

(Model.)

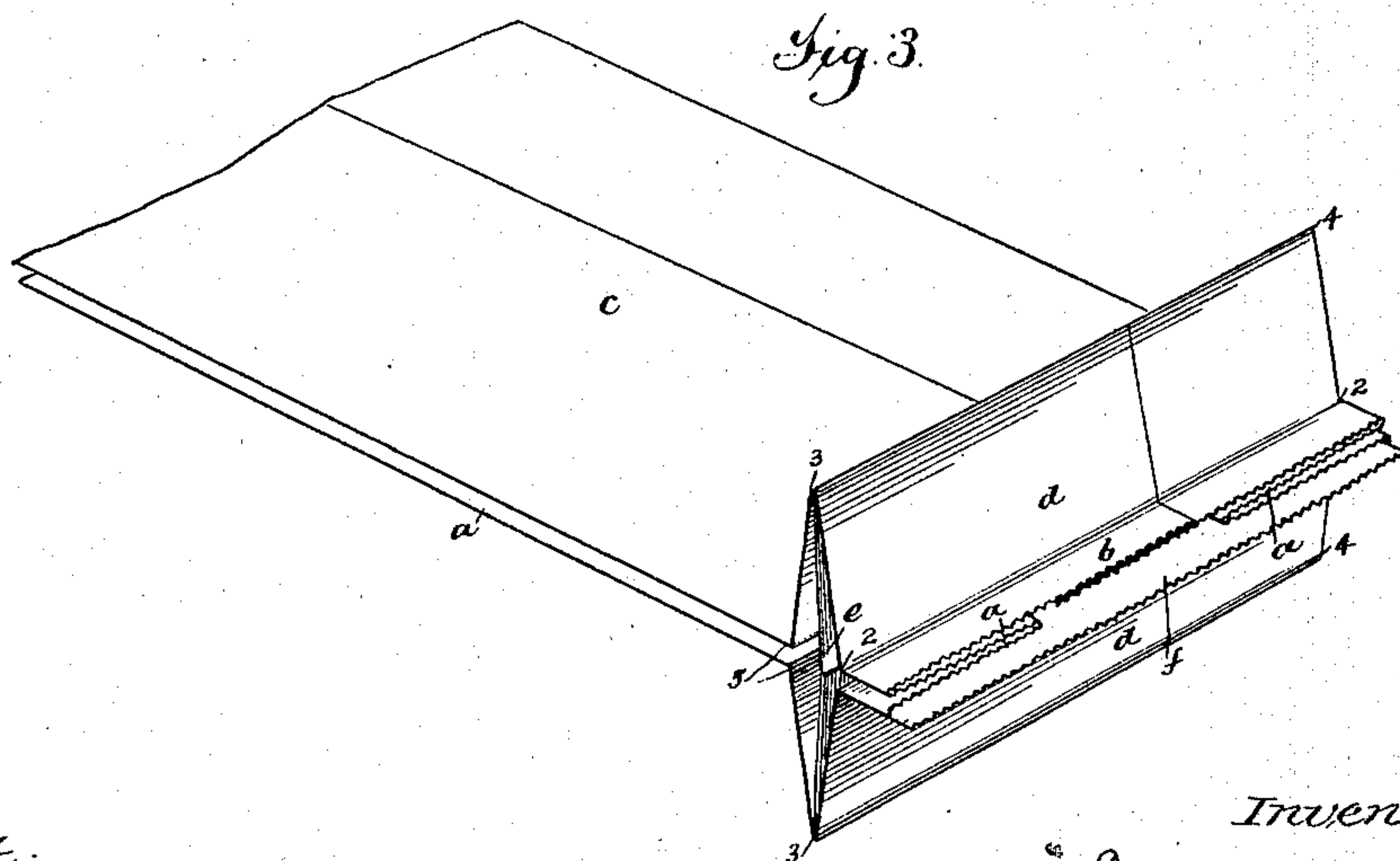
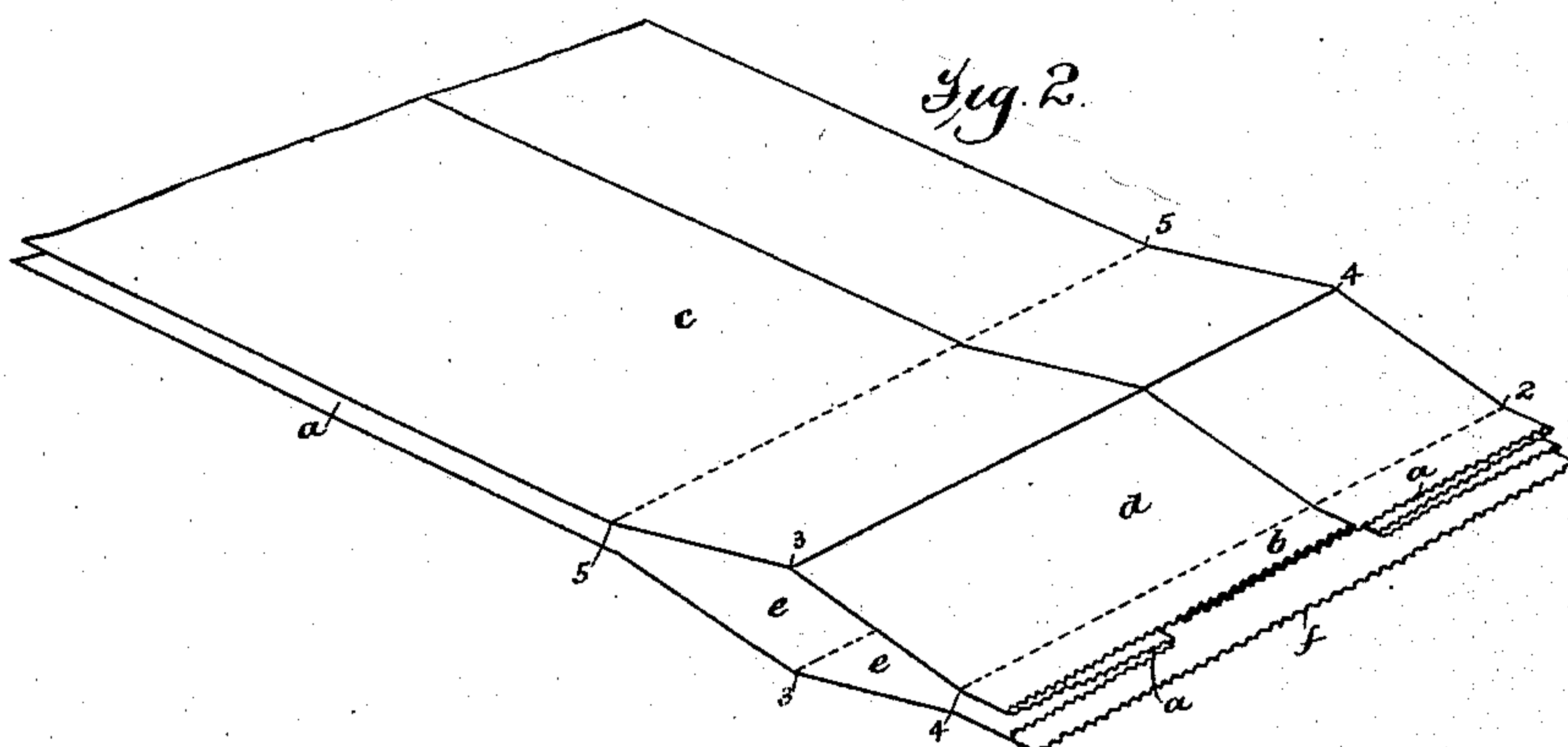
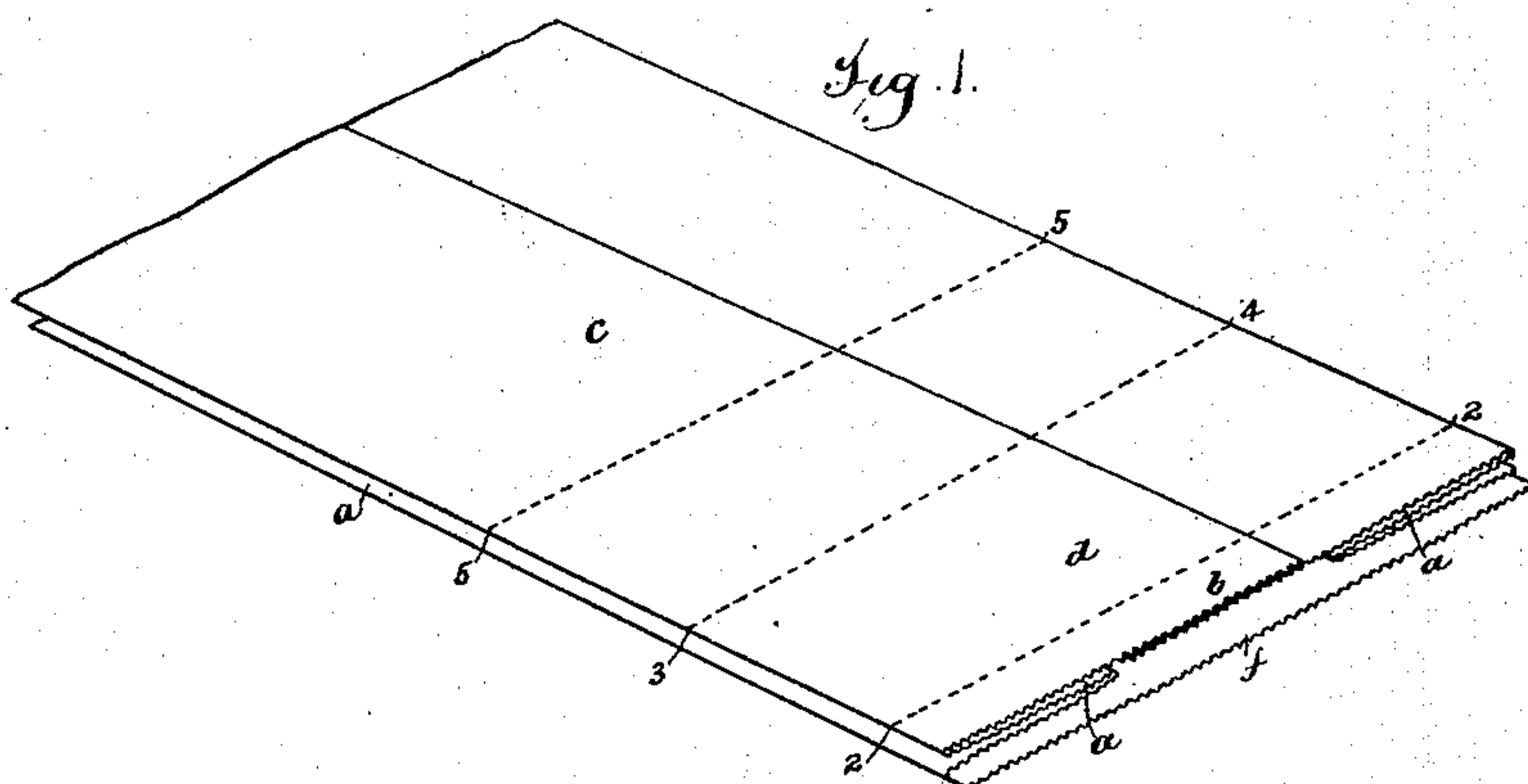
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D. APPEL.

ART OF MAKING PAPER BAGS.

No. 388,612.

Patented Aug. 28, 1888.



Attest:

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J. A. Hovey.

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(Model.)

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Fig. 4.

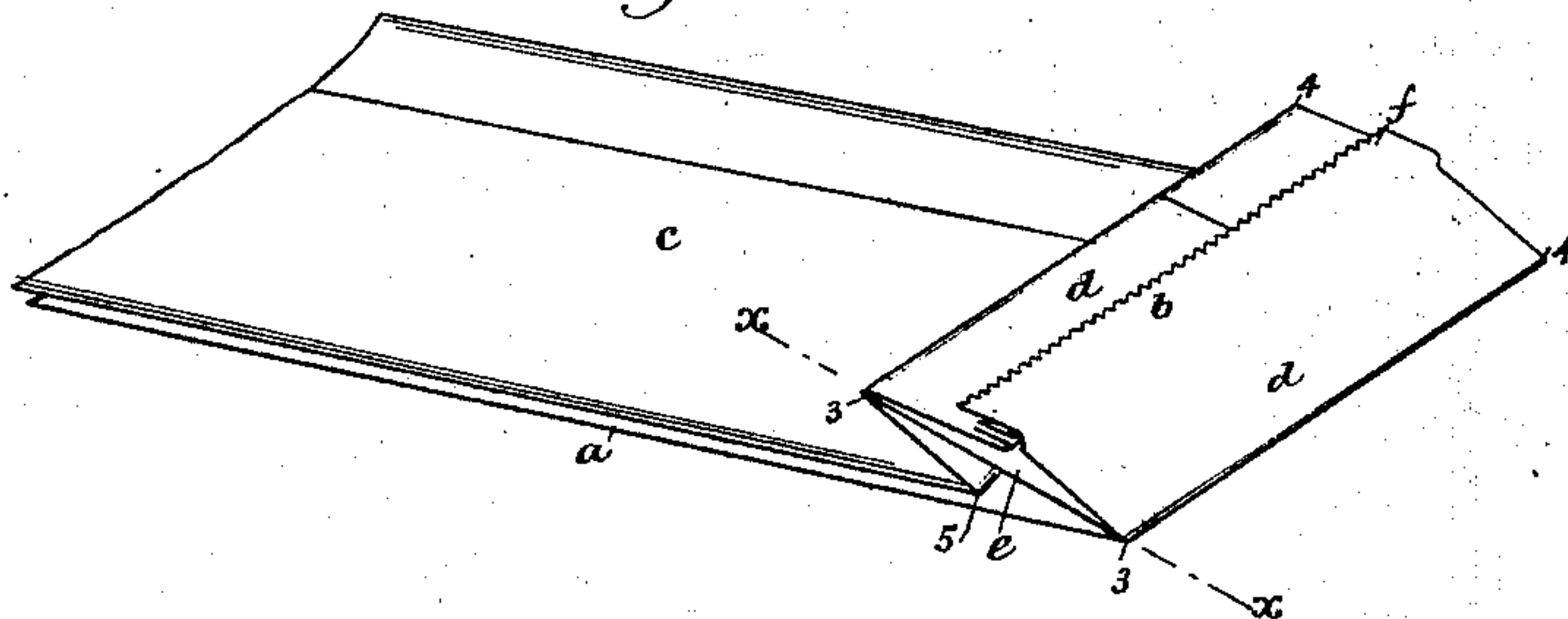


Fig. 5.

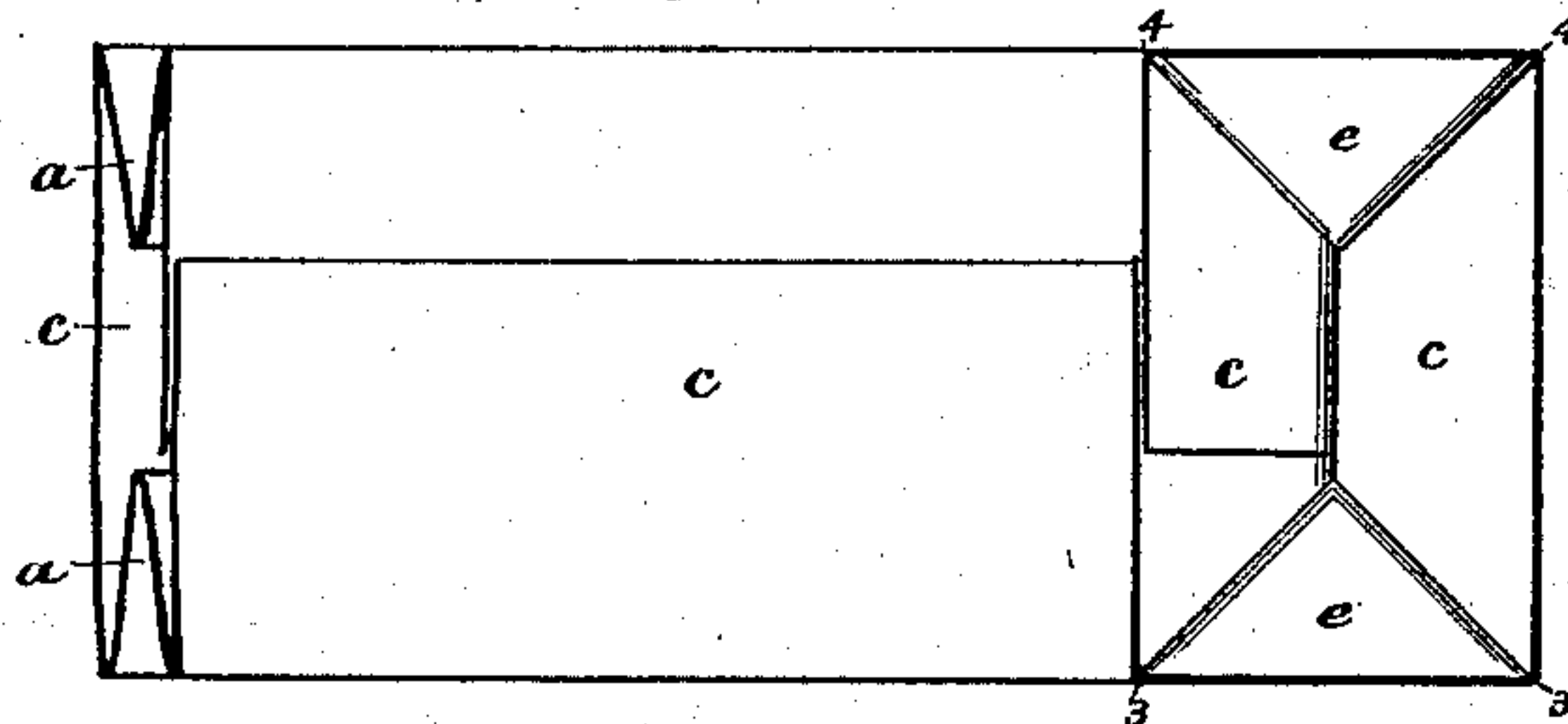
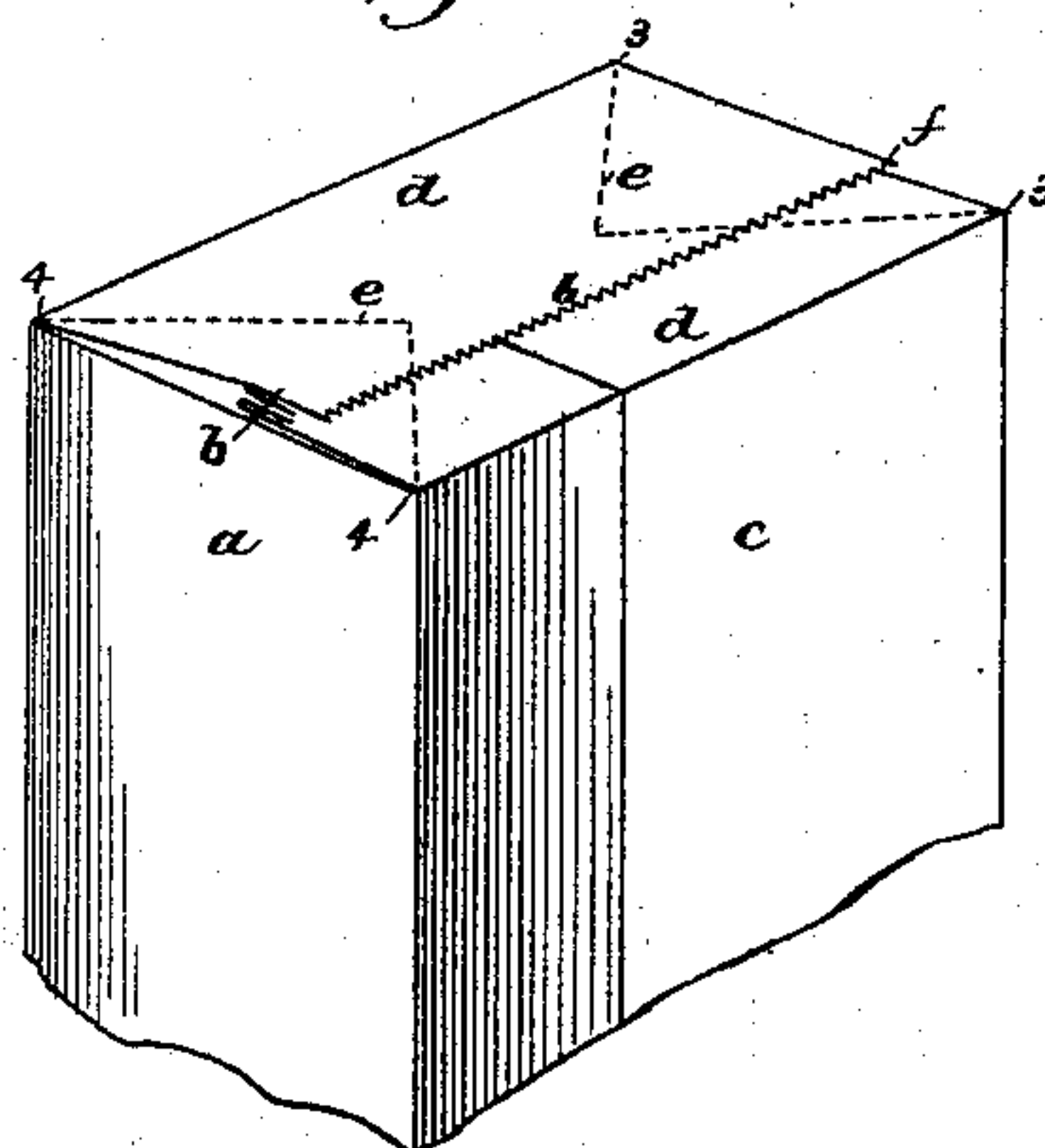


Fig. 6.



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Fig. 7.

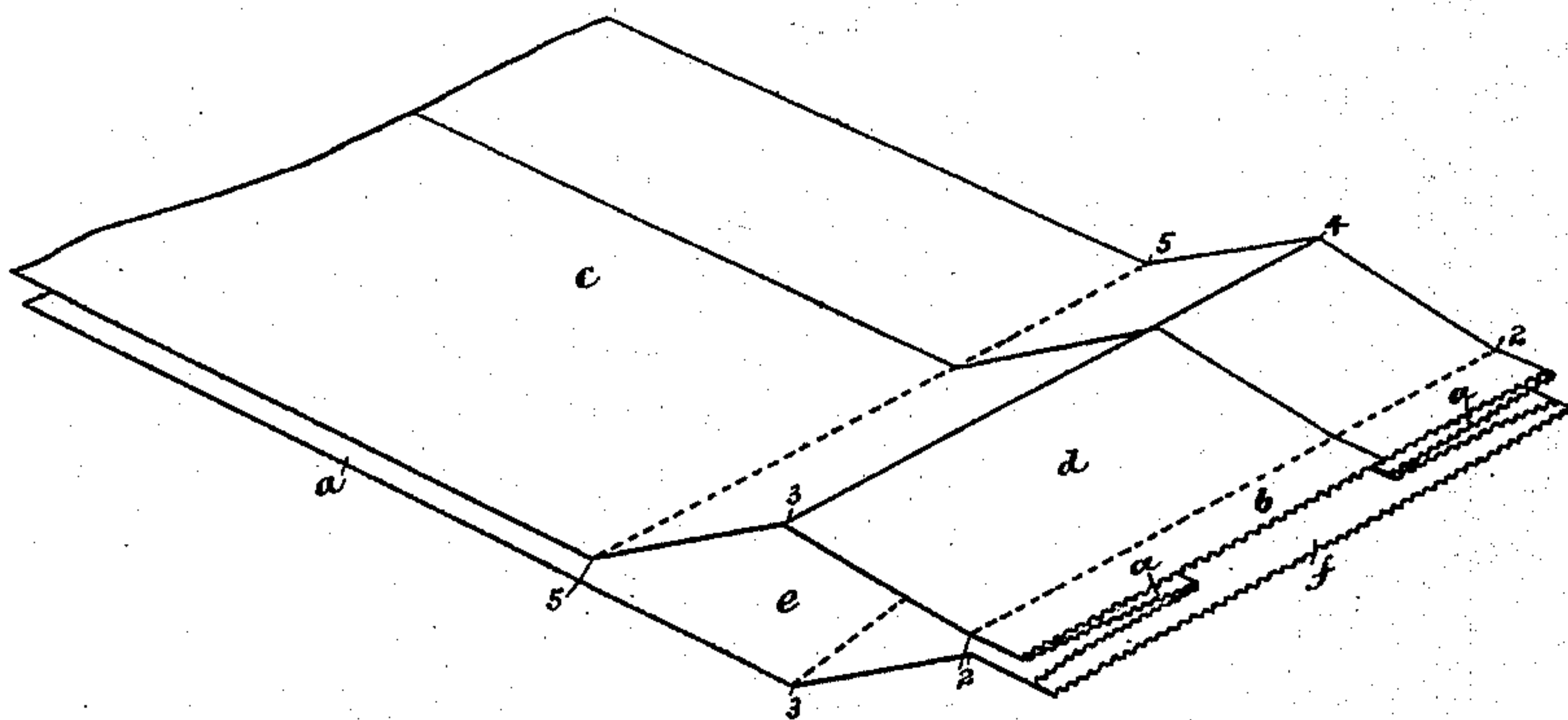
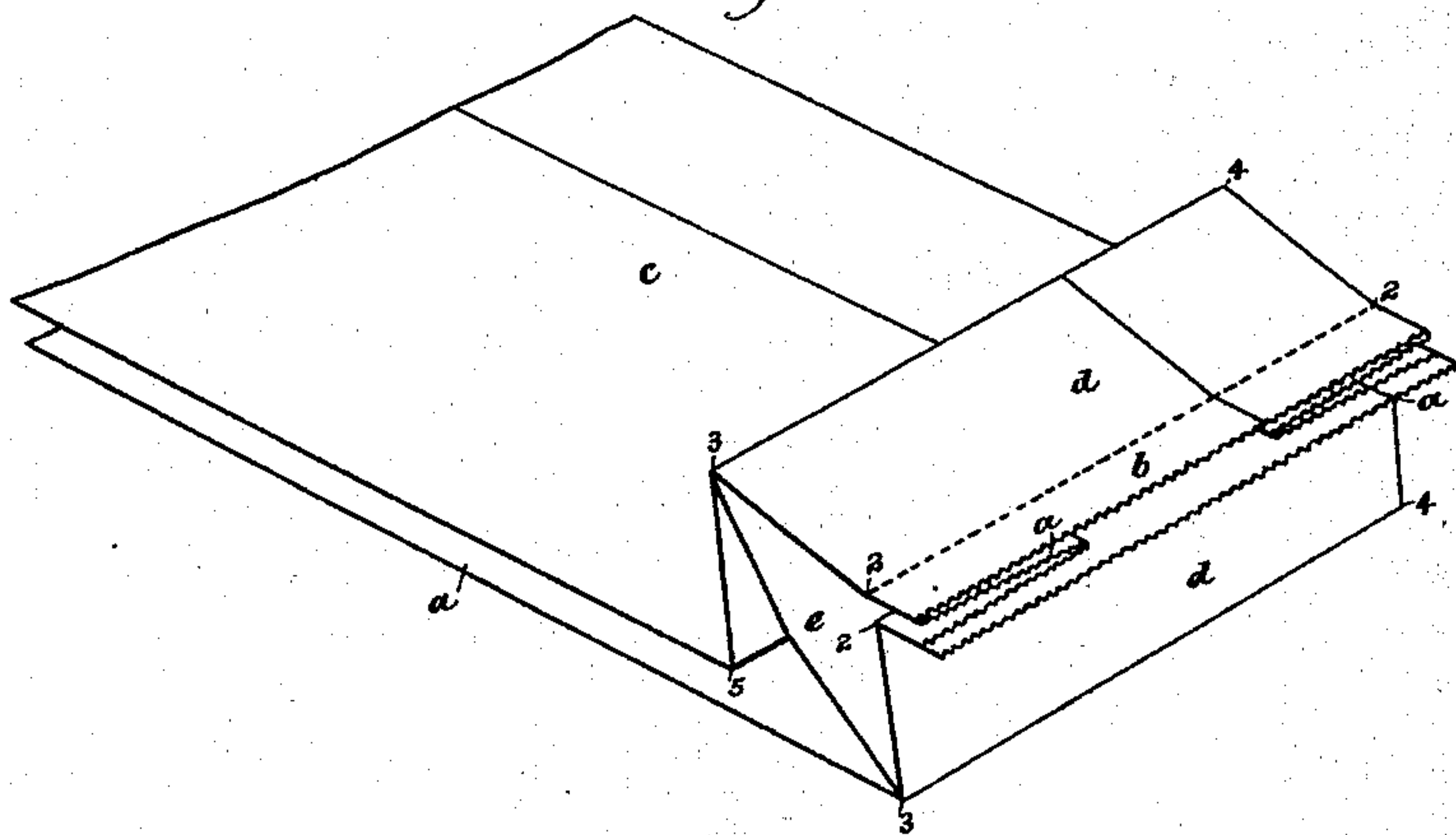


Fig. 8.



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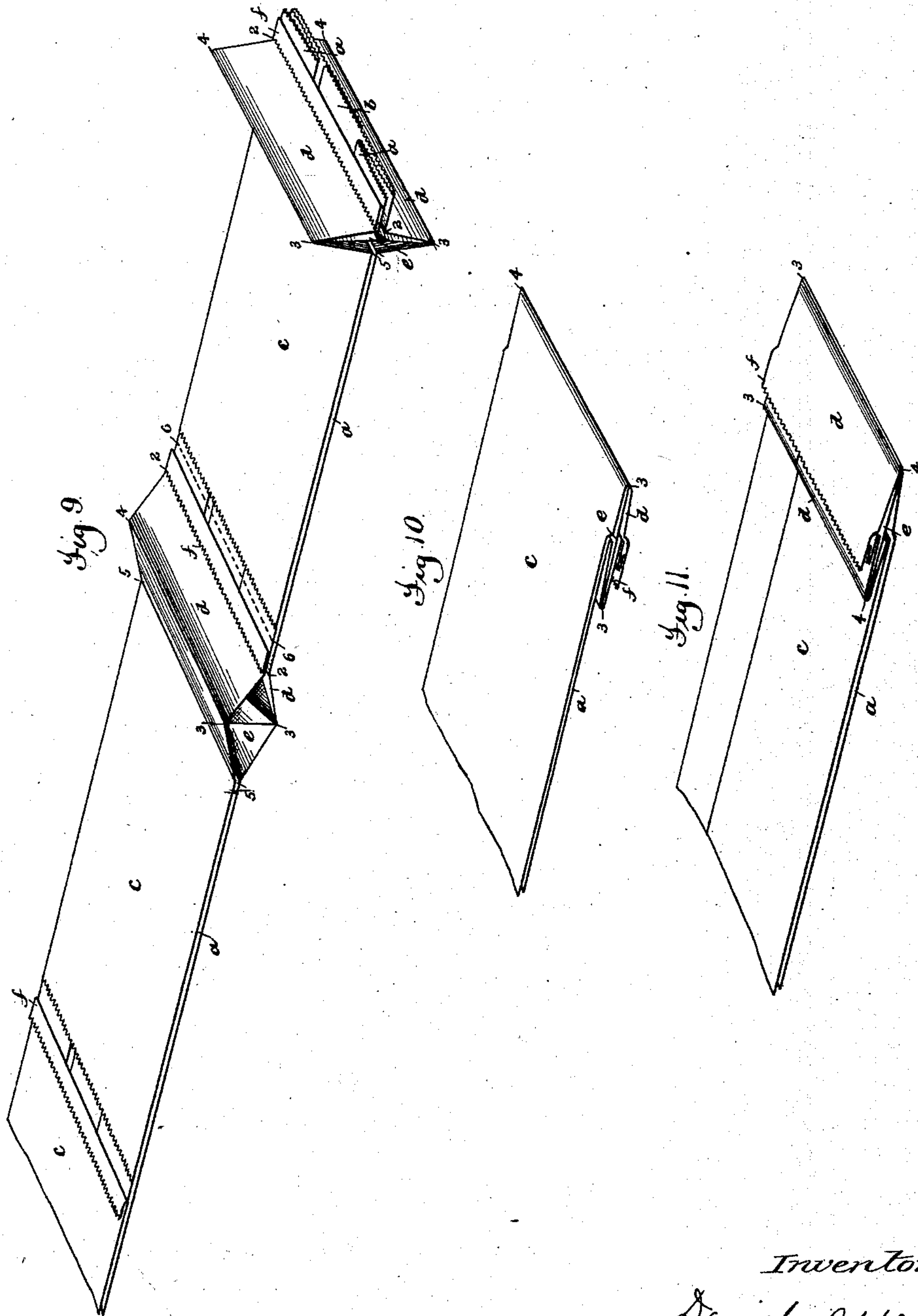
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D. APPEL.

ART OF MAKING PAPER BAGS.

No. 388,612.

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UNITED STATES PATENT OFFICE.

DANIEL APPEL, OF CLEVELAND, OHIO, ASSIGNOR TO THE UNION PAPER BAG MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

ART OF MAKING PAPER BAGS.

SPECIFICATION forming part of Letters Patent No. 388,612, dated August 28, 1888.

Application filed November 12, 1886. Serial No. 218,670. (Model.)

To all whom it may concern:

Be it known that I, DANIEL APPEL, a citizen of the United States, residing at Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in the Art of Making Paper Bags, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to the manufacture of that class of paper bags known as "bellows-sided square-bottom bags," and particularly to bags of the construction shown and described in my application for Letters Patent filed October 8, 1886, Serial No. 215,672.

15 The ordinary bellows-sided square-bottom bag, which is very extensively used at the present time, consists, as is well known, of a plain bellows-sided tube having a small portion at one end folded over and secured to the body to form the bottom. The bag-bottom thus formed will, if properly manipulated, assume a square or rectangular form when the bag is filled. To accomplish this, however, it is necessary, previous to filling the bag, to open the bag and form or partly form certain creases or folds in the material at the bottom by hand. This is of course undesirable, and efforts have been made to produce bags of this class which shall be so formed that this hand manipulation will be unnecessary in order to cause the bag-bottom to assume a square or rectangular form when filled. It has been proposed to accomplish this result in a variety of ways; but in all attempts which have heretofore been made to this end the operations required to be performed in the formation of the bag were so numerous and complicated that it was impracticable to perform the operations by machinery and with sufficient rapidity to make such bags a commercial success.

45 It is the object of the present invention to produce bellows-sided square-bottom bags which shall be so constructed that when the bag is distended, as in the act of filling, the bottom will assume a square or rectangular form without the necessity of any hand manipulation, and to so reduce and simplify the operations required to be performed in the formation of the bag-bottom that it will be

possible to produce these bags at a very rapid rate and by comparatively simple machinery.

To that end the invention consists in a method of forming a square-bottom bag from a bellows-sided tube, which will be now fully described and pointed out, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a bellows-sided tubular blank of suitable dimensions to form a bag. Figs. 2 and 3 are similar views illustrating the method of forming the bag-bottom. Fig. 4 is a similar view of the completed bag. Fig. 5 is a sectional view of the completed bag, taken on the line *xx* of Fig. 4. Fig. 6 is a perspective view of the bottom of the bag, the bag being distended. Figs. 7 and 8 are views similar to Figs. 2 and 3, illustrating a slightly-different manner of carrying out the method of forming the bag-bottom. Figs. 9 and 10 are perspective views showing a manner in which the method may be employed in the manufacture of bags from a continuous tube; and Fig. 11 is a view similar to Fig. 10, showing the opposite side of the bag.

Referring to Fig. 1, it is to be understood that the bag length or blank therein shown is provided with inwardly-folded or bellows sides *a*, formed by folding the material in the usual manner, and is of suitable form for the manufacture of an ordinary bellows-sided square-bottom bag—such, for example, as shown in Letters Patent No. 123,811. To produce the ordinary bellows-sided square-bottom bag, such as shown in said Letters Patent, the end portion, *b*, of the blank is simply folded over on the dotted line 2 2 and pasted to the side of the blank. The bottom of the bag thus formed will, if properly manipulated by hand previous to the filling of the bag, assume a square or rectangular form when the bag is filled, as shown in Fig. 6. In order, however, to make it certain that the bottom of the bag will assume this form, it is necessary previous to filling the bag to distend it and crease the bellows-sides *a* upon the lines 3 3 and 4 4, and also crease the sides *c* upon the lines 3 4. This hand-creasing it is especially desirable to avoid, and to do this it is necessary that the bag-bottom should be so formed that the lines 3 3, 4 4, and 3 4 will be defined in the process of mak-

ing the bag. In all of the methods of manufacture which have been heretofore proposed for accomplishing this result it was necessary to first open out or distend the mouth of the bottom-forming end of the tube, and then close it to form the bag-bottom by folding its sides inward. This method of forming the bag-bottom necessarily involved many operations, and was so complicated as to make it impracticable to carry on the manufacture by machinery and at a rapid rate.

According to my improved method of manufacture, this result is accomplished by simply distending or carrying apart the sides *c* of the tubular blank upon the lines 3 4, while the mouth of the bottom-forming end remains in a closed or practically closed position. The commencement of this operation is illustrated in Fig. 2, in which the sides *c* are shown as slightly distended and partially folded on these lines. As this operation is continued—that is to say, as the sides *c* are distended farther and farther upon these lines, (the mouth of the bottom-forming end and also the main part of the blank being retained in a closed or practically closed condition,)—the sides *c* will be folded upon the lines 5 5 and 2 2, thereby bringing the bottom-forming portions *d* against the sides *c*, and in this operation the portions of the bellows sides between the lines 2 2 and 5 5 will be distended and drawn outward and folded on the lines 3 3 and 4 4, thereby forming two triangular portions, *e*, at each side of the bag, which lie between the portions *c d* at each edge of the bag, as shown in Fig. 3. It will be seen that by this simple operation, and without opening either the mouth of the bottom-forming end of the blank or the main body portion of the blank, the lines 3 3, 4 4, and 3 4, defining the four edges of the bottom, are perfectly creased and defined in the operation of forming the bottom, so that when the bag is distended it will assume the square or rectangular form shown in Fig. 6 without any hand manipulation for that purpose. After this has been done the projecting portion *b*, which is provided with usual lip, *f*, will be folded over and secured to one of the bottom forming portions *d*, so as to close the bottom of the bag in the usual manner, and at the same time the bottom of the bag may be brought into line with the body, as shown in Fig. 4.

In practicing the herein-described method of forming the bag it is preferable that the projecting portion *b* and lip *f* should not be folded over and secured to the bottom-forming portion until after the square bottom has been formed, as just described; but in some cases it may be found advantageous to fold the projecting portion and its lip over on the line 2 2 and secure them to the bottom-forming portion while the blank is in the condition shown in Fig. 1, after which the square bottom will be formed by distending the sides of the blank upon the lines 3 4, the same as has already been described, and this can be done without

departing from the broad feature of the method. Neither is it essential that both of the sides *c* of the blank should be folded on the line 5 5, as indicated in Figs. 2 and 3. One of the sides may be folded back on this line, while the other side is simply folded over on the line 3 4, as indicated in Figs. 7 and 8. In this case the blank, instead of assuming the position shown in Figs. 2, 3, and 4, will successively assume the positions shown in Figs. 7, 8, and 4.

The method of forming the bag bottom which has been described can readily be practiced, and, in fact, in the manufacture of bags for the market will usually be practiced, upon a continuous tube instead of upon detached blanks. In such case the bottom of the bag may be formed upon the leading end of the tube in the manner already described, the completed bag being then severed from the tube and the next bag formed in like manner, or the bag length or blank may be severed from the tube and the bottom formed on the rear end of the blank. It will usually, however, when operating upon a continuous tube, be preferable to partially form the bottoms of one or more bags before the preceding bag has been severed from the tube. One way in which the method may be carried into practical operation in this manner is illustrated in Figs. 9 and 10. In such case the tube, after being formed in the usual manner, will have one of its sides *c* severed and slit rearward slightly, so as to form the loose lip *f*, which lip may be folded backward, as indicated at the left of Fig. 9. The sides *c* of the tube will then be distended upon the lines 3 4, as indicated at the middle of the figure, thereby folding the sides upon the lines 3 4, 5 5, and 2 2, and bringing the bottom-forming portions *d* against the adjacent portions of the sides *c*, and at the same time distending and folding the bellows-sides *a* upon the lines 3 3 and 4 4, as indicated at the right of the figure. After this is done the tube will be severed upon the dotted line 6 6, thereby severing the preceding bag, which in the meantime has been completed, from the tube, and the projecting portion *b* and its lip *f* will be folded over or wiped rearward against the bottom-forming portion, and at the same time the bottom will be brought into line with the bag, as indicated in Figs. 10 and 11.

If preferred, the necessary cuts to form the lip *f* may be made in the web before the tube is formed, or the bag-length may be severed from the tube in such manner as to provide the lip *f*. If preferred or found necessary, the various lines, or some of them, upon which the material is folded may be creased in advance of the folding to aid in that operation. The distending of the sides *c* upon the lines 3 4 may be accomplished by any suitable means arranged either to grasp the material upon those lines and draw the sides apart at those points, or by any suitable means arranged to act upon the inside of the tube, or both, the

bottom-forming end of the tube being at the same time retained in a closed or substantially closed condition in any suitable manner.

5 The bag herein shown and described is not herein claimed, as the same is claimed in my application for Letters Patent filed October 8, 1886, Serial No. 215,672.

What I claim is—

10 1. The herein-described method of forming a square-bottom bag from a bellows-sided tube, which consists in distending or carrying apart and folding the sides of the tube at the lines 3 4, which define two edges of the bag-bottom, while the mouth of the bottom-forming end of
15 the tube remains in a closed or substantially closed condition, substantially as described.

20 2. The herein-described method of forming a square-bottom bag from a bellows-sided tube, which consists in distending or carrying apart and folding the sides of the tube at the lines 3 4, which define two edges of the bag-bottom, while the mouth of the bottom-forming end of the tube remains in a closed or substantially

closed condition, and then folding over and securing to the bottom the portion *b*, substantially as described. 25

3. The herein-described method of forming square-bottom bags from a continuous tube, which consists in cutting the material to form the lip *f*, then distending or carrying apart
30 and folding the sides of the tube upon the lines 3 4, which define two edges of the bag-bottom, while the mouth of the bottom-forming end remains in a closed or substantially closed condition, then severing the tube upon the line 6
35 6, and then folding over and securing to the bottom the projecting portion *b*, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses. 40

DANIEL APPEL.

Witnesses:

Ⓢ E. H. BOHM,
Ⓢ SAMUEL S. MARSH.