April 19, 1955 J. J. WEBER 2,706,354

AUTOMATIC ELECTRICALLY CONTROLLED FLUID OPERATED HOT STAMPING PRESSES

Filed July 6, 1950 3 Sheets-Sheet 1

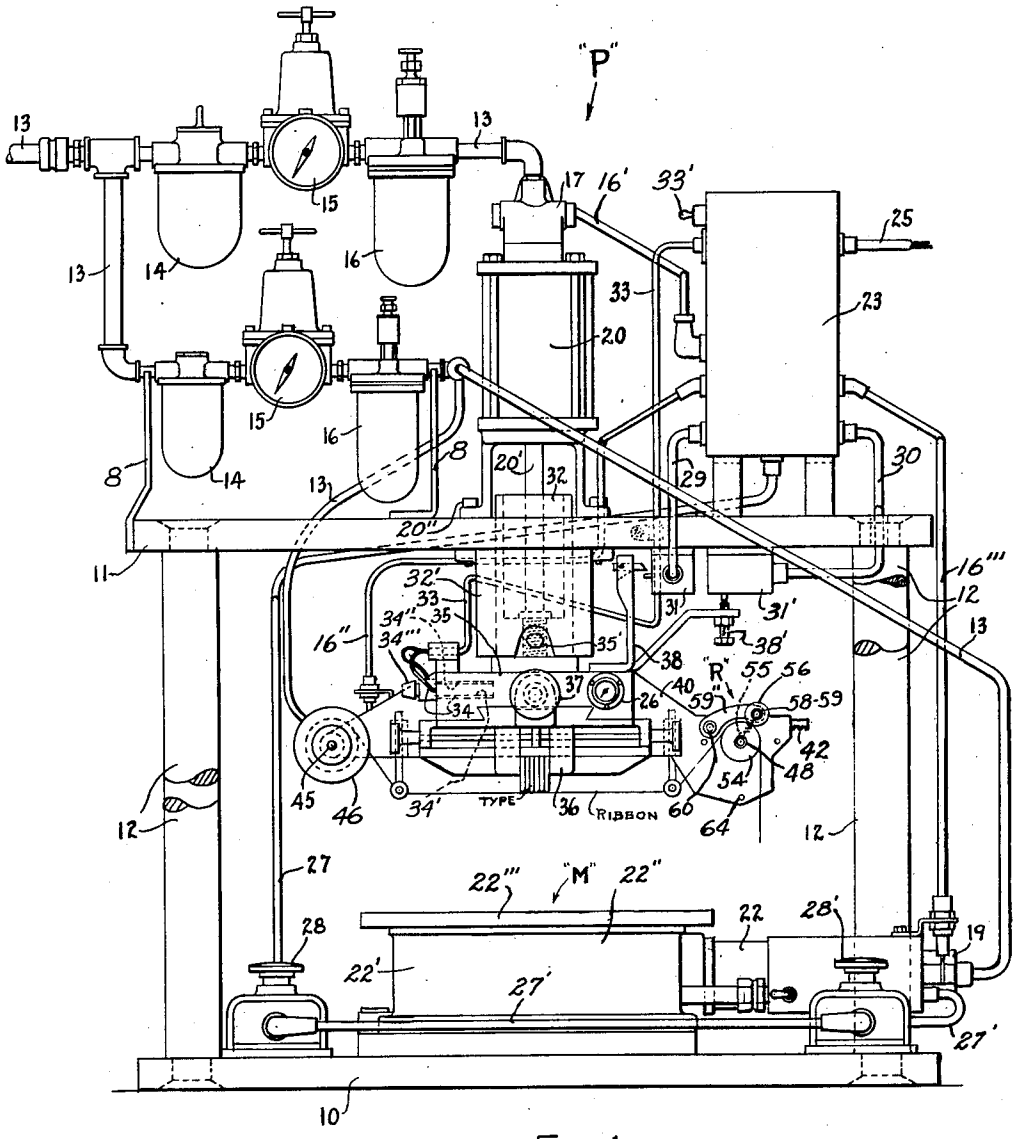


FIG. 1

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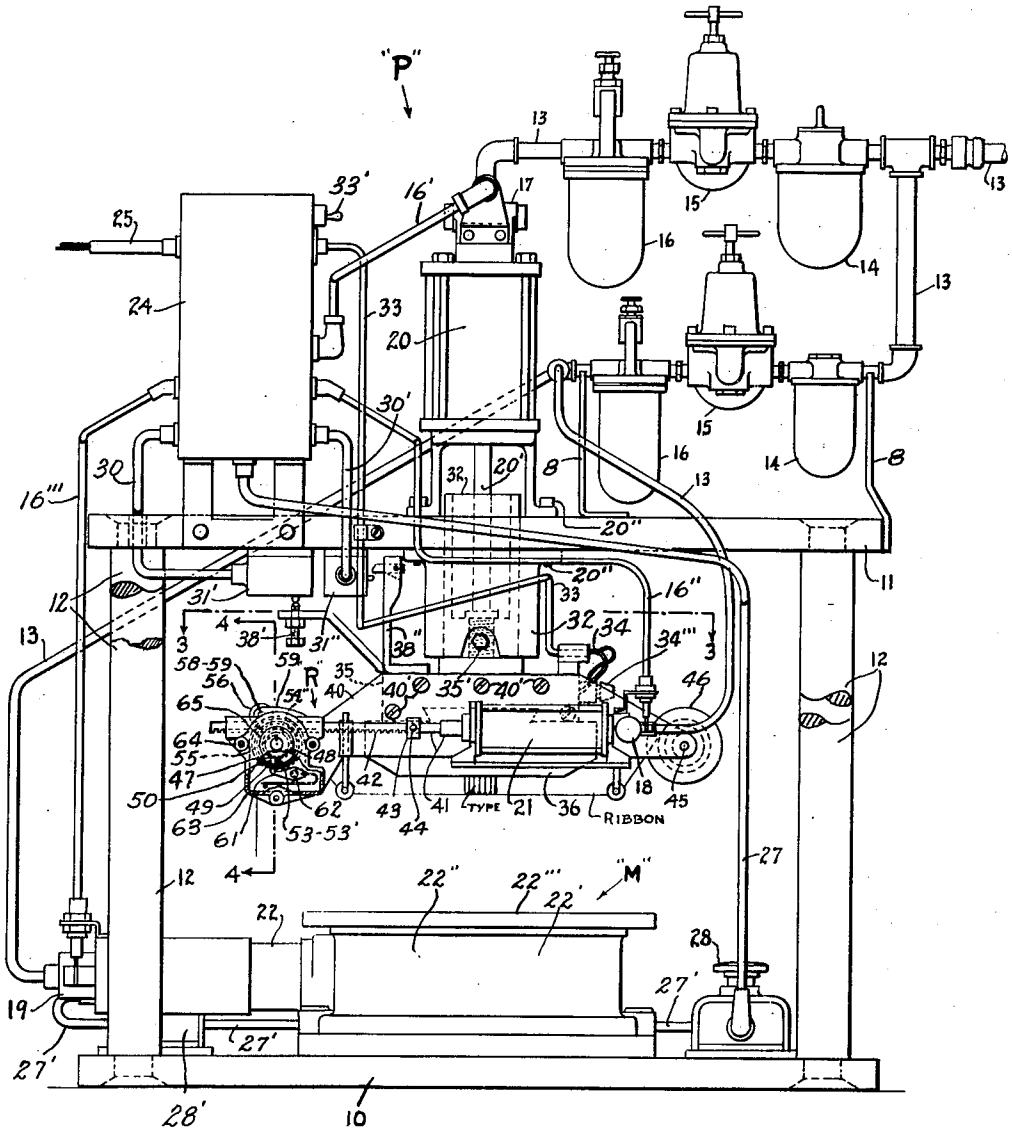


FIG. 2

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AUTOMATIC ELECTRICALLY CONTROLLED FLUID OPERATED HOT STAMPING PRESSES

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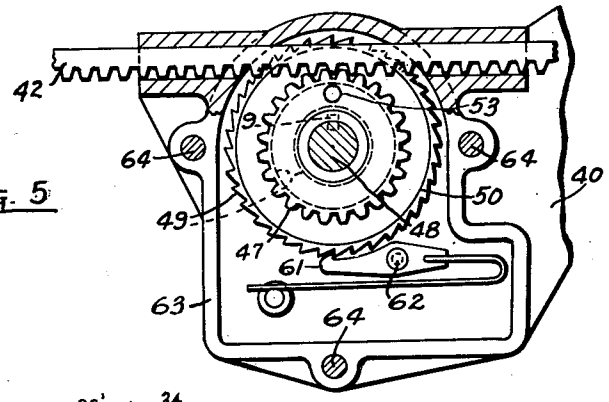


FIG. 5

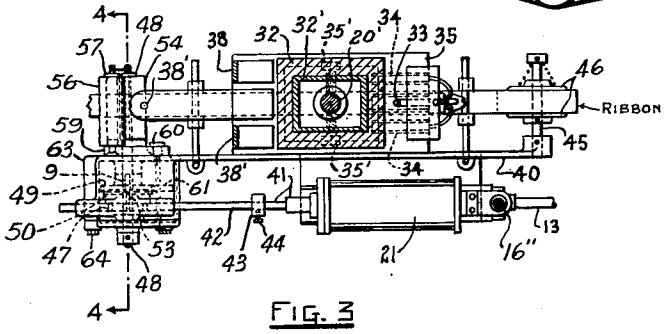


FIG. 3

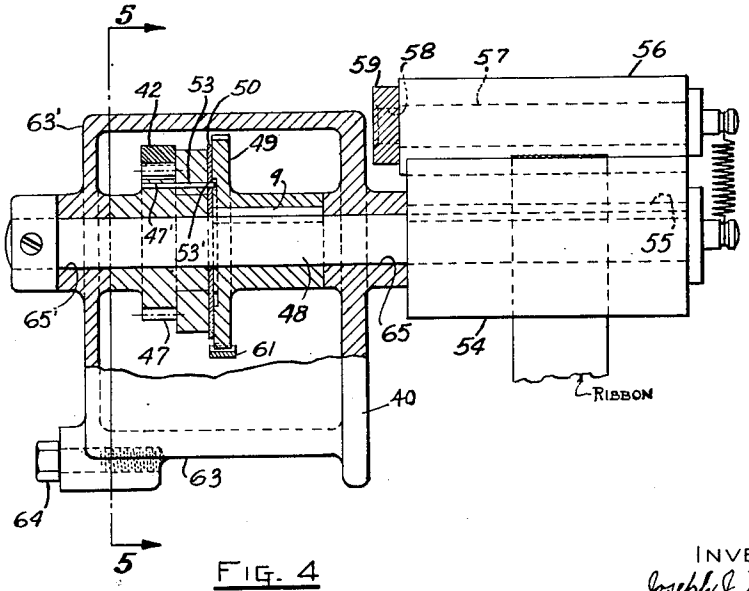


FIG. 4

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2,706,354

AUTOMATIC ELECTRICALLY CONTROLLED FLUID OPERATED HOT STAMPING PRESSES

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Application July 6, 1950, Serial No. 172,346

4 Claims. (Cl. 41—7)

In general, this invention relates to fluid operated hot stamping presses for stamping or pressing forms, letters, or characters, from ribbons of gold, silver, or such other suitable material, and transferring them onto various kinds of articles such as leather-goods, plastic materials, or such other material as may be capable of receiving impressions directly from marking devices, but more particularly, the invention relates to an improved automatic electrically controlled fluid operated hot stamping press in which is provided thermostats for automatically controlling the temperature of electrical heating elements which are arranged in association with stamping forms or marking devices being secured in a holder detachably fastened to the lower end of a fluid operated ram arranged centrally in a non-adjustable rigid skeleton or open framework of similar construction to that shown in my application for patent Serial No. 793,155, filed Dec. 22, 1947, for "Stamping and Embossing Machines," now U. S. Patent 2,621,435.

Further, the invention contemplates the provision of electrical devices such as solenoids for automatically controlling the operation of valves through which a fluid, under pressure, is directed alternately to opposite or upper and lower sides of a fluid operated piston being secured to the upper end of a ram having marking devices secured at its lower or opposite end. The invention also contemplates the provision of a centrally disposed fluid cylinder, in which said piston operates, to which is detachably secured an electrically controlled fluid pressure operated valve. And, piston operating mechanism for automatically controlling the speed, and/or periods, of operation of the piston in either its forward or backward movement, or, vice versa.

A further and important feature of the invention contemplates the provision of electrically controlled fluid powered valves for controlling the operation of ribbon foil, or other ribbon material, fluid operated mechanism and, also, for controlling the operation of fluid operated mechanism for controlling the operation of a revoluble table upon which a number of stations may be arranged where various stamping operations may be performed in such order as may be desired directly below and by a centralized fluid operated stamping or marking device.

It is further contemplated to provide, preferably, electro-magnet included pneumatic operated timing relays for controlling the period of operations of, for instance, the marking devices carrying ram, the ribbon operating mechanism and, also, the mechanism for operating a fluid pressure propelled revoluble table, and to provide the familiar sensitive type electrical switches such as the so-called micro switch for controlling certain operations of an arrangement of fluid operated motors and solenoid controlled fluid powered valves.

A further important feature of the invention is to provide a sturdy and rigid skeleton framework in which is centrally disposed a fluid operated marking devices mounting ram which is adapted to strike, with a regulated movement, a direct centralized vertical blow with always a constant and uniform force against the article to be marked assuring at all times a first class uniform stamping and/or embossing operation. And further, the invention contemplates the provision of fluid filtering devices, combined valve and fluid controlled pressure gauges, and lubricating devices.

The objects of the above-mentioned mechanisms as included in the invention may be better understood by referring to the illustrations in the accompanying drawings, and more fully described in the following specification, and more particularly pointed out in the appended claims.

Illustrated in the accompanying drawings:

Figure 1 is a front view of the invention showing the improvements as are embodied therein, and shows the stamping or marking ram in its uppermost position;

Figure 2 is a rear view of the invention shown in Figure 1;

Figure 3 is a sectional view taken on the plane 3—3, of Figure 2; and

Figure 4 is a sectional view taken on the plane 4—4, of Figures 2 and 3, and is shown on a larger scale. And, Fig. 5 is a view as seen from plane 5—5, of Figure 4.

In the several views, similar characters refer to similar parts.

Mainly, this invention comprises, as above-stated, "an automatic electrically controlled fluid operated hot stamping press," and is indicated, generally, by the reference character "P." And the mechanism included in the press consists, essentially, of a rigid open framework comprising a base plate **10**, an upper plate **11**, being supported above plate **10**, and in parallel relation thereto, by means of four upstanding vertical columns **12**, each of which being rigidly secured to plates **10** and **11**, as shown.

Upon plate **11**, is supported, by means of brackets **8**, a main fluid supply pipe **13**, connected to a pair of fluid filters **14**, thence to a pair of fluid pressure gauges and reducing valves **15**, thence to a pair of oilers or lubricators **16**, and thence, respectively, to solenoid controlled fluid-powered valves **17**, **18** and **19**. Respectively, valves **17**, **18**, and **19**, are secured to fluid motors **20**, **21**, and **22**. Fluid motor **20** is detachably secured centrally upon upper plate **11**, by means of screwbolts **20''**, fitted into said plate **11**.

Numbers **23**, and **24** indicate, respectively, electrical conventional or familiar type "Square D" switch and an electrical terminal box enclosing electrical, timer or relay units. And, number **25**, indicates the main electric current supply line which supplies electric current to such timer and relay units as may be installed in housing **24**.

A temperature gauge **26**, installed as shown, is provided whereby to indicate the temperature of the marking devices holder mounting **35**, caused by the electrical heating units installed therein. Said units or heating elements **34**, together with switch **34'''**, are electrically connected to power circuit **25**, through the medium of electrical conductor **33**, and toggle switch **33'**, which is mounted on timer housing **24**.

Conveniently installed on plate **10**, is a pair of manually operated safety or mushroom switches **28**, and **28'**, connected to each other by means of electrical conductor **27'**, and, to the main power circuit **25**, by means of electrical conductor **27**. The circuit through the switches, **28** and **28'**, being arranged in series with the power circuit **25**, provide means whereby the electrical circuit, through the several electrical devices installed in their respective places in the press "P," may be closed or opened as the occasion or circumstances may require.

Referring to Figures 1 and 2, it will be seen that three familiar conventional type "micro" electrical switches **31**, **31'** and **31''**, are installed on the underside of plate **11**. Respectively, switches **31**, and **31'**, and **31''**, are electrically connected to the main power circuit **25**, by means of, respectively, electrical conductors **29**, **30**, and **30'**, which are electrically connected to electrical timing or relay mechanism such as may be installed in housing **24**. And, the solenoids being installed in each of the solenoid controlled fluid powered valves, respectively, **17**, **18**, and **19**, are electrically connected to timer or relay mechanism such as may be installed in timer unit housing **24**, by means of, respectively, electrical conductors **16'**, **16''**, and **16'''**.

Extending from the piston in fluid motor **20**, is a piston rod **20'**, detachably secured, by means of set-screw **35'**, to marking devices holder mounting **35**; the same being formed to receive, interchangeably, various marking devices holders mounting devices such as, for instance, a

self-centering type holder 36, held in place by means of a lock-screw 37.

Into recesses, or counter-bores, 34', located in mounting 35, are inserted electrical heating units 34, and into an intermediate recess, or counter-bore 34'', is inserted thermostatically controlled automatic electric switch 34''', by means of which the temperature of the heating units is automatically controlled to a degree that mounting 35, and the marking devices holder 36, and the marking devices, such as they may be, will be suitably heated.

Referring to Figure 3, it will be seen that the ram-head 32, is in the form of an oblong rectangle, the longer dimension of which is about one-fourth greater than its shorter dimension. The ram-head being so constructed substantially prevents any lateral or twisting movement of the same in its downward or upward stroke within its guide or housing 32', assuring in each and every operation perfect and identical positioning of the marking devices, being carried thereby, upon such article being stamped.

Referring to the several views, it will be seen that a ribbon carrying and operating mechanism, generally indicated by the reference character "R," is mounted on a bar 40, which is detachably secured to mounting 35, above-mentioned, by means of screw-bolts 40'. And, detachably secured to bar 40, is said fluid motor 21. And, removably secured to motor 21, is, as above-stated, a solenoid controlled fluid powered valve 18. The motor 21, is provided with a fluid operated piston (not shown) to which is secured a piston rod 41, which extends out beyond the end of the motor in the form of a gear rack 42. And mounted on rod portion 41 of gear rack 42 is an adjustable stop collar 43, which is provided with a set-screw 44 by means of which the collar 43 may be positioned on the rack at such point whereby the same may be permitted to travel only to such a distance as may be required to operate the ribbon take-up mechanism "R," to obtain an amount of ribbon taken from a roll of ribbon (as may be mounted on arbor 45, between adjustable spring-actuated ribbon retard discs or flanges 46) as may be required for each successive marking operation of the ram. The said ribbon retard mechanism being provided whereby to maintain a proper tension against the ribbon roll so as to secure a sufficiently taut ribbon at or under the marking devices which may be an arrangement of type secured in type-holder 36, or an arrangement of marking devices such as may be secured in a chase (not shown). As above-stated, either a type-holder such as 36, or a chase, may be readily interchanged one for the other and secured into place on mounting 35, as the occasion may require, and in the manner above-stated.

As will be seen in Figures 2 and 3, rack 42 is in engagement with a gear 47 which is loosely mounted on ribbon take-up roller shaft 48. Between gear 47, and ratchet wheel 49, is disposed a friction disc 50, which also loosely fits shaft 48; the said disc 50, being keyed to gear 47, by means of a key-pin 53, which loosely fits a perforation 53', located in disc 50, but is forcibly driven into a hole 47', located in gear 47, which is in correlation to the perforation in said disc 50. Ratchet wheel 49 is, preferably, forcibly driven onto shaft 48. A key 9, also may be provided. Gear 47, together with key-pin 53, and disc 50, provide means for operating ratchet wheel 49, which, in turn, operates take-up roller shaft 48, which, being keyed to take-up roller 54, by means of a key 55, operates the ribbon take-up mechanism which comprises said roller 54, and its correlative ribbon take-up roller 56, which is operably mounted on a shaft 57, being forcibly driven into an opening 58, provided in the free end of a spring-actuated arm 59, the other end, of which, being hingedly mounted on a shouldered stud 60, securely fastened to bar 40, as is shown in Figure 1. Engaging ratchet wheel 49, is a spring-actuated pawl 61, operably mounted on a stud 62, securely fastened into bar 40. A gear and ratchet wheel housing 63, is secured to bar 40, by means of screw-bolts 64. The housing 63, formed with bar 40 and housing cover-plate 63', provide bearings, respectively, 65, and 65', for the ribbon take-up roller shaft 48. The purpose of pawl 61, is to prevent take-up roller 54, being operated in reverse direction on the return or non-feed stroke of gear rack 42.

It may be here stated, that the timing mechanism, to which said switches 31, 31', and 31'', are connected, may be so set as to allow a fast, or a slow, or an alternately fast and slow, or vice versa, operation of motors 20, 21, and 22, and in synchronism with each other according to their respective operations. Also, the timing mechanism may be so set as to allow the ram 32, together with the heated marking devices being attached thereto, to dwell, for a suitable period of time, while the marking devices are performing their stamping or printing operation, and according to the length of time allowable for the heated marking devices to remain on the work, such as, for instance, a metallic ribbon, whereby to obtain a first class uniform imprinting and transferring operation.

In co-operative relation to the plungers of switches 31, 31', and 31'', is provided plunger operating devices, respectively, 38, 38', and 38''; the same being installed, as shown, in cooperative relation to the respective plungers of said switches.

Indicated, generally, by the reference character, "M," is a fluid powered machine of a familiar type 22', for operating a revoluble table or platform 22''', in successive revolutions, or parts of a revolution, according to the number of stations or places where marking operations are to be performed. Such stations or places, being arranged in a circular or annular path, are arranged to pass across and at right angles to the vertical center-line of ram 32, and of the marking devices as may be arranged in a marking devices holder 36, as may be secured to mounting 35. In this instance, the machine "M," comprises a fluid motor 22, having secured thereto a solenoid controlled air powered valve 19, which is adapted to automatically control, together with the above-mentioned timing mechanism, and micro switches as may be installed in housing 22'', of the machine 22', the operation of a fluid powered piston and its enclosed attached piston rod (not shown) which extends into housing 22'', and connects with the mechanism for controlling the operation of said table 22''', according to the number of stations as may be arranged in said circular path. The machine "M," in this instance, is mounted on the base plate 10, so that the table 22'', is located and arranged in the manner above-stated.

With the required marking devices being properly installed in their devices holder 36, and the ribbon, such as it may be, properly arranged under the marking devices and the work properly disposed under the ribbon, the press is ready to perform stamping operations. First, the fluid control valves 15, are opened to permit fluid, under pressure, to flow through the filter receptacles 14, and the oil receptacles 16, and through the fluid supply pipes 13, to the solenoid controlled air powered valves 17, 18, and 19; then the main electric supply circuit to the timing mechanism, which is installed in enclosure 24, and to the solenoids for the fluid powered valves 17, 18, and 19, and to the above-mentioned micro switches 31, 31', and 31'', and to the manually controlled switches 28, and 28', is closed by closing the main electric switch, which is installed in a "Square D" switch or terminal box 23, and by closing the manually operated switches 28, and 28'.

It may be here stated, that instead of employing a revoluble table as that which is installed on fluid powered machine designated by the reference character "M," it is contemplated to replace the said machine by a fluid powered endless chain belt or conveyor which carry a number of regularly spaced plates or stations whereupon objects may be printed or stamped while being intermittently conveyed to and centrally located in co-operative relation to an arrangement of marking devices. A device of the above description may be operated by a fluid powered motor similar to the one employed to operate said above-mentioned ribbon take-up or propelling mechanism.

Having thus described the invention it may be readily understood that the minor details of its construction may be altered in several ways without departing from the spirit and scope of the invention, and without losing any of its attendant advantages. Therefore, what is claimed is desired to be secured by Letters Patent.

I claim:

1. In an automatically electro-fluid operated hot stamping press, a rigid box-like frame-work with a base-plate and an upper plate, a centrally supported electrically controlled fluid powered upstanding motor, the said motor having a vertically operated piston reciprocably operable therein, a marking devices holder mounting detachably

secured to said piston, electro-fluid operated valves arranged to control the operation of said piston, a ribbon operating mechanism comprising a horizontally disposed electro-fluid operated motor detachably secured to said mounting, the said horizontal motor having a piston horizontally operable therein, a rack-gear formed on said horizontal piston, a gear wheel operably engaging said rack, a ratchet wheel operatively controlled by the operation of said gear wheel, a ribbon takeup mechanism comprising a pair of takeup rollers operably controlled by the operation of said ratchet wheel, and a stop collar adjustably secured to said rack-gear.

2. The combination in an automatic electro-fluid operated hot stamping press, of a combined electro-fluid operated stamping mechanism and an electro-fluid operated ribbon takeup or propelling mechanism, the said ribbon takeup propelling mechanism being carried by said stamping mechanism, the said stamping mechanism comprising an electro-fluid operated vertically upstanding centrally disposed motor having a centrally disposed electro-fluid vertically reciprocable piston disposed therein, an electro-fluid operated ribbon takeup mechanism mounting plate detachably secured to said reciprocable piston, an horizontally disposed electro-fluid operated motor detachably secured to said mounting plate, the said horizontally disposed motor having an electro-fluid operated horizontal operable piston disposed therein and extending out horizontally therefrom, the out-extending portion of said piston having a rack-gear formed thereon, a gear wheel arranged to engage said rack-gear carried by said mounting plate, a ratchet wheel frictionally engaging said gear wheel, and a pair of frictionally engaged ribbon takeup rollers operably connected to said ratchet wheel and operably mounted to said mounting plate, and electro-fluid operated valves for controlling the operation of the above-mentioned mechanism, and a rigid box-like skeleton frame-work with which to rigidly support the above-mentioned mechanism.

3. In combination, an automatically electrically controlled electro-fluid operated hot stamping press having an electro-fluid operated centrally disposed vertically upstanding motor having an electro-fluid operated vertically reciprocable non-revoluble piston disposed therein and terminating into a ram at its outer or lower end providing a mounting for a marking devices holder mounting, a marking devices holder mounting detachably secured centrally to said piston, an horizontally disposed electro-fluid operated motor detachably secured centrally to said piston, combined electro-fluid pressure means and electro-fluid operated valves arranged to control the operation of the above-mentioned mechanism, the said horizontally disposed motor having a piston reciprocably operable therein and having a rack-gear formed thereon, a gear wheel engaged to and operably controlled by the operation of said rack-gear, a ratchet wheel frictionally engaged to and operably controlled by the operation of said gear wheel, a ribbon takeup and propelling mechanism comprising a pair of frictionally engaged rollers operably connected to and controlled by the operation of said ratchet wheel, a stop-collar adjustably secured to said rack-gear providing means whereby to vary the amount of

ribbon being propelled by said ribbon operating mechanism, the above-mentioned stamping mechanism and ribbon operating mechanism being carried by the piston of said upstanding motor, and a rigid box-like frame-work having a base-plate and an upper plate, the said upstanding motor being centrally supported upon the said upper plate.

4. The combination in an automatically electrically controlled electro-fluid operated hot stamping press, of an electro-fluid operated centrally disposed upstanding motor having a non-revoluble electro-fluid operated vertically reciprocable piston terminating at its lower end into a mounting for a marking devices holder mounting, a marking devices holder mounting detachably secured centrally to said piston, and an automatic electro-fluid operated ribbon operating mechanism detachably secured to said mounting for supporting said marking devices holder mounting, and an electro-fluid operated ribbon operating mechanism horizontally disposed operating motor, the same being secured to said mounting being detachably secured to said vertically reciprocable piston, the said ribbon operating mechanism operating motor having a reciprocably operated piston disposed therein, said piston having a rack-gear formed therein, and a gear wheel arranged to operatively engage said rack-gear, and a ratchet wheel frictionally engaged to and operated by the operation of said gear wheel, and a pair of frictionally engaged ribbon operating rollers operably connected to and controlled by the operation of said ratchet wheel, and an automatically controlled electro-fluid operated work table operating motor, and an automatically controlled revoluble work table, the same being operably controlled by the operation of said table operating motor alternately and intermittently with respect to the operation of said vertically reciprocably operated piston, and combined electro-fluid pressure means and electro-fluid operated valves arranged to automatically control the operation of the above-mentioned mechanism, and manually operated electrical emergency control switches for controlling the operation of the above-mentioned mechanism, and a rigid box-like framework comprising a base-plate and an upper plate, and an arrangement of corner posts for maintaining said plates in rigid parallel relation to each other and rigidly support the above-mentioned mechanism.

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