Dec. 29, 1931. F. J. VLCHEK 1,838,470

MANUFACTURE OF SWAGED AND TEMPERED ARTICLES

Filed April 5, 1926 2 Sheets-Sheet 1

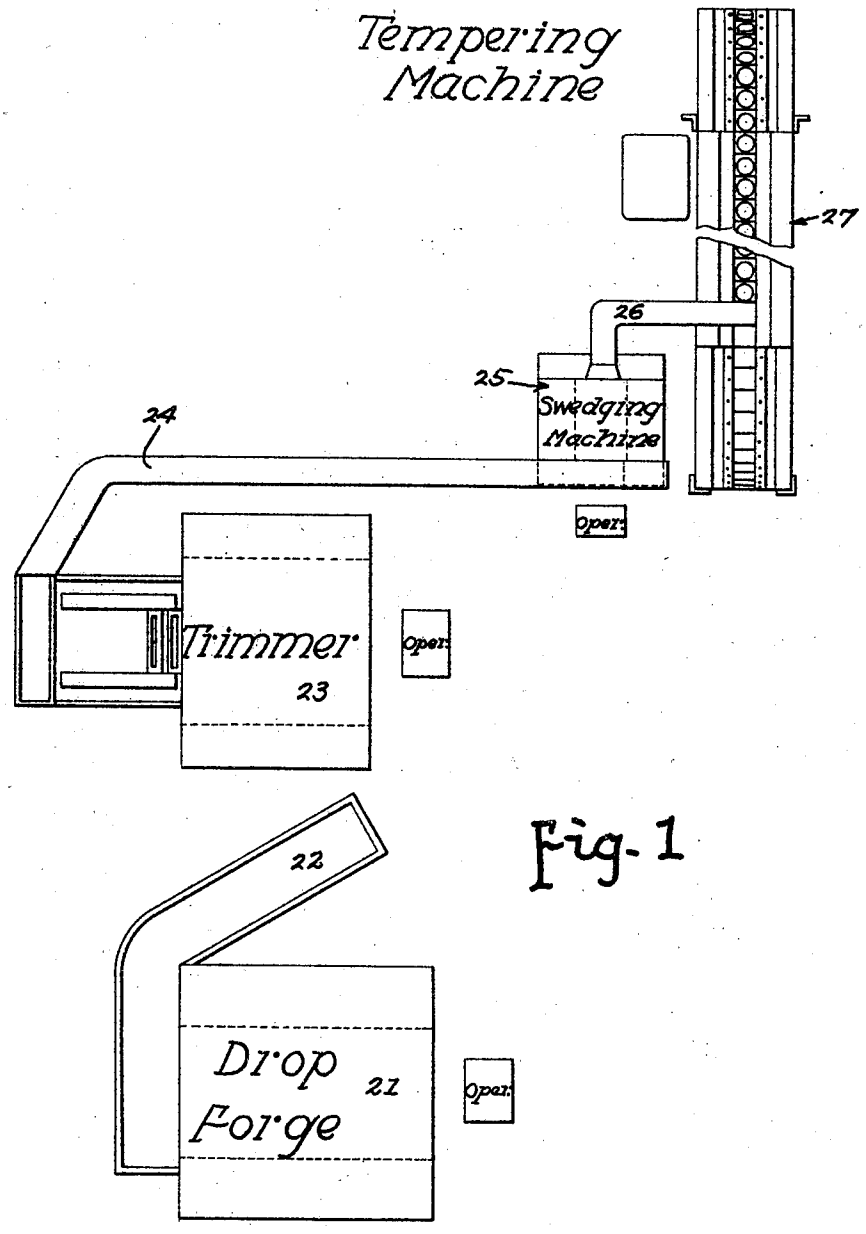


Fig. 1

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Fig. 2



Fig. 3

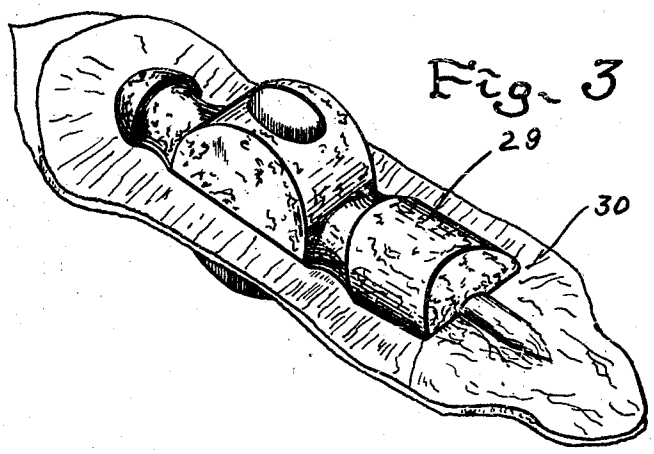
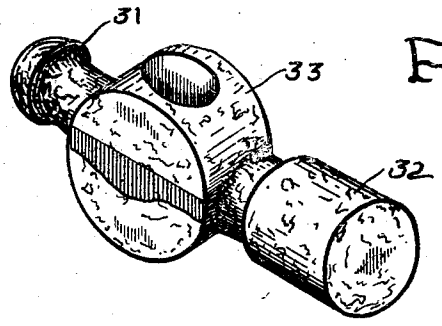


Fig. 4



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Patented Dec. 29, 1931 1,838,470

UNITED STATES PATENT OFFICE

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MANUFACTURE OF SWAGED AND TEMPERED ARTICLES

Application filed April 5, 1926. Serial No. 99,822.

My invention relates to the manufacture of swaged and tempered articles, and the principal object of my invention is to provide new and improved process for the manufacture of such articles. In the drawings accompanying this specification and forming a part thereof I have shown, for purposes of illustration, one form which my invention may assume, and inasmuch as my invention is particularly effective for the manufacture of machinists' hammer heads, I have selected for illustration herein an embodiment of my invention peculiarly adapted for that purpose. In these drawings:

Figure 1 is a view in the nature of a layout showing the positioning and co-ordination of the units employed in practicing the process,

Figure 2 is a perspective view of a bar of material from which the article is made,

Figure 3 is an enlarged perspective view of the article as it appears after the forging operation has been completed, while

Figure 4 is a reduced perspective view of the article after the swaging and tempering operations have been completed.

According to the embodiment of my invention herein described, and illustrating with a machinist's hammer head as the article being manufactured, the hammer head is formed in a drop forge unit 21 in the usual manner, is delivered into a chute 22 which carries the roughly formed hammer head into proximity to the trimming unit 23, is acted upon by the trimming unit 23 to remove the flange formed by the drop forge 21 and thus present the hammer head ready for swaging, is delivered to a suitable conveyor 24 which carries it into proximity to the swaging unit 25, is acted upon by the swaging unit 25 to complete the formation of the article, is inserted into a chute 26 leading to the tempering unit 27, and is acted upon by the tempering unit 27 to secure the desired hardening, the entire process being continuous, without interruption, with the hammer head retaining the original heat applied prior to the drop forging operation, and without the hammer head being reheated at any point or to any extent.

The drop forge unit 21 and the trimming unit 26 may be standard machines of any suitable type, the chute 22 is a simple chute of the type heretofore used, and the conveyor 24 may be of any type suitable for transferring the articles from the trimming unit 23 to the swaging unit 25.

The swaging unit 25 may be similar to that shown and described in my divisional application Serial Number 426,030, filed February 5, 1930. The tempering unit 27 may be similar to that described in my divisional application Serial Number 271,873, filed April 21, 1928.

The process herein contemplated comprises the provision of a blank of suitable material, indicated at 28, and in this embodiment adapted to be processed to provide an article such as a machinist's hammer shown in Figures 2, 3, and 4 of the drawings. The bank 28 is first heated, then operated upon by the drop forge unit 21, which may be of any suitable and well known construction and provided with proper dies for drop forging the material blank 28 to produce an article, such as the hammer head 29 shown in Figure 3 of the drawings. At the end of the forging operation the hammer head 29 will have a fin or flash 30 thereon, but otherwise will have substantially the shape of the finished product.

The hammer head 29 after leaving the drop forge unit 21 is then delivered by the chute 22 to a trimming unit 23, which may be of any well known construction, and while still retaining its first heat, the fin or flash 30 is trimmed therefrom, entirely completing the hammer head 29 so far as the general final shape is concerned, but still not in its finally processed condition but requiring finishing.

After the fin or flash 30 has been removed the hammer head 29 is ready for the next step in the process, which consists in swaging the hammer head 29 to finish the same; such swaging is done while the hammer head 29 still retains its first heat, and the swaging is preferably confined to the opposite ends 31 and 32 of the hammer head 29, leaving the central portion 33 unswaged; swaging is effected by a plurality of swaging blows, and

the hammer head 29 is rotated while such blows are delivered, apparatus for accomplishing this purpose being disclosed in my divisional application Serial Number 426,030 heretofore mentioned; the swaging results in finishing the hammer head 29, still on the same initial heat, and in such manner as to require none, or practically no grinding after the hammer head 29 is thus completed.

Following the swaging operation as described the hammer head 29 is immediately delivered to the tempering unit 27, and while still retaining its first heat, is subjected to a tempering process, comprising the application of the tempering bath to the opposite ends 31 and 32 only, leaving the central portion 33 of the hammer head 29 untempered; and the tempering process further consists in directing the tempering bath onto at least one of the ends 32 of the hammer head 29 so that the bath first strikes the center of said end 32 and then flows outwardly from said center, thereby hardening the center of said end 32 to the greatest extent, while the hardening progressively diminishes toward the edges of said end 32. Apparatus for carrying out the tempering process as above described is disclosed in my divisional application Serial Number 271,873 heretofore mentioned, and it should particularly be noted that the tempering operation is effected upon the hammer head 29 without reheating the same but utilizing the first heat remaining after the forging, trimming, and finishing operations heretofore referred to.

Particular attention is called to the fact that the hammer head is entirely completed by the forging and trimming operations, and the completed hammer head is then finished by swaging the opposite ends thereof, leaving the portion between the ends unswaged, and thereafter the tempering process is practiced so as to temper the opposite ends of the hammer head leaving the portion between said ends untempered, and these various steps of the process are effected all on the same or initial heat resulting from originally heating the material blank 28.

It will be apparent that the process herein described accomplishes at least the principal object of the invention, and such process has uses and advantages other than those herein referred to; furthermore various changes and modifications obviously may be made therein without departing from the spirit of the invention; accordingly it will be understood that the embodiment herein described is illustrative only and the invention is not limited thereto.

I claim:

1. The process of forming articles of the nature of hammer heads, which comprises: heating the material from which the article is to be formed; partially forming the article; then finishing the article by a succession of swaging blows; turning the article between the swaging blows; and then tempering a restricted area of said article; all on the same heat.

2. The process of forming articles of the nature of hammer heads, which comprises: heating the material from which the article is to be formed; forming the article by drop-forging and trimming; finishing the article by a succession of swaging blows; and turning the article between the swaging blows to remove the shear mark, all on the same heat.

3. The process of forming articles of the nature of hammer heads, which comprises: heating the material from which the article is to be formed; partially forming article; then finishing the article by a succession of swaging blows directed to the opposite end portions only of the article, leaving the portion of the article between said ends unswaged; and turning the article between the swaging blows; all on the same heat.

4. The process of forming articles of the nature of hammer heads, which comprises: heating the material from which the article is to be formed; partially forming articles; then finishing the article by applying a succession of swaging blows to a part only of said article; and turning said article between each of said swaging blows; all on the same heat.

5. The process of forming articles of the nature of hammer heads, which comprises: partially forming the article; then finishing the article by a succession of swaging blows directed to a restricted portion of said article; turning the article between the swaging blows; and then tempering said article at the restricted portion of said article to which said swaging blows are delivered.

In testimony whereof I hereunto affix my signature.

FRANK J. VLCHEK.