May 4, 1926. 1,583,172

T. E. PHYTHIAN

INKING MECHANISM FOR PRINTING MACHINES

Filed Nov. 21, 1925

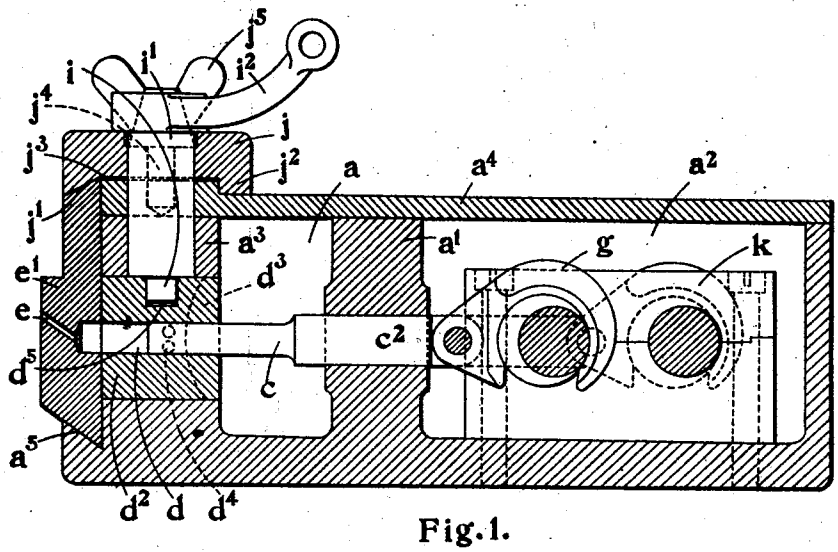
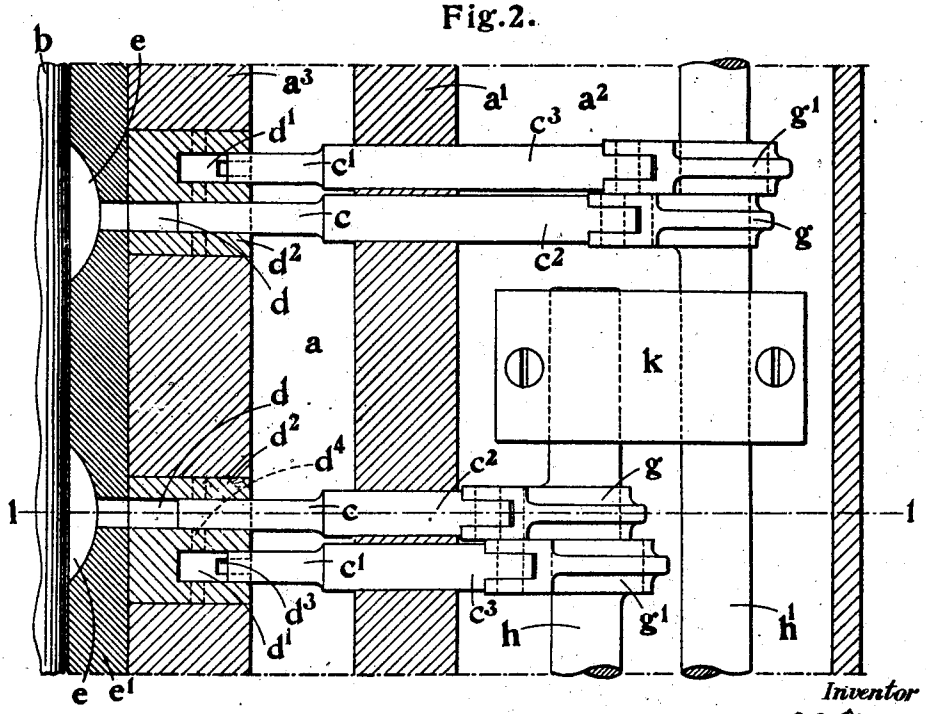


Fig.1.

Fig.2.



Inventor
T. E. Phythian:
by
W. R. Evans
Attorney.

Patented May 4, 1926. 1,583,172

UNITED STATES PATENT OFFICE.

THOMAS EWART PHYTHIAN, OF LEEDS, ENGLAND, ASSIGNOR TO R. W. CRABTREE AND SONS, LIMITED, OF VICTORIA IRON WORKS, LEEDS, ENGLAND.

INKING MECHANISM FOR PRINTING MACHINES.

Application filed November 21, 1925. Serial No. 70,631.

To all whom it may concern:

Be it known that I, THOMAS EWART PHYTHIAN, a subject of the King of Great Britain and Ireland, residing at 25 Headingley Mount, Headingley, Leeds, in the county of York, England, have invented certain new and useful Improvements Relating to Inking Mechanism for Printing Machines, of which the following is a specification.

This invention relates to inking mechanism for printing machines.

Inking mechanism for printing machines has before been proposed comprising an ink supply reservoir, a plurality of independent ink delivery conduits and a plurality of valveless plunger pumps disposed in the supply reservoir, each pump consisting of a single plunger which is adapted to be reciprocated both axially and laterally by means of an eccentric or eccentrics, and the inlet and outlet of ink to and from the pump cylinder being controlled by a corresponding lateral reciprocation of the pump cylinder which brings the open end of the cylinder alternately into communication with the reservoir and with a stationary port leading to the delivery conduit.

In such mechanism means have also been proposed for varying the stroke of each plunger independently of the others and for regulating or cutting-off the supply of ink from each pump, such latter means comprising rotary valves adapted to be operated to place the outlet of the pump in communication with the supply reservoir.

According to the invention, an inking mechanism for printing machines comprises a duct to which ink is supplied and a plurality of valveless plunger pumps each comprising two plungers and two cylinders, one plunger operating to withdraw ink from the duct and to force it into the cylinder of the other plunger, which latter plunger ejects the ink on to the distributing cylinder or drum. Each pump may be adapted to supply sufficient ink for one page of the printed product and may be controlled from the side of the machine by suitable mechanism to be hereinafter described.

According to the invention, moreover, the ink is distributed by means of orifices provided in a wall or cover plate of the duct adjacent the pump outlets with which the orifices are associated.

According to the invention, moreover, the capacity or delivery of each pump is regulated by axial adjustment of the pump cylinders.

According to the invention, moreover, means may also be provided for rendering inoperative the mechanism necessary for providing one page with ink without interfering with the supply of ink for the other pages.

The invention comprises the constructional features hereinafter described.

The invention is hereinafter described with reference to the accompanying diagrammatic drawing in which

Figure 1 is a sectional elevation on the line 1—1 Figure 2 and

Figure 2 is a part plan view in section corresponding to Figure 1.

In carrying the invention into effect, according to one construction and with reference to the accompanying diagrammatic drawing a duct a, disposed parallel with and adjacent the ink distributing cylinder or drum b, is provided with a plurality of valveless plunger pumps at determined intervals in its length. The duct may be provided with a cover plate a^4. Each pump comprises a pair of plungers c, c^1, disposed horizontally in adjacent side by side positions, and adapted to be reciprocated within their respective cylinders d, d^1 which are provided in a block d^2 which may be slidably mounted so as to be capable of movement axially. The outwardly extending parts c^2, c^3 of the plungers c, c^1 may be guided in the longitudinal rear wall a^1 of the duct a. Each of the cylinders d^1 communicates with the duct a through a hole or slot d^3 in the block d^2, which hole or slot d^3 opens into the cylinder; in such a position as to be uncovered by the plunger c^1 on its reaching its rear position. Each of the cylinders d communicates with an elongated outlet e, which is advantageously provided as a wide and shallow horizontally disposed channel which causes the ink to spread in a wide thin film on its being forced outwardly, whereby it is distributed upon the cylinder b. The outlet e may be provided integrally in a removable vertically disposed plate e^1 having its lower and upper longitudinal edges bevelled or otherwise provided to engage respectively with an under-cut longitudinal dovetailed projecting part a^5 on the

outer face of the front wall a^3 of the duct a, and with a corresponding longitudinal bevelled or other face j^1 provided upon a clamping bar j disposed in position above and adjacent to the cover plate a^4 of the duct a, the clamping bar j having at the rear a downwardly extending longitudinal projection j^2 which bears upon the upper face of the cover plate a^4 so that when the clamping bar j is in engagement with the upper edge of the plate e^1 a clearance space j^3 is provided between the clamping bar j and the cover plate a^4.

The clamping bar j may be positioned upon the cover plate a^4 by means such as studs or bolts j^4 projecting upwardly from the latter and having wing nuts or heads j^5 which engage with the upper face of the clamping bar j, whereby on rotation of the nuts or heads j^5 the bar may be pressed downwardly to clamp the plate e^1 in its position. By such means the plate e^1 is held at its respective longitudinal edges against the face of the front wall of the duct by pressure that may be adjusted by the operation of the respective nuts or heads j^5. Communication between the cylinders d, d^1 of each pair is permitted through a hole or holes d^4 provided in such position as to be closed by the plunger c in its forward position.

In the operation of each pump the hole or slot d^3 in the cylinder d^1 of each pair communicating with the duct a is uncovered by the plunger c^1 on its reaching its rear position, the hole or holes d^4 having been previously closed by the forward movement of the plunger c, and ink flows into the cylinder d^1 from the duct a by reason of the partial vacuum in the cylinder d^1.

On the plunger c^1 again moving forward, the hole or slot d^3 is closed by the plunger c^1, and the ink is forced by the latter into the other cylinder d of the pair, through the hole or holes d^4 communicating therewith, when the other plunger c has moved rearwardly sufficiently far to uncover the hole or holes d^4. The ink may be subjected momentarily to a certain amount of compression in the cylinder d^1 before the hole or holes d^4 are opened by the plunger c but owing to possible leakage due to the absence of glands or packing rings this compression is in practice unobjectionable. Owing to the momentary compression to which the ink is subjected by the plunger c^1 immediately prior to the opening of the hole or holes d^4 by the plunger c, the ink is ejected through the holes d^4 into the cylinder d with great impetus and although there is a tendency for the ink to be withdrawn again on the return stroke of the plunger c^1, a certain amount of ink will be trapped in the cylinder d by the plunger c which on its continued forward stroke will thus feed a quantity of ink, corresponding to the amount trapped in the cylinder d, to the outlet e.

The plungers c, c^1 may be operated by eccentrics g, g^1 respectively, or their equivalent, mounted in such manner as to cause their alternate reciprocation. The eccentrics g, g^1 for operating the pumps for the outside pages at one end may be mounted upon a shaft h disposed longitudinally in a chamber a^2 advantageously provided adjacent the duct a and extending short of the position at which the eccentrics for operating the pumps for the centre pages are disposed, and the eccentrics for operating the pumps for the outside pages at the other end may be mounted upon a shaft disposed similarly to the shaft h.

The eccentrics for operating the pumps for the centre pages may be similarly connected to their respective plungers and are advantageously mounted upon a shaft h^1 disposed parallel with and behind the shafts h. The shaft h^1 may be provided in two parts, that is, it may be divided at a middle position whereby the pumps for one half of the centre pages may be driven from one part of the shaft h^1, and the pumps for the other half of the centre pages by the other part of the shaft h^1. Thus the eccentrics operating the plungers of the pumps for the outside and centre pages are provided upon separate shafts and by stopping any of the shafts the supply of ink to the corresponding pages may be cut off.

The shafts h, h^1 may be mounted in bearings such as k and the eccentrics may be slotted, interrupted or otherwise provided to facilitate assembling and dismantling.

Each slidably mounted block d^2 may be adjusted to or away from the distributing cylinder by means of a pin i mounted eccentrically upon the lower end of a vertically disposed shaft i^1 which is rotatably mounted within the longitudinal front wall a^3 of the duct. An arm or lever i^2 may be provided upon the upper end of the shaft i^1 and may be adapted to be operated from a position adjacent either end of the duct for the partial rotation of the shaft i^1. The pin i engages within a transversely disposed slot or recess d^5 in the upper face of the block d^2, so that thus on rotation of the pin i the block d^2 may be moved axially towards or away from the shafts h, h^1.

On adjustment of the block d^2 away from the distributing cylinder, the hole or holes d^4 are opened by the plunger c for a shorter period of time whereby a greater quantity of the ink ejected into the cylinder d through the hole or holes d^4 is trapped by the plunger c, a corresponding increase in the feed of ink to the outlet e being thereby obtained. On further adjustment of the block d^2 a position is reached at which the plunger c

does not return far enough to open the hole or holes d^4 and thus the feed of ink to the outlet e is cut off.

By such means it will be understood that the capacity or delivery of each pump may be readily varied while in operation.

It will be understood that the invention is not limited to the details of construction hereinbefore described, for example the plungers of each pump may be disposed vertically one above the other in alignment and may be driven by means of eccentrics or the equivalent carried upon short vertically disposed shafts.

I claim:

1. Inking mechanism for printing machines, comprising a duct to which ink is supplied and a plurality of valveless plunger pumps each comprising two plungers and two cylinders, one plunger operating to withdraw ink from the duct and to force it into the cylinder of the other plunger which latter plunger ejects the ink on to the ink distributing cylinder or drum, substantially as hereinbefore described.

2. Inking mechanism for printing machines as specified in claim 1 in which the ink is distributed by means of orifices provided in a wall or cover plate of the duct adjacent the pump outlets with which the orifices are associated, substantially as hereinbefore described.

3. In inking mechanism for printing machines, as specified in claim 1 means by which the capacity or delivery of each pump is regulated by axial adjustment of the pump cylinders, substantially as hereinbefore described.

4. In inking mechanism for printing machines as specified in claim 1 means by which the pumps for the respective pages are adapted to be independently rendered inoperative, substantially as hereinbefore described.

THOMAS EWART PHYTHIAN.