Nov. 16, 1937. A. POTDEVIN 2,099,314

CUTTING-OFF MECHANISM FOR BAG MAKING MACHINES AND THE LIKE

Filed Nov. 7, 1935

Fig. 1

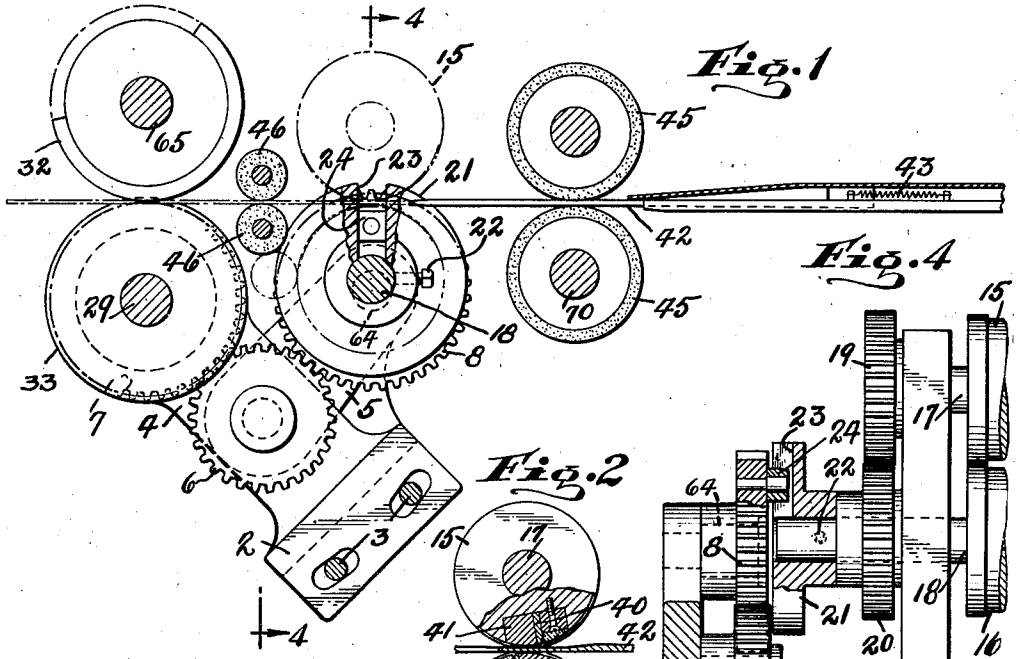
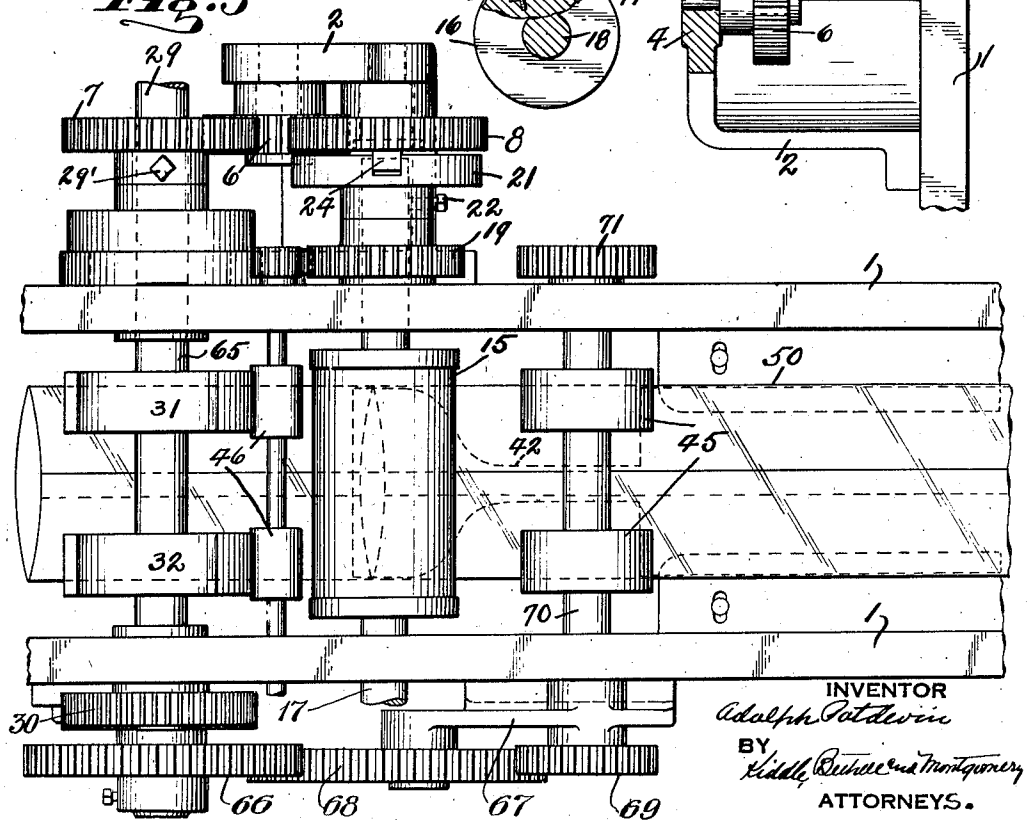


Fig. 4

Fig. 2

Fig. 3



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Patented Nov. 16, 1937 2,099,314

UNITED STATES PATENT OFFICE

2,099,314

CUTTING-OFF MECHANISM FOR BAG MAKING MACHINES AND THE LIKE

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Application November 7, 1935, Serial No. 48,614

3 Claims. (Cl. 164—68)

This invention relates to improvements in bag making machines and is particularly directed to improved cutting off mechanism of the rotatable type, that is to say, wherein the cutters are mounted on rotatable rollers or cylinders, these cylinders rotating at such a speed that the cylinders make one complete revolution for each bag length severed from the bag tubing which is fed continuously to the cutting off mechanism. My improved mechanism is designed primarily to increase the range of the machine and to facilitate the making of bags of different lengths.

In the accompanying drawing wherein I have illustrated one embodiment of my invention:

Fig. 1 is an elevational view of the cutting off mechanism;

Fig. 2 is an end view partly broken away of the cutting cylinders;

Fig. 3 is a plan view of the mechanism of Fig. 1; and

Fig. 4 is a view on the line 4—4 of Fig. 1 looking in the direction of the arrows thereon.

Referring to the drawing in detail, 1 designates the side frames of the machine to which a bracket 2 is adjustably secured by means of bolts 3.

The bracket 2 comprises two arms 4 and 5. The arm 4 is provided with a pinion 6 and at its free end with a gear 7 meshing therewith. The arm 5 carries a gear 8 mounted on a stub shaft 64 and also meshing with pinion 6.

15 and 16 designate a pair of cutter carrying rollers mounted one above the other on shafts 17 and 18. The shafts 17 and 18 are geared to each other by the gears 19 and 20.

On one end of the shaft 18 is a disc 21 adjustably secured to the shaft 18 by a bolt 22, which permits of the disc 21 being rotated relatively to the shaft 18 in setting the machine.

The disc 21 is provided in its outer face with a radial slot 23, this slot receiving a block 24 pivotally fixed to the gear 8 as plainly seen in Fig. 4.

The gear 7 above referred to and which meshes with the pinion 6 is mounted on a shaft 29, which in the illustration is the drive shaft of the machine, this shaft extending parallel to the shaft 18 and carrying a cylinder 33 cooperating with discs 31 and 32 mounted on a shaft 65 above the shaft 29.

The drive shaft 29 is equipped at one side of the machine with a change gear 66. On the shaft 70 of a pair of forwarding rollers 45 geared together to run at the same speed by gears 71, is a swing bracket 67, carrying a pinion 68 meshing with a gear 69 on the shaft 70 and with the change gear 66.

The discs 31 and 32, above referred to, are over-speeded with respect to the speed of the forwarding rollers so that the linear speed of these discs is higher than the speed of the paper being advanced by the forwarding rollers. This is for the purpose of momentarily applying tension to the paper to complete the severing operation. This will be mentioned hereinafter.

Each of the cutting off cylinders 15 and 16 is provided with a cutter 40 set into the face of the cylinder beside a land 41, the cutting edge of each cutter projecting slightly beyond the periphery of each cylinder as will be understood. These cutters cooperate with a cut off plate 42 over which the paper tubing, designated 50, is drawn by the forwarding rollers 45, this cut off plate and the cutters 40 providing a rolling pinch cut for severing both walls of the tubing from one side to the other, whereby the tubing is divided into bag lengths except for that part of the edge of the tubing which extends along the edges of the plate 42. This is torn through by the tension exerted on the paper by the overspeeded rollers or discs 31 and 32 which, as above mentioned, are traveling at a higher peripheral speed than the linear speed of the paper. This apparatus is fully set out in the copending joint application of myself and George Hampton, Serial No. 746,082, filed September 29, 1934. As indicated on the drawing, the plate 42 which is moved forward automatically by the cutting off mechanism is retracted by a spring 43.

It will be evident from the description thus far given and from the drawing accompanying this application that the cut off cylinders 15 and 16 make one revolution for each bag length. It is quite evident that with the cut off cylinders making one complete revolution for each bag length that the mere speeding up of the tubing 50 would not suffice to vary the bag lengths severed from the tubing by the cut off mechanism, because it is necessary in bag making machinery wherein rotary cutters are employed for dividing the bag tubing into bag lengths that the cutters when they engage the paper be traveling at substantially the same speed as the paper to avoid tearing of the paper. It becomes necessary, therefore, to effect some adjustment of the cutting off mechanism. One possibility would be to vary the diameter of the cut off cylinders. This would necessitate removal of the cylinders 15

and 16 and substitution of cylinders of a different diameter.

Let us assume, for example, that in the present case it be desired to increase the bag length cut off by the cutters 40 as compared with the setting of the machine illustrated in the accompanying drawing. In this event the change gear 66 will be removed and substituted by a change gear of larger diameter, thereby to increase the speed of rotation of the forwarding rollers 45 and with a corresponding increase in the speed of advance of the tubing 50, as will be understood. This change, however, does not alter the speed of rotation of the cut off cylinders 15 and 16 so that the knives 40 if allowed to contact with the paper for the cutting off operation would be traveling at a slower speed than the paper, which, as above pointed out, is undesirable. Accordingly it becomes necessary to alter the speed of rotation of the cut off cylinders 15 and 16 at the instant of cut-off so that when the knives 40 contact the bag tubing they will be moving at approximately the same speed as the tubing.

To effect this adjustment it is merely necessary to loosen the bolts 29' and 22 by which the gear 7 and disc 21 are held to their respective shafts. The gear train comprising the gears 7, 6 and 8, together with the disc 21, are then rotated as a unit, with the cutters set about as indicated in Fig. 2, but of course with the cutters stationary. This shifting of the gear train just referred to will alter the setting of the disc 21 with respect to the cutters 40 so that the cutters 40, with the new setting, will be traveling at a different speed at the instant of cut-off than they were before. It will be appreciated of course that the disc 21 does not travel at uniform speed due to its crank connection to the gear 8. With this new setting, the operator then turns the machine over by hand, and if he finds the cutters 40 are not traveling at paper speed at the instant of cut-off he again makes an adjustment. As an alternative to this second adjustment he may alter the setting of the bracket 2 to shift the position of the block 24 in the slot 23 of the disc.

It will be seen from all of the foregoing that the present invention provides a construction in which while the cut-off cylinders make a complete revolution for each bag length, the speed of the cutters at the instant of cut-off is varied without varying the speed of the drive shaft of the machine, so that by varying the speed of the paper as it passes through the machine the length of the bag lengths will be varied, the cutters at each operation, however, traveling at paper speed.

It will be understood that changes may be made in the details of construction and arrangement of parts within the purview of my invention.

What I claim is:—

1. In a machine for dividing tubing into bag lengths, the combination of forwarding rollers, a constant speed drive shaft therefor, a gear train intermediate said rollers and shaft, one gear thereof being removable and replaceable by another gear to vary the speed of said rollers, a pair of cut-off cylinders, cutters carried thereby, said cylinders making one revolution for each bag length, and means for driving said cylinders from said constant speed drive shaft and comprising a rotatable disc, a crank for driving said disc, whereby the cut-off cylinders between cut-offs are rotated at a surface speed different from their surface speed at the cut-off, and means for varying the setting of said disc circumferentially of the cut-off cylinders to accommodate the cut-off to variations in the speed of the forwarding rollers thereby to vary the bag lengths.

2. In a machine for severing tubing into bag lengths the combination of forwarding rollers for continuously advancing the tubing, a constant speed drive shaft therefor, a gear train intermediate said shaft and rollers, one gear thereof being removable and replaceable by another gear to vary the speed of said rollers, a pair of cutter-equipped cut-off cylinders and a cooperating plate for dividing the tubing into bag lengths with a rolling pinch cut, means for driving said cutter-equipped cylinders from said constant speed drive shaft, said means comprising a rotatable disc for driving said cut-off cylinders, a crank for driving the disc and means for varying the setting of said crank and disc to accommodate the cut-off cylinders to variations in the speed of the cut-off rollers thereby to produce a variation in the bag lengths.

3. In a machine of the class described, a pair of forwarding rollers for continuously advancing tubing which is to be divided into bag lengths, a constant speed drive shaft for said rollers, a gear train between said drive shaft and said rollers, a pair of cut-off cylinders for severing the tubing into bag lengths, said cylinders making one revolution for each bag length, adjustable means intermediate the said constant speed drive shaft and said cut-off cylinders for transmitting power to the cylinders, variations in the said gear train effecting changes in the tubing speed without varying the speed of the said drive shaft, and adjustment of said adjustable means intermediate the drive shaft and cut-off cylinders maintaining the surface speed of the cut-off cylinders at tubing speed at the instant of cut-off throughout the said changes in speed of the tubing.

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