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METHOD OF MAKING INK RECORDS

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This invention relates to a method for making records on paper, and particularly such paper as is ordinarily used in strips on recording instruments commercially known and used in the recording of volts, amperes, temperatures, pressures, etc.

It will be understood by those versed in the art to which this invention relates that such records have heretofore been made with ink, largely through the medium of commercially known recording instruments. In some cases such records have heretofore been made on smoked paper or by scribing on a waxed surface. It is in some instances, however, highly desirable that the record be made in ink for reasons of legibility, permanence, convenience, and economy, but the ordinary inking system has many undesirable features, and it is the purpose of this invention to eliminate and avoid such undesirable features.

It will be further understood that in using ink for such records, the ink is supplied to the instrument from an ink well of large volume and applied to the moving paper strip by means of a small siphon tube. The arrangement is well known as applied to most standard instruments and need not be herein described. Experience has demonstrated that perfect results with such application requires frequent attendance to the ink applying mechanism in order to clear the clogged pen tubes and to otherwise maintain a perfect functioning. It is seldom that such recording mechanism affords a continuous record of one month without attendance.

The weaknesses of the system heretofore used embody the evaporation in the large ink well which must be left open, and requires normally about ten times the volume of ink which is actually applied to the paper. This evaporation results in the ink continuously becoming thicker until a state of approximate muddy condition is reached. Tests have shown that clogging is liable to occur without definite time limit, but it practically always occurs within one week. In addition, the ink well must always be washed in water before each refilling. Such washing is not always convenient on remote installation. The troubles of the old system are overcome by my improved method.

Another purpose of my invention is to render available for use the old mechanism herein referred to, to derive all the benefits therefrom and to eliminate the difficulties as herein mentioned due to the evaporation, clogging, and otherwise, and to accomplish the various other advantages

and results which will be apparent from the following specification.

I accomplish the objects of my improved method by mechanically applying to the paper upon which the record is to be made, coloring matter, such as aniline dye, in such manner that such coloring matter is hardly visible to the naked eye. This application is conveniently and effectively made assuring a proper quantity for the purposes desired as follows:—

The coloring matter, in pulverized form, is first sifted upon the paper in sufficient quantity as to be clearly visible and to afford full coverage. The paper is then subjected, preferably on its reverse side to a slight tapping motion, or vigorously agitated or subjected to a blast of air, whereupon, is dislodged the excess coloring matter, other than the invisible portions thereof which adhere to the surface of the paper by reason of the force of attraction acting mutually between the paper and the particles of coloring matter tending to draw and hold them together.

The coloring matter may be applied to the surface of the paper in any one of various methods other than the one described and the paper may be passed through a rolling mill to provide greater adhesion, by which method, the coloring matter may be forced into the fibres of the paper and held more firmly thereon. Any of these methods will produce a prepared paper which answers the desired purpose without the addition of any other substance. A dye fixer such as tannic acid may be included in the coloring matter used if the records are desired to be water-proof. I have also demonstrated that if the coloring matter is mixed with an adhesive such as powdered sugar, it further resists the tendency to rub off. A coating of starch or any other white powder over the surface of the prepared paper will cover any slight discoloring of the paper surface if any such discoloring should appear, or starch may be also included in the original coloring matter if desired, all to the same purpose and effect.

Any of the methods referred to will satisfactorily apply the coloring matter, which, under the microscope appears as so many isolated particles upon the surface of the paper. By actual count under the microscope there is approximately one particle, of the diameter of three to five one thousandths of an inch, applied to each square of paper of about one thirty-second inch. This small proportion of the total area covered does not produce visible discoloration.

It will be seen that the results from the above application are to produce a sprinkling of minute

lumps over the entire surface of the paper upon which the ink record is to be produced.

The paper prepared as above is now ready for the second step in the method. Such paper is conveniently rolled in strips of the size and shapes used on the mechanism above referred to and placed in position on the recording instrument with the pen point in contact therewith. The chamber nominally known as the ink well is then filled with a solvent liquid which may be water or any other solvent liquid without solid content. Alcohol or glycerine may optionally be added in sufficient quantity to avoid freezing should occasion require. A syphon type of mechanism carries the solvent liquid from the reservoir into contact with the surface of the paper at the pen point as said paper moves along, and as the paper moves the solvent liquid is transferred to the paper so prepared whereupon it contacts with the particles of coloring matter upon the surface of the paper, and literally manufactures dye or ink from the particles along the line of the pen's movement. The record produced appears exactly as if ink had been used in the ink well instead of the solvent liquid without solid content.

My improved method will be well understood from the detailed description herein, covering one mode of practising the same. It will be realized, however, that the scope of the invention as defined by the claims hereto appended, is not limited to the particular materials or steps which have been chosen for illustrative purposes in this specification.

Having thus described my improved method, I claim as new and desire to secure by Letters Patent of the United States of America:—

1. The method of making a permanent ink record upon a given surface by applying aniline dye with a fixing acid as a coloring matter to a surface upon which the record is to be made, removing the excess portions of such coloring

matter, and applying a solvent liquid without solid content to such portions of said surface at which said record is desired to be placed.

2. The method of making a permanent ink record upon a given surface by applying aniline dye as a coloring matter in powdered form to a surface upon which the record is to be made, removing the excess portions of such coloring matter, and applying a solvent liquid without solid content to such portions of said surface at which said record is desired to be placed.

3. The method of making a permanent ink record upon a given surface by applying aniline dye as a coloring matter to a surface upon which the record is to be made, removing the excess portions of such coloring matter and applying a solvent liquid without solid content to such portions of said surface at which said record is desired to be placed, said solvent liquid causing said coloring matter to be disintegrated and dissolved and later precipitated and deposited upon said surface by the evaporation of said liquid.

4. The method of making a permanent ink record upon a given surface by applying aniline dye in powdered form to a surface upon which the record is to be made, subjecting the surface to vibratory action for removing the excess portions of the powder, and applying a solvent liquid to such portions of said surface at which said record is desired to be placed.

5. The method of making a permanent ink record upon a given surface by applying aniline dye as a coloring matter to one face only of a surface upon which the record is to be made, removing the excess portions of such coloring matter and applying a solvent liquid to such portions of said surface at which said record is desired to be placed, said solvent liquid causing said coloring matter to be disintegrated and dissolved and later precipitated and deposited upon said surface by the evaporation of said liquid.

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