

May 5, 1942.

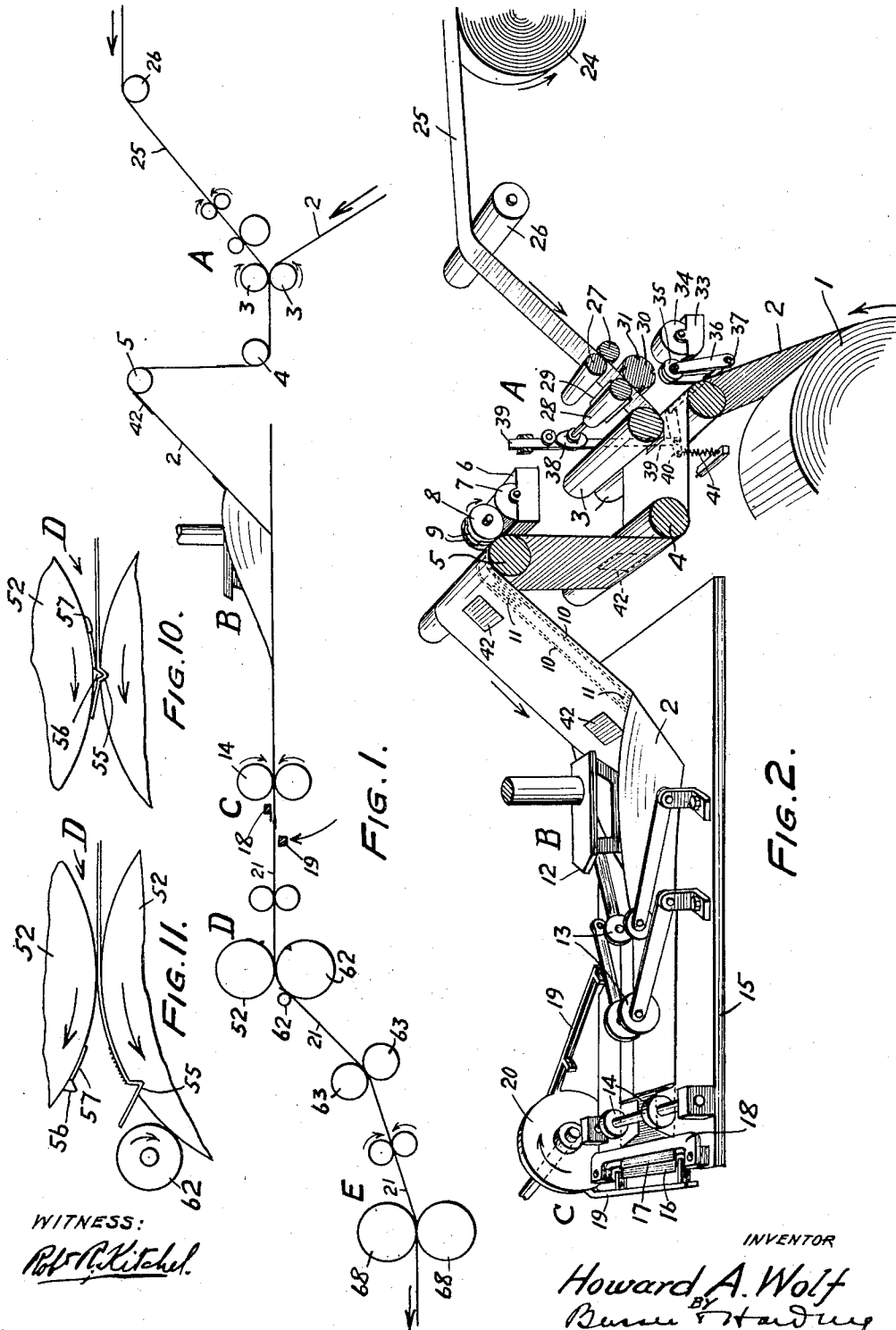
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2,281,964

METHOD AND APPARATUS FOR MAKING PAPER BAGS

Filed May 1, 1941

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

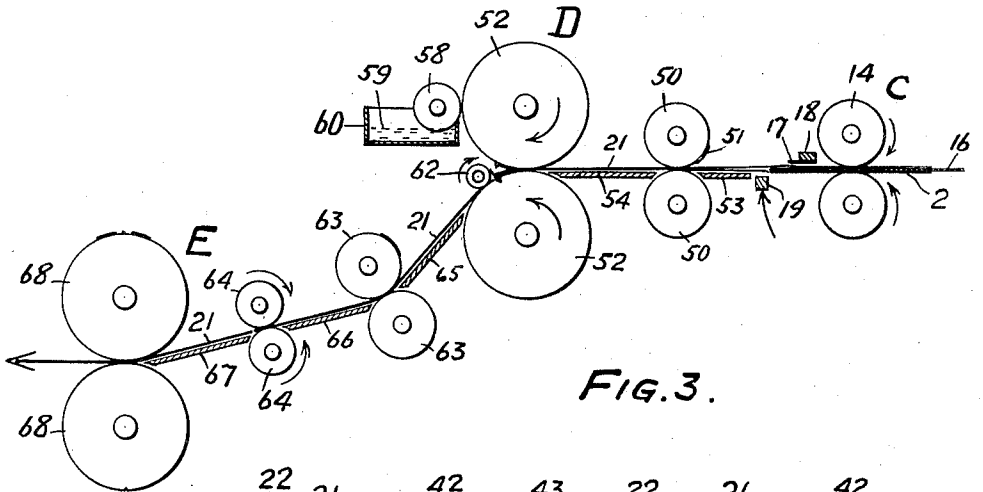


FIG. 3.

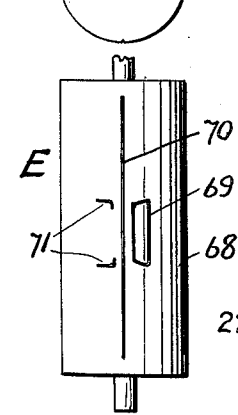


FIG. 8.

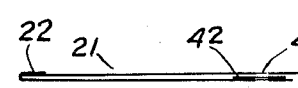


FIG. 7.

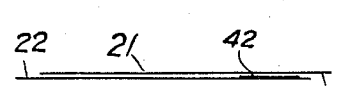


FIG. 5.

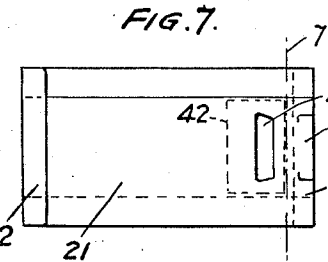


FIG. 6.

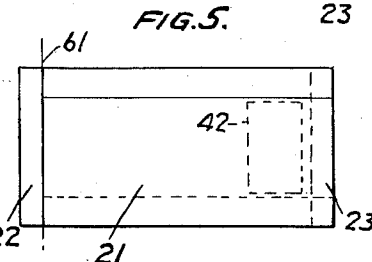


FIG. 4.

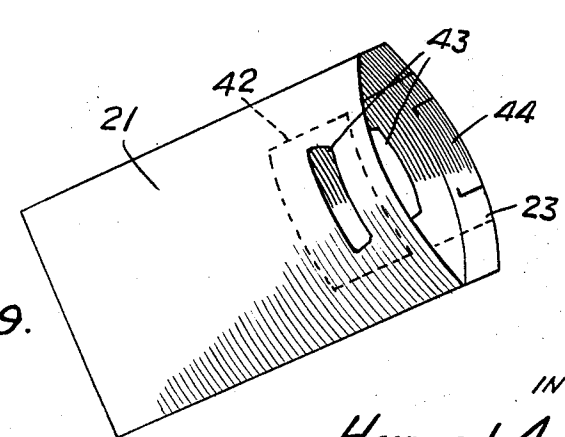


FIG. 9.

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2,281,964

METHOD AND APPARATUS FOR MAKING PAPER BAGS

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Application May 1, 1941, Serial No. 391,251

2 Claims. (Cl. 93—18)

This invention relates to method and apparatus for the manufacture of paper bags and, more particularly, of paper bags of the envelope type provided with registering reinforced openings in the front and back and closure flap for entry of the fingers and to enable them to be conveniently carried.

The method and apparatus according to this invention contemplate the continuous production of paper bags of the envelope type from a continuous strip of paper stock.

The method according to this invention will be made apparent from the following description of the apparatus, which, generally speaking, will comprise coordinated elements for applying reinforcing material to a moving strip of paper stock, folding and severing bag lengths, folding and securing the bottom closure, forming the finger openings, and creasing the top closure flap.

The several elements of the apparatus will be continuously operated in such arrangement and with coordination or timing as to progressively reinforce, fold and strike from a running strip of paper stock, and, after severance of the bag lengths, to fold and secure the bottom closure and perforate and crease the top flap, with continuity of all of the several operations.

Having now indicated, in a general way, the nature and purpose of this invention, I will proceed to a detailed description of a preferred embodiment thereof with reference to the accompanying drawings, in which:

Figure 1 is a diagrammatic view of an apparatus embodying this invention and adapted for carrying out the method according to this invention.

Figure 2 is a side view, partly in section, of the elements of the apparatus for applying reinforcing patches and folding.

Figure 3 is a side view, partly in section, showing details of the apparatus shown in Figure 1.

Figure 4 is a plan view of a folded bag blank.

Figure 5 is a diagrammatic sectional view of the blank shown in Figure 4.

Figure 6 is a plan view of a finished bag.

Figure 7 is a diagrammatic sectional view of the bag shown in Figure 6.

Figure 8 is a plan view of a perforating and creasing roll.

Figure 9 is a perspective view of the bag shown in Figure 6.

Figures 10 and 11 are end views, partly broken away, of rolls, in successive positions, for folding and securing the bottom closure.

Referring to Figure 1, the apparatus shown comprises a reinforcement applying element A, a folding element B, an element C for striking off or severing bag lengths, a bottom closure folding and securing element D, and a perforating and top closure creasing element E.

Referring now more particularly to Figure 2, showing the elements A—C, 1 indicates a roll of paper of the desired type and weight for the bag to be produced. From the roll 1 a web 2 is led through a pair of driven rolls 3, 3 and around guide rolls 4 and 5. Adjacent to the guide roll 5 and cooperating therewith is a paster comprising, for example, a container 6 for paste in which a transfer roll 7 turns and transfers paste to a series of discs which are in contact with the upper surface of the web 2 as it passes around guide roll 5. The paster as shown comprises a pair of discs 8 between which are a pair of discs which are cut away peripherally except for the portions 9, so that in practice paste is applied to the web in two continuous lines 10 and two short lines 11 at intervals.

The web 2 after passing around roll 5 passes under forming device 12 about which its side portions are oppositely folded into overlapping relation by the action of folding rolls 13, 13. The tube formed by the folding of the web about the former 12 passes beneath a pair of driven rolls 14, 14, which, cooperating with the support 15 for the former, acts to draw the web with respect to the former and folding rolls and to advance the tube as formed beyond the end 16 of the former and of a serrated cutting edge 17 supported from a bracket 18.

The end 16 of the former acts as a cutting edge and may be serrated. The cutting edge 17 is spaced to the rear of the edge 16 of the former a distance equal to the length of the closing flaps desired for the bag to be produced.

A striker 19, carried by a disc 20, adapted to be rotated in the direction of the arrow, Figure 2, operates in cooperation with the edge 16 of the former and the cutting edge 17 to sever bag lengths 21 from the tube. The walls of the tube are severed on longitudinally spaced lines for the formation of flaps one of which, as the flap 22, as will be described, is folded over and pasted to form a permanent closure at one end of the bag and the other of which forms a closing flap 23.

A roll 24 of reinforcing material of desired type, as, for example, a heavy paper, a fabric, or the like, and of desired width is supported adjacent to the roll of paper 1 and a web 25 of the material is led over a guide roll 26, between

a pair of driven rolls 27, 27 and between a roll 28 carrying knives 29 and a roll 30 provided with slots 31 to receive the knives 29 as the rolls rotate.

Adjacent to the lower of the driven rolls 3, 3 is a paster comprising a container for paste 33 in which revolves a transfer roll 34 adapted to transfer paste to a series of discs 35. The discs 35 are carried by a bracket 36 mounted in a shaft 37 adapted to be rotated against the action of a spring 41 periodically, to bring the discs into contact with the surface of the web 2 as it passes into the nip of the driven rolls 3, 3, by a cam 38 through a rod 39 connected to a crank 40 carried by the shaft 37.

In the operation of the elements A—C, the web 2 of paper is drawn from the roll 1 at a given speed by the driven rolls 3, 3 and is drawn through the former by means of the rolls 14, 14, bag lengths being struck off of the tube formed by means of the striker 19.

Simultaneously with the feed of the web 2, the web 25 of reinforcing material is fed to the cutting rolls 28, 30 by the feed rolls 27, 27, which, however, are driven at a rate slower than the rolls 3, 3, so that lengths of reinforcing material 42 are scored by knives 29 at the moment that the end of the web 25 is engaged in the nip of the rolls 3, 3, which, traveling at greater speed, act in cooperation with knives 29, which are preferably dull, to pull the length off from the web. The lengths of reinforcing material are applied by the upper roll 3 to the web 2 at points corresponding to the position of the finger opening 43 in the body of the bag and through which passes the locking tongue 44 formed in the closure flap. The paste applying discs 35 are moved, by operation of the cam 38, into contact with the surface of the web at intervals in timed relationship with the cutting rolls 28, 30 so that lines of paste will be applied to the web 2 at intervals corresponding to the intervals of delivery of the reinforcing members 42 to the nip of the rolls 3, 3. The reinforcing elements 42 passing through the rolls 3, 3 with the web 2 will be adhered to the web by the paste applied by discs 35.

Referring now more particularly to Figures 3, 8, 10 and 11, at the moment of severance of the bag lengths, by the striker 19, the end of the folded web, guided by the table 53, with which may be associated a tape or conveyor, will have passed through the pinch rolls 50, 50, which contact with the folded web 2' for a moment once each revolution, just prior to the operation of the striker, through the medium of the raised portion or pad 51 on the upper roll 50, and, guided by the table 54, will be engaged in the nip of rolls 52, 52, which comprise essentially the bottom closure folding and securing element D. The pinch rolls 50, 50 travel at less speed than do the rolls 14, 14, so that when the pad 51 engages the folded web, it operates to let some slack build up in the tube to facilitate the severing action of the striker.

The rolls 52, 52 are shown in detail in Figures 10 and 11, from an inspection of which it will be noted that the surface of the lower roll is grooved longitudinally to form the V-shaped groove 55, while the upper roll is provided with a complementary projection 56 adjacent to which is a longitudinally extending paste pad 57 adapted to receive paste from a paster roll 58 turning in a supply of paste 59 in a container 60. Adjacent to and cooperating with the lower roll 52 is a presser roll 62.

In operation of the element D, on the severance of a bag length 21, by striker 19, the edge of projection 56 on the upper roll 52, will engage the bag blank along the line of juncture 61 (Figure 4) of the bottom closure flap with the body, and in the travel of the rolls will force it into the groove in the lower roll, thus creasing along the line 61 and bending the flap 22 up at an angle. Immediately following, the paste pad 57 applies paste to the end portion of the body of the bag. The bent-up flap 22 then contacts the presser roll 62, which acts to push the flap 22 back and press it down onto the pasted area of the body, thus securing it to the body.

As another bag length follows the course through element D, as just described, the first bag length, closed at its bottom, passes through the pair of rolls 63, 63 and 64, 64, and into the nip of the perforating and creasing rolls 68, 68, under the guidance of tables 65, 66 and 67. Tapes or endless conveyors may be provided to convey the bag lengths over any of the tables 65, 66 or 67.

The perforating and creasing rolls 68, 68 comprise the element E. The upper roll 68 is provided with a cutter 69, a creasing bar 70 and a pair of slitting knives 71, 71, arranged on the surface of the roll so that as the bag length passes through the roll the cutter 69 will cut through the reinforced areas of the walls of the bag to form finger openings 43, while the creasing bar 70 will form a crease along line 72 at the juncture of the closure flap 23 and the body of the bag and the slitters 71, 71 will slit the closure flap 23 to form the locking tongue 44, all with the production of the completed bag as shown in Figures 6 and 9. It is of importance that the cutter 69, creasing bar 70 and slitting knives 71, 71 be all mounted on the roller 68 in order that the slits and perforations be so exactly related to the crease that when the closure flap is folded down, the locking tongue formed by the slits will exactly register with the finger apertures.

It will be appreciated that in the formation of the completed bag shown in Figures 6 and 9, the web and severed bag lengths or blanks are in continuous motion. The application of the reinforcing patches 42 and the folding is accomplished successively with the web 2 in continuous motion. The striking off by the striker 19 is periodic with, however, the web 2 in motion. Following the striking off of the bag lengths the bag lengths continue in motion through the element D, where the closure flap is folded and secured, and in continuous motion through the element E, where the openings 43 and the slits forming locking tongue 44 are cut and the crease line for the closure flap formed.

It will thus be noted that the apparatus in accordance with this invention operates to carry out the method in accordance with this invention all in a continuous manner with simplicity, speed and high efficiency.

It will be understood that it is not intended that this invention shall be limited to the details described above for the purposes of illustration, it being contemplated that various modification in detail may be made without departing from the scope of the claims appended hereto.

What I claim and desire to protect by Letters Patent is:

1. Apparatus for making paper bags comprising, in combination, means for continuously advancing a web of paper, means for continuously

advancing a web of reinforcing material, means for severing lengths of reinforcing material from said web thereof and applying said lengths to said advancing web of paper at predetermined intervals, means for forming said advancing web of paper into a tube, means for periodically severing bag lengths having closure flaps at their ends from the advancing tube when formed, means for continuously advancing the bag lengths when severed, means operable in the continuous advance of the bag lengths for folding down and securing the closure flap at the leading end of the bag lengths and a pair of rolls adapted to receive the bag lengths in their continued advance, one of the rolls of said pair carrying means for first forming a finger opening in the body of the bag length adjacent to the trailing end, means for then creasing along the line of juncture of the closure flap at the trailing end and the body and means for finally slitting the said closure flap to form a locking tongue.

2. The method of forming paper bags which comprises continuously advancing a web of paper and a web of reinforcing material, severing patches from the web of reinforcing material and applying them at intervals to the advancing web of paper, forming the advancing web of paper into tubular form and periodically severing bag lengths with closing flaps at both ends from the tube formed, continuously advancing the bag lengths after severance from the tube, folding and securing the closure flaps at the leading ends of the advancing bag lengths, and, then while continuing to advance the bag lengths, successively first cutting a finger opening in the body of the bag lengths adjacent to the trailing end of the bag lengths, then creasing along the line of juncture of the closure flap at the trailing end and the body and finally slitting the closure flap to form a locking tongue.

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