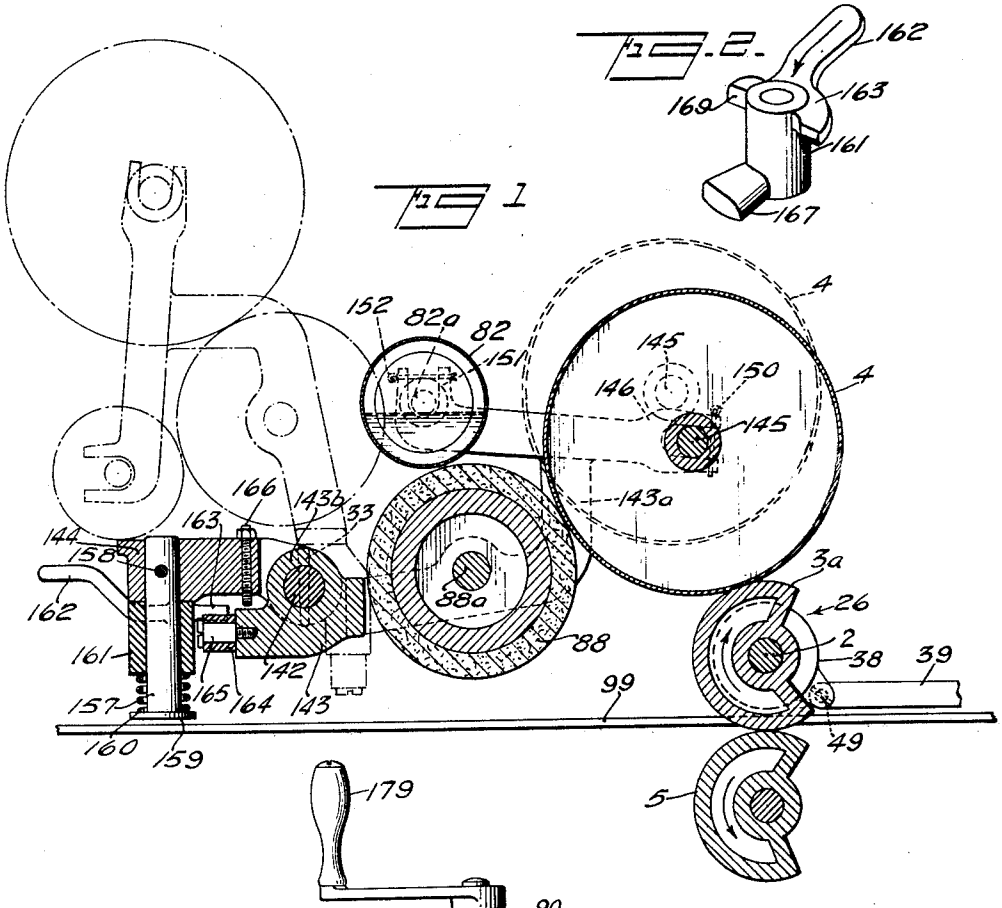
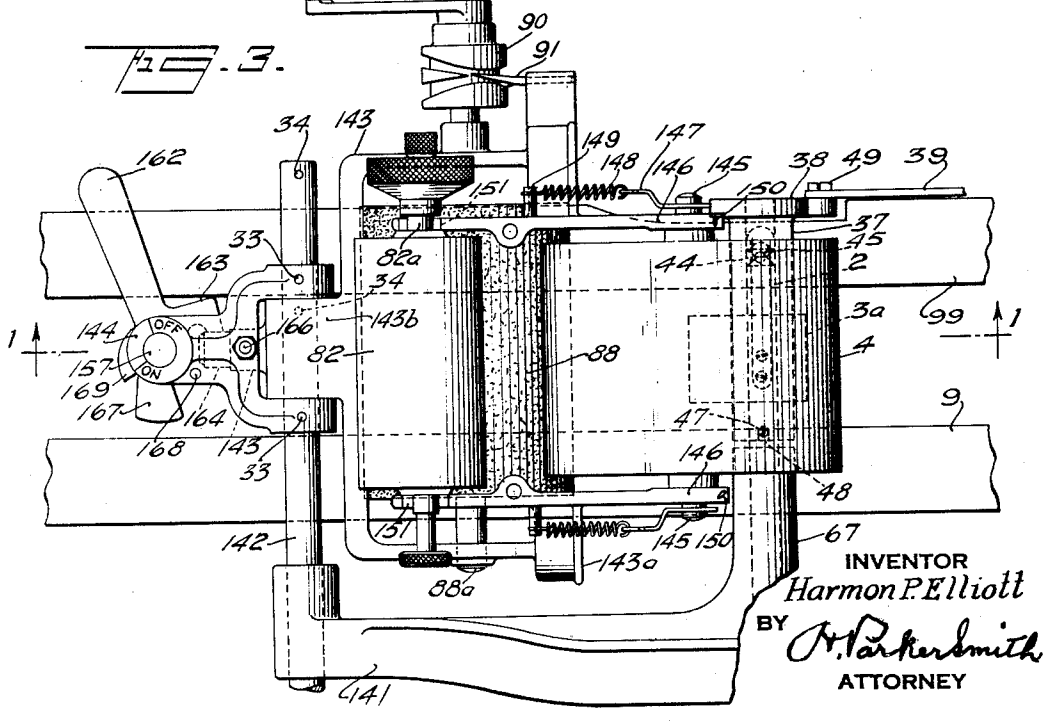
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INKING MECHANISM FOR PRINTING APPARATUS

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INKING MECHANISM FOR PRINTING APPARATUS

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16 Claims. (Cl. 101—352)

This invention relates to ink-supplying apparatus primarily designed for use on combined addressing and printing machines such as described in my pending application Ser. No. 473,322, filed August 6, 1930, and Ser. No. 572,480 and Ser. No. 572,482 filed of even date herewith but is capable of use on other types of printing machines.

In combined addressing and printing machines of the type described in my above noted applications, rotary ink-carrying platen sectors of various widths and characters are used at different times, and these occupy various positions as regards location on the main frame of the machine. When a wide ink bearing sector producing a large printing area is used it is particularly important that the ink shall be applied evenly throughout its entire effective surface because even a slight initial difference in pressures, when increasing progressively across a wide area of printing, will result in a noticeable total difference in the character of the printing produced thereby at and near opposite edges of any such wide printed area. Furthermore when a narrow faced ink carrying sector is used uniformity in the film of ink transferred to it from a wider inking roll may be difficult to maintain if said inking roll overhangs one side of such narrow sector much farther than it overhangs the other. Also the amount of pressure of the inking roll on the ink bearing sector should increase with the width of the latter, in order that the pressure per unit of area, and the consequent amount of ink applied thereto for printing purposes, shall remain constant so as to produce equally clear imprints under all of these varied conditions. Similar conditions arise when a plurality of ink bearing sectors are in operation at the same time, as when mounted on the same revoluble shaft. This particular arrangement is illustrated in my above noted pending patent application Ser. No. 572,482.

My present invention meets the requirements and overcomes the difficulties above outlined by producing an ink-supplying unit comprising the requisite ink fountain, distributing and ink-applying rolls journaled in a housing so pivoted at a point midway of its width that the inking roll will bear evenly by the action of gravity on any ink-carrying sector inserted beneath it, and then providing means for applying graduated spring pressure to the housing at its pivot or hinge to supplement or modify the action of gravity, said unit and pressure means being adjustable along lines parallel to the axis of the revoluble shaft on which the ink carrying sectors are to be mounted.

The best form of apparatus embodying my invention at present known to me is illustrated in the accompanying sheet of drawing in which

Fig. 1 is a vertical longitudinal section on line 1—1 of Fig. 3 showing my improved ink supplying unit and broken away portions of an addressing and printing machine of which it forms a part.

Fig. 2 is a detail perspective view of the pressure applying cam sleeve forming part of the unit, and

Fig. 3 is a plan view of the apparatus shown in Fig. 1.

Throughout the drawing like reference characters indicate like parts.

9 and 99 represent portions of the oppositely grooved, parallel straight bars serving as guides for stencils and also for postcards or sheets of paper to be printed which move along the exterior surfaces of said bars, all of which pass between the oppositely rotating platen sectors 3a and 5, as described in my above noted co-pending applications. When a series of address-bearing stencils are used they are fed along the grooves in 9 and 99 by a reciprocating claw-bearing slide (not shown) operated by connecting rod 39 pivoted at one end to crank pin 49 on the crank disc 38 formed on the outer end of rotating sleeve 37, which is removably mounted on revolving shaft 2, said shaft being journaled in housing 67. This housing and guide rails 9 and 99 are suitably supported by the base frame (not shown) of the addressing and printing machine in the manner shown in my said copending applications.

Sector 3a is adapted to carry ink which is transferred to it from inking roll 4, in contact with which it normally revolves. The sleeve 37 carrying this platen sector is yieldingly held on shaft 2 by spring-pressed pin 45 engaging annular groove 44 in the surface of shaft 2, so that it may be easily pulled off said shaft and other similar sleeves bearing other forms of platen sectors substituted for 3a. Each such sleeve has a notch 43 in its inner end which will engage radial drive pin 47 in shaft 2 so that whatever sector is mounted on shaft 2 must revolve with it in the direction of the arrow shown in Fig. 1.

The inking apparatus here shown is in the form of a unit pivoted on the horizontally extending shaft 142 which is fast in the bracket

141 extending horizontally from the upper portion of the housing 67. On this shaft is pivoted the forked housing 143 by means of the perforated lug 143*b* (see Fig. 3). This housing has an upwardly extending portion 143*a* terminating in a horizontally extending portion, one end of which is equipped with forks 146 in which the shaft 145 of the inking roll 4 is loosely journaled and prevented from removal by the split pins 150. At the other end this housing is equipped with the upwardly projecting forks 151 in which the shaft 82*a* of the rotary ink fountain 82 is journaled, being retained therein by split pins 152. The transfer roll 88 carried by shaft 88*a* is journaled in this housing beneath the ink fountain 82, and adjacent the inking roll 4. The latter is pulled toward the transfer roll 88 by means of springs 148 anchored at 149 and having their other ends connected to clips 147 which are loosely mounted on the ends of the inking roll shaft 145. A double grooved cam 90 on the rear end of shaft 88*a* of the transfer roll cooperates with the pivoted crescent pin 91 to produce an endwise sliding of the roll as it rotates. 179 is a crank on said shaft by which said roll may be rotated by hand when it is desired to transfer a larger quantity of ink to the roll 4 than would result from normal operation.

The inking unit above described would obviously be supported at its free end by the roll 4 resting on the upper sector of the ink impression apparatus and thus transferring a certain quantity of ink from roll 4 to the upper sector 3*a*, or to such other sector as might be in position on shaft 2, as hereinafter to be described. I have found, however, that frequently more pressure is required than is produced by the weight of the parts and accordingly the U-shaped housing 144 is pinned on shaft 142 so as to embrace the pivoted housing lug 143*b* (as shown in Fig. 3) and positive pressure means are mounted on this housing 144 to cooperate with the loose anti-friction sleeve 164 which is held by screw 165 on the rear end of housing 143 so as to positively swing the inking unit upward or downward.

Housing 144 may be fastened on shaft 142 by pins 33, 33 (Fig. 3) and by providing various sets of holes 34, 34, in shaft 142 for these pins, the housing and the entire ink supplying unit may be moved to one side or the other of the machine and fastened in various positions so assumed to produce any desired adjustment of the inking unit with reference to whatever ink-bearing sector is in use.

The preferred form of pressure apparatus for the inking roll 4 comprises the sleeve 161 mounted on vertical shaft 157 which is held in housing 144 by cross pin 158, said sleeve being provided with a radially projecting upper fin 163 and a lower radially projecting fin 167, which fins are respectively adapted to bear upon the anti-friction roller 164 when sleeve 161 is rotated on vertical shaft or pin 157 by means of the radially projecting handle 162. This sleeve is held against the housing 144 normally by spring 160 confined between the lower end of said sleeve and the head 159 on the lower end of shaft or pin 157. Its turning movement on shaft 157 is limited by pin 168 set in housing 144, and projecting into the paths of fin 163 and lug 169 on said sleeve. The setscrew 166 also set in housing 144 limits the upward movement of the rear end of swinging housing 143 when there is no support for the other end of said housing. Consequently the adjustment of screw 166 will limit the distance through which inking roll 4 will drop down when the space 26 between the ends of the curved face of the upper platen sector comes opposite said roll. The amount of ink to be delivered to the ink impression apparatus at each operation of the machine is dependent on the pressure with which inking roll 4 is forced down on said sector face, and this pressure is determined by the angle through which fin 167 is swung under anti-friction roller 164, and the consequent extent of compression of spring 160 which results from the inclined upper face of lower fin 167 being forced under anti-friction roller 164 by a counter clockwise rotation of handle 162 and sleeve 161, so as to force said sleeve downward and so compress spring 160 more or less. When the operator turns sleeve 161 in a clockwise direction the inclined under surface of the other radial fin 163 engages the anti-friction roller 164 and lifts inking roll 4 upward slightly, so as to cause it to clear the sector, as indicated in broken lines in Fig. 1. The upper platen sector then in position can then be removed to permit the substitution of another, or for any other purpose. Also the inking roll 4 can thus be freed from contact with the upper sector before the inking members are rotated by handle 179 to accumulate more ink on said roll 4.

A plurality of holes 34, 34, being provided in shaft 142, as shown in Fig. 3, as before stated, the entire inking unit may be shifted to one side or the other by removing pins 33, 33, and sliding housing 144 along shaft 142, carrying housing 143 with it, and then inserting said pins in another set of holes 34.

In operation, when only a light pressure of inking roll 4 on one ink-carrying sector such as 3*a* is needed the handle 162 is left in position such that neither fin 163 nor 167 presses on the anti-friction roller 164, and the pressure of inking roll 4 on the surface of such sector is only that produced by gravity. When a wider sector is substituted, or when for any other reason a greater pressure is desired, handle 162 is swung around until lower fin 167 is forced under the roller 164 and spring 160 is thereby compressed to the proper extent to produce the necessary downward pressure of roll 4 on the sector surface, as before described. The axis of roller 164 is in a vertical plane extending substantially midway between the forks 146, 146, in which the inking roll 4 is journaled, so that this pressure is applied equally at either end of the roll 4, and, by shifting the entire inking unit along shaft 142 as before described so that the axis of roller 164 will always be located in a vertical plane substantially midway between the outer edges of the sector, or sectors, then being employed, an even pressure along the entire ink-bearing surface of any such ink-carrying sector or sectors is assured, whatever the area or location (within limits) of the surface to be printed. This arrangement is advantageous, because there is always a certain degree of looseness in the hinge formed by 142 and 143*b* which would permit the roll 4 to tip slightly to one side or the other, if not evenly supported by the sector surface beneath.

On the other hand, so long as the ink bearing roll is thus evenly supported by its line of contact with the impression member, the slight looseness of fit between shaft 142 and the rela-

tively short, perforated lug 143b permits the U-shaped frame and ink bearing roll to automatically adjust the latter along the entire line of surface contact so as to produce a uniform pressure along the same at all points, provided said inking roll is urged toward the impression member by gravity alone, or by gravity supplemented by a mechanically produced force applied to said medially located lug 143b, or elsewhere in a plane extending substantially midway between the forks 146, 146 of the U-shaped frame, all as above explained. If, however, any floating inking unit is forced toward an ink receiving surface by a spring bearing on, or attached to, one side of said unit, undesirable variations in the printing done by it in collaboration with any wide stencil will result in different portions of the printed area, unless some complicated swivelling mounting for the inking roller is employed.

When changing the ink-bearing sectors the entire ink-supplying unit may be swung up, as indicated in broken lines in Fig. 1, instead of raising it slightly by turning the sleeve in a clockwise direction as before described.

Various changes in the details of construction here shown could be made without departing from the underlying principles of the invention as above explained or as may be obvious to those skilled in the art.

Having described my invention, I claim:

1. In a printing apparatus comprising an ink carrying impression member revoluble on a fixed substantially horizontal axis, the combination, with said above described apparatus, of a fixed horizontally extending shaft mounted thereon and an ink supplying unit comprising a plurality of rolls journaled in a housing which has a perforated lug relatively short lengthwise of said perforation located substantially at the middle of one end adapted to slip somewhat loosely over said shaft and form a hinge therewith and thereby permit one of said inking rolls to rest by gravity on said ink carrying impression member and automatically adjust itself to produce an even pressure thereon at all points of contact therewith.

2. In a printing apparatus comprising a rotary ink-carrying impression member journaled on a fixed substantially horizontal axis on the main frame of said structure the combination with said above described apparatus, of an ink-supplying unit comprising a housing hinged on a horizontal axis which is in fixed relation to said main frame by means of a perforated lug of relatively short length axially of its perforation, an inking roll journaled in said housing and adapted to rest upon said ink-carrying impression member, said roll having its axis parallel to that of said perforation and extending equal axial distances on either side of a vertical plane passing substantially midway between the end faces of said lug, and means for applying graduated pressure to said housing along a line lying in said plane and in a direction tending to force said inking roll against said impression member; whereby ink evenly distributed over the surface of said roll will be transferred to said impression member in a uniform film of the same thickness at all points.

3. An apparatus such as defined in claim 2 in which said pressure means is adapted to be reversed in its direction of application to said housing; whereby said inking roll may be temporarily lifted out of contact with said impression member.

4. In an ink supplying unit for addressing machines the combination of a housing, an ink-distributing roll journaled therein, an inking roll loosely journaled in substantially horizontal slots in said housing at one side of said distributing roll, and springs for forcing said inking roll journals along said slots toward said distributing roll together with a cylindrical ink fountain also loosely journaled in substantially vertically disposed slots in said housing above said distributing roll and resting thereon.

5. In a printing apparatus comprising a main frame, a revoluble, ink-carrying impression member journaled thereon, and an ink-supplying unit comprising a housing and a hinge therefor, one member of which is mounted on said main frame, an inking roll journaled in said housing adapted to rest on said revoluble impression member, the combination, with said above described apparatus, of a projection from said housing extending substantially radially from the axis of said hinge, and a cam member revolubly mounted on said main frame and adapted to bear on said projection in a direction which will force said inking roll toward said impression member.

6. A structure such as defined in claim 5, combined with a spring mounting for said cam.

7. A combination such as defined in claim 5 in which said cam member comprises a sleeve, the axis of which extends at right angles to the axis about which said housing swings, said sleeve having a radially projecting portion provided with an inclined face adapted to bear on said projection from said housing.

8. A combination such as defined in claim 5 in which said cam member comprises a sleeve the axis of which extends at right angles to the axis about which said housing swings, said sleeve having two radially projecting portions provided with inclined faces adapted to bear on opposite sides of said projection from said housing; whereby rotation of said sleeve may either force said inking roll toward or away from said revoluble impression member.

9. A combination such as defined in claim 5 in which said housing extends horizontally from its hinge and said inking roll is located over said revoluble impression member and said cam member comprises a sleeve, the axis of which extends at right angles to the axis on which said housing swings, said sleeve having a radially projecting portion provided with an inclined surface adapted to bear on said projection from said housing, and in which said sleeve projections are spaced apart circumferentially; whereby when neither of them engages said projection the inking roll may be held down on said impression member by gravity only.

10. In a printing apparatus the combination of a main frame, a revoluble, ink-carrying impression member journaled thereon, a fixed shaft supported on said main frame and extending parallel to the axis of said revoluble member, mechanism for supplying ink to said revoluble member mounted in a housing pivoted on said fixed shaft, a housing releasably held on said fixed shaft adjacent said pivoted housing, a cam rotatably mounted on said fixed housing, and a projection from said pivoted housing on which said cam may bear when rotated and

thereby swing said ink supplying mechanism toward said ink impression member.

11. An apparatus such as defined in claim 10 in which said cam comprises a sleeve which may both rotate and slide endwise on a shaft carried by said fixed housing and has a radially extending fin with an inclined face adapted to bear on said housing projection, combined with a spring also mounted on said last mentioned shaft and bearing on one end of said sleeve: whereby, when said cam is rotated said ink supplying mechanism is spring pressed against said impression member.

12. In a printing apparatus the combination of a main frame, a revoluble shaft journaled thereon and adapted to have an ink carrying platen sector releasably mounted on and geared to it, and a housing carrying an ink supplying mechanism adapted to cooperate with such platen sector also mounted on said main frame and movable in directions parallel to the axis of said shaft: whereby, when sectors of different width or location on said shaft are employed, said ink supplying mechanism may be adjusted correspondingly.

13. A combination such as defined in claim 12 in which said mounting for said housing comprises a shaft fixed on said main frame, a perforated lug on one end of said housing adapted to slide and turn on said fixed shaft, a U-shaped housing also mounted on and adjustable along said shaft and embracing said lug, and means for locking said U-shaped housing to said shaft in different positions thereon.

14. In a printing apparatus the combination of a main frame, a revoluble shaft journaled thereon, an ink-carrying platen sector releasably mounted on and geared to said shaft, a fixed shaft mounted on said frame and extending parallel to said revoluble shaft, a housing carrying an inking roll adapted to rest on the surface of said sector, said housing being provided at one end with a perforated lug adapted to slide and turn on said fixed shaft, a U-shaped housing adapted to slide on said fixed shaft and to engage said lug on both sides of the latter, means for fastening said U-shaped housing on said fixed shaft in different positions lengthwise thereof, and pressure means carried by said U-shaped housing and bearing on said other housing; whereby said inking roll, together with its mounting and pressure producing means, may be shifted as a unit in directions parallel to said revoluble shaft to conform to the area and position of the particular ink-carrying sector then mounted on said shaft.

15. An ink-supplying apparatus comprising, in combination, a fixed supporting shaft, a housing having a relatively short perforated lug at one end by which it may be hinged on said shaft, a projection from said housing extending in a plane at right angles to said shaft, an inking roll provided with journals resting in bearings in the other end of said housing, the axis of said journals being parallel to said fixed shaft, said journals being located on either side of and at substantially equal distances from said plane, and means for applying pressure to said projection in a direction parallel to said plane.

16. In a printing apparatus comprising a main frame, an ink carrying impression member revoluble on a substantially horizontal axis on said frame and a stencil movable under and in contact therewith, the combination, with said above described apparatus, of an ink supplying unit comprising an inking roll, an ink fountain and ink transferring and distributing means all mounted in a U-shaped housing connected to said main frame by a hinge having a horizontal axis and comprising a shaft supported by said frame and a short perforated lug located on said housing midway between the two branches of the U, and somewhat loosely engaging said shaft.

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