Nov. 17, 1936. A. NOVICK 2,060,821

MANUFACTURE OF ENVELOPES, BAGS, OR OTHER CONTAINERS

Original Filed Oct. 7, 1933 4 Sheets-Sheet 1

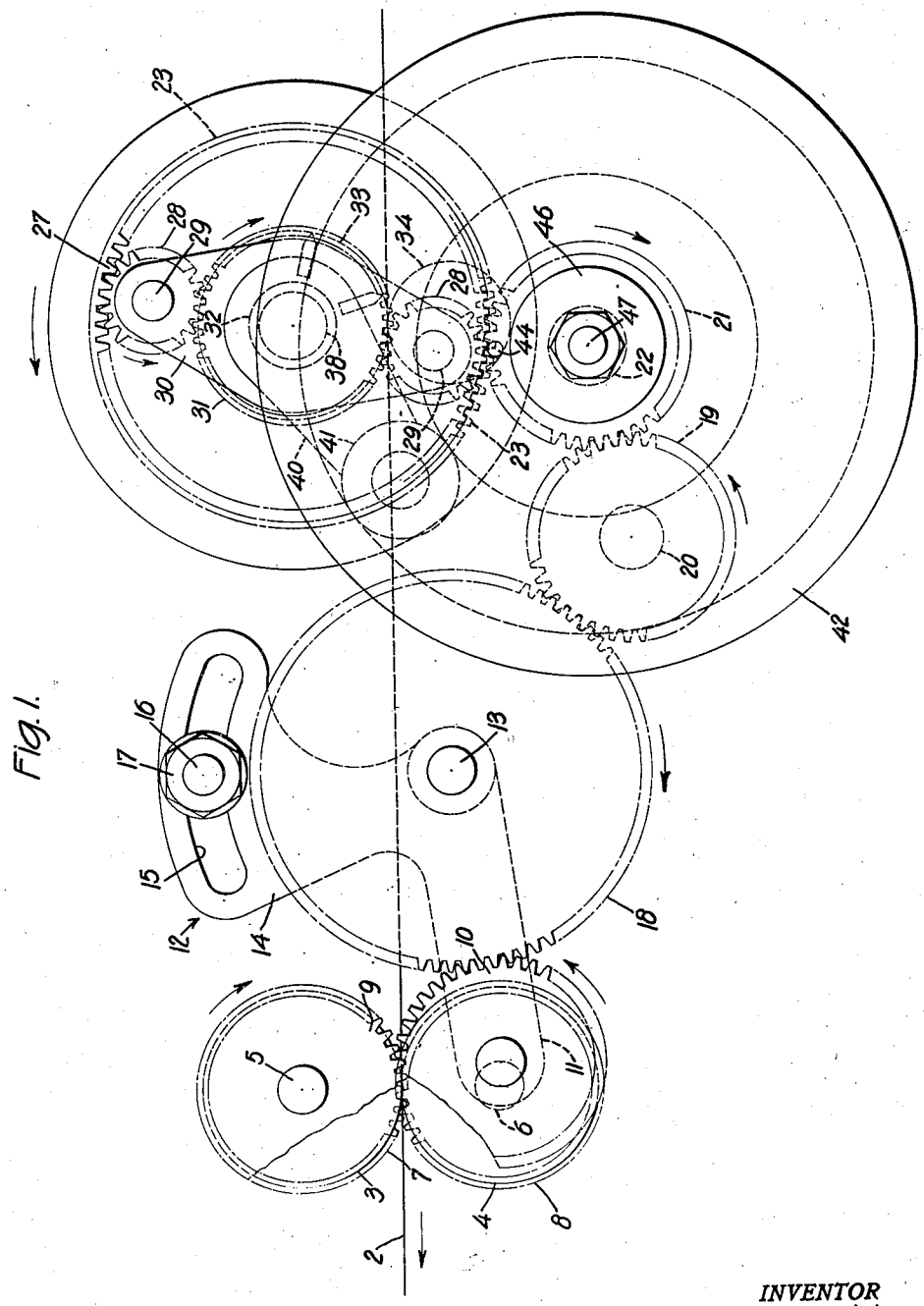


Fig. 1.

INVENTOR
Abraham Novick.

BY—Moses and Nolte

ATTORNEYS

Nov. 17, 1936. A. NOVICK 2,060,821

MANUFACTURE OF ENVELOPES, BAGS, OR OTHER CONTAINERS

Original Filed Oct. 7, 1933 4 Sheets-Sheet 2

Fig. 3.

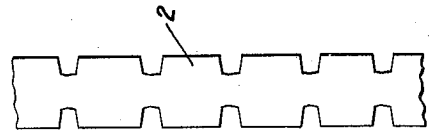
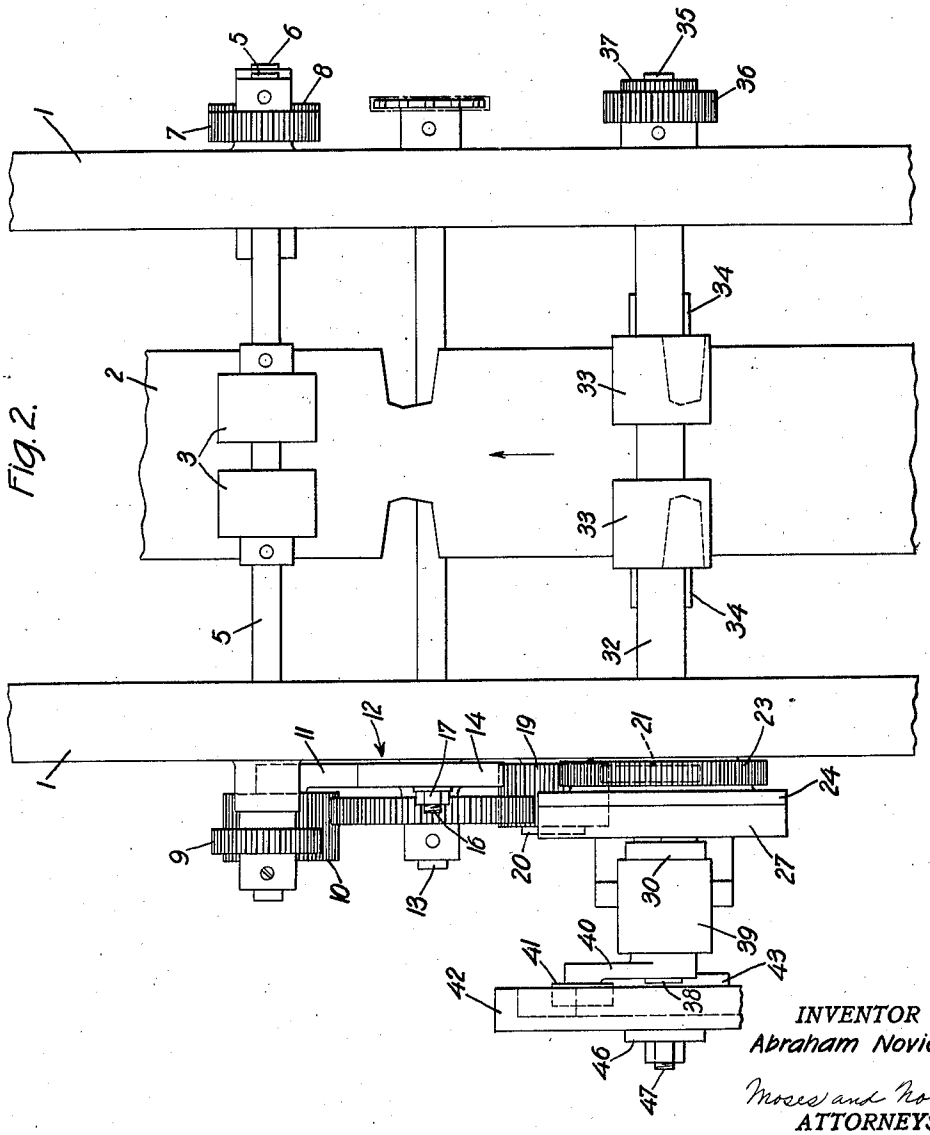


Fig. 2.



INVENTOR
Abraham Novick.

Moses and Holte
ATTORNEYS

Nov. 17, 1936. A. NOVICK 2,060,821

MANUFACTURE OF ENVELOPES, BAGS, OR OTHER CONTAINERS

Original Filed Oct. 7, 1933 4 Sheets-Sheet 3

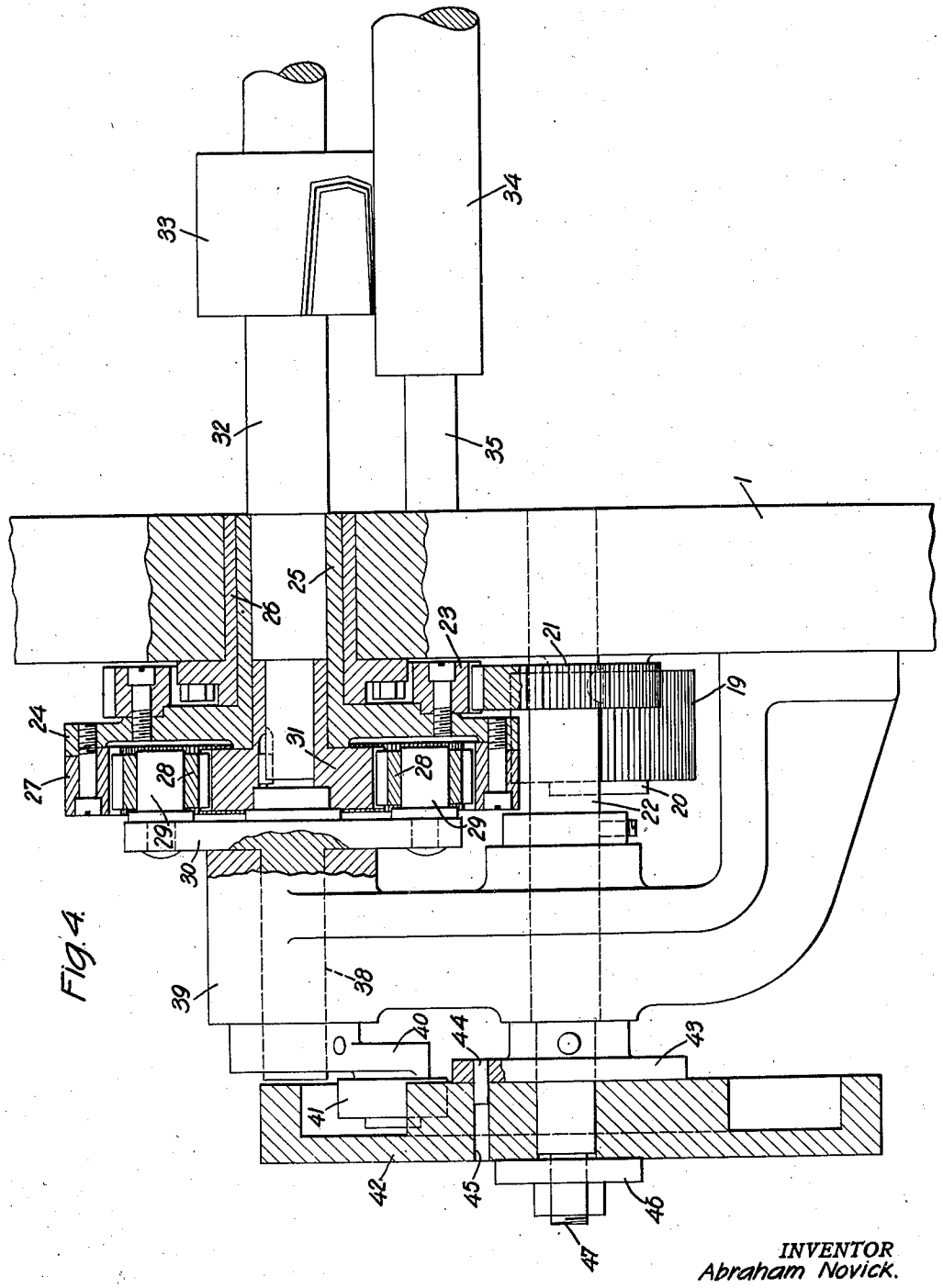


Fig. 4.

INVENTOR
Abraham Novick.

BY
Moses and Nolte
ATTORNEYS

Nov. 17, 1936. A. NOVICK 2,060,821

MANUFACTURE OF ENVELOPES, BAGS, OR OTHER CONTAINERS

Original Filed Oct. 7, 1933 4 Sheets-Sheet 4

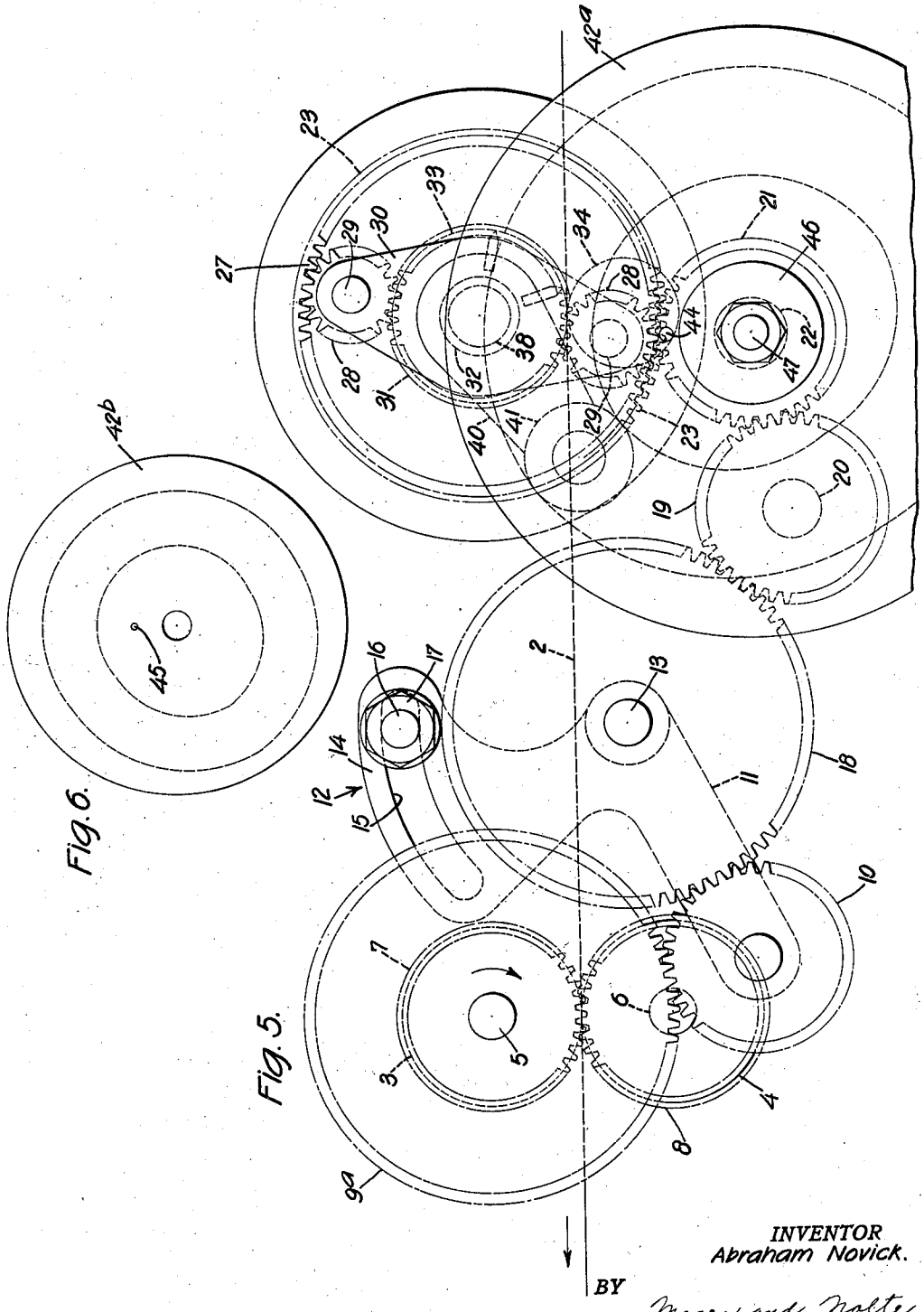


Fig. 6.

Fig. 5.

INVENTOR
Abraham Novick.

BY

Moses and Nolte
ATTORNEYS

Patented Nov. 17, 1936 2,060,821

UNITED STATES PATENT OFFICE

2,060,821

MANUFACTURE OF ENVELOPES, BAGS, OR OTHER CONTAINERS

Abraham Novick, Flushing, N. Y., assignor to F. L. Smithe Machine Co. Inc., New York, N. Y., a corporation of New York

Application October 7, 1933, Serial No. 692,553
Renewed February 18, 1936

6 Claims. (Cl. 164—64)

This invention relates to the manufacture of envelopes, bags or other containers from a web of paper, cellophane or other suitable material. The invention is in the nature of an improvement upon the invention disclosed and claimed in my pending application Serial No. 654,121, filed January 30, 1933, for Manufacture of envelopes, bags or other containers.

Like the invention of said pending application, this invention is concerned particularly with the provision of means for producing containers of variable lengths from a web.

According to the illustrated form of the present invention, containers of a selected length are produced by running the web at a selected speed through the machine and causing the mechanism which severs the web to operate upon the web at uniform intervals of time. With this arrangement different lengths of containers are produced, depending upon the amount of web that is passed under the severing cutters between successive operations thereof.

Certain of the mechanism, however, which is used to operate on the web, such, for example, as the notching cutters for producing notches in the sides of the web preliminary to the complete severance of the blank from the web, requires to be in engagement with the traveling web for a considerable period of time. It is necessary, therefore, that the linear speed of such mechanism be capable of temporary variation, so as to be equal to the selected linear speed of the traveling web during actual contact therewith. The present invention, therefore, provides a mechanism which permits the notching cutter or other operating mechanism to operate at a fixed number of revolutions per minute but provides for speed changes during each such revolution so that in that portion of each revolution in which it is in contact with the web its speed will be equal to that of the web.

The above stated objects are common to the present invention and to my pending application referred to above.

In accordance with the present invention, provision is made of improved means for temporarily altering the speed of the notching cutters or other operating instrumentalities, such means including a driving train comprising a pair of coaxial gears, a transmitting pinion constantly in mesh with said gears and means for rocking the pinion to and fro to increase and diminish the speed of the driven gear of said pair as required. Provision is made of means for automatically rocking the transmission pinion at the same points in each cycle of the notching cutters to increase or diminish the speed of the notching cutters to the speed of the web. Such means may desirably comprise a cam mounted on a uniformly driven shaft. Provision is further made of means for quickly and conveniently substituting one cam for another in the organization.

Other objects and advantages will hereinafter appear.

In the drawings forming part of this specification,

Figure 1 is a diagrammatic side elevation, partly broken away, illustrating mechanism for feeding a web and for driving a notching cutter that operates on the web;

Figure 2 is a fragmentary plan view of the mechanism illustrated in Figure 1;

Figure 3 is a small scale fragmentary plan view of a web upon which the notching cutters have operated;

Figure 4 is a fragmentary view in elevation, partly broken away, disclosing particularly the driving means of the notching cutters;

Figure 5 is a view similar to Figure 1 illustrating an altered gear train for driving the web feeding means; and

Figure 6 is a view in side elevation of a cam adapted to be used in rocking the transmission pinion mechanism.

The machine comprises frame members 1 whereby the other members to be described are carried. A web 2 of envelope or bag material is fed between upper feed rollers 3 and lower feed rollers 4 which are fast respectively upon upper and lower shafts 5 and 6. Gears 7 and 8 are fast, respectively, upon the shafts 5 and 6 and are in mesh with one another. The shaft 6 is accordingly driven from the shaft 5 through said gears. The shaft 5 has fixed upon one of its ends a gear 9 which, in accordance with the arrangement illustrated in Figure 1, is in mesh with a gear 10 which is journalled in an arm 11 of a bellcrank 12. The bellcrank 12 is pivoted upon a main shaft 13 and has its opposite arm 14 provided with an arcuate slot 15. Shaft 13 is rotated by a sprocket-and-chain drive, actuated by a source of power, said chain and source of power not being shown. A bolt 16 carried by the machine frame extends through the slot 15 and may be provided with a cooperating nut 17 for clamping the bellcrank in position to hold the gear 10 firmly in mesh with the gear 9. The gear 10 runs in mesh with a gear 18 which is fast on the shaft 13. The gear train described is effective to control the length of web fed dur-

ing a single cycle of the notching cutters. The substitution for gear 9 of a gear 9a of different size as illustrated in Figure 5 will obviously produce a different rate of feed for the web 2.

Regardless of the train of gearing employed for driving the feed rolls 3 and 4, the gear train from the main shaft to the notching cutters is always the same so that the notching cutters act at uniform time intervals. The gear 18 drives a gear 19 on a shaft 20. The gear 19 drives a gear 21 which is fast upon a stub shaft 22. The gear 21 in turn meshes with a gear 23, having external teeth, which is fixed upon a disc 24. The disc 24 has a sleeve or hub portion 25 which is journalled in a bearing 26 carried by the frame. The disc 24 also has secured upon it a gear 27 having internal teeth. The internal teeth of gear 27 mesh with pinions 28 which are journalled upon pins or stub shafts 29 carried by a rocker 30. The pinions do not normally have any planetary movement but are rotated by the gear 27 and serve in turn to rotate a further gear 31. The gear 31 is journalled in the sleeve portion 25 of disc 24 and is keyed to drive a shaft 32 which carries notching cutters 33. The bed cylinder 34 is fast upon a shaft 35. The shaft 32 may drive shaft 35 through gears 36 and 37 fast upon the respective shafts.

When the rocker 30 is held stationary, the notching cutters will obviously be rotated at uniform speed. If such uniform speed of the notching cutters is the same as the speed of the web, then there will be no occasion for rocking the rocker 30 to shift the pinions 28. In most instances, however, the speed of the web will be either greater or less than the normal or average linear speed of the notching cutters, and in such case it will be desirable to increase or diminish the speed of the notching cutters temporarily to cause them to travel at the speed of the web while in contact with it.

The rocker 30 is provided with a shaft or bearing portion 38 which is in axial alignment with the shaft 32 and which is journalled in a bearing bracket 39. A crank 40 which is fast upon the shaft 38 carries a cam follower 41 which is controlled by a cam path provided in a cam 42. The cam 42 is mounted upon shaft 22 to rotate in unison therewith but is mounted so that it can be quickly removed from said shaft to permit a similar cam having a different shaped cam track to be substituted. The shaft 22 has fast upon it a collar 43 which carries a pin 44. The cam 42 is provided with a bore 45 extending parallel to the cam axis which is adapted to receive the pin 44. The pin and bore form a driving connection between the cam and the shaft 22 and a nut 46 is threadable upon a reduced end portion 47 of the shaft 22 to hold the cam 42 in place.

When the normal or average speed of the notching cutter is the same as that of the web, a cam 42 may be employed having a circular cam track concentric with the axis of the cam so that the linear speed of the notching cutters is uniform at all times. When the gear train employed for driving the web feeding means produces a rate of web feeding slower than the average speed of the notching cutters, a suitable cam having a cam track appropriate to the situation may be substituted. Such a cam 42a is illustrated in Figure 5. In this figure the cutters travel at average speed while the cam follower is running upon the concentric portion of the cam, but the speed is decreased as the follower moves towards the center of the cam and is afterwards increased as the follower passes the low part and returns to the concentric portion. A cam of appropriate contour is provided for each condition which will be encountered in actual practice. For example the cam 42b in Figure 6 is used to temporarily increase the speed of the cutter rollers 33.

I have described what I believe to be the best embodiments of my invention. I do not wish, however, to be confined to the embodiments shown, but what I desire to cover by Letters Patent is set forth in the appended claims.

I claim:

1. In a machine of the kind described, in combination, web feeding means adapted to be driven at a selected uniform speed, a rotary member for operating intermittently on the travelling web, means for driving said operating member at uniform average speed irrespective of the speed of the web, comprising co-axial internal and external gears, an interposed pinion and a shaft for driving one of said gears uniformly, a rocker arm carrying said pinion, and means for rocking said arm at a predetermined point in each cycle to change the speed of the operating member temporarily to that of the web.

2. In a machine of the kind described, in combination, web feeding means adapted to be driven at a selected uniform speed, a rotary member for intermittently engaging and operating upon the travelling web throughout a substantial period in each cycle, means for driving said member at uniform average speed irrespective of the speed of the web, comprising co-axial gears and a pinion in mesh with said gears and swingable about the common axis of the gears while maintaining engagement with both of them, and means for swinging said pinion at a predetermined point in each cycle to change the speed of the operating member to a uniform speed the same as that of the web throughout the period of engagement with the web.

3. In a machine of the class described, the combination with a main shaft of web feeding means, means for facilitating the connection of the web feeding means to the main shaft in a selected gear ratio, a rotary member for intermittently operating on the web through a substantial period in each cycle, means forming a permanent driving connection between the main shaft and said operating member, comprising a pair of co-axial gears and a pinion swingable about the common axis of said gears while maintaining operative engagement with both of them, a cam operated from the main shaft for rocking the pinion to and fro at the same points in each cycle of the operating member to cause the operating member throughout its engagement with the web to travel at the speed of the web, a cam shaft supporting the cam near an end of the shaft, and a cam follower for controlling the pinion, located at the side of the cam remote from said shaft end.

4. In a machine of the class described, the combination with a main shaft of web feeding means, means for facilitating the connection of the web feeding means to the main shaft for operation at a selected relative speed, a rotary member for operating on the web throughout a substantial period in each cycle, means forming a permanent driving connection between the main shaft and said operating member, comprising a pair of co-axial gears and a pinion in mesh with said gears, a rocker carrying said pinion, said rocker including a bearing member disposed in axial alignment with the common axis

of said gears, and extending forwardly therefrom, a cam follower carried at the forward end of said rocker bearing, a cam shaft driven from the main shaft and extending forwardly therefrom in parallelism to the rocker bearing, and means for detachably mounting a cam at the forward end of the cam shaft in front of the other named parts and in cooperative relation to said cam follower so that a different cam can be used for each selected speed of the web, the arrangement being such that the attachment and removal of the cam is in no way obstructed by the other parts of the machine, said cam and cam follower constituting means to rock the pinion and cause the operating member to travel at the speed of the web throughout the period of its engagement with the web.

5. In a machine of the kind described, in combination, web feeding means for driving the web at selected uniform speeds comprising a prime driving member operating at uniform rotary speed, and means for facilitating the connection of the web feeding means to the prime driving member in a selected gear ratio to determine the speed at which the web is fed, a rotary member for intermittently engaging and operating upon the travelling web throughout a substantial period in each cycle, a driving train for driving said operating member at uniform average speed from said prime driving member irrespective of the speed of the web, and for causing the speed of the operating member to be changed from normal to the speed of the web at a predetermined point in each cycle and to be maintained at the speed of the web throughout the period of its engagement with the web, said driving train comprising a cam for causing said change of the speed from normal and means for facilitating the inclusion in the driving train of a different cam for each different speed of the web, each cam being appropriately shaped to secure the stated result for a particular speed of the web.

6. In a machine of the class described, the combination with a main shaft of web feeding means, means for facilitating the connection of the web feeding means to the main shaft in a selected gear ratio to select the speed at which the web is fed, a rotary member driven at uniform average speed for intermittently operating on the web through a substantial period in each cycle, means forming a permanent driving connection between the main shaft and said operating member, comprising a pair of co-axial gears and a pinion in mesh therewith, a pinion support journalled co-axially with the gears for swinging about the common axis to rock the pinion while maintaining the same in mesh with said gears, a cam operating from the main shaft at uniform rotary speed, and a cam follower engaging said cam and constituting a crank fixed upon the pinion support, the arrangement being such that the pinion is rocked in each cycle to make the speed of the operating member the same as that of the web throughout the period of engagement of said member with the web.

ABRAHAM NOVICK.