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2,183,796

FORMING TOOL

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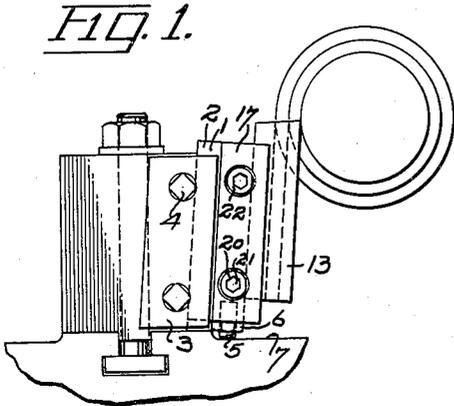


FIG. 6.



FIG. 2.

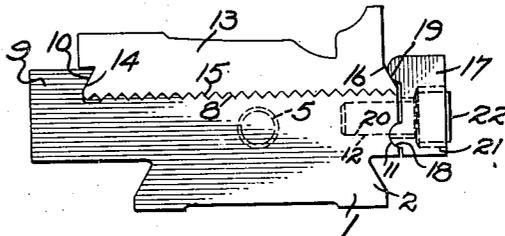


FIG. 3.

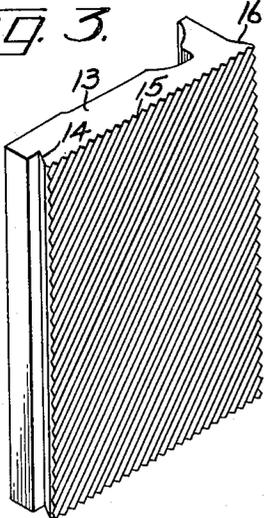
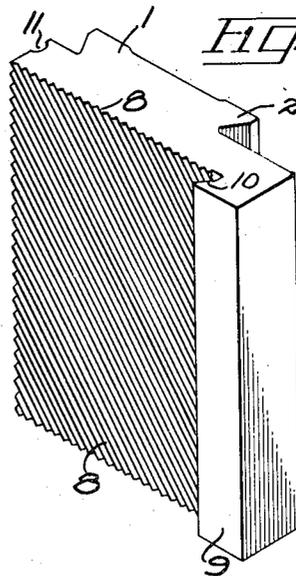


FIG. 4.



FIG. 5.



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## FORMING TOOL

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5 Claims. (Cl. 29-96)

This invention relates to improvements in forming tools for use on automatic machines and the like for forming the profile of various metal parts. At the present time it is customary to make forming tools out of a single piece of high speed steel which is usually of considerable thickness both to withstand the cutting strain and to produce satisfactory work at the speed which is demanded today. Again on most automatic machines a fixed slide is provided to receive the tool which must project somewhat above the slide substantially to the horizontal center line through the work; the tool must extend downwardly sufficiently into the slide to be rigidly supported thereby; and projecting from the underside of the tool and threaded thereinto is an adjusting screw the underside of which bears upon a horizontal portion of a carriage on which the slide is mounted and this screw is capable of only slight longitudinal adjustment. It is therefore apparent that the top horizontal face of the cutter along one margin of which the cutting edge is formed must be of substantial thickness with the result that there is a relatively large surface to be ground each time the tool is dressed particularly if a portion of the cutting edge has become nicked as occurs from time to time. Again only a limited vertical adjustment of the tool is permitted after these grindings both because the tool must extend some distance downward into the slide to insure solid mounting therein, and also due to the limited adjustability of the adjusting screw above mentioned.

It is an object of this invention to provide a forming tool consisting of a base and a separate removable cutter portion and means for rigidly supporting the latter in the former. Thus I aim to provide a forming tool wherein the combined thickness of the base and the removable cutter portion are together substantially equal to the thickness of the one-piece cutter now commonly employed. I am also enabled to use an ordinary alloy steel base and a high speed cutter portion thereby effecting a considerable saving in the cost of material, and, due to the fact that the cutter portion should always project somewhat above the top of the base, only the cutter portion need be ground thereby effecting a further saving each time the tool is dressed as this portion is obviously narrower than the whole tool.

Another object of the invention is to provide such a forming tool wherein means are provided for adjusting the cutter portion vertically upon the base so that after the said portion has been dressed, particularly if it has been necessary to

remove much stock, it may be vertically adjusted on the base without increasing the elevation of the latter in the slide.

A further object of the invention is to provide a forming tool consisting of a base and a cutter portion wherein the coating surfaces of these two parts are serrated, these serrations maintain the cutter portion at the desired elevation upon the base, and wherein means are provided on both sides of the base to prevent lateral movement of the cutter portion thereon.

Having thus stated some of the objects and advantages of the invention I will now proceed to describe an embodiment thereof with the aid of the accompanying drawing, in which:

Figure 1 illustrates a side view of my forming tool mounted upon a conventional slide.

Figure 2 is a plan view of the tool.

Figure 3 is a perspective view of the cutter portion.

Figure 4 is a perspective view showing the lock member.

Figure 5 is a perspective view of the base, and

Figure 6 is a perspective view of one of the screws by which rapid attachment or detachment of the lock member is obtained.

Referring to the drawing, 1 designates the base of my forming tool which may be provided with any preferred means for mounting it upon the machine on which it is to be employed. In the present instance the base is provided with a rearward projection 2 for engagement by a conventional slide 3 wherein it is securely held by bolts 4. In threaded engagement with the base 1 and projecting downwardly therefrom is a screw 5, such as is normally employed. This screw is held stationary by a lock nut 6 and bears upon a horizontal portion of a conventional carriage 7 on which the slide is mounted in the usual manner.

Formed upon the front of the base 1 are serrations 8, and projecting forwardly along one vertical margin of the base is a stop 9 the inner edge face of which is undercut at 10. Formed vertically in the other side of the base is a keyway 11 which is of concave form and extending into this side of the base are threaded openings 12.

The cutter portion 13 has the desired profile formed upon its outer face and its inner face is serrated at 15 to coact with the base serrations 8. One vertical edge face of the cutter portion 13 is undercut at 14 for a portion of its thickness to coact with the undercut portion 10 of the base 1, and its opposite vertical margin is forwardly

and inwardly inclined for a short distance from its serrated face as shown at 16.

A lock member 17 has a convex key 18 extending longitudinally from one side thereof to seat in the keyway 11, and projecting from the same side of the lock member is a bearing strip 19 which is parallel with the said key. This bearing strip engages the forwardly and inwardly inclined face 16 of the cutter portion and tends to force its undercut side 14 into intimate contact with the correspondingly undercut face 10 of the base, and also forces the cutter serrations 15 into intimate contact with the base serrations 8. The lock member is held in position by screws 20 which extend through suitable openings 21 therein and are in threaded engagement with the tapped openings 12 in the base. To permit rapid insertion and removal of these screws their heads 22 may be enlarged and externally knurled to facilitate manual rotation and also provided with multi-sided longitudinal openings to receive a suitable wrench. To accommodate the enlarged heads 22 the outer portions of the lock member openings 21 are counter-bored.

While in the drawing the coacting serrations 8 and 15 are diagonally arranged it will be noted that they may extend in any preferred direction non-parallel with the profile on the cutter portion 8, as they are utilized to support the latter at varying heights upon the base 1, and as the said cutter portion is held against lateral movement upon the base by the stop 9 and the lock member 17 serrations extending in directions other than the one shown may be satisfactorily employed.

It will also be noted that the vertical adjustment permitted the base 1 is the same as could be obtained with a conventional one-piece tool, and in addition the cutter portion 13 is independently adjustable for height upon the base. Consequently not only can a greater portion of the entire length of the cutter portion be utilized, but only the latter need be renewed.

While in the foregoing the preferred embodiment of the invention has been described and shown, it is understood that the construction is susceptible to such alterations and modifications as fall within the scope of the appended claims.

What I claim is:

1. A forming tool comprising a base having means thereon for attachment to a machine, one side of the base having serrations thereon, a stop extending forwardly from the serrated side along one margin which is angularly disposed to the serrations, the inner edge face of the stop being undercut, a cutter portion having a profile formed upon one side and serrations upon its opposite side, the serrations being angularly disposed to said profile and adapted to coact with the base serrations, one margin of the cutter portion which is angularly disposed to its serrations being undercut to provide a bearing which rests against the undercut portion of the stop, and a lock member removably mounted upon the edge face of the base parallel with and remote from the stop, and means on said lock member adapted to retain the

undercut portions of the stop and the cutter portion in engagement.

2. A forming tool comprising the combination set forth in claim 1, wherein a concave keyway is formed longitudinally in the edge face of the base against which the lock member is secured, a convex key upon the lock member engaging the keyway, and a bearing strip on said member parallel with said key bearing against an inclined face upon the cutter portion whereby the serrations upon the latter are retained in engagement with the base serrations.

3. A tool comprising a holder having means thereon for attachment to a machine, one face of the holder being serrated, and a stop integral with the holder extending forwardly from the serrated face and having its inner margin angularly disposed to said serrations, in combination with a cutter having a profile formed lengthwise on one side, the opposite side of the cutter having serrations formed thereon to engage the holder serrations, one edge of the cutter being adapted to rest against the stop, and a removable locking member on the holder adapted to engage the side of the cutter opposite said stop, the cutter having a cutting edge formed across one extremity of its profile whereby pressure exerted against the cutting edge forces the cutter serrations into intimate contact with holder serrations, and the angular disposition of the serrations relative to the stop being adapted to guide the cutter into intimate contact with said stop when pressure is exerted upon the cutting edge of the cutter.

4. A tool comprising a holder, means thereon for attachment to a machine, one face of the holder being serrated, and a stop integral with the holder and extending forward from its serrated face angularly to said serrations, the side of the stop adjacent said serrations being undercut, a flat form cutter having a profile formed longitudinally upon one side, the opposite side of the cutter being serrated to engage said holder serrations, one edge face of the cutter being formed to cooperate with the undercut side of the stop, and a removable locking member mounted upon the holder to engage the side of the cutter remote from the stop and hold said cutter immovable.

5. A tool comprising a holder, means thereon for attachment to a machine, one face of the holder being serrated, and a stop integral with the holder along one margin thereof extending forward from said serrated face angularly to said serrations, a flat form cutter having a profile formed along one side, the opposite side of the cutter being serrated to engage the holder serrations, one side of the cutter being adapted to bear against said stop, the opposite side of the cutter having a keyway formed therein and a bearing surface thereon parallel with and spaced from the keyway, a removable lock member mounted on the holder, a key carried by the holder to engage the keyway, and said member having a projection thereon to contact said bearing surface.

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