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COMPOSITION FOR A PENCIL LEAD

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This invention relates to a planographic image-forming pencil and to a so-called lead or writing rod therefor for use in forming planographic images upon master planographic printing plates including aluminum and paper or like cellulose base master planographic printing plates.

A number of problems are encountered in the manufacture of planographic image-forming writing rods or so-called leads and pencils embodying the same which are peculiar to such planographic image-forming pencils and which are not encountered in the manufacture of common so-called lead pencils. Among these problems are: A planographic image-forming pencil must be capable of forming an inscription or image which will produce a satisfactory number of copies from the master plate upon which the image is written; it must be capable of making uniform lines, that is to say, lines which are of substantially uniform width throughout their entire length upon the master plate; the writing instrument, that is to say, the substantially cylindrical writing rod or so-called lead which is embodied in such a planographic pencil must be neither too soft so that the inscription or image formed thereby will wash off the plate readily or so that it will produce lines which will vary in width as the pencil moves across a master aluminum or paper or like planographic plate on which it is being used to write an image, and it must not be sufficiently hard to scratch such a master planographic printing plate; and it must have good ink-respective and ink-retentive properties so that it will be receptive to and will retain the lithographic inks used in making reproductions from the master plate.

Accordingly, an object of the present invention is to provide a new and improved image-forming planographic pencil embodying a writing instrument or so-called lead which has good image-forming properties and which will produce images having good ink-receptive and ink-retentive properties for planographic or lithographic inks; which is sufficiently hard to enable it to make lines of uniform width upon a paper or other planographic printing plate and to prevent the image made thereby from washing off the plate; and which is otherwise a satisfactory image-forming planographic pencil.

Another object of the invention is to provide a novel composition for making the substantially cylindrical writing rods or so-called leads of the new planographic pencil.

A further object of the invention is to provide a new and improved planographic image-forming lead or writing instrument for use in a planographic image-forming pencil which may be employed in a planographic image-forming pencil

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of any suitable character including those of the mechanically propelled type.

Other and further objects of the present invention will be apparent from the following description and claims which describe preferred embodiments of the invention and the principles thereof and what we now consider to be the best mode in which we have contemplated applying those principles. Other embodiments of the invention embodying the same or equivalent principles may be used and changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

A typical formula which may be employed in preparing the so-called lead or the substantially cylindrical writing rod or writing instrument which may be embodied in a planographic image-forming pencil, in the practice of the present invention, may be that which is shown in the following example:

Example No. 1

	Parts by weight
Nigrosine	35
Japan wax	2
Aluminum stearate	40
Methyl cellulose solution (one part dissolved in six parts of water, by weight)	27.6

In the manufacture of the new planographic image-forming pencil, and the new planographic image-forming lead or writing rod therefor, the nigrosine and aluminum stearate referred to in the foregoing Example No. 1 may be mixed together in the dry state and the methyl cellulose may be dissolved in approximately six times its weight of water, whereupon the nigrosine-aluminum stearate mixture and the aqueous methyl cellulose binder solution may be thoroughly mixed for a period of two or three hours, in a suitable mixer. The Japan wax may then be melted to liquid form and added to the aforesaid mixture of nigrosine, aluminum stearate and methyl cellulose binder and the resulting mixture further thoroughly mixed for a period of two hours. The resulting base mixture is of doughy consistency and may be rolled and extruded in the form of substantially cylindrical rods and cut to suitable lengths to form the new planographic image-forming leads or substantially cylindrical planographic image-forming writing rods and the new planographic image-forming pencils embodying the same, whereupon the said leads or rods may then be forced dried until their moisture content is approximately three (3) per cent, by weight.

The thus prepared planographic image-forming leads or substantially cylindrical rods may then be encased or enclosed in grooved wooden

pencil casings in a conventional manner. This operation, as is well understood in the art, includes inserting the substantially cylindrical writing rods or so-called leads into a groove formed in one of two complementary sections of a wood or like pencil casing, adhesively securing the two complementary halves or sections of the pencil casing together with the substantially cylindrical writing rod or so-called lead therebetween; suitably shaping the outer surface of the pencil casing as by forming hexagonal faces thereon; and then suitably finishing the pencil casing as by sanding and painting the same.

In addition to being encased in a grooved wooden casing the new planographic image-forming leads or writing rods may, if desired, be employed in pencils of the mechanical type.

It will thus be seen that the new planographic image-forming writing rods or so-called leads which are prepared according to the foregoing Example No. 1, are comprised of the dried reaction product of an intimate mixture of an aqueous solution of a binder, namely, a solution of methyl cellulose in water, and the balance a mixture of the solid materials referred to in the foregoing Example No. 1, namely, nigrosine, Japan wax and aluminum stearate.

In place of the Japan wax specified in the foregoing Example No. 1 we may employ suitable equivalent quantities of one of the following substances or mixtures thereof, namely, tallow, stearic acid, carnauba wax, bees wax, paraffin wax, and spermaceti.

The aqueous solution of methyl cellulose (binder) specified in the foregoing Example No. 1 may be employed within a rather wide range of from approximately 10 per cent to approximately 50 per cent, by weight, of the complete pencil base mixture. However, it has been found that the resulting planographic image-forming pencil or writing rod becomes too weak if the percentage of the aqueous methyl cellulose binder is reduced below the minimum of 10 per cent, as specified; whereas if the percentage of the aqueous methyl cellulose binder is increased substantially in excess of the maximum of 50 per cent specified the writing or planographic image-forming qualities of the resulting pencil or writing rod are unsatisfactory.

In place of the aqueous solution of methyl cellulose specified in the foregoing Example No. 1 suitable equivalent quantities of the following materials, or mixtures thereof, may be employed as the binder, namely, ethyl cellulose, carboxy methyl cellulose, gum tragacanth, polyvinyl alcohol and clay.

Indulin may be employed in place of the nigrosine specified in the foregoing Example No. 1 and in place of the aluminum stearate specified we also employ suitable equivalent quantities of calcium stearate or zinc stearate, or mixtures of these materials.

Another composition which may be employed in preparing the base for the new substantially cylindrical planographic image-forming pencils or writing rods is illustrated in the following example in which all parts indicated are by weight:

Example No. 2

	Parts by weight	
Nigrosine	35	
Aluminum stearate	25	
Clay (binder)	15	
Methyl cellulose solution (one part dissolved in six parts of water, by weight)	27.6	75

The relative proportions and quantities of the various materials set forth in the foregoing Examples Nos. 1 and 2 may be increased or decreased as much as ten per cent of the quantities specified while still affording a planographic image-forming lead or writing rod having the novel and desirable properties and characteristics of the present invention.

The Japan wax, or other material substituted therefor, embodied in the substantially cylindrical planographic image-forming writing rod or instrument for the new planographic image-forming pencil enables a planographic image-forming pencil embodying the new planographic image-forming pencil or writing rod to slide or move easily over the surface of a planographic printing plate during the writing or image-forming operation; the nigrosine (or indulin substituted therefor) is an image-forming material and imparts necessary color to the substantially cylindrical planographic image-forming writing rod or instrument, namely, a black color; the aluminum stearate, or other material substituted therefor, is also an image forming material; and the methyl cellulose, with or without clay, serves as a binder to bind the various ingredients together.

It has been found that the new planographic image-forming so-called leads or writing rods prepared according to the present invention have good image-forming properties, and that images formed thereby have good ink receptive properties for lithographic inks; that they are sufficiently hard to enable it to form good images, including lines of uniform width, on paper and like planographic printing plates; that they provide images which will not readily wash off such plates; and that they provide images which will enable satisfactory editions or numbers of copies to be reproduced from a master paper or like planographic printing plate when the latter is employed in making reproductions in a rotary offset duplicating or planographic printing press or the like.

It will thus be seen from the foregoing description that the present invention provides a new and improved planographic image-forming pencil, and a new and improved planographic image-forming writing rod or instrument for use therein, and a novel composition for making the same, and that the invention has the desirable advantages and characteristics, and accomplishes its intended objects, including those hereinbefore pointed out and others which are inherent in the invention.

We claim:

A planographic image-forming pencil writing rod material consisting essentially of the dried product of an intimate mixture of the following materials within the range of the quantities specified, all parts being by weight:

Nigrosine	31.5 to 38.5
Japan wax	1.8 to 2.2
Aluminum stearate	36 to 44
Methyl cellulose (one part dissolved in six parts of water, by weight)	24.84 to 30.36

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