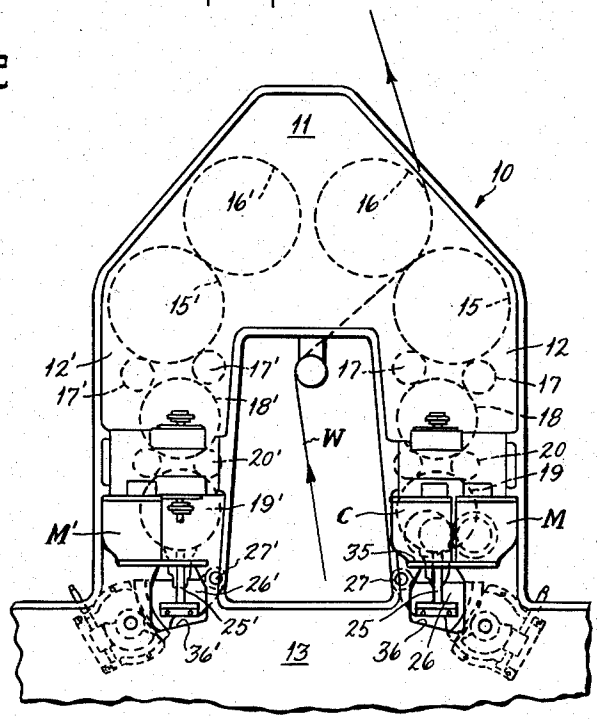
Aug. 25, 1959 C. A. HARLESS 2,900,900

INKING MECHANISM FOR PRINTING MACHINES

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Fig. 1



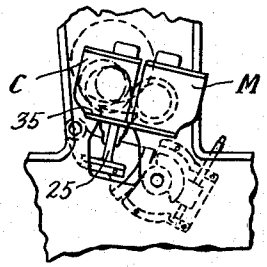


Fig. 1A

Fig. 2

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INKING MECHANISM FOR PRINTING MACHINES

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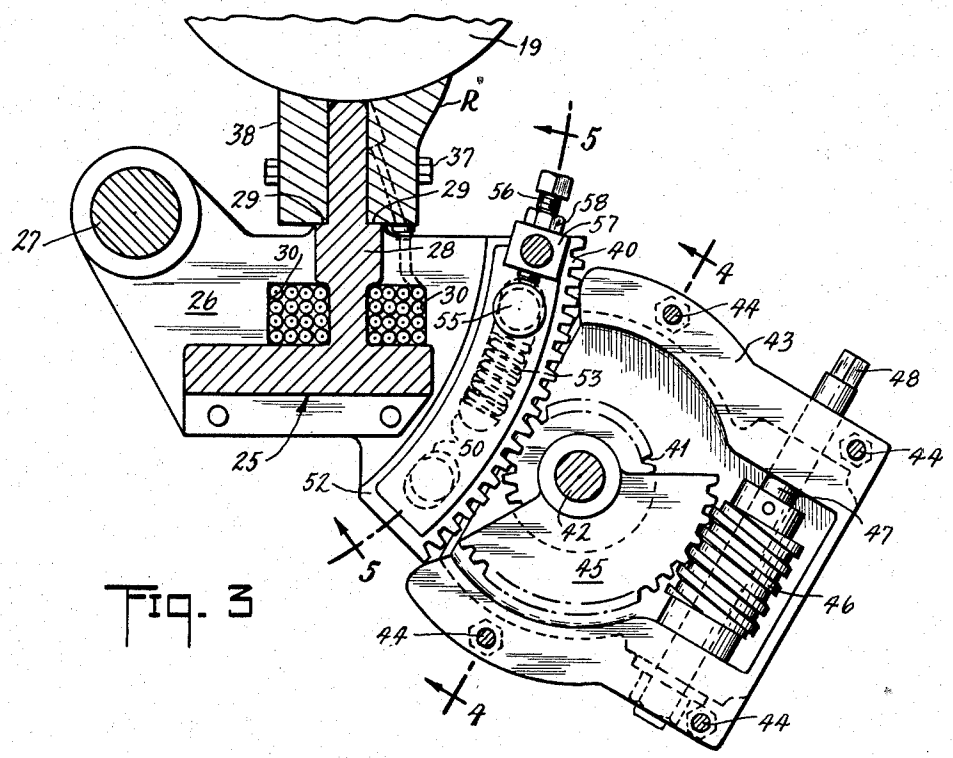


Fig. 3

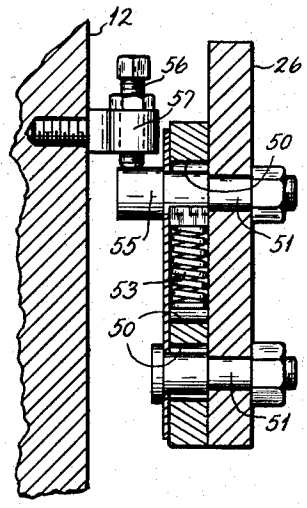


Fig. 5

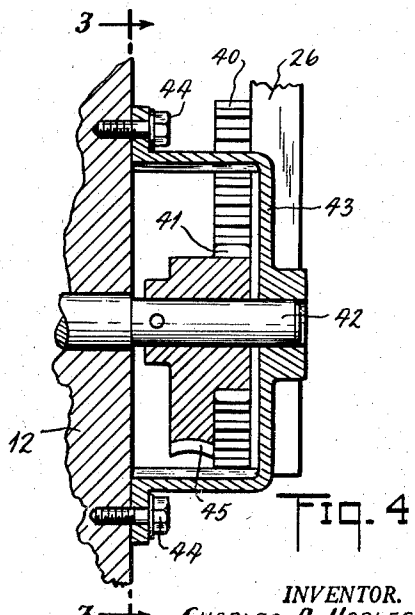


Fig. 4

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INKING MECHANISM FOR PRINTING MACHINES

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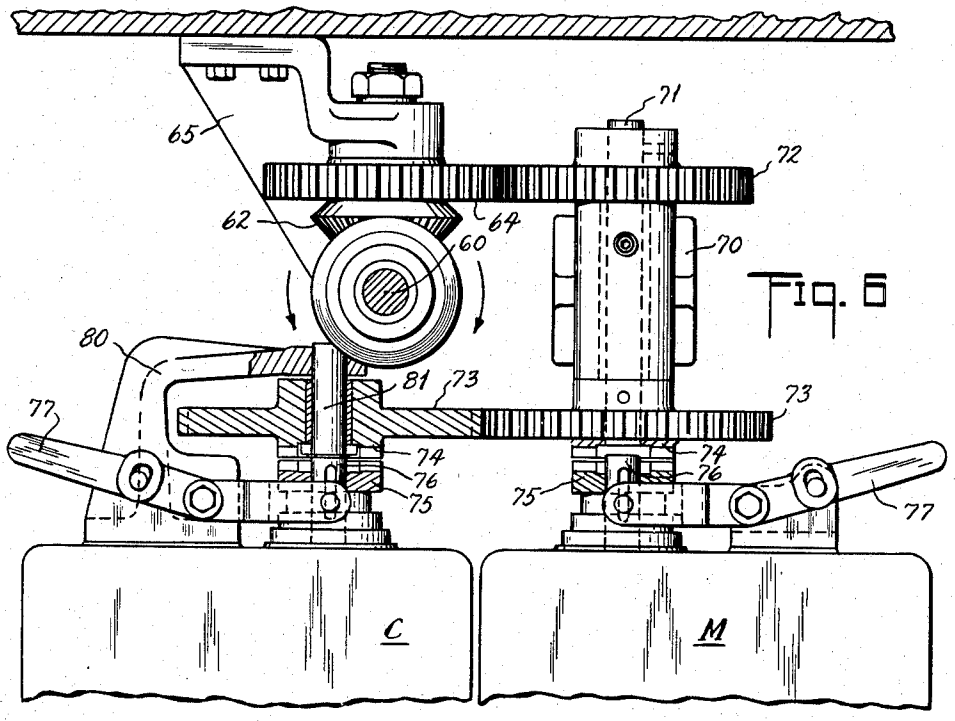


Fig. 6

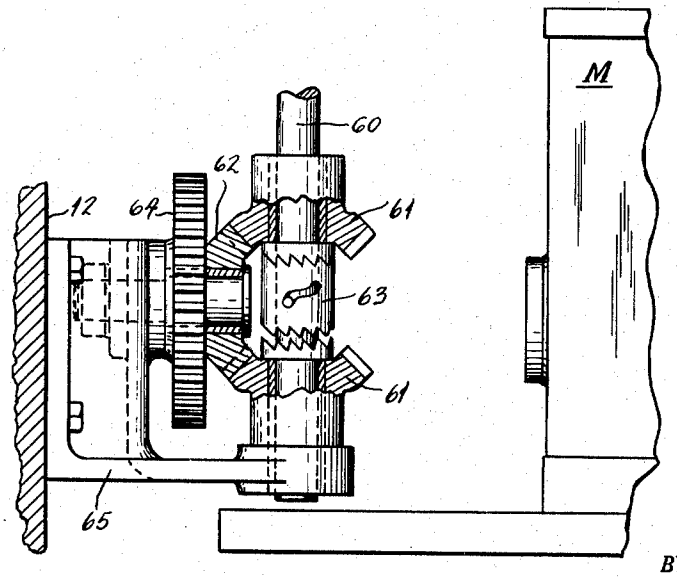


Fig. 7

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2,900,900

INKING MECHANISM FOR PRINTING MACHINES

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Application April 6, 1954, Serial No. 421,379

4 Claims. (Cl. 101—366)

This invention relates to inking mechanisms, and more particularly to the mechanism, typically an ink pump, by means of which ink is initially supplied in regulated quantity to an ink drum for applying ink to the plate or printing cylinder of a printing couple.

The general object of the invention is to provide an inking mechanism mounting which facilitates operating adjustments and changeover from monotone to multicolor operation. With this general object, as well as other objects which will appear in mind, the preferred embodiment of the invention will now be described in detail with reference to the accompanying drawing and the features forming the invention will then be pointed out in the appended claims.

In the drawing:

Fig. 1 is a schematic side elevation of a printing unit;

Fig. 1A is a fragmentary view similar to Fig. 1 but showing several parts in a different position;

Fig. 2 is a developed sectional view on an enlarged scale, taken on a line joining the axes of a printing couple and associated ink drums, and showing in elevation the inking mechanism mounting structure;

Fig. 3 is an enlarged detail sectional view, taken on a line 3—3 of Fig. 4;

Figs. 4 and 5 are sections on the respective lines 4—4 and 5—5 of Fig. 3;

Fig. 6 is a plan view showing principally the drive gearing for the ink pumps and partly sectioned to show one of the clutching mechanisms; and,

Fig. 7 is an enlarged view partly in elevation and partly broken away of a portion of the drive mechanism of Fig. 2.

There is represented in Fig. 1 a generally familiar arch type printing unit, including a frame indicated generally by the numeral **10** and including an upper cross piece or arch proper **11**, supported by columnar portions or legs **12** and **12'** from a bed plate **13**. This unit as is customary includes two printing couples together with associated mechanisms, which may be identical except for being respectively right and left hand. The elements of the left hand printing couple are identified by similar numerals to those identifying the parts for the right hand couple, except for the addition of a prime superscript, so that a description of the elements to the right of Fig. 1 will suffice for a full understanding of the structure.

The printing couple includes a plate cylinder **15** and impression cylinder **16**, the plate cylinder being inked by form rollers **17** which are supplied with ink by a drum **18**, which in turn is inked from a drum **19** by means of transfer rollers **20**, as indicated. While a specific arrangement of ink drums and rollers has been shown for definiteness, arrangements utilizing other elements or arranging the elements differently may be used, since the present invention is concerned only with the mechanism for applying ink to the first ink drum **19** of the ink motion.

Each ink mechanism includes an ink rail having a

nozzle or nozzles for supplying ink to a drum **19**, together with an ink pump. The ink rail support includes a girder member **25** (Figs. 1–3) attached to end plates or arms **26** which are pivotally hung from the machine frame legs **12** by means of studs or stud shafts **27**. An extension **35** of this girder **25** passes through an aperture **36** in the frame **12** and subjacent bed plate **13**, and supports a monotone ink pump M or color ink pump C, or both. The vertical flange or web **28** (Fig. 3) of the girder **25** constitutes a generally radial plate and is formed with shoulders **29** to support the further ink rail elements or ink rails proper, and an end plate **26** has apertures indicated in phantom at **30** for accommodating tubing or conduits leading from an ink pump to its associated ink rail. An ink rail element proper R (Fig. 3) is fixed to web or plate **28** of girder **25** by means of screws **37**, at convenient intervals and rests upon one of the shoulders **29**. When no rail is in position on one of the shoulders **29** it may be replaced by a filler block **38** as indicated in Fig. 3. The ink nozzle for applying ink to the cylinder **19** is formed by member R while the vertical part **28** of the girder as indicated clearly in Fig. 3, and the upper parts of elements R, **28** and **38** are shaped so as to provide the desired ink smoothing or distributing surfaces cooperating with the cylindrical contour of the drum **19**.

A gear sector **40** is carried by plate **26**, and meshes with a pinion **41** rotatably carried by a shaft **42** journalled in frame **12** and in a housing and bracket member **43** fastened to the frame by screws **44** (Figs. 3 and 4). Fixed to the pinion **41** is a worm wheel sector **45** meshing with a worm **46** carried on a shaft **47** also journaled in the bracket housing **43** and formed with an end **48** for turning by a wrench.

Gear sector **40** is mounted on plate **26**, for movement about the axis of shaft **27**, by means of arcuate slots **50**, cooperating with studs or pins **51** secured to the plate **26** and is held against the plate **26** by a cover member **52** as shown in Figs. 3 and 5. A spring **53** positioned in one of the slots **50** is compressed between stud **51** and the gear sector **40**, thus forming a yielding drive connection between this sector and the plate **26**. The extended end **55** of stud **51** is located for abutment against the end of a screw **56** threadably carried in a block **57** attached to the frame **12** and locked in the desired position of adjustment by a nut **58**. The operating position of the ink rail structure with reference to ink drum or ink cylinder **19** is thus determined by the setting of stop screw **56**. By turning the worm **46** in one direction, so as to force the head **55** of stud **51** against the end of screw **56**, the ink rail may be accurately located in desired operating position and this operating position may be minutely adjusted as desired. By turning the worm **46** in the opposite direction the ink rail and pump assembly may be dropped down to any desired extent for cleaning, replacement of parts or any required operational adjustments. It will be noted that while the ink rail is accurately positioned with reference to the cylinder **19**, it may nevertheless move downwardly against the force exerted by spring **53** to permit passage of paper or other material which may get on the drum **19**, thus avoiding damage to the parts.

The ink pump drive is best shown in Figs. 1–2 and 6–7. As there shown a vertical shaft **60** is driven by intermediate gearing off the gears which drive the ink drums. A pair of bevel gears **61** are freely rotatable on the shaft **60** and mesh with a common bevel gear **62**. A central clutching element **63** is provided for coupling the upper or lower gear **61** to shaft **60** as desired and accordingly reversing the direction of rotation of bevel gear **62** with reference to shaft **60**. Bevel gear **62** drives a gear wheel **64**, the entire assembly **60–64** being carried by a bracket

65 mounted on the machine frame structure 12. A pedestal 70 carried on the extension 35 of girder 25 (Figs. 2 and 6) supports a shaft 71 to which are fixed gears 72 and 73. Gear 72 meshes with gear 64 previously referred to and is driven thereby, while gear 73 carries a clutch element 74 positioned for engagement with a mating clutch member 75 mounted on the coaxial drive shaft 76 of ink pump M, the element 74 and 75 being clutched and unclutchd by a handle 77 and the usual fork and pin arrangement.

When it is desired to changeover for multi-color printing, filler piece 38 (Fig. 3) is removed, and a color ink rail R is fastened in its place on the girder vertical web 28, the color pump C associated therewith being fastened to the extension 35 of the girder (right hand side of Fig. 1 and Fig. 1A). The monotone ink rail and pump may be left in position in readiness for operation at any desired later time. The pump C (Fig. 6) is provided with the drive shaft 76 and coupling member 75 like those just described, and has a bracket 80 which supports on a short shaft 81 a gear 73 with clutch element 74 and meshing with the gear 73 of the pump M. As will be apparent, disengaging both clutches as indicated in Fig. 6 disconnects the drive from both pumps, while by clutching in either of the two clutches 74–75, either pump may be driven as desired, the other being inactive, or both pumps may be driven together. In the latter case provision may, of course, be made for supplying black ink or ink of one color to some columns and colored ink or ink of different color to others.

In the normal so-called "Forward" operation of the printing couple, the web W will pass upwardly and outwardly between the cylinders of the couple as indicated in Fig. 1, cylinder 15 rotating clockwise and cylinder 15' rotating counter clockwise. It is desirable, however, to have the ink pump rotate in the same direction, and provision is made for this by the clutching arrangement 63, etc., provided in conjunction with the vertical drive shaft 60.

What is claimed is:

1. In a printing machine inking mechanism, and in combination, an ink drum, an ink rail element for supplying ink thereto, a support member for holding the ink rail element in operative relation to the ink drum, means

pivotally mounting the support member for movement toward and away from the drum, yieldable mechanism for moving the support member to a position where it holds the ink rail element in operative relation to the ink drum and to a position spacing the ink rail element therefrom, and adjustable stop means for limiting further movement of the support member when moved to the first said position.

2. The combination according to claim 1, in which the yieldable mechanism comprises a thrust member movably carried on the support member, a spring connection between the two said members and mechanism for moving the thrust member to apply force to the support member urging it toward the stop means.

3. In a printing machine an ink rail structure comprising an ink rail supporting member, means pivotally mounting the said supporting member for movement toward and away from an ink drum, means for supporting an ink rail nozzle element and ink pump in either of two side by side positions upon the said member, an ink pump in each of the two said positions and gearing for driving the said pumps, comprising a first gear supported for rotation on a fixed axis, and cooperating gearing carried on the supporting member for movement into and out of engagement with the first said gear, the said cooperating gearing comprising a gear wheel for driving each of the two pumps and clutch mechanism for coupling and uncoupling each of the two said pumps.

4. An ink rail structure according to claim 3, in which the clutch mechanism comprises a coupling member carried by one of the said gears and a cooperating member and clutch operating mechanism carried by the associated ink pump.

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