April 29, 1952 E. GARRAHAN 2,595,070

INK TRANSFER DEVICE

Filed March 2, 1948 2 SHEETS—SHEET 1

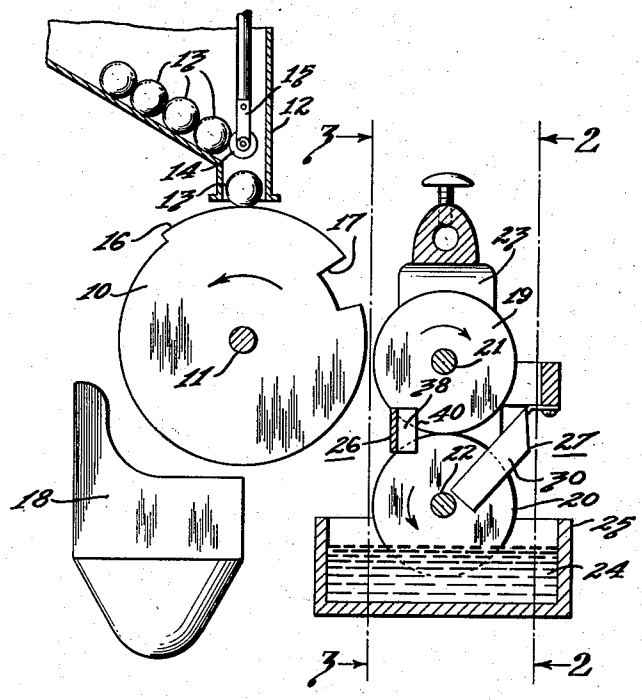
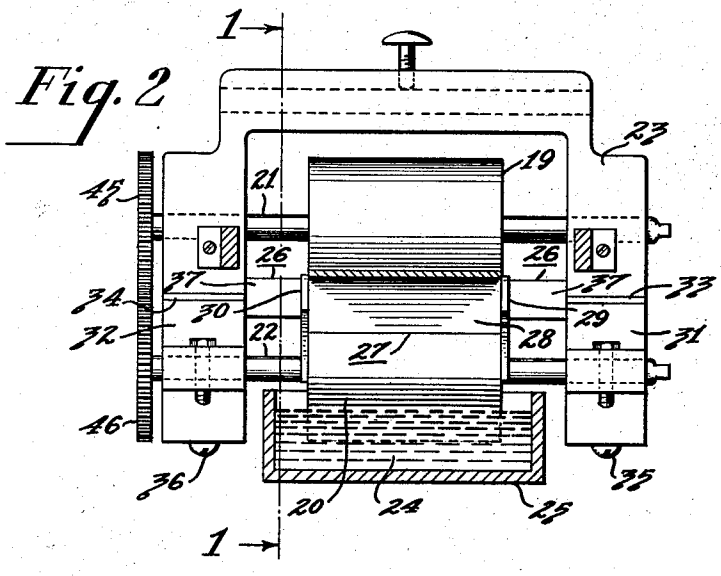


Fig. 1

Fig. 2



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Filed March 2, 1948 2 SHEETS—SHEET 2

Fig. 3

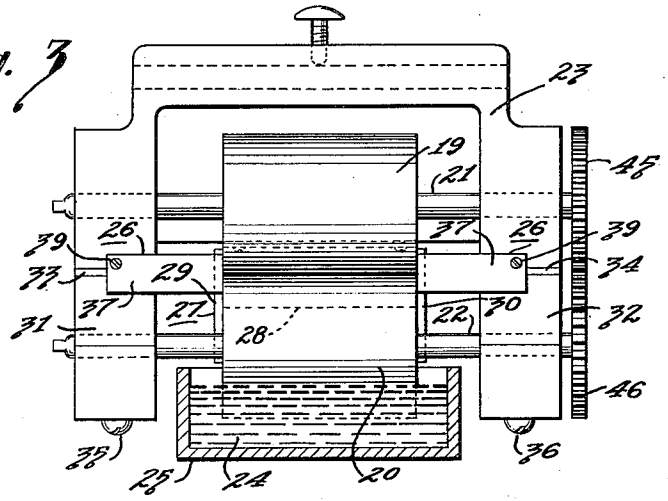


Fig. 4

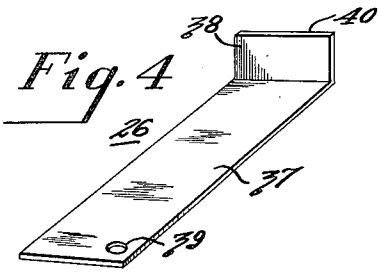


Fig. 5

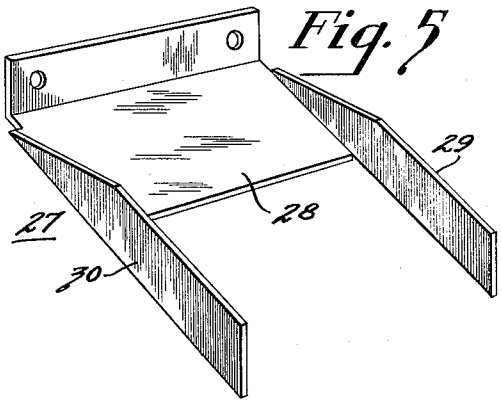


Fig. 6

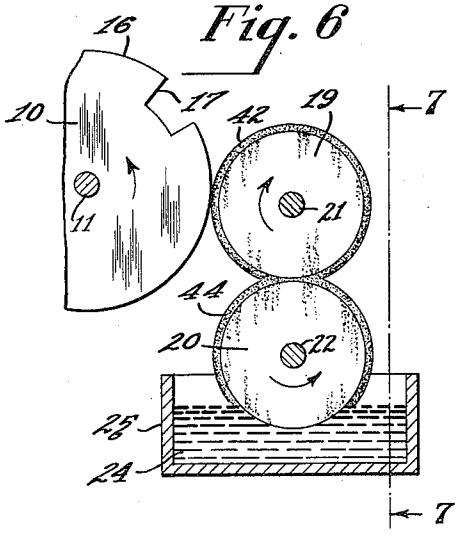
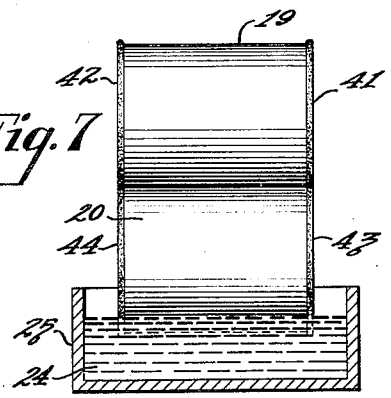


Fig. 7



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INK TRANSFER DEVICE

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6 Claims. (Cl. 101—350)

1

The invention relates to marking machines of the type employing a marking roller and one or more inking rollers for transferring ink from a reservoir to suitable type on the periphery of said marking roller, and more particularly to structures for controlling the amount of ink transfer.

It is an object of the invention to provide a marking machine for applying a clean imprint on units to be marked.

A further object is to provide an ink transfer device for a marking machine, for critically applying ink to a marking roller for assuring a clearly defined imprint by said roller.

An additional object is to control the amount and the area of application of ink to a marking roller to secure a highly legible imprint with freedom from smudging.

Another object is to control the amount of ink carried by an inking roller to prevent the application of ink in undesired quantities or locations on the marking roller.

A still further object is to prevent the transfer of ink on one or more of the inking rollers from the end surfaces to the peripheral surface thereof.

According to the invention these objects are attained by the provision of one or more controls of the ink quantity, at least on the inking roller adjacent the marking roller. These controls may include one or more scrapers of novel construction, preferably in association with an adjustable support for at least two rollers, in the event a plurality of rollers are used, whereby the pressure or spacing between the two rollers may be varied to secure any desired degree of impedance to ink transfer.

Referring to the drawing:

Figure 1 shows partly in section a side view taken along the line 1—1 of Figure 2 of a marking machine in which the invention is incorporated;

Figure 2 shows a front view partly in section along the line 2—2 of Figure 1;

Figure 3 depicts a view partly in section from the rear of the inking device taken along the line 3—3 of Figure 1;

Figure 4 is a perspective view of one of the novel scrapers of the invention for scraping an end surface of one or more inking rollers;

Figure 5 is a perspective view of another scraper of the invention which is employed to scrape both peripheral and end surfaces of one inking roller;

Figure 6 is a fragmentary side view, partly in

2

section of a marking machine showing the accumulation of ink on the end surfaces of the inking rollers in the absence of the ink transfer control means of the invention; and

Figure 7 is a front view of the rollers shown in Figure 6 and illustrates the bead formation of ink on the rollers adjacent their ends which results when the invention is not employed.

While my invention can be employed in association with one or more inking rollers, the use of two such rollers has been chosen for illustration, both because it permits of a clearer description of the invention and represents a preferred embodiment thereof. The use of two rollers is preferred because it permits of an advantageous employment of one of the rollers as an ink quantity control, which otherwise would require an additional member. In addition, while two of the ink controls provided by the invention may be used satisfactorily without the third control, it is preferred to employ all three ink controls to assure optimum results.

According to my invention two or more ink quantity controls engage peripheral and end surfaces of one or more inking rollers at angularly displaced locations thereon. The inking rollers may preferably be disposed one above the other. As the peripheral and end surfaces of the lower inking roller, which extend into the ink reservoir, emerge therefrom, they are first engaged by a novel scraper which contacts both the peripheral and end surfaces of this roller to remove a predetermined amount of ink therefrom. Further rotation of the lower inking roller brings its peripheral surface in adjacency or contact with the peripheral surface of the upper roller. A critical spacing between opposed surfaces of the rollers will provide an additional ink quantity control at this point by denying space to the passage of an excess quantity of ink beyond the line of contact or adjacency of the rollers.

These controls modify the ink content on the peripheral and end surfaces of the lower roller, and the amount of ink transferred to the peripheral surface of the upper roller. However, the second control referred to involving a critical spacing between the rollers is characterized by modified extrusion action as a result of which the ink on the peripheral surface is pushed away in a direction opposite to the direction of rotation of the rollers. Some of the ink thus pushed away will find its way to the ends of the rollers and will flow downwardly over the surfaces thereof and will return to the peripheral surfaces to form beads thereon at locations between the second

control referred to and the point of contact with the marking roller. Unless the formation of these beads is prevented, smudges will be produced on the marking roller, which may be transmitted to the units to be marked. Accordingly, the invention provides for a third ink control which is disposed between the second control and the point of contact between the upper inking roller and the marking roller. This third control comprises a novel scraper engaging the ends of the rollers to prevent the ink thereon from flowing to the peripheral surfaces thereof to form objectionable beads thereon.

A marking machine in which the invention may be used advantageously is shown in Figure 1. This machine includes a marking roller 10, mounted for rotation on shaft 11, a receptacle 12 holding a plurality of units to be marked, which may be electron discharge devices 13, is provided with a feed control comprising a roller 14 mounted on a support 15 for vertical movement into and out of the path of travel of the units 13. Rotary movement of roller 10 will cause a raised portion 16 on its periphery to engage the periphery of unit 13 for applying thereto a suitable imprint. Further, rotary travel of roller 10 will bring cutaway portion 17 thereof into registry with unit 13, whereby the latter will fall into said cutaway portion and be carried to chute 18 for transfer to another station.

According to the invention an ink transfer device is provided for inking the type on the raised portion 16 of roller 10. This device may include one or more inking rollers. Two inking rollers 19 and 20 are shown mounted for rotation on parallel shafts 21 and 22 which are axially displaced in a vertical plane. Shaft 11 of the marking roller 10 is in parallel relation to shafts 21 and 22. Shafts 21 and 22 are suitably supported in bearings in the yoke support 23 shown more clearly in Figures 2 and 3. The bottom inking roller 20 is partly submerged in ink 24 contained in ink reservoir 25.

The ink transfer device according to my invention is provided with one or more scrapers 26 and 27. Scraper 27 more clearly shown in Figure 5 may be made of sheet metal and is mounted to engage a peripheral portion of roller 20 with an edge of its transverse portion 28. Scraper 27 is provided with end wing portions 29 disposed in planes normal to the plane of transverse portion 28. The wing portions 29 engage the ends of roller 20. As will be noted from Figure 1 the direction of rotation of roller 20 is such that scraper 27 is the first ink control means to act on this roller after it emerges from the ink reservoir. The action of scraper 27 need not be critical and may, if this scraper is used in association with two additional control means of the invention to be described, be used to roughly condition the ink supply on roller 20 for such subsequent controls.

One of such subsequent controls is represented by the peripheral engagement of the inking rollers 19 and 20. This engagement may be accomplished with any desired pressure. As shown in Figures 2 and 3, the yoke support 23 includes two lower separable portions 31, 32, separated from the upper portion by bodies of resilient texture 33, 34. The lower portions 31, 32 are supported by screws 35, 36 which pass through a passageway or slot (not shown) in the said lower portions and engage suitable threads (not shown) provided in the upper portion of the yoke support 23. Rollers 19, 20 may therefore be caused to

approach or recede from each other in response to the turning of screws 35, 36 to vary the separation or pressure therebetween to a desired value. An increase in said pressure or a reduction in the separation of said rollers will result in a diminution of ink transferred to the peripheral surface of roller 19, while a reduction in such pressure or an increase in the separation of the rollers will provide an increased supply of ink on the peripheral surface of roller 19. Varying the pressure or distance between rollers 19 and 20 is therefore an additional manner in which the quantity of ink on the ink rollers may be controlled.

A third and final control of the ink quantity on the inking rollers provided by the invention is accomplished by scraper 26 shown more clearly in Figure 4. This scraper may also be made of flat sheet metal and includes transverse portion 37 and portion 38 disposed normal to portion 37. Portion 37 is provided with a hole 39 for mounting on yoke support 23 as shown more clearly in Figure 3. The portion 38 of scraper 26 is disposed with its flat side against a side of rollers 19, 20 and with its edge 40 facing a direction that is against the direction of rotation of said rollers.

Figures 6 and 7 show ink conditions on rollers 19, 20 that scrapers 26 and 27 are designed to correct. As the lower roller 20 passes through the ink 24 a relatively large quantity of ink adheres to its peripheral and end surfaces. Scraper 27 removes most of this ink on these surfaces but a further concentration of ink results from the pressure between rollers 19, 20 previously referred to. This further concentration of ink will flow downwardly toward scraper 27 and laterally to the ends of the roller. But scraper 27 has no control of such flow of ink. Without further control the ink that thus flows to the ends of the rollers after the bottom roller has passed scraper 27, will normally flow downwardly until it reaches the lateral extremities of the ends and will pass to the peripheral surfaces of rollers 19, 20 forming relatively thick beads 41, 42, 43, 44 shown in Figure 7. These beads may assume such large proportions as to bridge the distance between inking roller 19 and the unraised portion of the periphery of marking roller 10. Such undesired ink transfer to the marking roller may result in smudges on the units to be marked.

This undesirable ink condition on the inking rollers 19, 20 cannot adequately be prevented by scraper 27 and the pressure control between the rollers. Therefore the invention provides for the additional control represented by scraper 26 which engages end portions of the inking rollers and extends beyond the peripheral boundaries of such portions. It is not necessary that scraper 26 engage a radius of the roller ends. It will be noted from Figure 1 that the angular path of the upper roller 19, whose ink condition is more critical than that of the lower roller, between scraper 26 and engagement with marking roller 19, is less than 90 degrees. Therefore ink not removed by scraper 26 from the ends of roller 19 will have no opportunity of reaching the periphery of the roller prior to engagement of this roller with marking roller 10. Therefore when such engagement takes place the objectionable bead formations referred to will be effectively prevented by scraper 26.

It is preferred to drive rollers 19 and 20 by independent spur gears 45, 46 shown in Figures 2 and 3. It is however feasible to drive the lower

roller 20 only, and rely on the frictional surface engagement between rollers 20 and 19 for rotating the upper roller 19. Neither is the invention critical as to the rotary power for the marking roller 10. This roller may be actuated by an independent power source, or it may be rotated by frictional engagement with the upper inking roller 19. If it relies on such frictional engagement the advantages of the invention are most noticeable since under this condition the smudgy condition produced by the objectionable ink beads in the absence of my invention would be considerably aggravated.

Numerous modifications may be made in the invention without departing from the spirit and scope of the appended claims.

I claim:

1. A marking machine comprising a marking roller and at least one inking roller, a receptacle for presenting units to be marked to said marking roller, and an ink reservoir in which said at least one inking roller is partly submerged, and means for controlling the quantity of ink transferred by said at least one inking roller to said marking roller, said means comprising a scraper having an edge and two surface portions, said edge engaging a longitudinal portion of the peripheral surface of said inking roller, said two surface portions engaging opposite ends of said inking roller, an additional scraper engaging each end of said roller, said last named scraper having an edge disposed vertically and facing the direction of rotation of said roller and engaging a surface portion of said each end that is displaced from said ink reservoir more than 180 degrees in a direction of travel of said roller, and means for moving said at least one inking roller with respect to said scraper to control the amount of ink on said inking roller, said means being independent of said additional scraper.

2. An ink transfer device compr'sing two rollers, an ink reservoir receiving a portion of one of said rollers, supports for said rollers, one of said supports being movable with respect to the other for adjustably supporting said rollers on spaced parallel co-extensive axes for rotation in opposite angular directions, a scraper engaging peripheral and end surfaces of said one of said rollers, said scraper and the other of said rollers being mounted on said other of said supports, whereby adjustment of said supports controls separation of peripheral surfaces of said rollers and separation of said scraper from said one of said rollers for determining the amount of ink transferred to said other roller, and two additional scrapers engaging end surfaces of said other roller at a portion thereof angularly displaced from the plane of said axes in the direction of rotation of said other roller for preventing ink transfer from said end surfaces to the peripheral surface of said other roller, said additional scrapers being mounted on the support for said other rollers, whereby said adjustment leaves the effectiveness of said last-named scrapers unimpaired.

3. A marking machine including a marking roller having a raised peripheral portion containing marking characters and rotatable on a horizontal axis, means for supporting objects to be marked in engagement with said raised peripheral portion, said roller having an axial groove adjacent said raised portion for receiving said objects after marking, a receptacle for receiving said objects from said groove, inking rollers rotatable on parallel axes and in peripheral engagement for inking said marking characters, an ink

reservoir, one of said inking rollers extending into said reservoir, supports for said inking rollers, one of said supports being adjustable to vary the spacing between said inking rollers for controlling the amount of ink transfer, and means for preventing smudges on said marking roller, said means including a scraper engaging an end surface of one of said inking rollers, said one of said inking rollers being mounted for peripheral engagement with said marking characters, said scraper being fixed with respect to said one of said inking rollers and movable with respect to the other of said inking rollers, whereby the smudge control of said machine is independent of the ink quantity control thereof.

4. An ink transfer device comprising an upper roller and a lower roller mounted for rotation in opposite angular directions on parallel axes lying in a vertical plane, a longitudinal portion of said rollers being in mutual engagement, an ink reservoir, said lower roller extending into said reservoir, whereby a longitudinal portion and end portions of said lower roller receive ink from said reservoir, a fixed support for said upper roller, a U-shaped scraper fixed to said support and having a transverse portion and two legs, an edge of said transverse portion engaging a longitudinal portion of said lower roller for limiting the amount of ink fed to said upper roller, said legs engaging opposite ends of said lower roller for removing ink picked up by said ends, a second scraper fixed to said support engaging adjacent ends of said rollers for removing ink from said ends extruded by said mutual engagement of said rollers, and a movable support for said lower roller for moving said lower roller to and away from said upper roller and said U-shaped scraper for adjustably controlling the amount of ink transferred by said lower roller to said upper roller.

5. An ink transfer device comprising a lower roller and an upper roller mounted for rotation in opposite angular directions on parallel axes lying in a vertical plane, a longitudinal portion of each of said rollers being in mutual engagement, an ink reservoir, said lower roller extending into said reservoir, a fixed support for said upper roller, a U-shaped scraper mounted on said fixed support and engaging the ends of said lower roller and a surface portion of said lower roller displaced angularly from said reservoir less than 180 degrees in the direction of rotation of said lower roller, for removing excess ink picked up by said ends and said surface portion of the lower roller, a second scraper engaging an end of said upper roller at a portion thereof displaced angularly less than 90 degrees from the location of said mutual engagement in the direction of rotation of said upper roller, for removing ink extruded to said end by said mutual engagement of the rollers, and an adjustable support for the lower roller for adjusting the pressure between the rollers at said mutual engagement thereof and between said lower roller and said U shaped scraper, for varying the amount of ink fed to the upper roller by the lower roller.

6. An ink transfer device comprising a plurality of rollers in tangent relation, one of said rollers having raised characters for making an imprint on work pieces, an ink reservoir, another of said rollers extending into said reservoir, an intermediate roller for transferring ink from said another of said roller to said raised characters on said one of said rollers, fixed supports for said one and said intermediate of said rollers, and

means for controlling the amount of ink transferred to said raised characters to prevent smudged imprints on the work pieces, said means comprising two scrapers fixed to the support for said intermediate of said rollers, one of said scrapers engaging a surface of said another of said rollers emerging from said ink reservoir for controlling the amount of ink fed to said intermediate roller, the other of said scrapers engaging an end of said intermediate roller for removing ink extruded to said end by said tangent relation of said intermediate roller and said another roller, and an adjustable support for said another of said rollers for adjusting the pressure of said intermediate roller and said one of said scrapers on said another of said rollers for controlling the amount of ink fed to said intermediate roller.

EUGENE GARRAHAN.

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