Sept. 13, 1932. I. GURWICK 1,877,456

BAG MAKING

Filed May 9, 1929

Fig. 1.

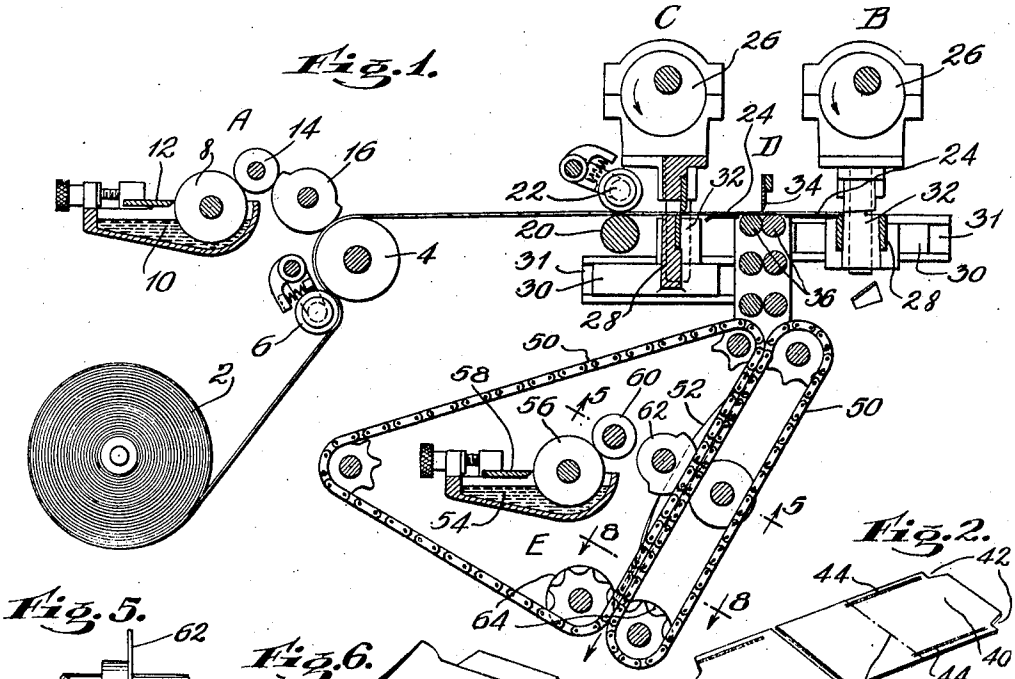


Fig. 2.

Fig. 5.

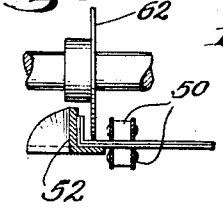


Fig. 6.

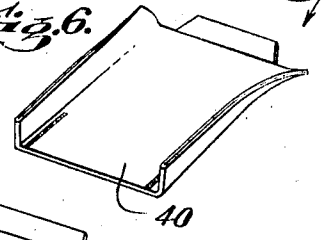


Fig. 3.

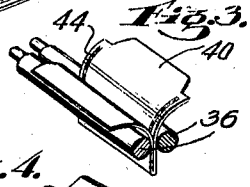


Fig. 7.

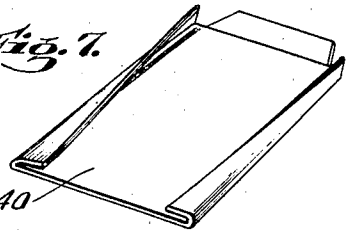


Fig. 4.

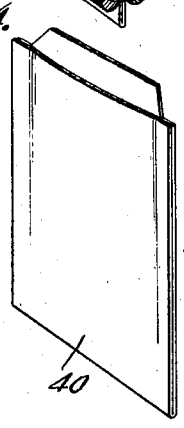


Fig. 10.

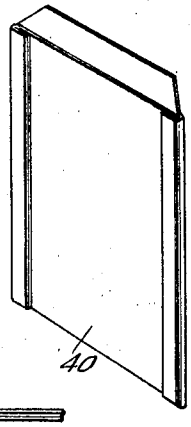


Fig. 8.

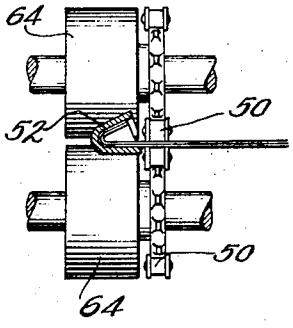


Fig. 9.



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1,877,456

UNITED STATES PATENT OFFICE

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BAG MAKING

Application filed May 9, 1929. Serial No. 361,583.

This invention relates to bag making, and more particularly to a bag made of cellophane or like material, and to a method for making the same.

Cellophane and like transparent paper stock is relatively brittle in texture and, consequently, is greatly weakened when subjected to a sharp crease. A primary object of my invention is to permit folded creases to be made in such material without weakening the resulting product. I have found that if the folded seam is made of a double thickness of he paper the resulting crease is relatively rounded, and even if subjected to considerable squeezing pressure is not made sufficiently sharp to impair the strength of the pap r.

The most vulnerable points in a paper bag are the edges adjacent its open end, for when the bag is first opened and articles inserted therein, there is a great tendency to tear these edges. It is, accordingly, a further object of my invention to provide a bag which is greatly strengthened against this form of rupture, and to this end I have devised a bag the edge seams of which are cemented and thereafter folded over upon a side of the bag and cemented thereto, so that the seam is doubly cemented, yet the bag may be opened to its full width, and is relatively strong at its edges because the crease, being one of double thickness, is not sufficiently sharp to weaken the edge of the bag.

The present invention further includes a novel bag making method. This method possesses desirable features, one of which is that the bag making operation is applied to a continuous web of paper. Another is that the web is kept under positive control at all times. Still another is that the web is kept in continuous motion.

Cellophane is exceptionally difficult to control, for it is very light, and the thinnest grades are the most popular, and it therefore is essential to keep the material under positive grip and control at all times during the process. In accordance with one feature of my invention, at the instant a blank is cut free from the web it is folded and gripped positively by folding rollers, no movement of translation being undergone by the free blank. To expedite this step, cement is applied during the continuous movement of the web before the blanks are cut therefrom.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, my invention consists in the bag and the steps in the method of making the same, as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by a drawing in which:

Fig. 1 is a schematic sectional elevation of the apparatus employed in the practice of my method;

Fig. 2 shows a cemented and cut blank;

Fig. 3 illustrates the folding thereof;

Fig. 4 shows the resulting intermediate product;

Fig. 5 is a fragmentary section taken in the plane of the line 5—5 in Fig. 1;

Fig. 6 illustrates the bag when in the stage shown in Fig. 5;

Fig. 7 indicates the bag at a later stage, with the partial fold of the edge being completed;

Fig. 8 is a section taken in the plane of the line 8—8;

Fig. 9 is a section through the bag showing the disposition of the strips of cement therein; and

Fig. 10 illustrates the complete bag.

While the present method possesses features of novelty which are applicable to any material, it is especially designed for use with cellophane or like transparent relatively brittle material. Cellophane is exceedingly light and flimsy, and the most popular commercially used cellophane is very light in weight, say eight ten-thousandths of an inch in thickness. It, therefore, is exceedingly important when handling cellophane to keep the web or sheet under positive control at all times, and it should never be left free in the machine. Furthermore, the material may vary in thickness, so that if not kept under positive control it may tend to move off at a tangent instead of in the desired direction, owing to the uneven distribution of weight. The material is also very sensitive to temperature and humidity changes, and its operating characteris-

tics are apt to greatly vary for this reason. This is true despite the application of temperature and humidity control to the plant in which the material is being worked.

To permit the paper to be worked with directly from the roll, and at the same time to overcome the various foregoing difficulties, I have devised a bag making method, the apparatus for which comprises, referring to Fig. 1, a first cement applying means A, a notcher B, a cutter C, folding apparatus D, and further cementing and folding apparatus indicated generally at E.

The cellophane or other paper web is drawn from a roll 2 by a driven feed roller 4, and a presser roller 6. Cement is picked up by a pair of glue wheels 8 from a glue fountain 10, the cement on the glue wheels being reduced to the desired amount by a scraper blade 12, and transferred through a transfer roller 14 to stencil wheels 16, which apply strips of the cement to the margins of the web intermittently. The cemented web is drawn under tension by a driven feed wheel 20 and a cooperating presser wheel 22, portions of the latter being reduced in diameter to avoid the strips of cement applied by the stencil wheels 16.

The web is fed past the guillotine cutting knife C, over the guide plates 24 and to the notcher B. The machine is so timed that the guillotine knife and the notcher begin to cut and travel along with the web at the proper speed, completing their cut when the blank is properly positioned above the folding mechanism D. It will be noticed that the notcher B and the cutter C are both actuated by eccentrics 26, which serve to reciprocate the upper cutting blades vertically, and which also serve to reciprocate both the upper and lower cutting blades horizontally. The lower cutting blades are carried by frames 28, arranged to slide with slide blocks 30, carried in guide rails 32. The frames 28 are operatively connected with the upper knife carrying frames for horizontal reciprocation, but not for vertical reciprocation, by means of the vertically reciprocable plungers or dowels 32.

In order to avoid the difficulty of moving and handling already cut blanks of the flimsy material, and with the further object of keeping the material always under positive control, at the instant the cutters have functioned, and before they have been retracted, the folding mechanism D has begun to function. The dull edged folding blade 34 descends and forces the blank to bend along a transverse line intermediate its length, whereupon the blank is gripped by the folding rollers 36 and is completely folded and carried by them into the further cementing and folding mechanism indicated generally at E. The folding rollers 36 are preferably rotated at a relatively great speed in order to quickly clear the folded blank out of the way of the approaching web, and to gain time which may later be used up in the subsequent operations performed by the apparatus E.

Figs. 2, 3, and 4 illustrate the condition of the bag during the phase of operations so far described. The blank 40 is notched at 42, assuming that a bag with a closing flap is desired, but these notches, and the entire notching mechanism B, may be omitted if a simple bag without a flap is to be made. The strips of cement 44 represent those which have been intermittently applied to the continuously moving web by the cementing means A. The transverse line 46 intermediate the ends of the blank shows where the folding blade 34 descends, and the resulting fold becomes the bottom edge of the bag, as is illustrated in Figs. 3 and 4. The folding rollers 36 may be reduced in diameter intermediate their ends, with a view to folding the halves of the blank together without creasing the bottom edge entirely across the width of the bag. However, such a crease is not harmful because it need not be made under high pressure. Furthermore, even if the bag is heavily creased entirely across the bottom, the effect is not as injurious as that which would result were a side seam so creased for the reason that the maximum strain is placed upon the bag at the edges adjacent the open end of the bag.

The blank in the form shown in Fig. 4 is carried from the folding rollers 36 directly into the grip of the carrying chains 50. These chains are so spaced apart that the bag projects at either edge beyond the chains a sufficient amount to permit of the subsequent cementing and folding operation next described.

Referring more particularly to Figs. 1, 5, and 8, there is a pair of formers 52, one for each side of the bag, which serve to turn up the two edges of the bag, and about at the time when the formers have turned the edges at right-angles to the body of the bag a pair of cementing mechanisms comprising a glue fountain 54, glue wheels 56, one for each side of the bag, a scraper blade 58, a transfer roller 60, and stencil wheels 62, one for each side of the bag, apply strips of cement on the sides of the bag just inside of the folded edges. It is obvious that these strips of cement may be applied before the folding operation has begun, as well as during it, in the manner here set forth, the present arrangement having the advantage of assisting the folding operation by holding the bag against the formers. The bag at that time is in the condition shown in Fig. 6.

The formers 52 next serve to gradually complete the folding of the edges of the bag over upon the side thereof, as is indicated in Figs. 7 and 8. At the end of the travel of the carrying chains 50 the bag reaches two

pairs of squeezer rollers 64, which heavily squeeze the folded double edges of the bag in order to bring all of the cemented surfaces into intimate contact, the cement being distributed relative to the edge of the bag in the manner illustrated by the section shown in Fig. 9. The finished bag is illustrated in Fig. 10.

It is important to observe that owing to the double thickness of paper provided at the marginal edges, the fold, practically regardless of the pressure of the squeezer roller 64, is left relatively rounded, and therefore is not creased sufficiently sharply to materially weaken the edges of the bag. Meanwhile the bag may be opened to its full width, for no cement is applied between the useful portions of the front and back sides of the bag.

The method of my invention, as is apparent from the foregoing detailed description, considered specifically, includes positively feeding a web from a paper roll or from a printing machine or the like, thru a first cementing means, thereafter cutting the previously cemented blanks from the web, without any appreciable dwell period, and folding the blank at the instant of completion of the cut without preliminarily moving the blank to any new folding position. Finally the cemented edges of the bag are folded over upon the side thereof, with additional strips of cement therebetween, and squeezed to fix various cemented surfaces in close contact. The process is characterized by the advantages of continuity, simplicity, direct operation on a web rather than on previously manufactured blanks, positive grip and control of the web at all times, and others equally inherent in the method.

The doubly folded and doubly cemented edge makes the bag much stronger than it would otherwise be, and results in the bag being absolutely sift-proof so that it may be used to carry even a finely divided powder. The seams are at the edges, and there is no center seam, in consequence of which the bag body is entirely transparent. The absence of a center seam also makes it possible for either side of the bag to be printed, and in fact either or both faces of either side may be printed, all of which printing may be accomplished before the web is fed to the bag making machine. These advantages are entirely absent in a bag structure having a center seam for obvious reasons, such as non-transparency at the seam, and the difficulty of bringing the printed matter at either side of the seam into registry.

It will be apparent that while I have shown and described my invention in the preferred form, many changes and modifications may be made in the bag structure and in the method here disclosed without departing from the spirit of the invention, defined in the following claims.

I claim:

1. A bag comprising a blank folded on a transverse line intermediate its length in order to form the body portion of the bag, the back side projecting beyond the front side in order to form a flap for closing the bag, the edges of the body portion of the bag being permanently cemented by means of an adhesive cement, and said cemented edges being folded over upon and permanently cemented to a side of the bag by means of an adhesive cement, the resulting doubly cemented seam being left in a flat and uncrimped condition.

2. A bag made of cellophane or a like thin transparent relatively brittle paper, said bag having a folded seam consisting of a double thickness of the paper folded over upon itself and cemented, whereby the resulting crease even when pressed is not sufficiently sharp to weaken or crack the said relatively brittle paper.

3. In a cellophane bag, a seam consisting of a cemented edge the double thickness of which is folded over upon itself and again cemented, whereby the resulting crease is not sufficiently sharp to weaken the paper.

4. A bag made of cellophane or a like thin transparent relatively brittle paper, comprising a blank folded on a transverse line intermediate its length in order to form the body portion of the bag, the edges of the body portion of the bag being folded over upon and cemented to a side of the bag, the resulting crease of double thickness of material being not sufficiently sharp to weaken the edges of the bag.

5. A bag made of thin transparent relatively brittle non-adhesive paper, comprising a blank folded on a transverse line intermediate its length in order to form the body portion of the bag, the edges of the body portion of the bag being permanently cemented by means of an adhesive cement, and said cemented edges being folded over upon and permanently cemented to a side of the bag by means of an adhesive cement, the resulting doubly cemented seam being left in a flat and uncrimped condition.

6. A bag made of cellophane or a like thin transparent relatively brittle paper, comprising a blank folded on a transverse line intermediate its length in order to form the body portion of the bag, the back side projecting beyond the front side in order to form a flap for closing the bag, the edges of the body portion of the bag being folded over upon and cemented to a side of the bag.

7. A bag made of thin transparent relatively brittle non-adhesive paper, comprising a blank folded on a transverse line intermediate its length in order to form the body portion of the bag, the back side projecting beyond the front side in order to form a flap for closing the bag, the edges of

the body portion of the bag being permanently cemented by means of an adhesive cement, and said cemented edges being folded over upon and permanently cemented to a side of the bag by means of an adhesive cement, the resulting crease of double thickness of material being not sufficiently sharp to weaken the edges of the bag, and the resulting doubly cemented seam being left in a flat and uncrimped condition.

8. A bag made of cellophane comprising a blank folded on a transverse line intermediate its length in order to form the front and back sides of the body portion of the bag, said back side projecting beyond the front side in order to form a flap for closing the bag, the edges of the body portion of the bag being cemented, and said cemented edges being folded over upon and cemented to the front side of the bag, the resulting crease of double thickness of material being not sufficiently sharp to weaken the edges of the bag.

9. The method of forming an edge seam for a bag made from cellophane or like thin transparent relatively brittle paper, which includes cementing the edge, applying a strip of cement to the side of the bag, folding the edge over onto the side of the bag with the strip of cement therebetween, and finally squeezing the folded double edge in order to bring the cemented surfaces into intimate contact.

10. The method of forming an edge seam for a bag made from cellophane or like thin transparent relatively brittle paper, which includes cementing the edge, applying a strip of cement to the side of the bag just inside of the cemented edge, thereafter folding the cemented edge over onto the strip of cement on the side of the bag, and finally squeezing the folded double edge in order to bring all of the cemented surfaces into intimate contact.

11. The method of forming an edge seam for a bag made from cellophane or like thin transparent relatively brittle paper, which includes cementing the edge, folding the cemented edge partially around toward the side of the bag and simultaneously applying a strip of cement to the side of the bag just inside of the partially folded edge, thereafter completing the folding of the cemented edge over onto the strip of cement on the side of the bag, and finally squeezing the folded edge in order to bring all of the cemented surfaces into intimate contact.

12. The method of making a bag from cellophane or like thin transparent relatively brittle paper, which includes folding a blank across a transverse line intermediate its length and cementing the edges to form a bag body, applying strips of cement to a side of the bag, folding the edges of the bag over onto the strips of cement on the side of the bag, and finally squeezing the folded edges of the bag in order to bring the cemented surfaces into intimate contact.

13. The method of making a bag from a web of cellophane or like thin transparent relatively brittle paper, which includes cutting off a blank of suitable length from the web, folding the blank across a transverse line intermediate its length and cementing the edges to form a bag body, applying strips of cement to a side of the bag inside of the cemented edges, folding the cemented edges of the bag over onto the strips of cement on the side of the bag, and finally squeezing the folded edges of the bag in order to bring the cemented surfaces into intimate contact.

14. The method of continuously making a series of bags from a moving web which includes applying a strip of adhesive to the edges of a flat unfolded moving web, completely cutting off a flat previously cemented blank from the web, and folding the cut off blank, in order to form flat front and back sides for the bag, and in order to bring the said sides into cemented relation.

15. The method of continuously making a series of bags from a moving web which includes applying a strip of adhesive to the edges of a flat unfolded moving web, thereafter completely cutting off a flat previously cemented blank of suitable length from the web, folding the blank across a transverse line intermediate its length in order to form flat front and back sides of the bag, and squeezing the edges of the bag in order to bring the cemented surfaces into intimate contact and thereby form a bag enclosure.

16. The method of making a bag which includes applying a strip of adhesive intermittently to the edges of a moving web, thereafter simultaneously notching the end of the web and cutting off a blank of suitable length from the web, folding the blank across a transverse line intermediate its length in order to form front and back sides of the bag with the notched end of the blank projecting on the back beyond the front side of the bag to constitute a flap therefor, and squeezing the edges of the bag in order to bring the cemented surfaces into intimate contact.

17. The method of making a bag which includes applying a strip of adhesive intermittently to the edges of a moving web, thereafter simultaneously notching the end of the web and cutting off a blank of suitable length from the web, folding the blank across a transverse line intermediate its length in order to form front and back sides of the bag with the notched end of the blank projecting to constitute a flap therefor, applying strips of cement to a side of the bag, folding the cemented edges of the bag over onto the side of the bag with the strips of cement therebetween, and finally squeezing the folded edges of the bag in order to bring all of the cemented surfaces into intimate contact.

18. The method of making a bag from cellophane or like thin transparent relatively brittle paper, which includes applying a strip of adhesive to the edges of a moving web, thereafter cutting off a blank of suitable length from the web, folding the blank across a transverse line intermediate its length in order to form front and back sides of the bag, applying strips of cement to a side of the bag just inside of the cemented edges, folding the cemented edges of the bag over onto the strips of cement on the side of the bag, and finally squeezing the folded edges of the bag in order to bring all of the cemented surfaces into intimate contact.

19. The method of making a bag from cellophane or like thin transparent relatively brittle paper, which includes applying a strip of adhesive to the edges of a moving web, thereafter cutting off a blank of suitable length from the web, folding the blank across a transverse line intermediate its length in order to form front and back sides of the bag, folding the cemented edges of the bag partially around toward a side of the bag and simultaneously applying strips of cement to the side of the bag just inside of the partially folded edges, thereafter completing the folding of the cemented edges of the bag over onto the strips of cement on the side of the bag, and finally squeezing the folded edges of the bag in order to bring all of the cemented surfaces into intimate contact.

20. The method of making a bag from cellophane or like thin transparent relatively brittle paper, which includes applying a strip of adhesive intermittently to the edges of a moving web, thereafter simultaneously notching the end of the web and cutting off a blank of suitable length from the web, folding the blank across a transverse line intermediate its length in order to form front and back sides of the bag with the notched end of the blank projecting to constitute a flap therefor, folding the cemented edges of the bag partially around toward a side of the bag and simultaneously applying the strips of cement to the side of the bag just inside of the partially folded edges, thereafter completing the folding of the cemented edges of the bag over onto the strips of cement on the side of the bag, and finally squeezing the folded edges of the bag in order to bring all of the cemented surfaces into intimate contact.

21. The method of making a bag which includes cutting out a blank of suitable configuration while the web is in motion, and folding and cementing the blank immediately at the finish of the cutting operation to form a completed bag.

22. The method of making a bag from cellophane or like thin transparent relatively brittle paper, which includes applying a strip of adhesive intermittently to the edges of a continuously moving web, thereafter simultaneously notching the end of the web and cutting off a blank of suitable length from the web while the web is in motion, folding the blank across a transverse line intermediate its length in order to form front and back sides of the bag with the notched end of the blank projecting on the back beyond the front side of the bag to constitute a flap therefor, folding the cemented edges of the bag partially around toward the front side of the bag and simultaneously applying strips of cement to the front side of the bag just inside of the partially folded edges, thereafter completing the folding of the cemented edges of the bag over onto the strips of cement on the front side of the bag, and finally squeezing the folded edges of the bag in order to bring all of the cemented surfaces into intimate contact.

23. The method of making a bag which includes moving a web in unfolded condition, applying adhesive to the moving web, cutting out and severing from said cemented moving web a flat blank of suitable configuration to form the sides and flap of the bag, and folding the cut-off cemented blank in order to form front and back sides and a flap for the bag and in order to bring the said sides exclusive of the flap into cemented relation.

Signed at New York, in the county of New York and State of New York this 20th day of April, A. D. 1929.

IRVING GURWICK.