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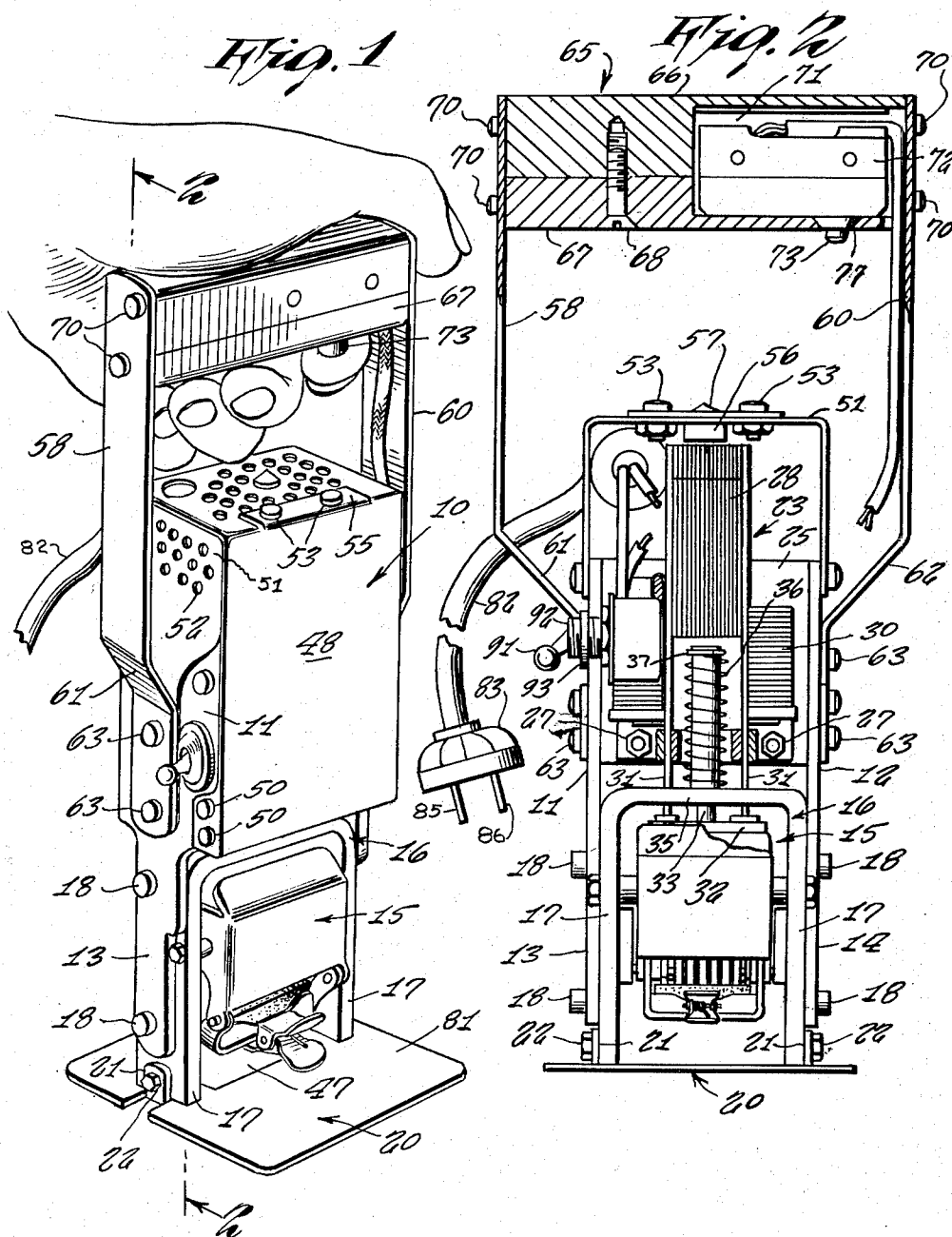
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2,801,583

POWER-OPERATED HAND NUMBERING MACHINE

Filed Dec. 2, 1954

2 Sheets-Sheet 1



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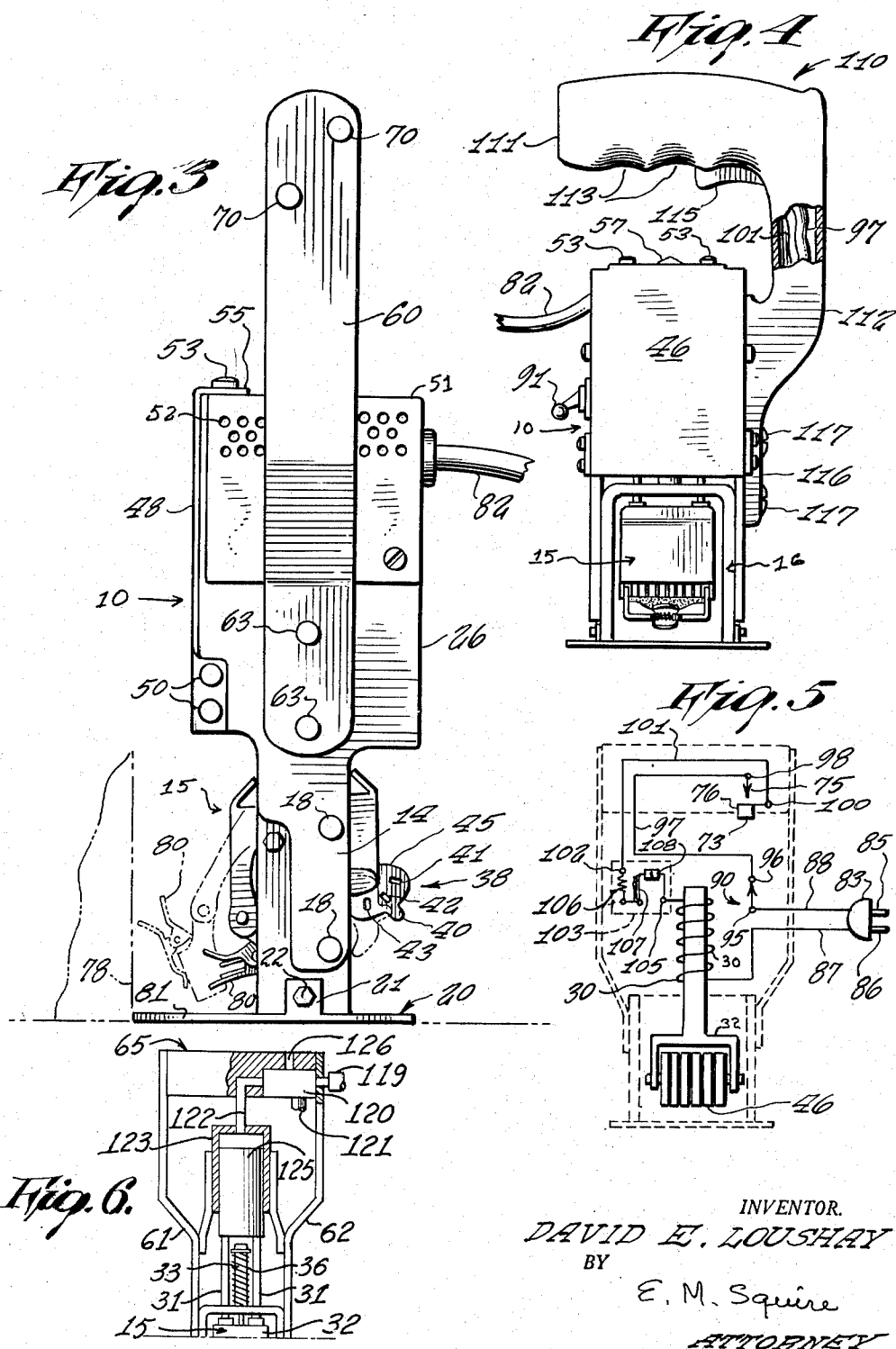
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POWER-OPERATED HAND NUMBERING MACHINE

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The present invention relates to a power-operated self-inking hand numbering or stamping machine which may be used to apply an inked impression to any desired surface portion of an article which is to be identified by a serial number, a lot number, a date or other indicia.

Hand operated self-inking stamps of this character are well known in the art and are generally satisfactory wherever such a hand stamp is used relatively infrequently.

For situations where numbers or other indicia are applied in rapid succession over prolonged periods to articles being manufactured on a production line basis or in cases where a large number of carbon copies are to be imprinted along with the original of a document, operator fatigue and lack of uniformity in the impressions interfere with the quality of the work.

Generally, the invention involves a hand machine comprising a handle to be grasped by the operator, a self-inking numbering or stamping head, a frame or housing connecting the handle to the numbering head, a power actuated device mounted in the housing and connected to operate the numbering head, and a manually operable control for the power actuated device mounted for convenient manipulation by the operator while grasping the handle.

Accordingly, it is an object of the invention to provide a light weight compact power-operated hand stamping or hand numbering machine which can be conveniently handled by an operator and actuated repeatedly at a rapid rate over a relatively long period of time without encountering operator fatigue.

A further object of the invention is to provide a power-operated hand numbering or stamping machine of this character which will inherently produce consistently uniform impressions.

A further object of the invention is to provide a hand machine of this character which will produce impressions with sufficient mechanical force to obtain a considerable number of good clear impressions on carbon copies.

Still another object of the invention is the provision of guard means associated with the printing head for preventing damage to the mechanism when producing impressions on surfaces which may be immediately adjacent to an outwardly projecting wall, housing or other obstruction which restricts and limits the area available to the machine when applying the inked impression.

Other and further objects, features and advantages of the invention will appear upon reading the following specification together with the accompanying drawing forming a part hereof.

Referring to the drawing:

Figure 1 is a perspective view of a numbering machine embodying the invention.

Figure 2 is a sectional view in elevation taken along the line 2—2 of Fig. 1, looking in the direction of the arrows.

Figure 3 is a side view in elevation of the machine shown in Fig. 1.

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Figure 4 is an elevational view on a reduced scale of a machine having a modified form of handle and control switch.

Figure 5 is a circuit diagram showing the electrical connections used in the numbering machine.

Figure 6 is a fragmentary elevational view, partly broken away and shown in section to illustrate details of construction, illustrating a modified form of the invention in which compressed air cylinder is used for operation of the numbering machine.

Referring to Fig. 1, there is shown a power-operated hand numbering machine which comprises a housing designated generally as 10. The housing 10 includes side walls 11 and 12 with integrally formed downwardly extending legs 13 and 14. Secured between the legs 13 and 14 is a numbering head designated generally as 15. A numbering head is shown merely by way of illustration, it being understood that a date stamp or other self-inking marking device or a stamping device for producing embossed impressions may be substituted for the numbering head, if desired.

Preferably, I employ for numbering head 15, a hand numbering machine manufactured commercially by The Roberts Numbering Machine Company of 700 Jamaica Avenue, Brooklyn, New York, and identified as their model No. 49, the usual hand operation knob being removed. Numbering machines of this type are shown in U. S. Patent No. 1,459,215, issued on June 19, 1923, and in Patent No. 1,648,276, issued on November 8, 1927, both to Maximilian H. Kern and in machines of this type, the numbering printing wheels advance automatically. The numbering machine may alternatively be of the type wherein a manually operated lever advances the numbering printing wheels and the same number will be printed repeatedly until the advancing lever is operated to advance the printing wheels to the next higher number. A numbering machine of the manually advancing type is shown in U. S. Patent No. 784,729, issued on March 14, 1905, to Edwin G. Bates.

The numbering head 15 comprises an inverted U-shaped frame designated generally as 16 and having spaced vertical leg portions 17 which are secured to the housing legs 13 and 14 by screws 18. A base plate designated generally as 20 supports the entire machine. Base plate 20 is provided with integrally formed upwardly turned ears 21 which are secured by screws 22 to the lower ends of numbering head frame legs 17.

There is shown disposed within the housing 10 a power actuable device (Fig. 2) exemplified by an operating solenoid designated generally as 23. Solenoid 23 comprises a laminated magnetic frame 25 which is secured to the rear wall 26 (Fig. 3) of housing 10 by bolts 27 (Fig. 2). Solenoid 23 further comprises a vertically movable laminated magnetic plunger 28 and an operating winding 30. When energized, operating winding 30 causes plunger 28 to move downwardly. A pair of laterally spaced non-magnetic legs 31 extend downwardly from plunger 28 and their lower ends are secured to the vertically movable printing wheel carrying yoke 32 of the numbering head 15.

An upright rod 33 is fixed to the vertically movable yoke 32 and extends freely slidably through the transverse portion 35 of inverted U-shaped frame 16. A helical compression spring 36 surrounds rod 33 and its upper end bears against a retaining washer 37 fixed to the upper end of rod 33. The lower end of spring 36 bears against the transverse portion 35 of frame 16.

Spring 36 acts as a retractile spring for drawing the printing wheels upwardly after the completion of each numbering operation. The wheels may be automatically advanced to the next higher number in the course of

this upward movement. However, the numbering head 15 includes an adjustment device designated generally as 38 (Fig. 3) which comprises a locking ratchet control member 40. The locking member 40 is provided with a projection which is selectively insertable in any one of three holes 41, 42 and 43 formed in a plate 45.

When locking member 40 is in the position determined by hole 41, the same number will be printed each time, it being necessary to change the number manually, moving the printing wheels using a wooden pick, a pencil or other suitable implement. With locking member 40 in the position determined by hole 42, each number will be duplicated or printed twice before the wheels advance to the next higher number. In the position determined by hole 43, consecutive numbers will be printed by successive operations of the machine.

The printing wheels 46 shown diagrammatically in Fig. 5 engage the surface to be imprinted through an aperture 47 (Fig. 1) formed in base plate 20.

The housing 10 also includes a separable front wall 48 which is secured to the remainder of the housing 10 by screws 50. Additionally, the housing 10 includes an upper cover portion 51 which has ventilating perforations 52 formed therein to facilitate the circulation of air for cooling the solenoid 23. The perforated cover 51 is secured to front wall 48 by screws 53 which engage a horizontally extending tongue or lip 55 at the upper end of separable front wall 48.

A bumper 56 formed of rubber or other suitable resilient material is centrally mounted in the top of the perforated cover 51 by means of an upwardly extending shank portion 57 which extends through the cover 51 with a snug fit holding the bumper 56 securely in place. Bumper 56 is positioned directly above the upper end of solenoid plunger 28 and cushions the mechanical shock which would otherwise occur as the plunger 28 returns to the upper limit of its stroke.

Secured to the side walls 11 and 12 of housing 10 are a pair of handle supports 58 and 60. The handle supports 58 and 60 have offset jog portions 61 and 62 which provide a wider spacing between the upper ends of the handle supports 58 and 60 than at their lower ends. The lower ends of handle supports 58 and 60 are secured to housing 10 by screws 63.

Extending horizontally between the spaced upper ends of handle supports 58 and 60 is a handle designated generally as 65. The handle 65 comprises superposed upper and lower handle members 66 and 67 which are held together by an upwardly extending flat head screw 68 passing through lower handle member 67 and threaded into the upper handle member 66. The handle 65 is connected to the upper ends of handle supports 58 and 60 by a plurality of screws 70.

The central portion of the handle 65, intermediate its ends, is located directly above the center of gravity of the machine considered in its entirety. The machine is sufficiently light in weight so that this makes it convenient for the operator of the machine to grasp the handle 65 with a single hand and lift the entire device with a minimum of effort. The operator may thus easily move the machine at will to position the aperture 47 in base plate 20 over any desired area of the surface to be imprinted so that the imprinted number or other impression will appear precisely in the correct location.

The handle members 65 and 66 are recessed to define an enclosed space 71 (Fig. 2) to receive and enclose an electric actuating switch 72 which is preferably of the snap-action "Microswitch" type requiring only a light mechanical pressure and a small amount of travel for its actuation. The switch 72 is provided with an actuating button 73 which causes normally open switch contacts 75 and 76 (Fig. 5) to close in response to a light upward pressure applied to the actuating button 73. The actuating button 73 protrudes downwardly through an aperture 77 formed in lower handle member 67 and is

disposed near the handle support 60 for convenient access by the index finger of an operator of the numbering machine as shown in Fig. 1. It will be noted that the actuating button 73 is so positioned with respect to the handle 65 that the operator uses the index finger of the same hand with which he grasps the handle 65 to operate the button 73. Each complete cycle of pressing and releasing button 73 causes a single complete reciprocatory movement of the numbering head 15 to produce a single inked impression on the surface to be imprinted.

As shown in Fig. 3, it is contemplated that the machine may be operated in a close or crowded space which is limited, for example, by a wall or other vertical surface 78 indicated in dotted outline. The numbering head 15 includes a removable ink pad secured to an upwardly and outwardly movable transverse bracket by a spring clip 80. The spring clip 80 swings upwardly and outwardly through the position indicated in dotted outlines in Fig. 3 in close proximity to the vertical surface 78. To prevent possible damage to the numbering head 15, the portion 81 of base plate 20 beneath spring clip 80 is extended to provide an adequate spacing of the spring clip 80 away from vertical surface 78, this spacing being sufficient to assure clearance between the end of spring clip 80 and the vertical surface 78. This extended portion 81 of base plate 20 additionally improves the stability of the machine when resting on a horizontal surface.

Energy for the operation of solenoid 23 is supplied through a flexible two-conductor cord 82 having a free end which terminates in an attachment plug cap 83. The cap 83 is provided with contact prongs 85 and 86 adapted to be inserted in the usual power outlet or wall receptacle.

Referring to Fig. 5, contact prong 86 is connected via a conductor 87 of cord 82 directly to one end of the operating winding 30 of solenoid 23. Contact prong 85 is connected via a conductor 88 of cord 82 to a power switch 90. Power switch 90 is of the tumbler type and is provided with an operating handle 91 conveniently accessible at the exterior of housing 10, the power switch 90 being disposed within the housing 10 and mounted by an exteriorly threaded shank member 92 and an interiorly threaded ring 93. Conductor 88 is connected to a terminal 95 of power switch 90. From the other terminal 96 of power switch 90 a conductor 97 extends directly to a terminal 98 of actuating switch 72. The other terminal 100 of actuating switch 72 is connected to a terminal 102 of a protective device 103 the other terminal 105 of which is connected to the operating winding 30 of solenoid 23.

The protective device 103 comprises a heater element 106 which is serially included in the energizing circuit for solenoid 23 and a bimetallic or otherwise heat sensitive control member 107 arranged to be heated by the heater element 106. The heat sensitive control member 107 controls a pair of normally closed contacts 108 serially included in the energizing circuit of solenoid 23, the control member 107 being arranged to open the contacts 108, preferably with a snap action, whenever the temperature of control member 107 exceeds a predetermined maximum temperature. Resetting means (not shown) are provided and may advantageously include a manually operable push button conveniently accessible at the exterior of the housing 10. Mechanisms of this character are well known and any desired type may be used. Preferably the protective device 103 is so arranged that contacts 108 cannot be reclosed until control member 107 has cooled off to a temperature sufficiently low so that it will not immediately re-open contacts 108 as soon as the solenoid 23 is energized a few times.

As an added feature of the invention, I prefer to dispose the thermal control member 107 so that it will not only be heated by the heater element 106 but also by the solenoid 23 itself and particularly by the operating winding 30 thereof. This will afford cumulative protection against overheating of the operating winding 30, even though the heating effect of the relatively fast heating and

fast cooling heating element 106 alone would never heat the control element to the temperature required to cause opening of contacts 108.

This additional protective effect may be obtained by placing temperature responsive control element 107 in contact with or in close proximity to the operating winding 30 of solenoid 23 or by arranging the control element 107 to be heated by convection currents of air passing over operating winding 30. A supplementary control element mechanically coupled to the main control element may be used for this purpose, if desired, or two separate control elements each with its own contacts may be provided, one control element such as 107 being responsive to heating element 106 only and the other control element being responsive to the temperature of operating winding 30 only, their respective contacts being serially included in the energizing circuit of solenoid 23.

By providing the protective device 103, I may advantageously use a solenoid 23 of relatively light weight and small dimensions such that the actual operating temperature of solenoid 23 will approach its maximum safe value when the machine is operated repeatedly at a rapid rate for a prolonged period of time, the operating conditions being estimated for ordinary and usual circumstances rather than for the most severe conditions possible. In this way, I may safely provide a lighter and more compact machine for ordinary use, yet without danger of overheating and damage if the machine is unexpectedly used under more severe conditions of service than those for which it was originally designed.

In the modified form of the invention shown in Fig. 4, instead of the handle 65, I provide a pistol grip type of handle designated generally as 110. The pistol grip handle 110 comprises a horizontal gripping portion 111 integrally formed with a hollow vertical shank portion 112. The underside of gripping portion 111 is provided with shallow rounded recesses 113 to engage the fingers of the operator and provide a more positive and comfortable grip. The actuating switch 72 is disposed within the handle 110 and comprises a trigger type actuating lever 115 disposed for convenient manipulation by the index finger of an operator. Conductors 97 and 101 are shown enclosed within the hollow shank portion 112 of handle 110. The lower end of shank portion 112 terminates in a flange 116 secured to the housing 10 by screws 117.

While I have shown and described a hand numbering machine which utilizes a solenoid for its operation, it is to be understood that other forms of power actuated mechanism may be used, if desired. As shown in Fig. 6, I may replace the flexible cord 82 by a flexible air hose 119 which terminates in a suitable coupling (not shown) for connection to a compressed air line instead of the attachment plug cap 83, the air hose 119 extending to a manually operable control valve 120 which replaces the actuating switch 72. The control valve 120 is shown provided with an actuating button 121 similar to the button 73 in Fig. 1. Alternatively, a trigger type control member similar to the actuating lever 115 shown in Fig. 4 may be provided. From the control valve 120, a further air hose or conduit 122 extends to a pneumatic cylinder 123 provided with a piston 125 and the laterally spaced legs 31 serve as a piston rod connecting the piston 125 to the vertically movable printing wheel carrying yoke 32 of the numbering head 15, as previously described in connection with the solenoid plunger 28. The helical compression spring 36 and rod 33 are used to move the piston rod upwardly after the printing operation has been completed. The control valve 120 connects the space in the cylinder 123 above the piston 125 to the atmosphere when the actuating button 121 is manually released. A passage 126 formed in the handle 65 is provided for this purpose.

I have shown what I believe to be the best embodiments of my invention. It will be apparent to those skilled in the art, however, that many changes and modifications

may be made therein without departing from the scope of the invention as defined in the appended claims.

What is claimed is:

1. In a device of the class described, in combination: supporting means; reciprocatory self-inking printing means carried by said supporting means and adapted to apply an impression to a surface to be imprinted in the course of a single complete reciprocatory movement thereof; reciprocatory power actuable operating means carried by said supporting means and connected to said printing means for actuation thereof; energizing means connected to said operating means for operation thereof; control means included in said connection of said energizing means to said operating means, said control means including a manually operable control member operable at will for causing a single complete reciprocatory movement of said printing means by said operating means for applying said impression to said surface; and handle means adapted to be grasped by a single hand of an operator of said device, said handle means being connected to said supporting means and disposed with its central portion directly above the center of gravity of said device considered in its entirety, the weight of said device and said disposition of said handle means permitting said operator conveniently to lift said entire device using said single hand and to manipulate the same for positioning said supporting means to cause said impression to be made at a desired position on said surface, said control member and said handle means being so positioned with respect to each other that said control member is conveniently manually operable by the same single hand of an operator while said hand simultaneously grasps said handle means.

2. A device according to claim 1, wherein said operating means is a solenoid comprising a movable plunger connected to said printing means; in which said energizing means is an electrical energizing circuit for said solenoid, and wherein said control means is an electrical switch having contacts serially included in said energizing circuit.

3. A device according to claim 2, further comprising thermally actuable circuit control means having contacts serially included in said energizing circuit and a temperature responsive element disposed in proximity to said solenoid to be heated thereby and connected to open said contacts when the temperature of said temperature responsive element exceeds a predetermined maximum temperature.

4. A device according to claim 1, wherein said operating means is a fluid pressure cylinder having a reciprocatory piston disposed therein, said piston being connected to said printing means; in which said energizing means comprises a flexible hose having one end adapted to be connected to a source of fluid under pressure; and wherein said control means comprises a valve connected between the other end of said hose and said cylinder, said valve including movable means selectively operable by said control member for connecting said hose to cause fluid flow to and from said cylinder for causing movement of said piston and said printing means.

5. A device according to claim 1, wherein said supporting means comprises a pair of spaced upwardly extending handle supporting members, said handle means extending between said handle supporting members and said control means being disposed within and enclosed by said handle means with said control member projecting outwardly therefrom.

6. A device according to claim 1, wherein said handle means comprises a horizontally extending pistol grip portion and a vertically extending hollow shank portion connected to said supporting means, said control means being disposed within said handle means and said control member being formed as a trigger member having a protruding portion disposed adjacent to said pistol grip portion for actuation by said operator.

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7. A device of the class described comprising, in combination: a reciprocatory imprinting head including an inverted U-shaped frame; an apertured base plate secured to the lower ends of said U-shaped frame; a vertically reciprocable yoke member disposed intermediate the legs of said frame; printing means carried by said yoke member and engageable with a surface to be imprinted through said aperture in said base plate, said printing means being adapted to apply an impression to said surface in the course of a single complete reciprocatory movement of said yoke member; upwardly extending supporting frame means secured to said U-shaped frame; reciprocatory power-actuable operating means carried by said supporting frame means and connected to said yoke member for causing vertical movement thereof; energizing means connected to said operating means for operation thereof; control means included in said connection between said energizing means and said operating means, said control means including a manually operable control member operable at will for causing a single complete reciprocatory movement of said yoke member by said operating means for applying said impression to said surface, and handle means adapted to be grasped by a single hand of an operator of said device, said handle means being connected to said supporting frame means and disposed with its central portion directly above the center of gravity of said device considered in its entirety, the weight of said device and said disposition of said handle means permitting said operator conveniently to lift said entire device using said single hand and to manipulate the same for positioning said aperture in said base plate to cause said impression to be made at a desired position on said surface, said control member and said handle member being so positioned with respect to each other that said control member is conveniently manually operable by the same single hand of an operator while said hand simultaneously grasps said handle means.

8. A device according to claim 7, wherein said operating means is a solenoid comprising a movable plunger connected to said yoke member; in which said energizing means is an electrical energizing circuit for said solenoid, and wherein said control means is an electrical switch having contacts serially included in said energizing circuit.

9. A device according to claim 8, further comprising thermally actuable circuit control means having contacts serially included in said energizing circuit and a temperature responsive element disposed in proximity to said solenoid to be heated thereby and connected to open said contacts when the temperature of said temperature responsive element exceeds a predetermined maximum temperature.

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10. A device according to claim 7, wherein said operating means is a fluid pressure cylinder having a reciprocatory piston disposed therein, said piston being connected to said yoke member; in which said energizing means comprises a flexible hose having one end adapted to be connected to a source of fluid under pressure; and wherein said control means comprises a valve connected between the other end of said hose and said cylinder, said valve including movable means selectively operable by said control member for connecting said hose to cause fluid flow to and from said cylinder for causing movement of said piston and said printing means.

11. A device according to claim 7, wherein said supporting frame means comprises a pair of vertically extending spaced parallel leg portions secured to the vertical leg portions of said inverted U-shaped frame.

12. A device according to claim 7, wherein said supporting frame means further comprises means defining an enclosed space and in which said operating means is disposed in said enclosed space.

13. A device according to claim 12, wherein said enclosed space defining means has a plurality of ventilating apertures formed therein to permit the passage therethrough of convection currents of air for cooling said operating means.

14. A device according to claim 7, wherein said printing means comprises at least one part which moves outwardly with respect to said inverted U-shaped frame in the course of printing operation of said printing means, and in which said base plate extends outwardly beneath the path of travel of said moving part for spacing said device away from a vertical surface which could otherwise interfere with said movement of said part.

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