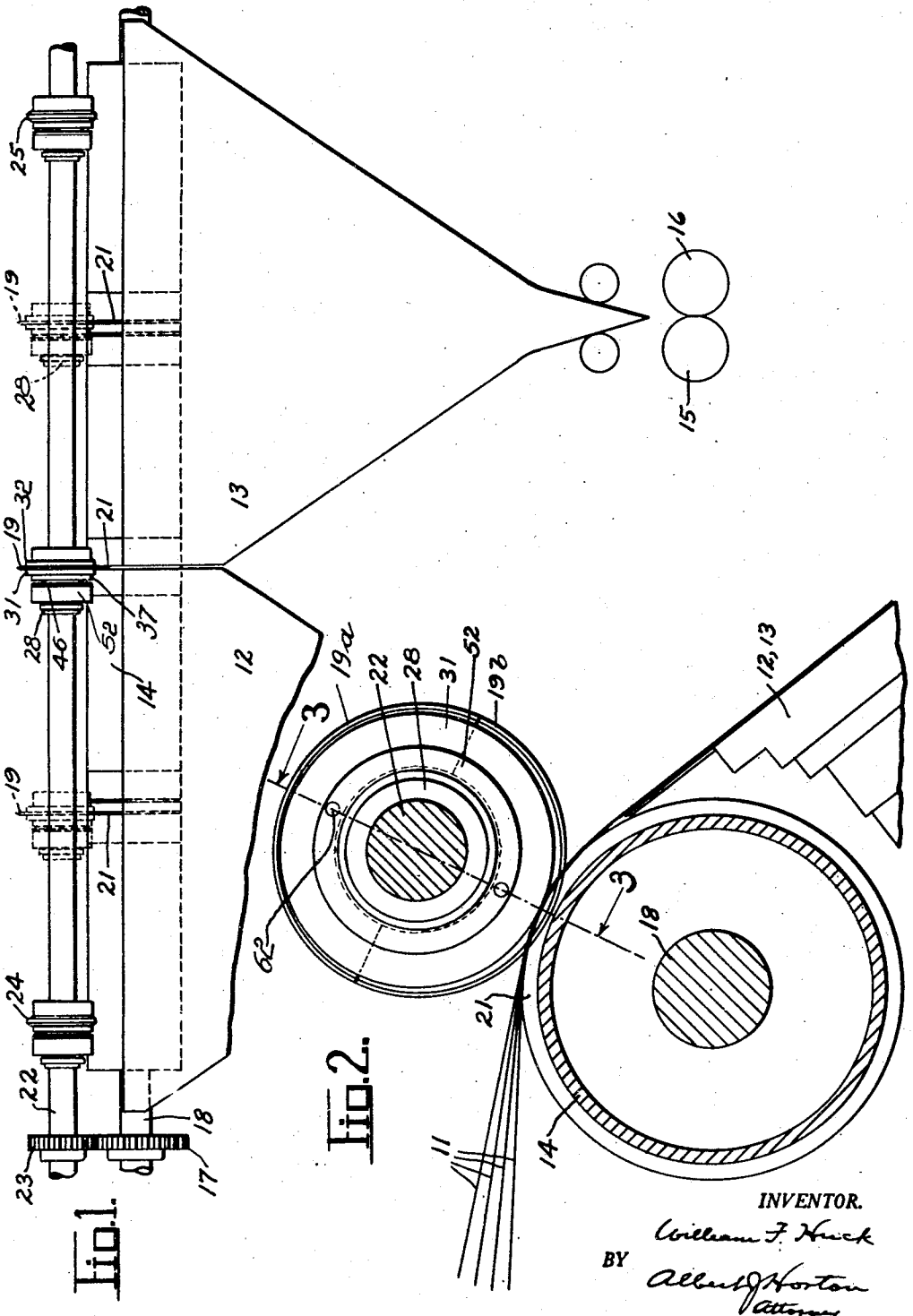
Dec. 3, 1946. W. F. HUCK 2,412,047

WEB FEEDING AND SLITTING MECHANISM

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Fig.3.

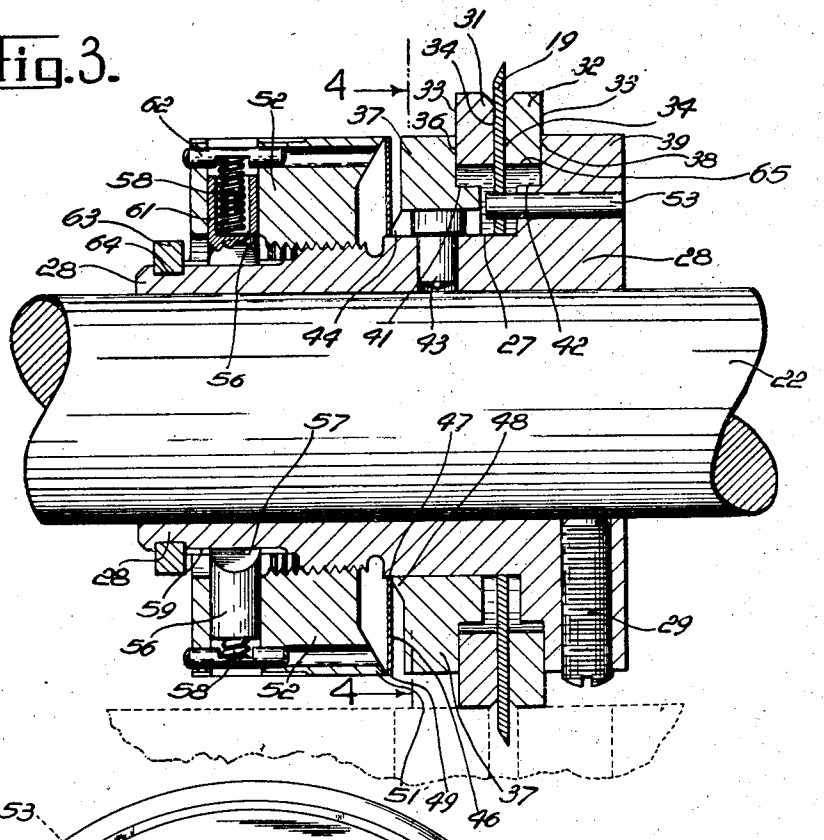
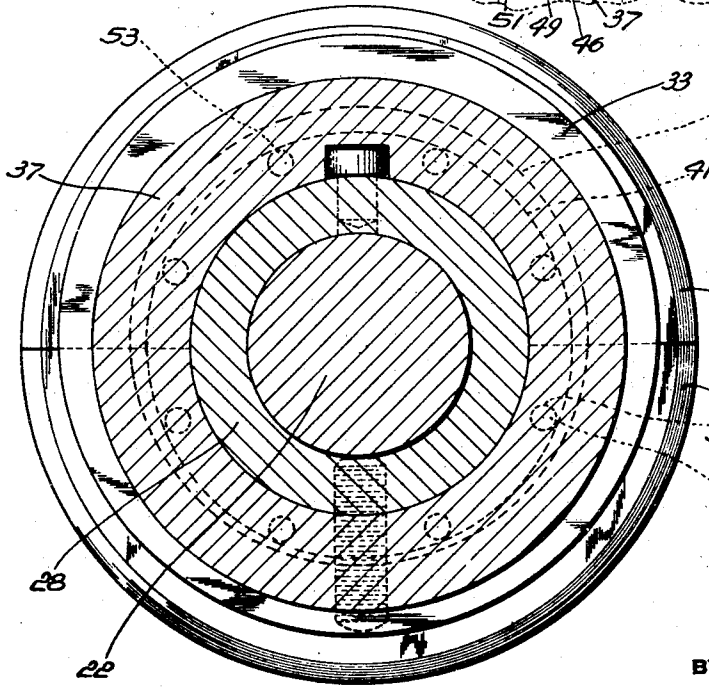


Fig.4.



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WEB FEEDING AND SLITTING MECHANISM

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11 Claims. (Cl. 164—61)

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This invention relates to printing machines and more particularly to web feeding and slitting mechanisms for machines that print on a web of paper or other material.

The device of the invention is especially useful in combination with a drag roller such as is usually positioned over a former folder, for simultaneously slitting a number of webs, and in cooperation with the drag roller, feeding the webs to and over the former, but it can also be used efficiently elsewhere in the printing machine. The use of the device of the invention eliminates the necessity for using pressure rollers which are commonly called "trolley rollers," to press the web, or webs, against the drag roller.

An object of the invention is to provide a combined web slitter and web presser member for use in cooperation with an abutment roller to slit and feed webs.

Another object is to provide, in combination with a rotary web slitting knife, web pressing means driven in unison with the slitting knife and arranged to engage the web edges adjacent the place where the web is slit, and press the edges against the abutment roller.

It is also an object of the invention to provide an improved web slitting and feeding device for a printing press which will be simple, durable and relatively inexpensive in construction, as well as convenient, practical, serviceable, and efficient in use.

With the foregoing and other objects in view, that will appear as the description proceeds, the invention resides in the combination and arrangement of parts, and in the details of construction hereinafter described and claimed, it being understood that various changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed, without departing from the spirit of the invention.

A preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a view showing a pair of formers, and a drag roller in cooperation with the web slitting and feeding device of the invention, whereby a web or webs may be cut into two or more ribbons and these ribbons fed to the formers;

Figure 2 is a cross-sectional view through the drag or abutment roller and showing an end view of the combined web slitter and feeding device;

Figure 3 is a sectional view of the combined

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web slitter and feeding device, taken on the line 3—3 of Figure 2; and

Figure 4 is a sectional view of the device taken on line 4—4 of Figure 3.

The combined web slitting and feeding device of this invention is arranged for slitting and feeding a web or webs 11 (Figures 1 and 2), into ribbons that are carried over formers 12 and 13. The device is supported in cooperating relation with an abutment roller 14, which is also commonly called a drag roller. From each of the formers 12 and 13, the web or webs 11, are fed between folding rollers 15 and 16 to a delivery of the printing machine. The drag roller 14 is driven from the printing machine drive (not shown), through a gear 17 secured to its shaft 18. The drag roller 14 is commonly provided with a number of suitably positioned grooves 21, any of which may cooperate with a slitting blade 19, that is preferably made in two semi-circular pieces 19a and 19b respectively so that it may readily be removed and replaced. As herein shown, one slitting device is positioned on a shaft 22, for cutting a web into two ribbons, and two additional devices are shown in dotted lines. By using one or both of these additional slitting devices, the web or webs 11, may be cut into three or four ribbons, as required.

The slitter shaft 22 is driven through a gear 23, that is in mesh with the gear 17 on the shaft 18 of the drag roller 14. Suitable web feeding devices 24 and 25 are mounted on the shaft 22, being disposed thereon to engage the outer edges of the web or webs 11, and being arranged to be driven by the shaft 22. These web feeding devices 24 and 25 are preferably similar to the device of the invention herein disclosed, but the slitting member is omitted.

As best shown in Figure 3, the slitting knife 19 is mounted on a slitter seat 27 of a sleeve 28, that is secured to the shaft 22 by a set screw 29. The knife 19 is disposed between two annular web presser members, or rings 31 and 32 each having parallel faces 33 and 34. The rings 31 and 32 are arranged to be pressed against opposite sides of the knife 19 and the rings are driven from the shaft 22 by being pressed between a face 36 of a collar 37, and a face 38 of a flanged collar portion 39 of the sleeve 28. The collar 37 has a cylindrical stepped surface 41 positioned inside of the ring 31, and the flanged portion 39 of the sleeve 28 has a cylindrical stepped surface 42 positioned inside of the ring 32. The internal diameters of the rings 31 and 32 are greater than the external diameters of the cylindrical surfaces 41 and 42

respectively. The friction collar 37 is mounted for axial sliding movement on the sleeve 28 but is keyed against rotation relative thereto by a stud-key 43 inserted in the sleeve 28 and extending into a keyway 44 provided in the collar 37.

The friction collar 37 is spring pressed toward the ring 31 and the face 38 of the flange 39 by a flat disc spring 46, an inner edge 47 of which engages an extended inner edge 48 of the collar 37. An outer edge 49 of the disc spring 46 is engaged by an outer edge 51 of a cup-shaped circular adjusting nut 52 which is screw-threaded into the sleeve 28. Tightening or loosening the nut 52 will adjust the pressure of the disc springs 46 against the collar 37 and thus will adjust the pressure applied to the sides of the rings 31 and 32 as well as the pressure of these rings against the knife 19. Pins 53 secured in the flanged portion 39 of sleeve 28, extend through holes 54 provided in the slitting knife 19 and cause the knife 19 to rotate with the sleeve 28 when it is rotated by the shaft 22. The pins 53 also provide a means for holding the two halves of the knife 19 in position.

Plungers 56 carried by the nut 52, and having V-shaped ends 57, are spring pressed by coiled springs 58 into V-shaped grooves 59 cut into the sleeves 28, to hold the nut 52 in its adjusted positions. The springs 58 are seated in openings 61 provided in the plunger 56 and abut against removable slotted pins 62 inserted axially into the nut 52 adjacent its periphery. A snap ring 63 inserted in a groove 64 in the front end of the sleeve 28 forms a stop for the nut 52 when it is retracted. When associated with an abutment roller 14, the web slitting and feeding device herein disclosed slits the web or webs 11 by cooperation of the knife 19 and the slot or groove 21 in the abutting roller, while the annular presser members 31 and 32 on each side of the knife 19 press the ribbon edges, at the cut, against the roller 14, whereby an even feeding force will be applied to each of these edges while the web is being slit. The difference in diameter between the inner periphery 65 of each ring 31 or 32, and the outer diameter of the stepped surfaces 41 of the friction collar 37, and 42 of the sleeve 28, permits the rings 31 and 32 to be moved laterally with respect to their axes, or in other words to be pushed off center and into eccentric relation to their driving members, the friction collar 37, the knife 19, and the flange 39, when the webs 11 are being fed between the drag roller 14 and the presser members 31 and 32. By manipulating the adjusting nuts 52, any desired driving pressure of the presser members 31 and 32 upon the webs may be obtained, and if one or more of the webs should break before reaching the slitter device, the remaining webs will still be pressed against the drag roller by substantially the same pressure as before.

It will be understood that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiment be considered in all respects as illustrative, and not restrictive, reference being had to the claims rather than to the foregoing description, to indicate the scope of the invention.

What I claim is:

1. In a device for cutting webs into ribbons, a slitter knife rotatable about its axis, an abutment roller rotatable on an axis parallel to the axis of the slitter knife and having a groove positioned to receive the edge of the slitter knife to slit the webs, an annular presser member having two parallel friction faces in planes normal to its axis and one of which faces engages the slittter knife, and means rotating with the slitter knife and having a driving member frictionally engaging the other contact face of the presser member, the presser member being adapted to move laterally in respect to its axis without moving the driving member and into an eccentric position relative to the axis of the slitter knife to yieldingly press the ribbons cut from the webs against the abutment roller and thereby feed them forward.

2. In a device for cutting webs into ribbons, a slitter knife rotatable about its axis, an abutment roller rotatable on an axis parallel to the axis of the slitter knife and cooperating therewith to cut the webs, an annular presser member at each side of the slitter knife, and having one side in engagement therewith, and a collar member rotating with the slitter knife and in frictional engagement with the other side of each presser member, the presser members being adapted to move laterally in respect to the axis of the slitter knife into an eccentric position to press each edge formed by cutting the webs into ribbons against the abutment roller to feed the ribbons forward.

3. In a device for cutting webs into ribbons, a slitter knife rotatable about its axis, an abutment roller rotatable on an axis parallel to the axis of the slitter knife and cooperating therewith to cut the webs, two annular presser members each having a side face in engagement with one side face of the slitter knife, and two collars rotating with the slitter knife and in frictional engagement with the other faces of the presser member, the presser members being adapted to move laterally into eccentric position relative to the axis of the slitter knife to press the edge of the ribbons cut from the webs against the abutment roller to lead them forward.

4. In a device for cutting webs into ribbons, a slitter knife rotatable about its axis, an abutment roller rotatable on an axis parallel to the axis of the slitter knife and cooperating therewith to cut the webs, an annular presser member at each side of the slitter knife and each having one side in engagement therewith, a pair of collars rotating with the slitter knife and each being in frictional engagement with the other side of each presser member, and an adjustable tension applying means acting on at least one of the collars to press it against the presser members and said member against the slitter knife, the presser members being adapted to move laterally in respect to the axis of the slitter knife into an eccentric position to press each edge formed by cutting the webs into ribbons against the abutment roller to feed them forward.

5. In a web slitting and feeding device, a driven disc type slitter knife, a drag roller having a groove positioned to receive the edge of the slitter knife to cut webs into ribbons, a presser member adjacent the slitter knife and having two parallel friction faces in planes normal to its axis and a peripheral face cooperating with the drag roller to feed the ribbons cut from the webs, a spring pressed collar having a friction face in engagement with one of the friction faces on the presser member to press it against the slitter knife, the presser member being adapted to move laterally without moving the collar and into eccentric relation in respect to the slitter knife to apply yielding pressure to the ribbons cut from the webs.

6. In a web slitting and feeding device, a driven slitting knife, a drag roller having means cooperating with the slitter knife to cut webs into ribbons, a presser member adjacent each side of the slitter knife and cooperating with the drag roller to feed ribbons cut from webs, a spring pressed collar in engagement with at least one of the presser members to press it against the slitter knife, the presser member being adapted to move laterally into eccentric relation in respect to the slitter knife to apply pressure to the ribbons cut from the webs.

7. In a device for slitting and feeding ribbons from a web, a driven shaft, a slitter knife mounted on the shaft to rotate therewith, a ribbon engaging presser member at each side of the slitter knife and being adapted to move laterally in respect to the axis of the shaft to be eccentric to the slitter knife, and a member engaging friction collar mounted on the shaft to rotate therewith to drive the presser members.

8. In a device for slitting and feeding ribbons cut from a web, a driven shaft, a slitter knife mounted on the shaft to rotate therewith, a ribbon engaging presser member at each side of the slitter knife and adapted to move laterally in respect to the axis of the shaft to be eccentric to the slitter knife, and a member engaging friction collar mounted on the shaft to rotate therewith to drive the presser members.

9. In a device for slitting and feeding ribbons from a web, a driven shaft, a slitter knife mounted on the shaft to rotate therewith, a ribbon engaging presser member at each side of the slitter knife and adapted to be moved laterally with respect to the axis of the shaft to run eccentric

to the slitter knife, a member engaging friction collar mounted on the shaft to rotate therewith to drive the presser members, spring means acting against the friction collar, and means to adjust the pressure of the spring.

10. In a device for slitting and feeding ribbons ribbons cut from a web, a driven slitter support including a sleeve having a flanged collar, an axially slidable collar on the sleeve, a pair of presser rings located between the collars and loose on the sleeve, a nut adjustable on the sleeve, and a spring between the nut and the slidable collar, in combination with a slitter knife held between the presser members and rotatably driven with one of the collars, and a driven abutment roller having a groove cooperating with the slitter knife, the slitter support being so mounted with respect to the abutment roller that the presser rings are forced into eccentric relation with the axis of the sleeve.

11. In a device for slitting and feeding ribbons cut from a web, a driven slitter shaft, a sleeve secured to the shaft and having a flanged collar, an axially slidable collar on the sleeve, a pair of presser members between the collars and loose on the sleeve, a slitter knife between the presser members and rotatably driven with one of the collars, a nut adjustable on the sleeve, a spring between the nut and the slidable collar, and a driven abutment roller having a groove cooperating with the slitter knife; the slitter shaft being so mounted with respect to the abutment roller that the presser members are forced into eccentric relation with the slitter shaft.

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