Feb. 4, 1958 A. DRESSEL 2,821,919

INKING MECHANISMS

Filed April 6, 1951 3 Sheets-Sheet 1

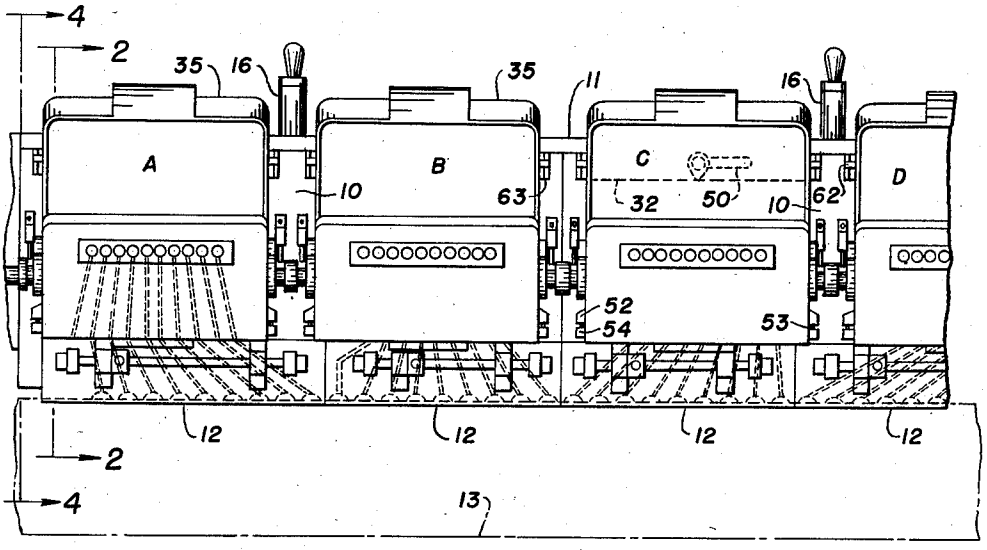


Fig. 1

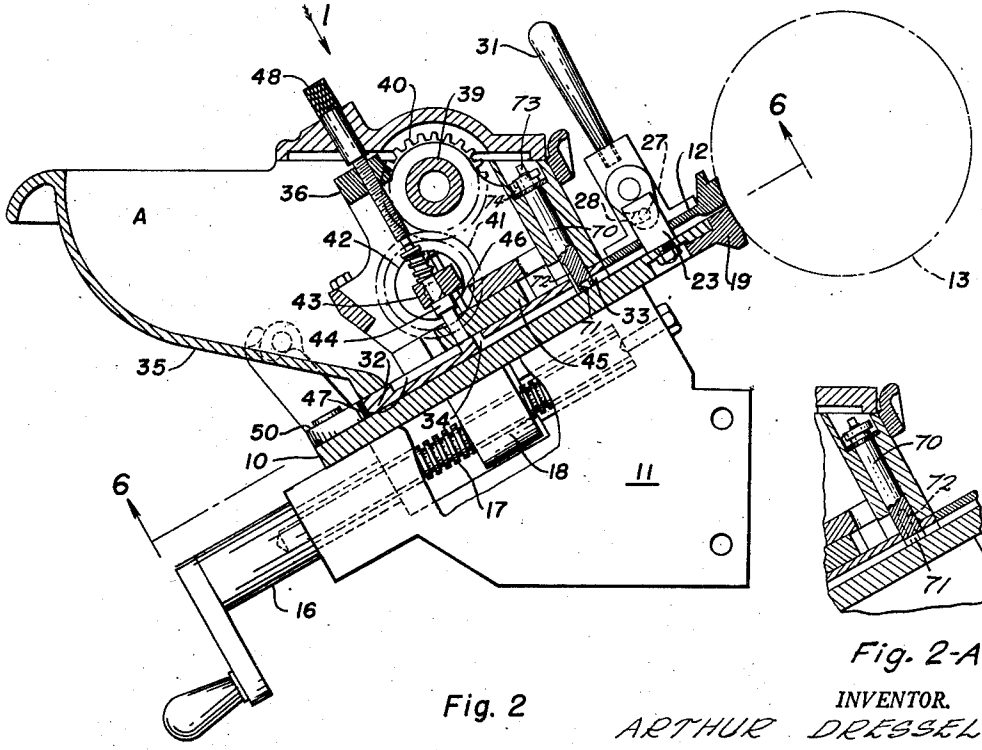


Fig. 2

Fig. 2-A

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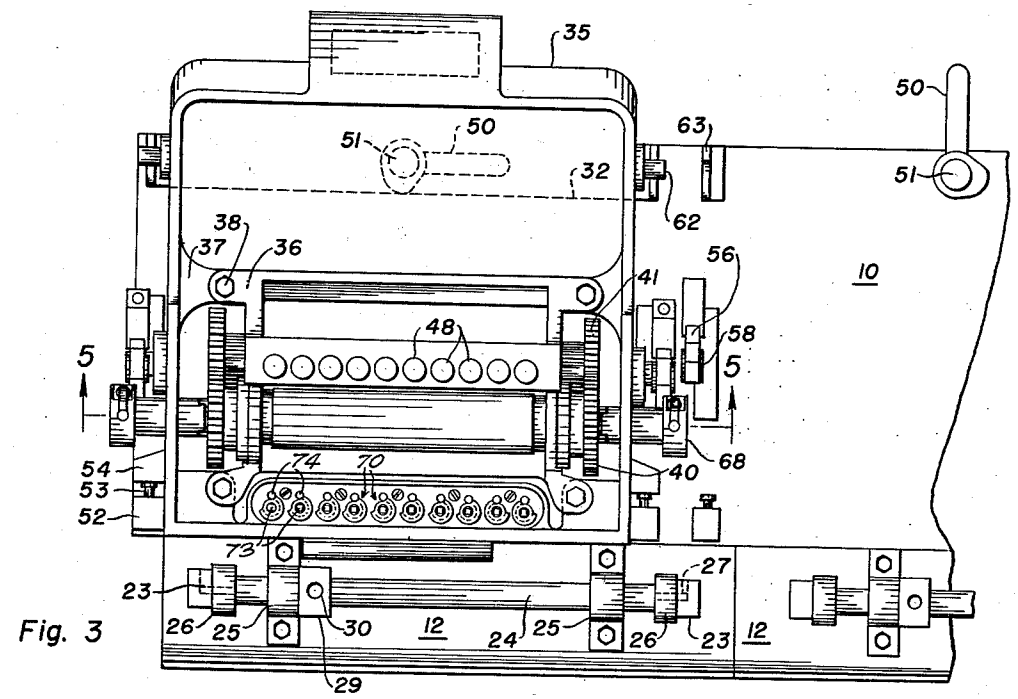


Fig. 3

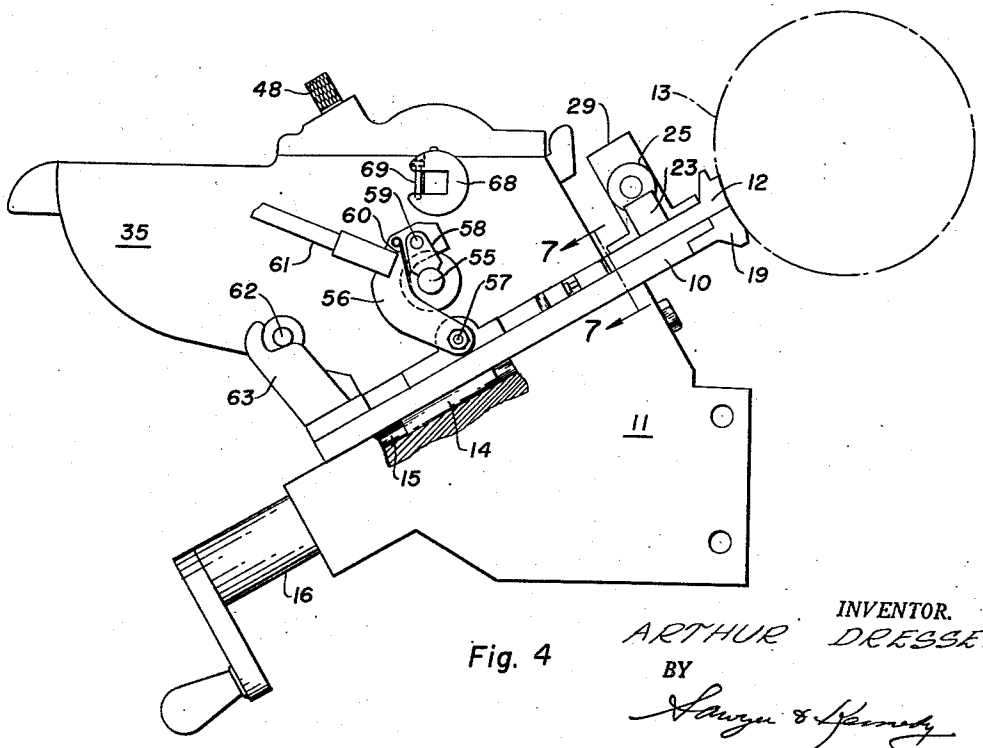


Fig. 4

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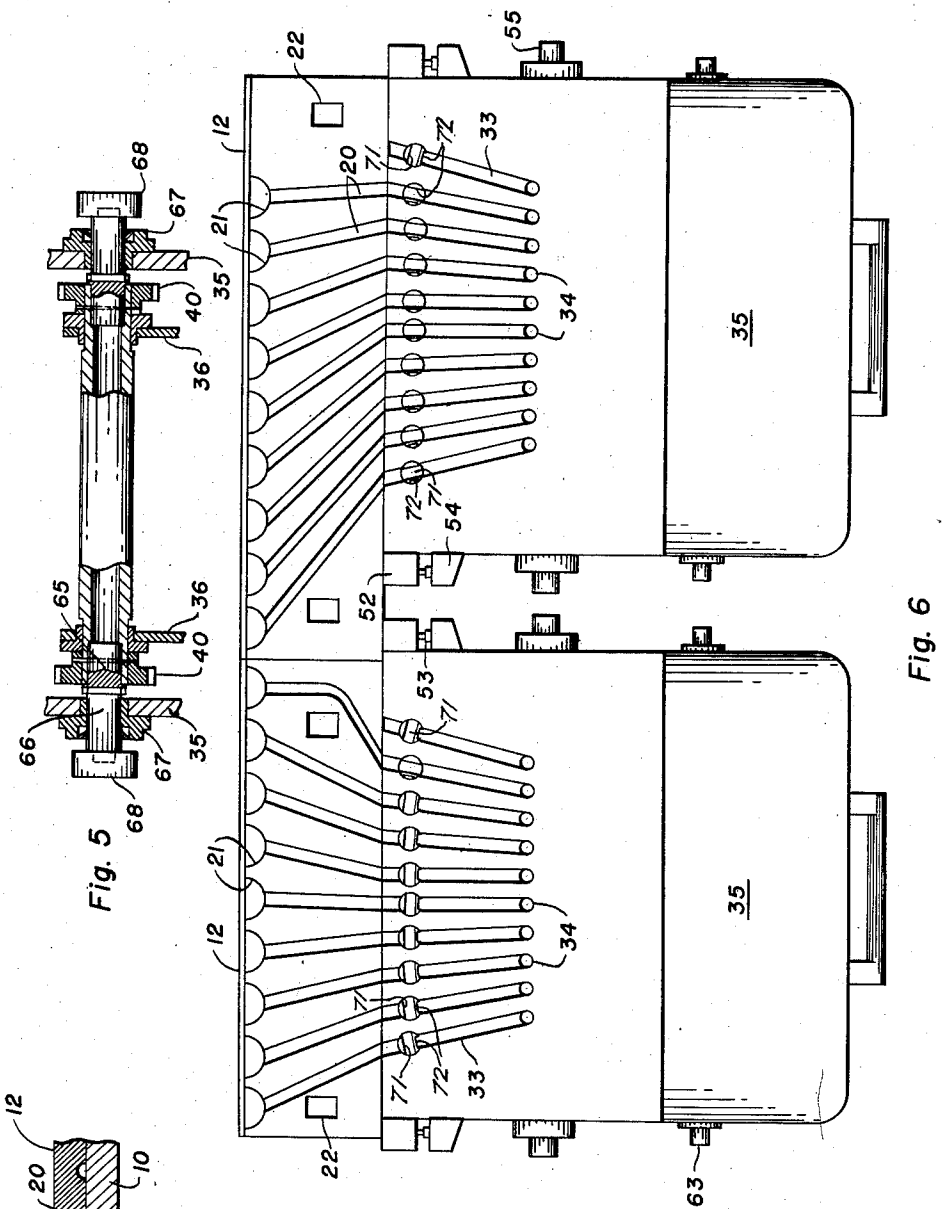


Fig. 6

Fig. 5

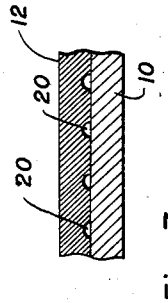


Fig. 7

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INKING MECHANISMS

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Application April 6, 1951, Serial No. 219,629

6 Claims. (Cl. 101—365)

This invention relates to improvements in inking mechanisms.

More particularly, the invention is concerned with inking mechanisms of the type in which ink is supplied to a distributing cylinder through an ink rail by means of individual pumps, each pump generally supplying one column width.

It is an object of the invention to provide for rapid and simple change in the color of ink supplied to various page widths.

A further object of the invention is to provide an inking mechanism including ink reservoirs, pumps and conduits of a character such that difficulty in cleaning is reduced to a minimum.

A further object of the invention is to make improved provision for adapting the inking mechanism to supply ink for pages of different widths.

With the foregoing objects and still other objects which will appear in mind, the invention consists in the combinations and arrangements of parts and details of construction which will now first be fully described with reference to the accompanying drawing and then be more particularly pointed out in the appended claims.

In the drawing:

Figure 1 is a plan view looking in the direction of the arrow 1 of Figure 2, of an inking mechanism embodying the invention in a preferred form;

Figure 2 is a section on the line 2—2 of Figure 1 and on an enlarged scale;

Figure 2–A is a fragmentary view corresponding to part of Figure 2, but showing a valve member in a different position;

Figure 3 is a plan view, showing a portion of Figure 1, and with parts removed to show more clearly the internal features of the construction;

Figure 4 is an end elevation of the inking mechanism;

Figure 5 is a detail view showing certain shafting of Figure 3;

Figure 6 is a bottom view of two of the inking units of the inking mechanism; and

Figure 7 is a detail cross section on the line 7—7 of Figure 4.

The inking mechanism includes a number of units for supplying widthwise page widths or other sections of a distributing cylinder, each of the units including an ink reservoir, ink pumping mechanism and having a number of grooves adapted to form ink conduits when the unit is placed on suitable supporting structure.

In a typical mechanism, as shown in Figure 1, four such inking units A, B, C and D will be provided. These units sit in pairs on a pair of plates **10**, which, in turn, are slidably supported on a cross member **11** which is fastened to the machine frames (not shown) in the usual way. A number of upper plates **12** cooperate with the inking units A, etc. and cooperate with the plates **10** to complete the conduit and nozzle structure necessary

for delivering the ink to the distributing cylinder **13**, which is indicated in phantom in Figures 1, 2 and 4.

It will be understood that the ink is conveyed from cylinder **13** to the printing cylinder by any of the usual arrangements of cylinders and rollers. The present invention is not concerned with the specific form of these devices, which are well known in themselves, and they will not be further described herein.

Each of the plates **10** is guided as by means of gibs **14** (Figure 4) running in grooves or guideways **15** formed in the member **11** and may be moved back and forth toward the cylinder **13** by means of a crank **16** (Figure 2), which turns a screw **17** cooperating with a nut **18** fixed to the plate **10**. The movement is parallel to a diameter of the cylinder passing through the ink supplying orifice or nozzle as hereinafter described.

A lower member **19**, fixed to the plate **10**, and upper members **12**, detachably mounted on the plate **10**, form the ink supplying nozzles.

The upper surface of plate **10** and member **19** is smooth and flat and the member **12** is grooved as shown in Figures 2 and 6 to provide ink supplying conduits **20** and properly shaped orifices or nozzles **21**. Apertures **22** in plate **12** accommodate posts **23** secured to the member **10**. A shaft **24** journaled in brackets **25** on the plate **12** carries terminal arms **26** having pins **27** adapted to enter arcuate cam grooves **28** in the posts **23**. A block **29** having a socket **30** for accommodating a wrench **31** is fixed to the shaft **24** to permit turning this shaft. With the shaft **24** in the position of the figures, pin **27** cooperates with groove **28** to lock the plate **12** down on the plate **10**. The unsupported length of shaft **24** gives sufficient flexibility to insure pressing the plate **12** down firmly in ink tight relation against the plate **10**. Turning the shaft **24** (clockwise in Figure 2) brings the pins **27** out of the cam slots **28** and permits removal of the plate **12** by lifting it off the posts **23**.

The inking unit has a bottom plate **32** formed with grooves **33**, the ends of which register with the ends of grooves **20** in the associated plate **12** and the opposite ends of grooves **33** terminate in pump discharge ports **34** through which the ink is supplied. Plate **32** is fastened to the main casting **35** of the inking unit, which casting supports the ink pump frame **36**, the frame being secured to bosses **37** in the casting by bolts **38**.

The ink pumping arrangement is generally of known type, such as shown in prior patents to Schmidt 1,438,900 and to White 1,311,198. A drive shaft **39** drives, by means of gears **40** and **41**, short stub shafts **42** journaled in the frame **36** and on which a piston operating block **43** is eccentrically journaled so as to have a rotary movement of translation. The ink pumping pistons **44** are slidably carried in this block and are spring pressed upwards as indicated, the lower ends of the pistons reciprocating in cylinder bores in a sliding cylinder block **45** which is also coupled to block **43** by pins **46**. As the block **43** rotates, the pistons move up and down and the cylinder block **45** moves from a position over the discharge ports **34** to a position over the inlet port **47**. The usual screw **48** is provided for each piston, for limiting its movement and thus regulating the quantity of ink pumped by it.

The inking units A, etc. are detachably secured to plates **10** and are properly positioned with relation to the plates **12** by means of cam locking levers **50** pivoted to plates **10** at **51** and pressing against the rear edges of the bottom plates **32** of the inking units. Forward movement is limited by stops **52** on the plate **10** carrying adjustable stop screws **53** against which abutments **54** of the unit A are pressed. The units A, etc. are also posi-

tioned lengthwise of the cylinder **13** by the blocks **52** to register the conduit grooves **33** and **20** accurately together.

The units A, etc. are held down on the plate **10** in ink tight relation thereto by means of trunnions **55** on the unit cooperating with locking levers **56** pivotally mounted on the plate **10** at **57** and carrying dogs **58** pivotally mounted on the levers at **59**. Dogs **58** are urged toward the cylinder **13** (counterclockwise in Figure 4) by means of springs **60**. The lever **56** is turned as by means of a wrench **61** to engage dog **58** in dead center position on a pin **55** as shown in Figure 4, securely locking the inking unit in plate **10**. The inking unit is released by rotating the levers **56** away from the cylinder **13** (counterclockwise in Figure 4).

Trunnions **62** on the inking unit cooperate with hooks **63** on the plate **10** to facilitate inserting and removing a unit. In inserting the inking unit, it is first placed in position on the plate **10** with trunnions **62** seated in the hooks **63** and then is swung down so as to rest on the plate. Thereafter, handles **50** and levers **56** are turned to lock the unit securely in position. In removing the unit, the order of operations is reversed and the unit may be swung counterclockwise on its trunnions **62** for emptying the ink from the reservoir space, within the unit generally, into a bucket before removing the unit entirely from the machine.

Shaft **39**, previously referred to, is a hollow shaft and its construction and mounting are shown in detail in Figures 3, 4 and 5. The shaft is journaled in the ink pump frame **36** and has fixed within it at each end a short coupling shaft **65**. A coupling shaft **66** slidably and rotatably carried in a bearing **67** mounted in the wall of the casting **35**, has a squared end fitting in a recess in the end of shaft **65** for rotatively coupling thereto. Shaft section **66** is coupled to the similar shaft of an adjacent unit by means of a yoke **68** having a square opening cooperating with square ends of the shafts **66** and removably held in position by a pin **69**. Removing the yoke **68** to either side of a unit disconnects its drive shafts for permitting removal of the unit. Where it is desired to operate the mechanism with one or more units removed, a shaft of suitable length may be inserted in place of the unit for coupling spaced units together.

The number of ink pumps and conduits **33** leading therefrom in the units A, etc. need not necessarily correspond to the number of conduits **20** in the cooperating plates **12**. Thus, ten conduits **33** may be provided, the ink pump associated with one of the conduits being silenced where only nine columns are to be supplied with ink. As will also be apparent, plates **12** having conduits **20** registering with the conduits **33** as shown but disposed at different angles may be employed. In this way, by merely substituting different plates **12** the mechanism may be adapted very simply for printing pages of different widths.

The pump supplying any of the conduits **33** may be silenced in the known manner, by adjusting the corresponding screw **48** so that the piston does not reciprocate. It is preferred in certain cases, however, to silence a pump leading to a conduit **33** without making this adjustment, as, for example, where it is desired to silence a pump without disturbing its adjustment. For this purpose, a valve structure **70** (Figures 2, 2A, 3 and 6) may be provided. Each valve comprises a valve body **70** which is generally cylindrical and carried in a bore in the casting **35** and bottom plate **32**, as indicated. Each valve body is formed with a transverse groove **71** at its bottom and with a longitudinal groove **72** on one side. With the valve body in the position of Figure 2, the groove or channel **71** will be disposed crosswise of the conduit **33**, thus preventing flow of ink through this conduit and the groove **72** will establish a channel of communication between the conduit **33** and the reservoir space within the inking unit. The associated pump will, therefore, pump ink through the conduit **33** up to the valve body **70** and then through the groove **72** back into the reservoir, by-passing the flow

of ink so that no ink is supplied through the channel **33**. A quarter turn of the valve body **70** will bring it into the position of Figure 2–A, in which position the transverse channel **71** is lined up with the groove **33**, permitting flow through this groove and the longitudinal channel **72** is brought against the wall of the bore, thus cutting off flow through this channel. As shown in Figures 2 and 3, each of the valve bodies **70** is provided with a square head **73** to permit turning by a suitable wrench and stop pins **74** are provided to position the body **70** in either open or closed position, as desired.

A change in the color of ink supplied to a given page may be very simply and rapidly accomplished by removing the appropriate one of the inking units A, etc. and substituting a duplicate unit charged with the desired color. The removal of the unit and the lifting of the plate **12** permits very simple and rapid cleaning of the upper surface of plate **10** and the grooves in the lower side of plate **12** may also be wiped clean with no difficulty preliminary to replacing the plate **12** and putting a substitute inking unit in position.

The ink change may also, of course, be made by changing the ink within a given unit. This is readily accomplished by unfastening and tilting back the unit in question and draining it into a bucket. Thereafter, the unit and associated plate **12** may be removed. The structure is such as to permit easy cleaning. Sliding the coupling shafts **66** outwardly and unfastening the bolts **38** permits lifting out the entire frame **36** together with the ink pumping mechanism carried thereby. This frame may then be immersed in suitable solvent for cleaning and the reservoir space within the unit is readily washed and wiped clean.

What is claimed is:

1. An inking mechanism for a printing machine comprising, in combination, a flat supporting plate, a plurality of inking units, each comprising an ink reservoir and a plurality of ink pumps, each inking unit having grooves on its bottom in communication with the discharges of its pumps and cooperating with the plate to form ink conduits when the unit is fastened thereon, and means for detachably fastening the inking units on the plate.

2. An inking mechanism for a printing machine comprising in combination, a flat supporting plate, a plurality of inking units, each comprising an ink reservoir and a plurality of ink pumps, each inking unit having grooves on its bottom in communication with the discharges of its pumps and cooperating with the plate to form ink conduits when the unit is fastened thereon, means for detachably fastening the inking units on the plate, a nozzle plate having grooves in its bottom registering with and continuing the first said grooves and forming ink conduits and discharge nozzles when fastened to the said supporting plate, and means fastening the nozzle plate to the supporting plate.

3. An inking mechanism for a printing machine comprising, in combination, a flat supporting plate, a plurality of inking units, each comprising an ink reservoir and a plurality of ink pumps, each inking unit having pump discharge bores through its bottom and grooves on its bottom in communication with the discharge bores and cooperating with the plate to form ink conduits when the unit is fastened thereon, and means for detachably fastening the inking units on the plate.

4. An inking mechanism for a printing machine comprising, in combination, a flat supporting plate, a plurality of inking units, each comprising an ink reservoir and a plurality of ink pumps, each inking unit having pump discharge bores through its bottom and grooves on its bottom in communication with the discharge bores and cooperating with the plate to form ink conduits when the unit is fastened thereon, means for detachably fastening the inking units on the plate, a nozzle plate having grooves in its bottom registering with and continuing the first said

grooves and forming ink conduits and discharge nozzles when fastened to the said supporting plate, and means for detachably fastening the nozzle plate to the supporting plate.

5. An inking mechanism for a printing machine comprising, in combination, a supporting plate, a plurality of units detachably mounted thereon and each comprising an ink reservoir and ink pumping mechanism including a unit drive shaft together with cooperating pistons and cylinders, a frame structure within the reservoir and supporting the ink pumping mechanism, the said frame structure being bodily removable from the reservoir, means detachably securing the frame structure within the reservoir, and coupling shafts slidably mounted in the reservoir walls for connecting to said drive shaft and moving out of the way to permit removal of the frame structure and inking mechanism.

6. An inking mechanism for a printing machine comprising, in combination, a supporting plate, a plurality of

units detachably mounted thereon and each comprising an ink reservoir and ink pumping mechanism including unit drive shafts together with cooperating pistons and cylinders, the unit drive shafts being aligned with each other and shaped and positioned to permit movement of one shaft away from an adjoining shaft by movement transversely thereof, and coupling members between drive shafts of adjoining units and removable to permit removal of a selected unit.

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