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3,373,090

ADHESIVE ELECTROLYTIC RECORDING PAPER

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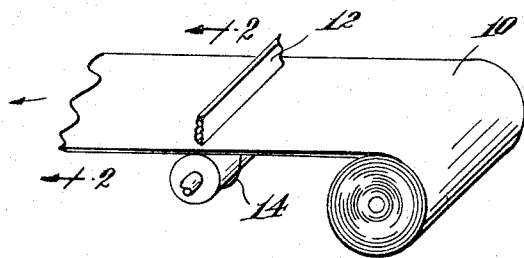


Fig. 1

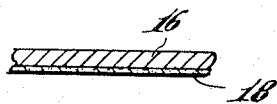


Fig. 2

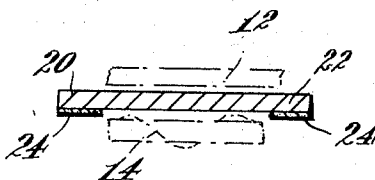


Fig. 3

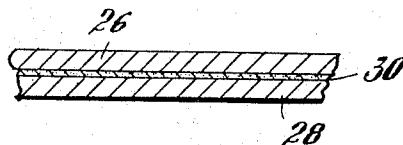


Fig. 4

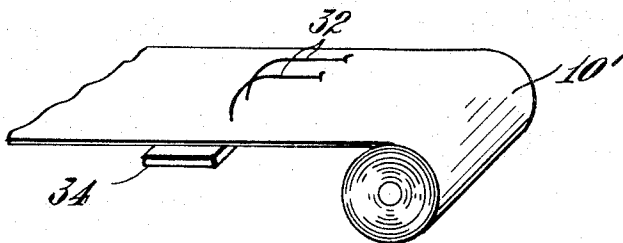


Fig. 5

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ADHESIVE ELECTROLYTIC RECORDING PAPER

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ABSTRACT OF THE DISCLOSURE

A moist recording paper impregnated with a solution of electrolyte and coated on one surface with an adhesive which may be electrically conductive.

This invention relates to electrolytic recording paper and more particularly to recording paper which includes an adhesive rendering it self-attaching to receiving surfaces and which in one of its embodiments provides a darker, more legible record.

Electrolytic recording on high moisture papers passing between cooperating electrodes is well known. One type of such apparatus is shown for example in U.S. Patent 2,789,029, granted Apr. 16, 1957, to Milton Alden. For some applications, for example in transmitting banking information, it is desirable to record on paper which contains an adhesive which will attach the record to a receiving surface. Since electro-sensitive paper is impregnated with a water solution and is recorded moist in contact with the recording electrodes, and since the paper must be electrically conductive, conventional adhesive techniques do not lend themselves to use on such papers.

Objects of the present invention include provision of conductive electrolytic recording paper provided with an adhesive which does not interfere with electrolytic recording and which provides a denser, more legible record.

In accordance with this invention these objects are achieved in electrolytic recording paper for passage between cooperating electrodes in contact therewith, said paper being impregnated with a water solution of an electrolyte and an electrolytic marking compound and having an adhesive coating on one side thereof. In one embodiment the adhesive contains an electrolyte which renders it electrically conductive. In a second embodiment the recording paper has a longitudinal edge portion which extends beyond at least one of the recording electrodes, and which is longitudinally coated on said portion with adhesive.

In a third embodiment of this invention the adhesive recording paper comprises two sheets of paper each impregnated with a water solution of an electrolyte and marking compound and being laminated together with an adhesive, such as polyvinyl alcohol, containing an electrolyte. Such paper can be made by first coating one of said sheets with the adhesive, impregnating both sheets with the electrolyte and lake-forming compound, laminating them together and recording while still moist, separating the sheets, and thereafter adhering the record to a receiving surface.

This invention may be better understood by reference to the accompanying drawing in which:

FIG. 1 is a schematic view showing a roll of recording paper passing between conventional cooperating electrodes;

FIG. 2 is a cross section of the paper taken on line 2-2 of FIG. 1;

FIG. 3 is a cross section of an alternative paper;

FIG. 4 is a cross section of a second alternative paper; and

FIG. 5 is a schematic view of a second type of known recording apparatus.

Referring to FIG. 1, a roll of impregnated recording

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paper 10 is passed between a conventional bar electrode 12 and a rotating helical electrode 14. A modulated current passes between these electrodes and through the moist paper causing visible marks to be formed therein which comprises the record. As the paper moves longitudinally between the electrodes and the helical electrode 14 rotates, a point contact between the electrodes moves successively across the paper.

In one known type of record, the current causes metal ions from the electrode to migrate to the paper and there combine with a marking compound such as catechol to form a colored lake. Such recording paper typically comprises a water solution of strong electrolyte to provide conductivity through the paper and a marking compound, the paper typically comprising from 30 to 50% moisture by weight. Other known wet recording papers involving color formation by dyes and the like in response to current are known and are disclosed, for example, in United States Patent Nos. 2,440,526, 2,631,918 and 2,686,858. Marking compound as used herein refers to a material of any of these known types which undergoes a color change in response to recording current passing through the paper or other suitable carrier. Suitable electrolytes are known and alkali metal or ammonium chlorides, bromides or nitrates are commonly employed.

As illustrated in FIG. 2, one embodiment of this invention comprises a fibrous web 16 coated on one surface with an adhesive 18. The adhesive 18 can comprise any well known heat or solvent activatable adhesive such as polyvinyl acetate. The adhesive is dissolved in a solvent, a small amount of water added and about six to twelve percent by weight of an electrolyte added. This adhesive is then coated to the paper web 16 and dried. The coated paper is then impregnated with known recording solutions comprising an electrolyte and a marking compound. A typical adhesive formula is as follows:

Polyvinyl acetate	-----grams--	38
Ethyl alcohol	-----do----	61
Water	-----do----	1.3
Lithium chloride	-----percent--	6-12

The adhesive 18 is activated after recording in the usual manner by means of heat and pressure or by means of solvent. Adhesive 18 should comprise a material which, like polyvinyl acetate, will absorb sufficient water to render the electrolyte therein conductive. Preferably it is not water soluble where intended to contact one of the electrodes. Water-sensitive is herein used to describe adhesives absorptive of sufficient water to render the electrolyte contained therein conductive of recording current.

While the embodiment shown in FIG. 2 permits a record to be formed on the paper which can thereafter be secured to a receiving surface, its efficiency is limited by the fact that small amounts of electrolyte in the adhesive appear to decrease somewhat the intensity of the recorded mark while large amounts of electrolyte may soften the adhesive coating sufficiently to permit it to collect on the contacting electrode.

A second embodiment of adhesive recording paper is illustrated in FIG. 3. In this embodiment the paper is wider than one of the electrodes and has edge portions 20 and 22 which extend laterally beyond one electrode, for example, helical electrode 14. The edge portions 20 and 22 are longitudinally coated with an adhesive 24 which may comprise any well known adhesive activated by heat or solvent or which may be pressure sensitive if covered with a release sheet. The polyvinyl acetate above shown can be employed without the electrolyte.

A third and preferred embodiment of adhesive recording paper is illustrated in FIG. 4. This embodiment comprises two sheets of paper 26 and 28 impregnated with

the recording solution of electrolyte and marking compound and which are joined together with adhesive 30. Adhesive 30 is absorptive of water, preferably water soluble, and contains an electrolyte which renders it electrically conductive.

Adhesive recording paper shown in FIG. 4 can be made by coating an unimpregnated sheet of paper with a solution of polyvinyl alcohol (e.g. 12 grams), in water (e.g. 80 grams), and containing an electrolyte (e.g. sodium nitrate, 20 grams). This coating is then preferably dried and the dried sheet is impregnated with the recording solution. A second uncoated sheet is also impregnated with the recording solution and adhered to the first sheet by means of the adhesive. When the laminated sheets are run together through the recording machine, the colored lake is formed in the bar electrode contacting sheet only (FIG. 1), which is then easily stripped from the second sheet and adhered to a receiving surface either while moist or, after drying, by heat and pressure. Quite unexpectedly, it has been discovered that the record formed on this composite sheet is not only as good as a single uncoated sheet but is substantially superior in that the mark is darker and denser, making it more legible.

FIG. 5 schematically illustrates a second type of known electrolytic recording apparatus with which the present invention can be employed. Paper 10' is passed between recording stylus electrodes 32 and platen electrode 34, current passing through the paper between these electrodes producing the desired record.

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

I claim:

1. Conductive electrolytic recording paper for passage between cooperating electrodes in contact therewith, said paper containing a water solution of an electrolyte and an electrolytic marking compound and having an adhesive coating on one side thereof, said paper having a large central area conductive of electricity, whereby a record can be formed on said paper and adhered to a receiving surface,

wherein said adhesive is water sensitive and contains an electrolyte which permits conductance of current therethrough.

2. Conductive electrolytic recording paper according to claim 1 wherein said adhesive contains from about 6% to about 12% by weight of lithium chloride.

3. Electrolytic recording paper according to claim 1 characterized by a second recording sheet separably adhered to said paper and also containing a water solution of electrolyte and electrolytic marking compound.

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