

(No Model.)

J. ARKELL.
PROCESS OF MAKING PAPER BAGS.

No. 414,934.

Patented Nov. 12, 1889.

FIG. 1.

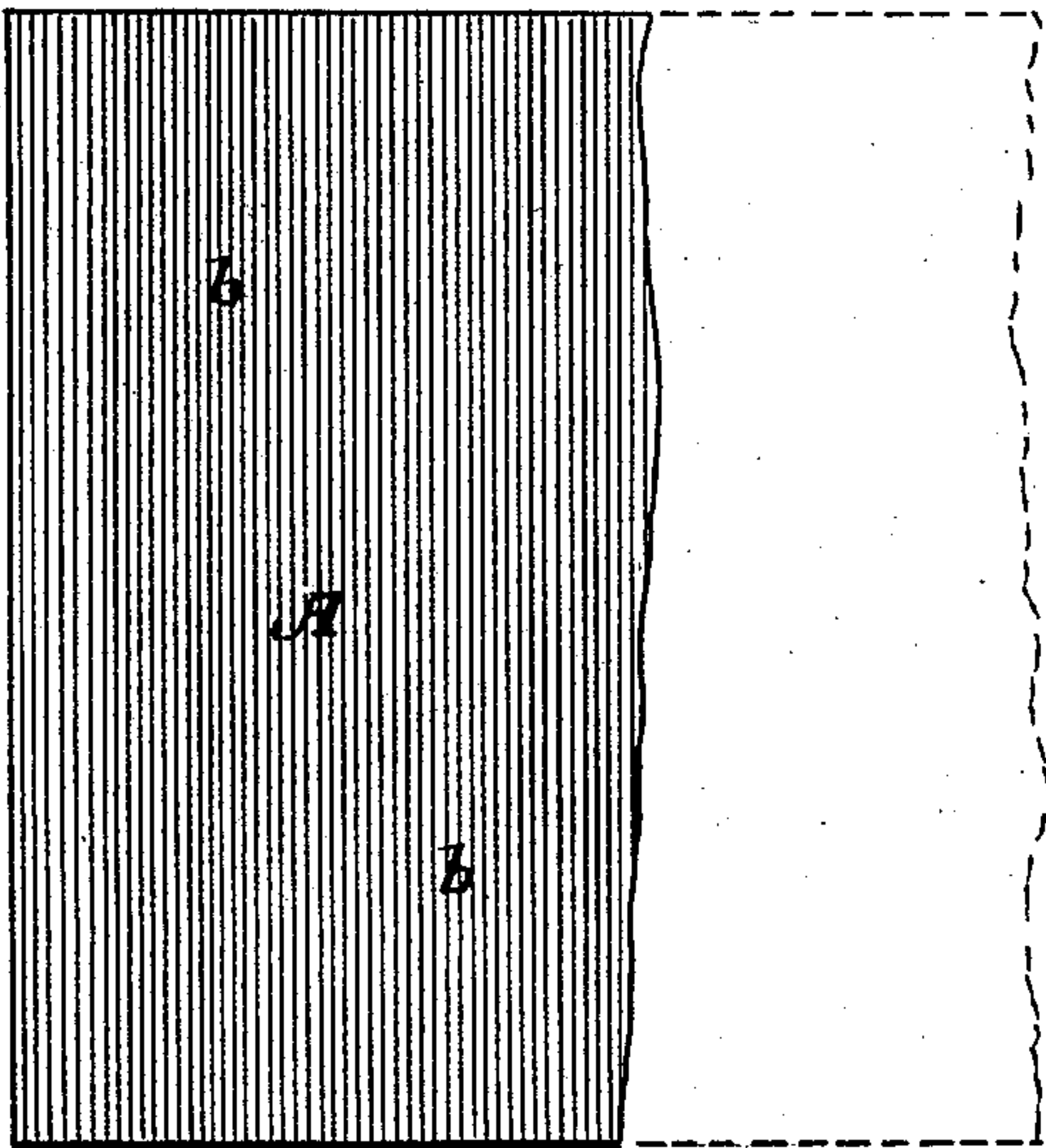


FIG. 2.

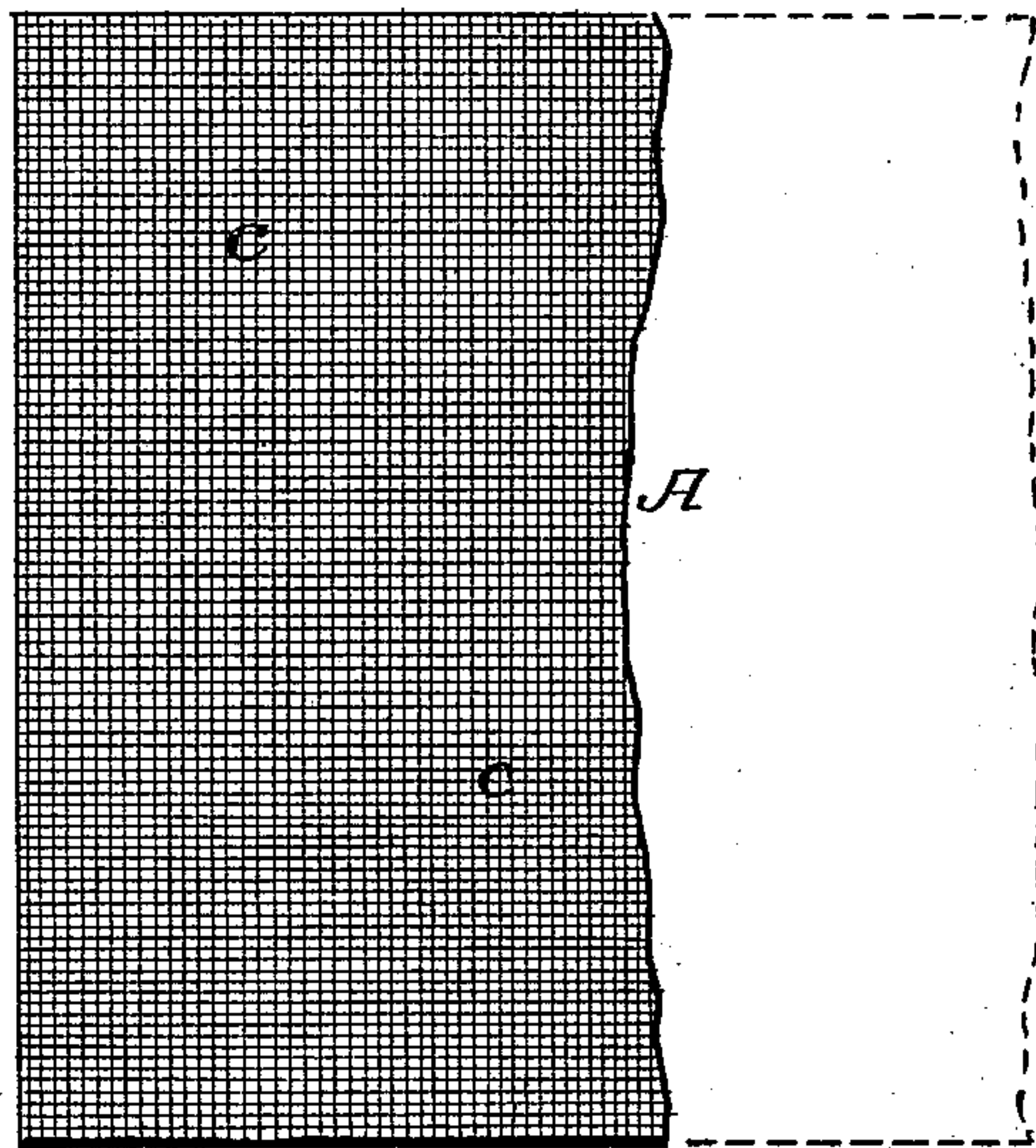


FIG. 3.

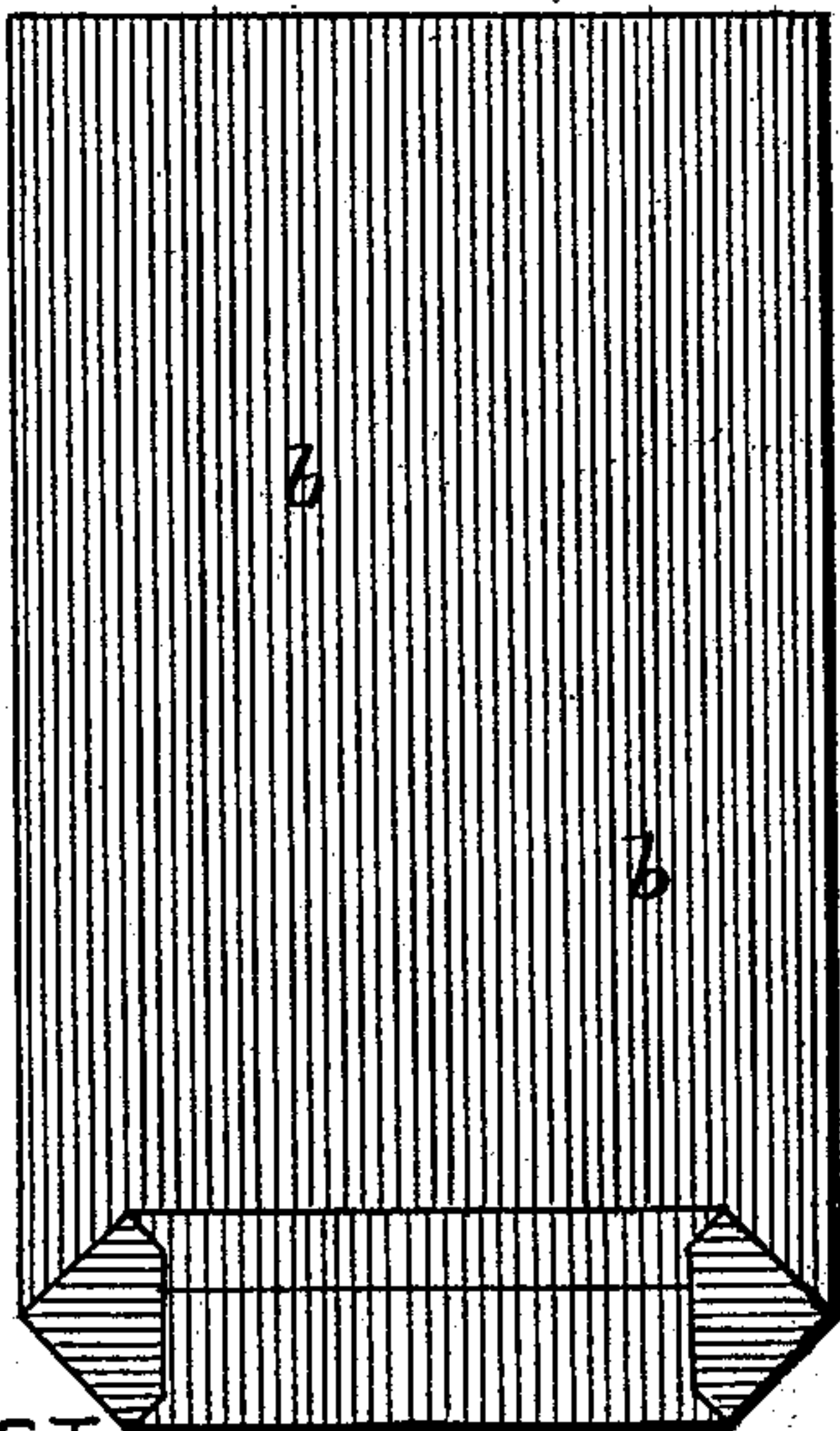
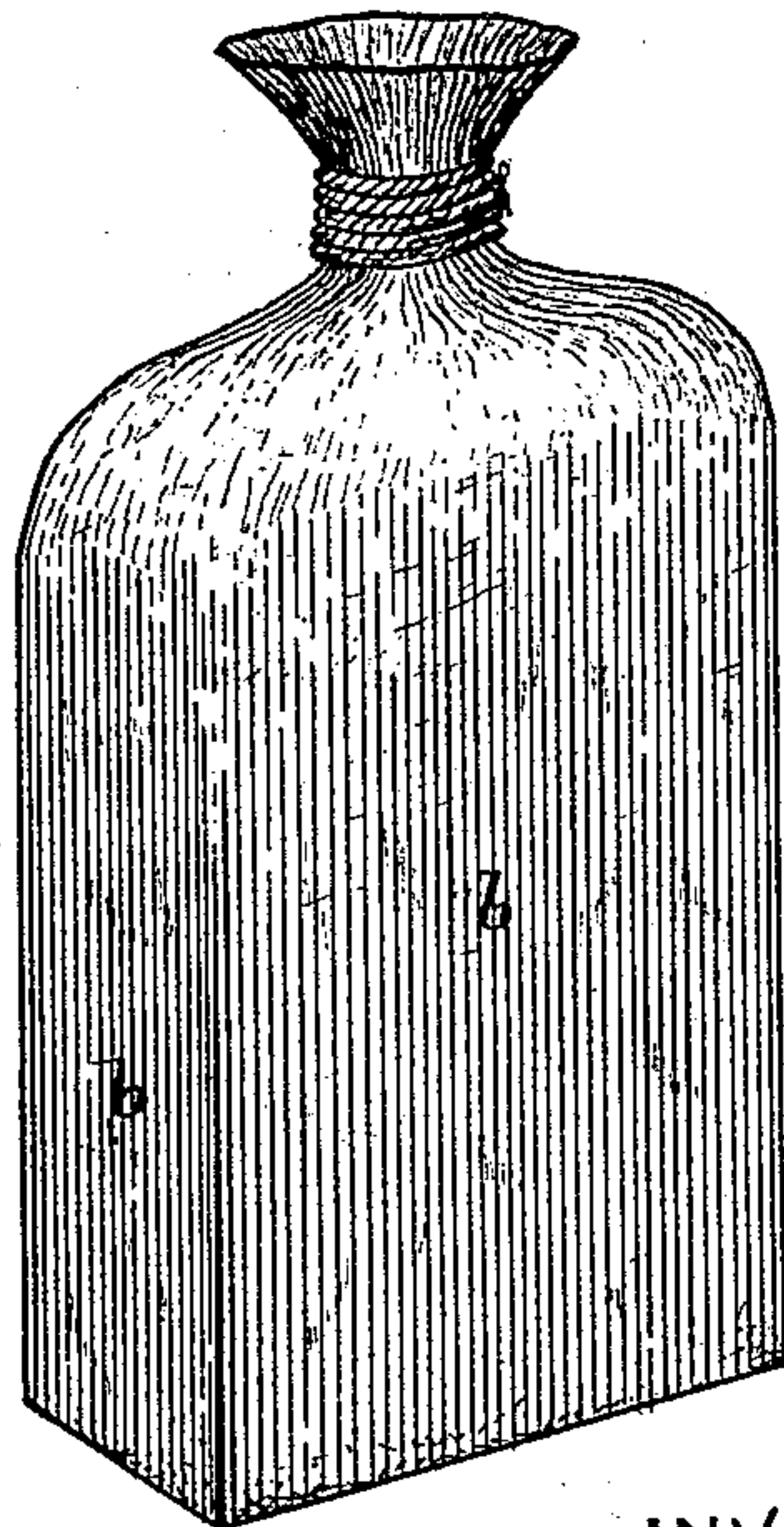


FIG. 4.



ATTEST.

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PROCESS OF MAKING PAPER BAGS.

SPECIFICATION forming part of Letters Patent No. 414,934, dated November 12, 1889.

Application filed February 27, 1889. Serial No. 301,371. (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 useful Improvement in the Art of Making Paper Bags; 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.

My invention relates to a new and useful improvement in the art of manufacturing paper bags or sacks, and has for its object to produce an article which shall possess certain hereinafter-described advantages over anything heretofore made in this line of manufactures.

In another application for Letters Patent by me, filed simultaneously with this case, I have set up a claim to the novel product resulting from the improvement in the art which is made the subject of this case.

My present invention relates more particularly or is more especially adapted to the production of that line or class of paper sacks or bags in the manufacture of which it is necessary to use material of comparatively great strength, the bags or sacks being designed to hold comparatively large quantities of heavy material and to be subjected to the usage to which flour and other sacks have to be subjected in handling them and their contents during the operations of transportation and storage which articles of commerce have to undergo.

Previous to my invention it has been customary in the art of making sacks or bags from paper to manufacture them from paper in the condition in which it is usually supplied to the market, or as it comes finished from the paper-mill. In thus making the sacks or bags from the comparatively heavy or stout paper of commerce the manufactured article does not possess either sufficient flexibility or sufficient elasticity in its body portion to successfully withstand the handling, storage, and transportation to which goods put up in bags have to be subjected. Such bags are liable to be broken open or ruptured, especially at the vicinities of any angular projections thereof, (such as usually exist at the bottom corners,) by any sudden

and severe blow, occasioned in the course of storage, handling, or shipment, and have not therefore been found practicable as a substitute for the more expensive line of bags produced from textile fabrics.

By my improvement or invention, which consists, essentially, in subjecting the ordinary paper to a mechanical crushing or breaking operation, by which it is rendered both pliable and elastic superficially, without any detracton from its tensile strength, I am enabled to provide for use paper sacks or bags which, while they are little or no more costly, are more durable and desirable, in that when filled they possess a greater degree of elasticity, and hence will readily expand more or less and assume such shapes as either internal or external pressure may tend to force them into; are less liable to get broken or ruptured by reason of the material not being so still and frangible as paper in the usual condition of the finished fabric, and will not when filled with any material the particles of which are comparatively small and mobile present protensions or projecting portions of such angularity or abruptness as to render them liable to fracture or tear in the handling or storage of the bags.

In carrying into effect my invention as I have so far practiced it I take the heavy stiff paper usually employed in the manufacture of bags or sacks (varying in thickness and quality according to the contemplated size and intended uses of the article to be made) and pass it in bulk between corrugated breaking or crushing rolls, which has the effect of forcibly indenting the stock in parallel lines and producing a series of corrugations or straight crimps, which are, however, of very slight depth, preferably not deeper than what will be equivalent to whatever may be the thickness of the paper being treated. In lieu, however, of this preferable mode of procedure, my invention may be carried into effect by first making the bag-blanks or flattened paper tubes from the paper in bulk and then subjecting the blanks to the action of the corrugated rolls which perform the crushing operation on the paper.

At Fig. 1 of the accompanying drawings, which form part of this specification, I have

shown a small portion of a sheet or web A of heavy manila paper (such as generally used in the manufacture of large-sized flour-sacks) which has been thus corrugated or crushed, as indicated by the series of parallel crimps *b*. If deemed expedient, the paper may be subjected to a second breaking action of the rolls by passing it between said rolls in a transverse direction, so as to produce a second set of crimps, as seen at *c*, Fig. 2, which forms portion of a sheet or web crushed or softened superficially by corrugations running in two directions.

Of course the degree of breaking up of the stiff paper by either a repetition of this fluted-roller process or by the subjection of the paper to the action of some other sort of mechanical device that will operate to indent it superficially (and thus break or soften without separating the rigidly-connected fibers and the adhesive ingredients of the fabric) may be varied according to surrounding circumstances and in the judgment of the skilled manufacturer.

The novel and important point from which all the good fruits or advantages of my invention flow rests in the idea of rendering the paper composing the bag limp or soft and exceedingly flexible without any disruption or weakening of the concrete fabric, and at the same time making the fabric elastic by some sort of crimping or superficial gathering up, so that the bag when filled will possess the capacity to expand more or less, (either at given portions of or throughout the whole extent of the package,) as various causes may tend to produce such expansion, and will be so flexible or pliable in all its parts as to vastly reduce the liability of any breakage or rupture of the package of material.

At Fig. 3 of the drawings I have shown in flattened condition (as it comes from the pasting and finishing machinery) and at Fig. 4 in a filled and tied-up condition a flour-sack made according to the invention made the subject of this application, the style or pattern of the bag shown being that of what has

been for years well known in the market as the "Arkell and Smith's satchel-bottom paper bag."

Of course my present improvement in the art may be adopted in the manufacture of paper bags of any other pattern.

I am aware of the fact that paper has been corrugated and indented in various ways for other purposes than that of rendering it more pliable, as in the case of embossed and struck-up wall-paper, &c. I am also aware that it is old in the art of making paper bags to have the mouth end or portion rendered more flexible and softer by crimping or corrugating the fabric to facilitate the tying up of the bag, as shown in the Arkell and Smith patent of June 6, 1865; but neither of these things has any special relevancy to and should not be confounded with my invention, since in the case of corrugated paper designed for covering walls, &c., no such effects were produced as in the case of my invention, and in the crimped bag-mouths known (under the patent just mentioned) as the "soft-tie" bag only the feature of pliability was utilized for the purpose of rendering it easier to gather together and tie up the mouth end of the bag, the main or body and filled portion of the bag being made of the paper in its natural stiff inelastic and frangible condition.

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

As an improvement in the art of making paper bags, subjecting the fabric of which the bag is composed to a crimping or corrugating and breaking-up mechanical treatment, which imparts to the paper a greater degree of pliability and renders it more or less elastic superficially, all substantially as and for the purpose 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.