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BIMETALLIC MOISTENING ROLLER FOR LITHOGRAPHIC PRINTING APPARATUS

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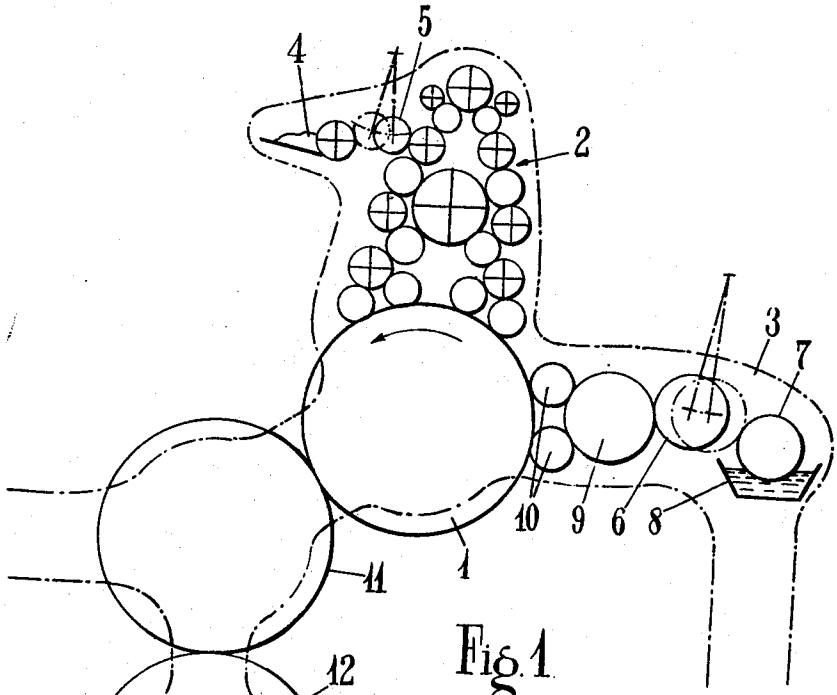


Fig. 1

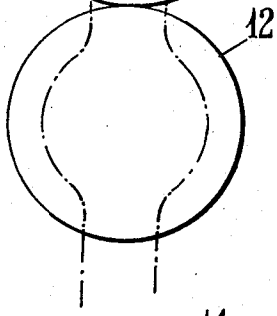
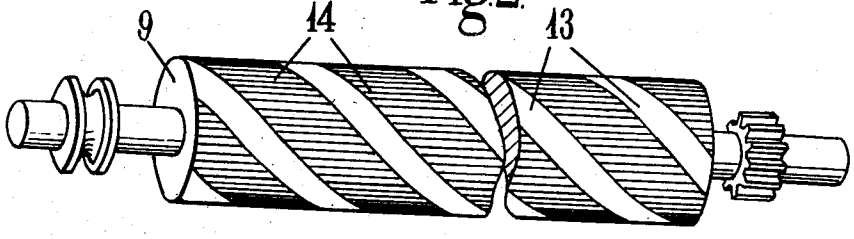


Fig. 2



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BIMETALLIC MOISTENING ROLLER FOR LITHOGRAPHIC PRINTING APPARATUS

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3 Claims. (Cl. 101—148)

1

This invention relates to lithographic printing apparatus with particular reference to the means adopted for supplying moisture to the non-printing areas of the printing surface.

Such moisture supplying means usually consists of a brass roller running in a trough of water, a fabric covered damping roller or rollers in contact with the printing surface, and intermediate rollers including one which is commonly known as a "scavenger" or "brass."

A typical lay-out is described in the specification of British Patent No. 488,444 which also describes the difficulty experienced with such apparatus due to the clogging of the damping rollers and fouling of the scavenger with ink or oily constituents so that it no longer feeds water.

One way of obviating the difficulty is described and claimed in the beforementioned specification by chromium plating the scavenging and preferably water trough rollers but in addition there must be provided brass or copper rollers in contact with the damping rollers to act as separate scavengers. This arrangement is rather bulky and usually it is found impossible to arrange the copper rollers within the available space.

We have now found a means by which the copper rollers may be dispensed with while at the same time the difficulty due to the clogging with ink will be obviated, and the invention consists in lithographic printing apparatus comprising a bi-metal lithographic roller for applying moisture to the damping rollers having a surface part consisting of an ink-receptive metal and part of a metal which is water-receptive and, at least when damp, ink repellant, arranged so that each operative part of the damping roller is, in operation, contacted by both metals during the course of several revolutions of the damping roller, suitably four or five revolutions.

It will be understood that, whilst in the operation of printing apparatus in accordance with this invention the various parts of the bi-metal roller must be in an active condition with respect to its lithographic properties the expression "ink-receptive" and "water-receptive" include the respective metals when not in an active condition.

In one convenient arrangement the bi-metal roller has a surface part consisting of copper or brass and the remainder of chromium or chromium alloy. In this arrangement it is preferred that the chromium should be uppermost and this may be achieved by plating a roller having a brass or copper surface with chromium or chromium alloy selectively to give a pattern effect with parts of the brass exposed or, alternatively, by chromium plating the whole of the brass or copper surface and then etching a pattern, through the chromium to expose the brass.

2

Instead of using chromium or chromium alloy as a water-receptive metal, tin-nickel alloy can be used. The nature of the pattern is not critical except, of course, that discrete annular bands may not be employed. Thus, longitudinal stripes, helices or a chequered pattern may be used of appropriate dimensions in relation to the diameters of the bi-metal roller and the damping roller to avoid any repeating effect for more than several revolutions of the damping roller. Where an oscillation is superposed on the rotation of the bi-metal roller in operation of the apparatus, a helical pattern is preferred.

Preferably, the arrangement is such that each operative part of the damping roller contact the water-receptive surface of the bi-metal roller once only for every one to four occasions on which it contacts the ink-receptive surface of the roller, to secure a desired balance between scavenging and wetting of the damping roller.

In one particular arrangement there is provided a bi-metal roller, having a brass surface overlaid with a chromium helix, preferably a multistart helix, which may be provided by an etching process as described above or alternatively by turning, in a lathe, a uniformly chromium plated brass or copper surface roller. The chromium helices may be, for example, ¼–½ inch wide and at a 45° angle to the axis of the roller, the spacing being such that there is from 1–3 times as much brass or copper exposed as chromium.

It will of course be understood that the chromium or chromium alloy is treated in a suitable manner to render it water-receptive and ink-repelling at the same time as the brass remains ink-receptive before the apparatus is put into operation.

The accompanying drawings show one embodiment of this invention, of which

Figure 1 is a diagrammatic sectional view of the lithographic printing apparatus, whilst

Figure 2 shows, in perspective, the bi-metal roller incorporated in Figure 1.

The apparatus comprises a lithographic cylinder 1 associated with a train of ink feeding rollers 2 and a train of water feeding rollers 3. The train 2 comprises steel rollers, which are shown shaded, and soft covered rollers which are shown unshaded and supplies ink from an ink duct 4 by way of the customary vibrating roller 5. The

latter is shown in the ink feeding position in full line and in the ink picking up position in dotted line.

The water feeding rollers 3 also comprise a vibrating roller 6 arranged to transfer water picked up by a roller 7 from a trough 8 to a bi-metal roller 9, the latter transferring this water to damping rollers 10.

The apparatus shown is for transfer printing and comprises a blanket roller 11 and an impression roller 12 between which the paper is fed. Part of the machine frame is shown diagrammatically in dotted outline.

The bi-metal roller 9 is shown in greater detail in Figure 2 and bears a multistart chromium helix 13, the cylinder as a whole being made of brass so that a multistart helix 14 of this material is exposed.

I claim:

1. In lithographic printing apparatus comprising a lithographic printing surface, together with a damping roller for supplying moisture to non-printing areas of said printing surface and a water-feeding roller for supplying water to said damping roller, a lithographic roller disposed between said water-feeding roller and said damping roller, said lithographic roller having a bimetallic surface, a part of said bimetallic surface consisting of an ink-receptive metal and a part consisting of a water-receptive ink repellant metal, the two metals being patterned so that each operative part of the damping roller is, in operation, contacted by both metals and thereby both dampened and scavenged during the course of several revolutions of the damping roller.

2. Apparatus as set forth in claim 1, in which such ink-receptive metal is selected from the group consisting of copper and brass, and said water-receptive metal is selected from the group consisting of chromium, and alloys of tin with nickel.

3. Lithographic printing apparatus as set forth in claim 1, in which the two metals forming the surface of the bi-metal roller are patterned to form a helix.

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