

June 19, 1928.

H. B. VANNOTE

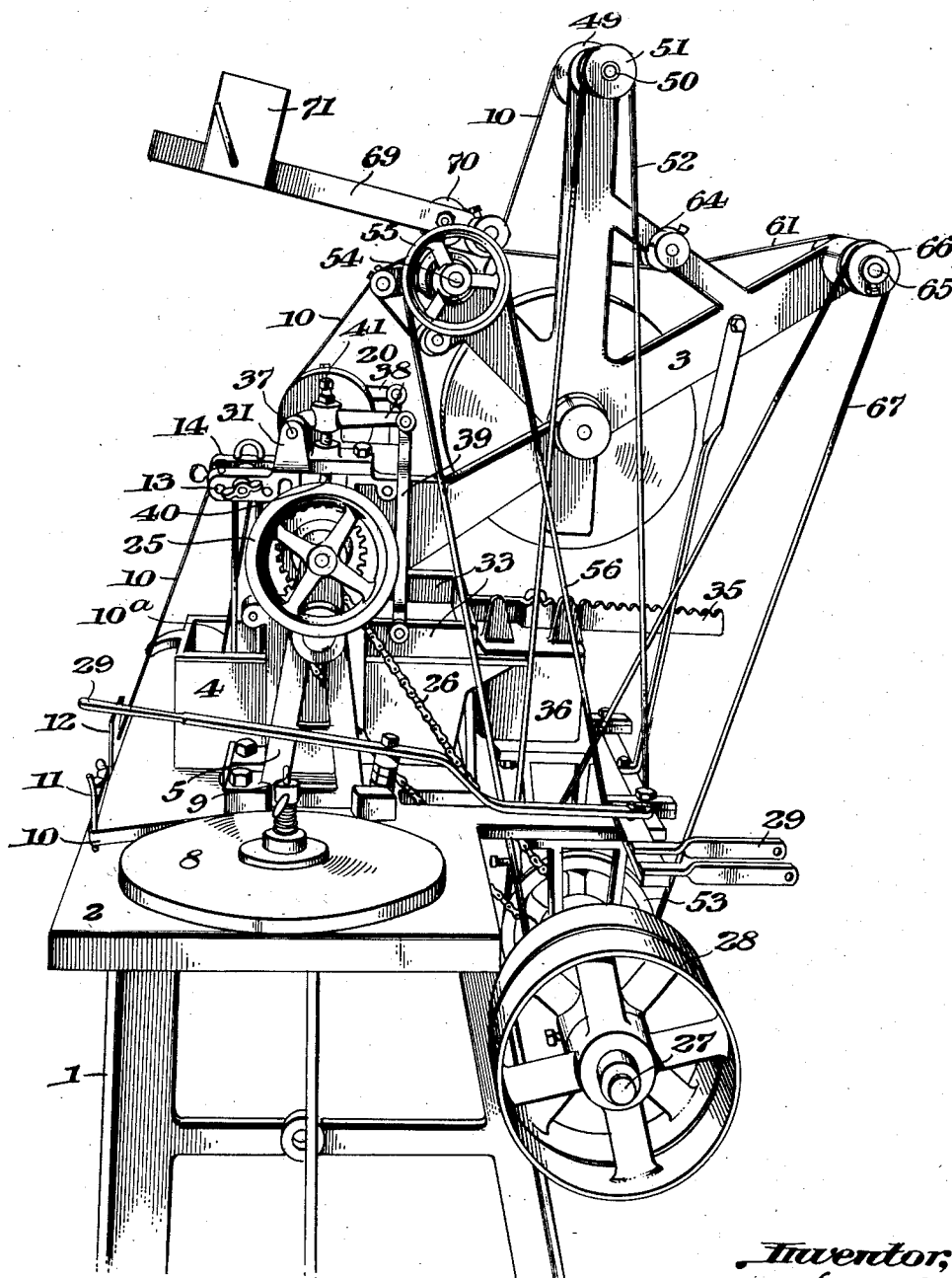
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METHOD AND MACHINE FOR PRODUCING PRINTING RIBBONS

Filed Dec. 6, 1921.

7 Sheets-Sheet 1

Fig. 1.



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June 19, 1928.

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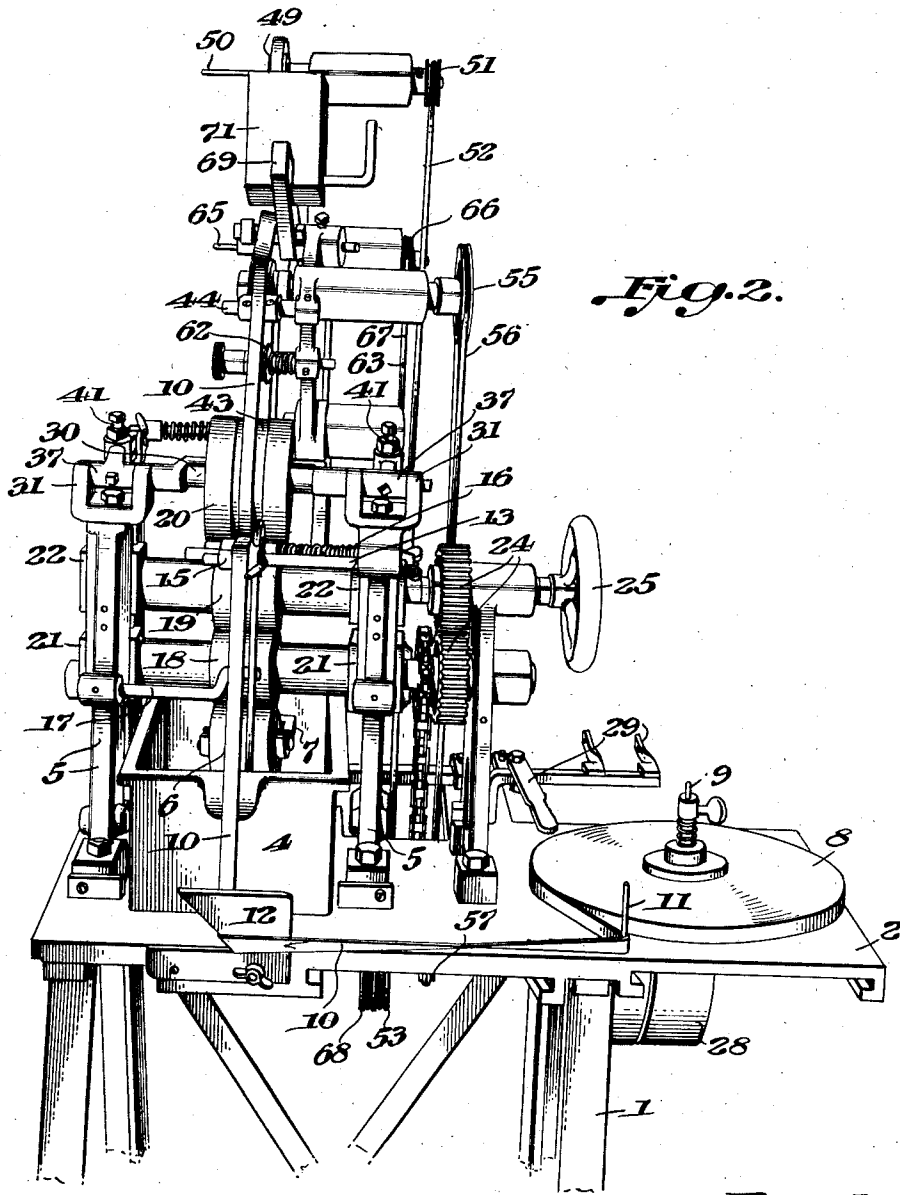


Fig. 2.

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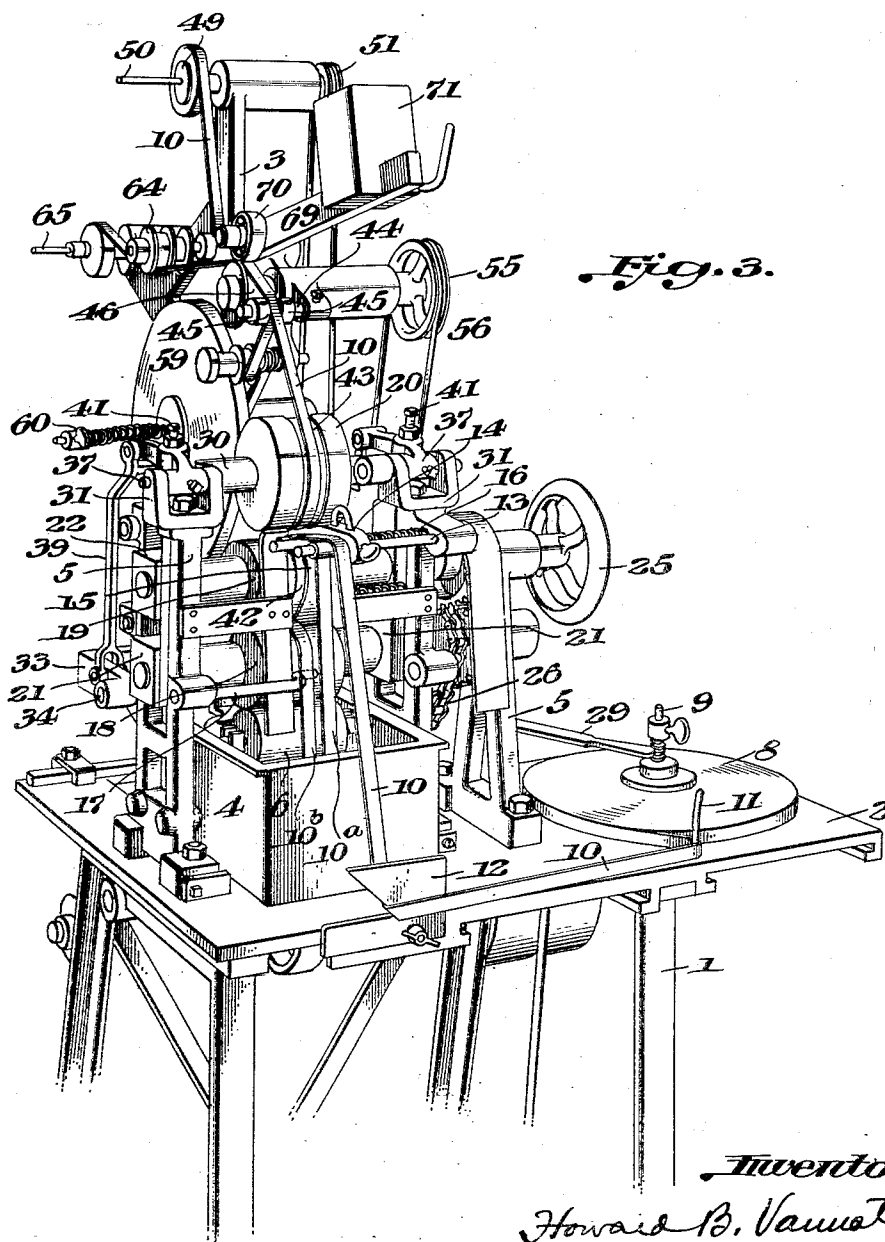


Fig. 3.

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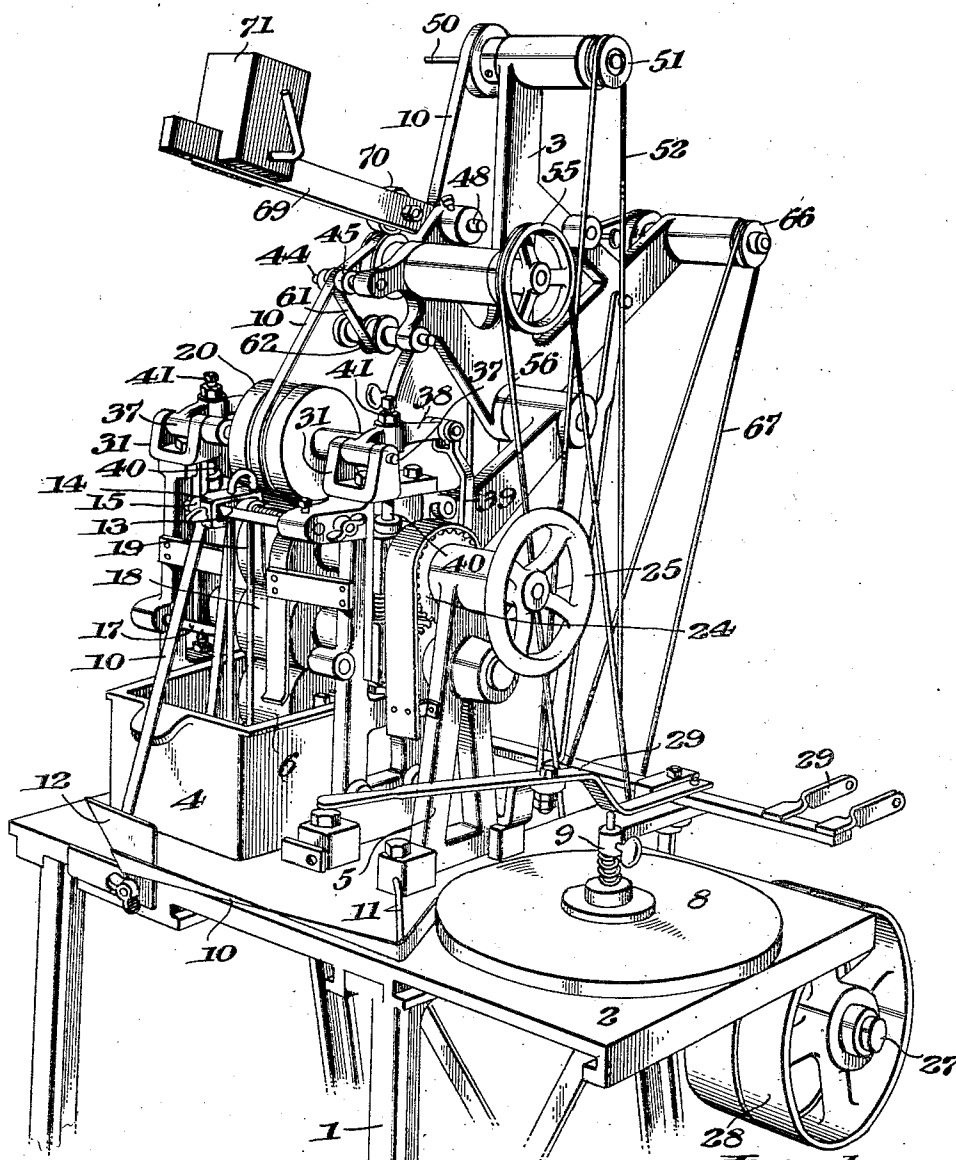
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Fig. 4.



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METHOD AND MACHINE FOR PRODUCING PRINTING RIBBONS

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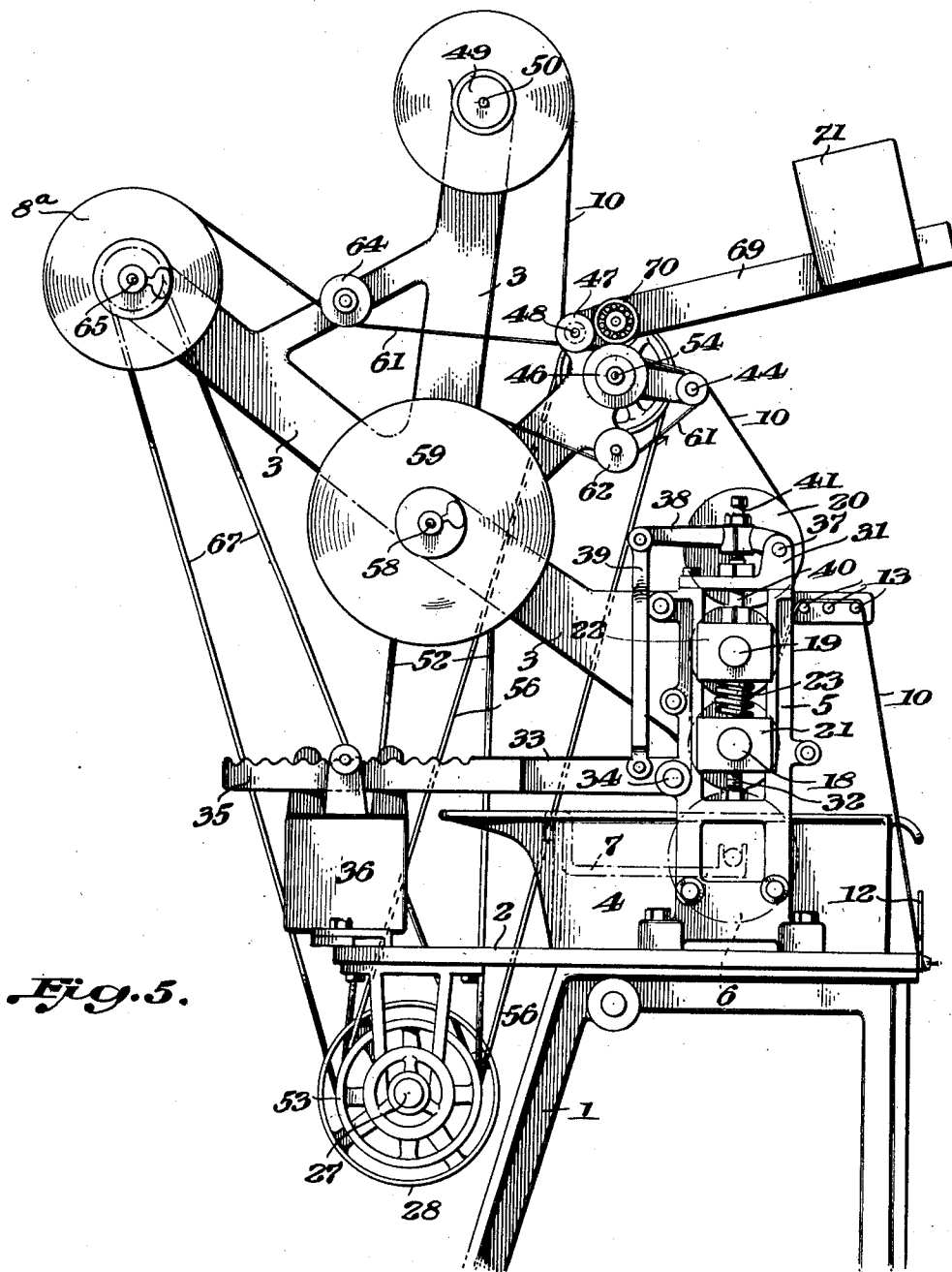


Fig. 5.

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Fig. 6.

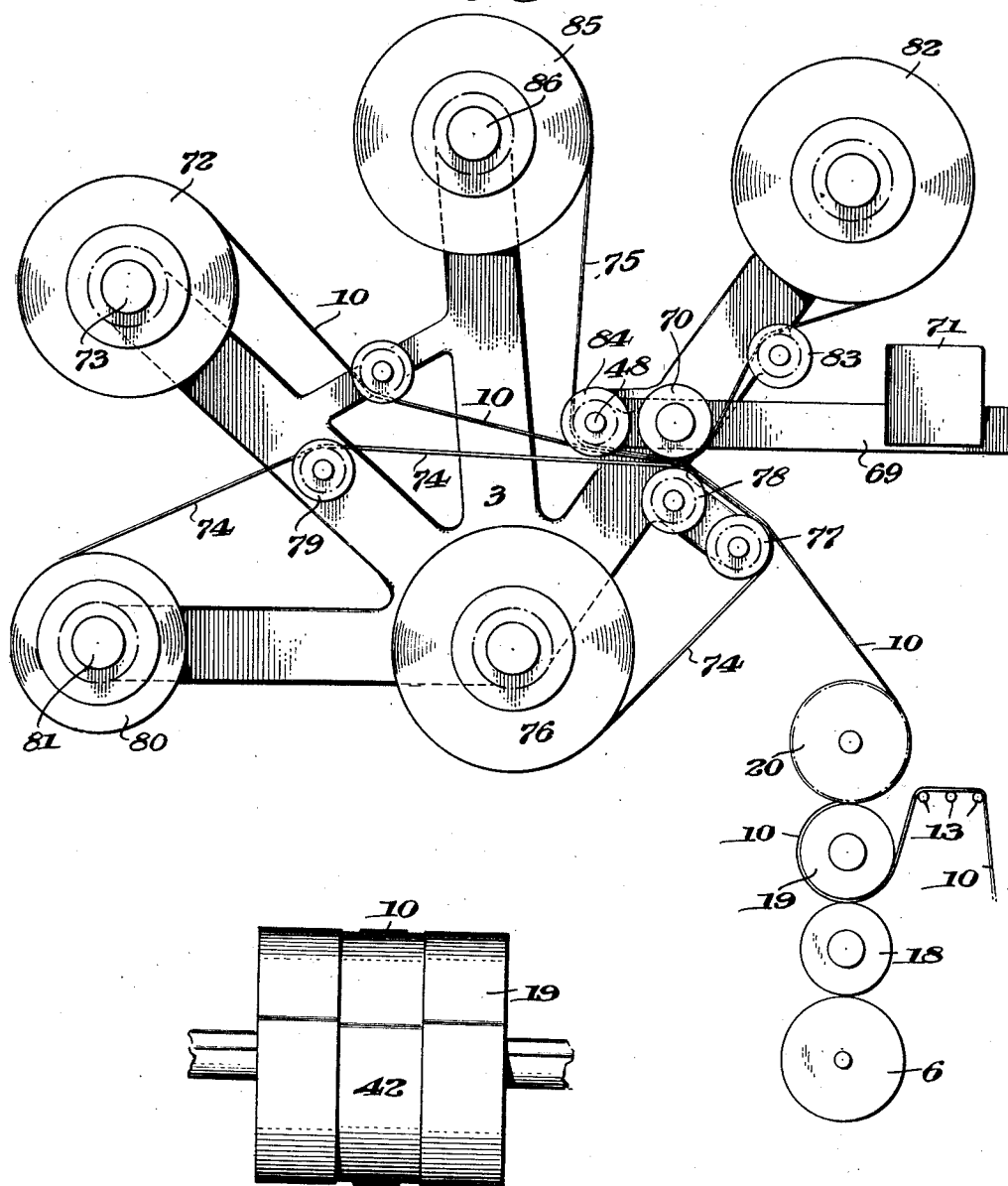


Fig. 7.

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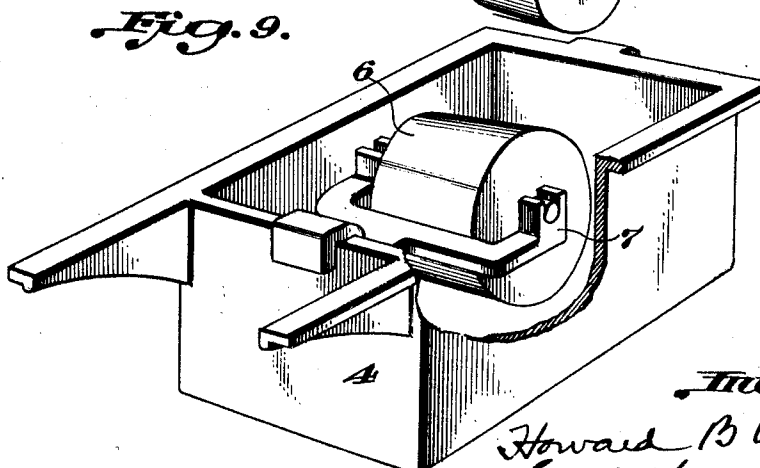
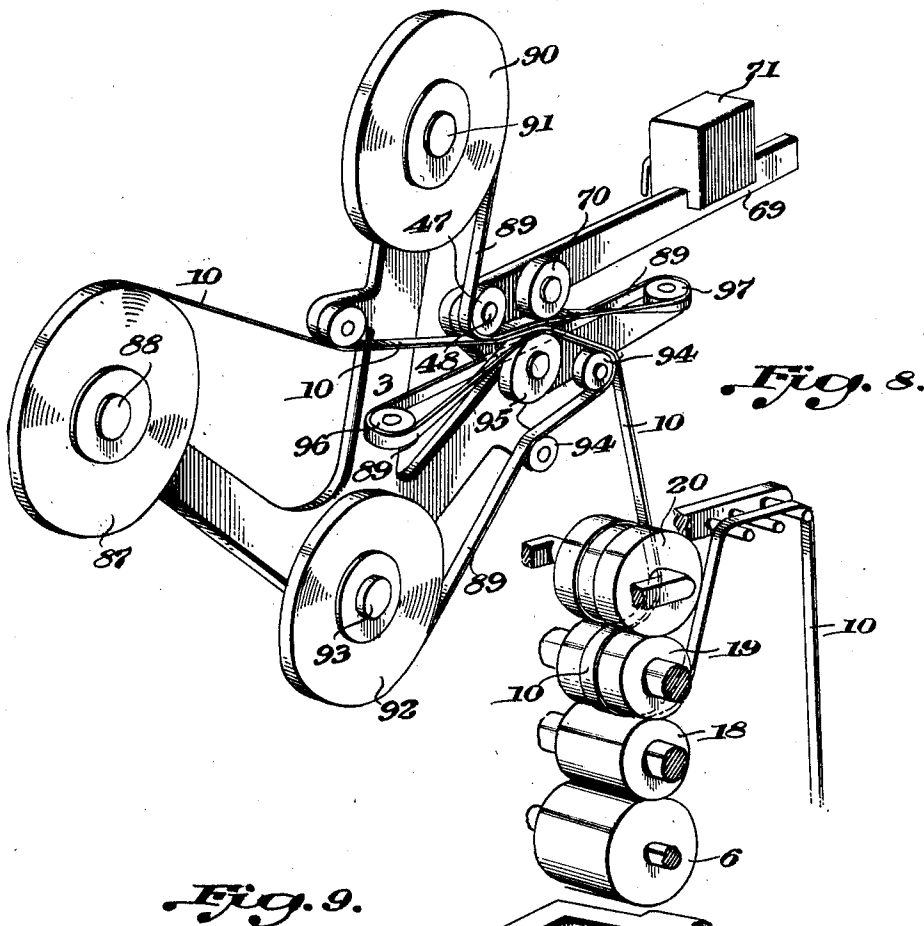
H. B. VANNOTE

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METHOD AND MACHINE FOR PRODUCING PRINTING RIBBONS

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UNITED STATES PATENT OFFICE.

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METHOD AND MACHINE FOR PRODUCING PRINTING RIBBONS.

Application filed December 6, 1921. Serial No. 520,346.

This invention relates to fabric coating methods and machines and, more particularly, to methods and machines for manufacture of printing ribbons such, for instance, as are used on typewriters.

The machine and method are adapted for the manufacture of either single color or bichrome ribbons and while they are described only in connection with the inking of narrow one-color ribbons, it is to be understood that the same principles may be employed in inking printing ribbons of any width and in a plurality of colors.

The object of my invention, generally stated, is to provide an improved method and machine for inking ribbons in such manner that the excess inking or coating material will be removed, in a novel manner, from either or both sides of the ribbon; further, to utilize one or more uninked or uncoated ribbons for the foregoing purpose to thereby absorb into such other "blotting" ribbon or ribbons a partial impregnation so that such blotting ribbon or ribbons will, when subsequently run through the machine for the purpose of completely inking them, require only a minimum amount of inking or coating material, thus enabling the machine to preliminarily coat or ink one or more ribbons while completely inking or coating another ribbon, whereby finished ribbons will be properly inked and the excess of the inking material will be removed, in an economical manner, tending to produce ribbons which have the correct proportion of inking or coating material.

The use of one or more absorbing or "blotting" ribbons to take up the excess inking or coating material from the ribbon being finished, enables the absorbing ribbon to be thoroughly brushed and inspected while passing through the machine during its use as an absorbing medium. Consequently, all lint or foreign material is removed by this operation so that when the absorbing or blotting ribbon is again run through the machine to receive its final coat, no foreign bodies will be carried into the ink to interfere with the coating operation of ribbon subsequently handled by the machine.

Another object is the provision of a method and means which will overcome what has

heretofore constituted a defect in inking or coating machines, particularly those used for manufacturing typewriter ribbons, to wit: the inability of the machine to properly ink or coat those portions of the ribbon which have an abnormal thickness caused by imperfections, joints, or other conditions where the coating rolls separate for the purpose of allowing the material to pass through and thus interfere with proper inking.

To overcome this defect I provide a method and means for effecting an adjustable or yieldable pressure on the rolls around which the ribbon passes so that the rebound occasioned by the rolls encountering an imperfection, joint, or the like, will be absorbed in such manner that the ribbon cannot escape proper inking when such parts pass through the rolls. The principle employed in this connection is, I believe, embodied in entirely novel means for this particular use.

A further object is to provide one or more peripherally grooved rolls around which the ribbon passes and in the groove or grooves of which it lies. The channel or groove in one or more rolls is of such depth as to be slightly less than the thickness of the ribbon being inked but within the elastic limits of such ribbon. As a result, while the inking or coating material will be evenly worked into the fabric, the crushing or weakening of the fabric or the damaging of its edges is prevented.

One roll may be provided with the peripheral groove or channel and the adjoining roll may have a peripheral rib, or may be smooth, or, adjoining rolls may each have a peripheral groove or channel.

The ribbon or fabric to be inked or coated may pass directly to the rolls, or, it may first pass into the tank or bath of inking or coating material.

A blotting or absorbing ribbon may be used only in connection with one side of the ribbon which has been inked or coated, or it may be arranged to contact first with one side of said ribbon and then with the other side so as to absorb excess ink or coating material from both sides of the ribbon, or two blotting or absorbing ribbons may be employed, one for one side of the ribbon which has been inked and the other for the

other side thereof. Various other modifications may be resorted to and it is to be understood, therefore, that the disclosures of the invention in the drawings and as hereinafter described is to be considered as illustrating practical embodiments of the machine and not all forms or arrangements which will carry into effect the principles thereof.

In the accompanying drawings:

10 Figure 1 is a side elevation of a machine wherein the ribbon first passes through the bath before going to the rolls and in which but one blotting or absorbing ribbon is used.

Fig. 2 is a front elevation thereof.

15 Figs. 3 and 4 are front perspective views thereof.

Fig. 5 is a side elevation looking toward the opposite side of the machine from Fig. 1 and illustrating how the ribbon may pass directly to the rolls as it enters the machine.

20 Fig. 6 is a side elevation showing a modification wherein two blotting or absorbing ribbons are employed, one for each side of the ribbon which has been inked or coated.

25 Fig. 7 is a detail front elevation of one of the rolls showing the use of the peripheral groove for the ribbon.

Fig. 8 is a perspective view showing another modification wherein a single blotting or absorbing ribbon is so arranged that it will run in contact with both sides of the ribbon which has been inked; and

30 Fig. 9 is a detail perspective of the tank or reservoir which contains the bath of ink-ing or coating material.

35 The machine has a frame 1, a table 2 and an upper framework 3 which carries the operative parts.

40 The tank 4 or reservoir for the ink or other coating or impregnating material is mounted on the table 2 between standards 5 which have bearings for the rolls.

45 It is within the scope of my invention to provide any suitable means for delivering the ink or coating material to the rolls and I do not limit the invention to the means disclosed which consists of the feed roll 6 which may be of metal and revolvably supported in the tank 4 by a yoke 7 (Figs. 5 and 9). The feed roll 6 is idly mounted so that it is turned by the rolls which act on the ribbon or fabric being inked.

50 Furthermore, it is within the spirit of my invention to use a tank 4 which has separate compartments to contain inks or coating materials of different colors and to provide means for the delivery of the separate colors to the ribbon or material to be coated or inked so that multi-colored ribbons may be produced, for instance, what is known as bichrome ribbons.

55 Furthermore, the ribbon may pass directly to the rolls or it may first enter the bath in the tank 4, passing around a roll therein so as to be primarily coated or inked, in

which event the roll 6 may be dispensed with.

In Figures 1, 2, 3, 4, I have shown how the ribbon may first enter the bath before passing to the rolls. In Figs. 5, 6 and 8 the ribbon is shown as passing to the rolls without first entering the bath in the tank 4.

For instance, referring to Figs. 1, 2, 3, 4, the ribbon or material to be inked or coated is taken off of the roll 8 in which it is wound. The ribbon roll 8 may be mounted to turn on any suitable spindle 9 projecting upwardly from the table 2, said spindle having a screw pressure device comprising a coil spring and a clamp collar removably located on the spindle 9, as shown, so that the roll will lie flat on the table 2 and allow the ribbon 10 to be taken off evenly therefrom. The ribbon 10 is guided in any suitable manner, for instance, by an upright pin 11, thence passing to a suitable guide 12 which changes its direction so that it passes upwardly to and over rods 13. The rods 13 are provided with suitable guiding means 14, 15, in the form of collars which may be set at different positions on the rods 13 and spaced apart just the right width to enable the ribbon to run freely between them. The collar 14 may be subject to the pressure of a coil spring 16 and clamped by a suitable thumb nut in its adjusted position.

The ribbon may now pass directly to the rolls as shown in Figs. 5, 6 and 8, or, it may first descend into the tank 4 to be immediately coated as shown in Figs. 1, 2, 3, 4. When the ribbon descends into the tank it passes around any suitable roll, not shown, immersed in the coating liquid in the tank, and then rises to the rolls. The descending and ascending reaches of the ribbon appear at 10^a and 10^b respectively. The ascending reach 10^b runs over a guide rod 17.

There are three rolls 18, 19, 20, mounted one above the other. When the ink or coating feeding roll 6 is employed it contacts with the lower roll 18 and is adapted to deliver ink or coating liquid thereto, whereupon the roll 18 conveys the ink or coating material to the ribbon. If the ribbon first passes through the bath, the feeding roll 6 may, or may not be employed.

The lower roll 18 is journaled in bearings or boxes 21 carried by the uprights or standards 5. The roll 19 is mounted in boxes or bearings 22 which are mounted so that they can slide up and down in the standards 5 and springs 23 are interposed between the boxes 21 and 22 to cushion the support of the roll 19 by the roll 18 although these rolls run in contact with each other. The roll 19 is driven from the roll 18 by spur gears 24 carried by the journals of said rolls. The journal of the roll 19 may be provided with a hand wheel 25.

Chain and sprocket gearing 26 is employed for driving the roll 18 from a countershaft 27 which is provided with fast and loose belt pulleys 28. A suitable belt shifter 29 is employed.

The roll 20 bears on the roll 19 and is carried by a crank-shaped shaft 30 which is journaled in cap yokes 31 mounted on the standards 5. The roll 20 is an idle roll which is turned only by contact with the roll 19 and such pulling action as the ribbon 10 exerts thereon as it passes from said roll. The roll 20 is relatively heavy and has an important function in absorbing the rebound of the rolls 18 and 19, especially that of roll 19, particularly when an accidental thickness of the ribbon 10 is encountered such as is caused by imperfections, joints, or other causes, and would, without the use of the roll 20, cause such separation of roll 19 from roll 18 as to allow several feet of the ribbon to pass through these rolls without becoming properly inked or coated.

Furthermore, the roll 20 also serves as a "massage" roll for the purpose of working thoroughly into the ribbon or fabric the ink or material which has been deposited thereon and which may not have been thoroughly impregnated in the ribbon by the passage of the latter between the rolls 18 and 19.

The invention is not limited to the use of a single shock absorbing and massage roll 20 as two may be employed, if desired.

The roll 18 is supported in an adjustable manner, as shown at 32, but the roll 19 is held down by an adjustable pressure against the action of the springs 23 which enables the pressure said roll 19 exerts on the ribbon 10 to be predetermined so that while the pressure is adequate for the purpose of incorporating the ink or coating material into the ribbon, it will not be sufficient to crush the ribbon beyond the elastic limits thereof. A yoke 33 which is pivoted at 34, is provided with a toothed bar 35 from which is suspended a weight 36, the weight being adjustable to any point of the bar. Pivoted at 37 to the cap yokes 31 are levers 38 whose rear ends are connected by links 39 to the yoke 33.

Slide bolts 40 pass through the cap yokes 31 and bearing on the boxes or bearings 22 of the roll 19, are pressed downwardly by adjustable screws 41 carried by the levers 38. The weight 36, through the medium of the yoke 33, links 39, levers 38, screws 41 and slide or push pins 40, hold the roll 19 down against roll 18 with a pressure which is adequate for the purpose hereinbefore set forth.

To prevent the adjustable pressure from crushing the fabric 10 beyond its elastic limits and to insure against damage to the edges of the ribbon or fabric, one or both of the rolls 18, 19, is provided with a peripheral groove or journal such as shown at 42,

Fig. 7, and which also appears in Fig. 3. This channel may be wholly carried by the roll 19 or partly carried by roll 19 and a corresponding channel provided in roll 18 or in roll 20, or, a peripheral rib may be provided on either roll 18 or roll 20. I have shown in Figs. 2, 3, 4, a peripheral channel 43 in the massage and rebound absorbing roll 20.

It is to be understood, however, that my invention is not restricted to the use of a peripheral channel in the roll 19 alone nor to the provision of corresponding channels in the rolls 18 and 20 and, further, that a peripheral rib may be provided on one of said rolls to enter the peripheral channel in the roll 19.

The width of the channel 42, and of the channel 43 is not necessarily restricted to being slightly greater than the width of the ribbon 10 as such channel may be considerably wider than the ribbon, as shown, for instance, at 43.

The depth of the channel 42 will depend upon whether this channel alone is used or it is used in connection with another peripheral channel in the adjacent roll, as shown for instance at 43, and, also, on the thickness of the particular ribbon or fabric 10 which is being inked or coated. The purpose of this part of my invention is to enable adequate pressure to be applied by the rolls to the ribbon or other fabric being inked or coated for the purpose of properly inking or coating said ribbon or fabric but without permitting the ribbon or fabric to be crushed or its edges to be damaged. In brief, the provision of the peripheral groove or channel is to protect the ribbon or fabric to the end that it cannot be subjected to pressure beyond its elastic limit. Therefore, it is impossible to specify the precise depth of the peripheral channel as it will depend upon the thickness of the ribbon or fabric but this channel should be of less depth than the thickness of the ribbon or fabric being treated and yet not so shallow that the ribbon or fabric can be crushed down beyond its elastic limit.

The roll 20 not only serves to absorb the rebound of the roll 19 as previously described, but it has the function of a massage or finishing roll which expresses from the ribbon the excess ink or coating material.

Referring to Figs. 1, 3, 4 and 5, the inked ribbon 10 passes from the roll 20 over a pin 44, between collars 45 thereof, thence over a spool 46, thence around a spool 47 carried by the pivot 48 and finally winds on a spool 49 which is carried and turned by a spindle 50 mounted in frame 3. The spindle 50 is provided with a pulley 51 which is driven by a round belt 52, from a suitable pulley 53 carried by shaft 27. Consequently the ribbon is positively reeled up as it is taken off from the massage and rebound roll 20. When a

reel of the inked ribbon is of sufficient size, it is removed from the spindle 50 and a new winding started on the spool 49.

The spool 46 is carried by a shaft 54 which is suitably journaled in frame 3 and carries a drive pulley 55 connected by round belt 56 to a pulley 57 on shaft 27 (Fig. 2). The positive driving of the spool 46 assists in taking the ribbon 10 off and feeding it along to the reeling up spindle 50.

Projecting from the frame 3 is a stub shaft or spindle 58 on which loosely turns an uninked or plain roll of ribbon 59, the latter being retained by a spring, and set collar 60. This uninked ribbon from roll 59 is used as an absorbing or blotting medium. From it the uninked ribbon 61 extends, first under an idle spool 62 carried by a stub shaft 63 projecting from frame 3. The ribbon 61 then extends around the stub shaft 44, thence over the pulley 46 and then to an idle pulley or spool 64 and being finally wound up or reeled on a spindle 65. The spindle 65 is journaled in the frame 3 and carries a pulley 66 which is driven by a round belt 67 from a pulley 68 (Fig. 2) carried by shaft 27.

The blotting or absorbing ribbon 61 is in contact with the under face of the ribbon 10 from the point where it passes over the pin or stub shaft 44 to where it leaves the pulley 47 and, in consequence, the excess ink or coating carried by the ribbon 10 is absorbed or taken up by the ribbon 61. When a proper length of ribbon 61 has been reeled on the spindle 65, the spool thus wound may be removed and when the spool or wound ribbon 8 is exhausted, the partly inked spool or winding 8^a may be placed on the pin 9 and the partially inked ribbon then run through the machine, then taking the place of the ribbon 10 previously described. Thus, the excess coating or ink which is carried by the ribbon 10 is absorbed and used as a partial coating or inking for an uninked ribbon, thus minimizing the amount of ink that will be necessary to properly coat or impregnate the new ribbon 8^a. This results in economy in the use of the coating material or ink; it saves on the time necessary to produce a properly inked ribbon; and it enables lint or foreign material carried by the ribbon 61 to be removed or brushed off while said ribbon is being used as a blotting or absorbing ribbon and hence when the ribbon 61 is, in its turn, run through the machine, it does not carry into the bath contained in the tank 4 any lint or foreign material.

To insure proper contact between the blotting or absorbing ribbon 61 and the inked ribbon 10, there is provided a lever 69 which is pivoted on the same pin 48 which constitutes a bearing for the spool 47, and this lever carries a self-adjusting ball bearing pressure roll 70 which bears on the inked ribbon 10 and presses it against the stretch

of ribbon 61 underneath it. The spool 46 supports the stretches of the ribbons 61 and 10 while this pressure is continually applied as the ribbons are passing through the machine. A weight 71 which is adjustably carried by the lever 69, enables the operator to regulate the pressure exerted by roll 70 on the ribbons.

An arrangement of ribbons may be employed whereby both sides of the inked ribbon will be subject to the blotting or absorbing action of one or more uninked ribbons.

In Fig. 6 there is shown an arrangement whereby the inked ribbon 10 is reeled at 72 under suitable driving action exerted on the spindle 73. The ribbon 10 passes between a lower blotting ribbon 74 and an upper blotting or absorbing ribbon 75. The ribbon 74 unreels from the roll 76, thence passes over plain or grooved rolls 77, 78, while in contact with the ribbon 10 and over an idle roll or pulley 79 and is reeled, as shown at 80, under the action of a suitably driven spindle 81.

The upper blotting ribbon 75 is taken off of a roll 82, thence passes over a roll 83 and thence over roll 70 which is carried by lever 69 and finally around roll or pulley 84 and is reeled at 85 by the driving action of a suitable spindle 86. The lever 69 is pivoted at 48 as heretofore, and the weight 71, which is adjustable along the lever 69, causes the pressure roll 70 to press all of the ribbons together so that the excess ink or coating is removed from both sides of the inked ribbon 10.

In Figure 8 there is shown an arrangement by which the inked ribbon 10 may be blotted on both of its sides by using only one uninked blotting ribbon. The ribbon 10 is wound up in the form of a roll 87 on a suitably driven spindle 88. The blotting or absorbing ribbon 89 is wound up as a roll 90 by suitably driving the spindle 91, as it is unreels from the roll 92 which is mounted loosely on the spindle 93. The ribbon 89 after passing over the idle rolls 94, runs over the roll 95, meanwhile being in contact with the under surface of the ribbon 10. The ribbon 89 then has a twist and passes to a horizontal idle roll 96, thence backwardly without contact with the ribbon 10, and around an idle roll 97, and then proceeds in partly twisted arrangement until it comes in contact with the upper side of the ribbon 10. The ribbon 89 passes under the pressure roll 70 and around the roll 47 and is finally reeled up at 90. The pressure roll 70 is carried by the lever 69 which is pivoted to the frame 3 at 48, said lever carrying the adjustable weight 71. While not illustrated, suitable means may be provided for driving the roll 95 and the spindles 88 and 91.

I claim:

1. The method of producing inked printing ribbons which consist in applying ink to a ribbon, absorbing the excess ink from the inked ribbon by an independent ribbon in contact therewith to thereby partially ink said independent ribbon and, subsequently, completing the inking of the last named ribbon.

2. The method of producing inked printing ribbons which consists in applying ink to a ribbon, absorbing the excess ink from the inked ribbon by an independent uninked ribbon traveling in contact therewith and which is wound up or reeled, said independent ribbon being thereby partially inked, and, subsequently, unreeling and completing the inking of the last named ribbon.

3. The method of producing inked printing ribbons which consists in applying ink to a ribbon, absorbing the excess ink from the inked ribbon by an independent uninked ribbon having a pressure contact with the inked ribbon, to thereby partially ink said independent ribbon, and, subsequently, completing the inking of the last named ribbon and absorbing the excess ink therefrom as aforesaid.

4. In a machine for producing inked printing ribbons, the combination with rolls operating on opposite sides of the ribbon, of an additional combined finishing and rebound roll resting on the rolls aforesaid, and adapted to absorb the rebounding action of said rolls.

5. In a machine for producing inked printing ribbons, the combination with rolls operating on opposite sides of the ribbon, of a combined finishing and rebound roll resting on the rolls aforesaid, adapted to absorb the rebounding action of said rolls, and adjustable pressure means acting on the first named rolls.

6. In a machine for producing inked printing ribbons, the combination of a pair of rolls which collectively have a peripheral groove or channel of less depth than the thickness of a ribbon adapted to pass therebetween, said groove being adapted to receive the ribbon, and a rebound roll resting on the rolls aforesaid.

In testimony whereof I affix my signature.

HOWARD B. VANNOTE.