April 9, 1957 G. R. BRODIE 2,787,955

APPARATUS FOR SUPPLYING INK TO INKING ROLLERS

Filed Nov. 13, 1952

Fig. 1.

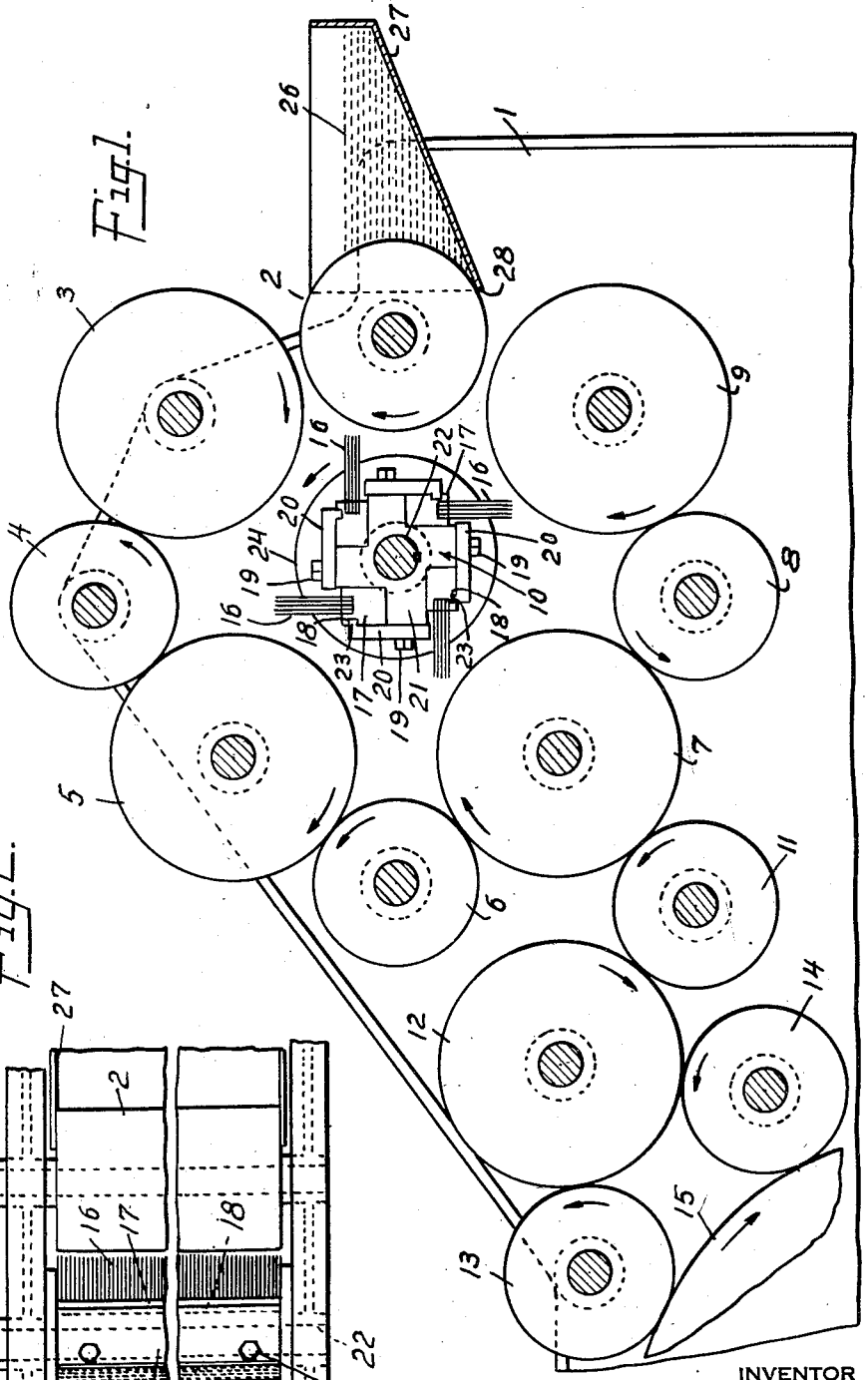


Fig. 2.

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United States Patent Office 2,787,955 Patented Apr. 9, 1957

2,787,955

APPARATUS FOR SUPPLYING INK TO INKING ROLLERS

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Application November 13, 1952, Serial No. 320,264

2 Claims. (Cl. 101—350)

The present invention relates to the art of printing and, more particularly, to an improved method of supplying printing ink to an ink-transfer roller. The invention is especially applicable to rotary printing presses and provides an improved method of applying the ink and apparatus especially adapted to that purpose.

In the operation of conventional rotary printing presses, the ink is supplied to what is known as a fountain roller and is conveyed from the fountain roller by means of a so-called ductor to a series of intermediate, parallel, ink-transfer rollers by which the ink is conveyed to and finally applied to the printing plates secured to the plate cylinder.

As is well understood in the art, the thickness of the film of ink on the fountain roller is usually controlled by a so-called doctor blade. For practical reasons, also understood by the art, the peripheral speed of the fountain roller is relatively slow. The peripheral speed of the ink-transfer rollers is usually the same as that of the plate cylinder and, in order to increase production, it is generally desirable that this speed be relatively high, substantially in excess of the peripheral speed of the fountain roller.

By reason of this difference in peripheral speeds of the ink-transfer rollers and the fountain roller, it has been found impractical to operate any of the ink-transfer rollers in constant peripheral contact with the periphery of the fountain roller. In order to convey the ink film from the fountain roller to the series of ink-transfer rollers, the so-called ductor has been employed.

The ductor is likewise a cylindrical roller positioned parallel to the other rollers of the press and is adapted to be moved intermittently, first in contact with the surface of the fountain roller, from which it picks up a film of ink, and then in contact with the first of the series of ink-transfer rollers, to which it applies the film of ink picked up from the fountain roller.

While in contact with the fountain roller, the ductor tends to assume the peripheral speed of the fountain roller and, when moved into contact with the ink-transfer roller, tends to assume the greater peripheral speed of that roller. Thus, the peripheral speed of the ductor is constantly changing and for the most part is either greater than, or less than, the speed of the roller with which it is brought in contact. This condition has caused an unevenness of the film of ink applied to the series of ink-transfer rollers. It is also responsible for placing excessive mechanical strains and stresses on the various elements of the rotary press.

A further difficulty encountered in rotary press operation is the feeding-back into the ink fountain of any dried particles of ink or other solids, lint for instance, from the web, which might accumulate on the series of ink-transfer rollers. Any such material will frequently work back along the series of rollers and be conveyed by the ductor to the fountain roller which carries it back into the ink fountain.

It is an object of my present invention to eliminate

the ductor and further to avoid all contact between the ink-transfer rollers and the fountain roller. These and other important advantages are derived from my present invention as will appear from the following description thereof.

In accordance with my present invention, the printing ink is applied to the ink-transfer rollers by means of a brush, co-extensive with said rollers in length, rapidly rotating in close proximity to at least one ink-transfer roller, but out of contact with all ink-transfer rollers, about an axis parallel to the axis of said rollers. At one or more points in the path of the brush, ink is applied to the bristles thereof. The speed of rotation of the brush is such that, at another portion of its path, the ink is thrown by centrifugal force onto one or more of the ink-transfer rollers.

The ink may be applied to the bristles of the rotating brush by moving the bristles in contact with the surface of a conventional fountain roller, for instance, the amount of ink picked up by the bristles depending upon the thickness of the film of ink on the fountain roller and being controlled by adjustment of the doctor blade in the conventional manner. However, the invention in its broader aspect is not restricted to this particular method or means for applying the ink to the bristles of the rotating brush. Instead of using a fountain roller, other regulatory ink-carrying surfaces may be used to apply the ink to the rotating brush. Such ink-carrying surface should be co-extensive with the brush in length.

In order to avoid the throwing of the ink from the rotating brush onto other parts of the press and press accessories, the periphery of the path of the brush is, with advantage, substantially completely surrounded by ink conveying surfaces, i. e., the ink-transfer rollers and the regulatory in-conveying surface by which the ink is applied to the brush. However, other shielding devices may be employed for this purpose, provided such shield be so constructed and arranged as to prevent the accumulation of ink at points from which it might drip onto the ink-transfer rollers and thus destroy the uniformity of the ink film conveyed to the plate cylinder.

The invention will be more fully described and illustrated by reference to the following drawings of which

Figure 1 represents, somewhat conventionally and fragmentarily, a vertical section of a rotary press embodying the presently preferred aspect of the invention, and

Figure 2 is a fragmentary plan view of the rotating brush and fountain roller.

In the drawing, the supporting frame of the rotary press is indicated at **1**, the various rollers hereinafter described being supported by said frame, as is well understood in the art. A conventional fountain roller is indicated at **2** and the rollers **3**, **4**, **5**, **6**, **7**, **8**, and **9**, represent ink-transfer rollers which, together with the fountain roller **2**, substantially completely surround the peripheral path of the rotating brush represented at **10**. Further ink transfer rollers **11**, **12**, **13**, and **14** serve to convey the film of ink from the roller **7** to the plate cylinder **15**.

The various rollers and the plate cylinder just described may be of the conventional type and, aside from the positioning of said rollers about the rotating brush and the method of and means for supplying ink to the rollers, the press may be of conventional construction and operated according to conventional practices.

The rotating brush **10** comprises flexible members **16**, advantageously of bristles, or the like, cemented into or otherwise secured to blocks **17**, advantageously of metal, the said flexible members and blocks being coextensive with the length of the rotating brush. The blocks **17** are provided with longitudinal grooves **18**, as shown, and are

adapted to be removably fastened, as by means of machine screws **19** and brackets **20**, to the main frame member **21** which, in turn, is keyed, or otherwise securely fastened to, and adapted to be rotated with the shaft **22** which, in turn, is supported by the press frame **1**. The brackets **20** are provided at their outer ends with lugs **23** which fit into the grooves of the respective blocks **17** and thus secure said blocks to the main frame of the rotating brush. Longitudinal movement of the blocks **17** is prevented by the flanges **24**. The shaft **22** may be rotated by any suitable means, for instance, a variable speed electric motor indicated at **25**.

The brush construction illustrated has the advantage of ready removal of the bristle members for replacement or cleaning. However, other types of rotary brushes may be used in place thereof without departing from the spirit of my present invention. For instance, I may use a cylindrical brush having radially extending bristles uniformly spaced over the entire circumferential surface of the cylinder or over one or more segments of the circumferential surface. In most instances, it will not be found necessary, or desirable to have the bristles positioned about the entire circumference of the cylinder, but they should, of course, be placed substantially uniformly over the entire length of the brush.

In operation, a body of ink **26** is maintained in the ink fountain **27**. The fountain roller **2** is operated in a clockwise direction in contact with the ink and the thickness of the film of ink carried from the fountain on the surface of the fountain roller is controlled, in the conventional manner, by the doctor blade indicated at **28**.

The rotating brush **10**, which is coextensive in length with the other rollers, is positioned with its axis parallel to that of the other rollers and is spaced from the fountain roller a distance such that when rotated, the bristles **16** move in contact with the constantly maintained film of ink of predetermined thickness on the circumferential surface of the rotating fountain roller. Thus, the bristles of the rotating brush pick up a regulated amount of ink from the fountain roller and this ink is thrown from the bristles by centrifugal force onto the surfaces of the surrounding ink transfer rollers.

Advantageously, the speed of rotation of the brush roller is controlled independently of the speed of the other rollers. The brush speed is subject to considerable variation, the optimum speed dependent upon other operating conditions, including the diameter of the path through which the bristles rotate, the amount of ink required and the viscosity and tack of the ink. The optimum speed of rotation of the brush will usually fall within the range of about 60 to 600 R. P. M.

In the particular apparatus shown, the brush is indicated to rotate in a counter-clockwise direction. When so operated, the major portion of the ink is usually thrown onto the surface of the ink-transfer roller positioned as represented in the drawing at **3**. With this arrangement, a uniform amount of ink is continuously supplied to the train of ink-transfer rollers, the amount of ink applied to the respective longitudinal sections of the rollers being nicely controlled by regulation of the doctor blade **28**.

The rotating brush may be so positioned with respect to the fountain roller that the tips of the bristles barely

touch the surface of the roller, or the brush may be positioned closer to the fountain roller so that the bristles are somewhat flexed by contact with the roller. In the latter case, particles of ink may be thrown from the bristles onto the cylinder **3** as the tension on the bristles is released upon passing out of contact with the surface of the fountain roller. It will appear, therefore, that the throwing of the ink from the bristles to the ink-transfer rollers may not be entirely due to centrifugal force, but may be effected, in part at least, by the flexing of the bristles.

The relative amount of ink applied to any longitudinal section of the respective ink-transfer rollers will depend upon the thickness of the ink film on the corresponding section of the fountain roller and may be readily controlled, as previously noted, by adjustment of the doctor blade.

I claim:

1. In combination with a rotary printing press comprising a plurality of ink-transfer rollers, means for applying ink to the said rollers which comprises a brush coextensive with the length of the ink-transfer rollers and adapted to be rotated in close proximity thereto, but out of contact with, said rollers about an axis parallel to the axis of said rollers, a solid surface coextensive with the length of said brush and so positioned with respect thereto that, when the brush is rotated, the bristles thereof pass in contact with said surface, means for supplying a film of ink to said surface and means for rotating said brush at a speed such that the ink is thrown from the bristles onto at least one roller, the solid surface and said ink-transfer rollers being so positioned that the path of rotation of said brush is substantially entirely surrounded by said rollers and surface.

2. In combination with a rotary printing press comprising a fountain roller and a plurality of ink-transfer rollers, means for transferring ink from the fountain roller to the ink-transfer rollers which comprises a brush coextensive with the length of the said rollers, and adapted to be rotated in close proximity to, but out of contact with, said transfer rollers about an axis parallel to the axis of said rollers, said fountain roller being coextensive in length with the length of the brush and so positioned with respect thereto that when the brush is rotated, the bristles thereof pass in contact with the surface of the fountain roller, means for supplying a film of ink to the surface of the fountain roller and means for rotating said brush at a speed such that the ink is thrown from the bristles thereof onto at least one ink-transfer roller, the path of rotation of said brush being substantially entirely surrounded by the ink-transfer rollers and the fountain roller.

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