May 23, 1939. L. H. ASHMORE 2,159,003

MANUFACTURE OF WRITING PENS

Filed May 28, 1938

Fig. 1.

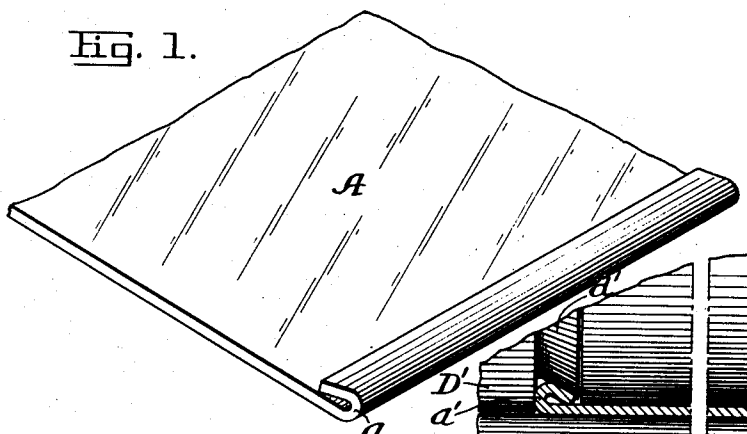

Fig. 2.

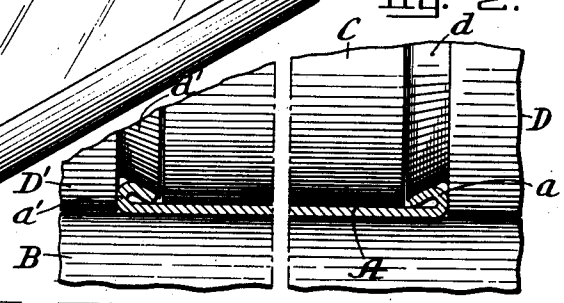

Fig. 3.

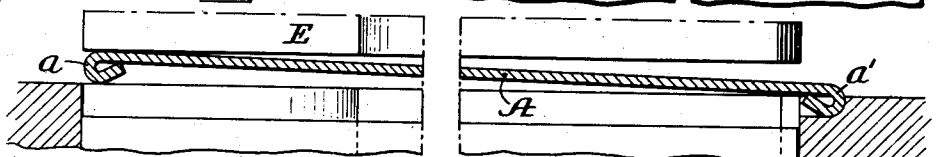

Fig. 4.

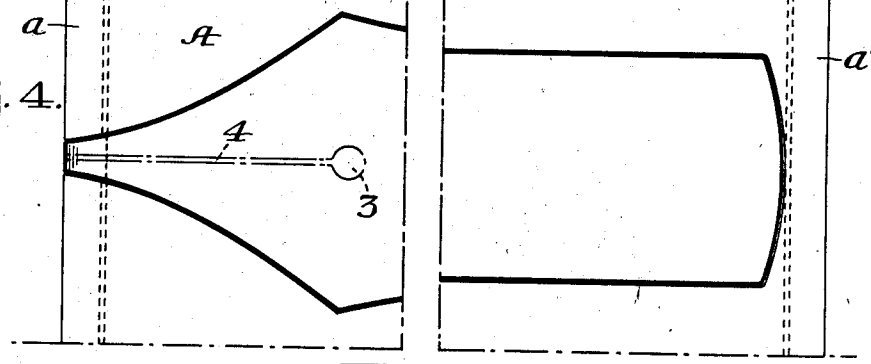

Fig. 5.

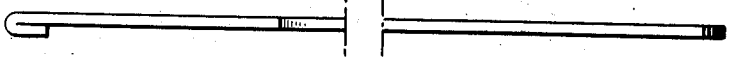

Fig. 6.

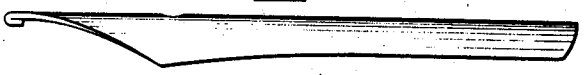

Fig. 7.

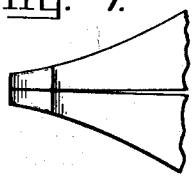

Fig. 8.

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UNITED STATES PATENT OFFICE

2,159,003

MANUFACTURE OF WRITING PENS

Leon Hehl Ashmore, Collingswood, N. J., assignor to The Esterbrook Steel Pen Manufacturing Co., Camden, N. J., a corporation of New Jersey

Application May 28, 1938, Serial No. 210,758

4 Claims. (Cl. 113—32)

My present invention, which relates to the manufacture of steel writing pens and/or pen points, is in the nature of an improvement in the manufacture of articles of this type as set forth in my prior Patent No. 2,037,699, dated April 21, 1936, which discloses a pen and/or pen point provided with a thickened writing tip end made from blanks die-cut from thin metal pen stock having a pre-formed turned or folded edge portion which is relatively narrow; is in close engagement with the body of the stock and subsequently forms the writing tip end of a pen or pen point produced from such stock.

In accordance with the method of manufacture set forth in said patent the pens or pen points are made from blanks die-cut from such metal stock whose relatively narrow pre-formed turned or folded edge portion has been flattened and compressed into close and permanent engagement with the body of the stock before the blanks are cut or stamped therefrom. The marginal edge of the folded portion may be substantially semicircularly curved and the part accompanying the blank when the latter is stamped from the pre-formed stock is that which forms the writing tip end of the finished pen and/or pen point.

I have found in preparing the thin metal stock from which pens and/or pen points designed to have a writing tip end composed of a tightly compressed and closely folded portion of the metal are produced, that it is unnecessary to effect a complete folding or close contact of the narrow portion of the metal subsequently forming such writing tip end of the pens or pen points prior to stamping or cutting the blanks therefrom. In carrying out my present invention it is only necessary to fold or turn over the desired narrow portion of the edge of the stock into relative engagement with the main portion of the same and without actual engagement therewith, and that the final close folding and/or compression and intimate permanent engagement of such narrow folded portion with body of the blank in the form that the writing tip end of the finished pen point shall possess, may be effected during the operation of cutting or stamping blanks from the strip of thin metal stock with such preformed and partially folded or turned-over edge.

These and other features of my invention are more fully described hereinafter; reference being had to the accompanying drawing, more or less diagrammatic in character, in which:

Figure 1 is a fragmentary perspective view of a section of thin strip metal stock prepared in accordance with my present invention and from which blanks to form my improved pens and/or pen points may be cut or stamped in the usual manner.

Fig. 2 is a fragmentary view showing the manner in which the metal stock may be finally rolled or otherwise operated upon to provide the turned-over or bent edge portion which will be disposed at the end of the blank subsequently becoming the writing tip end of the finished pen/or pen point.

Fig. 3 is a view in elevation, partly in section, showing the manner in which blanks to form my improved pens and/or pen points may be die-cut from metal stock of the character illustrated in Fig. 1.

Fig. 4 is a plan view, partly broken away; showing the manner of cutting one form of blank from the improved metal stock forming the subject of my invention.

Fig. 5 is an edge view of the blank shown in Fig. 4.

Fig. 6 is a side elevation of a finished pen or pen point.

Fig. 7 is a plan view of the underside of the nibs at the writing tip end of the pen or pen point and

Fig. 8 is a front elevation of the writing tip end of the finished pen point on the same scale as Fig. 7.

In carrying my invention into effect, thin strip metal pen stock is prepared by a deforming or upsetting operation which results in the folding or turning over of a narrow edge portion of the same against the body of the stock and in relative engagement therewith; such turned over edge subsequently becoming the writing tip end of a pen produced from such stock. In practice, in preparing this stock, both edges of the strip of metal operated upon will be turned inasmuch as such operation will insure an equal strain or tension upon the metal and produce at one edge—which may be either edge—the formation desired. The exact form of the opposite edge is not important since such part of the metal strip is waste. This stock may be of any suitable metal, and I have operated upon thin strip metal of the type familiarly known as "stainless steel", whose composition is more or less well known; preferring to employ that form of stainless steel which contains a small percentage of molybdenum.

Fig. 1 shows a fragmentary perspective view on a somewhat enlarged scale of a section of thin strip metal stock with a rolled, turned or folded-over edge portion, and from which my improved

pens or pen points may be made; such pens or pen points in their finished state being of the same character as those described in my prior patent. In this view the thin metal stock is indicated at A, and the turned, rolled or folded-over edge that is to become the writing tip end of the pen or point, is indicated at *a*.

Fig. 2 shows the relation of final rolls or other means which may be employed in the preparation of stock of the character shown in Fig. 1. In rolling this stock, it is desirable to produce rolled, folded-over or turned portions at each edge of the same and the edge of the stock opposite the edge that is to form the thickened writing tip end of the finished pen or pen point, is indicated at *a'*. In the roll assembly illustrated in Fig. 2, B represents an under roll, and C an upper roll; both in engagement with the broad portion of the thin stock A. At the ends of the rolls C and turning on the same axis, are rolls or roll portions D, D', each provided with an annular recess *d*, *d'*, which is shaped to control the final extent of the turned-over or rolled edge portion *a* and/or *a'*, of the thin strip stock indicated at A. While Fig. 2 illustrates one manner of partially turning over an edge of the thin metal stock into the position desired and out of permanent contact with the body of the stock, it will be understood that other means of producing a rolled or turned over edge of the character shown may be employed without departing from my invention. It will also be understood that the roll assembly illustrated in Fig. 2 may be changed as desired to produce a turned over edge of the character illustrated in Fig. 1.

Blanks for the production of pens and/or pen points may be cut or stamped from stock of the character illustrated in Fig. 1, in the manner illustrated in Figs. 3 and 4, wherein the turned or folded edge portion *a* is shown as being at the underside of the stock while being blanked. In addition the die mechanism includes a recess receiving the turned edge *a'* of the stock which forms a part of the waste after the blanks have been cut. Pens having straight nibs are usually blanked in lines at right angles to the edges of the stock, as indicated in Fig. 3, while stub pens, whose ends are usually disposed diagonally with respect to the longitudinal axis of the pen may be blanked from this stock in such diagonal relation. The manner of blanking pens or pen points is fully illustrated in my prior patent.

In this blanking operation, the die E cuts entirely through the turned or folded portion *a* at the edge of the stock and, due to the pressure exerted and the ductility of the metal operated upon, which is preferably stainless steel, the turned or rolled edge portion *a* which is shown in Figs. 1, 2 and 3 as being substantially out of contact with the body of the stock is brought into close and permanent engagement therewith, as clearly illustrated in Fig. 5, when the die reaches the limit of its cutting and pressing operation; a condition that is maintained in all further operations upon such blanks in the production of my improved pen points therefrom.

After the blanks have been cut from the stock, they may be pierced as indicated at **3**; slit, as indicated at **4**, and then shaped or raised to the desired curvature by the usual means, which latter operation brings the ends of the nibs into proper relation at the writing tip end of the pen. They are complete pens from these operations, and they may be finished in the usual way by rumbling. The rumbling action removes any fins left from the blanking operation. As the sides of the nibs at the forward ends of the same are on a substantially semi-circular curve, all angular portions at the sides of these ends round quite readily under the rumbling action, and the final condition of the pen is substantially that illustrated in Fig. 6. The finished writing tip end is illustrated in Figs. 7 and 8.

A pen point made in accordance with my invention from flat strip metal stock prepared with a partially folded or turned edge portion which is brought into close engagement with the body during the blanking operation provides initially the desired thickened end with a curved surface from which end the smooth writing point is developed; no further manipulation of such nib end being necessary after the pen has been blanked. By reason of this, the steps of manufacture have been greatly reduced, the production of my improved pen points simply requiring blanking, piercing, slitting and raising, and the usual finishing.

When these pens are made of stainless steel, the operation of turning or folding the edge portion of the stock and the compression into close engagement during the blanking operation tends to harden such turned portion, thereby increasing the wearing qualities of the writing tip end of the pen. This work-hardening effect is concentrated at the point of greatest wear, to wit: the thickened portions of the nibs which contact the paper.

The stock from which my improved pens are made may be of any gauge commonly employed in the manufacture of pens, and the amount of turned or folded portion may be anything desired or necessary to form a thickened end of proper dimensions.

The preparation of the flat metal stock to provide the same with the desired turned or folded edge is a continuous operation, and such turned or folded edge portion is rolled into relative engagement with the body of the stock in such position that it may be compressed into close contact with the end of the blank for full width thereof during the blanking operation; insuring the desired thickened writing tip at the ends of pens and/or pen points made therefrom and permitting the production of pens and/or pen points with such thickened writing tip end from any portion of such turned or rolled edge portion of the stock.

Inasmuch as the work incidental to turning or folding the edge of a section of stainless steel has a tendency to harden the thickened edge thus produced, the manufacture of pens and/or pen points of this particular character from flat stainless steel stock so prepared is an important feature of my invention, since such material will give a pen or pen point having a thickened writing tip end highly resistant to wear.

It will be understood, of course, that the character of the roll assembly illustrated in Fig. 2 may be changed, if desired, so long as the operation effected by the rolls produces the character of turned edge illustrated in Fig. 1, which is to be flattened into intimate and permanent engagement against the strip in the cutting or stamping of pen blanks from such metal.

Various modifications may be made in the foregoing embodiment of my invention without departing from the spirit and scope thereof as set forth in the appended claims.

I claim:

1. In the preparation of blanks from metal

stock for the production of pen points and the like, the steps of first bending an edge portion of a strip of thin metal to form a narrow non-contacting flange overlying the main body of the metal strip, and die-cutting blanks from such flanged stock and simultaneously compressing the flanged portion of the same into intimate and permanent contact with the body of the strip to provide a thickened portion for the nib end of the pen or pen point raised from such blank.

2. In the preparation of blanks from metal stock for the production of pen points and the like, the steps of first bending an edge portion of a strip of thin stainless steel to form a narrow non-contacting flange overlying the main body of the stainless steel strip, and die-cutting blanks from such flanged stock and simultaneously compressing the flanged portion of the same into intimate and close contact with the body of the strip to provide a thickened portion for the nib end of the pen or pen point raised from such blank.

3. In the preparation of blanks from metal stock for the production of pen points and the like, the steps of first bending edge portions of a strip of thin metal to form narrow non-contacting flanges overlying the main body of the metal strip, die-cutting blanks from such stock including one of said flanged edges and simultaneously compressing said flanged edge portion into intimate and permanent contact with the body of the strip to provide a thickened portion for the nib end of the pen or pen point raised from such blank.

4. In the preparation of blanks from metal stock for the production of pen points and the like, the steps of first bending edge portions of a strip of thin stainless steel to form narrow non-contacting flanges overlying the main body of the stainless steel strip, die-cutting blanks from such stock including one of said flanged edges and simultaneously compressing said flanged edge portion into intimate and close contact with the body of the strip to provide a thickened portion for the nib end of the pen or pen point raised from such blank.

LEON HEHL ASHMORE.