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PATENTED NOV. 27, 1906.

B. F. BROWN.  
BAG FILLING MACHINE.

APPLICATION FILED NOV. 20, 1897.

2 SHEETS—SHEET 1.





# UNITED STATES PATENT OFFICE.

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## BAG-FULLING MACHINE.

No. 836,665.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed November 29, 1897. Serial No. 660,110.

*To all whom it may concern:*

Be it known that I, BENJAMIN F. BROWN, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Bag-Fulling Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to apparatus for filling bags, more especially those adapted for seed and other small or fine material which is to be put into paper bags.

In United States Patent No. 539,171, dated May 14, 1895, an apparatus is shown for filling bags, the pile of bags to be filled being placed in a suitable guide-box, where they are suitably held, the guide-box preferably having a reciprocating motion to aid in detaching the endmost bag to be filled. The seed or other material to be put into the bags is discharged in measured quantities into a funnel in suitable manner. In order to open the bag to receive the material, a bag-opener enters between the lip of the bag and the shorter ply thereof, a lip-holder cooperating therewith and engaging the inner side of the lip, while at the same time bag-spreaders enter the bag and stretch and hold it open and in position while the material is deposited therein. After the bag is filled, the bag having been previously pasted, it is grasped by jaws or arms of a bag-carrier and moved into position opposite a folding plate or bed and clamped against it, so that the carrier in its further movement may open and retire from the bag. A folding-blade and lip-turning device then act upon the bag to lay the lip of the bag over upon the body portion of the bag, closing the same.

In the practical operation of this apparatus it has been found that sometimes the loaded or filled bag will be presented to the closing devices in such manner that the lip and shorter ply of the bag will wrinkle or buckle, so that instead of a smooth and flat fold of the lip over upon the shorter ply a very imperfect and unsightly closure results.

My present invention has for its object the production of simple means readily applicable to bag-filling apparatus—such, for instance, as shown in the patent referred to—for presenting the loaded bag to the closing

devices in such condition that when said devices operate no wrinkling of the bag-mouth can take place, the two plies being brought together flat and smooth, so that the lip when turned over will completely and perfectly close the bag along a flat fold.

Figure 1 is a front elevation of a sufficient portion of a bag-filling machine to be understood with one embodiment of my invention applied thereto, a bag being shown in position to be operated on by the closing device. Fig. 2 is a detached view in elevation of the bag-carrier with a bag filled thereby ready to move toward the bag-closing means. Fig. 3 is a top or plan view, partly broken out, of the mechanism shown in Fig. 2. Fig. 4 is a left-hand end elevation thereof. Fig. 5 is a right-hand end elevation thereof, a bag being partly shown by dotted lines, the bag-fulling mechanism not having operated. Fig. 6 is a cross-sectional detail taken on the line  $x x$ , Fig. 2, to more clearly show the manner of mounting the bag-carrier. Fig. 7 is an enlarged detail taken on the line  $x' x'$ , Fig. 2, looking to the right to more clearly show my invention. Fig. 8 is a partial side elevation thereof. Fig. 9 represents the filled or loaded bag as pinched between its ends and ready to be operated upon by the closing mechanism. Fig. 10 is a side elevation thereof, and Fig. 11 is a like view of a bag after its sides have been released and with the two plies at the mouth brought together just prior to closing.

Referring to Fig. 1, the framework A, having bearings  $A^2$  for the main shaft, provided with a pulley  $A^3$ , to which is applied the power to drive the machine, the stud  $a^3$  on which is loosely mounted the depending arm  $a^7$ , having a T-shaped lower end  $a^8$ , on the upper side of which is confined the folding-blade  $a^{13}$ , the rocking sleeve  $A^5$ , having arms  $A^6$ , in which the lip-closing device or roll  $B^{10}$  is mounted, controlled by springs  $B^8$  and adapted to travel over the folding-bed B, the bag-carrier, comprising jaws  $c c'$ , shaped to grasp between them the lower end of the bag, the support  $c^2$  on the jaw  $c$  to receive against it the bottom of the bag, the rod  $c^3$ , to which the said jaw is secured, supported in ears of a bar  $c^4$ , having a shank  $c^5$ , adjustably attached by screws  $c^7$  to an arm  $c^8$ , having a split hub  $c^6$ , clamped by a bolt  $c^9$  upon a sleeve  $c^{10}$ ,



mounted upon a stud  $c^{12}$ , the arm  $c^{13}$ , fast on the sleeve and provided with a stud  $c^{14}$  and roll to enter a cam-groove  $c^{15}$  in a cam  $c^{16}$ , fast on the main shaft, the operating mechanism for the movable jaw  $c$ , including a slide-rod  $d$ , extended through the hollow stud  $c^{12}$  and jointed to one arm of a crank  $d'$ , said rod acting when pushed in upon the arm  $d^4$  of a bell-crank lever mounted on a stud  $d^5$ , held in an ear  $d^6$  on the hub of arm  $c^8$ , to turn the said bell-crank lever, and thereby, through a link  $d^8$ , connected with an arm  $d^9$  of rod  $c^3$ , open the jaws, and the spring 107 to normally close the jaws, are and may be all substantially as shown and operating in said patent referred to, like parts herein having corresponding reference characters.

The hollow stud  $c^{12}$  has its shank reduced and threaded (see Fig. 6) to enter the main frame, the enlarged inner end of the sleeve  $c^{10}$  resting against the latter and being held in place by the enlarged head  $c^{20}$  of the stud. The shoulder  $c^{21}$  of the stud bears against the frame when the stud is tightened and prevents the sleeve  $c^{10}$  from being jammed between the stud-head and frame. A split ring  $a^{40}$  is clamped securely on the head  $c^{20}$  by a screw  $a^{41}$ , the ring having an enlargement  $a^{42}$ , on which is formed a projecting cam-block  $a^{43}$ , substantially triangular in contour, (see Figs. 3 and 4,) the base 2 and inclined outer side 3 being preferably rounded slightly at the point of intersection. The hub  $c^6$  and shank  $c^5$  are provided, respectively, with ears  $c^{60}$   $c^{50}$ , which form bearings for a rock-shaft  $b^{30}$ , having at its rear end an upturned arm  $b^{31}$  fast thereon and provided at its upper end with a roller or other stud  $b^{32}$ , adapted to travel about the perimeter of the cam  $a^{43}$  as the arm  $c^8$  is rocked, and thereby rock the shaft  $b^{30}$  in its bearings. At the front end the said shaft has fast thereon an arm  $b^{33}$ , (see Figs. 5 and 7,) connected by an adjustable link  $b^{34}$  with the depending end of one of the bag fulling or pinching members  $f$ , shown as a lever fulcrumed at  $f^x$  on the bar  $c^4$ , the upper end of said member being herein shown as provided upon its inner face with an adjustable convex block  $f'$ , held in position by a set-screw 6. A similar fulling member  $g$  is fulcrumed at  $g^x$  on the bar  $c^4$ , said members being movable toward and from each other and located outside the jaws  $c$   $c'$ , the said pinching members extending above the jaws in order that the bag, held in the latter, may be engaged by the members  $f$   $g$  at its longitudinal edges and between its ends.

The member  $g$  has a convex block  $g'$  thereon, held in adjusted position by a set-screw 7, the blocks directly engaging the side edges of the bag  $A^x$  and pinching or fulling the latter to thereby indent it at its sides, such indenting acting to kink the bag, as at 99, Figs. 9 and 10, and thereby brace the walls thereof in such manner that when the lip-closing de-

vice acts upon the bag the ply  $a^x$  and the lip  $a$  will be brought together smoothly and evenly, the bracing preventing any wrinkling of the lip or of the ply between the two side edges of the bag.

A spring  $s^{10}$  between the fulling members  $f$   $g$ , tends to normally maintain their upper ends separated, a set-screw  $g^2$ , carried by the member  $g$ , acting against a lug 22 on the bar  $c^4$  to limit the movement of the member  $g$  in one direction.

The member  $f$  has extended laterally therefrom opposite its fulcrum a preferably split forked arm  $f^3$ , tightened to take up wear by a suitable screw  $f^2$ , Fig. 7, the forked end of said arm being entered by the rounded extremity of an arm  $g^3$ , pivoted at  $g^4$  on the fulling member  $g$ .

The arm passes across the said member and at its outer end is turned over, as at  $g^5$ , to form a support for two adjustable stops, shown as screws 18 19, above and below the fulcrum  $g^x$  for the fulling member  $g$  and the fulcrum  $g^4$  for the said arm  $g^3$  and adapted to bear against the outer edge of the member  $g$ , the arm  $g^3$  being slotted at  $g^6$  to embrace the head of the fulcrum screw or stud  $g^x$ . Now when the rock-shaft  $b^{30}$  is turned to swing arm  $b^{33}$  in the direction of arrow 80, Fig. 7, the fulling member  $f$  will be rocked to depress the arm  $f^3$ , and this movement is transmitted to the arm  $g^3$  to thereby rock the member  $g$  oppositely to member  $f$ . By adjustment of the link  $b^{34}$  the throw of the members  $f$  and  $g$  is regulated according to the width of the bag, and by means of the stops 18 19 the position of the member  $g$  is adjusted to enable the upper ends of the two members to engage simultaneously the opposite longitudinal edges of the bag. The loaded bag held by the jaws  $c$   $c'$  of the bag-carrier is carried by movement of the latter from the loading means (not shown) into the position shown in Fig. 1 to have the mouth of the bag closed. As the carrier moves downward the base 2 of cam  $a^{43}$  acts upon the roll  $b^{32}$  to quickly rock the shaft  $b^{30}$ , and thereby cause the fulling members to engage and press inward the longitudinal edges of the bag then held on the carrier, so that the bag will be fulling or opened at its mouth, as shown in Figs. 9 and 10, with the ply  $a^x$  and lip  $a$  fully convexed or bellied outward. In this condition the bag is presented by the carrier to the action of the closing mechanism, (shown in Fig. 1,) and as such mechanism acts in opposite directions on the ply and lip they will be gradually flattened and brought together in a straight line without any possibility of wrinkling, twisting, or buckling, so that when the lip is folded down upon the short ply  $a^x$  the closure will be smooth, flat, and complete. The roll  $b^{32}$  will travel along the base 2 of the cam  $a^{43}$  around the corner and onto the inclined face 3 of the cam as the



bag-carrier descends, and in traveling over the face 3 the shaft  $b^{30}$  is permitted to slowly rock oppositely to arrow 80, Fig. 7, so that the fulling pressure on the bag is gradually decreased up to the point when the bag-carrier is stopped in its downward movement. While the lip-turning device is rolling down and acting against the rear side of the lip to turn it over the folding-blade the jaws  $c$   $c'$  are opened to release the bag, the release of the bag being effected through the slide-rod  $d$  and intermediate connections between it and the movable jaw  $c$ , although the kinks will remain during closure of the bag. As the fulling pressure on the bag has been relieved by the opening of the members  $f$   $g$ , the bag when closed is carried out of the way of the ascending bag-carrier by suitable means, as shown in the patent referred to. On its upward movement to take a new bag the roll  $b^{32}$  travels over the cam  $a^{43}$ , but in a reverse direction, to starting position. (Shown in Fig. 2.)

The invention will thus be seen to produce the desired effect by "fulling" the bag, as it is herein termed, by indenting or kinking one or more of the closed edges of the bag. The principle upon which the invention works will be seen when the nature of the article acted upon is considered. The bags which are handled by such a machine are flat and made of paper or similar material having three closed edges and one open edge, which is subsequently closed by the flap or lip. In other words, the bag is similar to the well-known paper envelop. The three closed edges of the bag are straight and naturally tend to remain straight, because of the fold in the paper and the tendency of the two sides of the bag to brace each other along the lines of the edges. Hence in order to distend the bag, so that it may be filled, the side edges of the bag must be brought into a position so that they will converge toward the top in order to open the mouth of the bag unless the edges of the bag are crumpled or kinked. When, therefore, any filling is placed in a bag of this character, unless the side edges are kinked or broken the mouth of the bag will take an oval form. If now it is desired to close the bag by turning over the flap, one or more of the four edges of the bag must give way, because the sides of the bag are more or less separated by the filling and the four edges cannot be restored to their opposite and parallel positions maintained in a flat empty bag. Under these circumstances the flap edge of the bag will naturally be the one to kink or break, because until the flap has been turned down this edge is weak and unbraced as compared with either of the three closed edges. This is just what is found to happen in the use of the machine to which this invention is particularly applicable. Upon attempting to fold over the

flap to fill a bag a kink will take place in the flap edge, thus rendering it impossible to produce a proper or slightly closure. If, however, one or more of the other three closed edges of the bag be kinked to full the bag, then it will obviously allow of the flap being folded over to present a straight edge, because while it is impossible in a filled bag to have the four edges straight it is possible to have any three or less straight.

The invention is not restricted to the precise construction and arrangement of parts herein shown and described, for it is believed to be broadly new to full a bag by external pressure, causing an indentation of one or more of the closed edges of the bag, thus allowing the flap or lip of the bag to be closed and sealed neatly and squarely. This indenting operation may take place either before or after the bags have been filled, the only requirement being that it shall take place before the flap is folded over. The appearance of the bag is greatly improved by causing the kinks to be formed in definite positions, thus making the bags symmetrical and slightly.

The invention thus described is defined by the following claims.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with bag-holding means, of means to engage externally and indent a closed edge of a bag to thereby full the bag and permit an even fold of the bag-flap to close the bag.
2. The combination with bag-holding means, of means to engage externally and indent the opposite closed side edges of the bag, to thereby full the bag and permit an even fold of the bag-flap to close the bag.
3. The combination with bag-holding means, of means to engage externally and indent a closed edge of a bag to thereby full the bag and permit an even fold of the bag-flap to close the bag, means for adjusting the bag engaging and indenting means to vary the degree of indentation.
4. The combination with bag-holding means, of means to engage externally and indent the opposite closed side edges of the bag to thereby full the bag and permit an even fold of the bag-flap to close the bag, means for adjusting the bag engaging and indenting means to vary the degree of indentation.
5. The combination with bag-holding means, of bag-fulling means for applying external pressure to the opposite side closed edges of the bag at points removed from the mouth of the bag to indent said edges, whereby the contained material is caused to retreat from the mouth and whereby the open mouth may close and the bag-flap be turned over to present a smooth unwrinkled closed edge.
6. The combination with bag-holding



means adapted to engage and hold the closed edge of the bag opposite the mouth, of means for applying external pressure to the opposite side edges of the bag to indent said edges whereby the open mouth may be closed and the bag-flap turned over to present a smooth unwrinkled edge.

7. In a bag-filling machine, a bag-carrier provided with bag-holding means adapted to engage the closed edge of the bag opposite the mouth, bag-fulling means mounted on the carrier and adapted to apply external pressure to the edges of and thereby indent the bag to full the same, bag-closing mechanism to operate on the bag, thus full and turn over the bag-flap to close the bag, and mechanism controlled by the movement of the bag-carrier to operate said bag-fulling means.

8. In a bag-filling apparatus, a movable carrier provided with holding means to engage the closed edge opposite the mouth of the bag, bag-fulling means, including opposite movable fulling members mounted on the carrier adjacent said holding means and adapted to apply external pressure to the opposite longitudinal edges of a bag below the open end thereof, to full the bag, and actuating mechanism for said fulling members, substantially as described.

9. In a bag-filling apparatus, a movable carrier provided with holding means to engage the closed edge opposite the mouth of the bag, bag-fulling means including opposite movable fulling members mounted on the carrier adjacent said holding means and adapted to apply external pressure to the opposite longitudinal edges of a bag below the open end thereof, to full the bag, means to independently adjust the throw of said members to accommodate bags of different widths and to insure simultaneous engagement of said members with the edges of the bag, and actuating mechanism for said fulling means, substantially as described.

10. In a bag-filling machine, a bag-carrier, bag-holding means, and bag-fulling means mounted thereon, means to close the open mouth of the full bag, and actuating mechanism for the fulling means, constructed and arranged to full the bag prior to its presentation by the carrier to said closing means and to release the bag from fulling pressure as the mouth of the bag is closed, substantially as described.

11. The combination with bag-holding means, of means movable in the plane of the bag and transversely to a closed edge thereof

to produce an indentation therein, whereby the open mouth of the bag may be closed flat by the body of the bag giving at the indentation.

12. The combination with bag-holding means, of means movable in the plane of the bag and transversely to a closed edge thereof to produce an indentation therein, whereby the open mouth of the bag may be closed flat by the body of the bag giving at the indentation, means for adjusting the throw of the bag-indenting means to vary the degree of indentation.

13. The combination with bag-holding means, of devices oppositely disposed and movable in the plane of the bag and transversely to the closed side edges thereof to produce indentations therein, whereby the open mouth of the bag may be closed flat by the body giving at the said indentations.

14. The combination with bag-holding means, of devices oppositely disposed and movable in the plane of the bag and transversely to the closed side edges thereof to produce indentations therein, whereby the open mouth of the bag may be closed flat by the body giving at the said indentations, means for adjusting the throw of said devices to vary the indentation.

15. In a bag-filling machine, a stud mounted in the machine-frame, a sleeve journaled on said stud, bag holding and carrying means mounted on said sleeve, means for rocking said sleeve, bag-edge-indenting means mounted on the bag holding and carrying means, a cam mounted on the end of said stud for operating the bag-edge-indenting means during the rocking of said sleeve.

16. In a bag-filling machine, a stud mounted in the machine-frame and provided with a shoulder abutting said frame and with an enlarged head, a sleeve journaled on said stud between the shoulder and head, bag holding and carrying means mounted on said sleeve, means for rocking said sleeve, bag-edge-indenting means mounted on the bag holding and carrying means, a cam mounted on the head of said stud for operating the bag-edge-indenting means during the rocking of said sleeve.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BENJAMIN F. BROWN.

Witnesses:

JAMES F. D. GARFIELD,  
KATHARINE B. KENFIELD.