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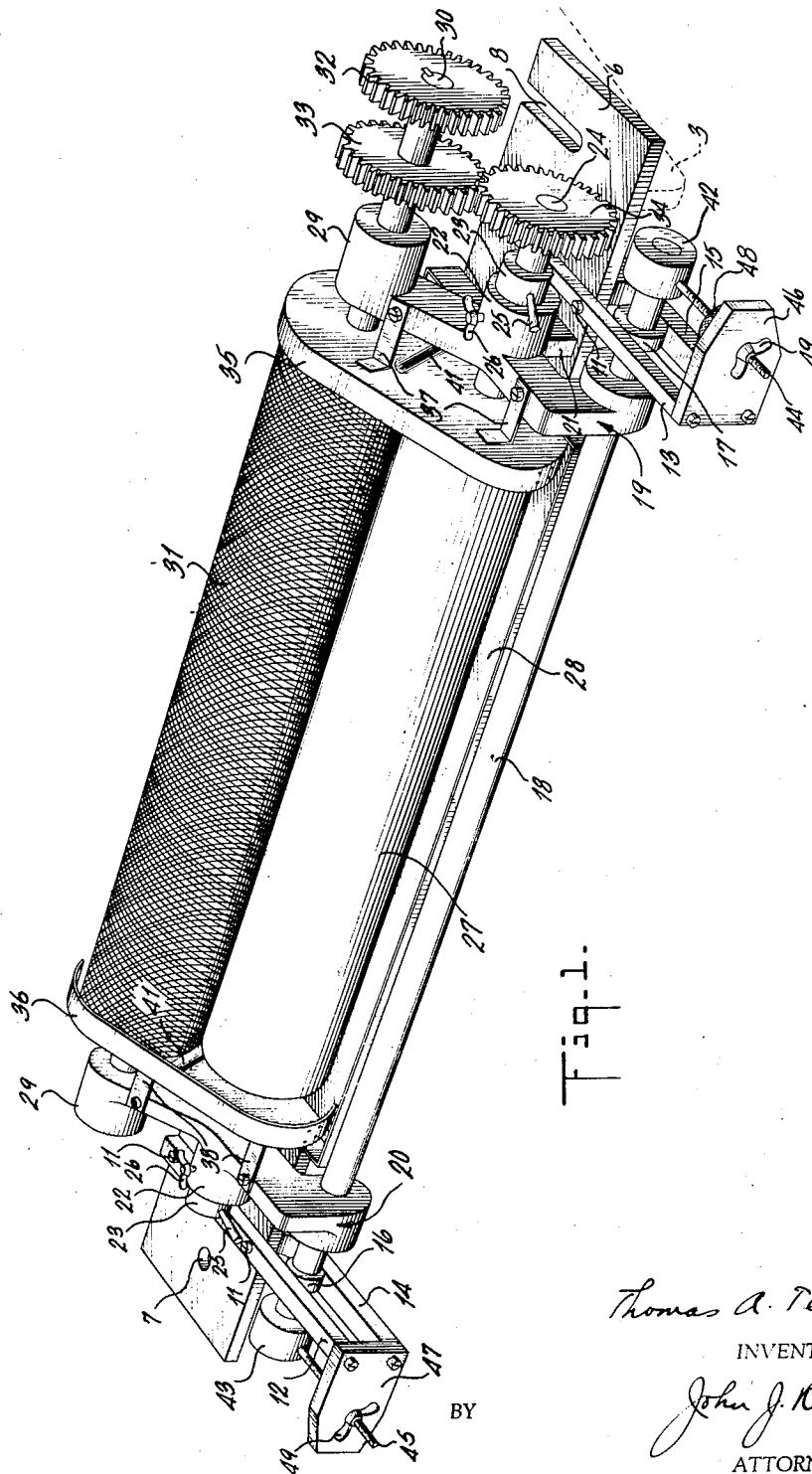
T. A. TERRY

2,333,962

INKING CONVERTER UNIT FOR JOB PRINTING PRESSES AND THE LIKE

Filed Nov. 2, 1940

6 Sheets-Sheet 1



Nov. 9, 1943.

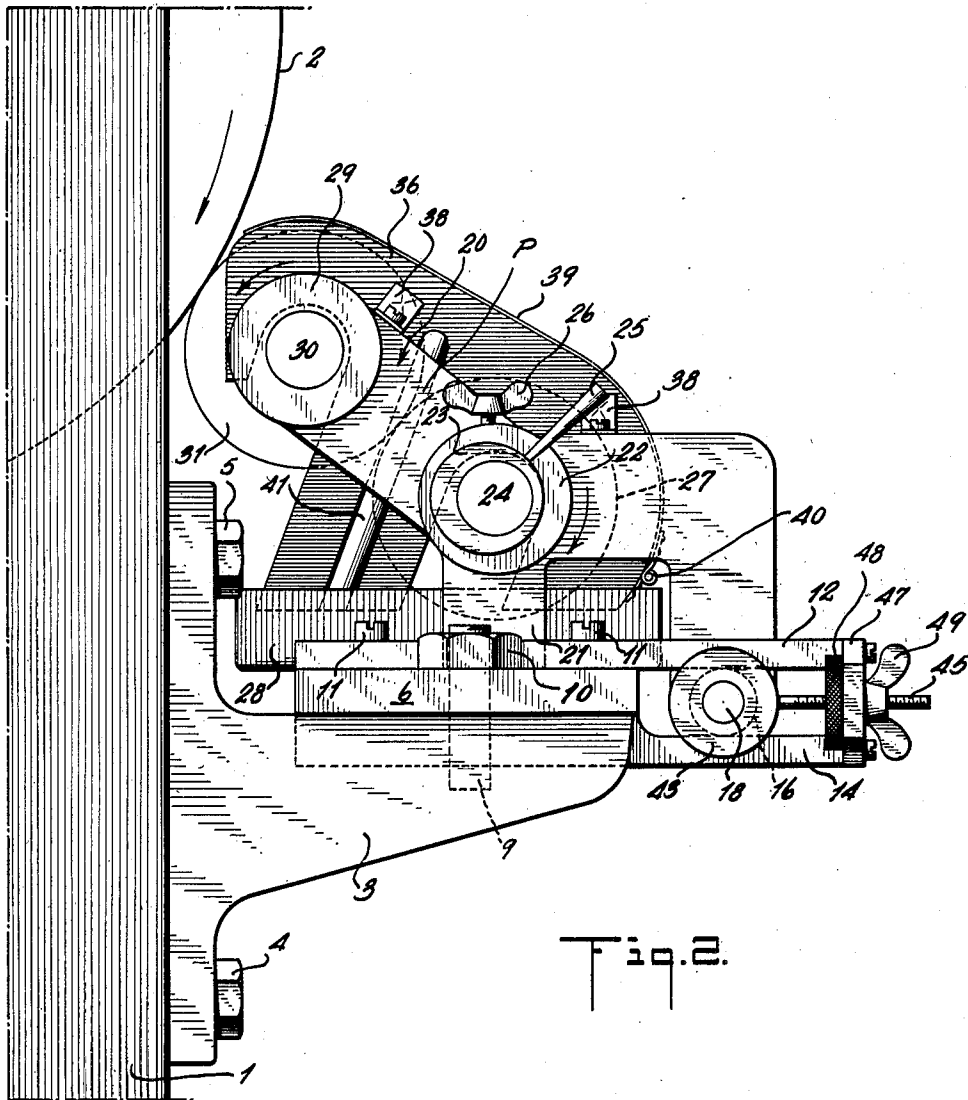
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6 Sheets-Sheet 2



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Thomas A. Perry
INVENTOR.

BY

John J. Logan
ATTORNEY.

Nov. 9, 1943.

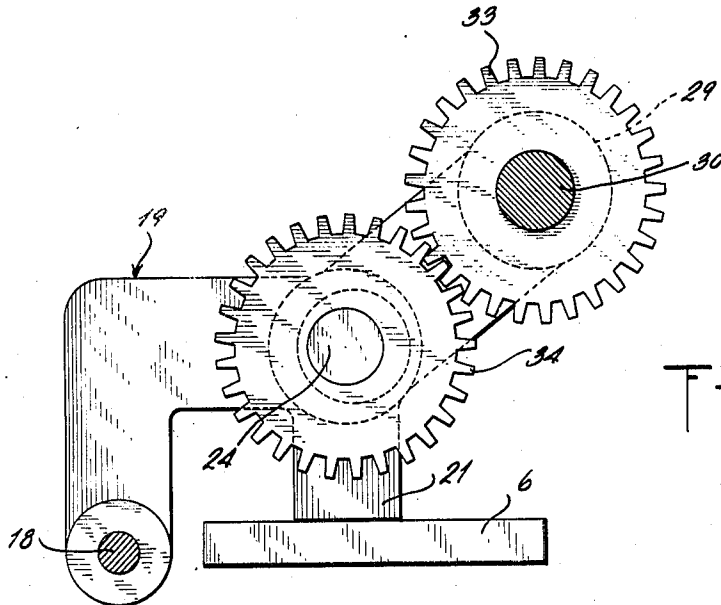
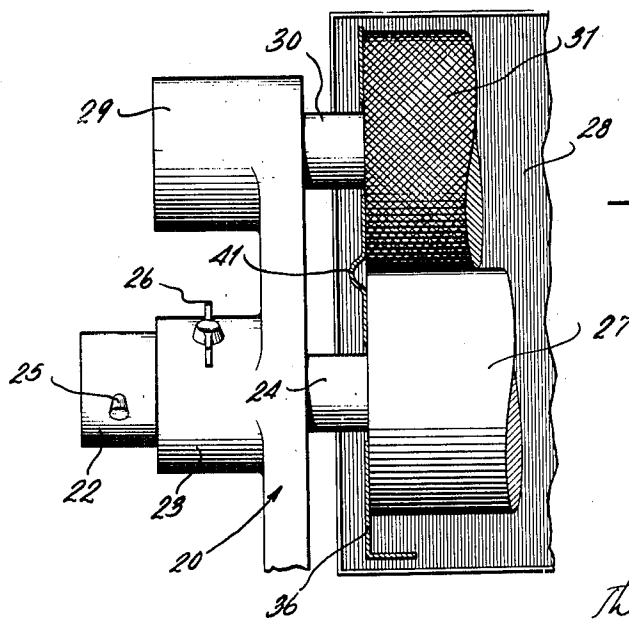
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6 Sheets-Sheet 3



Thomas A. Terry
INVENTOR.

BY

John J. Logan
ATTORNEY.

Nov. 9, 1943.

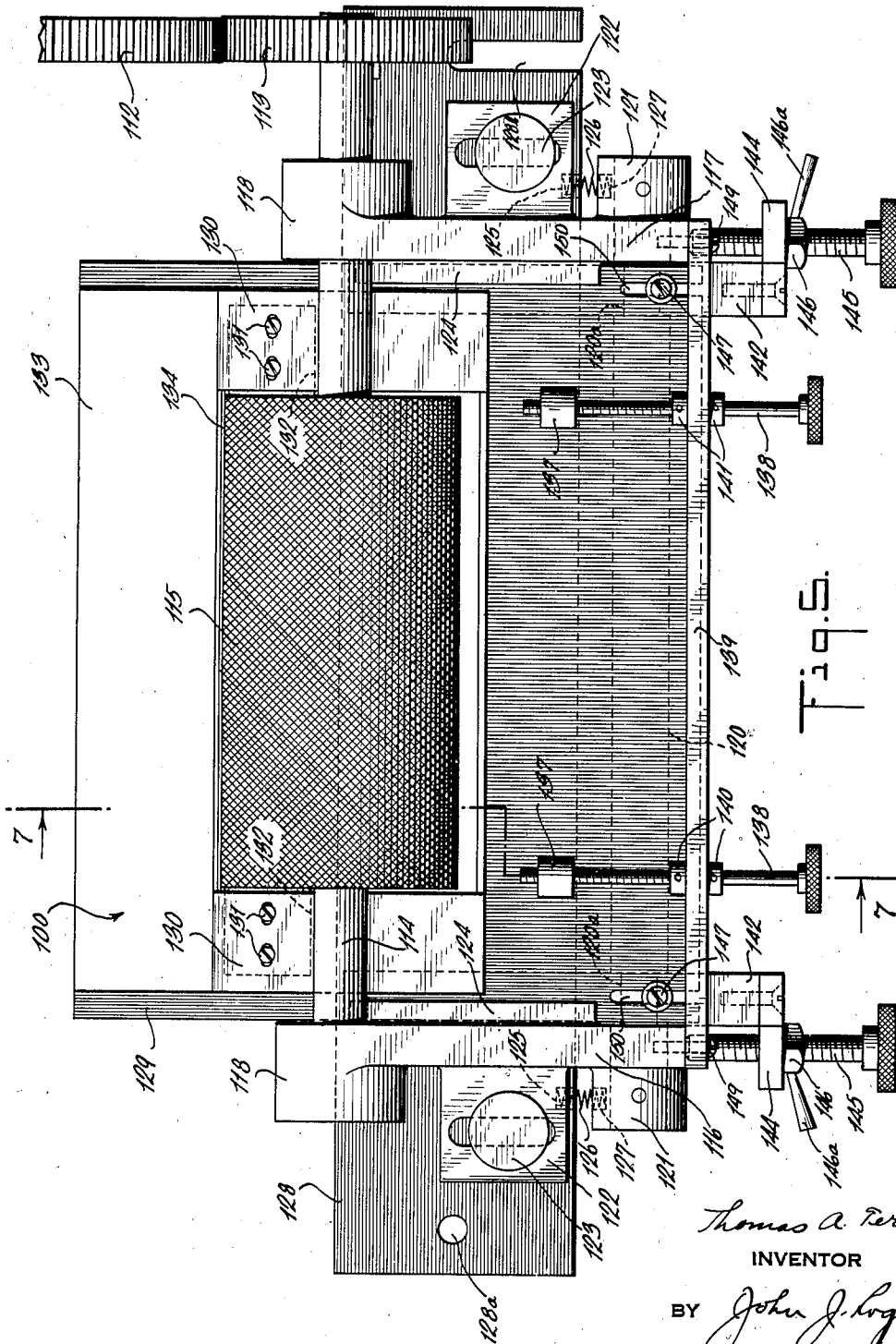
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6 Sheets-Sheet 4



Thomas A. Terry
INVENTOR

BY John J. Logan
ATTORNEY

Nov. 9, 1943.

T. A. TERRY

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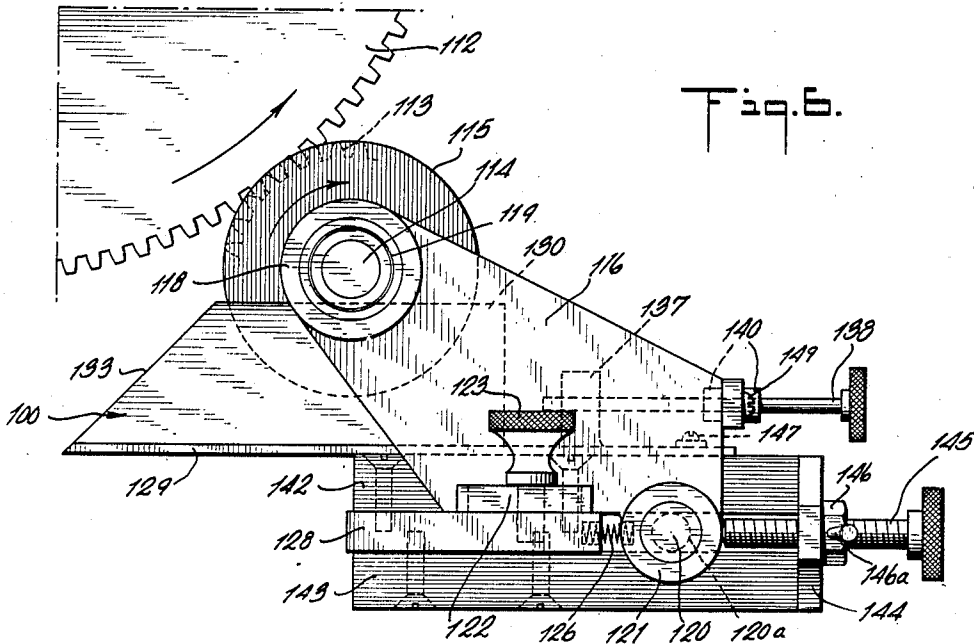
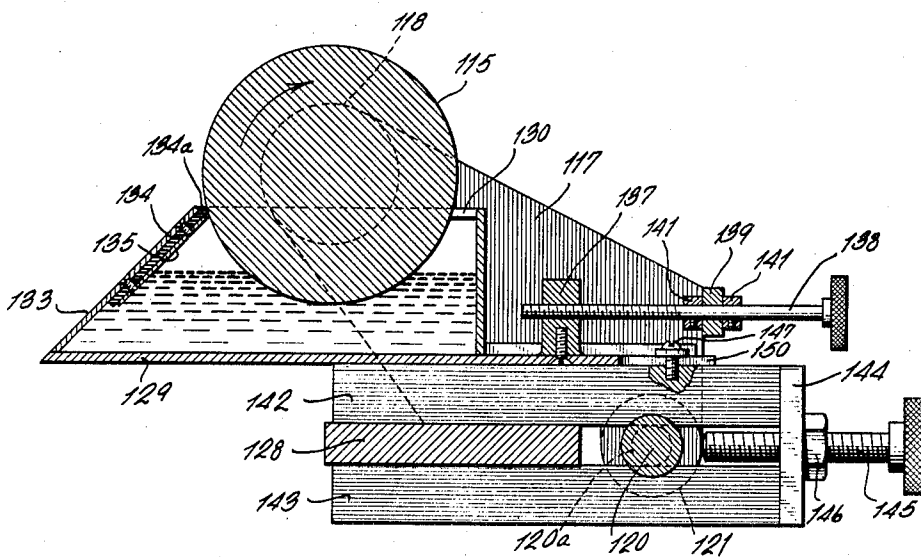


Fig. 2.

Thomas A. Perry
INVENTOR

INVENTOR

BY

BY *John J. Rogan*
ATTORNEY

ATTORNEY

Nov. 9, 1943.

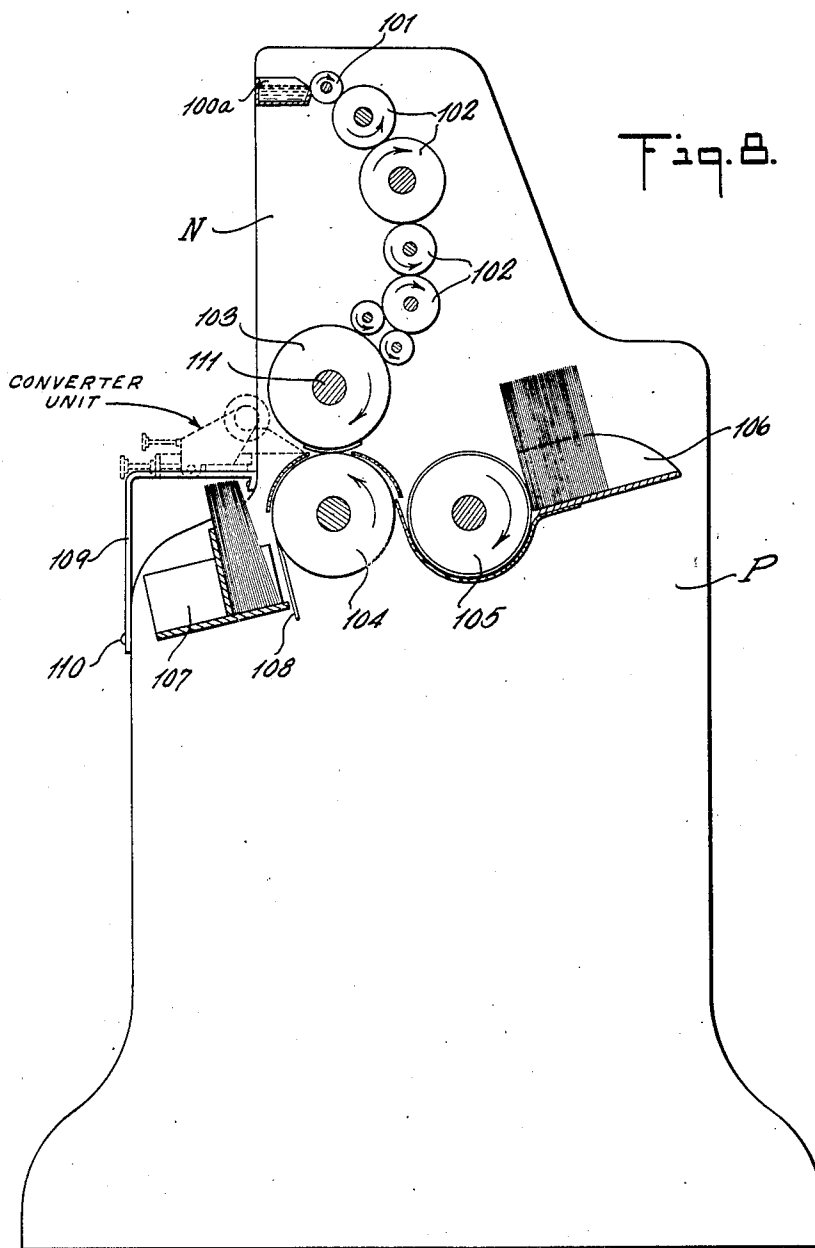
T. A. TERRY

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INKING CONVERTER UNIT FOR JOB PRINTING PRESSES AND THE LIKE

Filed Nov. 2, 1940

6 Sheets-Sheet 6



INVENTOR
Thomas A. Terry
BY John J. Logan
ATTORNEY

UNITED STATES PATENT OFFICE

2,333,962

INKING CONVERTER UNIT FOR JOB PRINTING PRESSES AND THE LIKE

Thomas A. Terry, Brooklyn, N. Y.

Application November 2, 1940, Serial No. 363,981

4 Claims. (Cl. 101—351)

This invention relates to printing machines and more especially to a unitary attachment for converting printing presses of the ordinary printer's ink or oil ink type to presses employing ink of a volatile fast drying type.

Heretofore in printing machines of the job-printing type, it has been customary to employ so-called job-printing ink which, because of its chemical and physical characteristics including its high viscosity and low volatility, requires a complicated system of feed and applicator rollers for working the ink and transferring it from the fountain to the final printing roller in order to insure that the ink has the proper consistency and uniformity at the printing point. As an example of a typical press which involves such a conventional ink feed and roller construction, reference may be had to the press which is sold in the trade under the designation "Harris type P2" manufactured by the Harris Seybold Potter Company, of Cleveland, Ohio. Entirely apart from the relatively complex ink feed and roller structure of these conventional job-printing presses, is the fact that the finished work requires a comparatively long time for drying. In most cases, a delay of twenty-four hours is necessary before the printing ink is sufficiently dry so that the work can be used or transferred to another point for supplementary work such as folding or the like. Because of this great delay, the unit cost of printing with such machines is materially increased.

While various attempts have been made heretofore to adapt conventional job-printing presses to the use of fast drying inks, these attempts have not been successful because of the complicated ink feed roller arrangements which allows the volatile materials of the ink to dry out before reaching the printing roller. Furthermore in some cases it is desirable to be able to use such conventional job-printing presses either with jobber's ink or with fast drying inks. Accordingly, it is a principal object of this invention to provide a simple, cheap and highly efficient converter unit which can be readily attached to existing job-printing presses whereby such presses can be converted rapidly to operate with fast drying inks.

Another principal object of this invention is to provide an inking device whereby job-printing and the like can be effected with a printing ink which dries substantially immediately after application. I have found that with this new device, it is possible to execute nearly all forms of commercial job-printing with fast drying inks, which inks consist of a volatile solvent or vehicle such

as an alcohol with the appropriate pigment therein. However, in order to use such inks commercially, it is necessary to design ink-feed and applicator arrangements so that the characteristics of such inks are fully taken advantage of.

Consequently a feature of the invention is to provide a novel and efficient ink-feed arrangement for printing presses whereby inks of the fast drying type may be efficiently employed.

Another feature relates to an ink-feed arrangement using inks having a volatile vehicle or solvent, whereby the pressure and adjustment of the various rollers can be made with the requisite accuracy in conformance with the physical characteristics of the ink.

Another feature relates to an ink-feed arrangement employing fast drying inks whereby a uniformly engraved metal roller of hard metal such as steel or the like is used to transfer the ink directly to the printing or type roller.

Another feature relates to an ink-feed arrangement for use with fast drying inks wherein a pair of ink-feed rollers are employed in closely adjusted relation, together with a special housing for the rollers whereby the lodging of excess ink between the rollers is substantially eliminated.

A further feature relates to an ink-feed arrangement wherein one of the ink-feed rollers is provided with independent adjustments at opposite ends whereby the quantity of ink transferred to a printing roller can be gauged in accordance with the closeness or openness of the printed subject matter at opposite margins or sections of the receiving surface.

A further feature relates to a unitary adaptor using fast drying inks designed for ready attachment to standard job-printing machines, wherein a single engraved ink-feed roller is mounted for adjustment to and from the printing or type roller of existing multi-roller job printers.

A further feature relates to an adaptor unit for expeditious attachment to existing multi-roller job printers wherein a specially designed ink roller is used in conjunction with a doctor blade to accommodate the physical and chemical characteristics of fast drying inks.

A still further feature relates to the novel organization, arrangement and relative location of parts which constitute a simple, improved and highly efficient unitary volatile-ink feeding adaptor for printing presses, whereby printing can be done with fast drying inks such as those containing a pigment in a volatile solvent or vehicle such as an alcohol or the like.

Other features and advantages not specifically enumerated will be apparent after a consideration

of the following detailed descriptions and the appended claims.

In the drawings which show certain embodiments,

Fig. 1 is a perspective view of a unitary ink-feeding device of the dual roller type embodying features of the invention.

Fig. 2 is an end view of Fig. 1 showing the manner of attaching the device to a printing press.

Fig. 3 is an enlarged view of part of Fig. 1.

Fig. 4 is an enlarged view of another part of Fig. 1.

Fig. 5 is a top-plan view of another and preferred embodiment of the invention.

Fig. 6 is an end view of Fig. 5.

Fig. 7 is a sectional view of Fig. 5 taken approximately along the lines 7—7 thereof looking in the direction of the arrows.

Fig. 8 is a diagrammatic elevational end view of a typical job-printing press embodying the features of the invention.

Referring more particularly to Figs. 1 and 2, the numeral 1 represents the frame or spaced vertical uprights of any well-known form of printing press such for example as that known to the job-printing trade as the "Harris type P2" job printer. The printing or type roller 2 carrying the rubber printing plate, is driven in the direction of the arrow by the motor and gearing mechanism of the press which is of well-known construction. The unitary ink-feed adaptor according to the invention is adjustably supported on a pair of brackets 3 disposed at opposite sides of the printing machine and attached to the uprights 1 thereof, by suitable bolts 4, 5. The brackets 3 are spaced apart sufficiently to allow the inking attachment to be moved bodily as a unit into proper cooperative relation with type roller 2.

The inking arrangement comprises a flat metal main support 6 which has a hole 7 at one end and a slot 8 at the other end. Attached rigidly to each of the brackets 3 is a threaded pin 9, the left-hand pin 9 passing through the hole 7, while the right-hand pin engages in the slot 8 whereby the entire assembly can be swung around the left-hand pin and the longitudinal relation between the feed rollers and the type roller 2 can be readily adjusted. For this purpose, the nuts 10 are loosened and the support 6 which carries the inking arrangement is swung around pin 9 as a pivot whereupon both nuts 10 are tightened to fasten the assembly in adjusted position. Fastened adjacent the opposite ends of support 6 by means of screws 11, are two tracks or guides 12, 13. These guides are disposed above and in alignment with the guiding projections 14, 15, forming an integral part of the member 6. Members 13—15 and 12—14 thus define a guide track for the rollers 16 and 17 which are loose on shaft 18. Fastened adjacent opposite ends of shaft 18 are a pair of metal castings 19, 20, shown in an enlarged form in Fig. 3. Each of the members 19, 20, is provided with a downwardly extending lug 21 which has a smooth flat machined underface resting on and adapted to slide on member 6. Each member 19, 20, also carries an integral bearing bracket 22 which is provided with an eccentric opening to receive the rotatably adjustable bearing sleeve 23, in which the ends of shaft 24 are journaled. Affixed to each sleeve 23 is an adjusting handle 25 whereby the sleeves may be independently rotated to vary the position of

the ends of shaft 24 with respect to shaft 18. After being properly adjusted, the sleeves 23 are locked in position by suitable wing-nutted set screws 26.

Rigidly fastened to shaft 24 is a fountain roller 27 which, in accordance with the invention, is of a smooth hard and impervious material such as polished metal or ceramic, and is adapted to rotate while partially immersed in the ink contained in the pan or reservoir 28 which is supported on member 6. Each of the members 19, 20, also has another integral bearing bracket 29 to receive the ends of shaft 30 to which is fastened the applicator roller 31 of hard metal such as steel or the like. In accordance with the invention, the roller 31 has its surface etched or engraved to provide a substantially uniformly reticulated surface. Preferably, the fineness of the engraving should on the average not exceed that corresponding to a 200 mesh screen and should not be coarser than that corresponding to a 100 mesh screen. I have found that by limiting the screen engraving within the above limits and by using the etched roller for the transfer of the quick drying ink to the printing or type roller, satisfactory results are obtained with fast drying inks of the type employing a volatile vehicle such as alcohol or the like. Preferably, the ink should be in the form of a pigment suspension in the solvent although it will be understood that it is within the compass of the invention to employ so-called colloidal solutions of pigment such as carbon-black, graphite, etc., in a volatile vehicle. A pigment ink that may be satisfactorily used is that sold under the trade name "Anilox" by International Printing Ink Company. Roller 31 is driven by a gear 32 which in turn is driven in suitable timed relation to the gear which drives the type roller 2. Shaft 30 also has keyed thereto a gear wheel 33 which meshes with gear wheel 34 keyed to shaft 24. Preferably, the teeth of gears 33 and 34 are made long and deep enough so that they maintain their proper driving relation in all adjusted positions of roller 27.

Rollers 27 and 31 are provided with a protective housing comprising the end plates 35, 36, which are fastened by brackets 37, 38, to the associated members 19, 20, and a cover plate 39 is hinged to the end plates 35, 36, by suitable hinges 40. The said cover plate is removed in Fig. 1 to show the rollers 27 and 31 more clearly.

As will be seen from Figs. 2 and 4, the rollers 27 and 31 are in very close contact, and since the ink supply is of the fast drying type consisting of a pigment or pigments suspended or colloidally dissolved in an alcohol or similar vehicle, the ink is of relatively low viscosity. Since the rollers are rotating in the direction of the arrows (Fig. 2), the excess ink would tend to form a pool in the trough-like region P between the rollers. In order to prevent this accumulation of ink, the rollers have their flat ends in close proximity to and preferably in contact with the end plates 36, 37, as shown more clearly in Fig. 4. Each of said end plates is formed or provided with an inclined groove or channel 41 which extends upwardly beyond the region P between the rollers 27, 31, and also extend downwardly into the pan 28. I have found that by this arrangement excess ink is prevented from lodging between the rollers and is returned directly through channels 41 to the ink reservoir 28. In order to adjust the spacing relation between the transfer roller 31 and type roller 2, shaft 18 has fastened

thereto at its opposite ends the members 42, 43. Fastened to members 42, 43, are the threaded arms 44, 45, which pass through openings in the corresponding plates 46, 47 fastened to members 13-15, 12-14. The position of shaft 18 and consequently the position of the entire inking unit is adjustable by loosening the lock-nuts 48 and wing-nuts 49 whereby the positions of the ends of shaft 18 may be independently adjusted whereupon the nuts 48 and 49 may be tightened to lock the assembly in its adjusted position with respect to the type roller.

I have found that when inks of the fast drying type employing a volatile vehicle such as an alcohol are employed, very frequently it becomes necessary to adjust with precision not only the pressure between the impervious fountain roller 27 and the applicator roller 31, but also the pressure or spacing between the applicator roller 31 and the printing roller 2. Furthermore, it may be necessary in certain kinds of printed subject matter to have the pressure or spacing between the rollers different from one end to the other. For example, the margin on one side of the printed sheet or surface may have dense or close printing, while the other margin may have relatively open or little printing. Because of the low viscosity and high flowability of the fast drying inks, it is desirable under such circumstances to provide a greater quantity of ink at one end of the type roller. For this reason, the independent adjustments are provided for each end of roller 27 with respect to roller 31, this adjustment being effected by the independently adjustable eccentric bearing sleeves 23 at each end of shaft 24. Likewise, the independent adjustment for each end of the roller 31 with respect to the printing roller 2 is provided by members 44, 45.

Referring to Figs. 5 to 8, there is shown a preferred modification of Figs. 1 to 4 wherein the fountain roller 27 is provided with a specially designed doctor blade, and the manner of adjusting the various parts is somewhat modified. The unit according to this preferred embodiment comprises an ink box or fountain 100 having a bottom 129 which extends forwardly beyond the front wall of the box. The rear wall 133 of the box is inclined and has attached thereto the doctor blade 134 which, in accordance with the invention, is in the form of a vulcanized hard rubber strip of the order of hardness represented by 85 durometer. This doctor blade is rigidly clamped between the metal strip 135 and the wall 133 by screws so that the overhanging or effective lip 134a can be adjusted to take up for wear.

The extended bottom wall 129 has fastened thereto at opposite ends a pair of threaded posts 137 to receive the threaded shanks of corresponding adjusting screws 138. The ink box is supported on a flat main supporting member or bed plate 128 adapted to extend transversely across the front of the press adjacent the printing or type roller thereof. Bed plate 128 is provided with a perforation 128a at one end and a slot 128b at the other end whereby the entire unit can be removably attached to the frame of the printing press and whereby it can be pivoted around the pin or bolt which passes through the opening 128a so as to enable the unit to be cleaned or repaired without disturbing the press proper. Fastened in any suitable manner adjacent the ends of member 128 are flat metal bars 142, 143, which extend forwardly of the plate to define guide-ways for purposes to be described.

The ink box rests for adjustable sliding movement on the upper members 142 and is locked in adjusted position by means of locking screws 147 which pass through slots 150 in member 129. The engraved or etched ink transfer roller 115 is fastened to a shaft 114 which is mounted in suitable journal bearings in the brackets 118 provided with retaining hubs to prevent longitudinal displacement of the shaft. Ink transfer roller 115 is, in accordance with the invention, of a hard material such as polished steel having a reticulated surface formed by etching or engraving with an average fineness preferably not exceeding 200 mesh and an average coarseness not exceeding 100 mesh as described above in connection with Figs. 1 to 4. Preferably the etched depressions are uniform in cross section. Instead of using an etched steel roller, a similar hard impervious and smooth-surfaced roller such as vitreous, ceramic or the like may be employed, the surface of the roller being etched or engraved in any well-known manner.

A gear 113 is affixed to shaft 114 and is in mesh with another gear 112 which forms part of the same driving mechanism which drives the various ink-feed rollers of the press such as the rollers 101 to 105 (Fig. 8) so that the etched inking roller 115 of the converter unit operates in proper direction and timed relation with respect to the printing or type roller 103 of the press on which the usual rubber printing plate is fastened, the direction of rotation being indicated by the arrows.

The bearing brackets 118 form part of a frame consisting of the side members or castings 116, 117, which are united at their forward ends by the rigid cross arm 139 and by shaft 120. Member 139 is provided with two openings through which pass the ink box adjusting screws 138. The castings 116, 117, have laterally extending integral lugs 122, each of which is formed with a slot through which passes the lock-nut fastening screws 123, the ends of which are threaded into plate 128.

In order to guide the ink box during its adjustable sliding movement, and to prevent it from tilting, the castings 116, 117, have integral lips 124 which define with the adjacent members 142 a channel or track in which the lateral ends of the member 129 ride. The end portions of the ink box are provided with cover members 130 to the rear portion of which are adjustably fastened by screws 131 the rubber wipers 132. Wipers 132 engage the flat ends of the roller 115 to prevent ink being carried upwardly thereby.

For the purpose of adjusting the position of the etched transfer roller 115 with respect to the printing or type roller 103 (Fig. 8) of the press, there are provided at opposite ends of the unit two threaded adjusting screws 145 which pass through corresponding threaded openings in the lugs 144 carried by members 142 and 143. The screws 145 are locked in place by suitable lock-nuts 146 preferably provided with their own adjusting handles 146a. The ends of screws 145 are adapted to butt against the front flat edges of the castings 116 and 117. Each of the castings 116, 117, is provided with a lateral integral hub 121 to receive the round shaft 120. Shaft 120 therefore passes between the guide members 142 and 143 at opposite ends of the unit and at these portions the shaft 120 is reduced in diameter so as to prevent lateral displacement of the frame carrying the roller 115 with respect to the remaining parts of the unit. The frame and roller 115 are nor-

mally urged to a forward position by means of a pair of compression springs 126 each of which has an end seated in a recess in the bed plate 128 and the opposite end seated in a corresponding recess in the hub 121.

With the foregoing arrangements, it is possible therefore to adjust the position of the ink box and therefore the position of the doctor blade 134a independently of the adjustment of the roller 115, while it is also possible to adjust the etched roller 115 and doctor blade and ink box as a unit. There is shown in Fig. 8 a diagrammatic side elevational view of a typical job-printing press of the type normally designed to employ a printing ink of low volatility such as the usual oil inks used in job printers. This type of press has the oil ink fountain 100a supported adjacent the top of the press frame. Located between the printing or type roller 103 are a series of ink working and distributing rollers 102 which are necessary in order to make sure that the ink from the fountain 100a has the proper consistency before it is actually applied to the type roller 103. Cooperating with the type roller 103 is an impression roller 104 and a feed roller 105 by means of which the envelopes or other blanks to be printed are carried from the inlet hopper 106 to the type roller and are discharged after printing into the receiving hopper 107. Presses of this general type are well-known in the art, of which the "Harris type P2" referred to hereinabove is typical. The converter unit of Figs. 5 to 7 is shown in dotted outline in Fig. 8 and the bed plate 128 of this unit is adapted to be removably fastened to a bracket 109 which is attached to the rear of the press by suitable bolts 110 so that the etched ink transfer roller 115 is in direct ink transfer engagement with the type roller 103.

By means of the single bed plate 128 which carries the entire unit, it is possible to attach this converter unit to existing presses in a very simple manner. When the bed plate 128 has been fastened, the nuts 146 are loosened and the screws 145 are turned so as to move the frame and etched roller 115 into proper relation with respect to the type roller 103. By means of the adjustments 145 at opposite ends of the unit, it is possible to regulate the pressure between the etched roller 115 and the type roller independently at opposite ends. When the roller 115 has been properly adjusted, the members 138 are adjusted causing the ink box and the doctor blade to move so as to provide the proper pressure between the edge 134a of the doctor blade and the edge cylinder 115. Here again by providing separate adjustments of each end of the unit, the pressure or clearances at the opposite ends of the doctor blade can be accurately regulated.

I have found that with arrangements such as those described employing the various individual pressure and spacing adjustments for the doctor member and the etched transfer roller, it is possible to use fast drying inks on the usual job-printing presses. I have also found that by using the inking arrangement as described, it is possible to effect job-printing with maximum speed since the ink dries substantially immediately. Furthermore, by using the particular arrangement and adjustment of parts as described

above, sharper and more readily controlled printing may be effected and the machinery can be maintained in continuous use without clogging, a disadvantage which is always present with the ordinary job-printing press inks because such inks are of high viscosity and tackiness and relatively low volatility tend to accumulate dust.

The arrangement as described consists of a complete and self-contained unit which can be attached readily to a wide variety of presses. Furthermore, the arrangement provides the maximum in accuracy of adjustment and enables the entire unit to be pivoted or swung around the shaft 18 (Figs. 1-4) or around the axis of shaft 120 (Figs. 5-8) in a plane parallel to the axis of the printing roller, and also to be swung around an axis substantially perpendicular to the printing roller. This enables the inspection and operation of the printing to be readily supervised for repair, cleaning or the like.

It will be understood of course that various changes and modifications may be made in the particular embodiment disclosed without departing from the spirit and scope of the invention.

What I claim is:

1. A converter unit of the type described comprising a support for removable attachment to the frame of a printing press, an ink box slidably attached to said support, an ink transfer roller, a frame also slidably attached to said support and carrying said roller, a doctor blade fixedly mounted with respect to said box, means to adjust the transfer roller with respect to said box, and with respect to the printing roller, and means to adjust the doctor blade with respect to said transfer roller.

2. A converter unit according to claim 1 in which the means for adjusting the relation between the transfer roller and printing roller is independent of the means for adjusting the doctor blade with respect to the transfer roller.

3. A converter unit according to claim 1 in which the means to adjust the transfer roller with respect to the printing roller of the press includes a pair of springs located between said frame and said support normally tending to separate said transfer roller from said doctor blade, and a pair of adjustable stops carried by said support and engaging said frame to adjustably limit the spacing between the doctor blade and said single roller.

4. A unitary ink feeding assembly for attachment to a printing press of the type having a type roller, said assembly comprising an engraved polished metal inking roller, a flat main supporting member adapted to extend transversely across the front of the press, a rigid frame having lateral bearing supports for said roller and slidable toward and away from the press on said supporting member, an ink box movable as a unit with said frame, horizontal guides for said frame, and means to pivotally support said main supporting member with respect to the press adjacent one side thereof whereby said assembly can be swung through a horizontal angle for cleaning, inspection and the like.

THOMAS A. TERRY.