

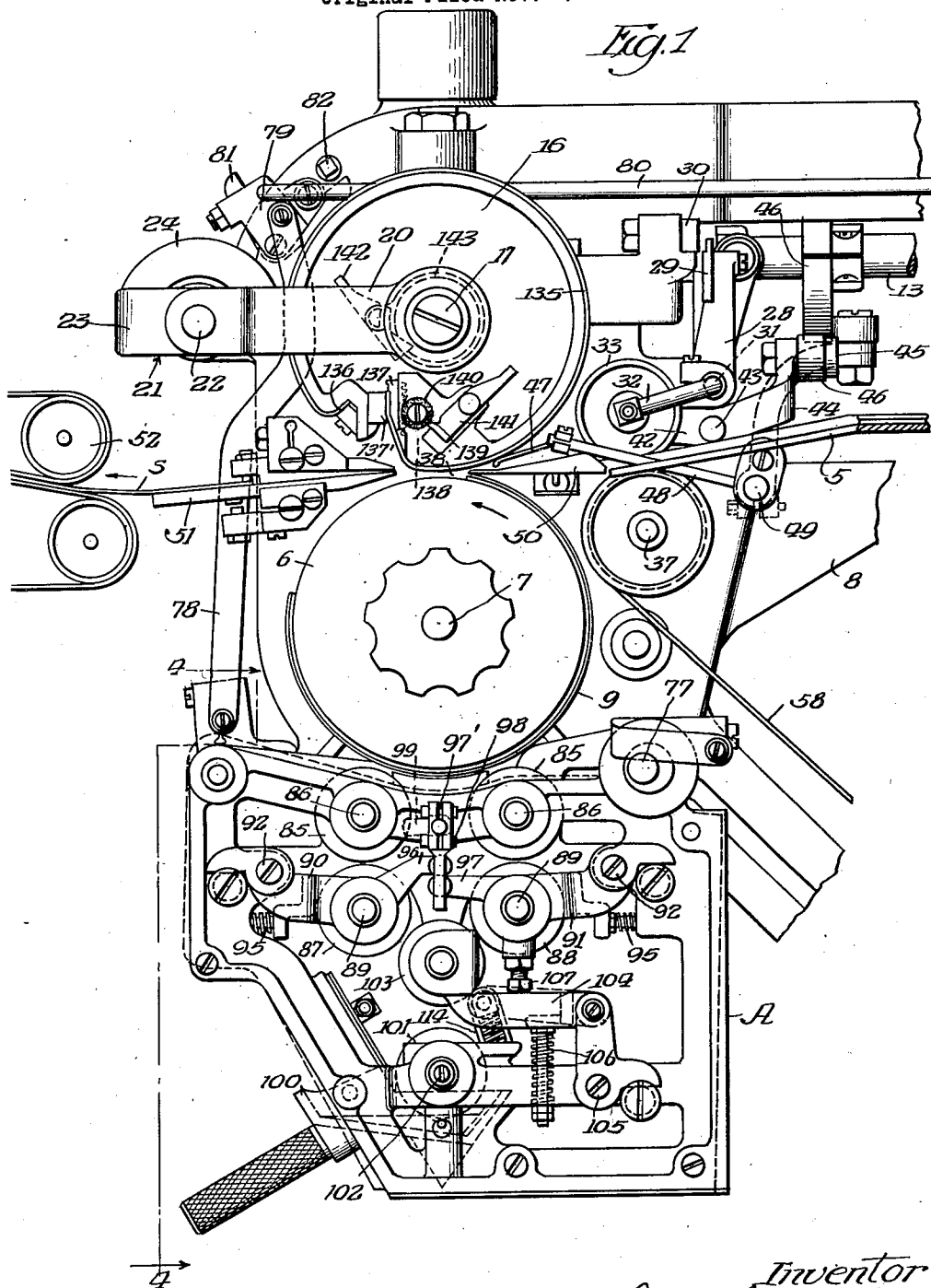
Feb. 6, 1934.

C. G. KRANZ

1,946,217

PRINTING MACHINE

Original Filed Nov. 1, 1929 3 Sheets-Sheet 1



Inventor
Curtis George Kranz
By W. B. Bell, Atty.

Feb. 6, 1934.

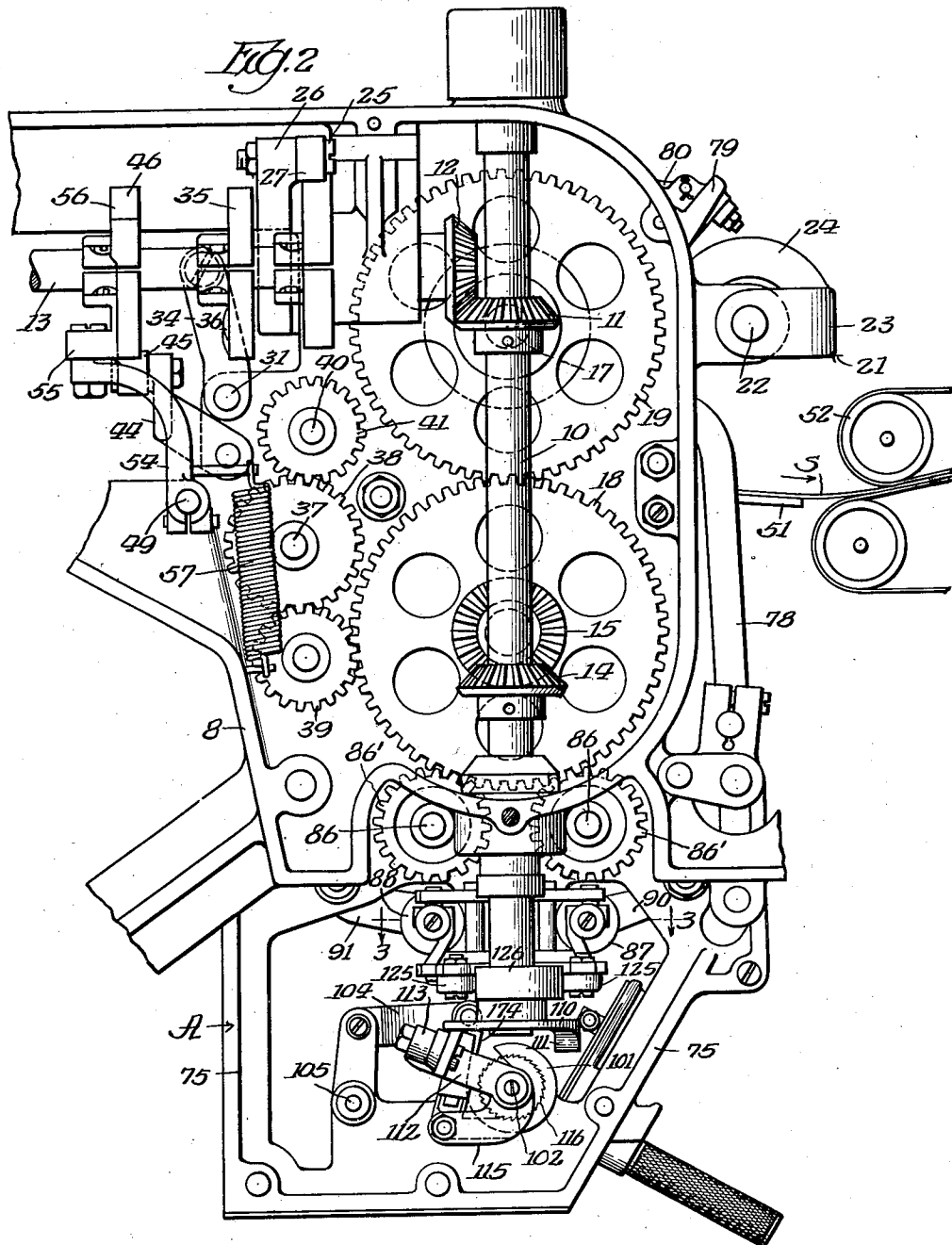
C. G. KRANZ

1,946,217

PRINTING MACHINE

Original Filed Nov. 1, 1929

3 Sheets-Sheet 2



Inventor:
Curtis George Kranz
By *N. D. Bell* Atty.

UNITED STATES PATENT OFFICE

1,946,217

PRINTING MACHINE

Curtis George Kranz, Chicago, Ill., assignor to
Addressograph Company, Wilmington, Del., a
corporation of Delaware

Original application November 1, 1929, Serial No.
404,092. Divided and this application Febru-
ary 6, 1931. Serial No. 513,946

13 Claims. (Cl. 101—351)

This application is a division of my application,
Serial No. 404,092, filed November 1, 1929.

This invention relates to printing machines and
more particularly to inking devices for supplying
ink to the printing devices in such machines. I
have illustrated my invention in connection with
a printing machine wherein a printing mecha-
nism is provided for printing addresses or other
variable information on the sheets passed there-
through, and another printing mechanism is pro-
vided for printing other constant data thereon,
and my improved inking device is shown in asso-
ciation with this last-named printing means.
While I have illustrated my invention in connec-
tion with such a machine and such a printing
means, it is to be understood that this is but an
illustrative embodiment of invention and that it
may be used in connection with any rotating
printing form.

Some of the objects of my invention are to pro-
vide a novel inking device for transferring the ink
from the fountain to the printing form in a uni-
form manner; and to separate the ink supplying
and receiving portions of the device when the
printing device is inoperative.

In the selected embodiment of the invention as
illustrated in the accompanying drawings

Fig. 1 is a front elevation of a printing mecha-
nism embodying my invention;

Fig. 2 is a rear elevation of the structure shown
in Fig. 1;

Fig. 3 is an enlarged detail plan section taken
substantially on the line 3—3 on Fig. 2;

Fig. 4 is a view, partly in section and partly in
elevation, taken substantially on the line 4—4 on
Fig. 1; and

Fig. 4a is a fragmentary sectional detail view
taken substantially on the line 4a—4a on Fig. 4.

The particular structure shown in the drawings
and in which my invention is embodied is in-
tended to be positioned at one end of a printing
machine wherein sheets have a printing operation
performed thereon prior to movement into the
mechanism illustrated in the drawings, and this
illustrated mechanism prints the body or fixed
data on the sheets in proper relation to the pre-
viously made impressions. The guideway 5 (Fig.
1) leads from the printing machine and is posi-
tioned to direct the printed sheets S between the
cylinders of the printing couple. In the present
structure a printing cylinder 6 is mounted on a
horizontal shaft 7 suitably journaled in bearings
in the frame 8. The printing cylinder carries on
its periphery an electroplate 9 or other printing
form. The printing cylinder is arranged lower-

most in the printing couple illustrated to print
on the underside of the sheets for the previously
performed printing impressions will have been
made on this side of the sheets. A vertical shaft
10 is journaled in suitable bearings in the frame
and is driven by beveled gears 11 and 12 from a
horizontally disposed main drive shaft 13 jour-
naled in bearings in the frame of the machine, and
this shaft may be driven from any suitable source
of power as, for example, that operating the
machine. The printing cylinder is positively
driven from the vertical shaft 10 by the beveled
gears 14 and 15. The platen or impression cyl-
inder 16 is mounted on a horizontal shaft 17 and
is positively driven by the meshing gears 18 and
19, respectively mounted on the shafts 7 and 17.
These gears are of the same size and therefore
the cylinders are rotated in synchronism. The
platen cylinder 17, however, is journaled in the
arms 20 of a swinging yoke 21 so that it may be
bodily swung vertically to and from the printing
cylinder. The yoke 21 is pivotally mounted on a
shaft 22 arranged in an elongated bearing in the
upper side of the frame. The yoke includes an
extension arm 23 reaching to the other side of the
shaft 22 on the opposite end of the bearing and
an integral bridge 24 extends from the arm 21 to
one of the arms 20 of the yoke to thereby provide
a very rigid structure to thus obviate any tend-
ency to yield or spring when operated to apply
printing pressure. The elongated bearing for the
yoke insures the application of uniform pressure
by the platen cylinder throughout the width of
the impression surface. The platen cylinder is
normally urged downwardly into printing relation
with the printing cylinder by a spring acting on
the horizontal shaft 17 which may be arranged to
be adjustable so that the pressure exerted thereby
may be regulated and, if desired, a stop lug may
be provided to limit the downward movement as
brought about by this spring. After each print-
ing operation the platen cylinder is raised by a
cam 25 on the main drive shaft 13. One of the
yoke arms 20 has a rigid lateral extension 26
carrying a roller 27 which rides on the periphery
of the cam 25. This cam includes a high portion
which engages the roller to raise the platen cylin-
der at a predetermined time in the operation
thereof which will be immediately after the com-
pletion of a printing impression. The platen cyl-
inder is prevented from contacting with the print-
ing surface of the printing cylinder when no sheet
is present between the cylinders to thereby pre-
vent the impression of offsets on the impression
cylinder. To prevent the lowering of the platen

cylinder when no sheet is present I provide a vertical arm 28 having a notched hardened stop plug 29 at the upper end thereof adapted to be swung into and out of the path of movement of a lug 30 on one end of a yoke arm 20. The vertical arm is mounted on a shaft 31 including a right angularly extending end portion 32 carrying a light feeler wheel 33 at the free end thereof which is positioned over the guideway 5 in the path of the sheets. Whenever there is no sheet present beneath the feeler wheel it will drop sufficiently to swing the arm 28 to position the stop lug 29 under the lug 30 to therefore hold the platen cylinder yoke in raised position. However, when a sheet is present the roller rides thereon and the lug 29 is held from the path of movement of the lug 30 to thereby permit downward movement of the platen cylinder. At the rear end of the shaft 31 there is an upstanding arm 34 having a roller end engaging a cam member 35 on the shaft 13. The cam member includes a high portion 36 which swings the arm 34 and the shaft 31 to move the stop lug 29 from the path of the lug 30 and the operation of this cam is so timed that it does not perform this operation until after the feeler wheel has operated to determine whether or not a sheet is present in the guideway 5, and this arrangement serves to hold the yoke in an upper position until the proper time for the start of a new printing operation. This cam is provided to positively actuate the locking arm 28 because when the pressure of the yoke is on the stop lug 29 the sheet would not afford sufficient resistance on the feeler wheel to overcome this pressure. When the sheets follow each other in regular succession in proper spacing the feeler wheel will drop into the space therebetween and rise on each succeeding sheet to swing the stop lug 29 out of the path of the yoke before it is lowered by the cam 25 and hence during normal succession of the sheets the feeler arm performs no work except the swinging of the arm 28. A pair of feed rollers (not shown) are positioned at the end of the guideway 5 adjacent the printing and impression cylinders in position to feed the sheets S into printing position. The lowermost of these feed rollers is mounted on a shaft 37 in the frame and on the rear end of this shaft is a gear 38 driven by an idler gear 39 meshed with the gear 18. The upper feed roller is mounted on a shaft 40 having a gear 41 on its rear end meshed with and driven by the gear 38. The shaft 40 is journaled in a bearing on one arm of a lever 42 pivotally mounted in the frame at 43 so that the shaft 40 and the feed roller carried thereby may be raised and lowered with respect to the feed roller on the shaft 37. The lever 42 has a rearward extension 44 carrying a roller 45 which rides on the periphery of the cam member 46 on the shaft 13. The action of this cam on the roller rocks the lever 42 to move the feed roller carried by the shaft 40 into engagement with the sheet just at the time the register device, to be described, releases the sheet for movement into register with the printing cylinder surface. The cam 46 raises the lever 42 sufficiently to permit the sheet to pass between the feed rollers but not sufficiently to disengage the gears 41 and 38. The register device consists of a hooked finger 47 on one end of an arm 48 mounted on the rock shaft 49 journaled in the frame. The hooked finger is arranged to operate adjacent the end of the short guide chute 50 positioned between the cylinders and the feed rollers, and this finger will act as a stop against which the end of the sheet may strike to

thereby delay movement of the sheet until it will register with the printing form on the printing cylinder and release and move into contact therewith, and when this finger is raised the sheet will move between the printing and impression cylinders to be gripped therebetween and be moved by the frictional engagement of the cylinders with the sheet. After moving past the cylinders the sheet is discharged into the narrow guide 51 and thence between the belts of the carrier 52 which may be of a type suitable for the purpose. The rock shaft 49 has an upstanding arm 54 carrying a roller 55 riding on the cam face 56 on the cam 46. This cam face has a high spot which is timed with the rotation of the cylinders to actuate the register finger at the proper time. The register finger and the parts associated therewith are yieldably urged into position by the spring 57. The sheets are carried along the guideway 5 and into the guide chute 50 by carrier belts 58 which travel around pulleys on the shaft 37. The printing cylinder is inked by inking mechanism supported in a sub-frame A positioned beneath the printing cylinder. This sub-frame comprises in general open side members 75 connected by suitable cross members 76. At one side this frame is pivotally connected to the main frame so that the sub-frame can be swung toward and from the printing cylinder. The pivot pin 77 (Fig. 1) is eccentrically mounted to provide an adjustment of the sub-frame for accurately positioning the inking rollers. The opposite corner of the sub-frame is pivotally suspended on the link 78 which extends upwardly and is pivotally connected to a bell crank 79 mounted on the upper portion of the main frame. The rotation of the bell crank raises and lowers the sub-frame as indicated by the dotted lines in Fig. 1. This bell crank is operated by a control rod 80 extending to a convenient position for the operator so that it may be operated as the machine is started or stopped. The bell crank has an adjustable stop lug 81 which engages a fixed lug 82 on the frame. By means of this adjustment the sub-frame may also be accurately adjusted with respect to the printing cylinder. The sub-frame carries two inking rollers 85 which are mounted on the shafts 86 journaled in the side members of the sub-frame. The inking rollers are moved into and out of direct contact with the cylinder surface by the movement of the sub-frame. These rollers are keyed to rotate with the shafts 86 and there is sufficient space at the ends of these inking rollers so that they may shift longitudinally of the shafts for the purpose of better distributing ink on the cylinder printing surface. The shafts 86 have gears 86' which mesh with and are driven by the large gear 18 on the printing cylinder shaft. Beneath the inking rollers is a pair of ink distributing rollers 87 and 88. These distributing rollers have shafts 89 which are journaled in the arms of yokes 90 and 91. The yokes are pivotally mounted at 92 in the sub-frame so that the distributing rollers may be swung vertically into and out of contact with the inking rollers. The yokes are yieldingly urged upwardly to maintain the distributing rollers in contact with the inking rollers by means of springs 95 positioned between the sub-frame and lugs on the yokes. It is desirable that the rollers be separated from contact with the cylinder and from contact with each other when they are not in operation to prevent the ink drying and sticking the rollers together, and to prevent streaks and smearing of the ink when the machine is again

started in operation. The inking rollers, as before mentioned, are separated from the printing cylinder by the movement of the sub-frame. In order to make the separation of the ink distributing rollers 87 and 88 automatic the main frame 8 of the machine has a fixed stop arm 93 which extends through an opening in the sub-frame in position to engage a stop lug 94 on the yoke 90, the stop lug 94 having an adjustable screw to regulate the extent of movement. The downward movement of the sub-frame causes the stop lug 94 to strike the fixed stop arm 93 and swing the yoke 90 about its pivot in a counter-clockwise direction as viewed in Fig. 4a to separate its distributing roller from the corresponding inking roller. The swinging movement of the yoke 90 is communicated to yoke 91 by the arm 96 which bears upon the end of a corresponding arm 97 on the yoke 91 to swing said yoke 91 downwardly. In the event that the operator desires to lower the distributing rollers while the machine is running there is provided a rock shaft 97' (Fig. 1) in the sub-frame having a handle 98 by which it may be operated. This rock shaft carries a short arm 99 which engages the arm 96 and operates to swing the yokes 90 and 91 downwardly. An ink fountain in the form of a removable receptacle 100 is positioned in the extreme lower portion of the sub-frame, and a fountain roller 101 is mounted on a shaft 102 which is journaled in bearings in the sub-frame so that the roller is partly immersed in the ink contained in the receptacle. The fountain roller is positioned below the ink distributing rollers. The ink is carried from this fountain roller to the distributing rollers by means of a transfer roller 103 which is adapted to be oscillated between said rollers. For this purpose it is supported in the arms of a yoke 104 which is pivoted at 105 in the sub-frame. The yoke is yieldingly urged upwardly in contact with the distributing rollers by means of the spring 106 positioned between the sub-frame and the yoke. The yoke 91 has a downwardly extending adjustable stop screw 107 which is engaged by the transfer roller yoke 104 and serves as an upward limit stop to regulate the degree of contact pressure of the transfer roller on the distributing rollers. This stop also serves to swing the transfer roller yoke downwardly when the distributing rollers are swung downwardly thereby separating the transfer roller from contact with the distributing rollers. The transfer roller is periodically vibrated by means of a face cam 110 mounted on the lower end of the vertical shaft 10. This cam has a high spot 111 which actuates a bell crank lever 112 (Figs. 2, 3 and 4) the hub of which is pivoted on the shaft 102 of the fountain roller. The upper arm of this bell crank has a roller 113 which rides on the cam 110, and the lower arm has a yielding spring link connection 114 with the transfer roller yoke 104. Thus when the bell crank is operated by the cam 110 it swings the transfer roller downwardly into contact with the fountain roller and then upwardly into contact with both distributing rollers. The lower arm of the bell crank 112 also carries a pivoted pawl 115 (Fig. 2) which engages a ratchet wheel 116 on the fountain roller shaft 102, and as the bell crank oscillates it rotates the fountain roller step by step to bring fresh ink upon the upper side of the fountain roller. The distributing rollers are given a positive endwise vibratory movement for the purpose of better distributing the ink on the inking rollers. The shafts 89 (Fig. 3) of the distributing rollers are journaled in bearings in the side members of the

sub-frame and have considerable endwise play in these bearings. The rear ends of these shafts have spaced collars 120 between which are mounted pivot forks 121. The forks are pivotally mounted in a rocker frame 122 which is pivoted at 123 on a portion of the frame. The rocker frame has short rearwardly extending arms 124 which carry rollers 125 at their ends. These rollers are engaged by an eccentric cam 126 mounted on the upright shaft 10. Thus when the shaft 10 is rotating the cam rocks the rocker frame 122 and shifts the distributing roller shafts alternately endwise. The vibratory movement of the distributing rollers, when in contact with the inking rollers, exert sufficient frictional drag on the friction member to vibrate said inking rollers endwise on their shafts as previously mentioned. The printing cylinder used in this invention may be of the character described and claimed in my co-pending application, Serial No. 511,707, filed January 28, 1931. The platen or pressure cylinder is provided with a cushion blanket pad 135 conveniently made of rubber and fastened at one end 136 fixedly to the cylinder. The other end of the blanket is provided with an elongated rack bar 137 engaged by an elongated pinion 138 on the shaft 139 carrying a ratchet 140 engaged by the spring pawl 141. The rack is held in engagement with the pinion by a block 137' on the drum, and the construction is such that when a tool is applied to the shaft 139 for turning it the pinion moves the rack bar and stretches the blanket on the drum. This provides an ample and convenient means for maintaining the blanket pad smoothly and evenly at all times so that the cylinder will efficiently perform its operation as a platen cylinder and so that a make-ready may be conveniently installed thereon. It may happen that the machine will be stopped with the blanket fastening means at the bottom of the cylinder and to enable the cylinder to be turned easily to bring the blanket fastening means uppermost I lock the cylinder to the shaft therefor by means of a dog 142 which is mounted on the hub of the cylinder and engages a recess in the collar 143 fixed to the shaft. The dog 142 can be operated manually to release the cylinder from the shaft so that it can be turned to any position for adjusting or releasing the blanket. An arrangement of this character is described in detail and claimed in my co-pending application, Serial No. 513,947, filed February 6, 1931.

While I have illustrated and described a selected embodiment of my invention it is to be understood that this is capable of variation and modification and I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such changes and alterations as fall within the scope of the following claims.

I claim:

1. In a printing machine the combination of a printing cylinder, a pair of inking rollers for inking the printing surface of the cylinder, an ink distributing roller for inking each inking roller, a movable sub-frame for supporting all of said rollers and for moving the inking rollers into and out of contact with the printing cylinder, and automatic means operable by the movement of the sub-frame for bodily moving the distributing rollers into and out of contact with the respective inking rollers.

2. In a printing machine the combination of a printing cylinder, a pair of inking rollers for inking the printing surface of the cylinder, an ink distributing roller for inking each inking

- roller, a movable sub-frame for supporting all of said rollers and for moving the inking rollers into and out of contact with the printing cylinder, means operable by the movement of the sub-frame for bodily moving the distributing rollers into and out of contact with the respective inking rollers, an ink supply fountain in said sub-frame, and an ink transfer roller oscillating between said fountain and the distributing rollers for transferring ink from the fountain to the distributing rollers.
3. In a printing machine the combination of a printing cylinder, a pair of inking rollers for inking the printing surface of the cylinder, an ink distributing roller for inking each inking roller, a movable sub-frame for supporting all of said rollers and for moving the inking rollers into and out of contact with the printing cylinder, means operable by the movement of the sub-frame for bodily moving the distributing rollers into and out of contact with the respective inking rollers, an ink supply fountain in said sub-frame, an ink transfer roller oscillating between said fountain and the distributing rollers for transferring ink from the fountain to the distributing rollers, and means for intermittently operating said inking and distributing rollers endwise relatively to each other and to the printing cylinder.
4. In a printing machine the combination of a frame, a rotary printing cylinder mounted therein, a pair of inking rollers for inking the printing surface of the cylinder, a sub-frame movably mounted on said frame for supporting the inking rollers and for moving the inking rollers into and out of contact with the cylinder, an ink distributing roller for each inking roller and mounted in said sub-frame, and means including a portion on the frame and operable by the movement of said sub-frame for bodily moving the distributing rollers into and out of contact with their respective inking rollers.
5. In a printing machine the combination of a frame, a rotary printing cylinder mounted therein, a pair of inking rollers for inking the printing surface of the cylinder, a sub-frame movably mounted on said frame for supporting the inking rollers and for moving the inking rollers into and out of contact with the cylinder, an ink distributing roller for each inking roller and mounted in said sub-frame, means including a portion of the frame and operable by the movement of said sub-frame for bodily moving the distributing rollers into and out of contact with their respective inking rollers, and means mounted in said sub-frame for intermittently shifting said distributing rollers endwise in contact with the inking rollers.
6. In a printing machine, the combination of a frame, a rotary printing cylinder mounted therein, a pair of inking rollers for inking the printing surface of the cylinder, a sub-frame movably mounted on said frame for supporting the inking rollers and for moving the inking rollers into and out of contact with the cylinder, an ink distributing roller for each inking roller mounted in said sub-frame, means automatically operable by the movement of said sub-frame for bodily moving the distributing rollers into and out of contact with their respective inking rollers, means supporting said sub-frame for intermittently shifting said distributing rollers endwise in contact with the inking rollers, an ink fountain supported in said sub-frame, an ink transfer roller, and means for bodily oscillating said transfer roller between the fountain and the distributing rollers for transferring ink from the fountain to said distributing rollers.
7. In a printing machine, the combination of a main frame, a rotary printing cylinder mounted in said frame, and an ink supply device for said printing cylinder, said ink supply device including a sub-frame, ink distributing rollers mounted in said sub-frame and engageable with said printing cylinder to apply ink thereto, means pivotally supporting the sub-frame on the main frame, and means including a member extended to a convenient place on the machine and adapted for manual operation by the operator of the machine to pivot the sub-frame about the mounting therefor to engage the ink distributing rollers with the printing cylinder as the machine is set in operation and to pivot the sub-frame to disengage the ink distributing rollers from the printing cylinder as operation of the machine is interrupted.
8. In a printing machine, a drive shaft, a printing couple including a printing cylinder and an impression cylinder, a vertical shaft extending past the axes of said printing and impression cylinders, means connecting said vertical shaft to said drive shaft, means operating said printing and impression cylinders from said vertical shaft, an inking device for said printing cylinder and including inking rollers engaging the printing cylinder, distributing rollers engaging said inking rollers, and a cam on said vertical shaft for vibrating said distributing rollers to uniformly distribute the ink supply to said distributing rollers from an ink fountain on said inking rollers.
9. In combination, a frame, a printing cylinder rotatably mounted in said frame, a sub-frame mounted on the frame, an inking device mounted in the sub-frame and including inking rollers, means for pivoting the sub-frame toward and away from the printing cylinder to move said inking rollers into and out of engagement with the printing cylinder, distributing rollers, yokes mounted in said sub-frame and carrying said distributing rollers, and means carried by the frame and engageable with a portion on one of said yokes for pivoting said yokes to disengage the distributing rollers from the inking rollers as the sub-frame is pivoted to disengage the inking rollers from the cylinder.
10. In combination, a frame, a printing cylinder rotatably mounted in said frame, a sub-frame mounted on the frame, an inking device mounted in the sub-frame and including inking rollers, means for pivoting the sub-frame toward and away from the printing cylinder to move said inking rollers into and out of engagement with the printing cylinder, distributing rollers, yokes mounted in said sub-frame and carrying said distributing rollers, means carried by the frame and engageable with a portion on one of said yokes for pivoting said yokes to disengage the distributing rollers from the inking rollers as the sub-frame is pivoted to disengage the inking rollers from the cylinder, a transfer roller mounted in the sub-frame, and means on one of said yokes for disengaging the transfer roller from the distributing rollers as the distributing rollers are disengaged from the inking rollers.
11. In a printing machine, the combination of a printing cylinder, an inking roller for inking the printing surface of the cylinder, an ink distributing roller for applying ink to said inking roller, supporting means for said inking and distributing rollers, means for moving said supporting means to move said inking roller toward and

away from the surface of the printing cylinder, and means including a fixed part for moving said distributing roller toward and away from said inking roller as said supporting means is moved
5 to move said inking roller toward and away from the surface of the printing cylinder.

12. In a printing machine which has a printing couple including a printing cylinder and an impression cylinder, a frame for said printing
10 couple, means for moving said cylinders into and out of cooperating relation, a drive shaft, means operated by said drive shaft and controlling movement of said cylinders whereby impressions
15 are made on sheets fed into the printing couple and said cylinders are held out of cooperating relation when no sheet is fed, the combination therewith of a sub-frame pivotally mounted on the frame for the printing couple and having ink supply means mounted therein, said ink supply
20 means including inking rollers engageable with the printing cylinder, and means for moving said sub-frame to move said inking rollers toward and away from the printing cylinder independently of the movement of said printing and
25 impression cylinders into and out of cooperating relation with each other.

13. In a printing machine which has a printing couple including a printing cylinder and an impression cylinder, a frame for said printing couple, means for moving said cylinders into and out of cooperating relation, a drive shaft, means operated by said drive shaft and controlling movement of said cylinders whereby impressions are made on sheets fed into the printing couple and said cylinders are held out of cooperating relation when no sheet is fed, the combination therewith
80 of a sub-frame pivotally mounted on the frame for the printing couple and having ink supply means mounted therein, said ink supply means including inking rollers engageable with the printing cylinder, ink distributing rollers engageable with said inking rollers, means for
85 moving said sub-frame to move said inking rollers toward and away from the printing cylinder independently of the movement of said printing and impression cylinders into and out of cooperating relation with each other, and means including a portion carried by the frame of the printing couple for separating the distributing rollers from the inking rollers as the inking rollers
90 are separated from the printing cylinder.
100

CURTIS GEORGE KRANZ.

30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145