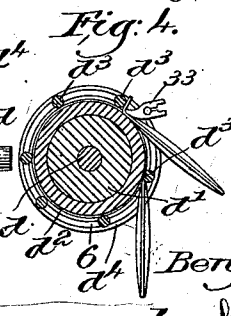
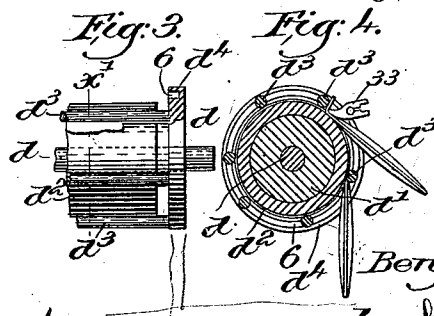
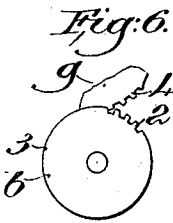
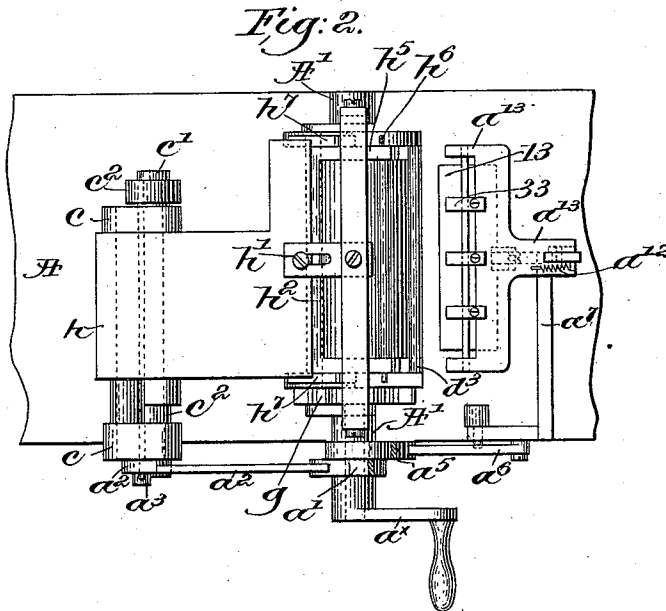
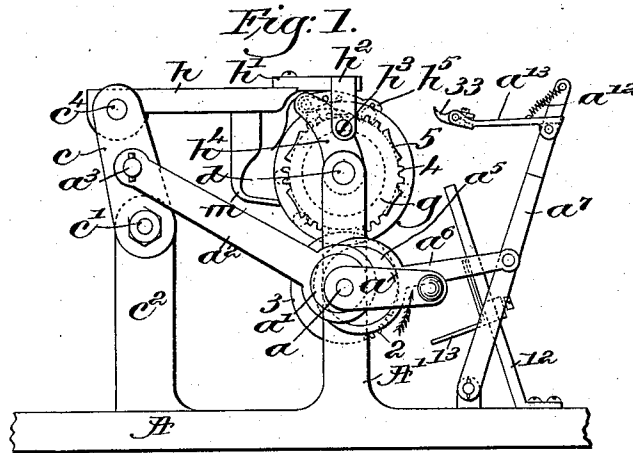
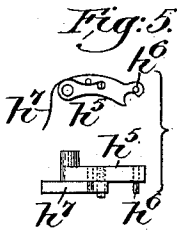


(No Model.)

B. F. BROWN.
FOLDING MECHANISM FOR BAGS, &c.

No. 578,133.

Patented Mar. 2, 1897.



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UNITED STATES PATENT OFFICE.

BENJAMIN F. BROWN, OF FITCHBURG, MASSACHUSETTS, ASSIGNOR TO THE
BROWN BAG FILLING MACHINE COMPANY, OF SAME PLACE.

FOLDING MECHANISM FOR BAGS, &c.

SPECIFICATION forming part of Letters Patent No. 578,133, dated March 2, 1897.

Application filed July 1, 1896. Serial No. 597,713. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. BROWN, of Fitchburg, county of Worcester, State of Massachusetts, have invented an Improvement in Folding Mechanism for Bags, &c., of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention is intended more especially for use in connection with bag-filling machines, such, for instance, as shown in Patent No. 539,171, dated May 14, 1895, but it may be used to advantage on other forms of bag-filling machines or where a bag or other paper article is to be folded and pasted at the fold.

The folding or creasing device, as I have herein chosen to illustrate my invention, is so made that it may also apply paste to the bag at the point where it is folded substantially as provided for in the said patent, or, in other words, the acting edge of the folding device in its retracted position will cooperate with a proper gumming mechanism to apply gum or paste to the parts of the folder which are to contact with the paper.

The folding-bed in this my invention is a novel one. Said bed is made as a cylinder, and it has preferably an elastic or yielding jacket or periphery. The bed-roll has suitable heads provided each with an annular groove, said grooves receiving and guiding the ends or journals of a series of nip-rolls, which may be pushed bodily over or with relation to the surface of the bed-roll, or, in other words, may be made to travel in said grooves about the bed-roll in one or the other direction, said nip-rolls being held firmly in position where left by or through the preferably yielding surface of the bed-roll. The bed-roll is moved intermittently and has a circular motion. The folding-blade as it approaches a bag supported against a nip-roll contacts with the said bag and pushes it against the surface of the bed-roll at a point near the nip-roll, and then the nip-roll is acted upon positively and pushed bodily forward for a short distance in its guiding-grooves in the direction of travel of the bed-roll, the latter at that time being, however, stationary,

the said nip-roll rolling over the folded portion of the bag and impinging the same to the bed-roll, while the folding blade or device retires, leaving the said bag held firmly by the nip-roll, the bed-roll or the elastic surface interposed between it and the nip-roll being of sufficient thickness and elasticity to be indented more or less by the nip-roll, such construction enabling the nip-roll to exert a firm pressure upon the bag and hold the folded and pasted parts closely together while the latter dries. In the further rotation of the bed-roll the nip-roll, holding the folded bag, strikes a stop, to be described, which arrests the nip-roll, while the bed-roll completes one of its movements, the arresting of the nip-roll causing it to be rolled off from the bag or paper held by it, freeing the same, so that it may drop into a suitable receptacle.

Figure 1 in side elevation shows a sufficient portion of a folding apparatus to enable my invention to be understood. Fig. 2 is a top view of the parts shown in Fig. 1; Fig. 3, a detail showing one end of the bed-roll and parts of some of the nip-rolls. Fig. 4 is a section in the line x' , Fig. 3, said figure showing part of the folding-blade in position and also showing a bag as caught by one of the nip-rolls. Fig. 5 is a detail showing the advancing pawl or dog for the nip-rolls, and Fig. 6 is a detail showing the gear b and part of the gear g .

The framework A, which may be part of a bag filling or a folding machine, has a shaft a , mounted in suitable bearings A' at each side thereof, said shaft being herein represented as provided with a hand-crank a^x , but in practice said shaft may be driven by power from any usual or suitable source. The lever a^7 , having the yoke a^{13} connected therewith in a yielding manner and provided with a folding device, (represented as a series of fingers 33,) are and may be all substantially as represented in said patent, said fingers in practice contacting with a part of the bag which has previously been pasted, as provided for in said patent, or in any other suitable manner. Herein the yoke a^{13} is held in yielding manner by a suitable spring a^{12} .

The lever a^7 has connected to it an eccentric link a^6 , the strap of which embraces an

eccentric a^5 , fast on the shaft a , said shaft having also a second eccentric a' , which is embraced by the strap of a link a^2 , which is pivoted at a^3 to a lever c , pivoted at c' , as herein shown, on a suitable upright c^2 , one at each side of the frame.

The levers c receive a rod c^4 , upon which is mounted a link or connection h , having, as herein represented, attached to it in an adjustable manner by a screw h' in a slot a yoke h^2 , the depending ears of said yoke being joined by stud-screws h^3 to a pawl-carrier h^4 , having its fulcrum upon the rod d , about which also, as herein shown, turns the bed-roll d' , to be described, said pawl-carriers having jointed to them suitable advancing-pawls h^5 , (shown separately in Fig. 5,) which pawls are represented as provided with pins h^6 , which ride upon the heads or plates d^4 of the bed-roll, said pawls being suitably notched to engage the nip-rolls, to be described, springs h^7 normally acting to keep said pawls with the pins h^6 upon the said heads.

The shaft a has fast upon it a driving-wheel b , having several teeth 2, and a laterally-projecting circular flange 3, the teeth 2 in use engaging the teeth 4 of a stop-wheel, said flange 3 cooperating with the concave portions 5 of the stop-wheel, said driving-gear operating the stop-wheel intermittingly, as will be well understood. The stop-wheel is fast to the bed-roll d' , which in practice will revolve about the journal d . The bed-roll has an elastic jacket d^2 , which may be of greater or less thickness and of greater or less elasticity, as desired, according to the work to be done, the ends or journals of said nip-rolls entering the annular groove 6, made in the inner sides of the heads d^4 of the bed-roll. The elastic surface of the bed-roll is shown as a little shorter than the nip-rolls, and the said elastic surface does not quite fill the space between the heads d^4 , but a space is left between the ends of the elastic surface of the bed-roll and said disks in which may move the pawls h^5 , already described, and also certain stops m , to be described.

The nip-rolls are substantially parallel one to the other, and they may be moved freely in either direction about the elastic surface of the bed-roll, their journals traveling in the said grooves, the friction of the contacting portions of the bed-roll serving to hold the said nip-rolls in any position in which they may be left.

I have shown the framework as provided with a guide 12, on which is adjustably mounted a rest or shelf 13, upon which may rest the lower end of the bag to be folded by the folding device, so that the acting edge of said folding device may contact firmly with the bag at the proper point, a point where it has been previously pasted and where it should be folded to close the mouth of the bag.

The connection h , before described, has depending from it suitable stops m , one for each end of the nip-rolls.

In operation let it be assumed that a bag supposedly folded and pasted rests at one end upon the rest 13. Now as the machine operates the folding device is moved forward by the link a^6 and contacts with said bag, pressing it against the surface of the bed-roll, very near one of the nip-rolls, as best represented in Fig. 4, and this done the connection h is operated or moved in the direction of the arrow on it in Fig. 1, causing the pawls h^5 to engage the nip-roll supporting the back of the seal-flap of the bag, said pawls pushing the nip-roll forward over the surface of the bed-roll, the latter being then stationary, folding the bag over upon the folding device, which latter retires as soon as the nip-roll gets hold of the creased or folded part of the bag, the folding-blade retiring completely from the bag, leaving the nip-roll pinching the said folded part of the bag firmly between itself and the elastic surface of the bed-roll, said pressure being continued for a sufficient time to enable the glue or paste used to become thoroughly dried, the bed-roll in its rotation carrying with it, for several steps, it may be, the filled bags pinched against the bed-roll by the nip-rolls. A bag having been folded and caught between the folding-bed and the nip-roll, the folding-bed in its rotation causes the bag to be taken off the rest 13.

In Fig. 4, where a portion of the folding device is represented, it will be seen that the seal-flap in the upper end of the bag overlaps the nip-roll; but when the nip-roll has been moved, as shown, by the second nip-roll, at the right in Fig. 4, the said nip-roll rides over the seal-flap, the bag having been folded, and holds the same during the further rotation of the folding-bed and until the said bag is to be discharged, which will be effected as soon as the nip-roll in the rotation of the bed-roll strikes the stops m , then moving backwardly, the arresting of the nip-roll while the bed-roll is moving causing the nip-roll to travel backwardly off the bag, letting it drop. The nip-roll shown at the extreme left in Fig. 4 is supposed to have been moved back, so as to release a bag.

Prior to my invention I am not aware that a folding-bed of any kind has ever had cooperating with it a series of independent nip-rolls adapted to be pushed bodily in one direction over the face of the folding-bed to thereby grasp and hold the folded part of a bag or piece of paper between said folding-bed and nip-roll during a part of the rotation of the folding-bed, the nip-roll being then moved in an opposite direction relatively to the surface of the bed-roll to effect the release of the folded bag, and hence this invention is not limited to the exact shape shown for the folding-bed, nor to the exact number of rolls, nor to the exact devices employed to move the said nip-rolls first in one and then in an opposite direction, as said devices may be variously modified by only the exercise of

the skill of the mechanic. Nor is this invention limited to the exact means shown for imparting to the folding-bed an intermitting movement.

5 In my invention the nip-rolls are guided by their journals in the grooves of the bed-roll, and they are held firmly in position solely by the elasticity of the jacket forming part of the bed-roll.

10 While for the best results and for cheapness and simplicity of construction it is best to apply the yielding medium (denominated the "jacket") directly to the bed-roll, yet my invention would not be departed from if the
15 nip-rolls should be covered with an elastic body or jacket and cooperate with a harder or more solid body or a substantially non-elastic body of the bed-roll, the purpose of the jacket being to adapt the nip-roll and the
20 bed-roll to come upon and grasp and hold firmly and then release thicknesses of paper, substantially as described.

The stops *m* are, as herein shown, carried by the connection *h*, and consequently partake
25 of its movements, so that said stops are moved intermittently into the path of the nip-rolls, in turn traveling with the bed-roll, the nip-rolls meeting said stops as the latter are moving or are about to be moved backward or
30 away from the bed-roll, and the stops having arrested the nip-roll and caused it to release a bag said stops are completely reversed from the path of the nip-rolls, letting said roll pass.

The sole purpose of the grooves in the heads
35 or plates at the ends of the folding-bed are to guide the nip-rolls as they are being moved over said folding-bed, and this invention is therefore not limited to the exact construction or shape of said guides.

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

1. In an apparatus for folding, a folding blade or device, a folding-bed, means to rotate said bed, a series of nip-rolls lying against the periphery of and surrounding said bed and movable therewith, combined with means to move each of said nip-rolls over the surface of said bed independently each of the
50 other of said nip-rolls, as and for the purposes described.

2. A folding-bed, a series of nip-rolls cooperating therewith, and an interposed yielding surface, combined with a guide near each end of said bed, into each of which guides are
55 entered the journals of a series of nip-rolls, said rolls being loosely mounted outside said folding-bed and adapted to be rolled independently over said bed to catch and hold
60 the paper to be folded, the said elastic surface serving to keep the nip-rolls frictionally in the position in which they are left about the surface of the bed, substantially as described.

3. In an apparatus for folding, a folding-bed, heads provided with grooves, a series of
65 independently-movable nip-rolls surrounding said bed and having their journals guided by said grooves, and an interposed yielding jacket, combined with a folding-blade, and
70 with devices to engage and move said nip-rolls to cause the same to travel upon the said bed to grasp and hold firmly the folded material, substantially as described.

4. In an apparatus for folding, a rotatable
75 folding-bed, a series of independently-movable nip-rolls cooperating therewith, guides for the journals of said nip-rolls, and an interposed yielding jacket, combined with a folding-blade, and with devices to engage
80 and move said nip-rolls to cause the same to travel upon the said folding-bed to grasp and hold firmly the folded material, and stops to move the said nip-rolls in an opposite direction to effect the release of the said material,
85 substantially as described.

5. A rotatable folding-bed having an elastic jacket, two disks or plates having grooves, a series of nip-rolls entered loosely in said
90 grooves and guided thereby, combined with a folding device, and with means to move said nip-rolls independently with relation to the surface of said jacket, to operate, substantially as described.

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

BENJ. F. BROWN.

Witnesses:

JOHN C. EDWARDS,
AUGUSTA E. DEAN.