

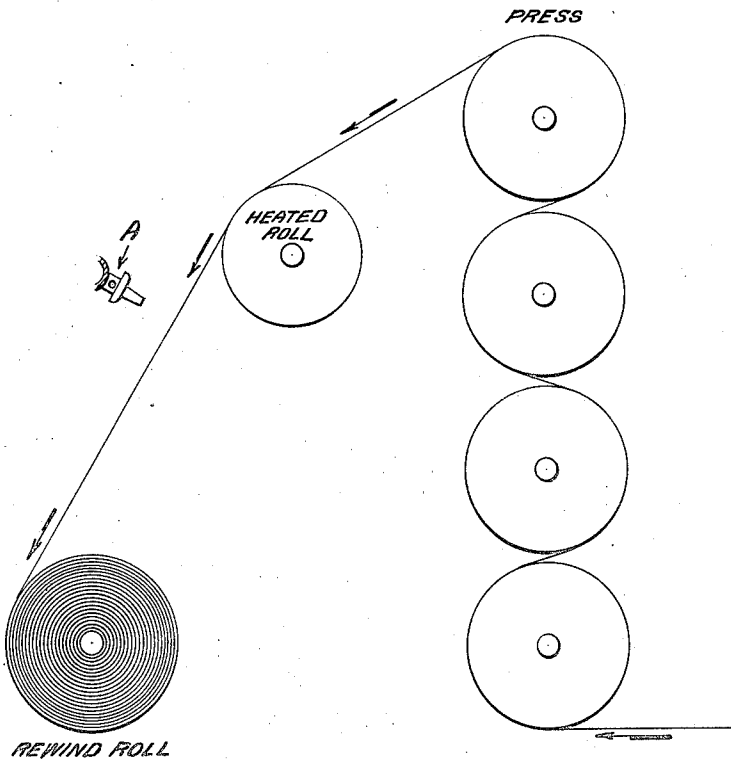
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APPARATUS FOR SETTING PRINTING INK

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APPARATUS FOR SETTING PRINTING INK

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3 Claims. (Cl. 34—48)

This invention relates to apparatus for setting printing ink and is adapted to be used in carrying out a method of printing and of setting ink on printed material, which is described and claimed in my application, Serial No. 56,303, filed December 27, 1935, of which this application is a division.

My method contemplates the use of an ink containing a solvent whose vapors are inflammable and includes the step of igniting and completely or partially burning the vapor of the solvent in the ink after the ink has been printed on paper or other material. The method has the advantage of causing a more rapid setting of ink than has heretofore been obtainable, and also of chemically destroying the solvent in the ink so that it cannot resoften the ink after it has been set. Furthermore, I have discovered that ignition and burning of the ink vapor may be carried out without scorching or burning combustible material such as paper to which the ink has been applied.

In the accompanying drawing, I have shown diagrammatically an apparatus which may be used for carrying out my method. To more fully explain the nature of my invention, I will describe a specific method embodying it which may be carried out by means of the apparatus indicated in the drawing.

The drawing shows diagrammatically a typographic printing press of any ordinary construction in which one or more printing inks are applied to a traveling web of paper, the usual rewind roll on which the printed web is wound after printing, and a steam-heated roll over which the web passes between the press and the rewind roll. The ink is applied by the press to the side of the web which is uppermost as the web leaves the press, so that the back or unprinted side of the web is in contact with the heated roll. Adjacent to the web between the heat roll and the rewind roll is a row of Bunsen burners extending across the web and directing gas flames against the printed side of the web. One of the Bunsen burners is shown at A in the drawing.

The ink used in my method, when applied to typographic printing, has a vehicle consisting wholly or in part to a colloid which serves as a thickener and binder dissolved in a solvent which is practically non-volatile at ordinary press room temperatures (20° to 25° C.), and which is rapidly converted into an inflammable vapor at the temperature of steam or slightly superheated steam (100° to 150° C.). Known inks of this character

include those whose vehicles consist of low-viscosity nitrocellulose dissolved in diethylene glycol monobutyl ether (butyl carbitol).

In carrying out my method with such an ink and with apparatus such as that indicated in the drawing, the ink solvent remains liquid in the press which is operated at ordinary room temperature (20° to 25° C.), so that substantially no drying of the ink occurs on the rollers or plates of the press. As the web passes over the heated roll, it is raised to a temperature at which the solvent vaporizes rapidly. Solvent vapor, therefore, rises from the web at and beyond the heat roll and the air overlying the web becomes mixed with the vapor. The vapor is ignited by the gas flames from the burners A, and being mixed with air the vapor burns very rapidly or "flashes." The vapor flashes so rapidly that the flame of the burning vapor extends only a short distance along the web. Any flame which may extend as far as the rewind roll is snuffed out as the web is wound up on this roll.

An important and unexpected feature of this process is that the web of paper is not burned or scorched although the temperature of the burning vapor is obviously high enough to scorch and burn paper. Without binding myself to any theory, I attribute this important result to the great rapidity with which the vapor when mixed with air burns or flashes.

While inks such as those to which I have referred may be set by volatilization of the solvent only, I have found that my ignition method results in a much more rapid setting than has been heretofore obtainable. Thus, in the apparatus illustrated, the ink is perfectly set when the web travels at a high speed, such as 400 feet per minute. Furthermore, in my process the danger of resoftening the ink by condensation of the solvent vapor upon the printed matter is eliminated by the chemical destruction of the solvent involved in the combustion of the solvent vapor.

Complete combustion of all the solvent vapor from the ink is probably not obtained in my method; and I have ascertained that the success of the method is not dependent upon actually burning all the vapor, but requires only that the vapor be ignited and that at least a part of it be flashed or burned.

My invention is not limited to use of the particular sort of ink, nor to the particular type of printing (typographic), which has been described in the specific method, but may be practiced advantageously in the use of any ink containing a volatilizable liquid whose vapor is inflammable,

whether said ink be applied to a web or other sort of sheet.

What I claim is:

1. The combination with means for applying
5 printing ink to material, of apparatus for setting the ink after printing, comprising means, spaced from the means for applying ink to the material, for heating the printed material to a
10 temperature which is sufficient to cause rapid vaporization of a liquid contained in the ink and insufficient to scorch the material to which the ink has been applied, and separate means located adjacent to the printed side of the printed material for igniting the vapor of said liquid emerging
15 from the ink.

2. The combination with means for applying printing ink to a traveling web, of apparatus for

setting ink which has been applied to the web, comprising heating means spaced from the means for applying the ink to the web and engaging the back or unprinted surface of the web at one point in its travel, and ignition means adjacent 5 to the front or printed surface of the web at a further point in its travel.

3. The combination with means for applying printing ink to a traveling web, of apparatus for setting ink which has been applied to the web, 10 comprising a heated roller spaced from the means for applying ink to the web and in contact with the unprinted side of the web, and a gas burner positioned to direct a flame against the printed side of the web at a further point in its travel. 15

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