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2,154,103

SHEET STOCK AND THE MANUFACTURE OF PEN POINTS

Filed Dec. 24, 1935

FIG. 1.



FIG. 2.



FIG. 3.

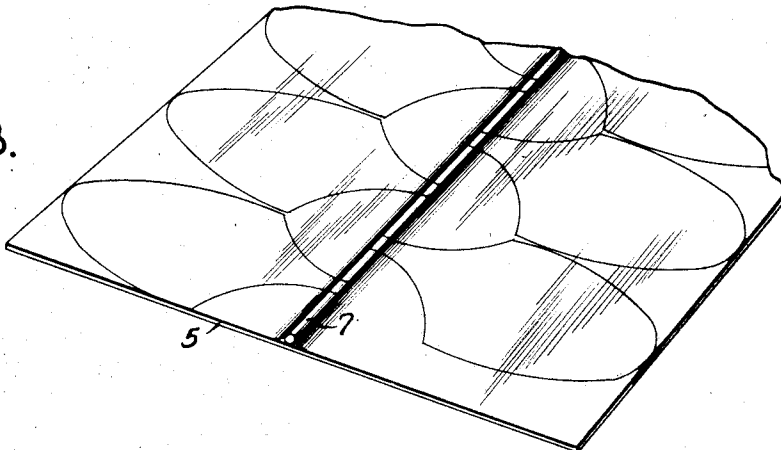


FIG. 4.

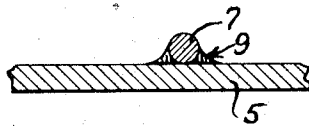


FIG. 6.

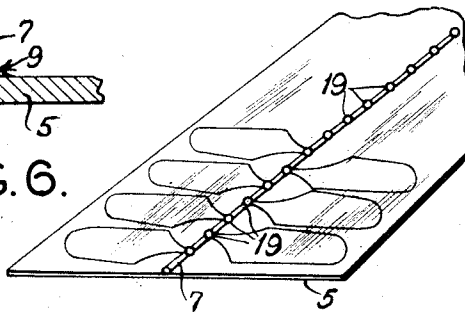


FIG. 5.

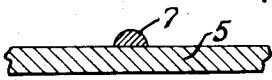
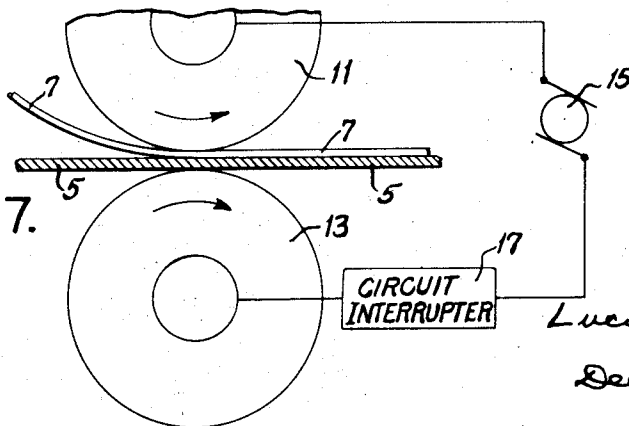


FIG. 7.



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UNITED STATES PATENT OFFICE

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SHEET STOCK AND THE MANUFACTURE OF PEN POINTS

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Application December 24, 1935, Serial No. 56,038

8 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.

5 The present invention is in the nature of an improvement over the invention described and claimed in my copending application, Serial No. 718,384, filed March 31, 1934.

Among the several objects of the invention 10 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 in such form that it provides, without further manufacturing operation, a suitable writing point; the provision of a sheet stock 15 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; the provision, on a pen point of 20 the class described, of a preformed substantially ball-shaped writing tip of hard material; and the provision of a method of manufacturing pen 25 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 35 will be indicated in the following claims.

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

Fig. 1 is an elevation of a pen point;

40 Fig. 2 is an end elevation of one form of sheet stock;

Fig. 3 is a perspective view of the sheet stock of Fig. 2, showing a layout for the stamping of pen points therefrom;

45 Fig. 4 is an enlarged cross section of the sheet stock of Fig. 2;

Fig. 5 is a cross section similar to Fig. 4 illustrating an alternative embodiment of the invention;

50 Fig. 6 is a perspective view similar to Fig. 3 illustrating another alternative embodiment of the invention; and,

Fig. 7 is a diagrammatic view illustrating a method of manufacturing sheet stock embodying 55 the present 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. By the use only of prior-art instrumentalities, such pen points can be manufactured only by a series of individual, distinct operations such as the following sequence:

1. A preliminary blank is cut from a gold or other metal sheet.

2. The bead or tip of hard alloy metal is attached. This is usually accomplished by fusing the bead or tip with a blow-torch, and results 15 in the softening of the blank.

3. The metal of the body of the pen point is then too soft and the blank must be separately re-rolled to acquire the proper temper.

4. The re-rolled preliminary blank is next cut 20 or trimmed to the shape of the final blank.

5. The pen points are individually stamped to shape and pierced.

6. The pen points are individually formed.

7. The pen points are individually slit for the 25 ink channel, each point requiring individual attention because no two beads or tips are uniformly attached.

8. The correct writing shape is ground on each tip separately, as again required by the non-uniformity of the beads or tips.

9. The pen points are smoothed.

In my said prior application, there is disclosed a sheet stock for use in the manufacture of pen points, which stock contains a strip of hard alloy properly positioned so that the pens may be blanked from the sheet with the writing point being taken from the strip. Thus, the individual operations of fusing the bead 3 to the pen points can be eliminated and in view of the uniformity 40 of the sheet stock, the manufacture of the pen points 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 proposed in said prior application, the labor cost 45 in the manufacture of pen points is reduced while at the same time, a more uniform and therefore superior product, results.

There is one difficulty in the use of the invention set forth in my said prior application. This 50 difficulty resides in the fact that, while the pen as blanked has the hard metal writing tip positioned therein, said writing tip is not most advantageously shaped simply as the result of the blanking operation to present the most advan- 55

tageous writing point. For example, the blanking operation leaves the tip with sharp, angular edges which are likely to "dig" in the paper unless they are first ground into the proper ball-like shape and then smoothed. Such grinding and smoothing operations are customarily accomplished only by individually handling the blanked pen points, and this introduces an undesirable labor factor into the manufacturing cost.

The present invention is similar to the invention of my aforesaid application in that it presents a sheet stock with the hard metal already associated therewith, so that the pen as blanked from the sheet stock contains the hard metal writing tip. However, it differs from my aforesaid application in that the hard metal is provided in the present application in such a shape that no grinding operation is required and only a light smoothing operation is necessary on the pen points after they are blanked from the sheet stock. Thus, by using the present invention, a still further saving in labor cost in the manufacture of pen points is accomplished.

Figures 2 and 3 illustrate one embodiment of sheet stock made in accordance with the present invention. Numeral 5 indicates a sheet or long strip of thin metal, which is ultimately to form the body of the pen points. Numeral 7 indicates a wire of metal which is to form the writing tip of the pen points, and which is welded or soldered down the strip 5 between its edges. If the sheet stock is to be used for the manufacture of high grade pens, it comprises a gold alloy of suitable fineness, or a suitable gold plated stock. The wire 7 is formed of whatever hard metal (such as iridium, or other metals of the platinum group, or alloys thereof) which is desired for the writing tip of pens. However, it is to be noted that the particular materials which form the strip 5 and the wire 7 are not of great importance in connection with the present invention. The present invention for example, is of great utility in the manufacture even of common steel pen points in which event the strip 5 may be of steel, such as stainless steel, while the wire 7 is of some relatively harder metal which is more durable as the writing point.

Fig. 3 is a perspective view indicating how the individual pen points are blanked from the sheet stock. It will be seen that the writing tips are so positioned that they are formed from a section of the wire 7. Because of the shape of the wire 7, this means that the tips will have a cylindrical surface. This type of surface closely corresponds to a ball, which is acknowledged to be the most advantageous form for the writing tip.

In Fig. 3, for the sake of clarity in illustration, the writing tips of the blanks are shown as considerably wider than they actually would be made in practice, relative to the other dimensions of the blank.

Fig. 4 is an enlarged cross sectional view illustrating how the wire 7 is affixed or secured to the sheet stock or strip 5. Numeral 9 indicates the region of the joint between the wire and the strip. This joint may be made of a suitable solder, or it may comprise metal from the wire 7 or the strip 5 autogeneously joining the two together. A convenient method of securing the wire 7 to the strip 5 is indicated diagrammatically in Fig. 7. This comprises a method using a strip-welding apparatus, which comprises a pair of pressure rollers 11 and 13. The rollers 11 and 13 are connected in an electrical circuit, in series with a

source of power 15 and a circuit interrupter 17. As indicated in Fig. 7, the sheet 5 and wire 7 are fed together between the rollers 11 and 13. The current intermittently heats the juxtaposed wire and strip, and welds them together in a substantially continuous spot-welding.

Fig. 5 illustrates an alternative embodiment of the invention wherein the wire 7, instead of being of a full circular cross section is semi-circular in cross section.

Still a further embodiment of the invention, and one which comes closest to achieving a true ball-point on the blanked pens, is shown in Fig. 6. Here the wire 7 is of general semi-circular cross section, as in the Fig. 5 embodiment, but it is beaded to form a series of spaced, substantially hemispherical beads 19. The beads 19 are spaced from each other at a proper distance so that upon subsequent stamping the blanks from the sheet stock, they are located at the tips of the blanks. It is to be noted that with this form of the invention it is desirable that there be a coordination between the operation of the dies for the blanking operation and the longitudinal positioning of the sheet stock in the blanking machine so that the blanking die does not split one of the beads 19 through its center.

It will be seen that pen points blanked from the Fig. 6 stock are thus automatically provided with a ball writing point.

Because the hard metal that is to constitute the writing tip of the pen point is already in proper shape and position on the composite sheet, automatic manufacturing operations may be employed. Contrasted to the long list of necessarily manual operations set forth above, pen points may be manufactured from the sheet stock of the present invention in the following fully automatic operations:

1. Blanking, forming, piercing, and stamping the pen points with progressive dies.
2. Slitting the pen points.
3. Smoothing the pen points.

The saving in labor is very good.

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 for the manufacture of pen points comprising a relatively broad area of a metal of a character adapted to constitute the body of the pen points and a wire of another metal of a character adapted to constitute the tip of the pen points rigidly secured along the face of said broad area of metal.

2. A sheet stock for the manufacture of pen points comprising a relatively broad area of a metal of a character adapted to constitute the body of the pen points and a wire of another metal of a character adapted to constitute the tip of the pen points rigidly secured along the face of said broad area of metal, said wire having a circular cross section.

3. A sheet stock for the manufacture of pen points comprising a relatively broad area of a metal of a character adapted to constitute the body of the pen points and a wire of another metal of a character adapted to constitute the

tip of the pin points rigidly secured along the face of said broad area of metal, said wire having a semi-circular cross section.

5 4. A sheet stock for the manufacture of pen
points comprising a relatively broad area of a
metal of a character adapted to constitute the
body of the pen points and a wire of another
metal of a character adapted to constitute the
10 tip of the pen points rigidly secured along the
face of said broad area of metal, said wire being
beaded along its length.

15 5. The method of manufacturing pen points
having relatively hard-metal writing tips com-
prising providing a sheet stock in the form of a
sheet of metal adapted to become the body of
the pen point with a wire of relatively hard
metal adapted to become the writing tip of the
pen point secured along a surface of said sheet,
20 blanking the pen point from said stock in such
manner that the body thereof is taken from said
sheet and the writing tip is simultaneously taken
from said wire, and thereafter merely slitting
and polishing the writing tip in order to bring it
to final, usable form.

25 6. A sheet stock adapted to be manufactured
into pen points comprising a relatively broad
area of thin, resilient metal adapted to consti-
tute the bodies of the pen points, and a narrow
stripe of relatively harder metal adapted to con-
30 stitute the final writing tips of the pen points
rigidly secured to the said area, said stripe having

a cross section such that it projects beyond the surface of the aforesaid broad area.

7. A sheet stock adapted to be manufactured
into pen points comprising a relatively broad area
of thin, resilient metal adapted to constitute the
5 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, said stripe having a cross sec-
tion such that it projects beyond the surface of
10 the aforesaid broad area, said projecting cross
section being generally semi-circular.

15 8. The method of manufacturing pen points
having relatively hard-metal writing tips com-
prising 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, said stripe having
a cross section such that it projects beyond the
20 surface of the sheet metal, 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, the projecting stripe providing ex-
25 cess thickness in the region of said writing tip
in the blanked pen point, and thereafter merely
shaping, slitting and polishing the writing tip in
order to bring it to final, usable form.

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