April 11, 1939. L. J. MOST 2,154,102

METHOD OF MANUFACTURING PEN POINTS, AND SHEET STOCK THEREFOR

Filed March 31, 1934

FIG. 1.

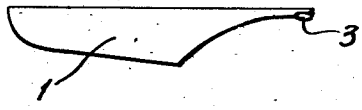


FIG. 2.

FIG. 3.

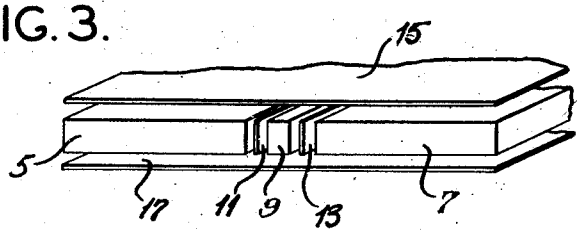


FIG. 4.

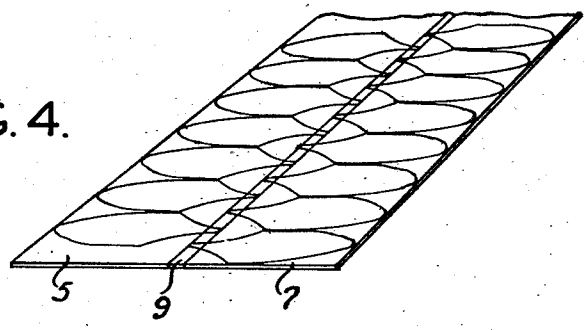


FIG. 5.

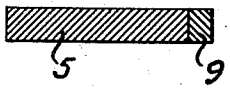


FIG. 6.

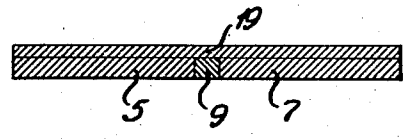
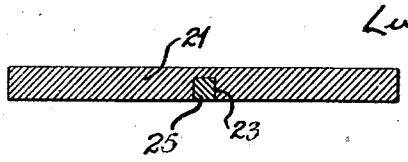


FIG. 7.



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2,154,102

METHOD OF MANUFACTURING PEN POINTS, AND SHEET STOCK THEREFOR

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4 Claims. (Cl. 113—32)

This invention relates to the manufacture of pen points, and with regard to certain more specific features, to a novel form of sheet stock from which pen points are formed.

Among the several objects of the invention may be noted the provision of a sheet stock of the class described wherein provision is made for the formation, on the ultimate pen point, of a tip of hard alloy; the provision of a sheet stock of the class described which, when manufactured into pen points, permits the mechanical production of pen points in quantities with uniform characteristics, and which substantially eliminates the human element from the procedure of manufacturing; and the provision of a method of manufacturing pen points of the class described which is cheaper to carry through than prior analogous methods. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, steps and sequence of steps, features of construction, and arrangements of parts, which will be exemplified in the structures and methods hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawing, in which is illustrated several of various possible embodiments of the invention,

Fig. 1 is an elevation of a pen point;

Fig. 2 is a cross section of one form of sheet stock;

Fig. 3 is an exploded view of elements going to make the sheet stock shown in Fig. 2;

Fig. 4 is a perspective view of one embodiment of the final sheet stock of the present invention, showing a layout for the stamping of pen points therefrom; and

Figs. 5, 6, and 7 are sectional views similar to Fig. 2 illustrating various other embodiments of the invention.

Similar reference characters indicate corresponding parts throughout the several views of the drawing.

Referring more particularly to Fig. 1, numeral 1 indicates generally a pen point of the type commonly used in fountain pens. Such pen points are ordinarily blanked and formed from a sheet of gold alloy and have a small bead of a harder alloy (usually composed principally of metals of the platinum group) welded on the writing point, as indicated at numeral 3, to withstand the wear which ensues at the point. The metal or alloy in the bead 3 is customarily very hard and has much greater wear-resisting qualities than the softer gold alloy from which the rest of the pen is usually made.

Welding the bead 3 into place on the writing tip of the pen points involves a number of delicate operations which are manually performed by skilled operators and, as these operations must be individually performed on each pen point, they represent a considerable part of the labor cost of manufacturing the pens.

When the bead 3 is put on each pen in this manner the channel between the nibs of the pen point cannot be cut until after the bead is welded into place, and, furthermore, since the form and positioning of the bead differs slightly from one pen to another and the channel must be cut so as to pass through the highest point on the bead where it will later be in contact with the paper during writing, the cutting of the channel on pens so made is a job requiring individual attention and not suited to be automatically performed.

It is the general purpose of the present invention to provide a sheet stock for use in the manufacture of pen points, which stock contains a stripe of hard alloy properly positioned so that the pens may be blanked from the sheet with the writing point being taken from this stripe. Thus, the individual operations of fusing the bead 3 to the pen point can be eliminated, and in view of the uniformity of the sheet stock the manufacture of the pens can be performed in the automatic manner that is now used in the manufacture of steel pen points. Thus, by the use of a sheet stock as herein proposed, the labor cost in the manufacture of the pen points is reduced while at the same time a more uniform and therefore superior product results.

In its preferred form, the present invention comprises a sheet stock such as that shown in Fig. 2, in which numerals 5 and 7 represent bars of metal or alloy that is to constitute the principal part of the pen. For fountain pen usage this may, for example, be an alloy of gold, 14 karat fine. Such an alloy has a Brinell hardness of 129 to about 215, depending upon the extent to which it has been worked. It may, however, be any metal or alloy which will have the desired resistance to ink corrosion and which can be welded or soldered and rolled out into sheets as hereinafter set forth.

The sheet stock includes, in addition, a central bar of harder metal or alloy indicated at numeral 9 in Fig. 2. This alloy must be one that is suitable for the soldering or welding and rolling operations that are to follow. The invention is not limited to any particular composition for this

metal or alloy, as any alloy can be used which will have the desired resistance to corrosion and will be hard enough to withstand the wear or use, and that may be joined to the bars 5 and 7 by any of the methods herein set forth and subsequently rolled to a thin gauge. As a nonlimiting example of a suitable alloy for this purpose, one having a composition as follows may be used:

	Per cent
Iridium (by weight)	25
Platinum (by weight)	75

Such an alloy, while somewhat softer than those ordinarily used for the beads in question, is much harder than the alloy used for the rest of the pen and hard enough to serve the purposes desired. For example, it has a Brinell hardness of 270 when annealed and about 370 when worked.

It is to be understood that the relative dimensions of the bars 5, 7, and 9 in Fig. 2 are by no means to be considered as representing accurately the dimensions to be used in carrying out the invention. For example, the width of the bar 9 has been exaggerated with respect to the width of the bars 5 and 7 in order more clearly to present the novel features of the invention. The same situation with respect to dimensions obtains with all of the other figures of the drawing of this specification.

It is important that the bars 5, 7, and 9 be joined together in such a manner that they form a unit substantially as strong as if the bars were formed of one metal. The reason for this is obvious. This joining of the three bars together may be accomplished, for example, in the manner shown in Fig. 3. The surfaces to be joined are first properly cleaned, either mechanically or chemically, or both. The bars are then assembled, as illustrated in Fig. 3, with thin sheets of solder 11 and 13. It is also found to be desirable to apply overlying sheets of solder 15 and 17 which, by flushing the top and bottom surfaces, help to insure a good joint at the outer edges of the bars. The particular solder employed for the sheets 11, 13, 15, and 17 depends upon the composition of the bars 5, 7, and 9. With the composition heretofore given for these bars, ordinary silver solder is satisfactory.

The assembled bars 5, 7, and 9, and solder sheets 11, 13, 15, and 17, are then clamped together or otherwise placed under pressure and put in a soldering furnace wherein they are fused or welded together.

When the overlying sheets of solder 15 and 17 are used, these are removed after the soldering operation by machining. As the excess solder from the strips 11 and 13 is squeezed out in the soldering operation, the unitary bar resulting has the appearance in cross-section as illustrated in Fig. 2, the solder layers having disappeared from view.

Instead of soldering as above described, it is also possible to weld the bars 5, 7, and 9 together directly, without using any soldering, the heat being sufficient to cause interpenetration of the bars 5 and 7 and the bar 9, so as to secure a good joint.

The desirable dimensions for the bars 5 and 7 depend upon the dimensions desired in the finished pen, and the operations which are to follow as will readily be apparent. The sheets of solder may be of any desired thickness, but as an illustrative example, 0.002" will suffice. The dimensions of the bar 9 depend upon the length of the tip desired on the pen and the operations which are to follow, as will readily be apparent.

From the Fig. 2 condition, in which the assembled bars have been joined into a composite unit by soldering or welding, the unit is reduced by a succession of rolling operations to produce sheets thin enough for the stamping of the blanks for the pen. Such a thin sheet is shown in Fig. 4, the bars 5, 7, and 9 still being recognizable in their thinned condition. Fig. 4 also shows how the pen point blanks are taken from the sheet. The blanks are stamped from both sides of the center stripe of hard metal 9 in such a manner that the points of opposing blanks alternate in the hard metal stripe. When blanked in this manner, a minimum amount of scrap metal results.

After the blanks have been taken from the sheet, what remains of the stripe of hard metal can be separated from the rest of the sheet by slitting, the greater portion of the sheet being thus in condition to be melted up and reused without being refined.

Fig. 5 illustrates an embodiment of the invention in which a single gold bar 5 is joined to the hard metal bar 9. When this composite bar shown in Fig. 5 is rolled, it permits the blanking of pen points therefrom but only in a single row. Thus, there is left in the scrap a greater proportion of the hard metal stripe, and since the hard metal stripe is usually more expensive than the rest of the sheet, this embodiment of the invention is not in general as economical as the embodiment previously described.

In some instances it may be desired to have the hard metal on only the under side of the tip of the pen, whereby more closely to approximate the structure of the pen point shown in Fig. 1. Fig. 6 indicates how this may be done. Referring to Fig. 6, numerals 5, 7, and 9 indicate the three bars heretofore shown in Fig. 2. In addition, however, a sheet 19 of the same metal or alloy that goes to make up the bars 5 and 7 is applied to the upper surface of the joined bar of Fig. 3. The sheet 19 is joined by welding or soldering in the manner already described. When a composite bar constructed as shown in Fig. 6 is rolled into a sheet, the hard metal stripe appears on only the under side of the sheet.

As an alternative way of accomplishing the same end, Fig. 7 shows a single bar 21 substituted for the two bars 5 and 7 and the sheet 19 of Fig. 6. In this case a groove 23 is machined into the center of bar 21, and a stripe 25 of the desired hard metal is inlaid in the groove 23. In this embodiment, accurate machining of both the groove 23 and the bar 25 are necessary, in order to provide for a solid and reliable joint throughout the length of the stock. The bar 25 may be subsequently permanently secured to the bar 21 by soldering or welding in the manner heretofore described.

In other possible variations, the shape of the bar 25 may be triangular, to fit into a V-shaped groove 23 in the bar 21. Other geometrical forms may also be employed.

The pen blanks, manufactured as hereinbefore indicated, are finished into pen points by the usual mechanical operations well known to the art. The uniformity of the blanks permits automatic manufacturing operations, while, at the same time, the hard metal tip gives long wearing qualities approximating those secured by individually soldering beads on the tips of the blanks as in the pens made according to the

methods heretofore used. As uniformity of the point is one of the criteria of the excellence of a pen, and such uniformity may be more readily secured by this method, a superior product results.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in carrying out the above constructions and methods without departing from the scope of the invention, 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.

I claim:

1. A sheet stock adapted to be manufactured into pen points comprising a relatively broad area of thin, resilient metal adapted to constitute the bodies of the pen points, and a narrow stripe of relatively harder metal adapted to constitute the final writing tips of the pen points rigidly secured to the said area, the ratio of the hardness of the broad area metal to the hardness of the stripe metal (in Brinell numbers) being at least of the order of 1 to 2.

2. The method of manufacturing pen points having relatively hard-metal writing tips comprising providing a sheet stock in the form of a sheet of metal adapted to become the body of the pen point with a stripe of relatively harder metal adapted to become the final writing tip of the pen point secured thereto, the ratio of the hardness of the sheet metal to the hardness of the stripe metal (in Brinell numbers) being at least of the order of 1 to 2, blanking the pen point from said stock in such manner that the body thereof is taken from said sheet metal and the writing tip is simultaneously taken from said stripe metal, and thereafter merely shaping, slitting, and polishing the writing tip in order to bring it to final, usable form.

3. A sheet stock adapted to be manufactured into pen points comprising a relatively broad area of thin, resilient metal adapted to constitute the bodies of the pen points, and a narrow stripe of relatively harder metal adapted to constitute the final writing tips of the pen points rigidly secured to the said area.

4. The method of manufacturing pen points having relatively hard metal writing tips comprising providing a sheet stock in the form of a sheet of metal adapted to become the body of the pen point with a stripe of relatively harder metal adapted to become the final writing tip of the pen point secured thereto, blanking the pen point from said stock in such manner that the body thereof is taken from said sheet metal and the writing tip is simultaneously taken from said stripe metal, and thereafter merely shaping, slitting, and polishing the writing tip in order to bring it to final, usable form.

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