

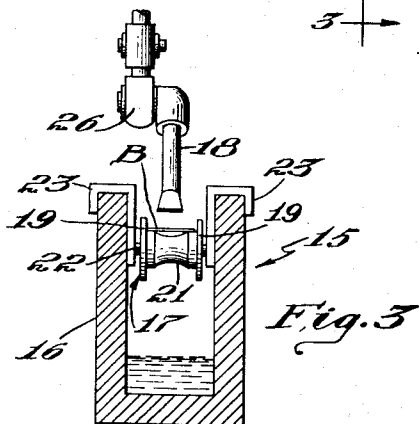
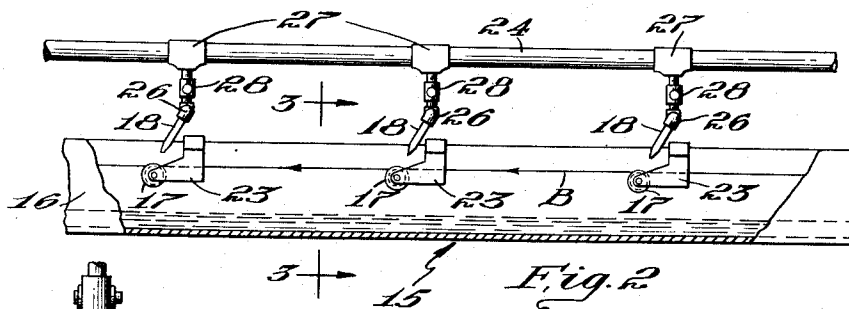
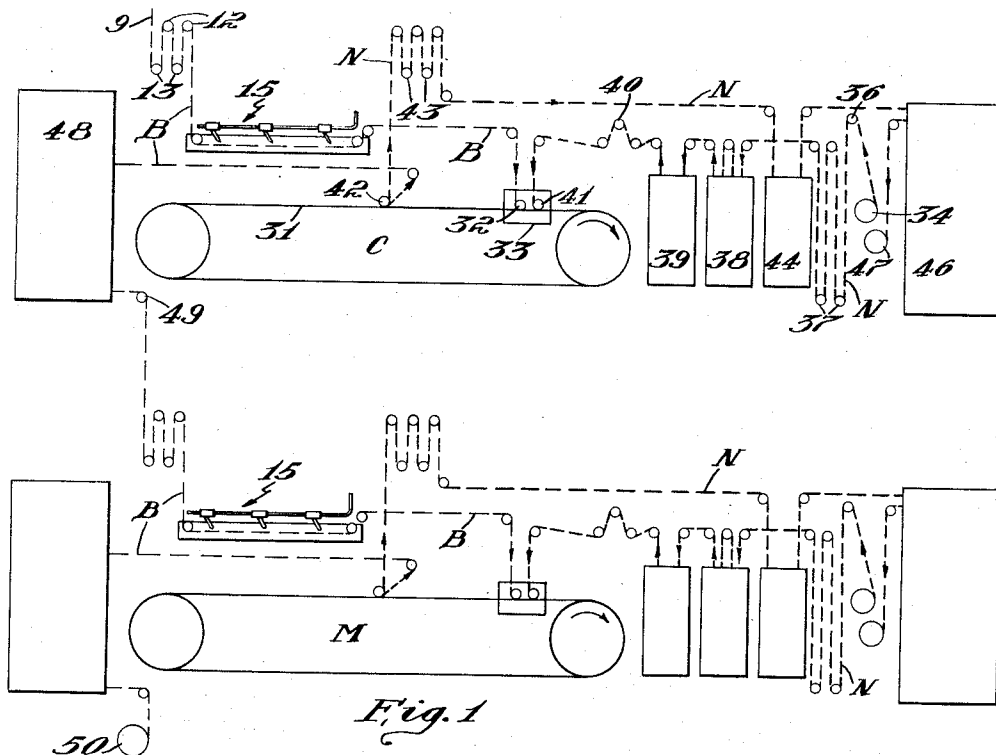
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METHOD OF PREWETTING IN IMBIBITION PRINTING

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METHOD OF PREWETTING IN IMBIBITION
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2 Claims. (Cl. 101—149.1)

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In the art of color cinematography it is customary to obtain three color aspect records or separation negatives upon which are separately recorded the red, blue and green aspects of the image. From each of these negatives is printed a matrix having a gelatin relief image dyed with a water soluble dye having a color complementary to the color of the negative from which the matrix is made. The respective matrices are then successively brought into superimposed intimate contact with hydrophylic colloid surface of a blank having a cellulosic base, each matrix traveling with the blank in intimate interlock contact to maintain registration therebetween as the printing takes place. Before being brought into contact with the respective matrices, it is necessary for the blank to be wetted so that dye from the matrix can be imbibed by the blank.

In the conventional process as carried on heretofore this prewetting of the blank is accomplished by passing the blank around a series of rollers submerged in a tank of water before it is brought into contact with each of the respective matrices. This means of wetting the blank provides satisfactory wetting before any dye, or at least before any dark dye, has been imbibed, but after dye has been imbibed from the first matrix, if succeeding wetting operations are carried out in this manner, the dye will flow resulting in streaks or smears of the colors in the record printed upon the blank.

Objects of this invention are to provide a method and apparatus which prewet a film blank before it is brought into contact with the respective colored matrices, which eliminate streaking and blurring of the dye imbibed previously, which are simple and trouble free, which are rapid in operation, which are adapted for use with present imbibition printing machines, which minimize the danger of damage to the blank, and which generally improve the art to which the invention relates.

In one aspect the invention involves the method which comprises successively pressing dyed matrices against a dye-absorptive blank for successively transferring different dyes to the blank and, after a dye transfer, wetting the blank to make it absorb dye more quickly, characterized in that said wetting is effected by spraying liquid against the face of the blank, thereby to minimize the blurring of the dye image already printed on the blank. Preferably the spray is in the form of a curtain of water directed along the path of the blank as it approaches the ma-

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trix. In the preferred embodiment liquid is sprayed against the face of the blank at each of a plurality of spraying stations located at intervals along the path of the blank as it approaches the matrix.

For the purpose of illustration a typical embodiment of the invention is shown in the accompanying drawing in which

Fig. 1 is a diagram of the portion of imbibition apparatus for printing a blank film from two matrices;

Fig. 2 is an enlarged fragmentary elevation view of the prewetting apparatus; and

Fig. 3 is a sectional view on line 3—3 of Fig. 2.

In Fig. 1 are schematically shown two imbibition printing machines C and M for printing the cyan and magenta aspects respectively of color motion pictures upon a strip of film blank B. The machine for printing the yellow aspect is not shown but may be similar to the machine described in Patent No. 2,448,691 to Taylor. The film blank B, after being printed with the yellow aspect as described in detail in such patent, is trained as at 9 (Fig. 1) over the elevator rolls 12 and 13 of the cyan machine C, the blank B then being directed through prewetting apparatus. As the yellow dye contributes little density or color to the final print it is possible to use either a conventional prewetting tank or apparatus similar to 15 such as is shown in detail in Figs. 2 and 3.

The apparatus 15 comprises a plurality of nozzles 18 which are disposed over a long, deep, narrow tank 16. The blank B is suspended above the level of the surface of the excess prewetting water collected in the bottom of the tank 16 by means of a plurality of rolls 17 arranged beneath the nozzles 18 respectively. The rolls 17 are not provided with pins for engaging the sprocket holes in the film blank B, the blank being maintained upon the rollers by means of two flanges 19 (Fig. 3) attached to the opposite ends of each roll respectively. To prevent scratching or marring of the surface of the film blank B, it is supported only at its edges, the central portion of the roller 17 being cut away as at 21. Each roll 17 is supported upon a pin or axle 22. The ends of each axle 22 are journaled in respective L-brackets 23 which are slidably suspended from the opposite sides of the tank 16 so that the rollers 17 carried thereby may be adjusted with respect to the point of impingement of the spray from the correlated nozzles 18.

The nozzles 18 are supported at spaced intervals of approximately three feet by a header 24

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(Fig. 2) which is also used to connect the nozzles to the water supply. The upper end of each nozzle 18 is provided with an adjustable swing joint 26 which is connected to a T 27 in the header 24 by means of a flow control valve 28. The lower end of each nozzle 18 is formed with a slot arranged transversely of the direction of travel of the blank B so that a thin curtain of water is directed across the width of the blank. The nozzles 18 are arranged in the direction of travel of the blank B, the swing joints 26 being adjusted so that nozzles 18 make an angle of approximately 60 degrees with the plane of the blank.

With the above described arrangement, the prewetting of the film blank B is accomplished entirely by the spray from the nozzles 18 which is preferably directed as a thin curtain of water in the direction of travel of the blank. It will be noted that the film blank B at no time is wetted by the water which collects in the bottom of the tank 16 before being carried away by a suitable drain (not shown), the tank being used only to collect the water discharged from the nozzles 18. As the film blank B is never submerged in the water in the tank, a thin layer of water, similar to that which adheres to the blank when it is passed through the water, is not formed so that the dye has no opportunity to diffuse and then re-enter the film at a point rearwardly removed opposite the direction of travel to cause a smear or streak.

After the wetted blank B leaves the wetting apparatus 15 described above, it is seated upon a pin belt 31 by means of a roller 32 located in a roll tank 33. The matrix N feeds from a supply reel 34 over a driven sprocket 36, thence through an elevator comprising lower floating rollers 37, thence through a dye tank 38, thence through a wash tank 39, thence over a series of rollers including a roller 40 held up by a weight (not shown) to provide a safety loop in the matrix, and thence under a second roller 41 located in the roll tank 33 where the matrix is seated upon the belt 31 in face to face contact with the blank B. From the roll tank 33, the matrix N and the blank B travel together upon the pin belt 31 until they reach the roller 42, during which time the cyan components of the pictures are printed on the blank by imbibition of the dye from the matrix. After leaving the pin belt 31 at the roller 42, the matrix N travels over the floating elevator rollers 43, thence to the matrix rinse tank 44, thence to a dry box 46, and thence to a take-up reel 47.

After leaving the pin belt 31 at rollers 42, the blank B passes to a dry box 48 and thence over roller 49 to the magenta machine M where it is printed with a magenta matrix and thence to a take-up reel 50. With the exception of the take-up reel 50 the magenta machine M is identical with the cyan machine C described in detail above, the prewetting of the blank B before contacting of the magenta matrix being accom-

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plished in this instance by spraying apparatus 15 thus preventing the streaking or smearing of the dark cyan dye previously printed upon the blank.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. In the art of imbibition printing cinematographic film, the method which comprises successively pressing dyed matrices against a dye-absorptive blank for successively transferring different dyes to the blank in a plurality of transfer stages in each of which the blank and one matrix are continuously fed together and thence in contact with each other along a predetermined path, after each dye transfer drying the blank, and before each dye transfer wetting the blank to make it absorb dye more quickly, each said wetting after the first dye transfer being effected entirely by spraying liquid against the face of the blank as it approaches the matrix, whereby the blank may be rendered dye-absorptive without submerging it in a tank.

2. In the art of imbibition printing cinematographic film, the method which comprises successively pressing dyed matrices against a dye-absorptive blank for successively transferring different dyes to the blank in a plurality of transfer stages in each of which the blank and one matrix are continuously fed together and thence in contact with each other along a predetermined path, after each dye transfer drying the blank, and before each dye transfer wetting the blank to make it absorb dye more quickly, each said wetting after the first dye transfer being effected by spraying liquid against the face of the blank at each of a plurality of locations along the path of the blank as it approaches the matrix, whereby the blank may be rendered dye-absorptive without submerging it in a tank.

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