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STENCILING APPARATUS

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FIG. 1.

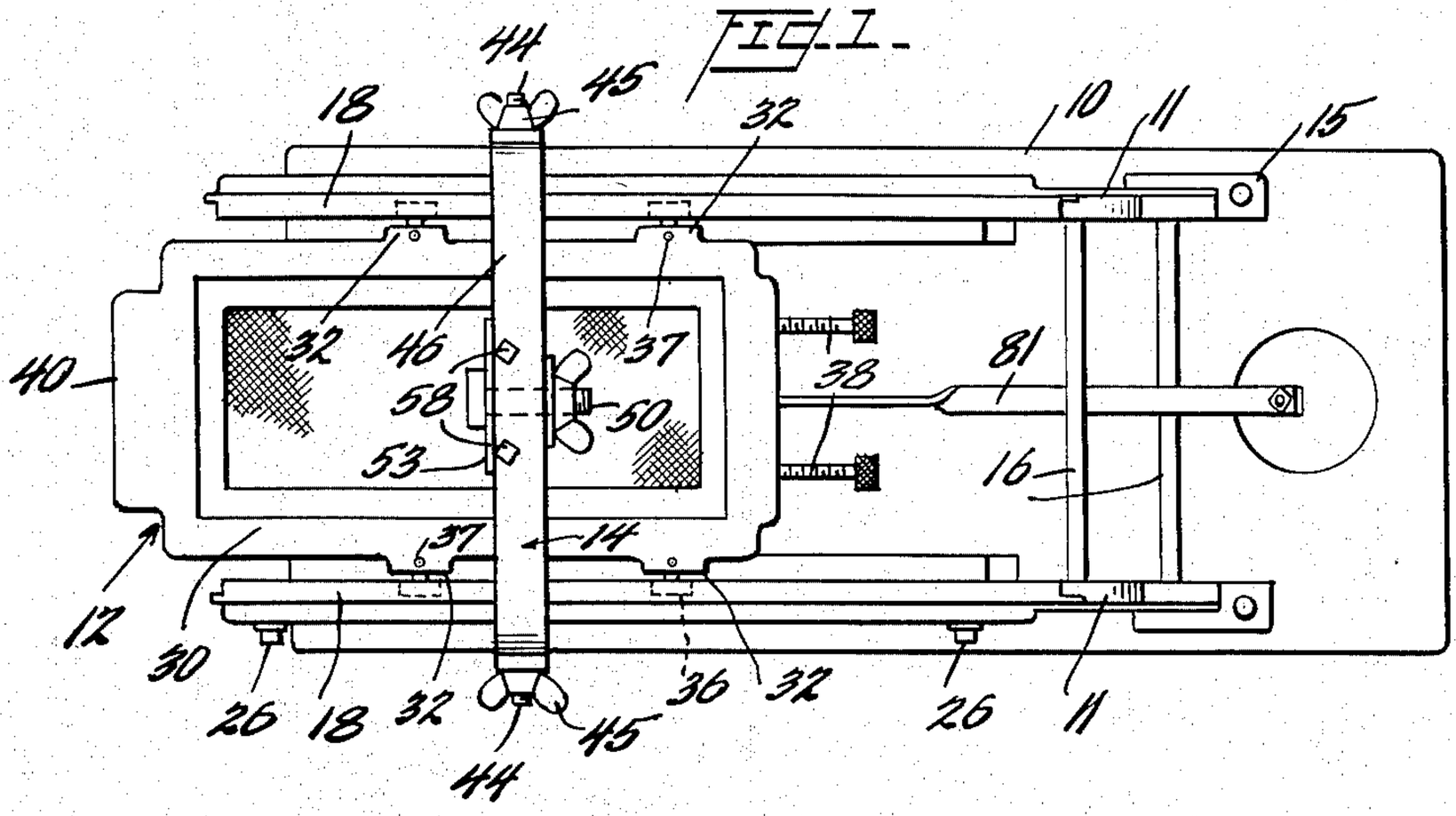

FIG. 2.

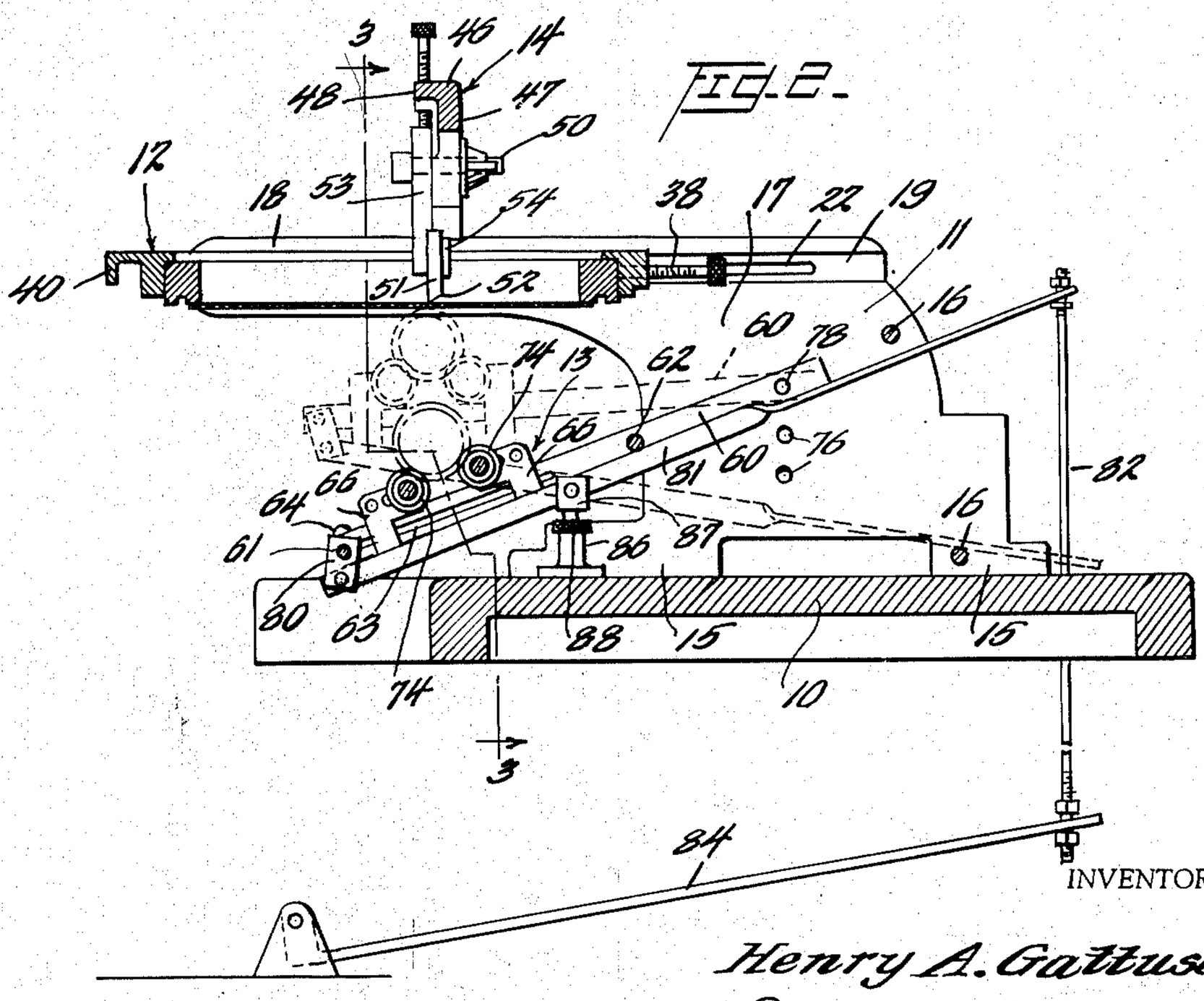

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FIG. 3.

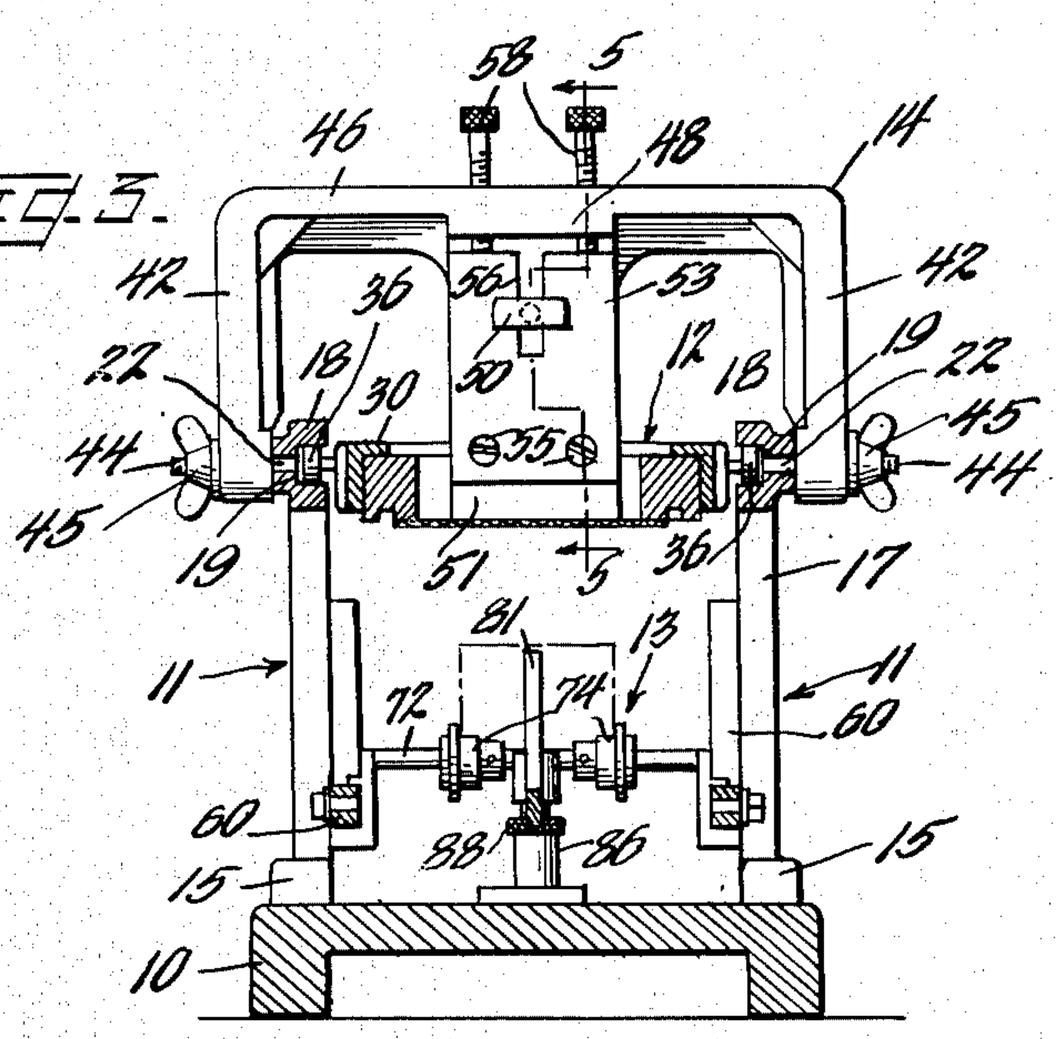

FIG. 4.

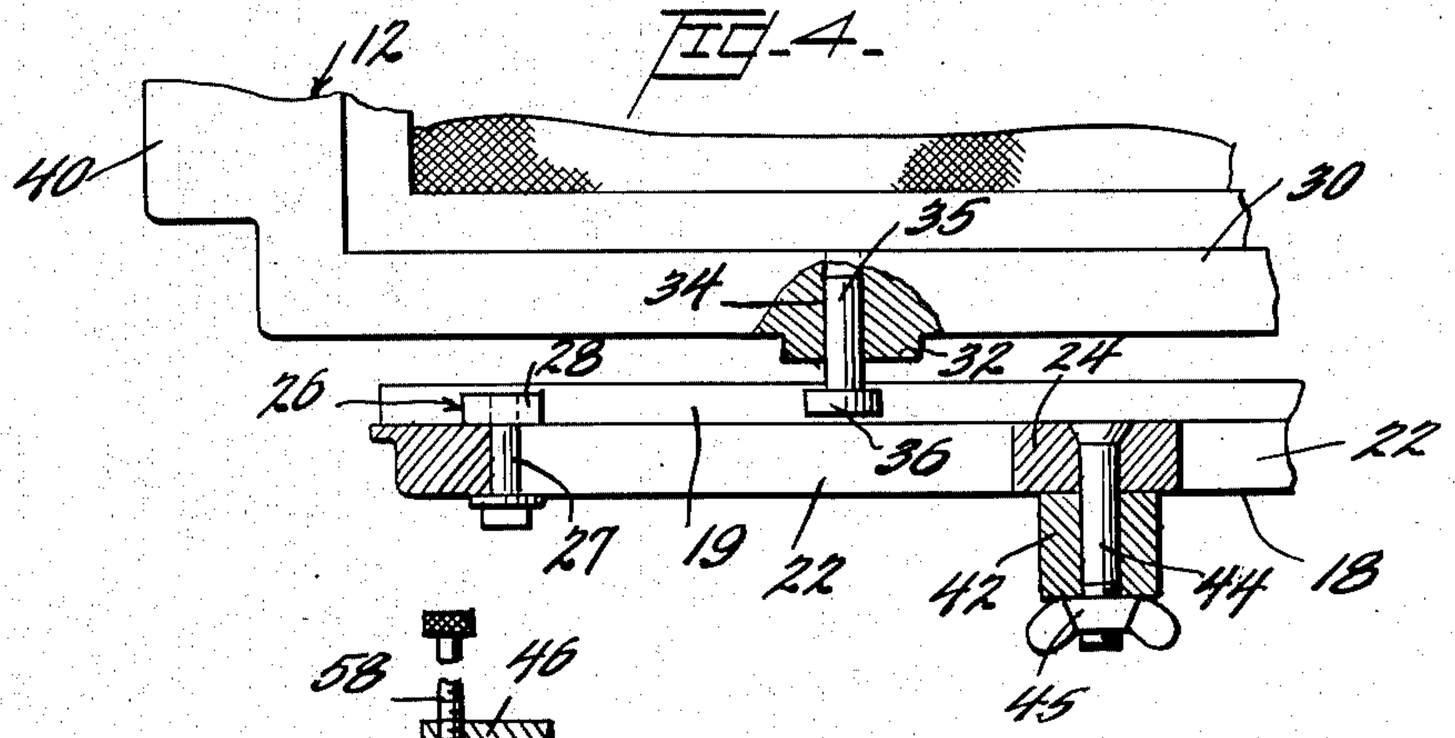

FIG. 5.

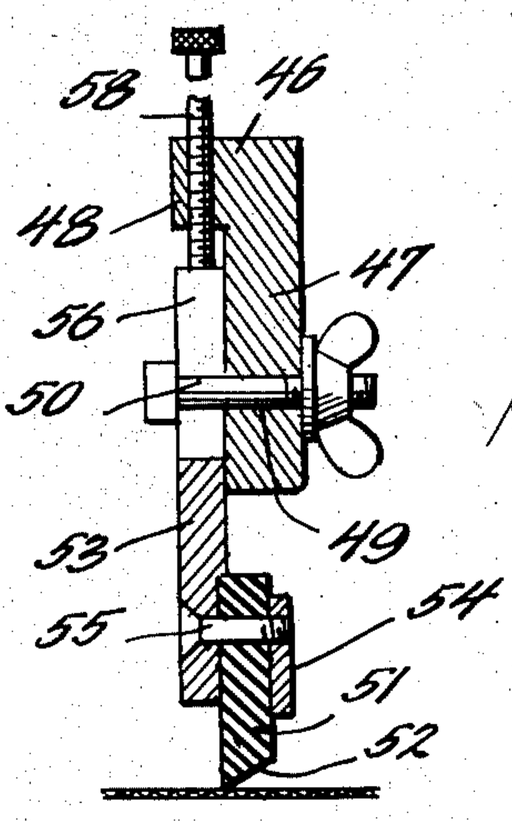

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FIG. 6.

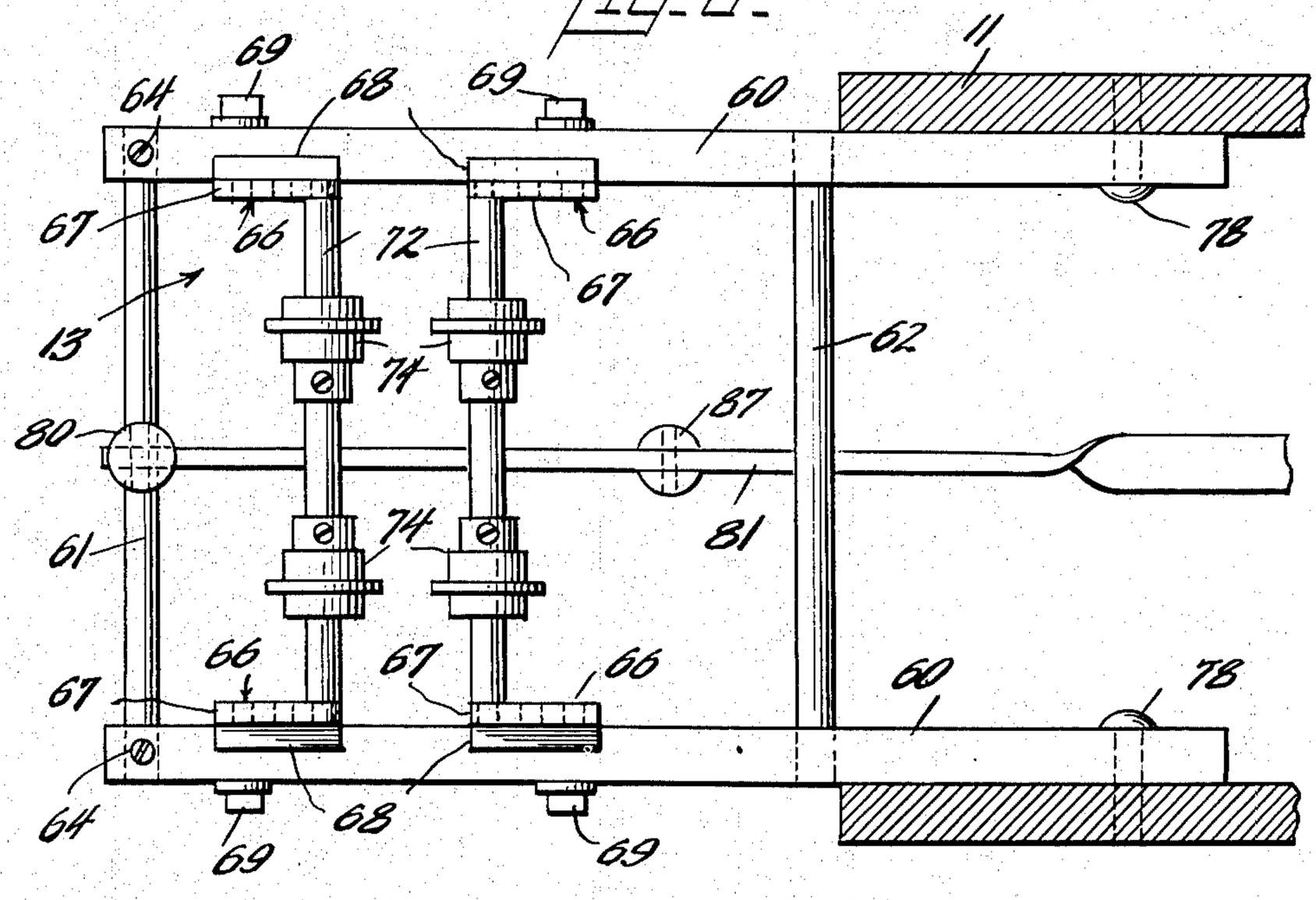


FIG. 7.

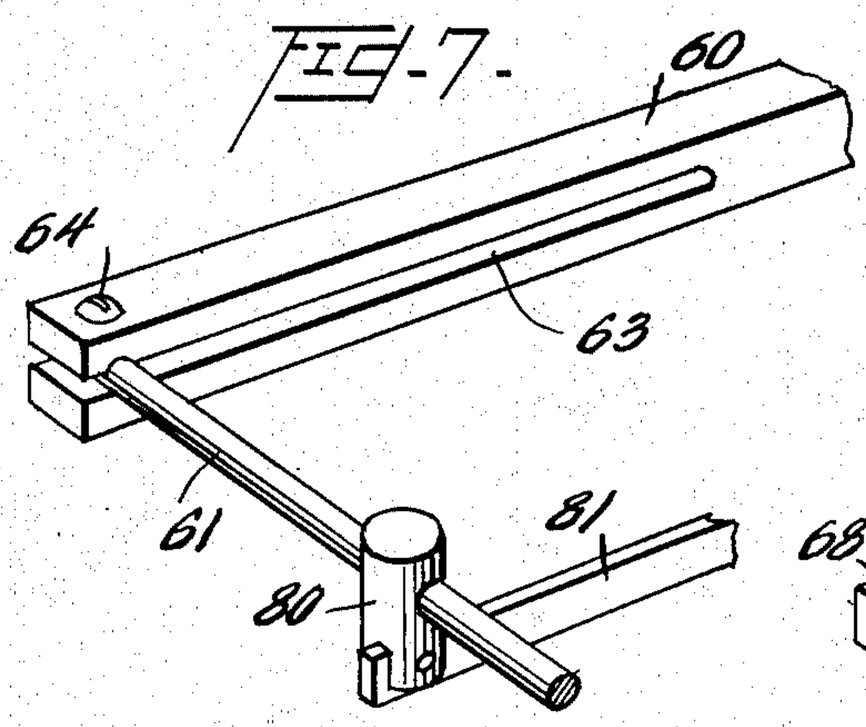
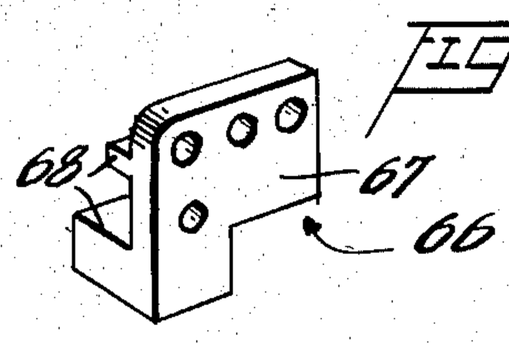


FIG. 8.



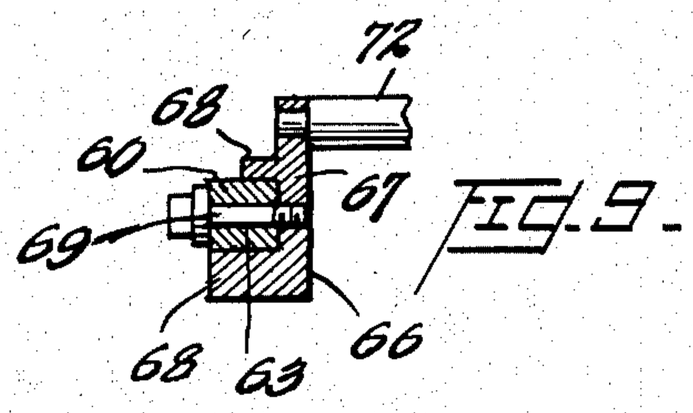


FIG. 9.

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STENCILING APPARATUS

Henry Andrew Gattuso, Adams, Mass.

Application January 30, 1950, Serial No. 141,323

1 Claim. (Cl. 101—126)

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The present invention relates to a stenciling apparatus particularly designed for marking, lettering, or decorating curved surfaces of cylindrical articles or the like, wherein the curved surface of the article is maintained in tangential rolling line contact with the stencil screen, while ink or paint is forced through the stencil by the action of a squeegee.

The primary object of this invention is to provide a simplified and improved apparatus, wherein cylindrical articles may be rapidly, easily, and efficiently marked as desired, by use of a stencil screen.

Another object of this invention is to provide a suitable work support which may be adjusted to receive work articles of a wide range of diameters.

Other objects of the present invention will become apparent from the accompanying drawings and the following specification which relate to one embodiment of the present invention. Variations thereof falling within the scope of the appended claim will be apparent to persons skilled in the art.

In the drawings:

Fig. 1 is a plan view of the apparatus.

Fig. 2 is a longitudinal sectional view.

Fig. 3 is a view taken on line 3—3 in Fig. 2.

Fig. 4 is a detail view to show the channel in which the screen carrier rides.

Fig. 5 is a view on line 5—5 in Fig. 3.

Fig. 6 is a plan view of the work support.

Figs. 7, 8, and 9 show several details of the work support.

The invention herein described, in general, provides an improved stenciling apparatus for the marking of the curved surface of cylindrical objects. The work is placed upon a support, consisting essentially of stationary rollers, such that the curved surface to be marked may be brought in tangential rolling contact with the underside of a stenciling screen which forms the bottomside of an ink trough. As the ink trough is moved in a direction tangential to the curvature of the work, the friction between the screen and the work causes it to rotate on its own axis. A stationary rubber squeegee, bearing on the line of contact between the screen and cylinder, causes the ink to pass through the previously designed portions of the screen and onto the work.

The present apparatus comprises a base 10, a pair of parallel frame elements 11 secured to the base, a slidable screen carrier 12, carried by the frame elements 11 and slidable in its own plane,

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and a work support 13 pivotally carried by the frame elements 11 for movement from a lower work receiving position to the upper position in which the work engages the lower face of the screen, and a squeegee and squeegee holder unit 14 carried by the frame elements 11.

Each of the frame elements 11 will be seen to comprise a pair of feet 15 which permit of the adequate securement of the frame elements to the base 10. Several cross rods 16 are also employed for generally imparting to the assembly the desired degree of rigidity. The frame members 11 will be seen to comprise main body portions 17 which are integral with the feet 15. For the purpose of facilitating the present description we may speak of the upper portion of each of the frame elements 11 as constituting a longitudinal bar 18 which extends the full length of the main body portions 17 and forwardly therefrom as shown. Each bar-like portion 18 has a channel 19 on its inner face extending its full length for receiving the screen frame 12. The outer face of each bar-like portion 18 extends beyond the outer face of the main body portion 17 of the frame and is preferably machined. Each bar is also provided with a pair of elongated passages 22 as shown, with the solid portion 24 interposed between the adjacent ends of each pair of passages 22. At least one of the bars 18 carries a movable stop 26 in each of the passages 22, these serving as adjustable stops for the forward and rearward movements of the screen carrier 12. The stops 26 consist substantially of a threaded bolt 27 and a square nut 28 lodged within the channel 19, thus they may be firmly secured for any desired position within their respective passages. If desired, the one or the other of the stops 26 may be removed and the screen carrier 12 may then be entirely withdrawn from the machine for any desired purpose.

The screen carrier 12 may be described as a substantially rectangular or oblong cast iron frame, each side of the frame having an inverted L-shaped cross section. The carrier provides a rectangular frame facing downward which can receive the frame of the screen, and inwardly directed flanges 30 which serve as stops for the upper face of the screen frame. The screen carrier is provided with means for supporting it in the channels 19 of the frames 11. Any suitable or desirable means may be provided for this purpose. In the present form of the invention each longitudinal element of the screen carrier 12 is provided with a pair of integral cast bosses 32 having transverse passages 34 which receive

the stubs 35 carrying rollers 36 which enter the channels 19. Set screws 37 are disposed in the upper faces of the bosses 32 for holding the stubs 35 securely in position. A pair of screws 38 are carried by the rear portion of the screen carrier 12 and serve to firmly secure the screen frame in position. The forward portion of the screen carrier 12 is provided with an integral cast handle portion 40 to facilitate the manual operation of the screen carrier 12.

The squeegee carrier unit 14 consists essentially of an inverted U-shaped casting which is pivotally mounted on the portions 24 of the bars 18 as shown. The portions 24 each carry a threaded bolt 44 having its threaded portion projecting exteriorly and having its head flush with the channel 19. The casting 14 is provided on the interior faces of the ends of the legs 42 with machined faces which engage the portions 24 on the bars 18. The threaded bolts 44 pass through these portions and receive the wing nuts 45. Thus it will be seen that the squeegee carrier unit 14 can be adjusted in any desired angular position with reference to the screen within the limits of approximately 90°.

The horizontal bar 46 of the squeegee carrier has an integral downwardly extending plate like portion 47 having a thickness smaller than the thickness of the bar 46, thereby providing in the bar a forwardly overhanging portion 48 in front of the plate 47. The plate has a transverse opening 49 which receives a headed bolt 50.

The squeegee is in the form of a rubber plate 51 having its lower edge 52 inclined downwardly and forwardly as shown. It is carried between a pair of cooperating plates 53 and 54 by a pair of screws 55 as shown. The plate 53 is provided with a vertical slot 56 which receives the bolt 50 and may thereby be firmly secured to the squeegee carrier unit 14. It will be seen that the upper edge of the plate 53 is disposed below the lower edge of the forward portion 48. The latter carries a pair of screws 58 which bear upon the upper edge of plate 53 as shown and may be employed for the purpose of adjusting the position of the squeegee about the bolt 50 as a center. This is sometimes necessitated by some slight irregularities in the work.

It will be observed that the rubber squeegee 51 extends to the extent of about half an inch below the lower edge of the rigid squeegee plate 53 and is disposed rearwardly thereof. The rubber squeegee and squeegee plate thereby cooperate to form a space or pocket for receiving ink.

The structure thus far described provides for the translational movement of the printing screen in its own plane. This is preferably in the present apparatus done manually. It will be understood, however, that if desired the screen carrier 12 with the screen may be reciprocated by a motor.

The work support unit 13 is disposed below the screen carrier and is designed to facilitate the insertion and removal of the work. The work support unit 13 is also particularly designed to maintain the surface upon which the printing is to be done in substantial parallelism to the screen under all conditions and in all positions. By the aid of such parallelism the quality of the print is maintained by reason of the fact that differences in pressure are minimized or eliminated. The parallelism permits contact between the work and the screen to be effective along the

entire line of contact at a single instant and it is desired to have the work exert substantial pressure against the screen such pressure is substantially uniform along the entire area of contact between the work and the screen.

The present work support unit is further organized to provide for work over a wide range of diameters. The present work support unit, therefore, can receive and the present apparatus can perform printing upon cylindrical articles that may only be a fraction of an inch in diameter and it may also perform similar high quality printing upon cylindrical articles several inches in diameter.

The work support unit comprises a frame consisting of a pair of longitudinal bars 60 and a pair of cross members 61 and 62. The front half of each bar 60 is split longitudinally as shown, thereby providing a passage 63 in each bar. The cross member 61 is mounted in the front end of the passages 63 and is held in fixed position therein by screws 64. A pair of sliders 66 is carried by each of bars 60. Each slider consists of a platelike main body portion 67 having a pair of parallel flanges 68 extending therefrom, the flanges being spaced from each other the vertical dimension of the bars 60. The screw 69 passes through the passage 63 and threads into a threaded aperture in the platelike portion 67 of the slides. The screws 69 are movable along the passage 63 and serve to firmly secure the sliders 66 in any desired position.

The upper portion 70 of the sliders are each provided with several openings which receive the spindles 72 and permit the free rotation of such spindles. A pair of collars 74 is carried by each spindle 72. The collars are slidable along the spindles and may be fixed in the desired position by means of set screws as shown. Each collar has several diameters.

Thus by the adjustment of the sliders in the passages 63, and by the selected location of the spindles in the selected aperture 71 and further by the selected adjustment of the collars with reference to each other, the work support unit may be adjusted to receive work ranging over a wide range of diameters.

The frame members 17 have several holes 76 which selectively receive the pins 78 carried by the rear ends of the bars 60. Further adjustment is, therefore, provided by selectively mounting the rear end of the work support unit in the desired hole 76.

The work support unit 13 is preferably operated by a foot pedal. For this purpose the cross bar 61 carries a downwardly dependent bifurcated stud 80 which is pivotal on the bar 61. An operating bar 81 is held by the stud 80 and extends rearwardly of the apparatus. Downwardly directed operator 82 is connected to the rear end of the operating bar 81 and is in turn connected at its other end to the pedal 84 through a hole provided therefore in the base 10.

The operating bar 81 is supported at an intermediate point to provide for the adjustment of its vertical position within desired limits. For this purpose the sleeve 86 is mounted on the base 10 as shown. A bifurcated stud 87 receives the bar 81 and is pinned thereto permitting pivotal movement of the bar 81 in the stud. The stud 87 at its opposite end has a threaded rod which enters the sleeve 86 and carries a knurled interiorly threaded nut 88 which serves as an adjustable stop for the stud 87.

Thus in addition to the adjustable devices pre-

viously described and which include the sliders **66** and the other devices carried by such sliders the entire work supporting unit is also adjustable by means of the nut **88** and its associated devices.

I claim:

An apparatus of the class described, comprising a base plate, a pair of parallel members secured to said base plate, a screen carrier carried by the members for reciprocating movement in a plane parallel to the base, a work support disposed between the screen carrier and the base plate pivotally mounted at its rear end in said parallel members, an operating bar attached to the front of the work support and extending rearwardly between the base plate and work support for operation by a pedal, a stud pivotally attached to said operating bar at a point intermediate its ends, and means mounted on the base plate receiving the stud and providing for adjustment of the operating bar and work support to desired levels intermediate the base and screen carrier determined by the diameter of the work.

HENRY ANDREW GATTUSO.

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