

(No Model.)

F. W. MUSSON.

LEAD FOR PENCILS AND METHOD OF MANUFACTURING SAME.

No. 582,133.

Patented May 4, 1897.

Fig. 1.

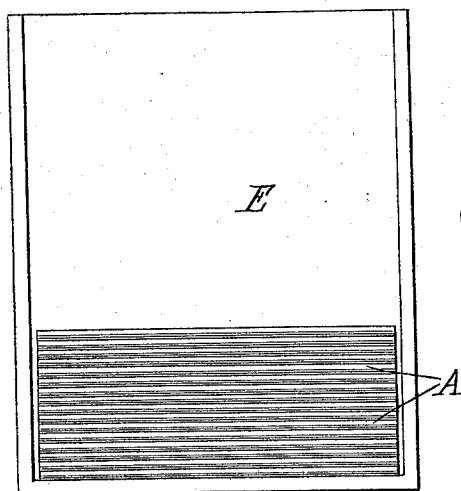


Fig. 4.

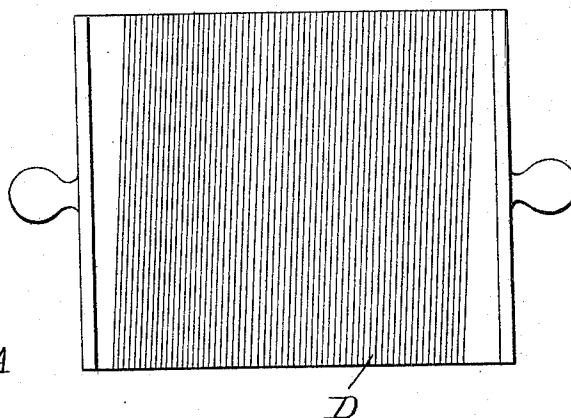


Fig. 2.

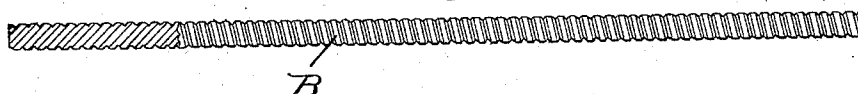


Fig. 3.

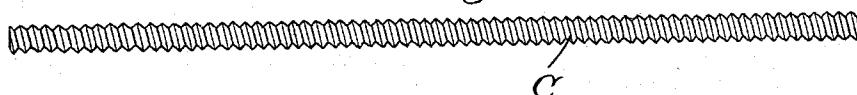


Fig. 5.

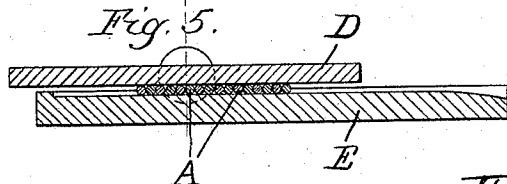
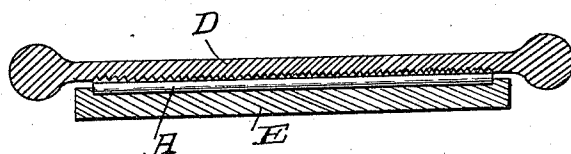


Fig. 6.



Witnesses.

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LEAD FOR PENCILS AND METHOD OF MANUFACTURING SAME.

SPECIFICATION forming part of Letters Patent No. 582,133, dated May 4, 1897.

Application filed August 10, 1896. Serial No. 602,273. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. MUSSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Leads for Pencils and Methods of Manufacturing the Same, of which the following is a specification.

My invention relates to the method and means for the manufacture of leads for lead-pencils, and has for its object to provide for use in certain automatic or movable-lead lead-pencils the screw-threaded or circumferentially-grooved leads necessary for that purpose.

There have been at different times automatic or movable-lead lead-pencils made or attempted to be made in which a screw-threaded or circumferentially-grooved lead was designed to be employed, but so far as I am advised it does not appear that any such lead-pencil has ever become commercially satisfactory. I have for some time past been engaged in developing and inventing lead-pencils of this character, and having succeeded in securing and patenting what appear to be successful forms of such lead-pencils I have encountered the difficulty of providing leads for the same commercially. In some of my pencils a spiral groove in the surface of the lead is required. In others a circumferential groove or series of grooves might be employed, but in neither case have I been able to find such leads commercially available. The attempt to cut the thread or grooves on the finished lead proved highly unsatisfactory. It would require more or less expensive machinery and involve certain dangers to the lead itself, so that by increased cost of manufacture and deterioration of the leads the advantages of my improvements in the pencil are overcome in great part. I have found that by following a certain process satisfactory grooves or screw-threads or spirals can be cut or formed in the lead. This process I will now describe.

The lead material, suitably ground and mixed and of a consistency something like putty, is preferably placed in a receptacle and there exposed to a very high pressure. An aperture of substantially the cross-section of the finished lead is provided, and

through this aperture the lead material is forced by such pressure. It comes out in a plastic condition and is cut into pieces of the proper length. These plastic lead rods so produced, or produced in any other manner, are placed either upon a flat plate or upon a plate having a die-surface whereby the screw-thread or groove is to be formed, and a corresponding flat surface or die-plate is then placed upon these lead rods. It is understood, of course, that these lead rods will first be gently rolled upon a flat surface and brought so that the last one of them is against a straight edge, whereupon they will all be found to lie parallel with each other, each thus being brought into the form of a straight rod. Having now been exposed to the dies, (and upon the form and construction of these dies I lay no great stress, as there may be great latitude in their construction,) such dies being formed upon the surface of one or both of the plates, between which the rods are now seated, one of these plates will be moved slightly forward, so as to roll into the surface of the leads the desired groove. Since these leads are to be thus rolled, it is necessary that there should be, at least in the first instance, a flat surface, and hence the first operation of the die or the first rolling of the leads in the process of forming the grooves or screw-threads involves no more than cutting the grooves in such manner that there will be left a flat surface of a relatively considerable extent between the successive grooves or spirals. These leads so formed are now subjected in the usual manner to proper heating and curing processes until they are formed into hardened leads fit for use, having thus formed on their surfaces these grooves or spirals or screw-threads which fit them for use in my pencils. Of course the groove can be deepened and thus the flat surface of the lead between the successive spirals be narrowed by successive rollings or exposures to the dies, so that in fact, though this I do not consider the best form of the lead, the lead may be brought into practically the condition of a screw-threaded rod.

As previously suggested, I do not attach any particular importance to the particular form of the devices used to bring about these

results, but I have in the accompanying drawings illustrated some features of my invention.

Figure 1 is a view of a series of plastic lead rods brought into parallelism on a proper surface. Fig. 2 is one of said rods after the groove has been first or partially formed, as the case may be. Fig. 3 is a view of one of said rods in which the groove has been so far developed as to make the ordinary form of a screw-thread. Fig. 4 is a view of the die whereby said grooves can be formed in the leads. Fig. 5 is a view of a series of leads in position between the two die-plates. Fig. 6 is a section through the dies at right angles to the section shown in Fig. 5.

Like parts are indicated by the same letters in all the figures.

A A are the leads in their plastic condition before treatment.

B is a lead with a spiral having a wide flat surface between its successive grooves.

C is a screw-threaded lead.

D is the die-plate.

E is a smooth-surface plate opposed to the die-plate.

One of the great practical difficulties which I encountered in rolling the grooves, spirals, or screw-threads into the leads grew out of the fact that the leads being plastic the attempt to cut or roll a deep groove or continuous screw-thread in its surface was unsatisfactory. I found that it was necessary that during this process of first forming the groove the lead itself must have a bearing-surface because of its plastic condition, and hence I begin by rolling the groove into and beneath the surface of the lead, so as to leave an exposed smooth outer surface of the lead of considerable extent between the grooves or successive spirals.

I have in the description and also in the claims for convenience used the term "lead" and "lead-pencil." By this, however, I do not wish or intend to be limited to graphite or to what in the narrowest sense might be included in the term "lead" or "lead-pencil." My invention is applicable to all such forms of marking materials. Thus there are colored crayons, wax-crayons, pastel-crayons, oil-crayons, paint-crayons, slate-crayons, and other such like marking materials, and doubtless some if not all of them could be used in a similar manner and treated in a similar manner to that indicated herein. I wish, therefore, to have it understood that by the term "lead" and "lead-pencil" as used in the description and in the claims I mean, broadly, to include and cover any and all such marking materials as can be treated in

the manner herein described as being applied to the specific marking material which I have made the base of my description.

I claim—

1. The process of forming leads for movable-lead lead-pencils which consists in producing the leads in a series of plastic rods, rolling these while arranged in a series side by side in association with a straight edge so as to bring them all into parallelism and straightness, then rolling them between die-plates so as to roll circumferential grooves therein with broad flat bearing-surfaces between such grooves, then drying and curing said leads to form the finished product.

2. The process of forming leads for movable-lead lead-pencils which consists in reducing the lead substance to a plastic mass, then producing therefrom a series of plastic leads, then bringing such leads in a mass or series into straightness and parallelism on a proper surface, then subjecting said leads *en masse* to the rolling action of die-plates so as to form on each circumferential grooves, said successive grooves separated in the first instance by a broad flat bearing-surface to permit such rolling process, then successively rolling said leads in like dies until the grooves are properly formed, then drying and curing the leads.

3. The process of forming leads for movable-lead lead-pencils which consists in reducing the lead substance to plastic rods, then bringing such rods in a mass or series into straightness and parallelism on a proper surface or die, then subjecting the entire series of rods to the rolling action of die-plates so as to form on each circumferential grooves substantially along its entire length, the grooves on all of the series being formed simultaneously by a single rolling of the die-plates, then drying and curing the rods.

4. The process of forming leads for movable-lead lead-pencils which consists in forming the lead into a series of plastic rods, then rolling a series of these rods in association with a straight edge so as to bring them all into parallelism and straightness, then rolling them between die-plates so as to roll circumferential grooves thereon and without changing the length of said leads, said circumferential grooves extending substantially the entire length of said leads and being formed by one operation of the dies.

Chicago, August 6, 1895.

FREDERICK W. MUSSON.

Witnesses:

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