

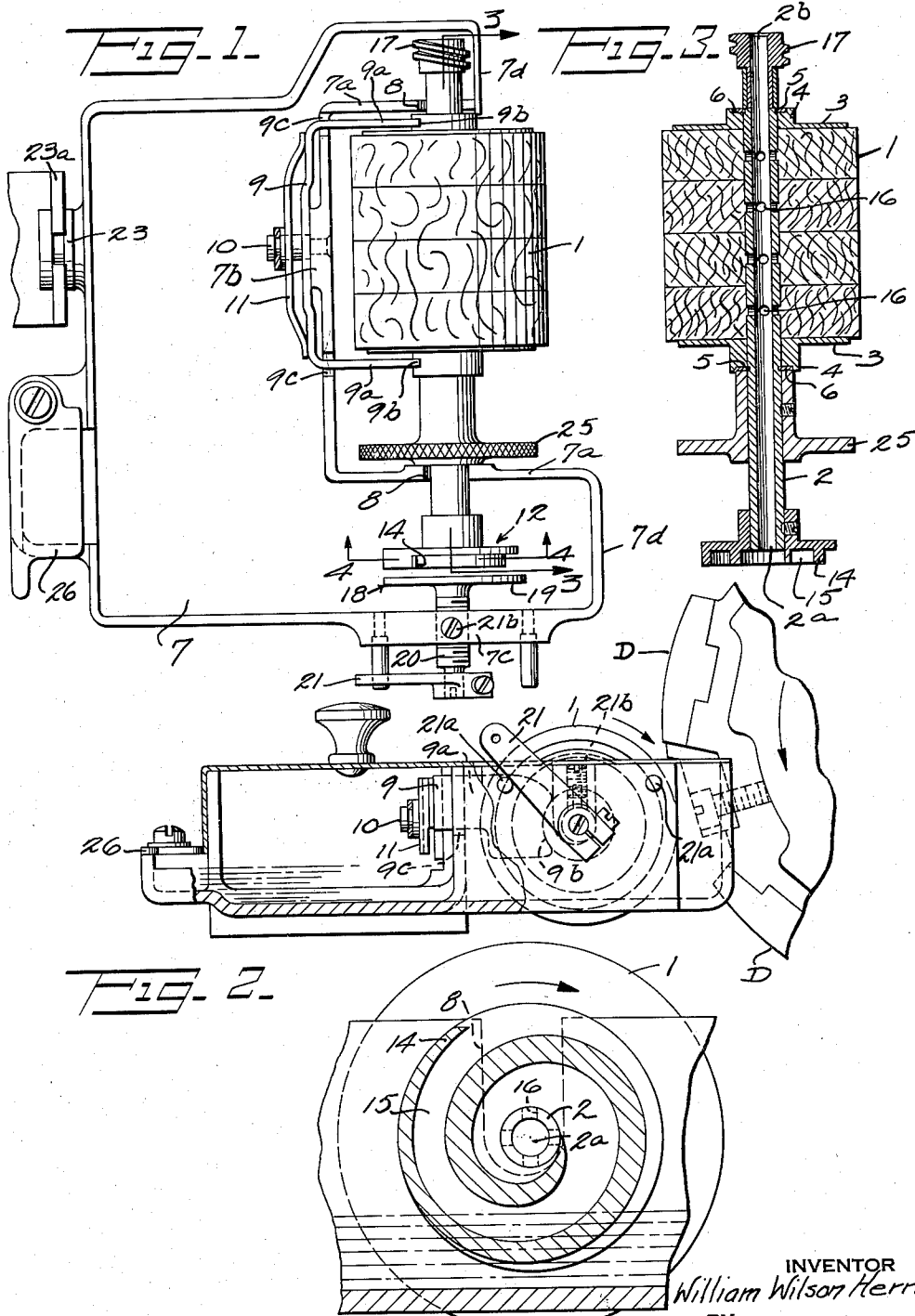
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INKING DEVICE

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INKING DEVICE

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This invention pertains to a combination of elements, functioning to supply fluid ink to an ink roller automatically as required.

Illustrated herein is one preferred embodiment of the invention as adapted to a tax stamping machine wherein the inking of the printing die portion of a rotatably driven printing cylinder is effected. The dies of the printing cylinder are particularly adapted for the printing of state tax stamps on the cellophane envelopes of cigarette packages or like articles in the manner disclosed in Patent No. 2,090,919.

Briefly the invention provides a rotatably mounted inking roller concentrically mounted on a hollow apertured shaft which drives a centrifugal pump also concentrically mounted on the shaft. By this arrangement the speed of the roller determines the speed of the pump. As a result, ink is supplied through the hollow shaft and apertures therein to the roller at a rate proportional to roller demand.

Other objects and advantages of this invention reside in yieldably mounting the roller to provide a constant pressure between roller and die. Maintaining proper contact between these two elements provides efficient ink transfer and proper contact between roller and die.

Another important object of this invention is the provision of a variable metering element whereby the rate of ink delivered to the roller is controlled to prevent excessive inking while the system is in operation.

A further object of this invention is the provision of simple means to allow quick removal of the roller for cleaning, replacement or storage.

Further objects and advantages, as well as the foregoing, will be readily understood by reference to the accompanying drawings and the following detailed description thereof, wherein,

FIG. 1 is a plan view with cover removed of the apparatus of this invention;

FIG. 2 is a side elevation of FIG. 1 with part in section showing the operative relation between the inking roller and printing cylinder having peripherally mounted printing dies;

FIG. 3 is a sectional view taken along lines 3—3 of FIG. 1 showing the roller and associated apparatus driven thereby in section; and

FIG. 4 is an enlarged view taken along lines 4—4 of FIG. 1 showing a section through a spiral or helical vane type lift pump.

Referring to FIG. 1 of the drawings, reference numeral 1 designates an inking roller of any suitable type and of absorbent material such as compacted felt which is adapted to be slightly compressed by the printing die as ink is received by the die surface. The roller 1 is secured to a hollow shaft 2 in a suitable manner such as by a pair of end bearing plates 3 provided with hubs 4. To prevent axial movement of the roller relative to the shaft, and at the same time allow quick and easy removal of a roller from the shaft, spring clips 6 engage slots 5 in the shaft at the hub ends.

A compact device is provided by mounting the roller assembly between end projections of an ink reservoir or tank 7. Said tank comprises a walled enclosure having a base and open top. Two wall portions 7a forming a part of end projections 7d of the tank 7, have open ended bearing slots 8 therein, as shown in FIG. 1, within which

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the shaft 2 is journaled. The roller shaft 2 is normally held against vertical movement in slots 8 by a horizontally positioned yoke 9 having arms 9a with arcuate ends 9b (FIG. 2) engaging the peripheral surfaces of the hubs 4 of the end bearing plates 3.

The yoke 9 is slidably mounted on a bearing pin 10 projecting from a tank wall at 7b and the arms 9a of the yoke are freely positioned in vertical slots 9c in the tank wall. By so mounting the yoke, it is only free to move coaxially of the pin 10. A leaf spring or like device 11, is also fixed to the pin 10 to effect spring tension against the yoke to provide yieldable roller contact pressure with the printing dies D.

From the foregoing it will be evident that the resiliently mounted yoke 9, with its arcuate arm ends 9a engaging the hubs 4 of the end plates 3 will allow quick and easy removal of the roller from bearing slots 8 by simply lifting the roller vertically. Also, the arrangement of oversize slots 8 and yoke 9 allows spring 11 to act as a pressure regulator and shock absorber to keep the roller under proper pressure and in contact with the dies at all times to obtain optimum ink transfer to the entire printing die surface.

Fixed to one end of shaft 2 is a pump element generally designated 12, which may be integral with or separately secured to the shaft 2. As best shown in FIG. 4 the pump element is preferably of the rotating spiral vane type. The vane 14 defines a volute channel 15 through which ink is forced by rotation of the vane and elevated to the open end 2a of shaft 2. As the ink enters the rotating shaft 2 it is subject to a force which causes it to enter and flow through the interior of the shaft. The ink forming this film is under a pressure proportional to the force created by the rate of rotation of the shaft 2. Incoming ink from the pump flows as a film axially along the interior periphery of shaft 2 and will enter apertures 16 in shaft 2 which roller 1 overlies. Ink not forced through apertures 16 is conducted to the opposite open end 2b of shaft 2 and flows back to the ink reservoir. Therefore, ink is quickly drained from the interior of shaft 2 when the device is not in operation.

A worm 17 threaded reversely to the shaft rotation is provided at end 2b of the shaft 2 to prevent ink from moving rearward along the periphery of the shaft 2 and leaking from bearing slot 8 or finding its way along end bearing plates 3 to the exterior of roller 1.

As best seen in FIG. 1 the volume of ink forced through channel 15 of the pump and into opening 2a of the shaft is controlled by varying the width of an ink escape or pump metering portion 18 defined by a metering valve disk 19 coaxial with but spaced from the adjacent vane 14. As the distance between the surface of the disk 19 and the surface of the vanes 14 is increased, the flow of ink through the shaft 2 will be correspondingly decreased. The space between the vane 14 and disk 19 is carried by axial movement of disk 19 and may be accomplished in any convenient manner. One arrangement for the support and adjustment of the disk 19 comprises a threaded screw 20 extending from the disk and through the reservoir wall 7c. A handle 21 clamped to an extended end of the screw 20 is adapted to be manually rocked between stop pins 21a—21a to thus rotate the screw and vary the width of space whereby the ink intake is varied. By means of a set screw 21b the adjusting screw 20 may be locked in its set position. The distinctiveness of the impression made by the printing dies can thus be controlled while the device is in operation.

Any suitable mounting means may be provided for the ink well and assembly such as by engaging an annular slotted lug extension 23 from the reservoir wall with a bracket 23a.

Before starting a printing operation, means is provided to manually prime the ink roller by rotating a wheel 25, fixed to the shaft 2, adjacent the wall 7a.

Ink may be supplied through a projecting filler cup 26. Having described the invention, what is claimed is:

1. An ink supply device comprising an absorbent cylinder, a hollow shaft rotatably mounting said cylinder, means communicating the interior of said shaft with said cylinder, an ink reservoir, a pump comprising a spiral vane mounted on one end of said shaft, said pump removing ink from said reservoir upon rotation of said shaft and introducing said ink to the interior of the shaft, and metering means including a disc having a face adjustably positioned relative to the spiral vane of the pump to control the rate at which ink is introduced into said shaft.
2. An ink supply device comprising an absorbent cylinder, a hollow shaft rotatably mounting said cylinder, means communicating the interior of said shaft with said cylinder, an ink reservoir, a pump comprising a spiral vane mounted on one end of said shaft, said pump removing ink from said reservoir upon rotation of said shaft and introducing said ink to the interior thereof, metering means including a disc having a face adjustably positioned relative to the spiral vane of the pump to control the volume of ink introduced into said shaft, and means carried by the shaft for effecting manual priming of the absorbent cylinder with ink.
3. An ink supply device comprising a rotatable roller, a walled enclosure containing a supply of ink for said roller, a perforate hollow shaft mounting said roller and loosely journalled within the walled enclosure, a rotary

spiral vane type lift pump associated with said hollow shaft, resiliently mounted yoke means to allow yielding movement of said roller within the journals, said pump delivering ink from the ink supply to the interior of said shaft upon rotation of said roller, and a variable metering disk coaxial with said spiral vane and axially movable in spaced relation thereto.

4. An ink supply device comprising a rotatable roller, a walled enclosure containing a supply of ink for said roller, a perforate hollow shaft mounting said roller and loosely journalled within the walled enclosure, said shaft having an ink intake end and a discharge end, a rotary spiral vane type lift pump mounted at the intake end of the shaft, a worm threaded reversely to the shaft rotation and mounted at the discharge end of the hollow shaft, resiliently mounted yoke means to allow yielding movement of said roller within the journals, said pump delivering ink from the ink supply to the interior of said shaft upon rotation of said roller, and a variable metering disk coaxial with said spiral vane and axially movable in spaced relation thereto.

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