July 10, 1962 R. WICK ETAL 3,043,218

ELECTRO-MAGNETICALLY OPERATED IMPRINTING DEVICE

Filed May 21, 1958 2 Sheets-Sheet 1

Fig. 1

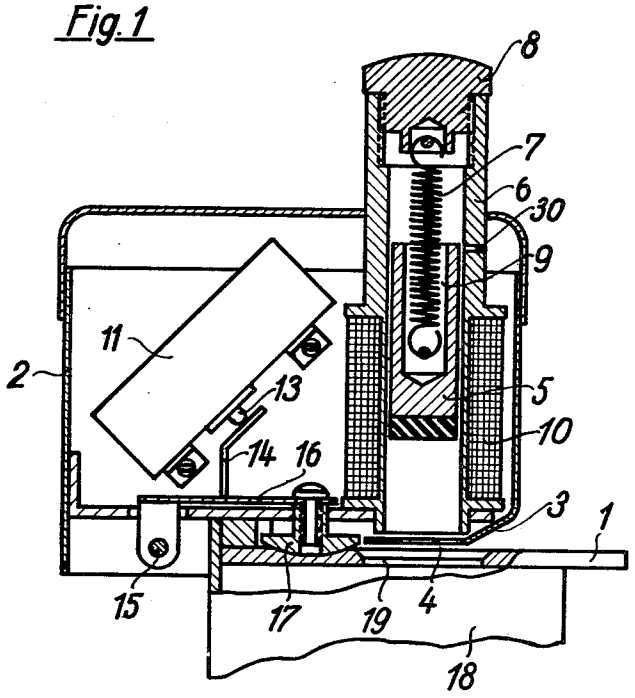
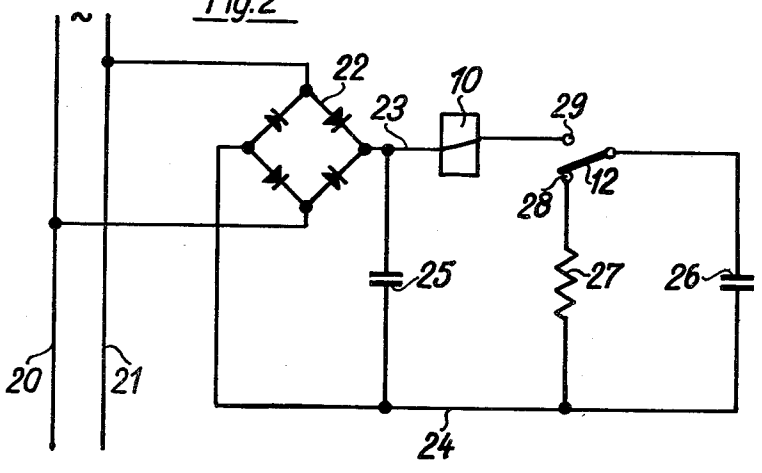


Fig. 2



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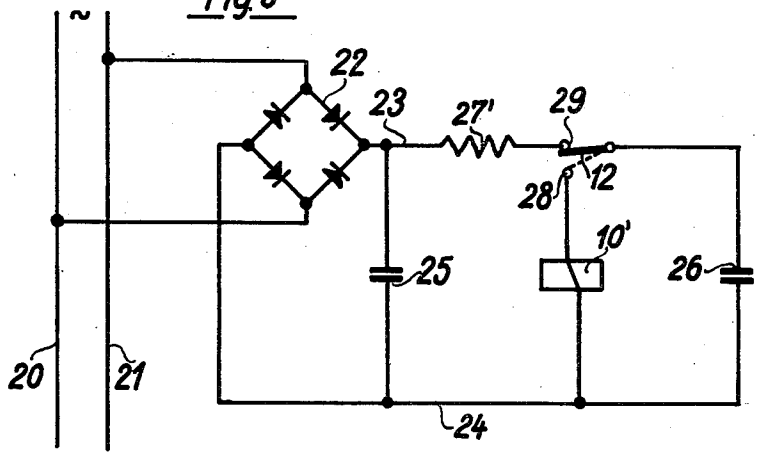
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ELECTRO-MAGNETICALLY OPERATED IMPRINTING DEVICE

Filed May 21, 1958 2 Sheets-Sheet 2

Fig. 3



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3,043,218

ELECTRO-MAGNETICALLY OPERATED IMPRINTING DEVICE

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17 Claims. (Cl. 101—287)

The present invention relates to improvements in apparatus for imprinting or stamping designations or the like upon a workpiece such as a card or paper placed upon an operating base or table against which a stamping member may be impelled by the power of a solenoid device. Usually, the workpiece itself being positioned upon the base actuates a switch which initiates the power printing stroke of the stamping member.

It is among the objects to provide an improved apparatus of this character which is simple, compact, with a minimum of parts, as well as light in weight, and highly accurate and reliable in its operation, to produce imprints that are clear and of a high quality.

More particularly, the invention aims to provide improved apparatus in which the size and weight of the solenoid coil may be significantly reduced without the risk of damage to the coil due to overload by protracted energization, and in which the solenoid device is accurately controllable to impart a brief or momentary yet powerful impulse to the stamping member without incurring overload, and whereby clear imprints of high quality are produced.

According to the invention a solenoid coil of great compactness and of minimum weight may be safely employed. This is made possible by the use in the energizing circuit of a condenser operated in such a manner that only the momentary flow of energy incident to a change in the state of charge thereof will energize the solenoid. In this way a powerful impulse or momentum may be imparted to the stamping member, with the point of interruption of the energizing circuit accurately controllable by the dimensioning of the condenser capacity.

Hence, according to one feature the improved apparatus is actuated from a direct-current source energizing the solenoid coil, with a condenser and a resistor provided in the circuit. The condenser cooperates with the resistor in governing the extent of momentary energization of the coil and the intensity of the resulting power stroke or stamping movement. When a double throw switch in the energizing circuit is thrown to one position it closes the direct current energizing circuit changing the state of the condenser charge in one direction thereby effecting the power stroke. Throwing the switch in the opposite direction it opens the energizing circuit thereby producing a change with respect to the condenser charge in the opposite direction. In this way, the flow of energy with respect to the condenser charging and discharging in the course of an operating cycle, is utilized to effect a sharply controllable momentary energization of the coil, without any additional mechanism or moving parts. A strong printing impact is thus attainable as the energizing impulse may be accurately terminated automatically, as a result of the condenser operation above set forth.

Other features lie in the manner in which the stamping member operates in the form of a solenoid core spring-suspended in the tubular guide structure of a solenoid carrying frame.

Other features lie in the provision of air cushioning means for snubbing or dampening the return stroke or rebound movement of the stamping member when the solenoid becomes de-energized.

Still other features lie in the provision of improved

switch operating means actuated by the introduction of the workpiece or card into printing position on the base of the machine.

Other features and advantages will hereinafter appear.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

FIG. 1 is a vertical sectional view of the improved imprinting apparatus according to one embodiment illustrating novel structural features thereof;

FIG. 2 shows the wiring diagram of the electrical operating system according to a preferred form of the invention; and

FIG. 3 shows a modified form of the electrical operating system.

Imprinting devices are known in which a solenoid is energized by the introduction of the workpiece or paper itself, where the energizing current was interrupted only when the paper was withdrawn subsequent to the stamping operation. Since a vigorous impact of the stamping member upon the workpiece as well as compactness of machine are desirable, prior devices have had the drawback that the solenoid coil would be relatively overloaded, as the size of the coil was to be minimized. In other words, prior devices have had to deal with the dilemma of either accepting a heavier and bulkier coil, or else to incur the hazard of overload and possible damage to the coil. At any rate in the devices as now known there exists the danger that where the workpiece or paper is allowed to remain in place upon the device for a longer period of time, destruction of the coil may result because of overload. Another disadvantage inherent in prior devices lies in the fact that the swingably or pivotally mounted stamping member will swing about its equilibrium position close to the printing surface, following the initial printing impact. Where the device is not carefully adjusted, this may produce a plurality of superposed imprints upon the workpiece and thus produce a blurred or deteriorated imprint. According to the present invention, a momentary single control impulse is imparted to the stamping member by the use of a condenser in the energizing circuit in such a manner that a momentary change in the state of the charge of the condenser is utilized to energize the solenoid coil. In a preferred form exemplary of the invention, the energizing current for the coil is that which is brought about by the flow of energy during the charging phase of the condenser.

In one embodiment of the invention the imprinting apparatus has an operating switch which is actuated by a feeler member when engaged by the leading edge portion of the paper, the feeler member being provided with a head portion substantially conically shaped so that it may be tangentially engaged by the leading edge portion of the paper.

In the embodiment here preferably shown, the stamping member is in the form of a solenoid core actuated by the energizable coil surrounding it. Furthermore, according to this invention, the improved imprinting device has an air-cushioning device for snubbing the return movement of the stamping member after the printing impact thereof has been performed. In this embodiment, the movement of the stamping member itself governs the timing of the snubbing operation. Preferably, the stamping member is in the nature of a piston while a surrounding cylindrical structure in which the piston operates is provided with a breather opening providing communication with the atmosphere. As the stamping member or

piston rebounds from its stamping impact, it will cover or overlap the breather opening whereby the escape of air from the cylinder is restricted and the desired snubbing effect is obtained. Preferably, the arrangement is such that the breather opening is covered after the stamping member has rebounded past the intermediate equilibrium position. Thus, said breather opening positioned to cooperate with a portion of the stamping member or piston constitutes an automatic snubbing control means.

This invention has the advantage that the period of energization is controllable independent of the length of time that the workpiece or paper is allowed to remain in place upon the device. That is to say, the energizing current for the coil is controllably maintained for only a very short period of time or momentarily, namely only during the period of charging or discharging of the aforementioned condenser, so that thereby the solenoid coil is effectively protected against overload persisting over any considerable period of time. Inasmuch as the coil is de-energized at or prior to the point of stamping impact, the stamping member will return at once to its position of rest. In this way superimposed stampings upon one and the same workpiece are positively avoided, while a very simple construction for operatively supporting the stamping member is thus provided. The stamping member having performed a vigorous impact will promptly return to its position of rest.

Referring more in detail to the embodiment of the apparatus shown in FIG. 1 as exemplary of this invention, it will be seen that a housing **2** is mounted upon a base plate or table **1**. The housing has a bottom wall portion **3** spaced from and constituting with the base plate or table **1** a passage **4** for receiving the workpiece or paper to be imprinted or numbered. A printing or stamping member **5** in a nature of a piston is longitudinally or axially movable in a cylindrical guide structure **6**, and it is vertically suspended therein by means of a tension coil spring **7**. The outer end of the spring is attached to a cap screw **8** which closes the upper free end of the cylindrical guide structure, while the inner or lower end of the spring is attached to the stamping member within an axial bore or hollow **9** provided therein. The stamping member **5** represents an armature which may be actuated by a surrounding solenoid coil **10** which in turn surrounds the lower portion of the cylindrical guide structure or solenoid frame **6**. The solenoid coil may be energized by operating a micro-switch **12** mounted within a housing **11** which in turn is mounted within the aforementioned casing **2**. The micro-switch controls an operating circuit to be described below.

A pin **13** may be actuated to operate switch **12** by the workpiece engaging a feeler member in the form on an arm **14** swingable about a pivot **15** stationary in the casing **2** and constituting part of a switch actuating lever **16**. The actuating lever **16** is provided with a substantially conical head portion **17** extending across the passage **4**.

A chamber provided underneath the operating table or base plate **1** has arranged therein a set of stamping indicia or chacters rising into the opening **19** in the table.

The circuit system for operating the device in accordance with the concept of this invention is shown in the diagram of FIG. 2. By way of example to illustrate the invention embodied in a preferred form, there is shown in this diagram a supply of alternating current indicated by conductors **20** and **21**. Connected to these conductors is a bridge rectifier **22** providing a source of direct current for energizing the solenoid coil **10** and for operating it in accordance with the concept of this invention. For the purpose of providing a direct current of suitable qualifications to the energizing circuit, there is provided a storage condenser **25** connected across the bridge rectifier **22**. Conductors **23** and **24** are provided so that the solenoid coil **10**, the switch **12**, and a charging and discharging condenser **26** may be connected in series in the energizing circuit. The condenser **26** may be connected in circuit with the resistor **27** by the operation of the switch **12** in the manner clearly shown in FIG. 2.

When the actuating switch **12** which is in the nature of a double throw switch, is in the full line position shown in FIG. 2, it will thus have closed upon the contact terminal **28** whereby the solenoid coil will have been disconnected and de-energized. If now a workpiece, for example, a photographic paper or other workpiece is introduced in the passage **4**, it will be seen that the leading edge of the paper will tangentially engage and raise the head portion **17** of the feeler member and thereby swing the switch actuating member or lever **16** in a counterclockwise direction and thus through its arm **14** actuate the switch **12** by engaging upon the depressing the pin **13** of the switch. This operation will open the switch **12** with respect to the contact element **28** (see FIG. 2) while establishing contact with the contact element **29**. In this way by closing the operating circuit through conductors **23** and **24**, there will be sent through the solenoid coil **10** a brief or momentary yet powerful impulse of current which terminates when the condenser **26** will have obtained the full charge in accordance with its capacity.

The short or momentary energization of the coil **10** causes the stamping member **5** to be impelled to execute a quick vigorous impact movement whereby the paper is pressed against the block of raised letters disposed in the opening **19**.

The condenser **26** is so dimensioned that the coil **10** shall become de-energized at the end of the impact movement, so that the stamping member will return promptly to its position of rest.

As the stamped paper is being withdrawn from the passage **4**, the head portion **17** with the switch actuating arm drops back to its inactive position, the switch thus makes contact with the contact terminal **28**, allowing the condenser **26** to discharge via the resistor **27** which is so dimensioned that the condenser **26** will have become discharged preparatory to starting the subsequent stamping operation, that is when the next paper may be fed into passage **4** to receive its imprint in the manner above described.

The stamping member **5** is in the shape of a piston having peripheral clearance in the cylindrical guide portion **6** closed by the cap screw **8**. In this way, there is formed an air-cushioning device which exerts a snubbing action upon the stamping member **5**. However, in the operation of this device it is desired that the rebound or return movement of the stamping member **5** be uninhibited or undamped up to the point of its neutral or starting position. For that purpose the guide portion **6** is provided with a radial bore or breather opening **30** disposed substantially at the level assumed by the upper edge of stamping member **5** when in the neutral position or position rest. Thus, the snubbing device or air cushion means remain ineffective while the upper edge of the stamping member is positioned below the breather opening **30**. If, however, the stamping member **5**, as a result of an impact movement, rebounds past its neutral position, it will overlap the opening **30** producing in the trapped air volume a super pressure or snubbing effect of short duration. That is to say, a position of the compressed air is allowed to escape through the clearance between the stamping member and the guide portion **6** before the stamping member will again move away from the opening **30**. A considerable portion of the kinetic energy of the stamping member is thus consumed. The oscillation of the stamping member is effectively damped about the intermediate neutral position, with the result that the stamping member attains its position of rest within a very short space of time. With the cushioning device thus acting only during part of the return movement of the stamping member **5** and the snubbing effect being governed by the return movement itself, assurance

is thereby given that the stamping member following each impact stroke will promptly resume starting position as shown in the drawing, and that it will perform the stamping operation properly and accurately.

The operating circuit may be modified within the scope of this invention in the manner shown in FIG. 3, since solenoid **10** and the resistor **27** may be substituted for each other, the position of the resistor being indicated at **10'** and that of the solenoid at **27'**. Consequently, the position of the switch member **12** must be reversed so that it will be normally closed upon contact **29** instead of upon contact **28**. That is, with the switch closed upon contact **29**, the condenser **26** will become charged over the resistor **27** preliminary to effecting the stamping operation. But with the switch closed upon contact **28** the coil will become energized briefly or momentarily by the energy now discharging from the condenser through the solenoid coil, thus effecting the stamping operation.

It is to be understood that the invention concerning the operating circuit, although illustrated in combination with a preferred form of the solenoid device, is not to be limited thereby. Nor is the invention to be limited to the specific construction of the air-cushioning device herein shown, other snubbing devices being within the combination or combinations herein illustrated.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. Imprinting apparatus comprising, in combination, a base, a stamping member movable to and from the base for producing an imprint upon a workpiece interposed between the base and the stamping member, a structure for movably mounting the stamping member, direct-current energizable actuating means for impelling said stamping member against the workpiece from a position of rest, a direct-current operated energizing circuit for said actuating means connected thereto and comprising a condenser chargeable by said current, a resistor and actuating switch means connected between said actuating means, said resistor and said condenser, said switch means connecting in one position thereof said actuating means in said circuit in series with said condenser for charging said condenser and simultaneously energizing said actuating means by direct current during the period of charging said condenser so as to impart a power impulse to said stamping member, while in another position of said switch means said actuating means is disconnected and said condenser is connected in series with said resistor whereby said condenser is permitted to discharge.

2. Imprinting apparatus comprising, in combination, a base, a stamping member movable to and from the base for producing an imprint upon a workpiece interposed between the base and the stamping member, a structure for movably mounting the stamping member, direct-current energizable actuating means for impelling said stamping member against the workpiece from a position of rest, a direct-current operated energizing circuit for said actuating means connected thereto and comprising a condenser chargeable by said current, a resistor and double-throw switch means connected between said actuating means, said resistor and said condenser, and operable to be thrown to one position to connect said actuating means in said circuit in series with said condenser for charging said condenser and for simultaneously energizing said actuating means by direct current during the period of charging said condenser so as to impart a power impulse to said stamping member, and to be thrown to the opposite position to disconnect said actuating means and to connect said condenser in series with said resistor whereby said condenser is permitted to discharge.

3. Imprinting apparatus comprising, in combination, a base, a stamping member movable to and from the base for producing an imprint upon a workpiece interposed between the base and the stamping member, a structure for movably mounting the stamping member, direct-current energizable actuating means for impelling said stamping member against the workpiece from a position of rest, a direct-current operated energizing circuit for said actuating means connected thereto and comprising a condenser chargeable by said current, a resistor and double-throw switch means operable to be thrown to one position to connect said actuating means in said circuit in series with said condenser for charging said condenser and for simultaneously energizing said actuating means by direct current during the period of charging said condenser so as to impart a power impulse to said stamping member, and operable to be thrown to the opposite position to disconnect said actuating means and to connect said condenser in series with said resistor whereby said condenser is permitted to discharge, said double-throw switch means comprising means to urge it normally into said opposite position, and further comprising a swingable switch actuating feeler member having a conically shaped head portion engageable tangentially by the leading edge portion of the workpiece being positioned in the path of said stamping member.

4. Imprinting apparatus comprising, in combination, a base, a stamping member movable to and from the base for producing an imprint upon a workpiece interposed between the base and the stamping member, a structure for movably mounting the stamping member, direct-current energizable actuating means for impelling said stamping member against the workpiece from a position of rest, a direct-current operated energizing circuit for said actuating means connected thereto and comprising a condenser chargeable by said current, a resistor and double-throw switch means operable to be thrown to one position to connect said actuating means in said circuit in series with said condenser for charging said condenser and for simultaneously energizing said actuating means by direct current during the period of charging said condenser so as to impart a power impulse to said stamping member, and operable to be thrown to the opposite direction to disconnect said actuating means and to connect said condenser in series with said resistor whereby said condenser is permitted to discharge, said double-throw switch means comprising means to urge it normally into said opposite position, and further comprising a swingable switch-actuating feeler member operable by the leading edge portion of the workpiece being positioned in the path of said stamping member, said feeler member having a head portion substantially cooperative with the adjacent portion of the base to constitute a bight, said feeler member being operable to actuate the switch means by the leading edge of the workpiece entering said bight when being positioned in the path of the stamping member.

5. Imprinting apparatus comprising, in combination, a base, a stamping member in the form of a solenoid core movable to and from the base for producing an imprint upon a workpiece interposed between the base and the stamping member, a structure for movably mounting the stamping member, spring means for suspending the stamping member from said structure, a direct-current energizable solenoid coil for impelling said stamping member against the workpiece from a position of rest, a direct-current operated energizing circuit for said solenoid coil connected thereto and comprising a condenser chargeable by said current, a resistor and double-throw switch means operable to be thrown to one position to connect said solenoid coil in said circuit in series with said condenser for charging said condenser and for simultaneously energizing said solenoid coil by direct current during the

period of charging said condenser so as to impart a power impulse to said stamping member, and operable to be thrown to the opposite position to disconnect said solenoid coil and to connect said condenser in series with said resistor whereby said condenser is permitted to discharge.

6. Imprinting apparatus comprising, in combination, a base, a stamping member movable to and from the base for producing an imprint upon a workpiece interposed between the base and the stamping member, a structure for movably mounting the stamping member, direct-current energizable actuating means for impelling said stamping member against the workpiece from a position of rest, a direct-current operated energizing circuit for said actuating means connected thereto and comprising a condenser chargeable by said current, a resistor and double-throw switch means operable to be thrown to one position to connect said actuating means in said circuit in series with said condenser for charging said condenser and for simultaneously energizing said actuating means by direct current during the period of charging said condenser so as to impart a power impulse to said stamping member, and operable to be thrown to the opposite direction to disconnect said actuating means and to connect said condenser in series with said resistor whereby said condenser is permitted to discharge, and air air-cushioning means for snubbing the return movement of the stamping member.

7. Imprinting apparatus comprising, in combination a base, a stamping member movable to and from the base for producing an imprint upon a workpiece interposed between the base and the stamping member, a structure for movably mounting the stamping member, direct-current energizable actuating means for impelling said stamping member against the workpiece from a position of rest, a direct-current operated energizing circuit for said actuating means connected thereto and comprising a condenser chargeable by said current, a resistor and double-throw switch means operable to be thrown to connect said actuating means in said circuit in series with said condenser for charging said condenser and for simultaneously energizing said actuating means by direct current during the period of charging said condenser so as to impart a power impulse to said stamping member, and operable to be thrown to the opposite position to disconnect said actuating means and to connect said condenser in series with said resistor whereby said condenser is permitted to discharge, and air-cushioning means for snubbing the return movement of the stamping member comprising snubbing control means governed by said return movement for rendering said cushioning means effective at a predetermined point of said movement.

8. Imprinting apparatus comprising, in combination, a base, a stamping member movable to and from the base for producing an imprint upon a workpiece interposed between the base and the stamping member, a structure for movably mounting the stamping member, direct-current energizable actuating means for impelling said stamping member against the workpiece from a position of rest, a direct-current operated energizing circuit for said actuating means connected thereto and comprising a condenser chargeable by said current, a resistor and double-throw switch means operable to be thrown in the one direction to connect said actuating means in said circuit in series with said condenser for charging said condenser and for simultaneously energizing said actuating means by direct current during the period of charging said condenser so as to impart a power impulse to said stamping member, and operable to be thrown in the opposite direction to disconnect said actuating means and to connect said condenser in series with said resistor whereby said condenser is permitted to discharge, and air-cushioning means for snubbing the return movement of the stamping member, comprising an air cushion chamber in which said stamping member operates, said chamber having a breather opening providing communication with the atmosphere, said stamping member being effective to overlap said opening at an intermediate point of the return movement to restrict the escape of air from said chamber.

9. Imprinting apparatus comprising, in combination, a base, a stamping member movable to and from the base for producing an imprint upon a workpiece interposed between the base and the stamping member, a structure for movably mounting the stamping member, direct-current energizable actuating means for impelling said stamping member against the workpiece from a position of rest, a direct-current operative energizing circuit for said actuating means connected thereto and comprising a condenser chargeable by said current, a resistor and double-throw switch means operable to be thrown to one position to connect said actuating means in said circuit in series with said condenser for charging said condenser and for simultaneously energizing said actuating means by direct current during the period of charging said condenser so as to impart a power impulse to said stamping member, and operable to be thrown to the opposite position to disconnect said actuating means and to connect said condenser in series with said resistor whereby said condenser is permitted to discharge, and air-cushioning means for snubbing the return movement of the stamping member comprising an air cushion chamber in which said stamping member operates in loose piston-and-cylinder relationship, said chamber having a breather opening providing communication with the atmosphere, said stamping member being effective to overlap said opening at an intermediate point of said return movement located past the position of rest of the stamping member to restrict the escape of air from said chamber.

10. Imprinting apparatus comprising, in combination, a base, a stamping member in the form of a solenoid core movable to and from the base for producing an imprint upon a workpiece interposed between the base and the stamping member, a structure for movably mounting the stamping member comprising a tubular portion with closure means at the free end thereof, spring means for suspending the stamping member inside said tubular portion from said closure means, a solenoid coil energizable to impel said stamping member against the workpiece from a position of rest, a direct-current operated energizing circuit for said solenoid coil connected thereto and comprising a condenser chargeable by said current, a resistor and double-throw switch means operable to be thrown to one position to connect said solenoid coil in said circuit in series with said condenser for charging said condenser and for simultaneously energizing said solenoid coil by direct current during the period of charging said condenser, so as to impart a power impulse to said stamping member, and operable to be thrown to the opposite position to disconnect said solenoid coil and to connect said condenser in series with said resistor whereby said condenser is permitted to discharge, and a swingable switch actuating feeler member having one portion located for actuatingly engaging said switch means and a substantially conically shaped head portion located to be engageable tangentially by the leading edge portion of a workpiece being positioned in the path of said stamping member.

11. Imprinting apparatus comprising, in combination, a base, a stamping member in the form of a solenoid core movable to and from the base for producing an imprint upon a workpiece interposed between the base and the stamping member, a structure for movably mounting the stamping member comprising a tubular portion with closure means at the free end thereof, spring means for suspending the stamping member within said tubular portion from said closure means, a solenoid coil energizable to impel said stamping member against the workpiece from a position of rest, a direct-current operated energizing circuit for said solenoid coil connected thereto and comprising a condenser chargeable by said current, a

resistor and double-throw switch means operable to be thrown to one position to connect said solenoid coil in said circuit in series with said condenser for charging said condenser and for simultaneously energizing said solenoid coil by direct current during the period of charging said condenser so as to impart a power impulse to said stamping member, and operable to be thrown to the opposite position to disconnect said solenoid coil and to connect said condenser in series with said resistor whereby said condenser is permitted to discharge, and switch means mounted on said structure, a swingable switch-actuating feeler member operable by the leading edge portion of a workpiece being positioned in the path of said stamping member, said feeler member having a substantially conically shaped head portion cooperating with the adjacent portion of the base to constitute a bight, said feeler member having a portion located for actuatingly engaging said switch means and being operable by the leading edge of the workpiece entering said bight when being positioned in the path of the stamping member.

12. A solenoid device for imparting impact against an abutment member, comprising, in combination, a solenoid coil, an armature reciprocable within the coil and adapted to be impelled against said abutment member by energization of the coil, a direct-current operated energizing circuit for said coil connected therewith and comprising a condenser chargeable by said current, a resistor and actuating switch means connected between said solenoid coil, said resistor and said condenser and operable alternatively, to connect in a first mode of operation, said coil in said circuit in series with said condenser for charging said condenser and for simultaneously energizing said coil by direct current during the period of charging said condenser so as to impart a power impulse to said armature, or, in a second mode of operation, to disconnect said coil and to connect said condenser in series with said resistor whereby said condenser is permitted to discharge.

13. A solenoid device for importing impact against an abutment member comprising, in combination, a solenoid coil, an armature reciprocable within the coil and adapted to be impelled against an abutment member by energization of the coil, a direct-current operated energizing circuit for said coil connected therewith and comprising a condenser chargeable by said current, a resistor and double-throw switch means operable to be thrown to one position to connect said coil in said circuit in series with said condenser for charging said condenser and for simultaneously energizing said coil by direct current during the period of charging said condenser so as to impart a power impulse to said armature, and to be thrown to the opposite position to disconnect said coil and to connect said condenser.

14. Imprinting apparatus, comprising, in combination, a base; a stamping member in the form of a solenoid core movable to and from said base for producing an imprint upon a workpiece interposed between said base and said stamping member; a tubular structure mounted perpendicularly on said base for guiding said movable stamping member in longitudinal direction during its movement and having closure means at its end remote from said base; spring means for resiliently suspending said stamping member from said closure means for returning said stamping member after a forward stroke toward the workpiece; a solenoid coil energizable to impel said stamping member against a workpiece from a position of rest, said stamping member in cooperation with said tubular structure constituting an air cushion chamber between said closure means and one end of said stamping member, said tubular structure having a radial breather opening providing communication between said air cushion chamber and the atmosphere and being located along the path of said stamping member within said tubular structure at a point where said opening is overlapped by said one end of said stamping member at an intermediate point of the return stroke thereof so as to restrict the escape of air from said air cushion chamber during a continuation of said return stroke beyond said intermediate point.

15. Imprinting apparatus comprising, in combination, a base, a stamping member movable to and from the base for producing an imprint upon a workpiece interposed between the base and the stamping member, a structure for movably mounting the stamping member, direct-current energizable actuating means for impelling said stamping member against the workpiece from a position of rest, a direct-current operated energizing circuit for said actuating means connected thereto and comprising direct current supply means, a condenser chargeable by said current and actuating switch means connected between said actuating means, said direct current supply means and said condenser, said switch means connecting in one position thereof said condenser in circuit with said direct current supply means for charging the latter by direct-current, while in another position of said switch means said condenser is disconnected from said direct current supply means and said charging by said direct-current is discontinued, and said condenser is connected in circuit with said actuating means for discharging across the same and for simultaneously energizing said actuating means so as to impart a power impulse to said stamping member, said switch means comprising a switch actuating feeler member having a portion located to be engageable by the leading edge portion of a workpiece being positioned in the path of said stamping member, and moving said switch means into said other position when engaged by the workpiece, and means for urging said switch means normally into said one position.

16. Imprinting apparatus comprising, in combination, a base, a stamping member movable to and from the base for producing an imprint upon a workpiece interposed between the base and the stamping member, a structure for movably mounting the stamping member, direct-current energizable actuating means for impelling said stamping member against the workpiece from a position of rest, a direct-current operated energizing circuit for said actuating means connected thereto and comprising direct current supply means, a condenser chargeable by said current, and double-throw switch means connected between said actuating means, said direct current supply means and said condenser, and operable to be thrown to one position to connect said direct current supply means in said circuit with said condenser for charging the latter by direct-current, and to be thrown to another position to disconnect said condenser from said direct current supply means and thereby discontinuing said charging of said condenser by said direct-current, and to connect said condenser in circuit with said actuating means for discharging across the same and for simultaneously energizing said actuating means so as to impart a power impulse to said stamping member, said switch means comprising a switch actuating feeler member having a portion located to be engageable by the leading edge portion of a workpiece being positioned in the path of said stamping member, and moving said switch means into said other position when engaged by the workpiece, and means for urging said switch means normally into said one position.

17. Imprinting apparatus comprising, in combination, a base, a stamping member movable to and from the base for producing an imprint upon a workpiece interposed between the base and the stamping member, a structure for movably mounting the stamping member, direct-current energizable solenoid coil means for impelling said stamping member against the workpiece from a position of rest, a direct-current operated energizing circuit for said solenoid coil means connected thereto and comprising direct current supply means, a condenser chargeable by said current and double-throw switch means connected between said solenoid coil means, said direct current supply means

and said condenser, and operable to be thrown to one position to connect said direct current supply means in said circuit with said condenser for charging the latter by direct-current, and to be thrown to another position to disconnect said condenser from said direct current supply means and thereby discontinuing said charging of said condenser by said direct-current, and to connect said condenser in circuit with said solenoid coil means for discharging across the same and for simultaneously energizing said solenoid coil means so as to impart a power impulse to said stamping member, said switch means comprising a switch actuating feeler member having a conically shaped head portion located to be engageable substantially tangentially by the leading edge portion of a workpiece being positioned in the path of said stamping member, and moving said switch means into said other

position when engaged by the workpiece, and means for urging said switch means normally into said one position.

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