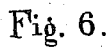


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2 SHEETS—SHEET 2.



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INKING DEVICE.

979,649.

Specification of Letters Patent.

Patented Dec. 27, 1910.

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To all whom it may concern:

Be it known that I, WALTER CHIPPERFIELD, a subject of Great Britain, residing at Romford, Essex, England, have invented new and useful Improvements in Inking Devices, of which the following is a specification.

The invention relates to inking devices in which rollers are required to deliver ink to a pad or the like passing around them, and is specially applicable to duplicators in which two or more rollers are used around which the stencil and its pad travel.

The object of the invention is to construct a self-feeding inking roller which can be operated at intervals to deliver a limited quantity of ink to the pad.

The invention consists in forming the roller with an ink reservoir and providing means for discharging a definite quantity of ink from such a reservoir when required by a single operation.

The invention further consists in an inking roller having a circumferential reservoir and an internal rotating part adapted to cause the discharge of ink from the reservoir when rotated relatively to the inking roller.

The invention also consists in means comprising a lever and cam surface actuating a ratchet wheel for causing the rotation of the internal rotating part relatively to the roller.

The invention also consists in causing the ink delivery devices to free a catch and allow the lever and cam surface to be automatically put out of operation when the ink delivering devices have been actuated.

The invention further consists in a duplicator in which the stencil and its pad pass around two or more rollers one of which is a self feeding inking roller which is caused to deliver a given quantity of ink to the pad by the single operation of a lever or the like.

The invention also consists in the improved inking devices for duplicators or the like hereinafter described.

With reference to the accompanying drawings, Figure 1 is a longitudinal section of the inking roller. Fig. 2 shows a cross section on the line A A Fig. 1. Fig. 3 is an end view of the ratchet gear. Fig. 4 shows

the cross section of the ink receiver on the line B B Fig. 1. Fig. 5 shows an external view of the roller with its connections to the machine. Fig. 6 shows an end view of the same. Fig. 7 is a section, showing devices by which air can escape from the roller, on the line C C Fig. 1, while Fig. 8 is a section taken on the line D D Fig. 7.

In carrying the invention into effect according to one form as applied to a duplicator in which the stencil and pad pass around the ink roller; the inking roller is formed of an outer tube, *a*, having perforations, *b*, for the delivery of ink. The tube is fast on two end disks, *c*, *d*, of which *c*, is fast on the shaft, *t*, by which the roller is rotated. A piece of sheet metal, *e*, extending the whole length of the roller is fixed at its longitudinal edges to the inside of the tube forming therewith a delivery reservoir, *f*, from which the ink passes through the perforations, *b*, to the outside of the roller. A second shaft, *g*, coaxial with the driving shaft enters the roller at the end opposite the driving shaft and has keyed to it cylindrical pieces, *h*, of less diameter than the tube and forming with such tube a circumferential reservoir for holding ink; slots are formed in these cylindrical pieces and in these slots are placed plungers, *k*, pressed outward by means of springs so that they bear against the inner surface of the tube and when the cylindrical pieces, *h*, are rotated relatively to the tube, sweep ink from the circumferential reservoir into the delivery reservoir, *f*, through suitable apertures, *i*, provided for this purpose.

An intermediate dividing body, *l*, forms a partition between the cylindrical pieces and is provided with a space, *m*, from which ink passes through suitable apertures, *n*, to the main circumferential ink reservoirs on each side of it.

In order to charge the roller a passage, *o*, is formed in the dividing body and in this passage a plunger, *p*, slides covering in its normal position a passage, *q*, leading to the ink space, *m*, in the dividing body; when ink is required the mouth of the ink container is screwed or otherwise inserted into this passage and presses the plunger *p*, back against a spring until it uncovers the passage, *q*, to the ink space; on removing the

container the plunger is pressed outward by the spring closing the ink outlet.

In order to rotate the cylindrical pieces, *h*, relatively to the roller a ratchet wheel, *r*, is keyed to the shaft, *g*, carrying them; when the roller is in operation and not delivering ink the ratchet wheel, *r*, is carried around by means of a pawl, *x*, carried by the roller. When relative motion is required in order to force ink from the circumferential reservoir to the delivery reservoir, *f*, a lever, *u*, pivoted to the frame of the machine is depressed bringing a cam surface, *y*, into such a position that during the rotation of the roller it bears against a pin *w*, on a pawl carrying slide, *v*, that is attached to end disk *d* by means of two screws *v'* and elongated holes *v''* in the pawl carrying slide, moving with the roller and presses this pin, *w*, and slide, *v*, inward against the action of a spring, *z*, causing the pawl, *s*, carried by the pawl carrier *v*, to rotate the ratchet wheel through the space of one or more teeth thus moving the cylindrical pieces, *h*, forward relatively to the roller and causing their plungers, *k*, to force ink into the delivery reservoir, *f*, from which it passes directly on to the pad. During the continued rotation of the roller, the pin, *w*, on the pawl carrier clears the cam surface *y*, on the lever, *u*, and allows the spring, *z*, to pull the pawl carrier back causing the pawl, *s*, to pass back over the teeth of the ratchet wheel. The pin, *w*, on the pawl carrier, as it presses over the cam surface, *y*, on the lever, *u*, comes against a projection, *1*, on a catch, *2*, pivoted to the lever, *u*, and frees this catch so that the lever *u*, is drawn back by a spring, *3*, carrying its cam surface out of the path of the pin, *w*, on the pawl carrier which then rotates without operating the ink delivery devices until the lever is again pressed.

In order to fill the circumferential ink reservoir the internal cylindrical part, *h*, is turned until the plungers, *k*, therein are adjacent to the ink delivery reservoir so that they are in their inmost position and in this position there are free passages 4, through the internal cylinder and plungers to the ink delivery reservoir. There are also provided two passages 20, leading from the circumferential reservoir to the outside of the roller by which air can pass from the said reservoir during filling. Further these passages prevent the formation of a vacuum in the circumferential reservoir when ink is being discharged into the delivery reservoir. On first filling the ink passes into the delivery reservoir through the passage *i*, and fills this reservoir which then always remains full of ink. As the ink rises on the two sides of the circumferential reservoir, the air from one side passes through the passages 4, and so to the passages 20, and from the

other side passes directly from the roller through the passage 20. When the roller is completely filled, ink discharges from all the perforations, *b*, as well as the end passages 20.

The inking roller may be arranged to work in conjunction with two rollers, 5, 6, Fig. 6, one at either side and the feeding mechanism so arranged that all the ink discharged is met by the rollers before being transmitted to the stencil and its pad. These rollers may be of the "waver" type, that is, having a reciprocating movement with regard to their longitudinal axes which assists in the equal distribution of the ink.

To prevent the inking lever, *u*, from being operated when the waver rollers are not in position a push spindle, 7, is provided which is connected to two shafts, 8, which slide in the frame of the machine directly under the ends of the bearing pins, 9, that carry the waver rollers. One of these shafts is provided with a slot, 10, and the inking lever, *u*, can only be operated when this slot is in a given position; cam notches are also formed on the shafts, 8, and control the bearing pins, 9, of the waver rollers allowing these to rest on the inking roller when the push spindle, 7, is in its outward position.

To prevent the waver rollers, 6, from resting on the inking roller, *u*, when the machine is not in use the push spindle, 7, is so arranged that it must be pushed home before the cover can be put on, the cam notches being so placed that the waver rollers are then out of contact with the inking roller.

An index finger 12, Fig. 3, may be arranged on the ratchet wheel to indicate the amount of ink in the roller.

The above described inking devices are especially suitable for use with inks of a thick consistency, such as the class of inks known as oil inks.

Claims.

1. An inking device consisting of a roller having a line of peripheral perforations, a circumferential ink reservoir, a lever, and an internal rotating part actuated by the operation of said lever for discharging a definite quantity of ink from said reservoir.

2. An inking device comprising a roller having a line of peripheral perforations, a circumferential ink reservoir, a lever, an internal rotating part for discharging the ink and actuated by the operation of said lever, a cam surface and a ratchet wheel actuated by said cam surface.

3. An inking device comprising a roller containing an ink reservoir, a lever, internal means actuated by the operation of said lever to discharge a definite quantity of ink and means for automatically putting the lever and parts out of action after the actuation of the ink delivery mechanism.

4. An inking device comprising a roller

containing a circumferential ink reservoir, a lever, internal means actuated by the operation of said lever to discharge a definite quantity of ink, and means for automatically putting the lever and parts out of action after the actuation of the ink delivery mechanism.

5. An inking device consisting of a roller having a line of peripheral perforations, an internal circumferential ink reservoir, a lever, internal means actuated by the operation of said lever to discharge a definite quantity of ink, and means for automatically putting the parts out of action after the actuation of the ink delivery mechanism.

6. An inking device consisting of a roller having an internal ink reservoir, a lever, an internal rotating part actuated by the operation of said lever for discharging a definite quantity of ink, and means for automatically putting the lever and parts out of action after the actuation of the ink delivery mechanism.

7. An inking device consisting of a roller having a peripheral line of perforations, an internal circumferential ink reservoir, a lever, an internal rotating part actuated by the movement of said lever to discharge a definite quantity of ink, and means for automatically putting the lever and parts out of action after the actuation of the ink delivery mechanism.

8. An inking device consisting of a roller, an internal ink reservoir, a lever, an internal rotating part for discharging a definite quantity of ink and actuated by the operation of said lever, a cam surface and a ratchet wheel actuated by said surface and means for automatically putting the lever and parts out of action after the actuation of the ink delivery mechanism.

9. An inking device consisting of a roller having an internal circumferential ink reservoir, a lever, an internal rotating part for discharging a definite quantity of ink and actuated by the operation of said lever, a cam surface and a ratchet wheel actuated by said cam surface and means for automatically putting the lever and parts out of action after the actuation of the ink delivery mechanism.

10. An inking device consisting of a roller having an internal circumferential ink reservoir, a line of peripheral perforations, a lever, an internal rotating part for discharging a definite quantity of ink and actuated by the operation of said lever, a cam surface and a ratchet wheel actuated by said cam surface and means for automatically putting the parts out of action after the actuation of the ink delivery mechanism.

11. An inking device consisting of a roller containing an ink reservoir and a rotatable body carrying a series of spring pressed plungers and a lever whereby the rotation

of the plunger bearing body is effected to discharge the ink.

12. An inking device consisting of a roller containing a circumferential ink reservoir and a rotatable body carrying a series of spring pressed plungers and a lever whereby the rotation of the plunger bearing body is effected to discharge the ink.

13. An inking device consisting of a roller containing a circumferential ink reservoir and a rotatable body carrying a series of spring pressed plungers, a lever whereby the rotation of the plunger bearing body is effected to discharge the ink and means for automatically putting the parts out of action after the actuation of the ink delivery mechanism.

14. An inking device consisting of a roller containing a circumferential ink reservoir and a rotatable body carrying a series of spring pressed plungers, a lever, a cam surface and a ratchet wheel actuated by said cam surface and means for automatically putting the lever and parts out of action after the actuation of the ink delivery mechanism.

15. An inking device consisting of a roller containing a circumferential ink reservoir and a rotatable body carrying a series of spring pressed plungers, a lever, a cam surface, a ratchet wheel actuated by said cam surface, a catch adapted to be freed after the operation of the ink delivery mechanism.

16. An inking device consisting of a roller having a circumferential ink reservoir, a second roller of smaller diameter than the first, said smaller roller being contained within and revoluble relatively to the first roller, spring pressed plungers within the second roller and plungers bearing against the inner surface of the outer roller, means for effecting the rotation of the inner roller relatively to the outer roller and means for automatically putting the parts out of action after the actuation of the ink delivery mechanism.

17. An inking device comprising a roller, a second roller of smaller diameter than the first contained within and revoluble relatively to the first roller, spring pressed plungers within the second roller arranged radially of the said roller and bearing against the inner periphery of the outer roller, means for effecting the rotation of the inner roller and means for automatically putting the parts out of action after the actuation of the ink delivery mechanism.

18. An inking device comprising a roller having a chamber forming a delivery reservoir, a second roller of smaller diameter than the first contained within and revoluble relatively to the first roller, spring pressed plungers within the second roller arranged radially of the said roller and bearing against the inner periphery of the outer

roller, means for effecting the rotation of the inner roller and means for automatically putting the parts out of action after the actuation of the ink delivery mechanism.

19. An inking device comprising a roller having a chamber forming a delivery reservoir and having its outer wall perforated for the passage of the ink, a second roller of smaller diameter than the first and contained within and revoluble relatively to the first roller, spring pressed plungers within the second roller arranged radially of the said roller and bearing against the inner periphery of the outer roller, means for effecting the rotation of the inner roller and means for automatically putting the parts out of action after the actuation of the ink delivery mechanism.

20. An inking device comprising a roller having a chamber forming a delivery reservoir and having its outer wall perforated for the passage of the ink, a second roller of smaller diameter than the first and contained within and revoluble relatively to the first roller, a hollow partition dividing the inner roller into two parts, said hollow partition communicating with the space between the inner and outer rollers, said space being in communication with said delivery reservoir and with the outer air, spring pressed plungers within the second roller arranged radially of said roller and bearing against the inner periphery of the outer roll, means for effecting the rotation of the inner roller and means for automatically putting the parts out of action after the actuation of the ink delivery mechanism.

21. An inking device comprising a roller having a chamber forming a delivery reservoir and having its outer wall perforated for the passage of the ink, a second roller of smaller diameter than the first and contained within and revoluble relatively to the first roller, a hollow partition dividing the inner roller into two parts, said hollow partition communicating with the space between the inner and outer rollers, said space being in communication with said delivery reservoir and with the outer air, spring pressed plungers within the second roller arranged radially of said roller and bearing against the inner periphery of the outer roll, a ratchet wheel upon the shaft of the inner roll, a lever upon the frame of the machine, a cam surface on the lever, a spring controlled slide moving with the roller, a pawl upon the slide and means for automatically putting the parts out of action after the actuation of the ink delivery mechanism.

22. An inking device comprising a roller having a chamber forming a delivery reservoir and having its outer wall perforated for the passage of the ink, a second roller of smaller diameter than the first and contained

within and revoluble relatively to the first roller, a hollow partition dividing the inner roller into two parts, said hollow partition communicating with the space between the inner and outer rollers, said space being in communication with said delivery reservoir and with the outer air, spring pressed plungers within the second roller arranged radially of said roller and bearing against the inner periphery of the outer roll, a ratchet wheel upon the shaft of the inner roll, a lever upon the frame of the machine, a cam surface on the lever, a spring controlled slide moving with the roller, a pawl upon the slide, a pin upon the pawl carrier and a catch upon the lever.

23. An inking device comprising a roller having a chamber forming a delivery reservoir and having its outer wall perforated for the passage of the ink, a second roller of smaller diameter than the first and contained within and revoluble relatively to the first roller, a hollow partition dividing the inner roller into two parts, said hollow partition communicating with the space between the inner and outer rollers, said space being in communication with said delivery reservoir and with the outer air, spring pressed plungers within the second roller arranged radially of said roller and bearing against the inner periphery of the outer roll, a ratchet wheel upon the shaft of the inner roll, a lever upon the frame of the machine, a cam surface on the lever, a spring controlled slide moving with the roller, a pawl upon the slide, a pin upon the pawl carrier and a catch upon the lever, said hollow partition being provided with a passage extending between said first mentioned passage and said ink space, and a spring pressed plunger sliding in said first passage, and normally closing said second passage.

24. An inking device comprising a roller having a chamber forming a delivery reservoir and having its outer wall perforated for the passage of the ink, a second roller of smaller diameter than the first and contained within and revoluble relatively to the first roller, a hollow partition dividing the inner roller into two parts, said hollow partition communicating with the space between the inner and outer rollers, said space being in communication with said delivery reservoir and with the outer air, spring pressed plungers within the second roller arranged radially of said roller and bearing against the inner periphery of the outer roll, a ratchet wheel upon the shaft of the inner roll, a lever upon the frame of the machine, a cam surface on the lever, a spring controlled slide moving with the roller, a pawl upon the slide, a pin upon the pawl carrier and a catch upon the lever, said hollow par-

tition being provided with a passage extending between said first mentioned passage and said ink space, a spring pressed plunger sliding in said first passage and normally closing said second passage, and means for connecting the mouth of an ink container with the passage of said hollow partition.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WALTER CHIPPERFIELD.

Witnesses:

ARTHUR BRYCE MEES,

EDWARD JAMES DEASON.