Feb. 25, 1947. W. G. KIFER 2,416,629

PROCESS OF MAKING STAMPING TOOLS

Filed Nov. 30, 1945

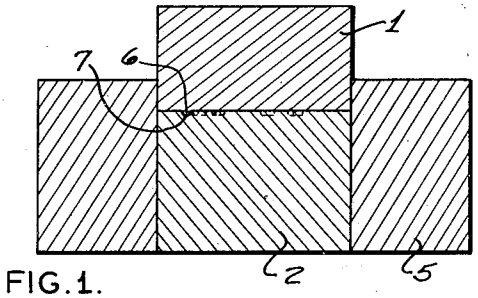


FIG. 1.

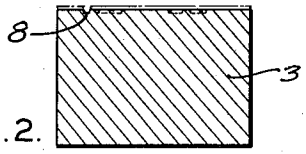


FIG. 2.

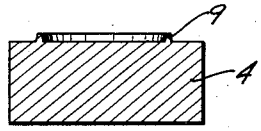


FIG. 3.

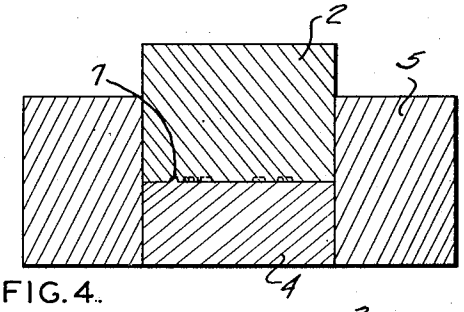


FIG. 4.

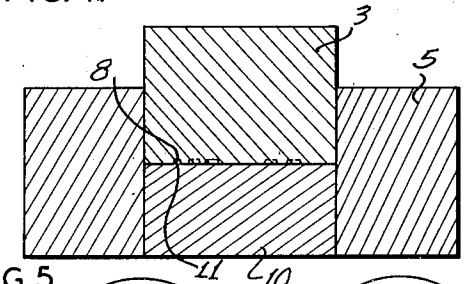


FIG. 5.

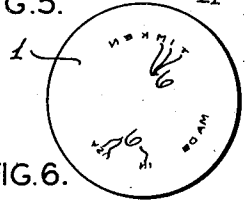


FIG. 6.

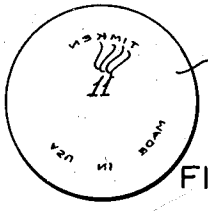


FIG. 7.

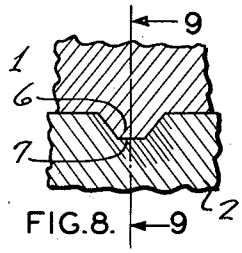


FIG. 8.

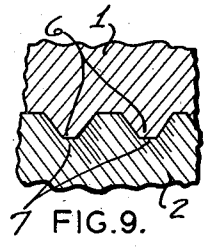


FIG. 9.

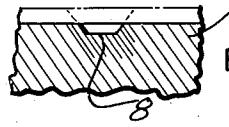


FIG. 10.

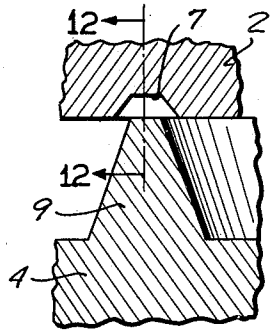


FIG. 11.

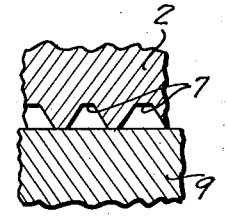


FIG. 12.

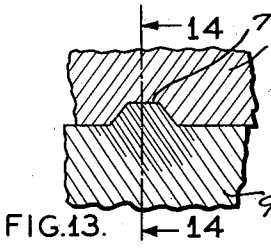


FIG. 13.

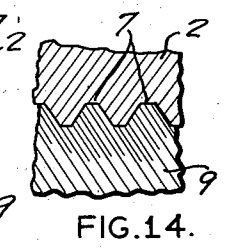


FIG. 14.

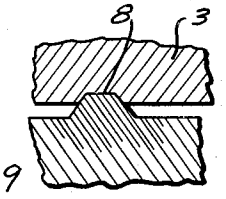


FIG. 15.

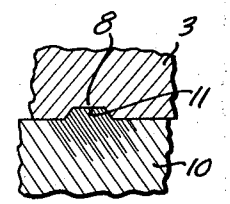


FIG. 16.

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Patented Feb. 25, 1947 2,416,629

UNITED STATES PATENT OFFICE

2,416,629

PROCESS OF MAKING STAMPING TOOLS

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Application November 30, 1945, Serial No. 631,941

2 Claims. (Cl. 76—107)

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This invention relates to stamping tools for impressing or imprinting identification marks, designs or the like upon articles of manufacture. The object of the present invention is to devise a new process of manufacture by which a large number of stamping tools may be efficiently and economically produced from a single master stamp.

The invention consists principally in providing a master stamp having raised marking elements thereon, pressing said master stamp first into engagement with a roughing punch and then into engagement with a finishing punch to impress the marking elements into each of said punches, removing a portion of the marked surface of said finishing punch to decrease the depression depth of the marks impressed therein, providing a stamp blank having a ridge thereon of greater height than the depth of the impressed marks in said roughing punch, pressing said roughing punch into engagement with said stamp blank to sink said ridges into said stamp blank and to substantially fill the depressed marks in said roughing punch and then pressing said finishing punch into engagement with said stamp blank to accurately conform the partially formed portions of said ridge to the impressed marks in said finishing punch. The invention also consists in the operations and combinations hereinafter set forth.

In the accompanying drawing wherein like symbols refer to like parts wherever they occur,

Figs. 1, 2, 3, 4 and 5 are sectional views showing the steps in my process of manufacturing stamps,

Fig. 6 is an end elevational view of the stamping end of the master stamp,

Fig. 7 is a similar view of one of the stamps produced from said master stamp,

Fig. 8 is an enlarged fragmentary sectional view similar to Fig. 1,

Fig. 9 is a fragmentary sectional view on the line 9—9 in Fig. 8,

Fig. 10 is an enlarged fragmentary sectional view similar to Fig. 2,

Fig. 11 is an enlarged fragmentary sectional view showing the roughing punch in position to engage the stamp blank,

Fig. 12 is an enlarged fragmentary section on the line 12—12 in Fig. 11,

Fig. 13 is an enlarged fragmentary sectional view similar to Fig. 4,

Fig. 14 is an enlarged fragmentary sectional view on the line 14—14 in Fig. 13,

Fig. 15 is an enlarged fragmentary sectional

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view showing the finishing punch seated on the partially formed letters on the stamp blank; and

Fig. 16 is an enlarged fragmentary sectional view similar to Fig. 5.

The elements employed in my process of producing stamping tools are a master stamp 1, a roughing punch 2, a finishing punch 3 and a stamp blank 4, all being of cylindrical form for insertion in the central circular opening of a supporting and piloting ring or die 5 adapted to be mounted on a press-bed (not shown).

The master stamp 1 comprises a hardened and finished steel body which is adapted to be secured to a press-ram (not shown) and has raised reverse or negative letters or other marking elements 6 projecting from the bottom surface thereof and arranged in a circle concentric therewith.

The roughing punch 2 is formed from a cylindrical steel slug which is mounted in the ring 5, after which the master stamp is forced downwardly by the press-ram into engagement with the upper surface of said slug to form depressed letters 7 therein. The finishing punch 3 is formed in a similar manner; but has its upper face ground away to reduce the depth of the letters 8 impressed therein. The set of punches 2 and 3 are ground on their lower surfaces to make them the same height and are then hardened and finished.

The stamp blank 4 is also made of steel and has an upstanding annular ridge 9 on the upper surface thereof concentric therewith of a diameter corresponding substantially to the diameter of the circular lines of depressed lettering in the roughing and finishing punches. As shown in the drawings, the annular ridge 9 is of substantially greater height than the depth of the depressed letters in the roughing and finishing punches and has a relatively narrow top portion and a relatively wide base portion connected by downwardly diverging sides. The depressed letters in the roughing and finishing dies have relative narrow bottom portions of a width corresponding to the narrow top portion of the ridge on the stamp blank and have downwardly and outwardly diverging sides that are disposed at a greater flaring angle than the side walls of said annular ridge.

In manufacturing a stamping tool, the stamp blank 4 is placed in the supporting and piloting ring 5 with the annular ridge 9 disposed uppermost. The roughing punch 2 is then mounted in the ring 5 above the stamp blank 4 therein with the circular series of depressed letters 8 in the bottom of said roughing die member directly above the top of the ridge 9. The roughing punch

2 is then forced downwardly by the press against the stamp blank 4, thus pressing or sinking the annular ridge 9 thereof downwardly into the body of the stamp blank. At the same time, there is a plastic flow of the ridge metal which substantially fills the letter impressions 7 in the bottom surface of said roughing punch, while the portions of the ridge outside the letter area are being forced down substantially flush with the main surface of the stamp blank. The roughing punch 2 is then removed and replaced with the finishing punch 3 which is then forced downwardly into engagement with the stamp blank 4, the letter forming portions of the annular rib of the stamp blank being further compacted and accurately conformed to the letter impressions 8 due to the shallower depth thereof. The stamp 10 thus produced is then hardened, without any additional grinding or shaping of the raised letters 11 thereon.

The hereinbefore stamp manufacturing process has several important advantages. Several hundred sets of roughing and finishing punches may be produced with one master stamp; and several hundred stamps can be made with each set of roughing and finishing punches. No guiding means is necessary to aline the depressed letters of the finishing punch with the partially formed letters formed by the roughing punch, as such alinement is obtained by merely rotating the finishing punch within the piloting ring until the depressed letters in the bottom of the finishing punch seat over the partially formed letters formed by the roughing punch. The cutting edges of the raised letters on the finished stamp are as sharp as the cutting edges of the raised letters on the master stamp; and the metallurgical properties of the finished stamp are superior to those of engraved dies because the structure of the stamp in the area of the letters is compacted by forcing the ridge of the stamp blank into the body thereof.

Obviously, the hereinbefore described process admits of considerable modification without departing from the invention. Therefore, I do not wish to be limited to the details hereinbefore described.

What I claim is:

1. The process of manufacturing stamping tools which consists in providing a master stamp having raised marking elements thereon, impressing the marking elements of the master stamp into a punch blank to form a roughing punch, impressing the marking elements of said master stamp into a second punch blank and removing a portion of the marked surface thereof to decrease the depth of the marks impressed therein, and form a finishing punch, providing

a stamp blank having a ridge on one face thereof of greater height than the depth of the impressed marks in both punches and located so as to be brought into alinement with said impressed marks, pressing said roughing punch into engagement with said stamp blank to sink said ridge into said face of said stamp blank and to cause portions of said ridge to substantially fill the impressed marks in said roughing punch and then pressing said finishing punch into engagement with said stamp blank to accurately conform the partially formed portions of said ridge to the impressed marks in said finishing punch and to further sink the conformed marks into said face.

2. The process of manufacturing stamping tools which consists in providing a master stamp having raised marking elements arranged in a circle thereon, impressing the circularly arranged marking elements of the master stamp into a punch blank to form a roughing punch, impressing the marking elements of said master stamp into a second punch blank and removing a portion of the marked surface thereof to decrease the depression depth of the marks impressed therein and form a finishing punch, providing a stamp blank having an annular ridge on one face thereof of greater height than the depth of the impressed marks in both punches and located so as to be brought into alinement with said impressed marks, pressing said roughing punch into engagement with said stamp blank to sink said ridge into said face of said stamp blank and to cause portions of said annular ridge to substantially fill the impressed marks in said roughing punch and then pressing said finishing punch into engagement with said stamp blank to accurately conform the partially formed portions of said annular ridge to the impressed marks in said finishing punch and to further sink the conformed marks into said face.

WARD G. KIFER.

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