

[54] **INK MIST SUPPRESSION ROLLER
ASSEMBLY FOR A ROTARY PRINTING
PRESS**

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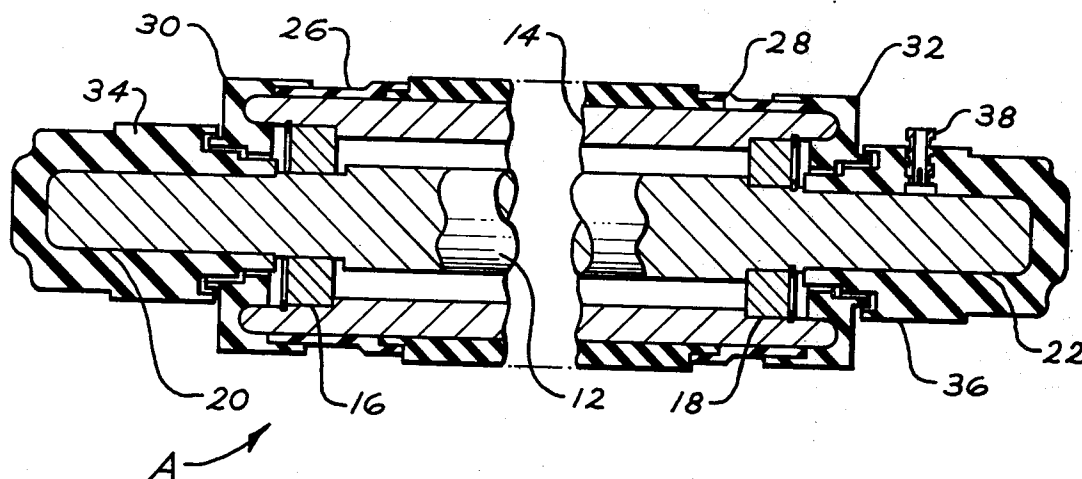
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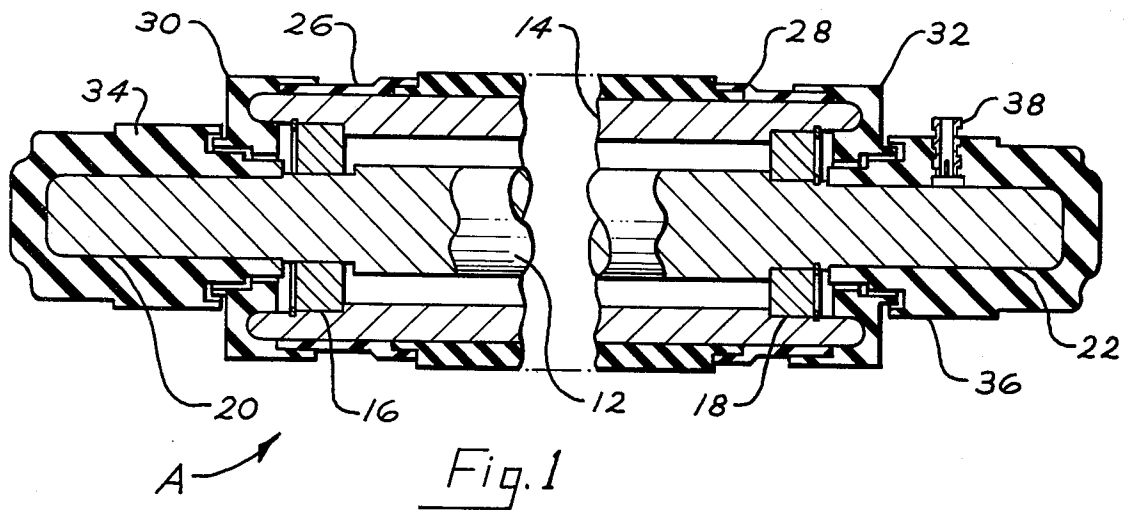
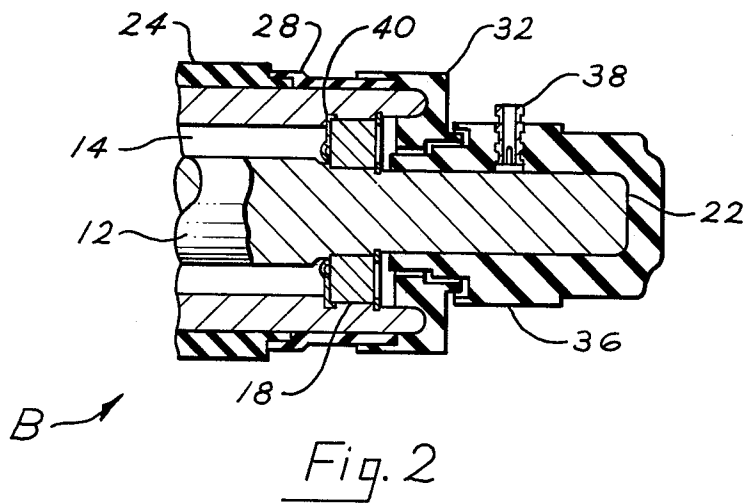
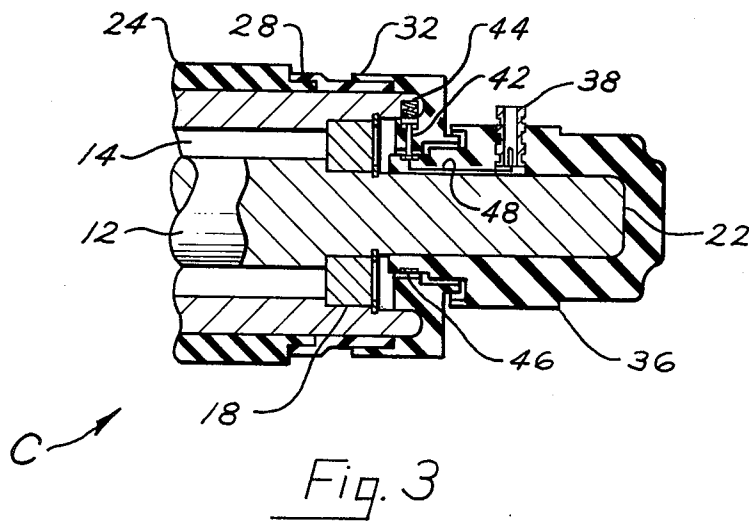
Primary Examiner—J. Reed Fisher

[57] ABSTRACT

An inking roller for use in a rotary printing press has a metal sleeve adapted to rotate on a stationary shaft. An outer covering on the metallic sleeve is a resilient rubber-like composition which contacts an adjacent rotatably-driven cylinder to provide driving force which causes rotation of the sleeve about the shaft. Ends of the sleeve projecting beyond the covering and the shaft ends are shrouded by interfitting insulating elements whereby a high electrical potential may be applied internally through the assembly from conducting lead projecting from one shaft end. An electrical contacting means is disposed between the stationary shaft and the rotatable sleeve whereby the sleeve is electrically charged to set up an electric field between the roller assembly and the adjacent driving cylinder to act upon ink mist particles released from the ink film on the adjacent cylinder and cause such particles to be attracted back to the film.

4 Claims, 3 Drawing Figures





INK MIST SUPPRESSION ROLLER ASSEMBLY FOR A ROTARY PRINTING PRESS

BACKGROUND OF THE INVENTION

The use of a high voltage charge to create an electric field in the vicinity between coacting rotating cylinders in a rotary printing press has proven to be a practical method of controlling the objectionable condition of ink misting. The practice of such an ink mist suppressing arrangement for a printing press is fully disclosed in U.S. Pat. No. 3,672,298 issued June 27, 1972 to Robert B. Reif. This patent teaches the use of a cylinder or roller having a resilient covering thereon for insulating it from its coacting cylinder and being charged with a high voltage for setting up an electrical field between the roller and coacting cylinder whereby ink mist particles are electrically attracted back to the ink film on the cylinder. The roller has a cylindrical body with oppositely disposed stub shafts properly journaled to permit rotation of the entire assembly. It is required that the disclosed roller be mounted with insulating flanges between the bearings and the stub shafts to prevent current conductance to the roller support at each end thereof. A means is provided for applying a high voltage current to the end of one of the stub shafts whereby substantially the entire roller is electrically charged.

The present invention is directed to the provision of a roller assembly adapted to be electrically charged for ink mist suppression and having certain significant structural improvements including improved stability and safety, appreciably extended life, and more dependable and positive electrical contacts in the assembly.

SUMMARY OF THE INVENTION

By the present invention, a roller assembly is provided for a rotary printing press wherein a metallic body portion in the form of a cylindrical sleeve is rotatably mounted about an elongated stationary shaft, and a circuit means is contained within the assembly including a contacting means between the stationary shaft and the sleeve for completing an electrical circuit from the shaft to the sleeve during sleeve rotation. The sleeve has an exterior resilient covering thereabout serving as drive surface for causing the sleeve to rotate from contact with an adjacent coacting cylinder. The covering has current resistivity characteristics such that an electric field is induced circumjacent the roller by application of a high voltage potential to the aforementioned circuit means. The ends of the rotatable sleeve and the shaft ends are provided with an insulating shroud means including substantially thick interfitting insulating elements, and a conductor lead or connection means projects from one shaft end outwardly through the insulating shroud means for connection to an external high voltage electrical source.

In one embodiment of the present invention, a circular contact ring is employed adjacent the bearing assembly between one end of the rotatable sleeve and the stationary shaft for assuring high voltage transmission between the shaft and the sleeve. Alternatively, the means of transmitting the electrical potential from the stationary shaft to the rotating sleeve may be the bearing assembly itself or a brush assembly carried outboard from the bearing assembly on the sleeve to form a sliding contact as hereafter described in further detail.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view taken in vertical section of one form of the roller assembly in accordance with the present invention;

FIG. 2 is a fragmentary view in vertical section showing the end of a roller assembly in accordance with the present invention, specifically illustrating an alternative form of the present invention;

FIG. 3 is a fragmentary view in vertical section of a roller assembly, illustrating a third form of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIG. 1 there is shown an ink roller assembly A adapted to have a high voltage potential directed therethrough for inducing an electric field in the vicinity of the nip or contact point between the roller assembly A and an adjacent rotating cylinder (not shown) for the purpose of suppressing ink mist by causing escaping ink particles to be attracted back to the ink film on the roller and cylinder surfaces. The assembly A includes an elongated metallic shaft 12 with a cylindrical metallic sleeve 14 coaxially mounted for rotation on the shaft 12 by means of spaced apart bearing assemblies 16 and 18. The shaft 12 has oppositely disposed shaft ends 20 and 22 projecting outwardly to facilitate mounting of the assembly A in a rotary printing press by adjustable mounting means (not shown). The rotatable sleeve 14 has a resilient outer covering 24 wrapped thereabout. The covering 24 serves to contact the surface of the adjacent coacting cylinder whereby the sleeve 14 is driven in rotation on the shaft 12. The covering 24 is of a composition having the proper current resistivity characteristics whereby it will permit conductance therethrough of significantly small current induced by the high voltage potential directed through the assembly A to create the desired electric field in the area outwardly circumjacent the cover 24.

A dielectric shroud means substantially encapsulates the entire roller assembly except for the resilient covering 24 and includes annular insulator elements 26 and 28 disposed at each edge of the cover 24 and interfitted with the cover edges in an overlapping contiguous relationship. The dielectric shroud means also includes annular collar-like insulator elements 30 and 32 which are press-fitted to opposite ends of the sleeve 14 and have apron-like extending portions overlaying the elements 26 and 28, respectively. Stationary shaft end-cap insulator elements 34 and 36 are also part of the dielectric shroud means. The elements 34 and 36 have inner surfaces structured to parallel the inward configuration of the adjacent insulator elements 30 and 32 while establishing a small gap therebetween which permits the elements 30 and 32 to rotate with the sleeve 14 without contacting the surface of the stationary elements 34 and 36.

A high voltage circuit means is provided through the assembly A shown in FIG. 1. The shaft 12 acts as a conductor in the circuit and is provided with an outwardly projecting connection means 38 serving as a terminal for a connection to a remote high voltage source. The bearing assemblies 16 and 18 serve as means for completing the circuit from the shaft 12 to the sleeve 14.

Continuity of the high voltage circuit through the roller assembly may be better assured by modification of

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the structure shown with reference to roller assembly A in FIG. 1 to that illustrated as roller assembly B shown in FIG. 2. Roller assembly B includes an annular somewhat flexible copper contacting ring 40 disposed in tightly fitted relationship to the bearing assembly 18 and the adjacent annular inside bearing-engaging surface of the sleeve 14. The ring 40, mounted as shown in FIG. 2, serves to assure a constant conductive pathway between the housing of the bearing assembly 18 and the sleeve 14. The inside surface of the bearing assembly 18 is press-fit tightly in its mounted position on the shaft 12 to thereby further assure a constant conductive pathway for the high voltage potential applied through the assembly B.

Alternatively, in the event the bearing assembly supporting the sleeve 14 on the shaft 12 does not afford sufficient firm contact to assure a constantly maintained circuit between the shaft 12 and sleeve 14, the contacting means between the sleeve and shaft may be a riding brush assembly including a radially inwardly extended brush arm 42 carried at the end of the sleeve 14 and having a spring 44 biasing it in the direction of the shaft axis toward a conductive annular contacting track 46 imbedded in the inward end of the shaft end cap insulator element 36, as shown in FIG. 3. Then, a connecting means such as lead 48 may also be imbedded within the insulator element 36 to establish the circuit between the terminal 38 and the conductive track 46 against which the brush 42 maintains contact as the sleeve 14 is rotated.

It is important to note with regard to the disclosed roller assemblies A, B, and C, that the exterior configuration remains unchanged regardless of the circuitry means utilized within. With respect to the shroud means encapsulating substantially all of the roller assembly, it is believed of particular importance that the shaft end-cap insulator elements (such as 36) be in an interfitting relationship with the adjacent annular collar-like insulator element (such as 32) in a stepped-surface configuration, with at least a projecting annular portion of one of the elements extending inwardly into a recessed annular area in the adjacent element whereby the gap between the elements does not provide a direct or straight pathway from outside the assembly and inwardly toward the shaft 12.

We claim:

1. An improved ink roller assembly for a rotary printing press ink mist suppression system comprising;

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a stationary, elongated shaft,

a cylindrical, electrically conductive sleeve disposed coaxially about an intermediate portion of said shaft,

bearing means supporting said sleeve for independent rotation about the axis of said shaft,

a resilient covering wrapped about the outer surface of the sleeve and having electrical resistivity characteristics such that a high voltage potential applied to the sleeve will create an electric field outwardly circumjacent the covering,

circuit means for applying a high voltage potential through the roller assembly to the sleeve including current conductor connection means projecting outwardly from an end of the shaft at a point outwardly beyond the sleeve, and contacting means for maintaining a circuit from the connection means to the sleeve when said sleeve is rotating, and dielectric shroud means substantially encapsulating the entire roller assembly, except for the resilient covering, including shaft end-cap insulator elements which remain stationary with said shaft, and annular collar-like insulator elements disposed about the opposite ends of the sleeve and rotatable therewith,

said end-cap insulator elements having stepped, annular, external surfaces formed at one end thereof to interfit with corresponding stepped annular, interval surfaces on said collar-like insulator elements, and said collar-like insulator elements having at least one axially projecting annular flange portion adapted to interfit with an annular recess provided in the end-cap insulator element adjacent thereto.

2. The combination of claim 1 wherein the bearing means comprises at least two spaced apart bearing assemblies, and one of the bearing assemblies serves as the conductor means.

3. The combination of claim 1 wherein the bearing means comprises at least two spaced apart bearing assemblies, and the conductor means is an annular contacting ring mounted in contiguous adjacency to one of the bearing assemblies.

4. The combination of claim 1 wherein the contacting means comprises an annular track having a brush element biased thereagainst.

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