Sept. 3, 1940. A. TAYLOR 2,213,419

INKING MECHANISM

Filed April 23, 1938

Fig. 1.

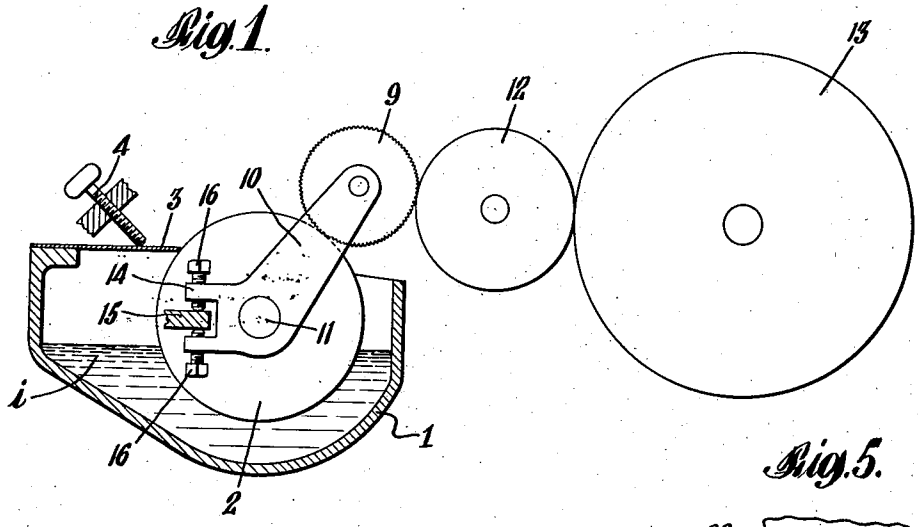
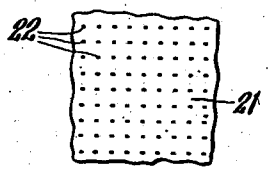


Fig. 5.



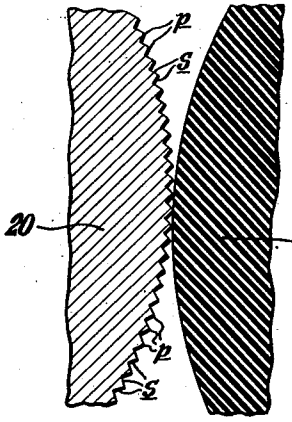


Fig. 2.

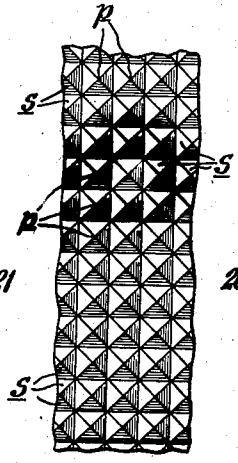


Fig. 3.

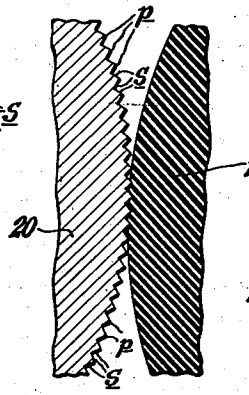


Fig. 4.

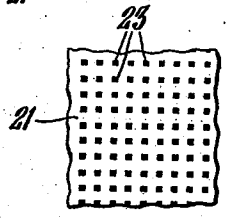


Fig. 6.

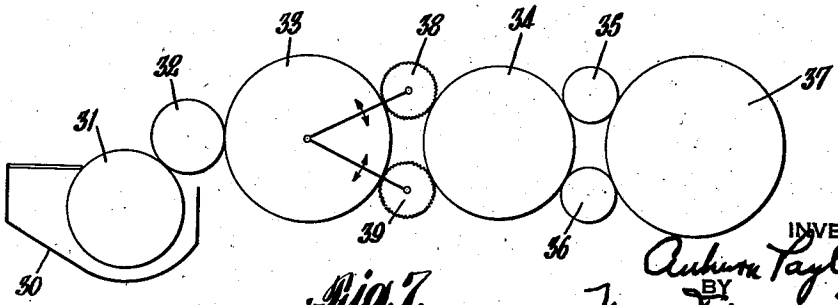


Fig. 7.

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INKING MECHANISM

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Application April 23, 1938, Serial No. 203,740

5 Claims. (Cl. 101—350)

The present invention relates to printing press inking mechanisms, and more particularly to a novel and improved method and apparatus for regulating and controlling the supply of ink to a rotary printing press.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawing, referred to herein and constituting a part hereof, illustrates one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawing:

Figure 1 is a diagrammatic sectional view of a typical and illustrative embodiment of the invention;

Figure 2 is a detailed fragmentary sectional view showing two of the ink transfer rollers in a position to transfer a relatively small amount of ink;

Figure 3 is a fragmentary elevation of the developed surface of one of the rollers;

Figure 4 is a fragmentary detailed sectional view of two of the ink transferring rollers in a position to transfer a relatively large amount of ink;

Figure 5 is a fragmentary elevation of the developed surface of one of the rollers showing the manner in which a relatively small amount of ink is transferred thereto;

Figure 6 is a similar view but showing the roller with a relatively large amount of ink transferred to it; and

Figure 7 is a diagrammatic vertical sectional view of a modified embodiment of the present invention.

The present invention has for its object the provision of a novel and improved inking method and mechanism particularly adapted for use in rotary presses and adapted to simply, effectively and minutely regulate and control over a wide range of variation the amount of ink delivered from an ink supply to the printing plates. A further object of the invention is the provision of a novel and improved supplying and varying method in which the ink is transferred from an ink supply to an ink distributing surface in the form of a large number of spaced-apart, relatively small dots of ink, the area of which is controlled and varied to obtain the desired quantitative regulation. The invention also provides such an improved inking apparatus in which ink is transferred by means of a pair of rollers running in contact with each other, one of the rollers having a surface wherein the outermost part of the roller consists of contiguous, pointed tapering bodies or projections, with sides sloping away from the points (constituting the ink-carrying elements), while the other roller has a smooth or even surface, and one of the two rollers is resilient so that by varying the pressure between the two rollers, the area of contact between the two rollers may be varied by reason of the pyramidal or conoidal protuberances projecting or being indented more or less into the resilient roller, thereby varying and accurately controlling the amount of ink transferred.

In accordance with the present preferred manner of carrying out the invention, and in the illustrative embodiment of the apparatus therefor, a roller having such an ink-receiving and conveying surface is adapted to run in contact with an ink-supplying or fountain roller, and with an ink transfer roller. The ink is transferred from the fountain roller to the above-described roller and is then transferred to the even surface roller, from which it may be transferred to a distributing drum and thereafter applied to the printing surface. Either roller is preferably made of resilient material. The desired form of the roller is preferably effected by forming the surface thereof as a large number of contiguous and relatively small and uniform cones, pyramids, or other bodies, having a relatively small area at their outer end and having sloping sides. The fountain roller may be of substantially conventional construction and is preferably adapted to cooperate with a doctor blade which regulates the amount of ink adherent thereon and thereby causes a uniform amount to be transferred to the surface of the uneven roller. Means are provided, in accordance with the present invention, for varying the pressure exerted between the aforesaid roller and the even roller, and as one of these two rollers is of resilient material, or is provided with a resilient surface, the area of contact between it and the aforesaid roller may be widely varied by varying the degree of pressure exerted between them. When only the lightest degree of pressure is employed, the even roller contacts only with the tops of the spaced-apart, uneven or sloping-sided bodies forming the roller sur-

face, and only a very small amount of ink is transferred in the separated dots, while by increasing the pressure between these two rollers, the area of their surface contact is increased, thus increasing the size of the dots of ink transferred and thereby effecting an increase in the amount of ink fed from the ink supply to the transfer roller.

In accordance with the illustrated modified embodiment of the invention, the reticulated roller is formed of resilient material, and is adapted to operate as a transfer roller between the distributing drums, and a similar effect is obtained by varying the degree of pressure exerted between the transfer roller and one or both of the distributing drums.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the embodiment of the invention illustrated by way of example in the accompanying drawing, an ink fountain 1 is provided, which may be of known or other suitable form. A fountain roller 2 is shown mounted to rotate in the ink *i* in the fountain, which roller likewise may be of known or other suitable form. A suitable doctor blade 3, having screw-threaded positioning means 4, may be utilized in a known manner to regulate the thickness of the ink coating on the fountain roller, and various other parts and appliances, not shown, may be employed as desired or required in connection with the fountain mechanism to regulate the inking action. In the form shown in Fig. 1, a roller is provided which takes ink from the fountain roller 2 in spaced-apart dots, the amount of ink in the dots being regulated and varied as desired, and this is done wholly or in part, by varying the area of the dots of ink. To this end, one of these two coacting rollers is provided with a surface having spaced-apart ink-conveying projections, and one at least of the rollers is formed wholly or in part of resilient material, whereby through varying the pressure between the rollers, the surface areas of the contact points are varied and the amount of ink transferred is thereby accurately and minutely regulated.

In said embodiment a roller 9, adapted to take ink from fountain roller 2, is rotatably mounted in a pair of arms 10, which are medianly pivotally mounted at 11 on any suitable support. Roller 9 conveys ink to a roller 12, which in turn transfers it to the drum 13. Means are provided for varying the pressure between the rollers 9 and 12, and as embodied the ends of arms 10 are formed into yokes 14, which straddle a lug 15, and are provided with adjusting screws 16 acting on opposite sides of lug 15. The surface of roller 9 is preferably formed as a large number of relatively small and uniform cones, pyramids, or other bodies having a relatively small area at their outer ends and having sloping sides. By adjustment of the fountain, these may be inked as far or as little down their sides as desired at the fountain and may be pressed into the transfer roller to the desired degree to transfer the desired amount of ink. If either roller 9 or 12 has a resilient outer part, by varying the pressure between them, the contacting area of the reticulations can be varied and the amount of ink conveyed from roller 9 to roller 12 can be nicely regulated. The ink is conveyed onwardly and is changed to a continuous uniform coating by the coaction of roller 12 and drum 13, and is conveyed forward to ink the printing plate, all in a well-known manner.

In Fig. 3 a reticulate ink-conveying surface is diagrammatically shown, having pyramidal conformation, and a point *p* may be regarded at the apex of one projection or pyramid, having outwardly sloping sides *s*. In Fig. 2 a reticulate cylindrical body 20 is shown sectionally in light contact with a smooth cylindrical body 21, which would effect the transfer of ink from 20 to 21 as dots of small area, and containing little ink, as diagrammatically shown at 22 in Fig. 5. In Fig. 4, the bodies 20 and 21 are shown in contact under increased pressure, which would effect the transfer of the ink to 21 in dots of larger area and containing more ink as diagrammatically shown at 23 in Fig. 6. The doctor blade 3 and the pressure means for the reticulate roller may be cooperatively regulated to realize various desired results; for instance, the ink can be cut fairly fine on the fountain roller and the pressure at the reticulate roller can be increased so as to get a maximum of ink on to the plate, which is frequently desirable in fast presses and conduces to eliminate ink throwing at high speeds.

In Fig. 7 there is shown diagrammatically an entire rotary inking system comprising a fountain 30, fountain roller 31, transfer roller 32, ink drums 33, 34, form rollers 35, 36 and a plate cylinder 37. In this arrangement the broken surface rollers 38, 39 are resilient, and are mediate the drums 33 and 34, and may be moved angularly in either direction, as indicated by the arrows, to increase or decrease the pressure between the rollers 38, 39 and the drums 33 and 34, to vary and regulate the ink supply in the manner and according to the method precedingly described.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:

1. The method of controlling the amount of ink transferred in an inking system which comprises supplying ink in regulated degree to a plurality of closely contiguous, pointed, tapered inelastic projections at and adjacent their points, pressing said projections against a resilient ink-receiving surface to effect a desired degree of indentation of said projections in the resilient surface to govern the amount of ink transferred to said ink-receiving surface.

2. In an inking system the combination of a fountain, a fountain roller, means acting on the fountain roller to regulate the amount of ink taken thereon, a hard roller running in contact with the fountain roller, its cylindrical surface comprising a plurality of contiguous, pointed, tapering ink-receiving and ink-conveying points adapted to take ink in regulated amounts at and about their points from the fountain roller, a resilient ink-receiving roller running in contact with said last-named roller, and means for varying the pressure between said hard roller and ink-receiving roller to govern the degree of indentation of the ink points into the surface of the ink-receiving roller to govern the amount of ink transferred.

3. The method of controlling the amount of ink transferred in an inking system to a printing surface which comprises employing two contact-

ing ink-conveying surfaces, one of which has a plurality of contiguous, pointed, tapering inelastic bodies, and the other of which has a smooth resilient surface, applying ink in regulated quantity to one of said surfaces and regulating the pressure between said contacting surfaces to vary the indentation of the resilient surface by the inelastic surface to regulate the amount of ink transferred by one of said surfaces to the other.

4. In an inking system, the combination of an ink-conveying member having an inking surface comprising a plurality of closely contiguous, spaced-apart, rigid projections with tapered side walls, an ink-conveying member having a resilient even surface, means for applying ink in regulated quantity to one of said surfaces, and means for varying the pressure between said surfaces to regulate the degree of indentation of said resilient surface to vary the amount of ink transferred from one of said surfaces to the other.

5. In an inking system, in combination three consecutive contacting inking cylinders, the middle cylinder having a surface comprising a plurality of closely-contiguous spaced-apart, tapered, rigid projections with tapered side walls, the cylinders at either side having resilient surfaces capable of being indented by the projections on the middle cylinder and means for regulating the pressure between the three cylinders to regulate the amount of ink received and the amount conveyed by the middle cylinder.

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