LEAD PENCIL AND METHOD OF PREPARING PENCIL LEADS

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INVENTOR
Isidor Chesler

BY
Dean, Jankow, Hame & Foster
ATTORNEYS
My present invention relates to pencils and pencil leads, and is more particularly concerned with the secure bonding of the leads into the wooden sheaths of pencils of generally conventional appearance.

An object of the invention is to provide a lead of appropriate writing specifications, the surface of which, unlike that of a lead merely impregnated in the ordinary non-water-soluble oils or greases, has a surface miscible with water-soluble glue and, therefore, capable of being bonded with respect thereto.

Another object is to provide a method requiring no elaborate apparatus or expert care and expeditiously carried out at small cost for producing the desired leads.

In carrying out the invention, use is made of a wetting and penetrating agent, preferably a sulphonated oil or grease, or, if desired, a sulphonated petroleum, fatty alcohol or naphthol, which, being readily miscible with the water-soluble glue commonly employed in encasing the lead in the wooden sheath, will afford a secure bond.

In a preferred embodiment, the wetting and penetrating agent partly or wholly replaces the usual non-water-soluble waxes, oils or greases, employed in impregnating leads. Of course, where such agent wholly replaces the oil or grease usually employed in leads, it must have appropriate specifications to duplicate insofar as possible, the writing characteristics of such waxes, greases or oils. Where, however, mixtures are employed of non-water-soluble oils or greases and of the wetting and penetrating agent, such as sulphonated oils or greases, it is obvious that the characteristics of each ingredient may be so selected as to produce a blend of any desired characteristic, for hardness or softness of the lead, and the wetting and penetrating ingredient, if in sufficient proportion will render the lead satisfactory from the standpoint of adhesiveness with respect to the glue.

In a simple method of carrying out the process, the wetting and penetrating agent, preferably sulphonated oil or grease, or the blend including sulphonated oil or grease, is heated sufficiently to maintain the solution at low viscosity. Preferably unwaxed, or if desired, previously waxed leads placed in baskets, are submerged in the bath and left for a sufficient period of time to insure complete penetration. After removal of the leads from the bath, they are allowed to drip for a short while and then tumbled in heated sawdust, which serves to clean the surface of the lead from the surplus oil or grease. The surfaces of the leads having been thus cleaned, are not apt to stick together, and are ready to be assembled and glued between the segments of a wooden pencil casing.

It is distinctly to be understood that the invention relates to applying the wetting and penetrating agent to the lead after the latter has been completely formed and calcined so that the wetting and penetrating agent is present as such, to perform its function of affording a surface miscible with water soluble glue to assure adequacy of bond. Where a soap or sulphonated oil is introduced into the mix from which the lead is fabricated, it is apparent that in the subsequent calcining action such efficacy as such material might otherwise have for miscibility of water soluble glue would be destroyed and regardless of what other improvements the introduction of such elements into the mix might bring about, the particular utility of the present invention would not be attained.

In the accompanying drawing, in which is shown one of various possible embodiments of the several features of the drawing.

Fig. 1 is a dis-assembled view showing a pencil lead about to be assembled in its sheath, and Fig. 2 is an enlarged transverse sectional view through the completely assembled pencil.

The lead 10 with sulphonated oil or grease penetrating or at least at the surface thereof is covered by the glue coating 12 which bonds it to blocks 11 of wood, that are glued together along the contacting surface thereof.

It will thus be seen that there is herein described an article and method in which the several features of this invention are embodied, and which in practice, attain the various objects of the invention and are well suited to meet the requirements of practical use.

As many changes could be made in the above article and method, and many apparently widely different embodiments of this invention could be made without departing from the scope hereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A calcined lead of graphite and binder, having its interstices filled with a grease-wetting and penetrating agent, capable of effecting an
adequate bond with respect to a water soluble glue.

2. A pencil lead of calcined graphite and binder, impregnated throughout the mass thereof with an appropriate softening agent of the class which includes certain waxes and oils to impart the desired degree of softness, and impregnated also with a softening and wetting agent of the class which includes sulphonated oil, sulphonated grease, sulphonated fatty alcohol and sulphonated naphthol, to afford a bonding surface for gluing lead into the wooden sheath.

3. A lead pencil of the type comprising a lead, a wooden sheath and a glue bond between the lead and the sheath, the lead having an impregnation throughout the mass thereof of a softening agent of the class which includes certain waxes and oils and also with a grease wetting and penetrating agent capable of effecting an adequate bond of the glue with respect to the lead.

4. A lead pencil of the type comprising a lead, a wooden sheath and a glue bond between the lead and the sheath, the lead having an impregnation of grease-wetting and penetrating agent, for adequate bond of the glue with respect thereto.

5. A lead pencil of the type comprising a lead of graphite and filler, impregnated with a softening agent of the class which includes certain waxes and oils, a wooden sheath, a layer of glue between the sheath and the lead, the lead having at the surface thereof a grease wetting and penetrating agent mixed with said grease wetting and penetrating agent for adequate bond with respect to the glue.

6. The method of preparing a pencil lead, which consists in admixing graphite and clay, extruding the material through dies, calcining the product and then impregnating the same in a sulphonated grease-wetting and penetrating agent, to afford the desired degree of softness and at the same time to provide a surface capable of making an adhesive bond with water soluble adhesive.

7. The method of preparing a pencil lead, which consists in admixing graphite and clay, extruding the material through dies, calcining the product and then impregnating the same with a material of the class that includes sulphonated oil and sulphonated grease, to afford the desired degree of softness and at the same time to provide a surface capable of taking an adhesive bond with water soluble adhesive.

8. The method of preparing pencil leads, which consists in submerging leads, retained in baskets in a molten composition including a grease-wetting and penetrating agent, removing the baskets and allowing the leads to drip, and then tumbling them in heated sawdust.

9. The method of preparing pencil leads, which consists in submerging leads, retained in baskets in a molten composition including a softening agent of the class which includes certain waxes and oils and a material of the class that includes sulphonated oil and sulphonated grease, removing the baskets and allowing the leads to drip, and tumbling them in heated sawdust.

10. A pencil lead including pigment and binder and having incorporated therein, a material of the class comprising sulphonated fatty alcohol and sulphonated naphthol.

11. A calcined lead of graphite and binder, having its interstices filled with a material of the class comprising sulphonated fatty alcohol and sulphonated naphthol, and capable of effecting an adequate bond with respect to a water soluble glue.

12. A lead pencil of the type comprising a lead of graphite and filler, impregnated with a softening agent of the class which includes certain waxes and oils, a wooden sheath, a layer of glue between the sheath and the lead, the lead having at the surface thereof in addition to said softening agent, a grease wetting and penetrating agent, said agent being of the class comprising sulphonated fatty alcohol and sulphonated naphthol and serving for adequate bond with respect to the glue.

13. The method of preparing a pencil lead, which consists in admixing graphite and clay, extruding the material through dies, calcining the product and then impregnating the same in a softening agent of the class which includes certain waxes and oils and a softening and wetting agent of the class which includes sulphonated oil, sulphonated grease, sulphonated fatty alcohol and sulphonated naphthol, to afford the desired degree of softness and at the same time to provide a surface capable of taking an adhesive bond with water soluble adhesive.

14. The method of preparing pencil leads, which consists in submerging the leads, retained in baskets in a molten composition including a softening agent of the class which includes certain waxes and oils and a material of the class that includes sulphonated oil and sulphonated grease, removing the baskets and allowing the leads to drip, and tumbling them in heated sawdust.

ISIDOR CHERLER.