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WATER-SOLUBLE COATING COMPOSITION FOR PAPER

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1 Claim. (Cl. 260—29.6)

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This invention relates to disposable writing surfaces, and more particularly is directed to a paper base coated with a water-soluble substance capable of being written upon with ink and pencil.

It is an object of this invention to provide a disposable paper having a water-soluble coating which may be legibly written upon with ink and pencil.

It is another object of this invention to provide a disposable paper having a water-soluble coating which is stable under extreme climatic conditions and does not exhibit any tendency to become brittle or tacky under such conditions.

A further object of this invention is to provide a material having a writing surface that is stable under adverse climatic conditions and quickly disposable upon being brought into contact with water.

The foregoing and other objects and advantages of the invention will be more apparent from reading the detailed description in the following specification.

The invention comprises, generally, coating a backing sheet with a water-soluble coating composition that is receptive to ink and pencil writing which will remain legible under adverse climatic conditions.

Any light paper backing sheet is suitable for the coating composition, described hereinafter. The preferred backing sheet, however, is paper employed in mimeograph stencil backing. If the coated paper is to be such that it may be personally destroyed by mastication and swallowing, it should be of vegetable fibre composition and have a weight of approximately six and a half pounds per ream of five hundred sheets measuring two by three feet.

This relatively light weight vegetable fibre paper is coated with a non-tacky, water-soluble composition that will retain ink and pencil writing in a legible condition in hot, cold, dry and moist environments. It has been found that a polyvinyl alcohol dispersed in a suitable solvent will provide a coating composition having the general properties desired. The polyvinyl alcohol selected should be soluble in cold or hot water, however, since some of the desirable polyvinyl alcohols are difficultly soluble; it is advisable to incorporate a softening and solubilizing agent, such as an ester of a polyhydric alcohol, in the composition to render it more soluble and easily disposable, care being taken that the quantity of softening agent added does not render the composition tacky. In order to provide a better

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writing surface and to opacify the sheet, thereby enhancing the receptivity to writing, it is desirable to add an opacifying pigment to the coating composition. In instances wherein it is contemplated that the coated paper is to be destroyed by mastication and swallowing, it is advisable to incorporate a small quantity of flavoring or sweetening material in the coating composition to render it more palatable. The specific materials used and the relative proportions thereof may be varied according to the properties desired in the final product.

The desired final product for military security use should be a paper having a writing surface coating that will take either ink or pencil writing with complete legibility. It should also be capable of withstanding tropical, jungle, arctic, and desert climatic conditions without breaking, cracking, or sticking together when folded, pressed, or creased; and, it must be disposable by wetting with water in the aforementioned climates, or upon mastication, and it should be possible to chew and swallow a small sized piece of the coated paper without any injurious effects.

A product having the above desired properties is obtainable by coating the preferred paper of six and a half pounds weight per ream with a composition comprising:

	Parts by weight
Polyvinyl alcohol	75
Ethyl alcohol solvent	300
Water	300
Titanium dioxide pigment	90
Sorbitol Lactate	64

To this composition 0.25 part by weight of saccharin, USP insoluble, may be added to impart palatability to the product.

Various grades of the ingredients employed in the composition are available all of which are suitable in practicing this invention. The proportions given above, however, may vary slightly with the different grades to obtain the most desirable final product. In making the coating composition, the polyvinyl alcohol is first dispersed in the ethyl alcohol solvent and then the water is slowly added with constant stirring to prevent the polyvinyl alcohol from lumping. It is advisable to warm the mixture slightly to facilitate solution. The other ingredients, titanium dioxide, sorbitol lactate and saccharin are added to the mixture, which is then passed through a colloid mill, or other suitable device, to completely disperse the titanium dioxide pigment.

The coating composition must be diluted to proper coating consistency before it can be applied to the paper base. A mixture of equal parts by weight of water and an ethyl alcohol solvent is an effective and efficient diluent, and 826 parts by weight of this mixture will dilute the coating composition to an excellent coating consistency.

The coating composition diluted to a coating consistency is placed in a vat and the paper base floated thereon. The paper picks up approximately two and a half times its weight of coating solids and is then passed over a doctor roll and dried in a low temperature drying oven according to standard practices in the paper coating industry.

Several tests were conducted on the coated sheets to prove the utility under adverse climatic conditions. Each sheet was written upon with ink and pencil and some of the sheets were tested separately, others were stacked and placed under pressure, while the remaining sheets were folded and placed under pressure. These units, single sheets, stacked sheets under pressure, and folded sheets under pressure, were submitted to the following different environments and periods of exposures: a temperature of 100° F. and a relative humidity of 90 per cent, for twenty-four hours; a temperature of —20° F. for two hours; and, a temperature of 150° F. and a relative humidity of 20 per cent, for 6 hours. After being subjected to the above environments the written material on the sheets was still legible. The sheets, single, folded and stacked, were flexible and could be rolled, folded and creased without sticking, cracking or breaking. These simulated tropical, arctic, and desert climates apparently had little or no effect upon the coated paper or the writing thereon. The paper readily disintegrated when placed in water; and, a small piece of the paper was destroyed by chewing and then swallowing the masticated mass.

Having thus described our invention, what we claim as new and wish to secure by Letters Patent is:

A coating composition for paper comprising:

	Parts by weight
Polyvinyl acohol	75
Ethyl alcohol	300
Water	300
Titanium dioxide	90
Sorbitol lactate	64

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