June 12, 1934. T. M. AVERY 1,963,042

INKING MECHANISM FOR PRINTING MACHINES

Original Filed Nov. 11, 1931 4 Sheets-Sheet 1

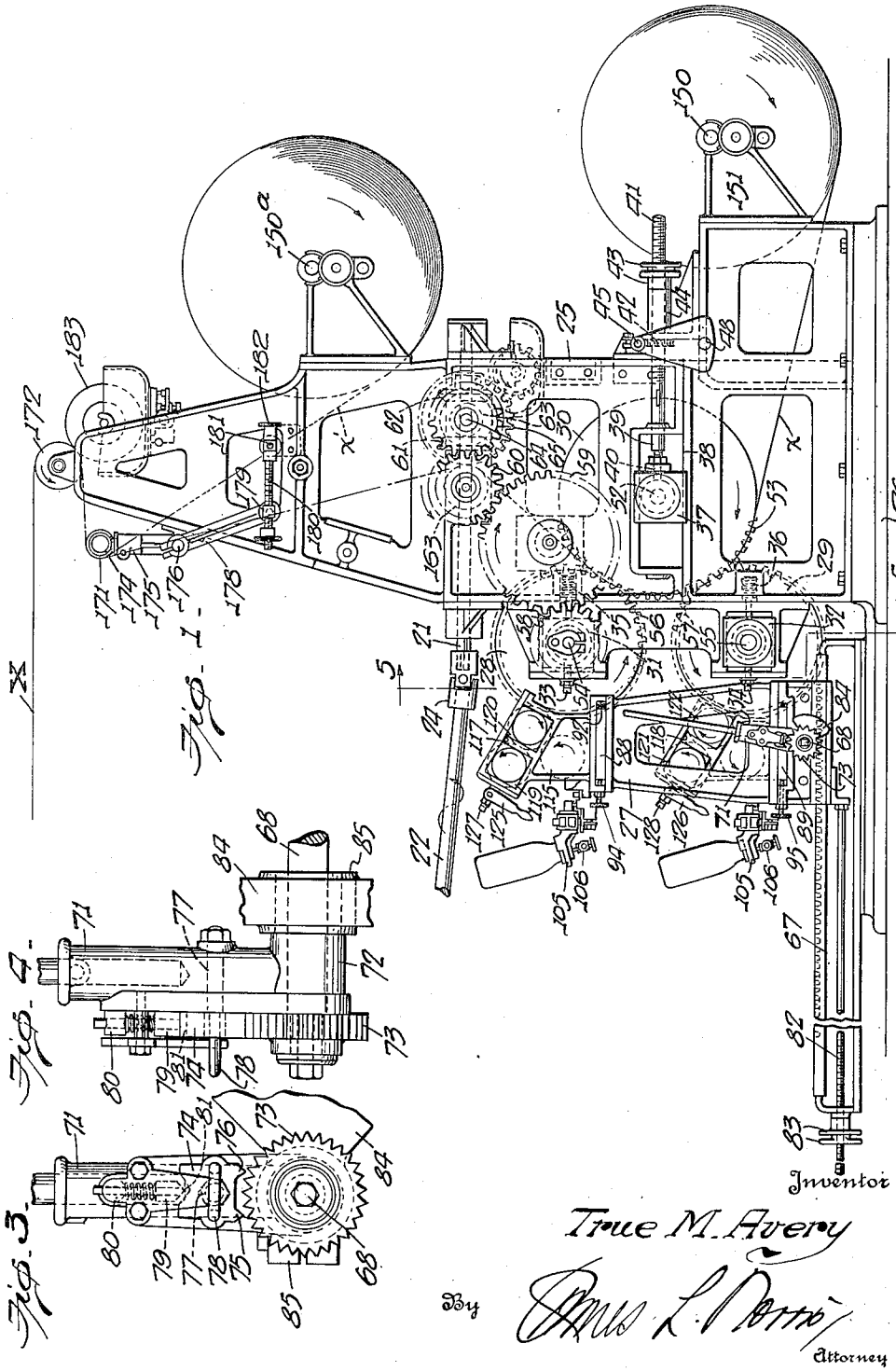

Fig. 1.

Fig. 4.

Fig. 3.

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INKING MECHANISM FOR PRINTING MACHINES

Original Filed Nov. 11, 1931 4 Sheets-Sheet 2

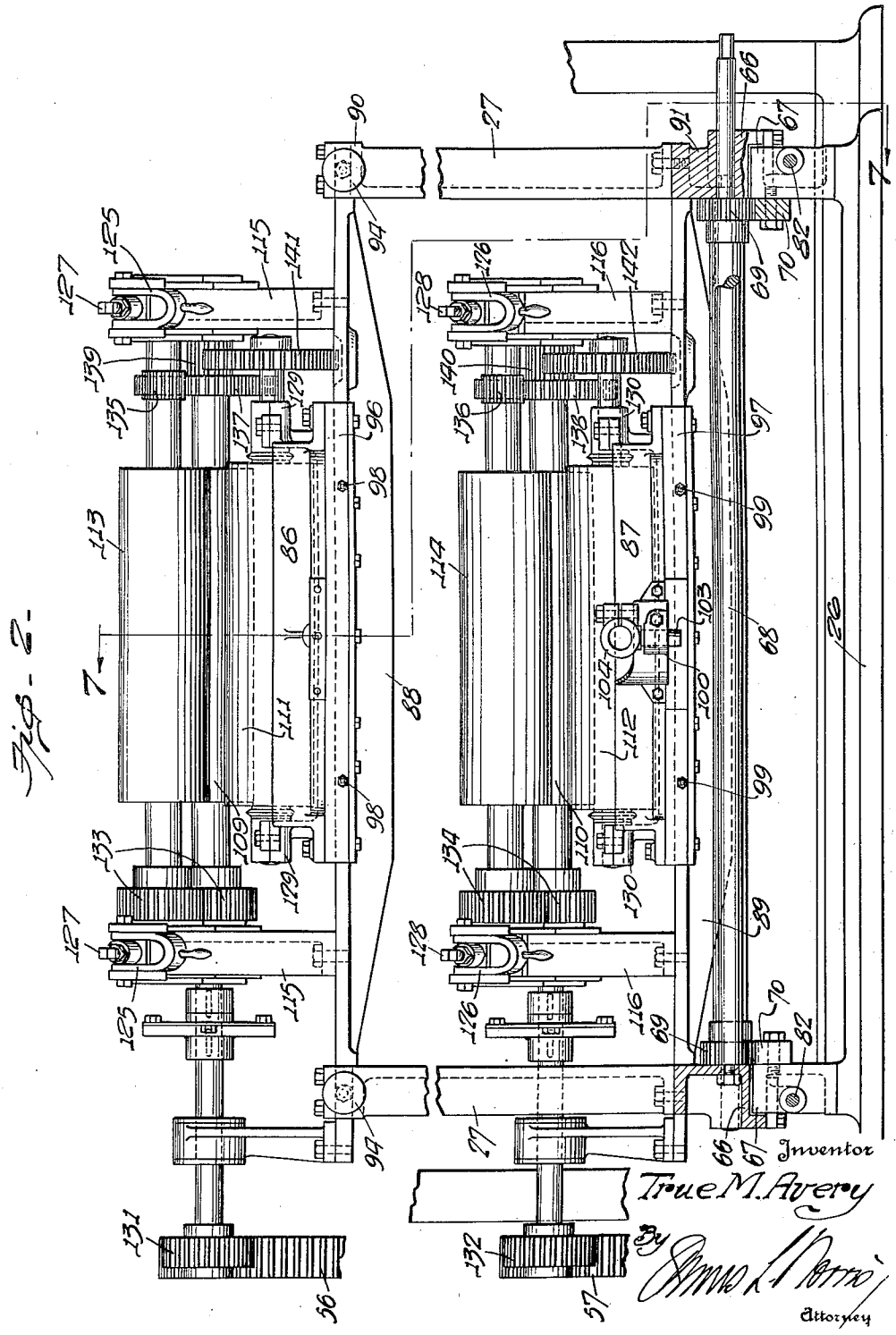

Fig. 2.

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INKING MECHANISM FOR PRINTING MACHINES

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Fig. 6.

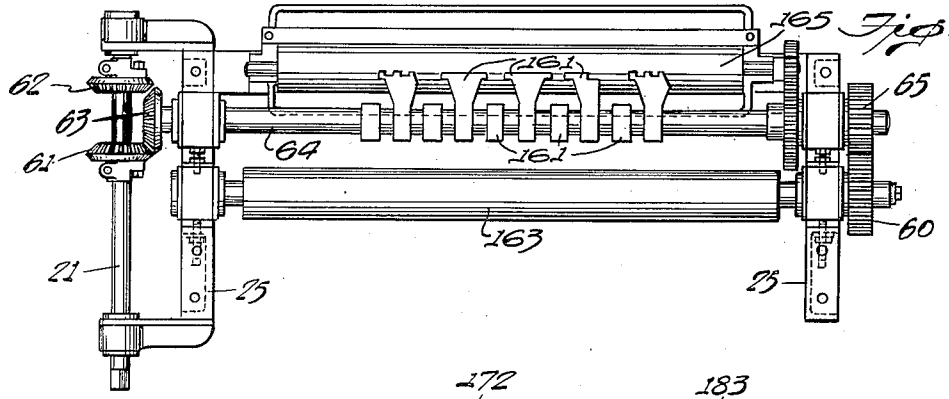
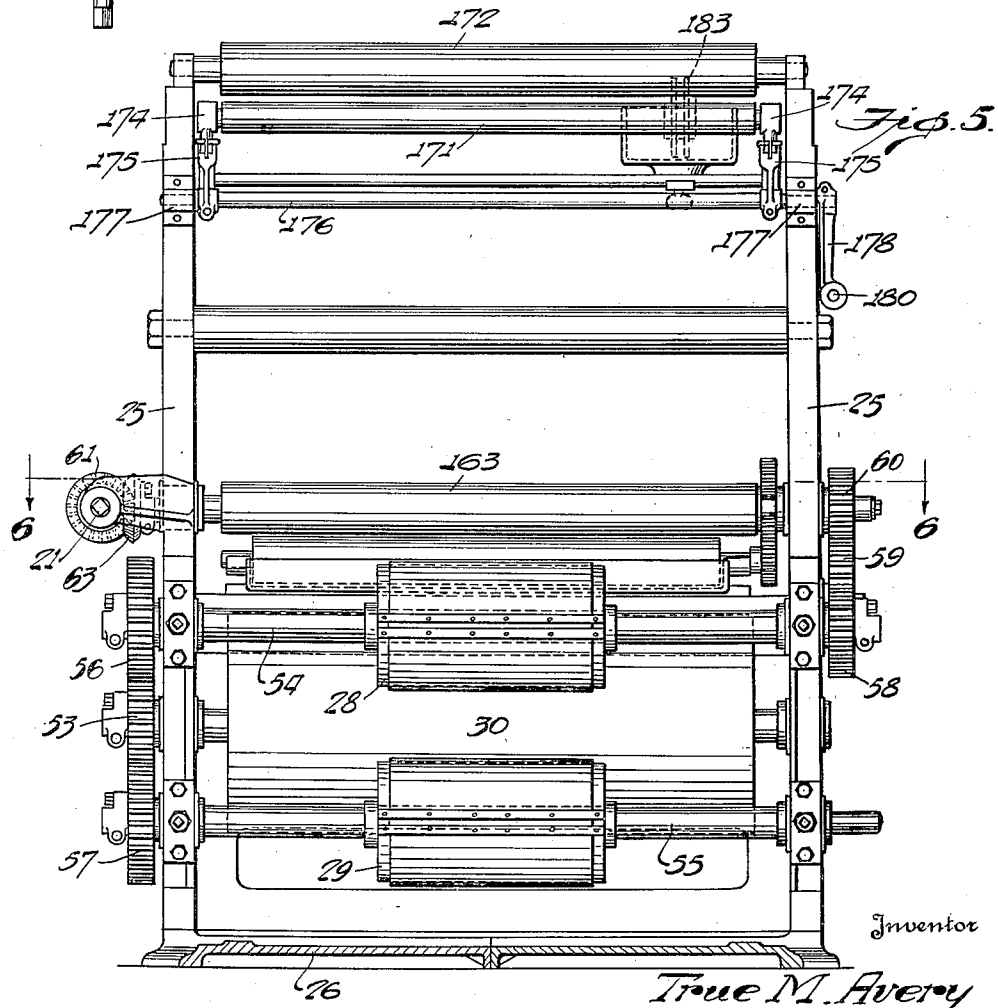


Fig. 5.



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INKING MECHANISM FOR PRINTING MACHINES

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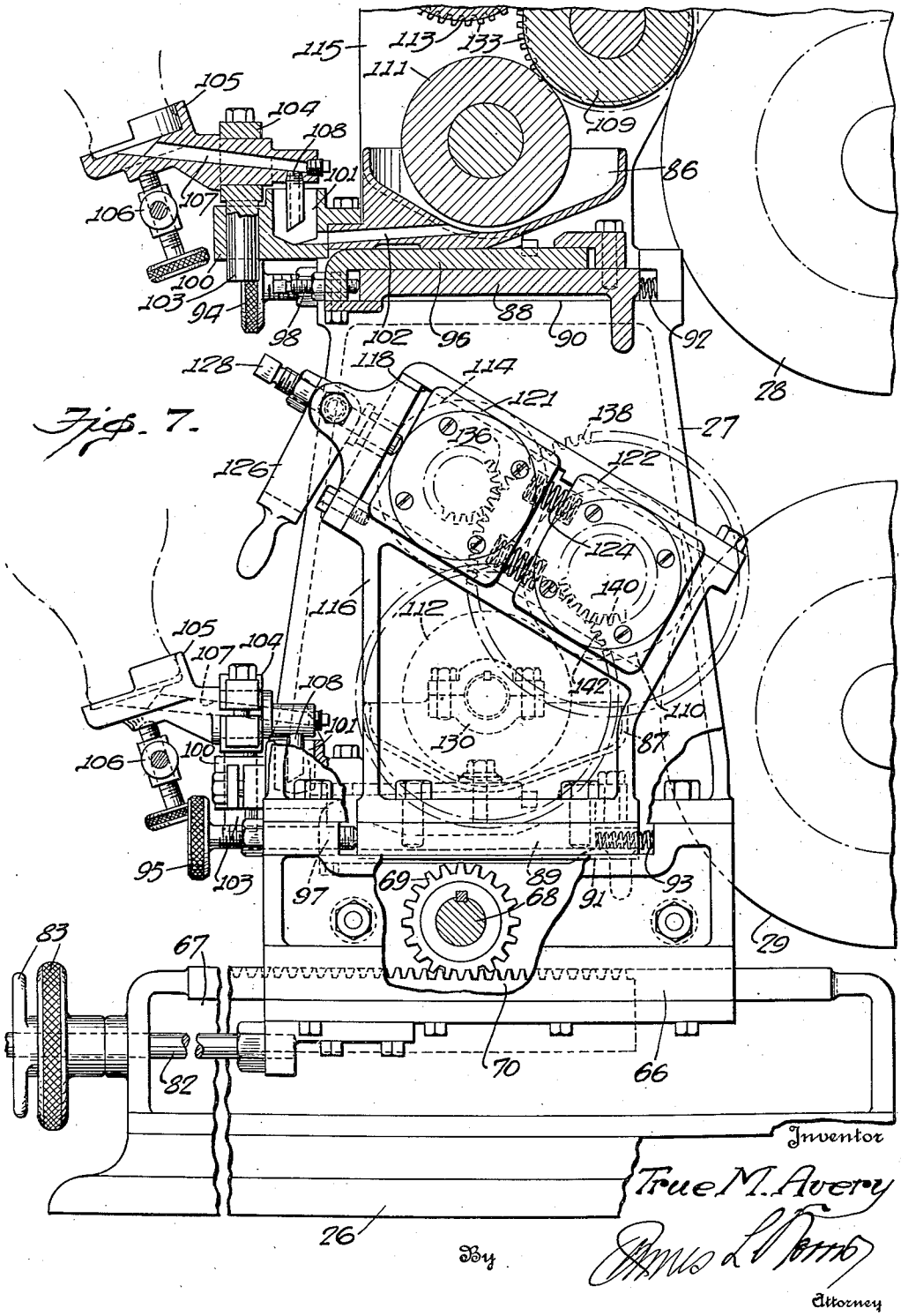

Fig. 7.

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UNITED STATES PATENT OFFICE

1,963,042

INKING MECHANISM FOR PRINTING MACHINES

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Original application November 11, 1931, Serial No. 574,407. Divided and this application April 7, 1933, Serial No. 664,993

7 Claims. (Cl. 101—351)

The present invention relates to printing machines and more especially to machines for printing strips of paper or the like to be used for the making of paper or similar bags whereby the bags will bear desired printed impressions on a side or face thereof, the present application being a division of my co-pending application, Serial No. 574,407, filed November 11, 1931.

One of the primary objects of the present invention is to provide novel and improved means for mounting the inking mechanism for the printing roll or rolls, so that the inking mechanism may be shifted bodily out of cooperative relation with the printing roll or rolls either to relieve pressure between the inking and printing rolls while the machine is idle, or not in operation, thereby avoiding the development of flat spots in the peripheries of the rolls as would otherwise result from prolonged pressure between the rolls while motionless, or to provide convenient access to the printing rolls for the changing or other manipulation thereof and to enable the inking mechanism to be adjusted to conform with printing rolls of different diameters, means being provided for insuring the immediate return of the inking mechanism accurately to proper working relation with the printing roll or rolls.

Another object of the invention is to provide novel and improved inking mechanism embodying a fountain roll rotatable in an ink fountain, an inking roll cooperative with the fountain roll to receive ink therefrom, and a doctor roll cooperative with the inking roll to remove surplus ink therefrom, the inking and doctor rolls having means for rotating them in reverse directions at substantially equal surface speed, and the fountain roll having means for rotating it at a relatively slower speed so that undue lifting or splashing of ink from the ink fountain will be avoided although the proper amount of ink will be received by the inking roll for transfer to the printing roll.

To these and other ends, the invention consists in certain improvements and combinations and arrangements of parts all as will hereinafter appear, the features of novelty being pointed out particularly in the claims at the end of the specification.

In the accompanying drawings:

Figure 1 is a side elevation of a printing mechanism embodying the present invention;

Figure 2 is an elevation, on an enlarged scale, of the inking mechanism as viewed from the left in Figure 1;

Figure 3 is a view on an enlarged scale, of the ratchet mechanism for shifting the inking mechanism to and from operative position;

Figure 4 is a detail view of the ratchet mechanism shown in Figure 3 as viewed from the right in that figure,

Figure 5 is an end elevation of the printing mechanism as viewed from the left in Figure 1, the lower portion of this figure being in section on the line 5—5 of Figure 1,

Figure 6 is a horizontal section taken on the line 6—6 of Figure 5 and looking in the direction of the arrows, and

Figure 7 is an enlarged vertical section taken on the line 7—7 of Figure 2.

Similar parts are designated by the same reference characters in the different figures.

Printing mechanism embodying the present invention is adapted for use generally wherever the printing of a traveling strip or web is desirable, but it is particularly applicable in conjunction with a bag-making machine of well known construction such, for example, as that shown and described in U. S. Letters Patent No. 417,346, granted Dec. 17, 1889 to C. B. Stilwell, whereby the printing of the impressions which it is desired to appear on bags may be made upon the bag strip while the same is being fed into the bag-making machine.

The printing mechanism, according to the present invention, comprises a main frame 25 which rests on a suitable base 26 and provides a support for the various parts of the printing mechanism with the exception of the auxiliary frame 27 which supports the inking mechanism so that it may be shifted into and out of cooperative relation with the printing mechanism, as will be hereinafter described. The printing mechanism shown comprises a pair of printing rolls 28 and 29 which are adapted, for example, to print in different colors, and a cooperating impression roll 30. The printing rolls are mounted in bearings 31 and 32 so that one of these rolls will be directly above the other, and the bearings for these rolls are slidable horizontally in the sides of the main frame 25 and rest against set screws 33 and 34 against which they are held yieldingly by compression springs 35 and 36, the set screws 33 and 34 sustaining the impression pressure exerted by the impression roll 30 upon the printing rolls. The impression roll 30 is mounted by its shaft in a bearing 37 at each end thereof, and each bearing 37 is slidable in a horizontal guideway 38 formed in the respective side of the main frame 25 so that the center of the impression roll is shiftable in a

plane which is perpendicular to a line connecting the centers of the printing rolls 28 and 29 and passes midway between the centers of the printing rolls. By so mounting the impression roll, it may be simultaneously brought into or removed from cooperative relation with both printing rolls which are of equal diameter, or it may be adjusted toward or from the pair of printing rolls and thus made to conform with pairs of printing rolls of smaller or larger diameters.

A spindle 39 is threaded at one end into the respective bearing 37, as at 40, and the other end thereof is threaded along its length, as at 41, and has a thread engagement within a worm wheel 42 which is rotatably mounted in the respective side of the main frame 25, and a pair of lock nuts 43 are mounted on the outer end of each spindle and at the outer side of a bracket 44 which is fixed to the respective side of the main frame to gauge or limit the movement of the impression roll toward the printing rolls and thereby insure the proper degree of impression pressure. A transverse shaft 45 is rotatably mounted in the respective sides of the main frame 25, this shaft having a pair of worms fixed thereon and meshing with the worm wheels 42 which are rotatable on the respective spindles 41, as shown in my co-pending application hereinbefore referred to, the end of the shaft 45 at the front of the machine having a crank 48 fixed thereon, rotation of the shaft 45 by the crank 48 causing both of the spindles to be shifted simultaneously in a direction to move both ends of the impression roll 30 toward or from the printing rolls, as explained in my said co-pending application.

The printing rolls 28 and 29 and the impression roll 30 are geared together so that they will rotate at equal surface speed, the shaft 52 of the impression roll being provided for this purpose with a gear 53 which is fixed thereon to turn therewith, the pitch circle of this gear being of a diameter which equals the diameter of the impression roll, and the shafts 54 and 55 of the printing rolls have gears 56 and 57 which are fixed thereon to turn therewith, the gears 56 and 57 having pitch circles the diameter of which is equal to the diameter of the printing rolls, and these gears mesh with the gear 53 on the shaft of the impression roll. The printing rolls and the impression roll are driven through a gear 58 which is fixed on the shaft 54 of the upper printing roll, the gear 58 meshing with and being driven by an idler gear 59, said idler gear meshing with and being driven from a gear 60 mounted loosely on the shaft of a roll 163.

Printing rolls of different diameters may be accommodated in the printing mechanism in place of the printing rolls 28 and 29. By providing printing rolls of different diameters having gears 56 and 57 of appropriately corresponding diameters to mesh with the gear 53 on the impression roll shaft, such printing rolls of different diameters may be substituted and they will be caused to rotate at the same surface speed as that of the impression roll and to receive the same impression pressure from the impression roll through the adjustment of the impression roll toward or from the printing rolls in a plane passing midway between the centers of the printing rolls, as hereinbefore described.

The drive shaft 21, which may be connected for example to the striker or cut-off device of a bag making machine by the shaft 22 and universal joint 24 so that it will make one revolution to each revolution of the striker or cut-off device, is connected through a bevel gear 61 or 62 fixed thereon, according to the direction in which the shaft 21 turns, and a cooperating bevel gear 63 of equal size fixed on a shaft 64, to a gear 65 which is fixed on shaft 64 and meshes with and is of the same size as the gear 60 so that the latter will always make one revolution to each revolution of the striker or cut-off device of the bag making machine, and by using a gear 58 of the same diameter as that of the gear 60, the printing rolls will always be driven so that they will each make one revolution to each revolution of the drive shaft 21 and of the striker or cut-off device of the bag making machine. The smaller or larger diameter of the printing rolls used will conform with the slower or higher speed of the paper strip through the bag making machine to produce relatively shorter or longer bag lengths, and the use of change gears 56 and 57 which conform with the smaller or larger diameter of the printing rolls will provide proper meshing of these gears with the gear 53 on the impression roll shaft when the surfaces of these rolls are in contact and will insure the driving of the printing and impression rolls at uniform surface speed to conform with the speed of the paper strip through the bag machine.

The inking mechanism for the printing rolls 28 and 29 is carried by an auxiliary frame 27 so that the inking mechanism may be shifted bodily out of cooperative relation with the printing rolls either to relieve pressure between the inking rolls and the printing rolls while the machine is idle or to provide convenient access to the printing rolls for the changing or other manipulation thereof, as well as to enable the inking mechanism to be adjusted to conform with printing rolls of different diameters. In the construction shown, the auxiliary frame 27 carrying the inking mechanism is formed at its lower end with slides 66 which are movable horizontally on rails 67 on the base 26 so that the frame 27 may move horizontally in a direction toward or from the printing rolls, and the frame 27 has a cross shaft 68 extending across its width and rotatably mounted therein, this cross shaft having pinions 69 fixed thereon near its ends and meshing with rack bars 70 which are fixed to the inner sides of the rails 67, so that rotation of the shaft 68 will cause the pinions 69 in engagement with the rack bars 70 to shift the frame 27 horizontally along the base in a direction toward or from the printing rolls. The shaft 68, according to the present invention, is rotated by a ratchet lever 71, the hub 72 of which is rotatably mounted on the forward end of the shaft 68, and a ratchet wheel 73 is fixed to the forward end of the shaft 68 in front of the lever 71. The lever 71 carries a double acting pawl 74 having teeth 75 and 76, the pawl being mounted rotatably on a pivot 77 which is bolted or otherwise fixed in the lever 71, and the pawl is provided with a handle 78 by means of which it may be rotated to throw either the tooth 75 or the tooth 76 into engagement with the ratchet wheel. A spring-pressed plunger 79, guided by a pivot pin 80 mounted rotatably in the lever 71 is arranged to bear in a transverse recess 81 formed in the upper edge of the pawl 74, the plunger 79 so acting that when the pawl 74 is rocked in one or the other direction to engage the tooth 75 or the tooth 76 with the ratchet wheel 73, the spring plunger will slide into the

appropriate end of the recess 81 to yieldingly hold the pawl 74 in such position, although yielding to permit retrograde movement of the active tooth with respect to the ratchet wheel. Reversal of the position of the pawl will cause a corresponding reversal of the position of the spring plunger. Such ratchet lever and ratchet wheel enable the frame 27 to be shifted readily in either direction to bring the inking mechanism into cooperation with the printing rolls or to remove it therefrom. Means is also provided for properly gauging the movement of the inking mechanism toward the printing rolls, such means comprising a rod 82 fixed to each side of the frame 27 at the bottom thereof, each of these rods being threaded and extending through the outer end of the respective rail 67 and provided with lock nuts 83 which are adjustable along the respective rod and are adapted to be set against the outer end of the respective rail after the inking mechanism has been properly set with respect to the printing rolls, the lock nuts acting as automatic limit stops to arrest the movement of the inking mechanism toward the printing rolls while being returned to cooperative relation therewith. Means is also preferably provided for normally retaining the inking mechanism in cooperative relation with the printing rolls and for holding the lock nuts 83 against the ends of the rails 67, such means as herein shown comprising a weight 84 having a split hub 85 which is adapted to be clamped on the hub 72 of the ratchet lever 71, this weight being set in such a position that it will tend to descend and thereby turn the shaft 68 in a direction to move the inking mechanism carrying frame 27 toward the printing rolls and to thereby hold the lock nuts 83 against the ends of the respective rails. Preferably, the weight 84 is set at the side of the ratchet lever 71 which is toward the printing rolls so that while the ratchet lever is in substantially upright position, the weight will act thereon to swing it in a direction tending to move the inking mechanism toward the printing rolls.

The inking mechanism, in the present instance, comprises two inking rolls to cooperate with the respective printing rolls, and ink fountains and rolls for supplying ink to the respective inking rolls. The employment of two printing rolls enables printing to be done in different colors, and in that case, the different inking rolls and their cooperative fountains and feeding rolls will supply ink of different colors to the printing rolls. As shown a pair of ink fountains 86 and 87 are employed which carry the inking and ink supply rolls, these fountains and the rolls cooperative therewith being preferably substantially duplicates. The ink fountains are mounted on base plates 88 and 89 which extend transversely across the auxiliary frame 27 and rest slidably on guideways 90 and 91 on the respective side members of the frame 27 so that each ink fountain is shiftable relatively to the frame 27 in a direction toward and from the respective printing roll. Springs 92 and 93 are interposed between the forward edges of the respective base plates 88 and 89 and the frame 27, these springs acting normally or yieldingly to withdraw the respective ink fountains relatively to the printing rolls, and screws 94 and 95 are threaded in the frame 27 and bear on the edges of the base plates 88 and 89 respectively opposite to the edges thereof engaged by the springs 92 and 93, these screws serving to provide relatively fine or accurate adjustments of the inking devices relatively to the respective printing rolls. Preferably, a pair of screws 94 and 95 are provided to cooperate with the ends of the respective base plates 88 and 89, the screws for each base plate being independently adjustable so that the inking roll carried by the base plate may be brought evenly at both ends into engagement with the respective printing roll. The ink fountains 86 and 87 are preferably adjustable on the respective base plates 88 and 89, they being mounted for this purpose on angle plates 96 and 97 which are slidable transversely on the respective base plates 88 and 89 and carry pairs of set screws 98 and 99 which bear against the adjacent edges of the respective base plates 88 and 89, each pair of these set screws being adjustable either in unison or independently to gauge the distance of the respective ink fountain from the respective printing roll or to adjust it angularly relatively thereto.

The ink fountains may be supplied with ink in different ways, the ink supply means shown in the present instance being similar to that shown in my prior application, Serial No. 455,919, filed May 26, 1930, it being believed sufficient for the purposes of the present invention to describe the ink supply means shown as comprising a bracket 100 for each ink fountain, the bracket having a well 101 therein which communicates with the bottom of the respective ink fountain through a passageway 102, a swivel pin 103 which is rotatable on a vertical axis in the bracket 100 and is provided with a clamp-like socket 104 at its upper end, and an ink bottle carrier 105 which is swiveled in the socket 104 to rotate on a horizontal axis, this carrier being adapted to receive a bottle of ink while the latter is in upright position and to secure the bottle thereto by a clamp 106, after which the ink bottle may be inverted by swiveling the carrier 105 in the socket 104. The carrier 105 contains a duct 107 which leads from the bottle mouth-receiving portion of the carrier to a tube 108, the latter being arranged to project downwardly into the ink well 101 when the carrier 105 is in a position to support the ink bottle in upright or ink-feeding position. The ink flowing from the bottle through the duct 107 and tube 108 will fill the well 101 and the ink fountain to a predetermined level which is determined by the height of the lower end of the tube 108, this tube automatically maintaining the ink at a predetermined level in the ink fountain by controlling the admission of air to the bottle to relieve the vacuum therein.

The base plates 88 and 89 support the inking rolls 109 and 110 which are supplied with ink by the respective fountain rolls 111 and 112 and doctor rolls 113 and 114 which remove surplus ink from the inking rolls and thereby insure the transfer of the proper amount of ink therefrom to the printing rolls. For this purpose, the base plates 88 and 89 have bearing brackets 115 and 116 bolted or otherwise fixed thereon, these bearing brackets having guides 117 and 118 in which are mounted bearings 119 and 120 and 121 and 122 for the shafts of the rolls 113 and 109 and 114 and 110 respectively, the bearings 119 and 121 being slidable in the respective guides in an inclined direction substantially radially of the axes of the respective printing rolls 28 and 29 so that the doctor rolls 113 and 114 carried by these bearings may move toward and from the respective inking rolls 109 and 110. Springs 123 and 124 normally act on the bearings 119 and 121 to yieldingly withdraw the rolls 113 and 114 from the respective inking rolls, and cam levers 125 and 126, pivoted on the respective bearing brackets act on plungers 127 and 128 to force the rolls 113 and 114 into

operative relation with the respective inking rolls 109 and 110. By this arrangement, when the levers 125 and 126 are swung into positions which permit retraction of the plungers 127 and 128, the springs 123 and 124 will act to disengage the doctor rolls 113 and 114 from the respective inking rolls, thus avoiding the development of flat spots in the peripheries of these rolls while the machine is idle or not in operation.

The fountain rolls 111 and 112 are rotatably mounted in bearings 129 and 130 which are formed in the ends of the respective ink fountains 86 and 87, these rolls dipping into the ink in the respective fountains and transferring it to the respective inking rolls. Preferably, a very slight gap is left between each fountain roll 111 or 112 and the respective inking roll 109 or 110, so that the inking roll will contact with the film of ink lifted from the ink fountain by the fountain roll and will thus receive ink therefrom. The independent adjustment provided for the ink fountain as hereinbefore described and controlled by the set screws 98 and 99 enables each fountain roll to be adjusted very accurately in relation to the respective inking roll to effect the transfer of ink between these rolls without requiring actual contact thereof. The doctor rolls 113 and 114 bear upon the respective inking rolls 109 and 110 and serve to remove surplus ink picked up by the inking rolls and to return such ink to the respective ink fountains.

The inking mechanisms just described are driven from the gears 56 and 57 on the shafts of the respective printing rolls by gears 131 and 132 connected to the shafts of the inking rolls 109 and 110. The doctor rolls 113 and 114 are driven from the inking rolls 109 and 110 by gears 133 and 134 which are fixed on the shafts of these rolls, these gears being preferably of equal size so that the inking and doctor rolls will rotate at substantially equal speed but in reverse directions, and the fountain rolls 111 and 112 are driven at a relatively lower speed so that undue lifting or splashing of ink from the ink fountains will be avoided, the driving means for the fountain rolls comprising relatively small pinions 135 and 136 which are fixed on the shafts of the doctor rolls 113 and 114 and mesh with relatively larger gears 137 and 138 which are loosely mounted on the shafts of the respective inking rolls and are connected to relatively smaller pinions 139 and 140 which mesh with relatively large gears 141 and 142 fixed on the shafts of the respective fountain rolls, the reduction gear drive for each fountain roll thus insuring rotation thereof at a sufficiently low speed to avoid splashing or undue lifting of ink from the ink fountains. The contact between the doctor rolls 113 and 114 and the inking rolls 109 and 110 and the rotation of these rolls in opposite direction insures the squeezing of surplus ink from the inking rolls and the return of such ink to the ink fountains.

It is to be understood that the inking rolls 109 and 110 are adapted to contact with the type faces borne by the printing rolls 28 and 29 to supply such type faces with ink for transfer to the paper strip while the latter passes between the printing rolls and the impression roll, and it will be obvious from the diagrammatic illustration of printing rolls of different diameters in Figure 7 that the inking rolls may be brought into operative relationship with printing rolls of different diameters by shifting the auxiliary frame 27 on which the inking mechanisms are mounted, in a direction toward and from the printing rolls by the adjusting means hereinbefore described.

The strip of paper or the like which is printed by the printing rolls is designated x and it is supplied from a paper roll mounted on a reel shaft 150, rotatably supported in bearing brackets 151 provided on the main frame 25.

The paper strip x after passing successively between the printing rolls and the impression roll so as to receive the desired printed impressions, is conducted from the printing mechanism to a bag-making machine, or to any other desired point, and when the printing mechanism is adapted to the making of so-called duplex bags, that is, bags of double thickness formed from two paper strips, the shaft 64 on which the gears 63 and 65 are fixed serves, in cooperation with the roll 163 and paste roll 165, as a paster shaft to apply paste to the paper strip x by paste applying members 161 which are suitably arranged on the shaft 64 and receive paste from a paste roll 165 and apply it in spots on transverse lines to said strip as it passes the freely revoluble roll 163, and a second bag strip x' is fed into the machine so that it will unite with and become pasted to the strip x, the second strip x' being fed into the machine from a paper roll which may be mounted on a reel shaft 150^a which may be similar to the reel shaft 150, the two strips when united forming a strip X, which passes around a tension roll 171 and freely revoluble idler roll 172 and past paste wheels 183 which apply paste to the longitudinal edges of the strips x and x' for forming the longitudinal seams thereof when fed to a bag machine. The tension roller 171 is freely revoluble in bearing members 174 in the upper ends of a pair of arms 175 which are fixed to and extend upwardly from a shaft 176 which extends across the width of the frame 25 and is journaled in suitable bearings 177 in the side members thereof, and an operating arm or lever 178 is fixed to the shaft 176 and extends downwardly therefrom and carries at its lower end a nut 179 which is engaged by a screw 180. One end of this screw is rotatably mounted in a swivel pin 181 supported on the frame 25 and one end of the screw is provided with a knurled head 182 by means of which it may be rotated. By this construction, the paper strip x' is pressed into adhering relationship with the side of the strip x bearing the paste applied by the member 161 as the two strips pass around the tension roller 171 and around the idler roller 172, and also, the screw adjustment provided for the tension roller 171 enables the position of this roller and hence the length of the strips x and x' contained in the loop between the pasting mechanism and the bag-making machine to be increased or decreased in order to bring the printed impressions and the transverse lines of paste on the strip x into proper registry with the severing device and other operative parts of the bag machine into which the two strips x and x', united to form the strip X, are fed.

The present invention enables printing rolls of different diameters to be placed in the printing mechanism for the printing, for example, of bag strips for the making of bags of different sizes, and the inking devices to be accommodated thereto, with facility. In order to change the printing rolls, the auxiliary frame 27 carrying the inking devices is retracted from the printing rolls along the rails 67 by manipulation of the ratchet lever 71 to rotate the pinion shaft 68 in the appropriate direction, such retraction of the inking devices rendering the printing rolls conveniently

accessible, and the impression roll 30 is retracted from the opposite side of the printing rolls by rotation of the crank 48 in the appropriate direction. After the printing rolls in use have been removed and the substitute printing rolls of another size introduced into the machine, the auxiliary frame 27 is advanced by manipulation of the ratchet lever 71 to rotate the pinion shaft 68 in the appropriate direction, until the inking rolls 109 and 110 are brought into contact with the respective printing rolls, and the impression roll 30 is brought into contact with the printing rolls and the gear 53 on the impression roll shaft meshed with the change gears 56 and 57 on the printing roll shafts by rotation of the crank 48 in the opposite direction. After the inking rolls have been set with the proper pressure against the printing rolls, the lock nuts 83 are adjusted so that they abut against the outer ends of the rails 67, they thus forming limit stops for gauging the position of the inking rolls relative to the printing rolls, and the ratchet lever 71 is set in a position where the weight 84 will act to hold the lock nuts 83 in position against the rails 67. After the impression roll 30 has been set for the proper impression pressure against the printing rolls, the lock nuts 43 are adjusted so that they abut against the outer ends of the brackets 44, they thereby forming limit stops for gauging the movement of the impression roll toward the printing rolls. In this way, printing rolls of different diameters may be readily interchanged in the machine to conform with bag sections of different lengths made in the bag machine, and the inking devices and the impression roll may be readily adjusted to conform with the printing rolls of different diameters.

When the machine is to become idle, the ratchet lever 71 may be operated in a direction to retract the inking rolls 109 and 110 from the printing rolls and the crank 48 may be turned in a direction to retract the impression roll from the printing rolls, the pressure between these sets of rolls being thereby relieved so that the development of flat spots in the peripheries of the rolls under prolonged pressure while motionless is avoided, and before starting up the machine after an idle period, it is only necessary to operate the ratchet lever 71 to bring the lock nuts 83 into engagement with the outer ends of the rails 67 and to rotate the crank 48 to bring the lock nuts 43 into engagement with the outer ends of the brackets 44, the lock nuts in the two instances providing gauging or limit stops which enable the inking devices and the impression roll to be restored to proper working relationship with the printing rolls without requiring resetting thereof.

I claim as my invention:

1. In a printing machine having a pair of printing rolls inking rolls having means supporting them to move to and from cooperative relation with the respective printing rolls, said inking rolls being relatively adjustable on their supporting means into operative relation with the respective printing rolls, and limit means capable of being set to accord with the operative relation between the inking rolls and the printing rolls to limit the movement of the inking rolls toward the printing rolls.

2. In a printing machine having a main frame provided with means for supporting a pair of printing rolls, an auxiliary frame mounted on said main frame to move toward and from said printing rolls, a pair of inking rolls having means for supporting them on said auxiliary frame for individual adjustment toward and from the respective printing rolls and also for movement with said auxiliary frame to and from cooperative relation with the respective printing rolls, and limit means capable of being set in different positions to limit the movement of said auxiliary frame and of the inking rolls thereon toward the printing rolls.

3. In a printing machine having a main frame having rails extending longitudinally thereon and a printing roll mounted in said main frame, an auxiliary frame supporting an inking roll and movable on said rails on the main frame to carry the inking roll to and from cooperative relation with the printing roll, members fixed to said auxiliary frame and extending along the respective rails and beyond the outer ends thereof, and limit means adjustable longitudinally on said members and arranged to abut against said ends of the rails and thereby arrest the movement of the inking roll toward the printing roll when the inking roll comes into operative relation with the printing roll.

4. In a printing machine having a printing roll and an inking roll having means supporting it to move to and from cooperative relation with the printing roll, limit means capable of being set to accord with the operative relation between the inking roll and the printing roll to limit the movement of the inking roll toward the printing roll, and means for moving the inking roll toward and from the printing roll including means active to hold the inking roll in cooperative relation with the printing roll as determined by the setting of said limit means.

5. In a printing machine having a printing roll and an inking roll having means supporting it to move to and from cooperative relation with the printing roll, limit means capable of being set to accord with the operative relation between the inking roll and the printing roll to limit the movement of the inking roll toward the printing roll, a rack connected to the inking roll supporting means, a pinion cooperative with said rack and rotatable to move the inking roll toward and from the printing roll, a lever to act on said pinion to rotate it, and a weight connected to said lever and tending to actuate it in a direction to hold the inking roll in operative relation with the printing roll as determined by the setting of said limit means.

6. In a printing machine, inking mechanism comprising an ink fountain, a fountain roll having a shaft for rotatably mounting it therein, an inking roll having a shaft supporting it in cooperative relation with said fountain roll to receive ink therefrom, a doctor roll having a shaft supporting it in cooperative relation with the inking roll to remove surplus ink therefrom, and means for rotating the inking and doctor rolls in reverse directions at substantially equal surface speed and a train of reduction gearing embodying a pinion fixed to the doctor roll shaft, intermediate gears rotatably mounted on the inking roll shaft and a gear fixed on the fountain roll shaft for rotating the fountain roll at a relatively slower speed.

7. In a printing machine having a main frame supporting a printing roll, inking mechanism comprising an auxiliary frame slidable longitudinally on the main frame toward and from the printing roll, an inking roll having supporting means slidably mounted on said auxiliary frame for movement therewith to carry the inking roll to and from operative relation with the printing

roll while maintaining the inking roll in parallelism with the printing roll, means for adjusting the inking roll supporting means on the auxiliary frame in directions to position the inking roll for even engagement with the printing roll, an ink fountain slidably mounted on the inking roll supporting means and supporting a fountain roll to cooperate with the inking roll, and means for adjusting the ink fountain and the fountain roll relatively to the inking roll supporting means to vary the operative relationship between the surfaces of the fountain roll and the inking roll.

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