

Dec. 19, 1939.

D. KAHN

2,183,573

PRODUCTION OF PENS

Filed Jan. 18, 1936

2 Sheets-Sheet 1

Fig. 1.

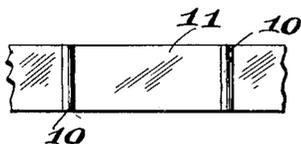


Fig. 2.

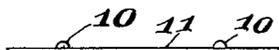


Fig. 3.

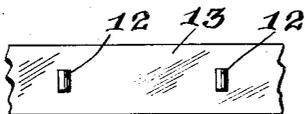


Fig. 4.

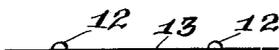


Fig. 9.

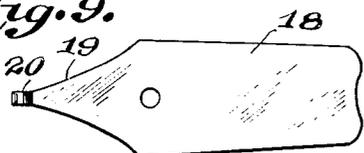


Fig. 10.

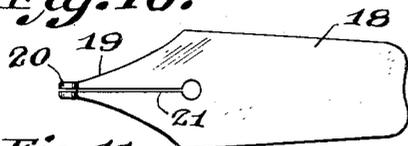


Fig. 11.



Fig. 12.

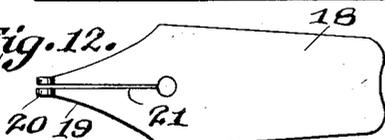


Fig. 12.^a

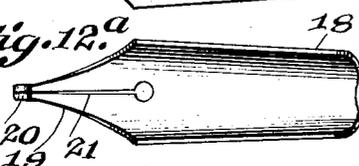


Fig. 5.

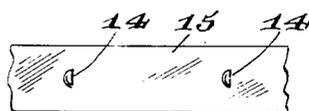


Fig. 6.

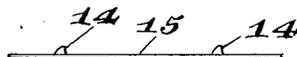


Fig. 7.

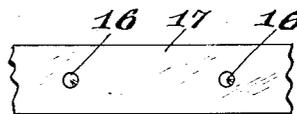


Fig. 8.



Fig. 13.

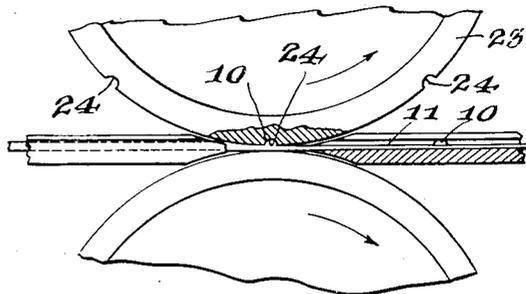
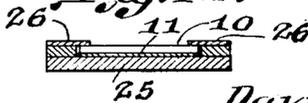


Fig. 14.



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PRODUCTION OF PENS

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2 Sheets-Sheet 2

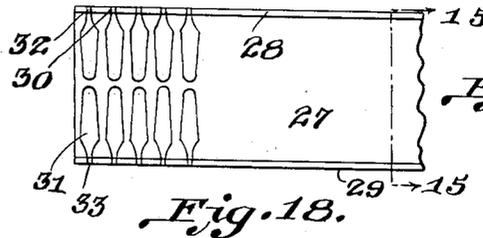
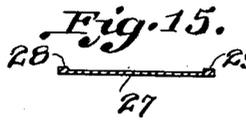


Fig. 17.

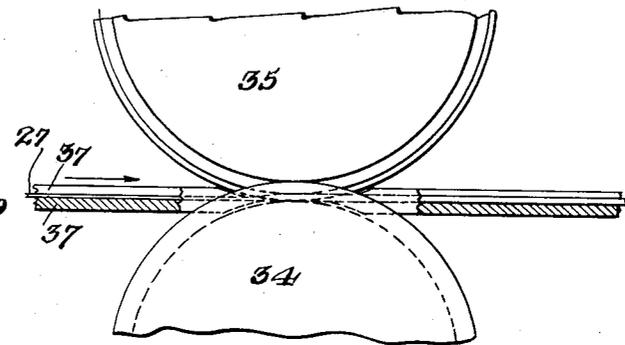
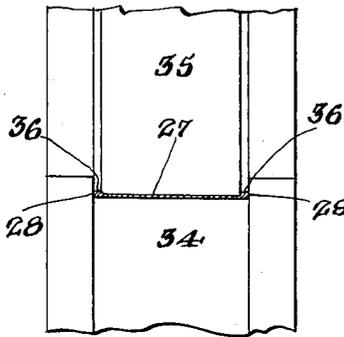


Fig. 19.

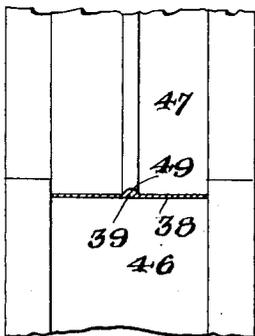


Fig. 20.

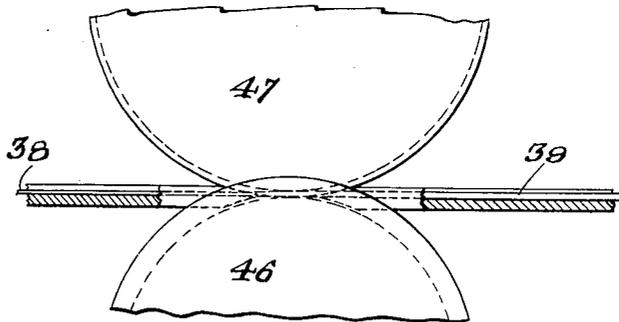
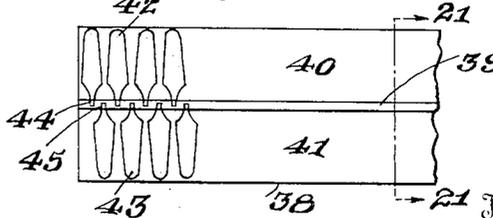


Fig. 22.



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UNITED STATES PATENT OFFICE

2,183,573

PRODUCTION OF PENS

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Application January 13, 1936, Serial No. 59,768

10 Claims. (Cl. 113—32)

This invention relates to pens and has special reference to a pen and method of manufacturing the same.

In the production of pens for smooth writing, it is quite common to provide on the pen tip, where it contacts with the paper, a rounded contacting surface commonly termed a "ball". Such points are frequently referred to as "tipped" or "ball pointed pens."

In the more expensive pens, such as gold pens, these balls are usually made of some very hard material, such as iridium, and are soldered in place. Cheaper pens, such as steel pens, have been devised in which the ball is formed in different ways. For instance, the ball in one such pen is formed by bending the tip back and under to form what is known as a "ball" point. In another form, wings are provided, one on each side of the tip, and these wings are bent down to lie parallel to each other. Pens formed in the latter manner do not possess the firm or smooth writing quality so characteristic of the solid ball.

In still another form of such pens, the thin metal strip from which the pen blank is cut is rolled or stamped to force some of the metal out of the plane of the body of the strip in the form of a small hollow projection, the blank being then cut so that this hollow projection forms the point, which is known as a "bowl point." Here again, it is impossible to obtain the smooth or fine writing point so characteristic of the solid ball point, which, after all, forms the most satisfactory point.

One important object of the present invention is to provide a novel method of manufacturing pens with ball points, wherein the strip is so rolled as to provide a solid projection on that face which becomes the inner face of the pen when the manufacture is complete, the other face of the strip being preferably maintained as a substantially plane surface.

A second important object of the invention is to provide a novel form of pen having a ball formed integrally with the tip throughout its base. That is to say, the ball is formed without any bending down or under of projecting parts, but is an integral part of the strip from which the pen is formed.

With the above and other objects in view, as will become clear as the present description progresses, the invention consists in general of certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawings and specifically claimed.

In the accompanying drawings, like characters of reference indicate like parts in the several views, and:

Figure 1 is a plan view of one form of the strip, after rolling, to provide the ball-forming projections.

Figure 2 is an edge view thereof.

Figure 3 is a plan view of a second form of such strip.

Figure 4 is an edge view of the second form.

Figure 5 is a plan view of a third form of such strip.

Figure 6 is an edge view of this third form.

Figure 7 is a plan view of a fourth form of the strip.

Figure 8 is an edge view of the fourth form.

Figure 9 is a plan view from the underside of a pen blank as cut from the strip, the view being to an enlarged scale.

Figure 10 is a plan view of the pen blank, after it has been cut on parallel lines and before the free ends of the nibs have sprung apart.

Figure 11 is an edge view of the blank shown in Fig. 10.

Figure 12 is a view from the inner side of the blank after it has been slitted and the nibs have sprung apart.

Figure 12a is a view from the inner side of the completed pen constructed in accordance with the present invention.

Figure 13 is a view showing the manner of rolling such a strip as is used in connection with this invention.

Figure 14 is a cross section through the guide used in rolling the strip.

Figure 15 is a cross sectional view taken on the line 15—15 of Fig. 16, of a strip after rolling, said strip being provided with opposed marginal ribs.

Figure 16 is a plan view showing the stock with the oppositely disposed marginal ribs being blanked.

Figure 17 is an end view of the stock passing through the rollers.

Figure 18 is a side view of the same.

Figure 19 illustrates a further modification of the invention in which the stock is being passed between rolls to provide the stock with a central rib.

Figure 20 is a side view showing the manner of rolling the strip.

Figure 21 is a cross sectional view of the strip taken on line 21—21 of Fig. 22, showing the central rib.

Figure 22 is a plan view showing the stock with the central rib portion being blanked.

In the construction of pens in accordance with the present invention, preferably the stock is of sufficient thickness to form the necessary ball of the pen, for example .035 of an inch thick. The stock is passed through rollers so as to form ribs of substantially the thickness of the stock while rolling down the remainder of the pen stock to provide a considerable thinner body portion suitable for the pen body, as for example to the thickness of about .010 of an inch thick.

As shown in Fig. 1, the rolling provides a series of transversely extending ribs 10 of segmental cylindrical form, between which is thin pen body material 11. In this form the ribs run from one edge of the strip to the other. In the form shown in Figures 3 and 4, the ribs are indicated at 12 and are short ribs which project from body stock 13, these short ribs being also of substantially segmental cylindrical form. In the form shown in Figures 5 and 6, the ball forming projection is semi-circular in plane as at 14 and the remainder of the stock 15 is rolled thin to provide for forming the body of the pen. Similarly, in the form shown in Figures 7 and 8, each projection is hemispherical in shape, so that it is circular in plane and the stock 17 is rolled down to pen body thickness. It will be noted that in each of these forms, the projection is rounded longitudinally of the strip.

Using any one of these strips for the purpose, the stock is run through a blank cutting machine to cut a blank, the body of which is shown at 18 in Figure 9, and this blank is so cut that the tip 19 includes at least a portion of the width of the projection to form a ball 20. In such cases as are shown in Figures 5 and 7, the ball 20 may be formed from the whole projection (14 in Figure 5 and 16 in Figure 7) if a coarse pen is desired. If, on the contrary, a fine pen is desired, the ball will be cut only from a portion of such projection. The pen is then finished by pressing the blank into a hollow trough-shaped form, as is usual in pens, and providing a slit 21 at its forward end, this slit passing through the ball to divide it into two portions, as clearly shown in Figure 10. The slit 21 may be made by cutting along parallel lines, as shown in Figure 10, the double edge cutter being preferably employed. The blank is confined while making the cut, and when it is released from confinement, the slit assumes the form shown in Figure 12, the free ends of the nibs having sprung apart, due to the resilience of the pen metal. In this manner, a triangular opening is formed with the base of the triangle at the base of the nibs. The nibs may be brought together in any suitable manner, as shown in Figure 12, and again a triangular opening is formed, but the base of the triangle is at the pierce hole. The pen may be then plated or lacquered, or otherwise finished, as desired.

In making the above referred to pen point, the stock as shown in Figure 13, is passed between a flat smoothly cylindrical roller 22 and a roller 23 having grooves or depressions 24 at intervals around its periphery. These two rollers are so spaced as to roll the original stock, which may be about .035 inch thick, preferably in one pass through the rolls down to pen body thickness, which may be about .010 inch, while leaving the stock raised at spaced intervals, as shown in Figures 1 to 8 inclusive.

To insure the stock travelling in a straight line between the smooth and grooved rollers, the stock

is guided over a plate 25, as shown in Figure 13, said plate being provided with overhanging lips 26 extending along its side. The stock in passing through the roller is held beneath the lips 26 and the guide is wide enough to permit the necessary expansion.

In the form of the invention set forth in Figures 1 to 8 inclusive, the stock is shown formed with a convex ball-forming projection made by passing through a roller having a groove or concavity. It is within the spirit of the present invention to make the grooves on the upper roller convex so as to produce a concave groove in the stock, the metal forced out from the material of the stock when the concave groove is formed appearing on the reverse side of the stock as a convex projection.

In the form of the invention shown in Figures 15 to 18 inclusive, the stock 27 is rolled to provide oppositely disposed ribs 28 and 29 projecting from the thin body portion material, said ribs being adjacent the marginal edges of the stock and of such size and shape as to be adapted to form the balls of the finished pens. The ribs 28 and 29, which are preferably of substantially segmental cylindrical form, run longitudinally of the stock.

The stock 27 is preferably of such a width that two sets of blanks may be cut therefrom, as shown in Figure 16. It is to be noted that the oppositely disposed blanks 30 and 31 are cut from the stock 27, the points 32 and 33 of the pens being formed, respectively, from the oppositely disposed ribs 28 and 29. The pens are finished by forming, as heretofore set forth, and by slitting, as shown in Figures 11 and 12.

In any of the forms of the basic invention herein set forth, it is within the spirit of the invention to slit first and then form.

In forming the ribs 28 and 29, the stock 27 is passed between the flat smoothly cylindrical roller 34 and the roller 35 provided at its marginal edges with grooves 36 substantially of the size, shape and contour of the desired ribs 28 and 29. As the stock, which may be advantageously about .035 of an inch, passes through the rolls, the original thickness being substantially retained only at the marginal edges to form the ribs 28 and 29, while the intermediate portion is reduced to provide a considerably thinner body, as for example, about .010 of an inch. Guide members 37 facilitate the passage of the stock through the rollers.

In this form of the invention, it is within the spirit thereof to make the rib portions 28 and 29 of less thickness than the original thickness of the stock, while greatly decreasing the thickness of the intermediate portion of the stock which forms the pen body.

While it is preferred to form the ribs 28 and 29 and reduce the intermediate portion of the stock to the necessary thinness in one pass through the rolls, the stock may be passed through the rolls several times, if it is necessary, to properly form and proportion the rib members relative to the remainder of the stock and/or to provide the necessary thinness of the pen body portion.

In the form of the invention shown in Figures 19 to 22 inclusive, the stock 38 has formed centrally thereof a projecting rib 39, said rib being of such a size and shape as to be adapted to form the balls in the finished pens. On each side of the rib 39 are the pen body portions 40 and 41. The width of each of these pen body

portions is sufficient to allow oppositely disposed sets of blanks 42 and 43 to be cut therefrom, the rib portion 39 forming the ball points 44 and 45 of each pen. The pens are finished by forming and slitting, as shown in Figures 10, 12 and 12a.

In making the central rib 39, the stock is passed between the flat smoothly cylindrical roller 46 and the roller 47 provided with a central groove 49 of substantially the size, shape and contour of the central rib 39. Here again, the central rib 39, which is the potential ball-forming material, may be of less thickness than the original thickness of the stock 38, and, if desired, it may be made of greater thickness than the original thickness of the stock. The stock is, of course, reduced in thickness as it passes through the rolls, as for example from .035 of an inch thick to .010 of an inch thick.

The present invention provides a method of making a pen in which the pen stock is reduced, preferably, in one pass through the rollers from its original thickness to that thickness which is required for the final pen body, with the exception that ribs or projections are provided which finally form the point of the pen. Where in rolling the stock it is not possible to reduce it to the proper thickness for the pen body in one pass, the stock may be passed through the rollers again.

The present invention is particularly applicable to the production of pens from chrome steel or stainless steel. However, the invention may be applied to other metals, such as gold, silver, brass, copper or alloys containing said metals or other metals or metal alloys commonly used in the manufacture of pens.

While it is preferred to have the ribs substantially of the original thickness of the metal stock, this is the preferred thickness of the ribs or projections, and it is within the spirit of the present invention to make the ribs or projections less than the original thickness of the stock, and in many cases, by suitable procedure, these ribs may be greater than the original thickness of the stock.

In accordance with the present invention, the stock is continuously passed between the rollers to produce a continuous supply of pen point blanks having ribs or projections of substantially the thickness of the original stock. The rolled material is, therefore, provided with a multiplicity of potential blanks each having a raised portion which serves for the formation of the ball of the pen.

With pens of the character herein set forth, very smooth writing is accomplished and there is no loss incurred from breakage, due to bending of the very small tip end. Also, the manufacture can be carried out very rapidly and economically.

It is obvious that changes may be made in the form and construction of the pen and in the method of manufacture without departing from the material principles involved. It is not, therefore, desired to confine the invention to the exact form of article and method of manufacture herein set forth, but it is desired to include all such as come within the scope claimed.

In the claims, the term "metal" is intended to include metals or alloys thereof.

This application is a continuation in part of copending application Serial No. 45,664, filed October 18, 1935, for Method of making pens, and strip for pen blanks.

I claim:

1. The method of making pens having a solid

ball point comprising producing a ball-forming projection composed of a solid integral mass of stock metal substantially the shape of the said solid ball point on one face of metal stock of substantially the original thickness of the stock while reducing the stock to a thickness suitable for the pen body, cutting blanks from the stock with the ball-forming projection cut to form the point portion of the pen, and forming a finished pen therefrom with the ball projection at the point on the inner side of the arc of curvature.

2. The method of making pens having a solid ball point comprising forming on one face of metal stock ball-forming ribs of substantially the original thickness of the stock, each rib being of substantially the shape of the said solid ball point, while reducing the remainder of the stock to a thickness suitable for the pen body, cutting blanks from the stock with the ribs cut to form the point portion of the pen, and forming a finished pen therefrom with the ribs at the point on the inner side of the arc of curvature.

3. The method of making pens having a solid ball point comprising forming a ball-like rib composed of a solid integral mass of stock metal substantially the shape of the said solid ball point centrally of one face of metal stock while maintaining the other face of the stock as a plane surface, cutting blanks from the stock with the central rib cut to form the point portion of the pen, and forming a finished pen with the rib at the point on the inner side of the arc of curvature.

4. The method of making pens having a solid ball point comprising forming a central rib shaped to form the said solid ball point on one face of metal stock, said central rib being of substantially the original thickness of the stock while reducing the remaining portion of the stock to a thickness suitable for the pen body, cutting blanks from the stock with the central rib cut to form the point portion of the pen, and forming a finished pen therefrom with the rib at the point on the inner side of the arc of curvature.

5. The method of making pens having a solid ball point comprising forming a ball-like rib composed of a solid integral mass of stock metal substantially the shape of said ball point centrally of one face of metal stock while maintaining the other face of the stock as a plane surface, cutting blanks from the stock on each side of the central rib with the central rib cut to form the point portion of the pen blank, and forming a finished pen with the rib at the point on the inner side of the arc of curvature.

6. A blank strip for pens having a body of substantially the thickness of the pen body portion of a finished pen and having a relatively thick ball-forming rib extending centrally of the strip and substantially the shape of the ball of a finished pen, and composed of a solid mass of stock metal integral throughout its base with the remainder of the stock.

7. The method of making pens having a solid ball point from metal stock comprising reducing the thickness of a part of the metal stock to the thickness of a pen to produce a ball-forming projection composed of a solid integral mass of stock metal substantially the shape of the said solid ball point on one face of the stock, cutting pen blanks from the stock with the ball-forming projection positioned to form the point portion of the pen and forming the finished pen therefrom with the ball projection at the point thereof.

8. The method of making pens having a solid

ball point from metal stock comprising reducing the thickness of a part of the metal stock to the thickness of a pen to produce ball-forming ribs longitudinal of the stock and composed of a solid integral mass of stock metal substantially the shape of the said solid ball point on one face of the stock, cutting pen blanks from the stock with the ball-forming ribs positioned to form the point portion of the pen and forming the finished pen therefrom with the ball ribs at the point thereof.

9. The method of making pens having a solid ball point from metal stock comprising reducing the thickness of a part of the metal stock to the thickness of a pen to produce ball-forming ribs longitudinal of the stock and composed of a solid integral mass of stock metal, said ribs being spaced one from the other and substantially the shape of the said solid ball point on one face of the stock, cutting pen blanks from the stock with

the ball-forming ribs positioned to form the point portion of the pen and forming the finished pen therefrom with the ball ribs at the point thereof.

10. The method of making pens having a solid ball point from metal stock comprising flowing a part of the metal adjacent one face only of the metal stock while maintaining unchanged the position of a relatively small section corresponding in shape to the ball of the finished pen, the metal in said section thus forming a ball projection homogeneously integral with the remainder of the stock, the other face of the stock being simultaneously maintained as a plane surface, cutting blanks from the stock with the ball forming projection positioned to form the writing tip portion of the pen and forming the finished pen therefrom with the ball projection at the point thereof.

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