May 10, 1960 E. H. BRONSTEIN 2,935,940

FLUID DISTRIBUTING SYSTEM FOR PRINTING MACHINES

Filed Feb. 27, 1958 2 Sheets-Sheet 1

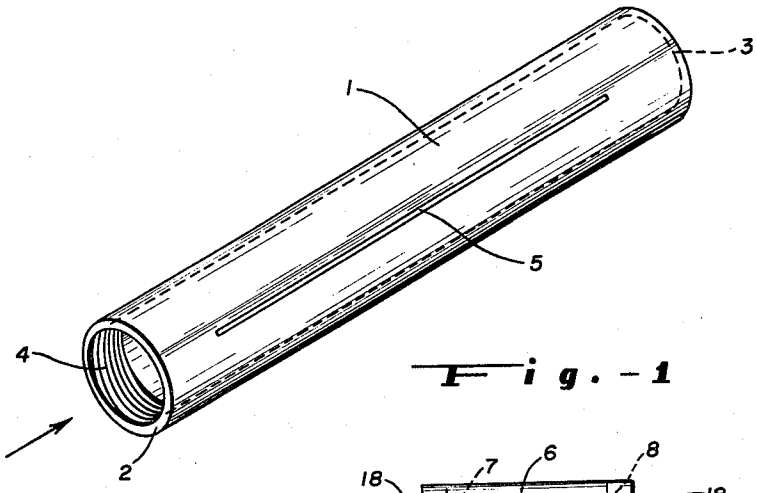


Fig. - 1

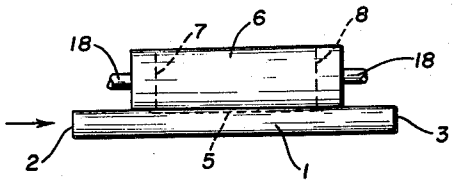


Fig. - 2

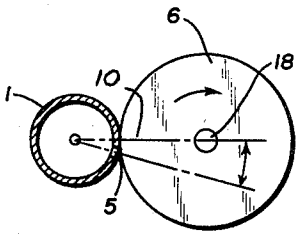


Fig. - 3

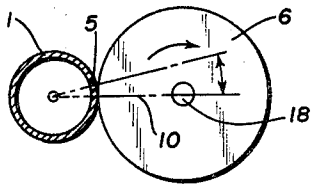


Fig. - 4

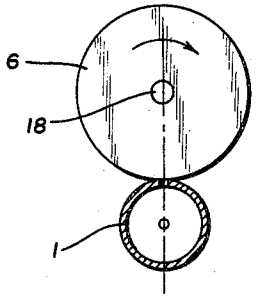


Fig. - 5

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FLUID DISTRIBUTING SYSTEM FOR PRINTING MACHINES

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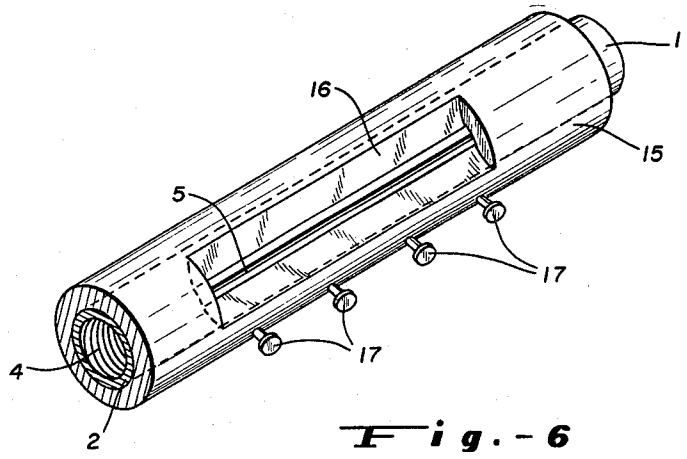


Fig. - 6

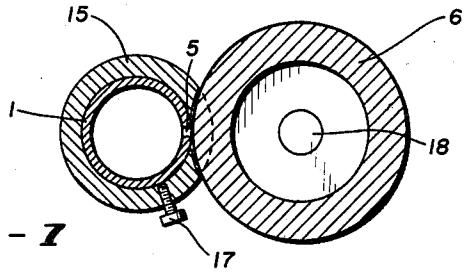


Fig. - 7

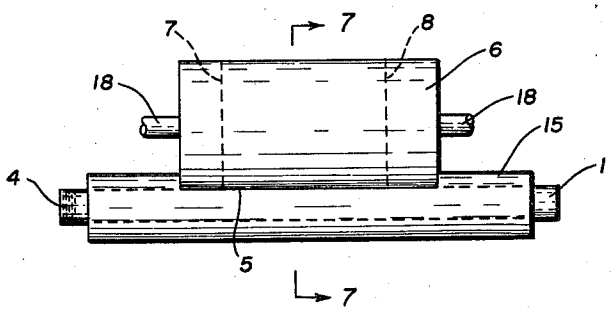


Fig. - 8

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FLUID DISTRIBUTING SYSTEM FOR PRINTING MACHINES

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Application February 27, 1959, Serial No. 796,171

5 Claims. (Cl. 101—335)

This invention relates to fluid distribution systems, and more particularly to means for uniformly distributing fluid onto a roller for correctly distributing ink or other fluids onto the reproducing mechanism of a printing machine.

The present invention includes, in general, an elongated tube which is connected to a source of fluid for printing machines. The tube is mounted in close proximity to a roller of a printing machine. The roller may be a transfer roller, inking or moistening roller or the actual printing roller, as the case may be. The tube is provided with an elongated, very narrow slit extending parallel to the axis of the tube, the slit, however, being only long enough to extend across the actual printing area of the reproducing mechanism of the machine. The slit of the tube may be arranged to lie directly on or to one side or the other of a plane passing through the parallel axes of the tube and the roller, thereby permitting various areas of the wall of the tube to be used as a rubbing agent against the roller as required by the viscosity or the density of the fluid used. Normally, the inking tube will be horizontally aligned with the axis of rotation of the roller and the slit will be positioned above or below the plane passing through the axes of the two members. A protective sheath of relatively thick material may be provided around a relatively thin-walled inking tube, to protect the tube and to keep the slit at substantially correct width. The sheath has a cut out facet exposing the slit, and the facet is preferably milled to generally conform to the curvature of the roller. Set screws bearing against the tube through the sheath may be provided so as to adjust the width of the slit along its length and thereby aid in controlling the flow of fluid. The inking tube provides a standardized mechanism for distributing fluids onto the inking or moistening rollers of printing machines. The single inking tube replaces the train of distributing rollers normally found in various types of printing machines. In a platen press, for example, rollers passing across a heavy, smooth surface distribute the ink on the rollers so that the ink may be evenly distributed across the type of the press. In other types of printing or lithographic machines, a train of several rollers, including oscillating rollers, is provided for spreading the ink uniformly onto the type or printing surface. Various types of silk screen printers, also, use a train of rollers for spreading the ink or printing fluid uniformly along the printing surface. With various types of ink, for example aniline ink which is very thin and dries very rapidly, a press using the train of rollers must be a very high speed press to compensate for the characteristics of the ink. Different types of ink may not be used on all types of presses, since a distribution system designed for one ink will not handle all the various types of inks. This, of course, requires a different press for each of the different types of inks. The tube of the present invention is adapted to replace the fluid distributing systems of the printing presses of the prior art so

that a single standard inking tube permits the use of various types of inks on different types of presses.

The single tube of the present invention provides an effective and easy device for starting and stopping a printing machine. In the prior art, in stopping the printing machines all the rollers in the train had to be individually cleaned. A substantial amount of time was therefore utilized in the stopping of the machine. Also, considerable time was required to distribute the fluid on the roller train in starting the machines. With the tube of the invention, the inking tube may be turned up after the printing is terminated, and a piece of plastic or airtight material is placed over the slit so that the ink will not dry. The few remaining rollers may be readily cleaned, and in many of the cases a single roller is all that is required to be cleaned. For starting up the machine, the plastic may be removed from the slit of the tube, the tube turned into position and the machine started.

Included among the objects and advantages of the present invention is a simplified system for uniformly distributing fluid onto a roller of a printing machine. The invention includes an elongated tube having a narrow, single slit extending along the length of the printing area of the printing machine. A roller is juxtaposed in close proximity to the tube forming a line of contact therebetween for breaking up the ink or fluid deposited on the roller. The term "breaking up" is a term used in the printing art to mean the spreading and evenly distributing ink or a uniform thickness on the inking rollers. The tube is arranged so that the slit may be positioned for optimum spreading of fluid onto the roller. A protective sheath is provided for the tube so that a thin-walled tube may be protected and a slit maintained in proper alignment along the roller, and means are provided for adjusting the width of the slit along its length for controlling the distribution of fluid across the roller. The tube is arranged for distributing fluids such as ink and the like along a transfer roller, printing roller or other rollers of a printing machine.

These and other objects and advantages of the present invention may readily be ascertained by referring to the following description and appended illustrations in which:

Fig. 1 is a perspective view of an inking tube according to the invention;

Fig. 2 is a top plan view of an inking tube juxtaposed to a roller of a printing machine;

Fig. 3 is a cross sectional view of an inking tube in relation to a roller, illustrating one position of the inking slit;

Fig. 4 is a cross sectional view of an inking tube in relation to a roller tube showing another position of the inking slit;

Fig. 5 is a cross sectional view of an inking tube in vertical alignment with a roller;

Fig. 6 is a perspective view of a tube with a surrounding protective sheath mounted thereon;

Fig. 7 is a cross sectional view of the inking tube mounted with its protective sheath on a roller; and

Fig. 8 is a top plan view of an inking tube and its sheath juxtaposed in position to a roller.

In the device illustrated in Fig. 1, an elongated tube having a relatively thin wall includes an open end 2 and a closed end 3. The open end 2 is internally threaded at 4 so it may be connected to a source of fluid under pressure, not shown, and an elongated, narrow slit 5 extends along the tube. The slit 5 is milled to correct dimensions, and the width of the slit is normally controlled by the viscosity of the ink to be used in the tube. The slit may be ten thousandths of an inch or more wide, depending on the length of the slit and the fluid passing through it. The length of the slit and the length of the

tube 1 is determined by a juxtaposed roller and the actual printing area of the machine. A roller 6 mounted for rotation on an axis 18 may be a transfer roller, inking roller, moistening roller, or a printing roller, and, in general, the printing width, illustrated as the width between dotted lines 7 and 8 on roller 6, is always less than the length of the roller 6. The slit 5 is of a length to correspond to the actual printing width.

The tube 1 has been illustrated with a single open end 2; it will be obvious, however, that with very long inking tubes, for example in lengths of six feet or more, it may be desirable to introduce fluid into both ends of the tube so that the distribution of fluid through the slit will be substantially uniform along its length. The fluid is introduced into the tube under sufficient pressure to provide substantially uniform discharge of the fluid through the slit. With very light fluids, a gravitational flow of small head may be sufficient for the even distribution of fluids; however, with some very viscous fluids, a high pressure pump may be utilized. In certain instances with a high viscosity fluid, pumping the fluid into both ends of the tube aids in controlling the distribution of the fluid uniformly onto a roller.

In the majority of printing machines, a train of spreading rollers transfers ink or other printing fluid from a source of supply in a uniform coating onto the type, lithograph plate, silk screen, or other printing media. In a very few instances, however, the fluid is transferred directly onto the printing surface. It is substantially immaterial, however, whether the roller 6 is merely a transfer roller, or a printing roller carrying fluid to the type, plate, or silk screen directly, since the function of the inking tube is substantially the same as used herein. The roller 6, as used herein, may include any type of roller in which fluid for a printing machine is spread.

In most operations, the inking tube 1 will be used horizontally aligned with the axis of rotation of the roller 6 substantially as illustrated in Figs. 3 and 4, and the position of the slit will be determined by the character of the fluid being deposited on the roller. The spacing between the roller and the tube is such that there is a very minor clearance which aids in metering the amount of fluid released onto the roller as well as scraping off the excess. In the device of Fig. 4, the slit 5 is positioned above the horizontal line 10 between the two members, in position for introducing low viscosity fluids onto the roller. With the slit positioned above the plane, surface tension holds the fluid from pouring over the lip of the slit until it is wiped off by the roller. In some cases the fluid may be permitted to overflow into the alley between the roller and the tube, particularly if the roller is covered with a cloth or other absorbent material. With the slit positioned below the plane 10, illustrated in Fig. 3, sticky or viscous fluid being fed through the slit will ooze out onto the roller and the excess fluid will be wiped off the roller and spread as the roller passes the line of contact between the two members.

The position of the rollers, illustrated in Fig. 5, having a vertical arrangement of the tube in relation to the roller 6, permits the slit 6 to be positioned on either side of the vertical plane between the axes of the members so that the clockwise rotation of the roller aids in the correct distribution of the fluid thereon. The excess material which may be distributed onto the roller is wiped off by the contact of the tube with the roller, where the slit is to the right side of the vertical plane.

As the inking tube 1 is usually made of relatively thin material, such as brass tubing, spring steel tubing, etc., a heavy walled sheath may be provided for supporting the inking tube and to hold the slit in approximately the correct width. A heavy walled sheath 15, tightly fits around the tube 1 illustrated in Fig. 6, and the sheath has a milled out portion or facet 16 which is of substantially the same length as the roller on which it is used. The facet is cut through the wall of the sheath so that it exposes the slit 5 in the tube 1 held therein. A series of set screws 17, which extend through the wall of the sheath in contact with tube 1, are provided along the lower portion of the sheath. The screws are arranged to bear on the tube for adjusting the width of the slit therein.

Fig. 7 illustrates the device with its protective sheath in operation with roller 6. The tube 1 enclosed within its sheath 15 is placed adjacent the roller 6 with its axis on the horizontal plane passing through the axis 18 of the roller 6. The sheath with its milled out facet 16 fits around the peripheral curvature of the roller 6, but normally is spaced a slight distance therefrom so that there is substantially no rubbing between the sheath and the roller. The sheath, however, may be utilized as an extra rubbing surface, should one be desired, in which case the sheath may be turned slightly so that one of its faces will rub the surface of the roller 6. The slit 5 of the tube is placed in position above or below the horizontal plane passing through the axis of the roller, in a manner similar to that described in Figs. 3 and 4. The distribution of the fluid from the tube onto the roller is, likewise, similar to that described in Figs. 3 and 4.

The set screw 17 may be adjusted so that the width of the slit may be varied. In very severe inking projects, one side of the roller 6 may require a minimum of ink for light or no printing and the other side may require a heavy inking for very dark printing. The set screws along the sheath on the end which requires very little or no inking may be turned to substantially close the slit 5, and the screws on the other end may be varied in accordance with the inking requirements. Since the inking tube 1 is normally a relatively thin-walled metal, the milled slit 5 will not maintain its desired width along its length due to the thinness of the metal and the length of the slit in relation to the supporting structure. The sheath 15, which is a closely fitting covering for the tube, tends to hold the slit in proper width but the set screws 17 may be utilized as an additional aid to control the width and to keep it in proper proportions.

In a very simple machine, where the roller 6 is the printing roller, the cleaning of the machine is simply performed by turning the tube so that the slit is in uppermost position so that the fluid will not flow out, and a protective plastic or other cover may be placed over the tube to prevent the drying of the fluid on the slit. The roller may then be removed and cleaned. Where the ink is to be changed, the tube is simply and easily removed and cleaned.

While the invention has been described in relation to specific embodiments, there is no intent to limit the device to the precise details so illustrated, except insofar as set forth in the following claims.

I claim:

1. A fluid distributing system for a printing machine comprising in combination with a roller, an elongated, cylindrical tube having at least one open end for connection to a source of fluid, said tube being sufficiently long to extend beyond both ends of said roller, said tube being juxtaposed in close proximity to said roller substantially forming a line of contact therewith, and an axially extending, narrow, continuous slit of uniform width in said tube of a length less than the roller and substantially centered thereon and positioned during operation adjacent to and on one side of a plane passing through the axes of said tube and said roller, said line of contact being substantially along said plane whereby fluid exudes from said slit and is uniformly deposited on said roller and uniformly broken up by the contact between the two members.

2. A fluid distributing system for a printing machine comprising in combination with a roller, an elongated, cylindrical tube having one open end for connection to a source of fluid and one closed end, said tube being sufficiently long to extend beyond both ends of said roller, said tube being juxtaposed in close proximity to said roll-

er substantially forming a line of contact therewith, and an axially extending, narrow, continuous slit of uniform width in said tube of a length less than the roller and substantially centered thereon and positioned during operation adjacent to and on one side of a plane passing through the axes of said tube and said roller, said line of contact being substantially along said plane whereby fluid exudes from said slit and is uniformly deposited on said roller and uniformly broken up by the contact between the two members.

3. A fluid distributing system for a printing machine comprising in combination with a roller, an elongated, cylindrical tube having one open end for connection to a source of fluid under pressure and one closed end, said tube being sufficiently long to extend beyond both ends of said roller, said tube being juxtaposed in close proximity to said roller substantially forming a line of contact therewith, and an axially extending, narrow, continuous slit of uniform width in said tube of a length less than the roller and substantially centered thereon and positioned during operation adjacent to and on one side of a horizontal plane passing through the axes of said tube and of said roller whereby one side of said slit is in close proximity to said roller, said line of contact being substantially along said plane whereby fluid exudes from said slit and is uniformly deposited on said roller and uniformly broken up by the contact between the two members.

4. A fluid distributing system for a printing machine comprisng in combination a roller, an elongated thin-walled tube having at least one open end for connection to a source of fluid, said tube being sufficiently long to extend beyond both ends of said roller, said tube being juxtaposed in close proximity to said roller and substantially forming a line of contact therebetween on a plane passing through the axes of said tube and said roller, an elongated axially extending narrow, continuous slit of

uniform width in said tube arranged to be positioned adjacent to and on one side of the line of contact between said tube and said roller, a close fitting sheath telescoped over said tube said sheath being longer than said roller and arranged to extend beyond the ends thereof, a cut-out facet portion in said sheath mounted so as to expose said slit, the ends of said sheath extending over the ends of said roller whereby substantially enclosing said facet adjacent the periphery and ends of said roller, and a plurality of set screws in said sheath arranged to bear against said tube for varying the width of said opening.

5. A fluid distributing system for a printing machine comprising in combination a roller, an elongated thin-walled tube having one open end for connection to a source of fluid under pressure, and one closed end, said tube being sufficiently long to extend beyond both ends of said roller, said tube being juxtaposed in close proximity to said roller and substantially forming a line of contact therebetween on a plane passing through the axis of rotation of said roller, an elongated axially extending narrow slit of uniform width in said tube arranged to be positioned adjacent to and on one side of the line of contact between said tube and said roller, and a close fitting sheath telescoped over said tube, said sheath being longer than the roller and arranged to extend beyond the ends thereof, a cut-out facet portion in said sheath generally conforming to the curvature of said roller and mounted so as to expose said slit, the ends of said sheath extending over the ends of said transfer roller whereby substantially enclosing said facet adjacent the periphery and ends of said roller, and a plurality of set screws in said sheath arranged to bear against said tube for varying the width of said opening.

No references cited.