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O. MACKENSEN

ENGRAVING MACHINE

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1,986,004

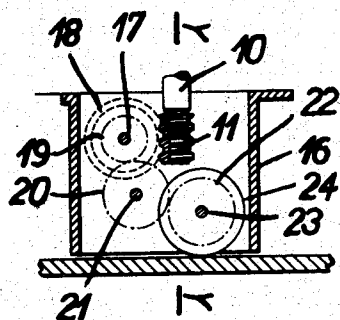


Fig.2

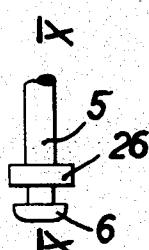


Fig.3

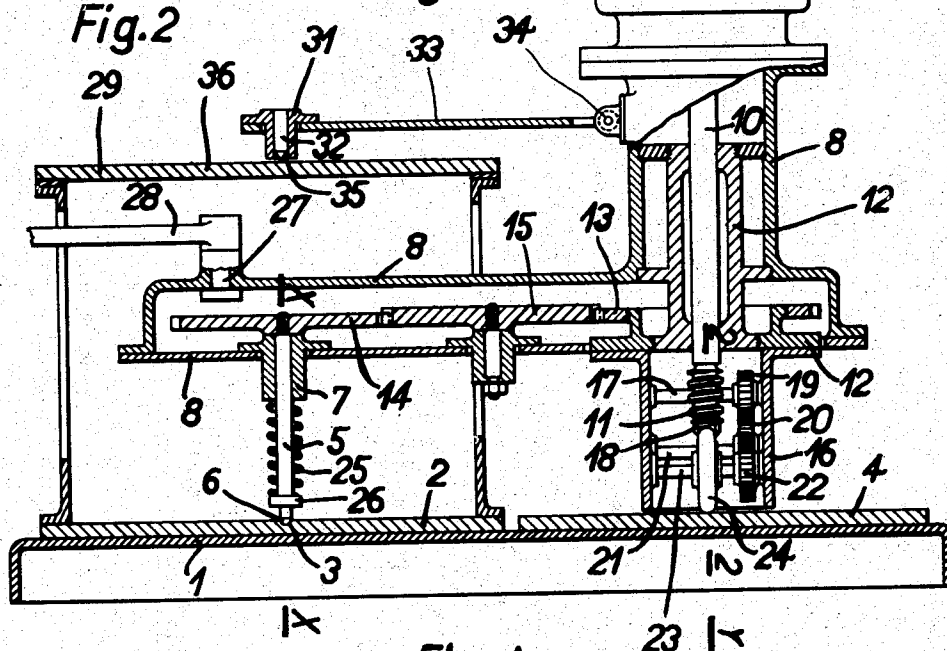


Fig. 1



Fig.4

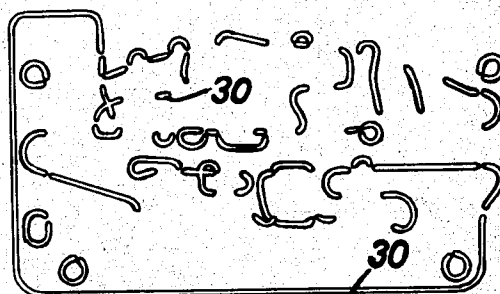


Fig.5

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ENGRAVING MACHINE

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5 Claims. (Cl. 33—18)

I have filed an application in Germany, January 2, 1932.

The invention concerns a machine for engraving in a work piece characters cut into a guide plate.

According to the invention, the characters cut into the guide plate are so designed that they form part of a continuous groove without angles, and means are provided for automatically raising the engraving tool from the work piece when the guide pin moves in that part of the continuous groove which does not represent any of the characters.

It is convenient to coordinate to the guide plate an auxiliary guide plate whose grooves, or guiding elements, represent only one of the said two parts of the continuous groove and which cooperates with a control member coupled for equal movement to the guide pin, the purpose of the control member being to effect a change in the working and rest positions of the engraving tool as soon as it is caused to pass over the ends of the said guiding elements.

To obtain reliable movements of the guiding member in the groove of the guide plate, especially when a groove is concerned whose different elements intersect each other, it is advisable to use a guide head on which are mounted for rotation about parallel axes, on the one hand, the guide pin moving in the groove of the guide plate and, on the other hand, the bearing for a motor-driven roller which cooperates with a guide surface and serves for automatically displacing the guide head according to the directions of the groove, that part of the guide pin which extends into the groove being boat-shaped and so coupled to the said bearing that the longitudinal axis of the said boat-shaped part is permanently at right angles to the driving axle of the roller.

The accompanying drawing represents a constructional example of that part of an engraving machine which corresponds to the invention. Figure 1 shows the guide head of the engraving machine in a section through the axis of the guide pin. Figure 2 is a partial section through line 2—2 in Figure 1. Figure 3 shows in a side view the guide pin and that part of this pin which is boat-shaped and extends into the groove. Figure 4 represents the example of a continuous groove, and Figure 5 shows the grooves in the appertaining auxiliary guide plate which cause the interruptions in the engraving process.

In Figure 1, the numeral 1 represents a support to which are fixed, on the one hand, a guide plate 2 with a groove 3 (cf. Figure 4) and, on

the other hand, a guide plate 4. Into the groove 3 extends a guide pin 5 having a boat-shaped foot 6. The guide pin 5 is so mounted in a bearing 7 as to be rotatable about its longitudinal axis X—X. The bearing 7 is fixed to a housing 8 which supports a motor 9 whose shaft 10 has at its lower end a worm 11. On the housing 8 is revolvably mounted a body 12 which is concentric to the axis Y—Y of the shaft 10. To this body 12 is screwed a toothed wheel 13 which has the same circular pitch and number of teeth as a toothed wheel 14 fixed to the guide pin 5. The two toothed wheels 13 and 14 are in mesh with an intermediate wheel 15 revolvably mounted on the housing 8. To the body 12 is fixed a housing 16 on which a worm wheel 18 meshing with the worm 11 is revolvably mounted by means of a shaft 17. Through the agency of a toothed wheel 19, the rotations of the shaft 17 are transmitted to a toothed wheel 20 which is fixed to a shaft 21 and in mesh with a toothed wheel 22 of a shaft 23. The shaft 23 has a guide roller 24 resting on the guide plate 4. These parts are so arranged that the longitudinal axis of the boat-shaped foot 6 of the guide pin 5 is at right angles to the driving shaft 23 of the roller 24. The wheels 13, 14 and 15 provide that this condition is maintained regardless of the directions the longitudinal axis of the boat-shaped foot 6 may assume. Thus, the guide pin may move freely without any disturbance, which is of importance especially in the case of characters similar to those shown in the drawing, in which the groove 3 has elements 3a that intersect each other. In its bearing 7, the guide pin 5 is displaceable in the direction of its axis of rotation X—X and may be raised from the groove 3 against the action of a spring 25 which presses, on the one hand, against the bearing 7 and, on the other hand, against a collar 26 fast with the pin 5. By means of a bolt 27, the housing 8 is connected to an arm 28 assumed to belong to one of the usual pantograph systems, which may be so coupled to the support for the work piece to be engraved that it displaces this support according to the movement of the guide pin 5 in the groove 3 of the guide plate 2. Above this plate 2 is disposed an auxiliary guide plate 29 the grooves 30 of which (Figure 5) correspond to those parts of the groove 3 which so connect the different characters to be engraved as to provide one continuous groove without angles. The auxiliary guide plate 29 is so positioned that its groove elements and those of the plate 2 which correspond to them are vertically above each other.

A pin 32 fixed to an insulating body 31 cooperates with the auxiliary guide plate 29. The insulating body 31 is fixed to an arm 33 which is so mounted on the housing 8 as to be tiltable about a pin 34. The point 35 of the pin 32 protrudes so far from the insulating body 31 that, when it is opposite one of the groove elements 30, this insulating body 31 rests on the surface 36 of the auxiliary guide plate 29. The guide plate 29, the pin 32 and the engraving tool (which is not represented in the drawing) are assumed to be electrically connected in such a manner that the engraving tool is raised from the work piece at the moment when the pin 35 is out of touch with the surface 36 of the plate 29, the consequence being that only that part of the continuous groove 3 is transmitted to the work piece which represents the characters to be engraved.

I claim:

1. An engraving machine for displacing relatively to each other a work piece and an engraving tool according to the characters to be engraved, comprising a principal guide plate with a groove, the characters to be engraved representing part of this groove, this groove being continuous and without angles, the other part of this groove interconnecting the said characters, a housing movably disposed relatively to the said principal guide plate, a guide pin mounted on this housing, this guide pin extending into the said groove, electric contact means comprising two members, one member being fixed to the said principal guide plate and the other member being so mounted on the said housing as to be displaced according to the displacements of the said guide pin when the housing is moved relatively to the principal guide plate, these contact means being coupled to the guide pin adapted to act on the tool for making the tool ineffective when the guide pin moves in the said other part of the groove.

2. An engraving machine for displacing relatively to each other a work piece and an engraving tool according to the characters to be engraved, comprising a principal guide plate with a groove, the characters to be engraved representing part of this groove, this groove being continuous and without angles, the other part of this groove interconnecting the said characters, a housing movably disposed relatively to the said principal guide plate, a guide pin mounted on this housing, this guide pin extending into the said groove, an auxiliary guide plate fixed to the said principal guide plate and having grooves that correspond only to one of the said parts of the groove of the principal guide plate, a control member cooperating with the auxiliary guide plate, this control member being so mounted on the said housing as to be displaced according to the displacements of the said guide pin when the housing is moved relatively to the principal guide plate, electric contact means comprising two members, one member being connected to the auxiliary guide plate and the other member being connected to the said control member, these contact means being adapted to so act on the tool when this tool is at the ends of the grooves of the auxiliary guide plate as to make the tool alternatively effective and ineffective.

3. An engraving machine for displacing relatively to each other a work piece and an engraving tool according to the characters to be engraved, comprising a support, a principal guide plate disposed on the support and provided with

a groove, this groove being continuous and without angles, the other part of this groove interconnecting the said characters, an auxiliary guide plate disposed on the support and provided with one of the said two parts of the groove of the principal guide plate, a housing, a body revolvably mounted on this housing, a roller revolvably mounted on this body, this roller resting against the support, means for driving the roller, these means being disposed in the housing, a guide pin revolvably mounted in the housing, a boat-shaped part fixed to the lower end of the guide pin and extending into the groove of the principal guide plate, means for so coupling the guide pin to the said body that the longitudinal axis of the said foot-shaped part is permanently at right angles to the axis of the said roller, a control member mounted on the housing and cooperating with the auxiliary guide plate, an electrical contact means coupled to the control member, these contact means being adapted to act on the tool when this tool is at the ends of the grooves of the auxiliary guide plate, for making the tool alternatively effective and ineffective.

4. An engraving machine for displacing relatively to each other a work piece and an engraving tool according to the characters to be engraved, comprising a support, a principal guide plate disposed on the support and provided with a groove, this groove being continuous and without angles, the other part of this groove interconnecting the said characters, an auxiliary guide plate disposed on the support and provided with one of the said two parts of the groove of the principal guide plate, a housing, a body revolvably mounted on this housing, a roller revolvably mounted on this body, this roller resting against the support, an electromotor disposed on the housing, means for coupling the electromotor to the roller, a guide pin revolvably mounted in the housing, a boat-shaped part fixed to the lower end of the guide pin and extending into the groove of the principal guide plate, means for so coupling the guide pin to the said body that the longitudinal axis of the said foot-shaped part is permanently at right angles to the axis of the said roller, a control member mounted on the housing and cooperating with the auxiliary guide plate, and electrical contact means coupled to the control member, these contact means being adapted to act on the tool when this tool is at the ends of the grooves of the auxiliary guide plate for making the tool alternatively effective and ineffective.

5. An engraving machine for displacing relatively to each other a work piece and an engraving tool according to the characters to be engraved, comprising a support, a principal guide plate disposed on the support and provided with a groove, this groove being continuous and without angles, the other part of this groove interconnecting the said characters, an auxiliary guide plate disposed on the support and provided with one of the said two parts of the groove of the principal guide plate, a housing, a body revolvably mounted on this housing, a roller revolvably mounted on this body, this roller resting against the support, means for driving the roller, these means being disposed in the housing, a guide pin revolvably mounted in the housing, a boat-shaped part fixed to the lower end of the guide pin and extending into the groove of the principal guide plate, a string of wheels so cou-

pling the guide pin and the said body that the longitudinal axis of the said foot-shaped part is permanently at right angles to the axis of the said roller, a control member mounted on the housing and cooperating with the auxiliary guide plate, and electrical contact means coupled to the control member, these contact means being adapted to act on the tool when this tool is at the ends of the grooves of the auxiliary guide plate, for making the tool alternatively effective and ineffective.

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