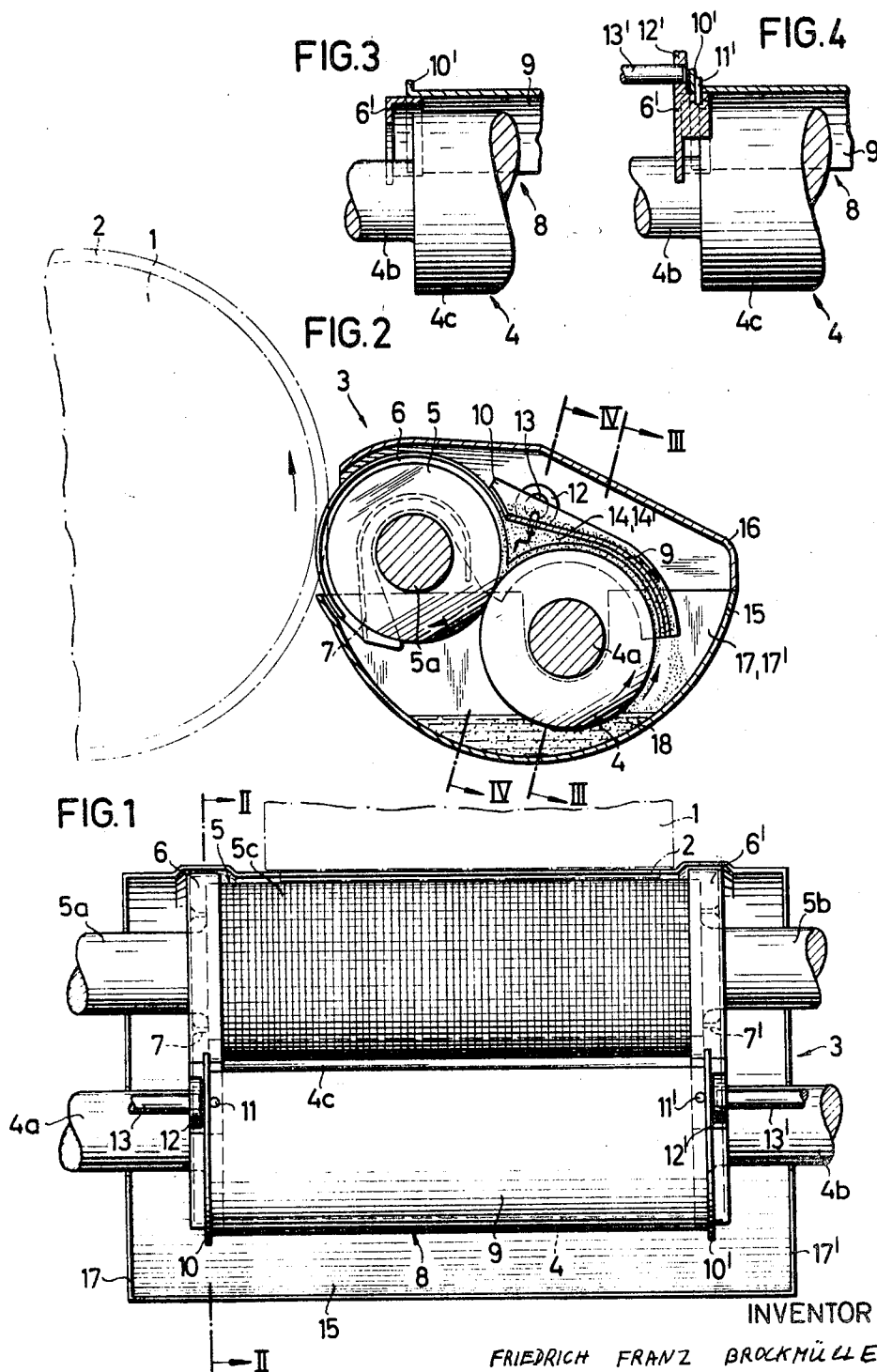


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 INKING SYSTEM PROVIDED WITH A TUB FOR HIGH-SPEED
 FLEXOGRAPHIC PRINTING MACHINES
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INKING SYSTEM PROVIDED WITH A TUB FOR HIGH-SPEED FLEXOGRAPHIC PRINTING MACHINES

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2 Claims

ABSTRACT OF THE DISCLOSURE

An immersion roller rotates to feed ink carried along from the ink tub from above into the nip between the immersion and ink-applying rollers. Surplus ink which has been fed into the nip is recirculated by means of an inclined plate, which is disposed over the immersion roller and extends beyond the nip towards the ink-applying roller so as to leave a gap for the passage of ink between its free edge and the peripheral surface of the ink-applying roller. The recirculating plate has at least over the nip the same width as the inking system and is provided at its side edges with elevations and connected on both sides to limiting plates, which engage the two rollers and retain the ink in the nip.

This invention relates to ink-recirculating means in inking systems provided with a tub and used in high-speed flexographic printing machines. In high-speed printing machines, it is difficult to effect a nonturbulent recirculation to the ink tub of the surplus ink which has been withdrawn from the ink tub of the inking system by the immersion roller but has not been transferred to the ink-applying roller. In inking systems in which the immersion roller in dependence on the direction of rotation of the ink-applying roller, which depends in turn on the direction of movement of the web, withdraws the ink from the ink tub from below and feeds the ink from above to the ink-applying roller, the ink begins to splash and to run in streams laterally and over the end faces of the immersion roller and the ink-applying roller when the speed of the inking system roller exceeds a certain value. As a result, the ink reaches also the journals of the inking system rollers and runs along said journals and drops to the floor outside the ink tub.

In inking systems which are provided with a tub and in which the immersion roller has the above-mentioned direction of rotation, the ink collects in the nip. It is known laterally to deflect the thus collected ink and to return it to the ink tub by doctors and guide plates, which are provided at the end faces of the inking system rollers. These arrangements are not sufficient, however, to prevent particularly a lateral splashing from the inking systems and an outward running of the ink along the journals of the rollers during an operation at high speed.

For this reason it is an object of the invention to provide an inking system which has a tub and a means for recirculating surplus ink fed to the cylinder nip and which prevents a foaming or splashing and an uncontrolled lateral escape of the surplus ink that has not been accepted by the ink-applying cylinder, and ensures a nonturbulent recirculation of the surplus ink into the ink tub.

In an inking system for high-speed flexographic printing machine, which is provided with a tub and in which the immersion roller rotates to feed ink carried along from the ink tub from above into the nip between the immersion and ink-applying rollers, and which comprises means

for recirculating surplus ink that has been fed into the nip, this object is accomplished according to the invention in that the recirculating means consist of an inclined recirculating plate, which is disposed over the immersion roller and extends beyond the nip towards the ink-applying roller so as to leave a gap for the passage of ink between its free edge and the peripheral surface of the ink-applying roller, and said plate has at least over the nip the same width as the inking system rollers and is provided at its side edges with elevations and connected on both sides to limiting plates, which engage the two rollers and retain the ink in the nip.

The cover plate, which substantially covers the nip, reliably prevents a splashing of ink from the nip. Through the gap which is formed throughout the width of the inking system between the ink-applying roller and the free edge of the cover plate, the ink can get on the upper surface of the cover plate and owing to the inclination of the latter can flow back into the ink tub on this surface. The arrangement according to the invention ensures also that in full operation the nip is always filled with ink as far as the recirculating cover plate so that splashing and foaming are further suppressed. As a result, the ink which emerges from the gap between the recirculating plate and the ink-applying roller has already been stilled so that no splashing or the like can occur when the ink is emerging through the gap. Another advantage is the large surface of the recirculating plate according to the invention. This plate extends throughout the width of the immersion cylinder. As the ink being recirculated is distributed over a surface which is as large as possible, the layer of liquid is relatively thin and the velocity of flow can be held at a low value owing to the adhesive internal friction close to the interface. This fact contributes also substantially to a nonturbulent recirculation of the ink. These measures result in a nonturbulent recirculation of the ink without splashing. On the other hand, a lateral escape of the ink over the end faces of the inking system rollers should be avoided. This is accomplished according to the invention in that the ink-filled space between the inking system rollers and the recirculating plate is laterally confined as far as possible by limiting plates, which may be wedge-shaped.

When it is desired to process viscous dyestuff solutions, e.g., inks having a small liquor ratio, it is possible according to the invention to make the recirculating surface of the recirculating plate of liquid-repellent material unless the recirculating plate has a sufficiently strong inclination to the ink tub and, if desired, hugs the curvature of the peripheral surface of the immersion roller so that a recirculation of the ink at a sufficiently high speed is ensured.

The invention will be described more fully hereinafter with reference to the drawing, which shows an embodiment by way of example,

FIG. 1 is a top plan view showing an inking system provided with a tub and intended for use in a flexographic printing machine,

FIG. 2 is a sectional view taken on line II—II of FIG. 1, FIG. 3 is a sectional view taken on line III—III of FIG. 2, and

FIG. 4 is a sectional view taken on line IV—IV of FIG. 2.

An inking system 3 serves for inking printing plates 2, which are secured to a plate cylinder 1 of a flexographic printing machine. The inking system 3 comprises an immersion roller 4 having journals 4a and 4b and a rubber-covered cylindrical body 4c. The inking system 3 comprises further an ink-applying roller 5 having journals 5a and 5b and a cylindrical body 5c, which is formed with a grid pattern on its peripheral surface. The journals 4a, 4b,

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and 5a, 5b are rotatably mounted and held against longitudinal displacement in housing walls, not shown. A pair of ink deflecting plates 6, 6' carry doctors in the form of webs 7, 7' on the inside surface of the plates 6, 6', which surfaces confront the end faces of the ink-applying roller 5. The plates 6, 6' embrace the journals 5a, 5b from above. Those portions of the plates 6, 6' which extend over the end and peripheral surface portions of the immersion roller 4 close to the edge thereof serve as a mounting and supporting means for an ink-recirculating device 8.

The ink-recirculating device 8 consists substantially of a plate 9, which partly conforms to the curvature of the peripheral surface of the immersion roller and which carries limiting strips 10, 10' at those edges which are parallel to the edges of the immersion roller. The strips 10, 10' serve for guiding the ink which is recirculated on the upper surface of the plate 9. The plate 9 is secured to the ink-deflecting plates 6, 6' by pins 11, 11', as is shown in FIGS. 1, 2, and 4. The ink-deflecting plates are held to housing parts, not shown, with the aid of pins 13, 13' mounted in pin holders 12, 12'. Each of the two-ink-deflecting plates 6, 6' is provided with a wedge-shaped extension 14, 14'. These extensions define with the peripheral surfaces of the rollers 4 and 5 a gap, which is as small as possible to prevent a lateral escape of ink. The immersion roller 4, the ink-applying roller 5, the ink-deflecting plates 6, 6' and the ink-recirculating plate 8 are enclosed by a device which consists of an ink tub 15 and an ink tub cover hood. The side walls 17, 17' of the ink tub embrace the journals 4a, 4b of the immersion roller 4 from below.

In operation, the immersion roller withdraws ink from a body of ink 18 in the ink tub 15 at a rate which depends on the surface velocity of the roller. That part of said ink which is fed into the nip between the immersion roller 4 and the ink-applying roller 5 is limited by the narrow gap defined between the immersion roller 4 and the ink-recirculating plate 8. Only a small part of this limited amount of ink is transferred by the ink-applying roller 5 to the printing plate 2 on the plate cylinder 1. This

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small part will depend on the setting of the immersion roller 4 relative to the ink-applying roller 5. That ink which is not accepted by the ink-applying roller 5 is accumulated in the nip. Owing to the sealing wedge-shaped lateral extensions 14, 14', the accumulated ink can escape only upwardly through the gap defined between the ink-applying roller 5 and the forward edge of the ink-recirculating plate 8. The ink will flow without turbulence on the outside of the plate back into the tub and is not carried upwardly by the immersion roller 4, which rotates in the opposite sense.

What is claimed is:

1. An inking system for high-speed flexographic printing machines, which is provided with a tub and in which the immersion roller rotates to feed ink carried along from the ink tub from above into the nip between the immersion and ink-applying rollers, and which comprises means for recirculating surplus ink that has been fed into the nip, characterized in that the recirculating means (8) consist of an inclined recirculating plate (9), which is disposed over the immersion roller (4) and extends beyond the nip towards the ink-applying roller (5) so as to leave a gap for the passage of ink between its free edge and the peripheral surface of the ink-applying roller, and said plate has at least over the nip the same width as the inking system rollers (4, 5) and is provided at its side edges with elevations (10) and connected on both sides to limiting plates (14, 14'), which engage the two rollers and retain the ink in the nip.

2. An inking system according to claim 1, characterized in that the recirculating surface of the recirculating plate (9) consists of liquid-repellent material.

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