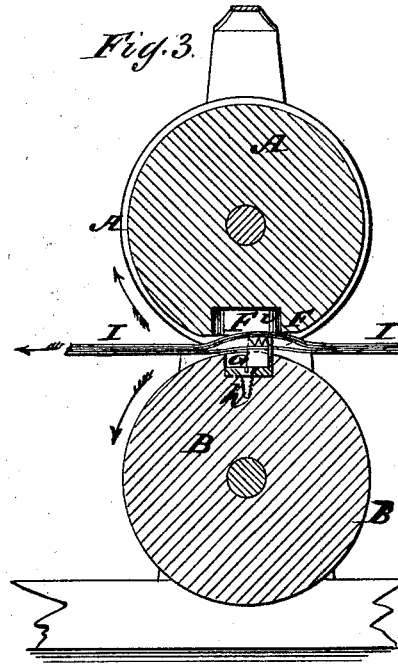


Fig. 2.



Witnesses:
E. Wolff
Jacob Felbel

Fig. 3.



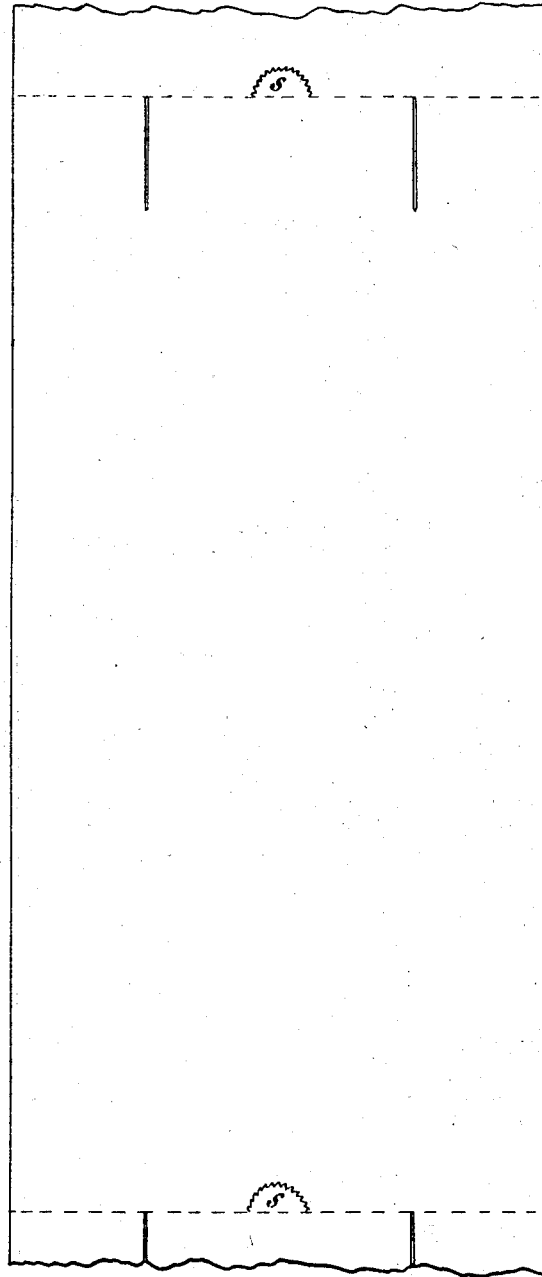
Inventor:
James Arkell
 By his attorney
G. A. McQuire

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Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES ARKELL, OF CANAJOHARIE, NEW YORK.

IMPROVEMENT IN PAPER-BAG MACHINES.

Specification forming part of Letters Patent No. **184,127**, dated November 7, 1876; application filed September 16, 1876.

To all whom it may concern:

Be it known that I, JAMES ARKELL, of Canajoharie, in the county of Montgomery, in the State of New York, have invented certain new and useful Improvements in Making Paper Bags; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My present invention relates to a novel means for puncturing paper in the manufacture of paper bags, more especially that kind of bag in which one or more notches are cut out of one of the edges of the paper at the mouth of the bag, as set forth in an application for separate Letters Patent by me for this kind of bag, and now pending in the United States Patent Office.

Previous to my invention it has been customary, in all sorts of paper puncturing or cutting mechanism, to cut or puncture the paper by the action of some sort of cutting or puncturing device or instrument operating on the paper while the latter was in contact with some sort of surface adapted to oppose the thrust of the cutting device, and so that the cutting device would penetrate all the stock placed between it and said opposing surface.

This mode of operation is not well adapted to the manufacture of such bags as are, when finished, to have one side only punctured or cut out at one or more points, and which are made from a flattened tubular blank, because in the making of such an article the cutting has to be done on only one of two thicknesses of paper arranged pretty close together.

My invention has for its object to provide a way by which one of the two thicknesses of a flattened paper tube or bag-blank may be punctured or cut clean through in any desired form, and at any desired point or points, without rupture of the immediately-adjacent other thickness of stock; and, to this end and object, my invention consists in a mechanism or means by which the flattened paper tube or bag-blank has one of its thicknesses struck and cut through by a suitable cutting-instrument, while both thicknesses are moved along between rolls in such a manner that the thickness to be cut through shall be kept taut, while

the other is comparatively unstrained, and no opposing surface is presented for the cutter to thrust against, all as will be hereinafter explained more fully.

To enable those skilled in the art to make and use my invention, I will proceed to describe more fully, by reference to the accompanying drawings, the means employed to carry out my said invention, as I have successfully practiced it in the manufacture of paper bags of the kind hereinbefore referred to.

In the accompanying drawings, Figure 1 is an elevation or side view of so much of the machinery employed by me in the manufacture of the article alluded to as it is necessary to show in order to illustrate fully the invention made the subject of this application. Fig. 2 is a vertical section of the same at the line *xx* of Fig. 1, and showing the rolls and cutting device in the position in which the latter would be just previous to puncturing the bag-blank or flattened paper tube from which the blanks are to be formed; while Fig. 3 is a similar sectional view, but with the parts in that position in which they would appear at the time of the performance of the puncturing operation, and illustrating the operation performed on the paper. Fig. 4 is a view representing a strip or piece of the punctured flattened tube as it appears before having been separate or cut up crosswise into lengths composing separate bag-blanks.

In the several views the same parts and devices will be found designated by the same letter of reference.

A and B are two rolls, mounted in suitable bearings in the frame of the machine, and so geared together by spur-wheels C and D that both shall rotate (in opposite directions) at the proper velocity imparted to one of them, and so arranged relatively that they shall be capable of carrying through, between opposite portions of their peripheries in a proper manner, the double thickness of paper or flattened tubular and continuous blank, as the latter is passed to and through said rolls from the usual forming and pasting mechanism employed to make the continuous flattened tube from a roll of paper used for the manufacture of the bags. One of these rolls, A, is made

with a portion of its periphery, near the middle of it lengthwise, turned down to a less diameter than the rest of the roll, as shown at E, and at one point in the circumference of this portion of smaller diameter the stock of the roll is slabbed off, as clearly shown at F. In this portion F of the roll A is formed a circular or other shaped cavity or recess, F², of sufficient depth to answer the purpose for which it is intended, (which purpose will be presently explained,) and of about the same contour as, and a little larger in area than, the cutting device or punching-tool G, which projects from the periphery of the other roll, B. This tool or cutter, as represented at G, is in the shape of a half-tube, or semi-cylindrical in form, has its semicircular cutting-edge serrated, as shown, and is arranged to project sufficiently beyond the periphery of the roll B to effectually perform its intended function, in the manner to be presently explained.

This cutter or puncturing-instrument I make, by preference, with a solid circular bottom or head, as illustrated, and secure it at this head or base to the stock of the roll B by a single screw or bolt, *h*; but the shape of the cutting-edge, the construction of the cutter, and the manner of its securement to the roll may, of course, be modified or varied at the pleasure of the constructor, and to suit the form of notch or cut to be made in the paper; or, if deemed expedient, more than one cutter may be combined with roll B, in which case a corresponding number of cavities, F², would be made in roll A.

In Figs. 2 and 3 I have shown at I portion of a continuous flattened tube (or continuous blank) of paper, such as is prepared in the usual manner, before mentioned, in the conditions in which it would be during its passage through the rolls, and while undergoing the puncturing operations.

From Fig. 2 it will be seen that the flattened tube of paper I, as it passes between the rolls A B, is only held fast between the impinging peripheries of said rolls, where the larger portions of the roll A run in contact with the paper, and that the said paper tube or blank is therefore not pinched between the rolls during so much of its width (near its middle widthwise) as comes opposite the smaller portion E of said roll A; and by reference to Fig. 3 it will be seen that when the rolls A B, during their rotation, come into the proper positions for the puncturing operation to be performed, not only will the paper be free of any pressure from the top roll A at the locality of the smaller portion E of the periphery of said roll, but will be free to move upward to a considerable extent by reason of the slabbed-off portion F coming at this time immediately over the paper I; and it will also be seen from this figure that, in this position of the rolls, the cavity F² comes immediately over the cutter G.

The operation will be understood to be this:

Supposing the rolls to be rotating at a sufficiently fast rate of speed, every time the cutter G and the roll A, with its cavity F², come round to the positions shown at Fig. 3, the cutter G, striking the lower one of the thickness of the paper blank (or flattened tube) I, cuts through it, making a cut or puncture corresponding in shape to the contour of the cutting-edge of the knife G.

It will be understood that this mode of operation is made possible by reason of the lower thickness of the blank being held taut, widthwise, between the impinging portions of the rolls, while it is unsupported by, or has no opposing surface present above, that portion in the locality of the striking-cutter; and it will be seen that, under this condition of circumstances, the paper located over the thickness through which the puncture is made, being double and looser, (or not strained like the lower thickness,) will simply be thrown or bulged upward by the knife-edge without being fractured or cut by the latter.

As the cutting-edge (or points) of the knife G projects some distance beyond the periphery of roll B, it consequently travels at a velocity a little greater than that at which the paper I, moved by the periphery of said roll, (and its companion A,) travels; and hence a sort of shearing cut is performed, which tends to facilitate the operation of the knife on the paper. Of course the size of the rolls should be such that the puncturing of the paper at each revolution shall occur at such distances apart on the flattened tube I as correspond to the length of the bag-blanks into which said tube I is to be cut up.

In the enlarged view of a punctured tube shown at Fig. 4, the dotted lines illustrate where the subsequent cutting up crosswise is done to form the bag-blanks; and from this view it will be seen that, when cut up, each blank will have the necessary notch formed in it at *s*, at one edge of one end of the blank designed for the mouth or open end of the finished bag.

Without desiring to limit myself to any peculiarities of form and details of construction of the several parts or devices of the machine shown,

What I claim as new, and desire to secure by Letters Patent, is—

In a mechanism for puncturing one thickness only of a flattened tube or blank, the combination, with means, substantially as described, for carrying along and holding taut the paper blank, in the manner described, of a cutting or puncturing device operating upon that part of the blank which is unsupported against the thrust of the cutter, substantially as set forth.

Witness my hand and seal this 26th day of August, 1876.

JAMES ARKELL. [L. s.]

In presence of—

J. N. MCINTIRE,
JACOB FELBEL.