(54) Title: APPARATUS FOR ENGRAVING UPSTANDING SURFACES

Engraving apparatus adapted to engrave an upstanding surface of a wall in an elevated position in situ has a main frame (11) with a channel section (27) for receiving stencils (18) with symbols to be replicated by an engraving tool (29). The tool (29) and a complementary stencil-engaging guide (15) are mounted on a carriage (12). The carriage (12) is displaceable along sets of tubular guides (21, 19) to enable an operator to follow the symbols defined by the stencils (18). The main frame (11) is supported by an adjustable base frame (30, 40) which holds the main frame in an elevated position or by a jib (60) of a mobile vehicle which can raise or lower the frame (11) to or from the elevated disposition.
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Apparatus for engraving upstanding surfaces.

TECHNICAL FIELD

The present invention relates to engraving apparatus for engraving concrete wall surfaces or the like in an elevation position in situ.

BACKGROUND ART

A known engraving machine of the type with which the present invention is concerned is described in GB Patent Publication No 2138748.

DISCLOSURE OF INVENTION

The present invention provides apparatus for use in engraving an upstanding concretious surface in an elevated position in situ; said apparatus comprising a frame, means on the frame for receiving one or more stencils, a carriage, means supporting the carriage for movement relative to the frame within a plane parallel to the surface to be engraved, an engraving tool or tool holder supported by the carriage for permitting the tool to engage the surface to be engraved, a stencil guide which can be made to follow a pattern defined by a stencil by movement of the carriage in said plane, and means for supporting the frame in said elevated position alongside the surface to be engraved or for raising and lowering the frame to and from such a position.

As is known from GB 2138748 tubular guides or the like can define the directions of movement of the carriage.

Conveniently, the support means for the frame can
take the form of a multi-sectional base frame which is adjustable, at least partly, to vary the height of the frame.

Alternatively, the frame can be conveniently mounted to a raisable jib or arm of a vehicle which enables the frame to be raised and lowered to and from the elevated position.

Thrust means can be provided to urge the frame towards the surface to be engraved although where the frame is carried by the arm of a vehicle the vehicle or arm can serve to provide thrust force.

In accordance with a further aspect of the invention means is provided to compensate for the effects of gravity otherwise tending to move the carriage downwardly in its plane of movement.

The invention may be understood more readily and various other aspects and features of the invention may become more apparent from consideration of the following description.

20 **BRIEF DESCRIPTION OF THE DRAWINGS**

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, wherein:-

**Figure 1** is a perspective view of part of an engraving apparatus in accordance with the invention;

**Figure 2** is an end elevation of the apparatus constructed in accordance with the invention;
Figure 3 is a front elevation of a unit of a base frame of a further form of apparatus;

Figure 4 is a side elevation of the unit shown in Figure 3;

Figure 5 depicts a mobile vehicle adapted as the engraving apparatus in accordance with the invention;

Figure 6 is a schematic part-sectional view of part of the apparatus showing a modification; and

Figure 7 is a schematic part-sectional view of part of the apparatus showing a further modification.

MODE(S) FOR CARRYING OUT THE INVENTION

In the accompanying drawings, the reference numeral 10 denotes a unit composed of various parts of the engraving apparatus used with other equipment described hereinafter. The unit 10 is held in an elevated position or is moved to and from such a position, by associated means designated 90 in Figure 1. The unit 10 as depicted in Figure 1 is composed of a frame 11 with side members 28 and a channel-like transverse structure 27 which receives cut-out stencils 18. Bearing blocks or collars 20 are mounted for sliding along a pair of tubular guides 19 disposed between the side members 20. A pair of tubular guides 21 interconnect the blocks 20 and a carriage 12 in turn slidably mounted on the tubular guides 21 with the aid of bearing blocks or collars 22. The guides 21 extend perpendicular to the guides 19. The carriage 12 has a handle 24 for displacing the carriage 12 along the guides 21 in the direction of arrows C-D. The guides 21 are
additionally connected at their ends with a cross-piece serving as a handle 25 for displacing the carriage 12 along the guides 19 in the direction of arrows A-B. The carriage 12 supports a stencil-engaging guide 15 which an operator can displace by moving the carriage 12 as appropriate to follow the shape of the stencils 18. A rotary engraving tool 29 with a replaceable hardened bit is likewise supported by a holder on the carriage 12 and follows the path described by the guide 15 to permanently mark an upstanding surface 30, usually a wall of a building, in situ and in an elevated position.

A base frame 50 adjustable with screw devices 51 or the like can be used as shown in Figure 2 to bring the machine into a desired height position. The main frame 11 is supported on the base frame 50 with the aid of straps 54 and adjustment of the frame 50 can raise and lower the main frame 11. The base frame 50 can be made up from easily-assembled units permitting the frame 50 to be built up to any desired height.

Figures 3 and 4 depict one of a pair of units 40 which combine to form another base frame 50 for holding the machine 10 in an elevated disposition. As shown each unit has major and minor upstanding support legs 41,42 interconnected with bracing straps 43,44. The side members 28 of the machine frame 11 are detachably fixed to mounting blocks 81 on the major legs 41 of the units 40. The legs 41,42 are provided with adjustable feet 45 which
can be swivelled and raised and lowered with the aid of adjusting rings 46. The major leg 41 is additionally provided at its upper end with a bracket 47 pivotally joined to an inclined support arm 48. The lower end of the arm 48 is provided with a strap 49 which receives another adjustable foot 45. To hold the frame 11 reliably in place during engraving additional thrust producing means such as piston and cylinder units or rams pneumatic or hydraulic can be interposed between the base frame 50 and the elevated frame 11.

As a general alternative to the base frames 50, the machine 10 may be carried by a mobile vehicle capable of holding the frame 11 in an elevated position against the surface 30. Figure 5 depicts a vehicle 59 which has a raisable and lowerable jib or arm 60 supporting the frame 11 in a detachable manner. A linkage 61 can be interposed between the frame 11 and the arm 60. The vehicle 59 or the arm 60 can also serve to thrust the frame 11 against the surface to be engraved during use but additional thrust producing means such as hydraulic or pneumatic rams can also be interposed between the arm 60 and the frame 11 if desired.

The carriage 12 tends to move downwardly on the guides 21 due to gravity and an operator needs to overcome this bias when raising the carriage 12 to follow the stencils 18. In accordance with a further feature of the invention means is provided to compensate for this. Thus, as shown in Figure 6, to assist in controlling the
displacement of the carriage 12 a counterweight W is linked via a cable 46 engaged on a rotatably pulley 45 to the carriage 12. Alternatively compression springs 42 can be mounted on the guides 21 between the blocks 22, 20 as shown in Figure 7, to compensate for the effects of gravity on the carriage 12.

INDUSTRIAL APPLICABILITY

The above description essentially relates to a product of manufacture which is moreover industrially usable in a useful manner to engrave or mark an existing concrete surface in its external environment in situ.
WE CLAIM

1. Apparatus for use in engraving an upstanding concretious surface in an elevated position in situ; said apparatus comprising a frame (11), means (27) on the frame for receiving one or more stencils (18), a carriage (12), means (20, 21, 22) supporting the carriage (12) for movement relative to the frame within a plane parallel to the surface to be engraved, an engraving tool or tool holder (29) supported by the carriage (12) for permitting the tool to engage the surface to be engraved, a stencil guide (15) which can be made to follow a pattern defined by a stencil by movement of the carriage in said plane, and support means (50, 59, 60) for supporting the frame in said elevated position alongside the surface to be engraved or for raising and lowering the frame to and from such a position.

2. Apparatus according to claim 1, wherein the frame (11) is composed of side members (28) with a channel-like transverse structure (27) therebetween, said structure constituting at least in part the stencil reception means.

3. Apparatus according to claim 1, wherein the carriage support means supports the carriage for movement in orthogonal directions.

4. Apparatus according to claim 2, wherein a first set of elongate guides (19) extend between the side members (28), and the carriage support means takes the form of bearing collars (20) mounted for sliding on said first set
of guides, a further set of elongate guides (21) extending perpendicularly to the first set of guides and interconnecting said collars (20) and further bearing collars (23) mounted to the carriage (12) for sliding on said further set of guides.

5. Apparatus according to claim 4, wherein the further set of guides are interconnected by a cross-piece (25) serving as a handle for displacing the carriage (12) along the first set of guides and the carriage has a further handle (24) for displacing the carriage along the further set of guides (21).

6. Apparatus according to any one of claims 1 to 5, wherein the support means for the frame comprises a further adjustable base frame (50).

7. Apparatus according to any one of claims 1 to 5, wherein the support means for the frame comprises a raisable and lowerable jib (60) of a mobile vehicle (59).

8. Apparatus according to any one of the preceding claims and further comprising thrust means for urging the frame towards the surface to be engraved during use.

9. Apparatus according to claim 7, wherein the jib (60) or vehicle (59) is used to thrust the frame towards the surface to be engraved during use.

10. Apparatus according to any one of the preceding claims and further comprising means for compensating for the effects of gravity otherwise tending to move the carriage downwardly in said plane.

11. Apparatus according to claim 10, wherein the
compensation means takes the form of a counter-weight (W) linked to the carriage (12) with a cable (46).

12. Apparatus according to claim 10, wherein the compensation means takes the form of compression springs (47) biasing the carriage (12) in an upward direction.
## INTERNATIONAL SEARCH REPORT

### I. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC) or to both National Classification and IPC

**IPC**: B 44 B 3/00; B 28 D 1/00; B 25 H 1/00

### II. FIELDS SEARCHED

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**Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched**

### III. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>GB, A, 13335 AD 1915 (J.F. KELLER ET AL.) 3 August 1916, see page 3, lines 19-22; page 8, lines 21-28; figure 2</td>
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### IV. CERTIFICATION

- **Date of the Actual Completion of the International Search**: 23rd October 1986
- **Date of Mailing of the International Search Report**: 25 Nov 1986
- **International Searching Authority**: EUROPEAN PATENT OFFICE
- **Signature of Authorized Official**: M. VAN MOL

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