

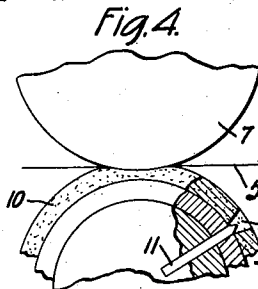
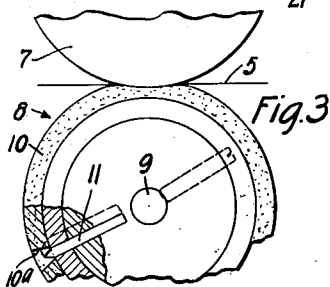
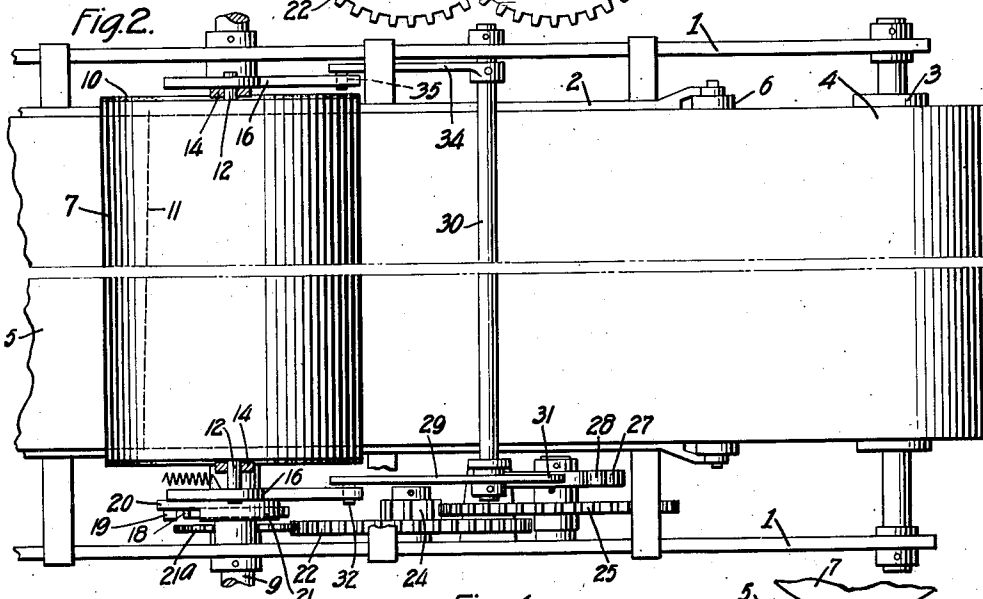
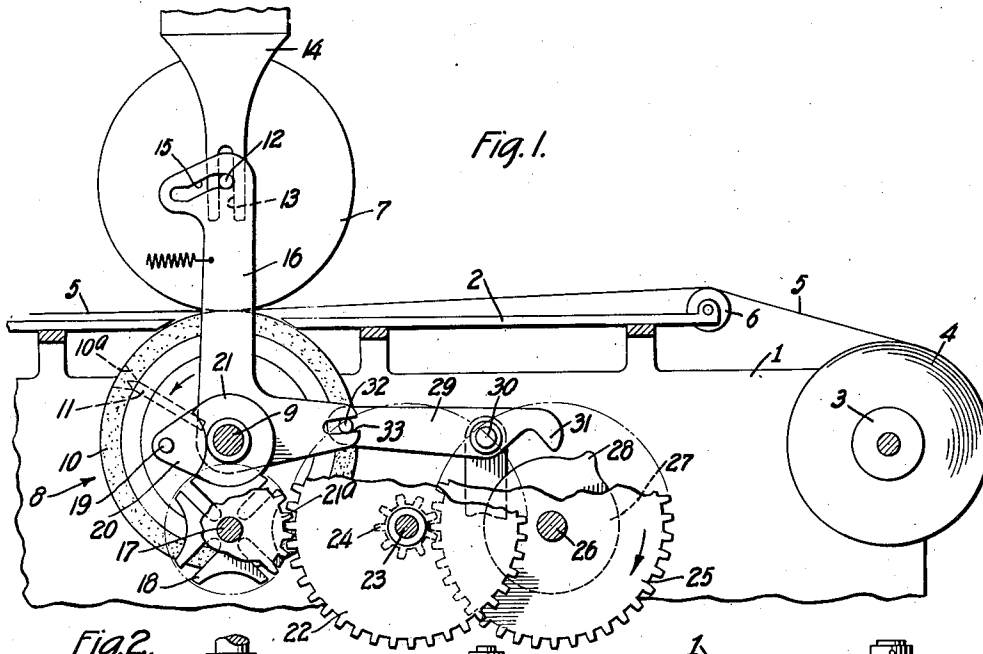
Dec. 1, 1931.

H. R. WILLIAMS

1,834,299

WEB MEASURING AND CUTTING MECHANISM

Filed March 16, 1929



INVENTOR
Harrison R. Williams.
BY *Morse & Nolte*
ATTORNEYS

UNITED STATES PATENT OFFICE

HARRISON R. WILLIAMS, OF NEW YORK, N. Y.

WEB MEASURING AND CUTTING MECHANISM

Application filed March 16, 1929. Serial No. 347,535.

This invention relates to mechanism for automatically measuring and cutting a continuous web into predetermined lengths.

The invention has for an object to provide a mechanism which may be simply and cheaply constructed, which is simple and reliable in its operation, and particularly which maintains positive control of the web at all times both before and after severance.

In accordance with an important feature of the invention as herein illustrated, provision is made of a pair of coaxing feed rollers, of which one having a predetermined circumferential measurement is positively driven. Through suitable control mechanism a knife, rotatable in unison with one of said members, is caused to become effective at the conclusion of a predetermined number of revolutions of said member to cut off a predetermined length of the web.

In accordance with an important feature of the invention, the knife is fixed with relation to the feed roller with which it moves, and has its blade held in fixed position within the normal peripheral bounds of such roller. The peripheral portion or cover of such roller is composed of yielding material, and the measuring mechanism is effective to urge the rollers toward one another to compress such material at a predetermined period in the cycle of operations to enable the knife, without altering its position radially of the roller with which it moves, to engage and sever the web. This feature has the important advantage, among others, that at the time the web is severed, the yieldable outer portion of the knife carrying roller is compressed, so that the web is gripped between the feed rollers for a substantial distance on either side of the knife, with the result that there is no tendency for the feed rollers to lose their grip upon that portion of the web which is being drawn into the feed rollers upon the severance of the web.

Other objects and advantages will herein appear.

In the drawings forming part of this specification:

Figure 1 is a fragmentary, sectional, side

elevation of a measuring and cutting mechanism embodying features of the invention;

Figure 2 is a fragmentary, plan view, cut away intermediate the sides of the mechanism for compactness of illustration, showing substantially the same portion of the mechanism as Figure 1;

Figure 3 is a fragmentary view illustrating how the external portion of the knife carrying roller is compressed during the revolution in which cutting occurs;

Figure 4 is a view similar to Figure 3, but illustrating the parts in a different portion of the cycle; and

Figure 5 is a view similar to Figures 3 and 4, illustrating the parts at the moment of severance.

In the illustrative embodiment of the invention, provision is made of a machine frame 1 which supports a table 2. A reel 3 carries a roll 4 of web material 5, the reel being journaled in the frame 1 of the machine. From the reel 3 the web 5 is drawn over a guide roll 6 by cooperating feed rollers 7 and 8. The feed roller 8 is fixed upon a driven shaft 9 journaled in the machine frame, and is provided with a cover 10 of yielding material such as soft rubber. The roller 8 carries a fixed knife 11, the blade of which terminates within the normal peripheral bounds of the roller cover 10 and lies in a notched out portion 10a of such roller cover. In the normal rotation of the feed rollers the yielding cover 10 projects beyond the knife blade and prevents the knife from coming into engagement with the web 5, and hence prevents the severance of the web.

Provision is made, however, for causing relative approach of the rollers 7 and 8 after a predetermined number of revolutions of the roller 8. The roller 7 is provided with spindle or hub elements 12 which are received in vertical slots or guides 13 of fixed brackets 14. The spindles 12 also extend into cam slots 15 of bell crank levers 16, which levers are rocked in unison periodically, to press the spindles 12 downward, and thereby to force the roller 7 toward the roller 8. The roller 7 may have its entire surface formed of sufficiently hard material to serve as a suitable

cutting bed for the knife, or it may have a suitable cutting bed member set into it.

The mechanism for so operating the bell cranks 16 consists of a train of reducing and intermittent gearing operated from the shaft 9 on which the roller 8 is fixed. The shaft 9 drives a shaft 17 through Geneva gearing comprising a Geneva gear 18 fast on the shaft 17, an operating pin 19 carried by a crank 20 fast on the shaft 9, and a notched locking disc 21 fast on the shaft 9 and arranged to coact with the Geneva gear to prevent rotation thereof except at the time when said gear is to be driven by the driving pin 19. The shaft 18 also carries fast thereon a gear 21a in mesh with a larger gear 22 supported on a shaft 23. A pinion 24 fast with the gear 22 drives a gear 25 supported on a shaft 26. The gear 25 has fast therewith a cam 27 which is circular in form throughout the major portion of its circumference, but is provided with a projection 28 at one portion thereof. A lever 29 fast on a shaft 30 is provided at one end thereof with a cam finger 31 adapted to be engaged and moved upward by the projection 28 of the cam 27. At the end of the lever 29 remote from the finger 31 provision is made of a pin 32 which plays in a slot 33 formed in the lower arm of one of the bell cranks 16. At the opposite side of the machine the shaft 30 has fast upon it a crank 34 provided at the outer end thereof with a pin 35 which plays in the slot of the lower arm of the other bell crank 16. When the projection 28 of the cam 27 comes underneath the finger 31, the lever 29 is rocked in a counter-clockwise direction and swings the bell cranks 16 in unison in a clockwise direction. The cam slots 15 of the bell cranks 16 are thereby made effective to depress the spindles 12 of the roller 7 and force the roller 7 toward the roller 8. This compresses the cover 10 of the roller 8 and causes the knife to be effective to sever the web when the knife next comes opposite the roller 7.

It will be observed that the Geneva gearing provides for intermittent actuation of the cam 27, and that the cam is rotated throughout approximately only one-fourth of each revolution of the roller 8. As a consequence, the projection 28 on the cam may be moved underneath the finger 31 of lever 29 and permitted to remain idle in such position throughout a substantial portion of a revolution of the roller 8. It is accordingly not necessary to design the cam projection 28 for precise timing, since the cam projection 28 is at rest beneath the finger 31 throughout the major portion of a revolution of the roller 8.

In the illustrative embodiment of the invention the gearing is so proportioned that the web will be severed at the conclusion of thirty-two revolutions of the roller 8. It is obvious, however, that the gear train may

be altered to produce lengths forming any other multiple of the circumference of the roller 8, or that the mechanism might be otherwise varied to secure other lengths of the material, if desired.

While I have illustrated and described in detail certain preferred forms of my invention, it is to be understood that changes may be made therein and the invention embodied in other structures. I do not, therefore, desire to limit myself to the specific constructions illustrated, but intend to cover my invention broadly in whatever form its principle may be utilized.

I claim:

1. In a web measuring and cutting machine, in combination, a pair of feed rollers, one of which is provided with a yielding, peripheral portion, a knife located within the normal peripheral bounds of said roller, and movable in unison therewith, and means periodically moving the other roller toward the knife carrying roller for causing the yielding, peripheral portion of the knife carrying roller to be compressed to expose the knife and render it operative to sever the web.

2. In a web severing mechanism, in combination, a first feed roller having a substantially unyielding periphery, a second feed roller having a yielding, peripheral portion, a knife fixed with relation to the second feed roller within the normal peripheral bounds thereof, and means for pressing the rollers together to compress the peripheral portion of the second feed roller and cause the first roller to come into cooperative relation to the knife.

3. In a web severing mechanism, in combination, a first feed roller having a substantially unyielding periphery, a second feed roller having a yielding, peripheral portion, a knife mounted in one of the feed rollers and coacting with the other to cut the web periodically, and means automatically increasing the area of web gripped by the feed rollers at the time of cutting.

4. In a web severing mechanism, in combination, a first feed roller having a substantially unyielding periphery, a second feed roller having a yielding peripheral portion, a knife located within the normal peripheral bounds of the second feed roller, and mechanism geared to one of said feed rollers and acting automatically after a predetermined rotation thereof to force the rollers together to compress the peripheral portion of the second roller and thereby render the knife effective to cut the web.

5. In a web measuring and cutting machine, in combination, a first feed roller, a second feed roller cooperative with the first and having a yielding, peripheral portion, means for positively driving one of said rollers continuously, a knife carried by the second feed roller within the normal peripheral bounds

thereof, and mechanism for periodically forcing the rollers toward one another including force multiplying mechanism, operated proportionately to the second feed roller.

- 5 6. In a web measuring and cutting machine, in combination, a first feed roller providing a cutting bed, a second feed roller co-
operative with the first to grip the web and
10 feed it continuously, a knife carried by the second feed roller for cutting the web, and
means for rendering the knife effective periodically after a predetermined number of
15 revolutions of one of the rollers, comprising an operating member operated in unison with said roller, intermittent gearing advanceable
step by step, and through a predetermined
distance at each revolution of said roller, and
20 means operated by said gearing after a predetermined number of steps thereof to cause the knife carrying roller and the other feed
roller to increase their grip on the web.

In testimony whereof I have affixed my signature to this specification.

HARRISON R. WILLIAMS.