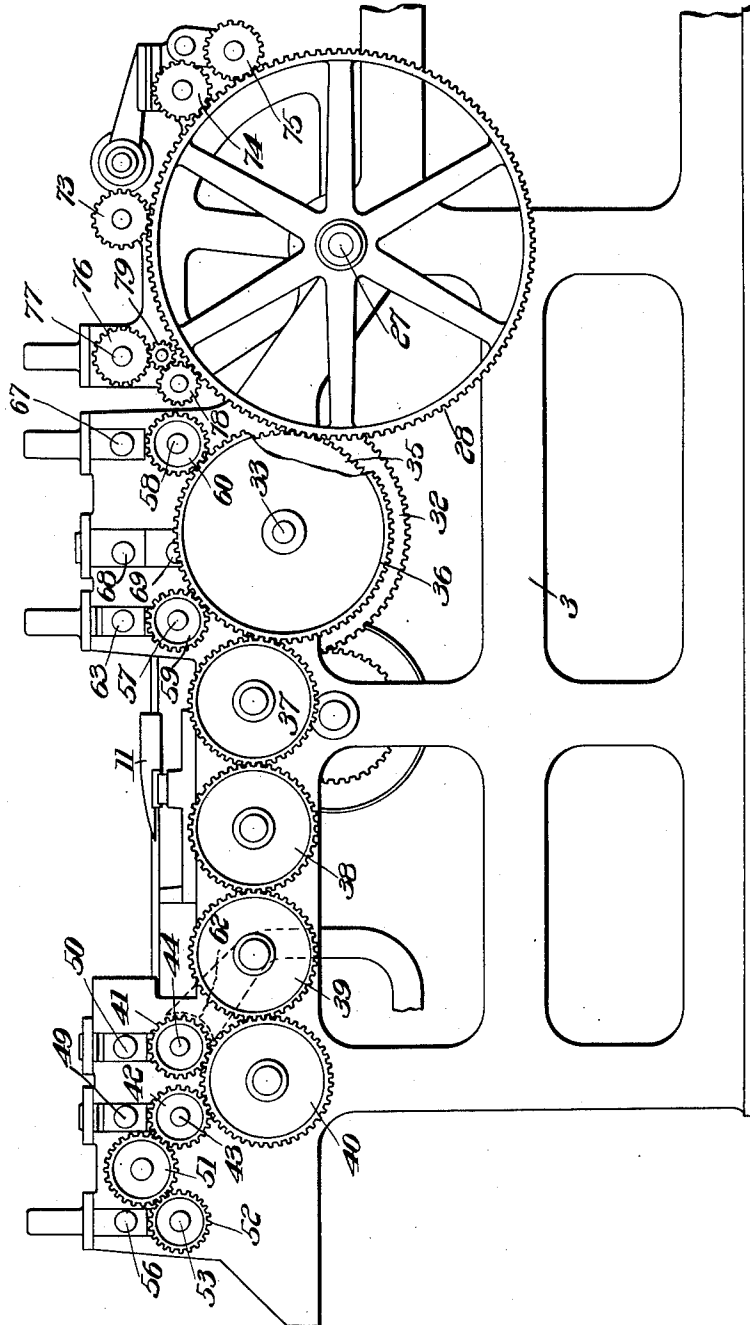


J. FROEHLICH.
PAPER BAG MACHINE.
APPLICATION FILED FEB. 11, 1911.

1,007,856.

Patented Nov. 7, 1911.
3 SHEETS—SHEET 1.

Fig. 1.



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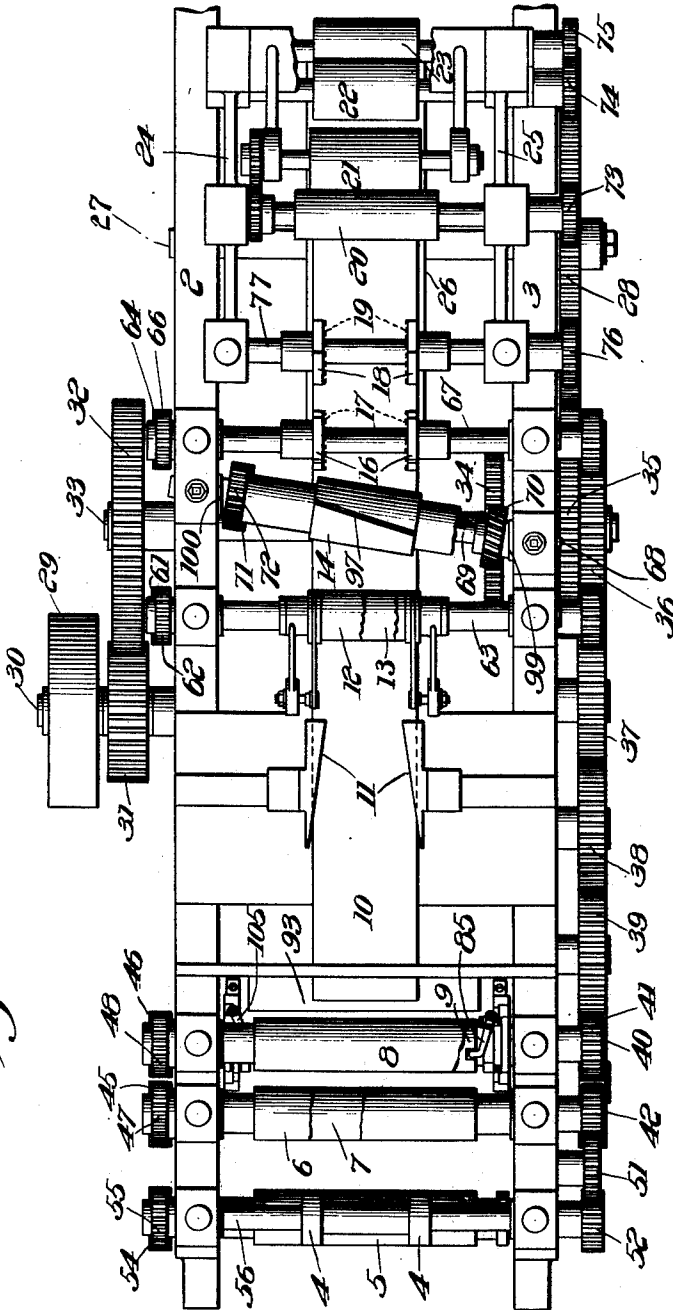
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS-SHEET 3.

Fig. 4.

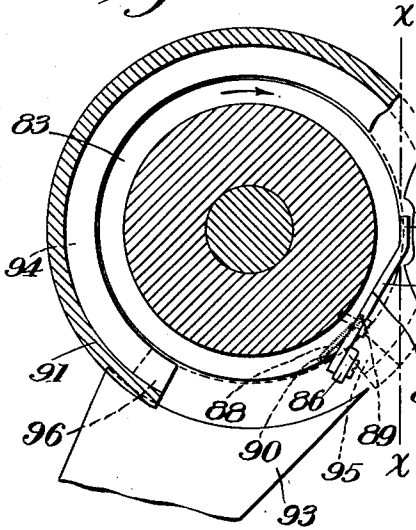


Fig. 3.

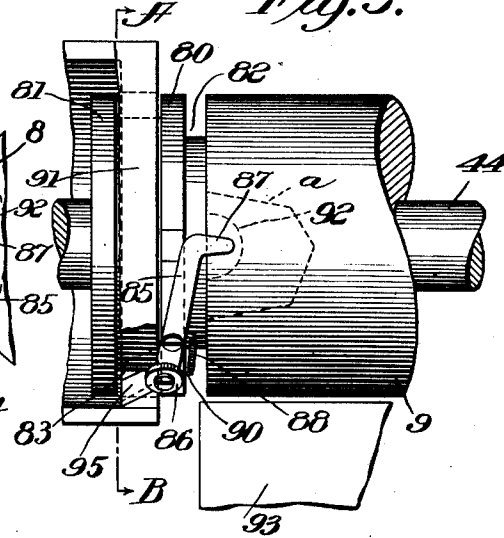


Fig. 6.

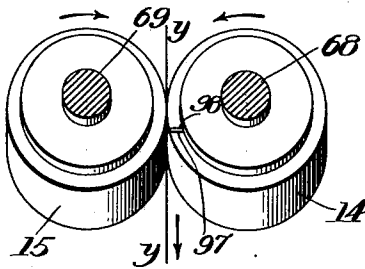


Fig. 5.

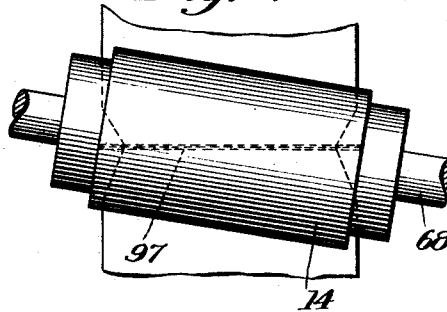
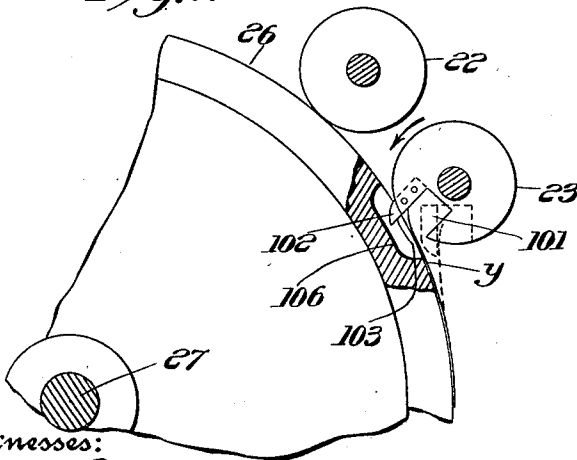


Fig. 7.



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UNITED STATES PATENT OFFICE.

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PAPER-BAG MACHINE.

1,007,856.

Specification of Letters Patent.

Patented Nov. 7, 1911.

Application filed February 11, 1911. Serial No. 608,150.

To all whom it may concern:

Be it known that I, JOSEPH FROEHLICH, a citizen of the United States, and a resident of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a specification.

This invention relates to paper bag machines and is illustrated as embodied in a machine of the class specified for making the so called "candy-bag" or open ended envelop, wherein from a continuous web of paper the blanks are cut, folded and gummed, from said web as it passes substantially in one plane through the machine.

The object of my invention is to furnish means comprising few parts, of simple construction which may be run with accuracy at high speeds for the purpose above set forth. My improvements are not however limited to the manufacture of the particular form of paper bag known as the "candy-bag" but are equally applicable to other forms of paper bags as will be obvious to those skilled in the art.

The nature of my improvements may be best understood as described in connection with the drawings accompanying this specification, and in which,

Figure 1 is a side elevation of so much of a paper bag machine of the class specified, as will suffice to illustrate the preferred form of my improvements. Fig. 2 is a plan view of what is shown in Fig. 1, with certain parts broken away for clearness of illustration. Fig. 3 is a plan view, on an enlarged scale, of the waste cut holding means with the cutting roll removed. Fig. 4 is a sectional view on the line A B of Fig. 3. Fig. 5 is a plan view on an enlarged scale of the cutting off or separating roll with the knife shown dotted in its cutting position. Fig. 6 is an end elevation of the cutting off roll and its coacting roll. Fig. 7 is an end elevation, on an enlarged scale of the delivering roll and its coacting drum, the latter partly in section.

My improvements relate to those parts of a paper bag machine of the class described as pertain to cutting and separating the blanks and delivering the completed bag to the drying means, and particularly to means for delivering the chips or waste, cut from the blanks, to a convenient point outside the

machine, means for separating lengthwise the blanks or partially formed bags, one from another and means for underlapping successive bags as they are delivered to the drying mechanism.

The present machine may comprise the usual side frames, as 2 and 3 in which are erected the various operative parts. In Figs. 1 and 2 the left hand end is the feed end of the machine and the right hand end, the delivery end.

Mounted in coacting pairs, on shafts supported in suitable bearings in side frames 2 and 3, and in spiders adjustably supported by said frames, are the various feed, cutting, gumming and delivery rolls, properly timed and spaced for the forming of a paper bag as the paper web is fed through the machine, substantially in one plane, from a roll which may be supported by any convenient means, not shown.

Beginning at the feed end of the machine, rolls 4, 5 receive the paper web from the source of supply and deliver it to creasing rolls 6, 7 and thence to cutting rolls 8, 9 and thence over table 10 and under side flap folding blades 11, 11 to feed rolls 12, 13 which deliver the side folded blank web to the cutting off or separating rolls 14, 15. The side folded and separated blank is then forwarded by the edge feed rolls 16, 17 and 18, 19 under end flap gumming roll 20, which receives gum from a reservoir, not shown, by means of transfer roll 21. The bottom flap on the leading end is then folded over and down against the bag body by any well known means not shown and the completed bag passes under feed roll 22 and delivery roll 23 and is discharged to the drying mechanism, not shown. Rolls 18, 19, 20, 22 and 23 are fixed to shafts revolvably mounted in spiders 24, 25 adjustably supported by side frames 2 and 3 respectively. Rolls 20, 22 and 23 are not in coacting pairs but coact with drum 26 fixed on shaft 27 to which is also fixed spur gear 28.

The machine is driven, from any source of power, by belt to pulley 29 fixed on shaft supported in bearings of side frames 2 and 3. Said shaft 30 has gear 31 fixed thereon, which drives gear 32 fixed to main shaft 33; fixed to said shaft 33 between frames 2, 3 is gear 34 and outboard frame 3, gears 35 and 36 are fixed to said shaft. Said gears 34, 35 and 36 drive through properly proportioned

gear trains, the various parts of the machine as hereinafter described. Gear 36 meshes with gear 37 and through the train of gears 38, 39, and 40 drives gears 41 and 42 fixed to shafts 44 and 43 of the rolls 9 and 7 all respectively. Shafts 44 and 43 carry at their other ends outboard side frame 2, gears 46 and 45 meshing with gears 48 and 47 mounted on shafts 50 and 49 respectively. Meshing with gear 42 is gear 51 driving gear 52 carried by shaft 53 of feed roll 5; said shaft 53 has fixed on the other end thereof gear 54 meshing with gear 55 fixed on shaft 56 of upper feed roll 4. Shafts 57 and 58 of lower feed rolls 13 and 17 have fixed thereon gears 59 and 60 respectively driven by gear 36 on shaft 33. Shaft 57 has gear 61 fixed thereon outboard side frame 2 and drives gear 62 on shaft 63 of feed roll 12 and gear 64 fixed to shaft 58 drives gear 66 fixed to shaft 67 of feed roll 16.

Shafts 68 and 69 of the cutting off rolls 14 and 15 respectively are revolvably supported in the side frames 2 and 3 and disposed obliquely to the direction of travel of the web as shown in Fig. 2. Shaft 69 carrying lower cut off roll 15 has fixed thereto helical gear 70 driven from gear 34. Fixed near the other end of said shaft 69 is gear 71 driving gear 72 fixed to shaft 68 of upper cut off roll 14. Rolls 20, 22 and 23 have gears 73, 74, 75 fixed to their shafts respectively and are driven by gear 28 which gear is driven by gear 35 on shaft 33. Gear 76 fixed to shaft 77 is driven from gear 28 through intermediate gears 78 and 79.

Directing attention now more particularly to my improvements, Figs. 3 and 4 illustrate the means provided for holding the waste portion of paper cut from between two adjacent bag blanks, carrying it beyond the plane of travel of the paper web and delivering it to a chip receiver having suction means. In Fig. 3 the upper or cutting roll 8 is removed for clearness of illustration and the waste portion of paper is indicated by dotted profile *a*. In Fig. 4 a portion of the upper or cutting roll 8 is shown, the cutting knives being omitted. Flanges 80, 81 are fixed on shaft 44 the former being separated from roll 9 by groove 82 and the two flanges from each other by groove 83. Pivottally mounted on a flat-turned portion 84 of the periphery of flange 80 is the chip lever 85 carrying at the end nearest its pivotal center, roller 86, the other end of said lever is provided with a tongue 87 for engagement when in its inner position, with the periphery of roll 9. Tension spring 88 attached to pin 89 on chip lever 85 and to pin 90 on flange 80 is efficient to urge chip lever 85 to its inner position with tongue 87 thereof in engagement with roll 9. Fixed cam 91 lies within recess 83 between flanges 80 and 81, and may be secured in any suitable manner

to the adjacent side frame of the machine. Said cam is shown partly by full and partly by broken lines and is so formed as to release and engage at the proper times roller 86 mounted on chip lever 85. The upper or cutting roll 8 is recessed at 92 to admit the entrance of tongue 87 of chip lever 85, between the rolls 8 and 9. In front of the roll 9 and below the plane of travel *a*, of the paper, I mount chip receiver 93 from which the air may be exhausted by some suitable means, not shown.

The operation of my improved chip holding and discharging means is as follows: As flange 80 and roll 9 fixed to shaft 44 revolve in a clockwise direction, roller 86 of lever 85 while in engagement with the flat portion 94 of cam 91 maintains said lever in its outer position against the tension of spring 88, and the tongue 87 out of engagement with roll 9. The inclined surface 95 of cam 91 is so positioned as to allow roller 86 to ride off when the tongue 87 of lever 85 is tangent to rolls 8 and 9 at their point of cutting contact, spring 88 throws said lever inwardly with tongue 87 over the waste portion of paper *a*, as it is being cut from the paper web and holds it firmly to roll 9 until said waste or chip reaches chip receiver 93; thereupon roll 86 climbs inclined surface 96 of cam 91 and lever 85 is thrown outwardly and tongue 87 releases chip *a*, which is drawn by suction through the chip receiver 93. A similar chip lever 105 is provided at the other end of roll 9, as indicated in Fig. 2, mounted and operated as just described in connection with lever 85.

Figs. 5 and 6 show in detail my diagonally disposed cutting off rolls for separating the web into blanks in an approximately straight line normal to its direction of travel. Upper roll 14 has blade 97 rigidly mounted in slot 98 planed therein oblique to the axis of said roll, for coaction with the face of roll 15 thereunder, said blade has a cutting edge all points of which are equidistant from the axis of its roll 14 and said cutting edge is elliptical in profile. Roll 14 may be mounted in bearings 99, 100 in frames 3, 2 respectively. I am aware that coacting helical cutters having their axes diagonally disposed have been heretofore used for cutting a web normal to its direction of travel. The construction and maintenance of such a helical cutter is difficult and expensive and my improved arrangement of blade 97 is much simpler and its line of cut is substantially a straight line. The highly desirable shearing cut, starting at one edge of the paper and finishing at the other edge thereof is thereby attained without the intervention of the elaborate true helical cutter.

In delivering the completed bag to the drying means, which travels at a much

slower speed than the bag in its formation, it is necessary to lap the bags, leaving the gummed sealing flaps exposed to the drying action of the air. To accomplish this lapping of the bags, I employ delivery roll 23 in coaction with drum 26. Said roll 23 is provided with a rectangular recess or slot 101 extending its entire length, see Fig. 7. A finger 102 is fixed near each end of said roll and the working edge 103 thereof is co-incident with the rearward face of slot 101. Drum 26 is provided with recesses 106 at proper intervals in its circumference to admit fingers 102 of roll 23. The action of the fingers 102 upon the completed bag is as follows:—The bag *y* in its passage between roll 23 and drum 26 is so timed that its unsealed flap registers with the recess 101 of roll 23 and but partially covers the recesses 106 of drum 26. Fingers 102 follow the end of the bag, enter recesses 106 and lift the bag from the surface of the drum as shown in dotted lines, Fig. 7. The leading end of said bag is then delivered to receiving means not shown and the leading end of the next succeeding bag passes under bag *y* and as its gummed flap following end reaches roll 23 the lifting operation is repeated and so on indefinitely.

30 I claim:—

1. A paper bag machine including in combination, a pair of rotating cutting rolls, and unitary waste gripping and discharging means mounted on one of said rolls.
- 35 2. A paper bag machine including in combination, a rotating roll, means coacting therewith for cutting a chip from the edge of a sheet delivered thereto, means mounted on said roll for gripping said chip to the cylindrical face of said roll and for releasing said chip.
- 40 3. A paper bag machine including in combination, a rotating roll, means coacting therewith for cutting a chip from a sheet delivered thereto, means mounted on said roll for gripping said chip to the cylindrical face of said roll and for releasing said chip

from said roll and means for conveying said chip from said roll.

4. A paper bag machine including in combination, a roll, means coacting therewith for cutting a chip from a sheet delivered thereto, a lever mounted on said roll, a fixed cam for coaction with said lever to cause it successively to grip said chip to the cylindrical surface of said roll and to release said chip from said roll.

5. A paper bag machine including in combination, means for advancing a web, a pair of coacting rolls having their axes oblique to the direction of travel of said web and parallel with each other, one of said rolls having a straight blade obliquely mounted therein whose cutting edge is elliptical and conforms to the cylindrical surface of said roll for coaction with the other roll to sever said web at approximately right angles to its direction of travel.

6. A paper bag machine including in combination, means for advancing a web, a pair of coacting rolls having their axes oblique to the direction of travel of said web and parallel with each other, one of said rolls having mounted lengthwise therein a cutter having an elliptical profile for coaction with the other roll.

7. A rotating member having a continuous cylindrical face, a gripping lever mounted adjacent to said rotating member for rotation therewith, said lever having a tongue for coaction with the cylindrical surface of said rotary member for gripping a chip thereto, a cutting member for coaction with said rotating member to cut a chip from a sheet of material delivered thereto and means for actuating said lever for causing said tongue to alternately grip and release.

Signed this 6th day of February 1911 before two subscribing witnesses.

JOSEPH FROEHLICH.

Witnesses:

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ELIZABETH SCHMIDT.