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PAPER MANUFACTURE

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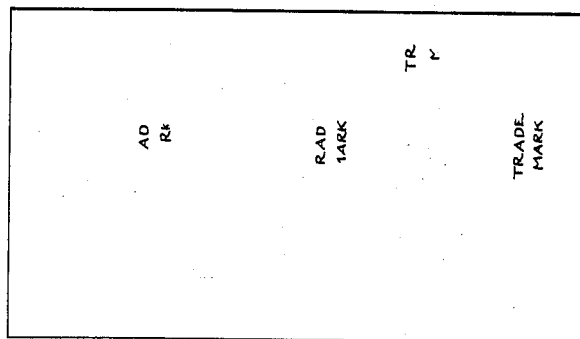
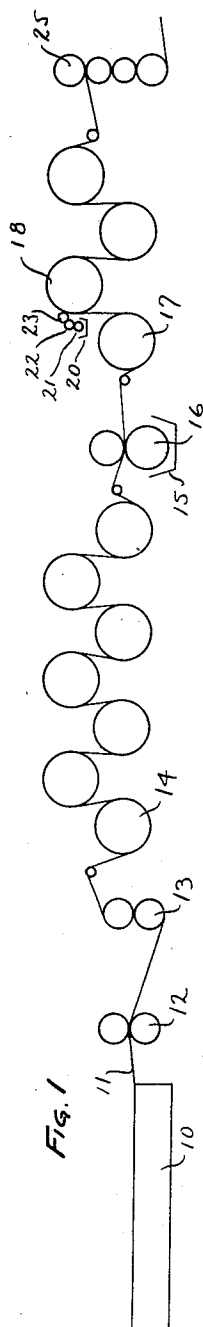


Fig. 3

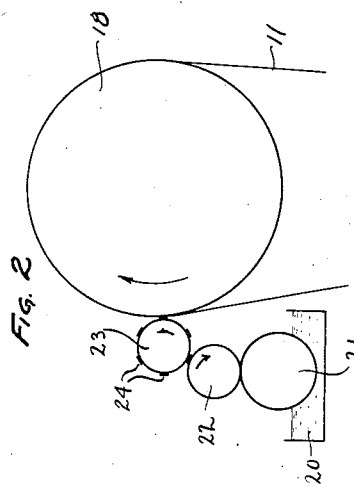


Fig. 2

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PAPER MANUFACTURE

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1 Claim. (Cl. 92—48)

This invention relates to paper manufacture and more particularly to the application of an identifying mark to the paper.

It is the principal object of the invention to provide a simple and inexpensive method of applying to a sheet of paper a mark, such as a trade-mark, trade name, or other insignia indicative of origin, which mark is normally invisible but is capable of being made visible when desired in order to determine the source of manufacture of the paper.

It is a further object to provide as a new product, a sheet of paper which is to all appearances the same as an ordinary sheet of paper but which bears certain normally invisible marks of identification which have the latent capability of being made visible upon the application of an alkali or a bleaching chemical thereto, thereby providing a means of identifying the source of manufacture of the paper.

Other objects and advantages will be apparent from the accompanying drawing, the description and the appended claim.

In the drawing,—

Fig. 1 is a diagrammatic view showing the method of making and marking the paper according to the present invention;

Fig. 2 is an enlarged view of a portion of this apparatus showing the manner of applying the trade-mark or the like to the paper; and

Fig. 3 represents a sheet of paper formed according to the present invention, a portion of which has been treated with an alkali or a bleaching chemical to make visible the normally invisible trade-mark carried by the sheet.

It is customary, particularly in the case of the better grades of paper, for the manufacturer to provide some means of identification for his product. In some cases this identifying device takes the form of a watermark which is impressed upon each sheet of paper so that it becomes immediately possible to detect any substitution of one quality or sheet for another by merely holding the paper up to the light and noting the water-marks on the several sheets.

In many instances however it is not practicable to provide the sheet with a watermark as for instance on account of the surface characteristics, opacity, thickness, or the like. The present invention provides for applying an identifying characteristic to a sheet of paper which embodies none of the above mentioned limitations and so is equally applicable to paper of all types. The mark is applied by means of an invisible printing upon the traveling sheet of paper during the

process of manufacture, the chemical printing solution being so chosen that it remains inert and colorless throughout the normal uses of the paper. It has however the latent capability of being made visible at any subsequent time upon the application thereto of an alkali, such as caustic soda and ammonia water, etc., or a bleaching chemical containing chlorine, such for example as the product known commercially as zonite.

Referring to the drawing which illustrates a preferred embodiment of the invention, a paper forming machine, which may be of any desired characteristics, is indicated diagrammatically at 10. The formed traveling web of paper 11 leaves the machine 10 and is led through a first press 12 and second press 13. After passing through the desired number of press rolls, the web then passes to the rotating drums 14 of the first dryer section, the number of these rolls being selected in a known manner to achieve the desired drying effect.

After leaving the first dryer section, the sheet is preferably sized, the size being applied from a tub 15 by means of a sizing roll 16. The sheet then proceeds to the rolls 17 of a second dryer section where further drying of the sized sheet takes place.

At a convenient point in the process of manufacture, preferably in this second drying section and at the drying cylinder 18 as indicated, the invisible printing is applied. The apparatus for applying this printing comprises a vat 20 adapted to contain a suitable quantity of the colorless liquid which is printed upon the sheet of paper. This material preferably comprises a 2% aqueous solution of manganese chloride, as this has been found to give entirely satisfactory results from the standpoint of invisibility and inertness throughout the normal uses of the paper and is quickly rendered visible upon the application of an alkali or a bleaching chemical thereto.

Dipping within the vat 20 is a pick-up roll 21 which picks up a film of the liquid from its surface and carries it into contact with a transfer roll 22. These two rolls preferably are rubber covered; they may run in contact with each other or slightly spaced, and may rotate in the same or opposite directions. An even distribution of the solution over the surface of the transfer roll is thus produced. The transfer roll runs in contact with a print roll 23 carrying in raised rubber letters 24, the trade-mark or insignia desired to be printed upon the sheet of paper. These rubber letters are adapted to contact the traveling

sheet of paper as it passes around drum 18 and so apply the printing solution to the paper in the desired outline.

After having obtained the printing, the sheet passes around drying roll 18 and around the subsequent drying rolls of the second drying section where it is dried to the desired degree. This drying action serves to dry the sheet of paper as well as the printing which is not damaged by the heat of the drying drums. After leaving the drying rolls the sheet preferably passes to a calender stack 25. This calendering operation conditions the sheet in a desired manner without adversely affecting the disposition of the chemical on the surface thereof.

The sheet formed as described is to all outward appearances the same as an ordinary sheet of paper and may be given any of the desired finishes or colors customarily used upon such paper. The printing however has the latent capability of being made visible whenever desired upon the application thereto of a small amount of bleach liquor or an alkali.

Fig. 3 indicates a sheet of paper a portion of which has been treated with the bleaching chemical or an alkali to bring out the trade-mark insignia while the remainder, which has not been

treated, retains the original appearance of the paper.

The method of applying the printing chemical to the sheet during the process of manufacture constitutes a simple and inexpensive process of manufacture in that it is possible to produce this new product with only a minimum amount of additional equipment required on the part of the manufacturer. Furthermore additional economy results in that the same drying section that is used to dry the sheet of paper also serves to dry the printing on the sheet.

While the process and article herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to this precise process and article, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claim.

What is claimed is:

The method of making a paper product of the character described which comprises forming a traveling web of paper, partially drying the web, printing a mark of origin on the partially dried web with a solution of manganese chloride, and finishing the drying of the web.

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