March 31, 1936. G. G. GUSTAFSON 2,035,650

MACHINE FOR GLUING

Filed July 5, 1933 4 Sheets-Sheet 1

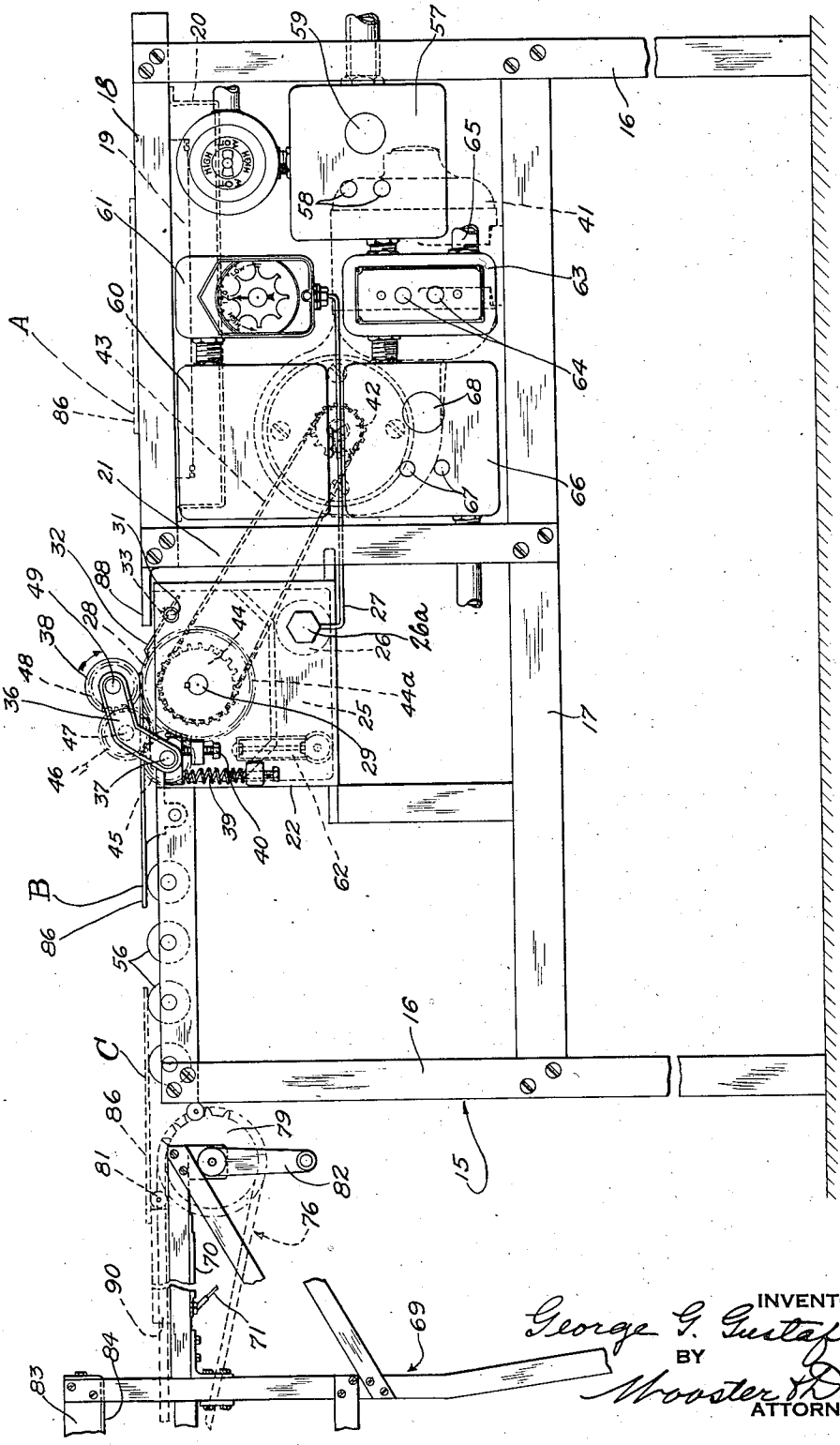

Fig. 1

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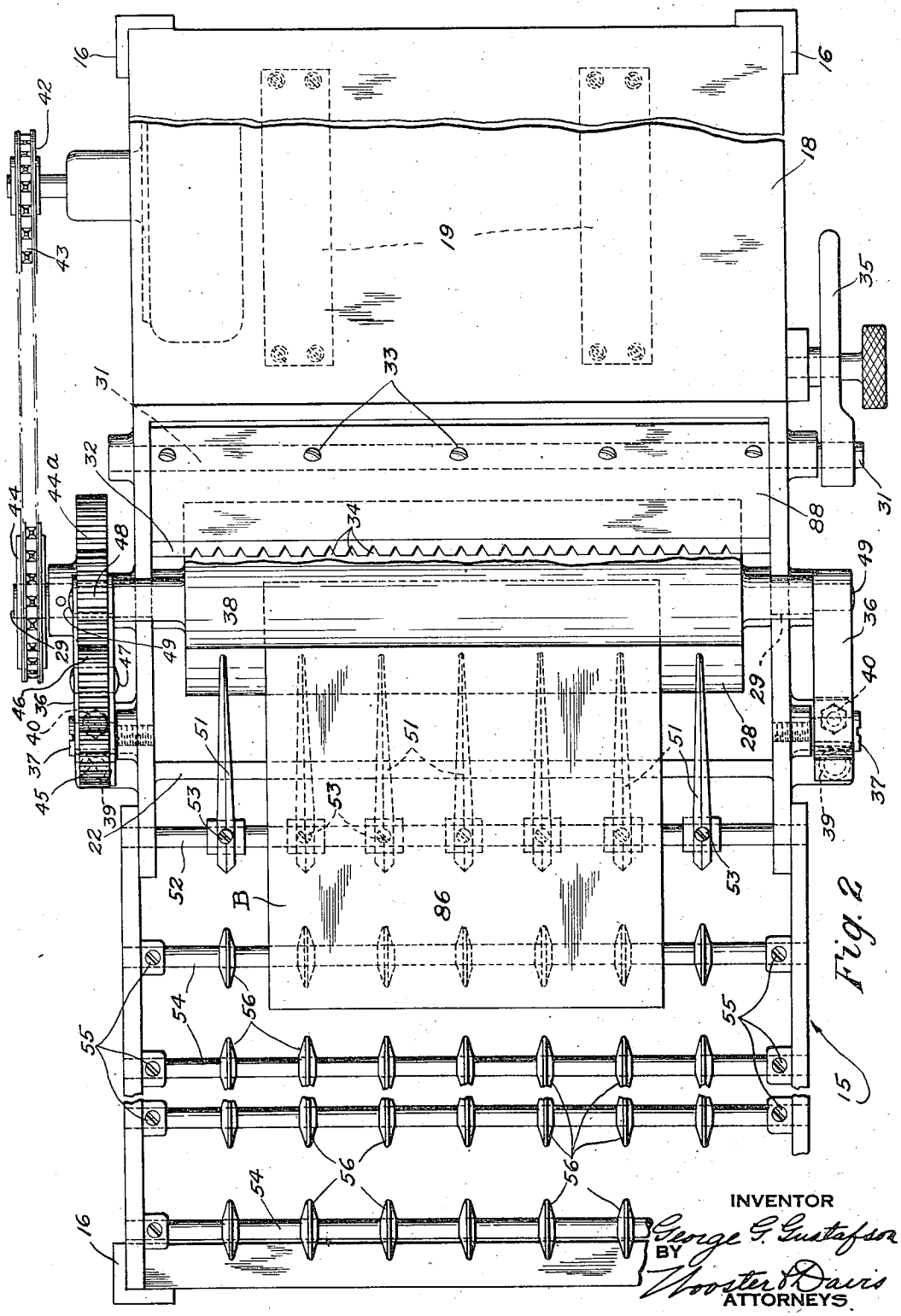

Fig. 2

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MACHINE FOR GLUING

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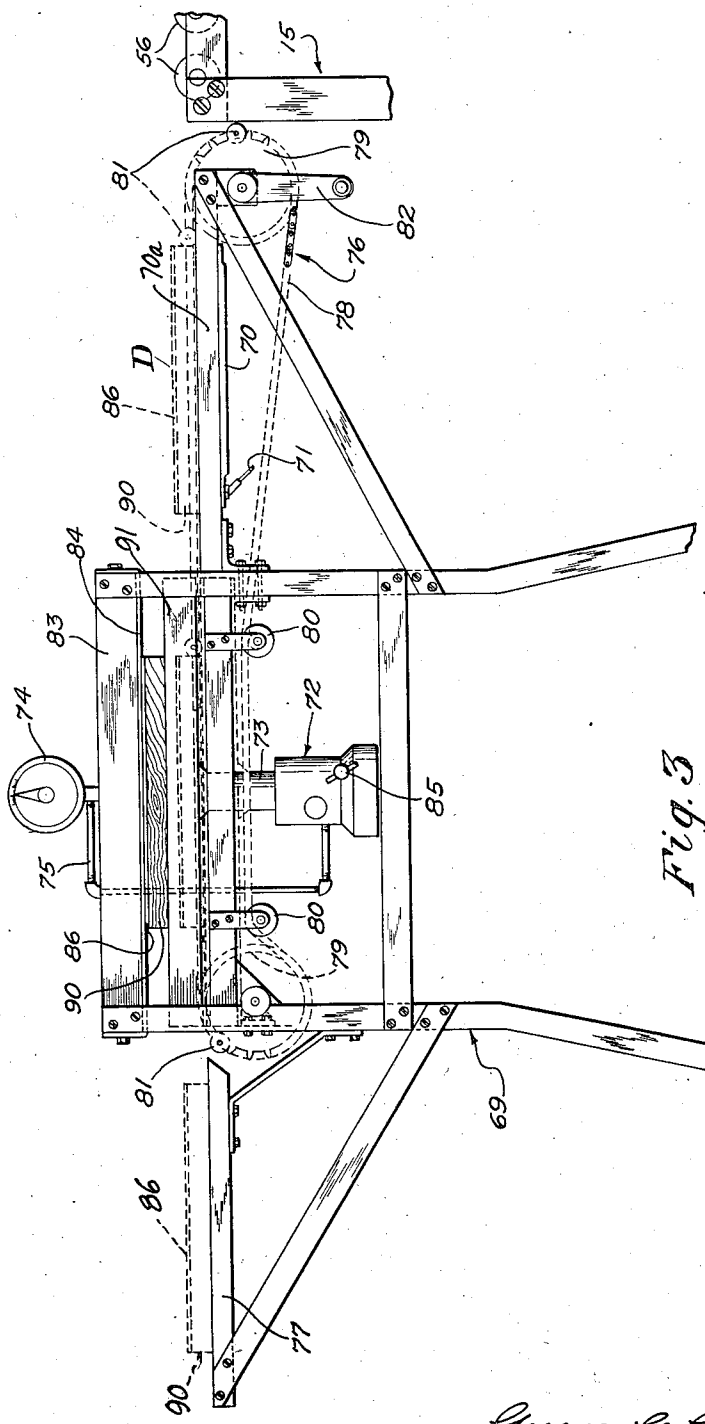

Fig. 3

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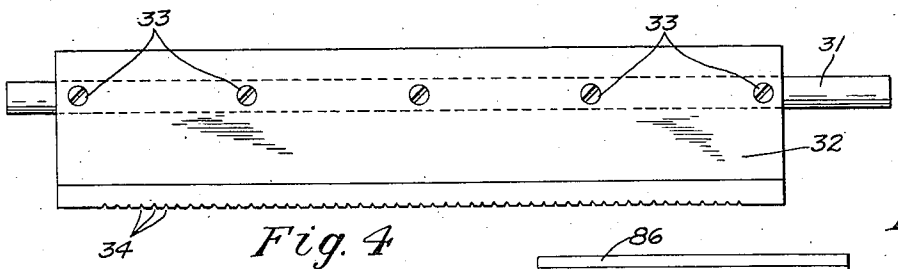

Fig. 4

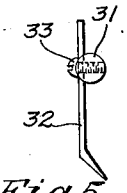

Fig. 5

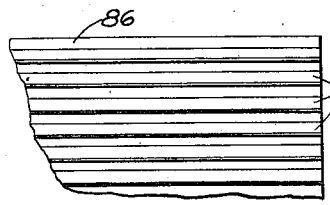

Fig. 10

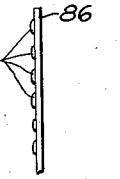

Fig 11

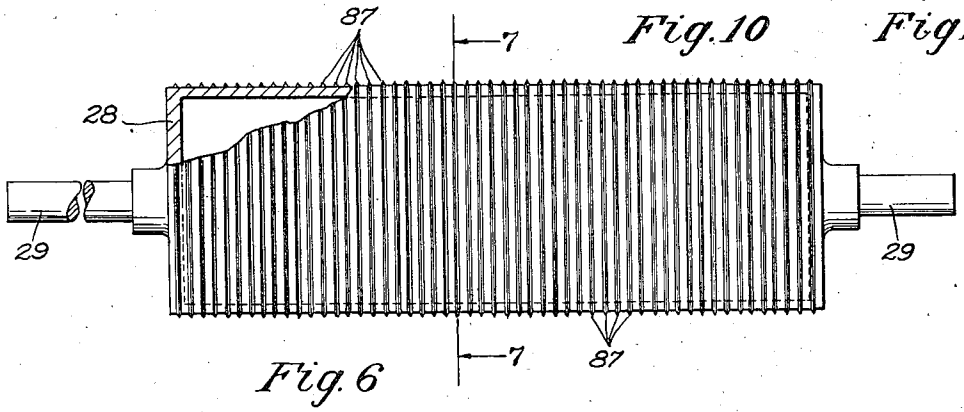

Fig. 6

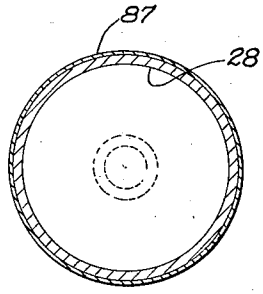

Fig. 7

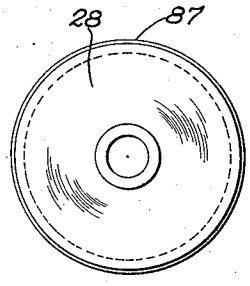

Fig. 8

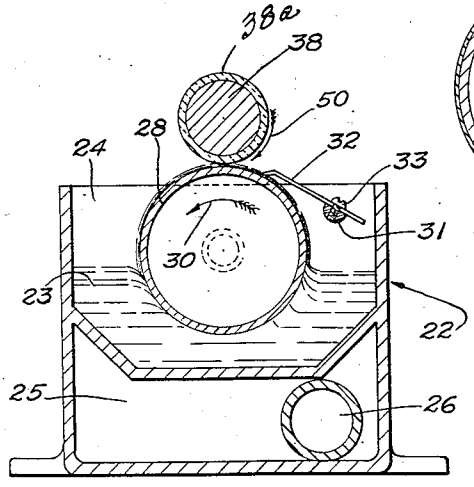

Fig. 9

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UNITED STATES PATENT OFFICE

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MACHINE FOR GLUING

George G. Gustafson, Stamford, Conn.

Application July 5, 1933, Serial No. 679,048

11 Claims. (Cl. 154—2)

This invention relates to a method and machine for gluing and has particular relation to a method of and machine for gluing zinc or copper printing plates or electros to metal or wood bases or backs.

An object of the invention is to provide an improved means and method of securing electros to bases or backs without the use of nails or brads whereby the printing surface or face of the electros may extend to the edges of the latter.

Another object is to provide a means and method for the purpose stated and by which the printing plates or electros will be secured to lie flat against their bases, any slight hollow spaces in the back of the plates or in the bases being filled whereby to have each plate supported uniformly over its entire surface.

A further object is to provide a machine of simple construction by means of which printing plates or electros may be rapidly and uniformly secured to either metal or wood bases.

Other objects and advantages will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein a satisfactory embodiment of the invention is shown. However, it will be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is a side elevational view showing the forward portion of the machine of the present invention, a small part of the rear or press portion of the machine being shown;

Fig. 2 is a top plan view on an enlarged scale showing the forward portion of the machine;

Fig. 3 is a side elevational view of the rear part or press portion of the machine;

Fig. 4 is a plan view of a doctor blade employed;

Fig. 5 is an end view of the doctor blade;

Fig. 6 is an elevational view of a glue applying roller;

Fig. 7 is a transverse sectional view through said roller, the view being taken as along the line 7—7 of Fig. 6;

Fig. 8 is an end elevational view of the roller of Fig. 6;

Fig. 9 is a detail sectional view showing the roller of Fig. 6 in association with the glue pot and other cooperating parts;

Fig. 10 is a bottom plan view showing a portion of a printing plate or electro after having glue applied to its under side by the machine of the present invention; and

Fig. 11 is an edge view looking from the right in Fig. 10.

Referring in detail to the drawings, and at first particularly to the forward portion or part of the machine, at 15 is generally indicated a frame or support including uprights or legs 16 connected and braced intermediate their ends as by horizontals 17. In the upper portion of the frame adjacent one end there is supported a heater plate 18 arranged to be heated in any suitable manner as by the electrical units 19 which may be enclosed at the under side of the plate by a guard 20. This heater plate may be supported at one end as by a pair of the uprights or legs 16 and at its other end it may be supported by uprights 21 extending vertically from the intermediate horizontals 17.

Arranged adjacent one edge of the heater plate 18 is a glue or cement pot 22 adapted (see Fig. 9) to contain a quantity of glue or other suitable cement 23, the glue or cement receiving portion being open at its upper end 24 and partially enclosed in its lower portion by a water jacket 25. A pipe or casing 26 is extended into the water jacket and is adapted to contain an electrical or other heating element 26a to which may be connected wires 27 for the purpose of supplying current whereby the water in the jacket 25 will be heated and the glue or other cement 23 maintained in a liquid state.

A glue or other cement applying roller 28 is mounted in the upper portion of the pot 22, the roller being rotatably mounted as on end shaft portions 29 and being driven as will hereinafter be fully described. It will be noted particularly with reference to Fig. 9 that the roller 28 is so mounted as to have its upper portion extend through the open end of the glue pot and have its lower portion pass through the cement in the pot whereby as the roller is turned in the direction of the arrow 30 it constantly picks up a coating of glue or other cement.

A rockable shaft 31 extends across the glue pot in parallel relation to the glue applying roller 28 and this shaft carries a doctor blade 32 which may be secured to the shaft in any suitable manner as by screws 33. The doctor blade is so located that one of its edges may be brought into engagement with the glue applying roller and such edge of the doctor blade is notched as at 34, the notches as here shown being V-shaped, but they may be other shapes if desired. To one end

of shaft 31 at the outer side of the glue pot there is secured a handle 35 by means of which the shaft and doctor blade may be rocked so as to shift the doctor blade from an operative to an inoperative position in which latter position the notched edge of the blade will be spaced from the roller.

At each side of the machine or at each end of the glue pot there is arranged a bracket or link 36 each bracket being pivotally mounted as on a short shaft or stud 37. These brackets rotatably mount a feeding and pressing roller 38, which may be covered with rubber as indicated at 38a, and dispose the same above the glue applying roller 28. Coil springs 39 tend normally to rock the brackets about their pivots 37 to force the feeding roller 38 toward the glue applying roller 28. Adjustable stops in the form of screws 40 are provided to limit the movement of the brackets under the influence of the coil springs and to keep the roller 38 the proper distance from roller 28.

Means are provided for driving the rollers 28 and 38 in directions to feed electros between them, such driving means including an electric motor 41 mounted in the frame below the heating plate 18 and connected to drive a sprocket 42 over which is trained a chain 43 also trained over a sprocket 44 on the shaft 29. With this arrangement it will be apparent that the glue applying roller 28 is driven in a positive manner.

Also, mounted on the shaft 29 is a gear 44a which meshes with and drives a small pinion 45 on a stud or shaft 37, pinion 45 in turn meshing with and driving a pinion 46 on a short shaft 47 mounted by one of the brackets 36. This pinion 46 meshes with and drives a pinion 48 on the shaft 49 of the feeding roller 38. With the described arrangement it will be understood that the glue applying roller will be driven in a counter clockwise direction as indicated by the arrow 30 of Fig. 9 while the feeding roller 38 will be driven in a clockwise direction as indicated by the arrow 50 of said figure.

At the side of the glue applying roller opposite the doctor blade 32 there are arranged a series of guide or stripper fingers 51 here shown as supported on a shaft or rod 52 to which they are secured in spaced relation as by screws 53. Beyond shaft 52 are a series of stationary shafts or rods 54 mounted in the frame and secured as by set screws 55. These stationary shafts or rods 54 each support a series of narrow faced rollers 56 adapted to support electros or printing plates as will later be described.

In addition to the motor 41 other mechanism such as controls may be mounted in the frame 15 below the heater plate 18 and heater elements 19 and as here shown such other mechanism includes the switch for the heating element 19 generally indicated at 57, the push buttons being designated 58, and a pilot light being shown at 59. The glue pot heater relay cabinet is designated 60 and has associated with it a thermostat 61. If desired, a thermometer 62 may be mounted on the glue pot so that the operator may be instantly advised as to the temperature. A thermo oil motor switch is generally designated 63 and includes push buttons 64 and may be connected to the motor as through a conduit 65. The glue pot switch is generally indicated at 66 and as shown includes push buttons 67 and a pilot light 68.

Beyond the narrow faced supporting rollers 56 is a stand generally designated 69 supporting at one end a heater 70 to which current may be supplied from any suitable source as through a cable 71. This heater is provided for the purpose of heating a warming plate 70a for heating or warming a base 90 to which an electro or printing plate 86 is to be secured. Beyond the heater plate 70a there is mounted a hydraulic press generally designated 72 and including a ram 73 adapted to perform as will later be described. A pressure gauge 74 may be connected with the press as by suitable piping 75. Any suitable conveyor 76 is provided for shifting objects from the heater into the press and from the press onto any suitable supporting platform 77.

This conveyor 76 as here shown includes endless chains 78 on opposite sides of the plate 70a operating over sprockets 79 and supported intermediate the sprockets as by rollers 80. Chains 78 are connected by cross members 81 and a crank 82 is connected with one of the sprockets whereby on turning movement of the crank the conveyor will be driven or operated. As will later be described the press 72 is adapted to force an electro or printing plate and a base against a head 83 by means of a supporting and vertically movable head or plate 91, the under surface of which head 83 is preferably covered with a blanket 84 of rubber or other suitable material whereby to prevent marring of the printing surface of the electro. Any suitable means may be provided for controlling the press, the means here being shown as a hand valve 85.

In the operation of the machine when an electro is to be attached to a base the switch to the heater elements 19 is closed to heat the plate 18 and the electro 86 is placed on the plate 18 as shown by dotted lines in position A in Fig. 1. The motor 41 is started and the rollers 28 and 38 are driven. Since the notched edge of the doctor blade 32 is in engagement with the glue or other cement applying roller, a large portion of the glue or other cement picked up by the roller will be scraped off it and returned to the pot. The glue or other cement remaining on the roller will be in the form of narrow spaced strips 87 as best shown in Fig. 6.

When the electro reaches the proper temperature, in the neighborhood of 120° C., it is moved along the heater plate 18 over a guard plate 88 and fed through or between the rollers 28 and 38 as suggested in its full line position B in Fig. 1. Since the glue is on the roller 28 in the form of spaced strips 87, it will be applied to the underside of the electro in the form of narrow spaced strips as best shown at 89 in Figs. 10 and 11. Fingers 51 prevent the electro from following around the glue applying roller and on leaving such roller, the glued electro moves onto the narrow faced supporting rollers 56. Since such rollers have narrow faces or edges they will not remove any substantial portion of the glue from the underside of the electro and they will not spread or smear the glue on the electro.

While the foregoing action has been taking place a base or back 90 for an electro has been heating on the heater 70a and when the electro is glued and deposited on the roller 56, position B, the base 90 will have reached the proper temperature and the electro is then moved on to the base, being moved along as through the position C of Fig. 1 to the position D of Fig. 3. After the glued electro has been deposited on the heated base, as indicated in Fig. 3, the crank 82 is operated to have the conveyor 76 carry the base and electro into the press, one of the transverse members 81 engaging the end of the base and sliding it along

onto head 91. Thereafter, the press is operated to lift head 91 and the base and plate to close and force the base and electro against one another, the upper surface of the electro engaging the yielding blanket 84 above referred to. The press remains closed until the glue has cooled and set after which the press is opened resulting in the lowering of the base and electro and the conveyor is operated to carry the completed article out of the press and deliver it to the platform 77.

From the foregoing description it will be appreciated that with the means of the present invention electros or printing plates may be rapidly secured to bases. The electros and bases are heated to approximately the temperature of the glue to prevent chilling of the glue as it is applied to the electro and as the glued electro is placed on the base to which it is to be secured. When the base and electro are placed under pressure the glue which has been applied to the electro in the form of narrow lines or strips is pressed out to form a thin film of uniform thickness adhering to both the base and the electro.

The scraper or doctor blade can be shifted to a position out of engagement with the glue applying roller when the machine is not in operation, the said glue applying roller preferably being kept in operation to prevent congealing of the glue. Of course, the glue may be heated in any desired manner or by any desired means and the application of heat to the glue is preferably controlled by thermostat whereby to keep the glue at the proper temperature. While the pressure applying means is disclosed as the hydraulic press 72 it will be understood that the pressure may be applied by any other power or by hand.

Since the glue is applied by a machine a better job than may be accomplished by hand results, since the glue is more uniformly applied. However, according to the present invention the glue is applied to the electros not as a continuous layer but as the series of spaced strips or lines 89. (See Figs. 10 and 11.) The dimensions of these lines may, of course, vary, but ordinarily the strips or lines are about a sixteenth of an inch wide and are spaced apart approximately three-sixteenths or one-quarter of an inch. When the glued electro is placed on the base and pressure applied the glue strips spread out evenly into a film about two-thousandths of an inch thick.

As the glue is thus spread any hollow space in the base or plate will be filled with glue so that the plate or electro will be uniformly secured and backed over its entire area, and the face of the electro will be in a single plane so no extra operations are required to make it level. Where the glue is spread over an entire surface of the electro or base trouble may result owing to the fact that the glue fails to spread evenly under pressure with the result that the center of the electro is often higher than its remaining portions. This requires further operations to make the face flat. With the means and method of the present invention, this trouble is obviated.

When an electro or printing plate is to be nailed to a base the electro must be provided with a flange beyond its printing surface. Such flange is not necessary when the electro is glued to a base and the printing may extend to the edges of the electro. Also, when nailing an electro to a metal base the nails or brads force the metal up causing the plate or electro to have an irregular surface. Further, when an electro is to be no longer used, the base may be reclaimed by heating it to soften the glue after which the old electro may be removed or peeled off the base. When the electro and base are heated to approximately the temperature of the glue or so as not to chill the glue when it is applied, a stronger and better bond between the electro and base is provided by the glue. I have used the term glue in the specification and claims as meaning any suitable cement whether it is strictly a glue or not.

Having thus set forth the nature of my invention, what I claim is:

1. In a machine for gluing an electro to a base, a heater to heat an electro, a glue pot at one edge of said heater, a glue applying roller operating in said glue pot and extending above the glue therein, a doctor blade engaging said roller as the roller leaves the glue in said pot, said doctor blade having a notched edge engaging the roller whereby a portion of the glue is removed from the roller and the glue remaining on the roller is in the form of spaced ridges, means for pressing a surface of a heated electro against said roller whereby to apply glue in the form of spaced strips to the electro, supporting means receiving the glued electro from the roller, a second heater beyond said supporting means to heat a base, a press adjacent said second heater, a conveyor operating across said second heater to carry objects therefrom to the press, said conveyor adapted to remove a heated base having a glued electro thereon from the second heater into the press, and means to close the press to force the heated base and electro together to spread the glue uniformly between them.

2. In a machine for gluing an electro to a base, a heater to heat an electro, a glue pot at one edge of said heater, a roller operating in said glue pot and extending above the glue therein, means for pressing a surface of a heated electro against said roller whereby to apply glue to the electro, supporting means receiving the glued electro from the roller, a second heater beyond said supporting means to heat a base, a press adjacent said second heater, a conveyor operating across said second heater to carry objects therefrom to the press, said conveyor adapted to remove a heated base having a glued electro thereon from the second heater into the press, and said press adapted to force the heated base and electro together to spread the glue uniformly between them.

3. In a machine for gluing an electro to a base, a heater to heat an electro, a glue pot at one edge of said heater, means for heating the glue in said pot to maintain it liquid, a roller operating in said glue pot and extending above the glue therein, means for pressing a surface of a heated electro against said roller whereby to apply glue to the electro, supporting means receiving the glued electro from the roller, a second heater beyond said supporting means to heat a base, a press adjacent said second heater, a conveyor operating across said second heater to carry objects therefrom to the press, said conveyor adapted to remove a heated base having a glued electro thereon from the second heater into the press, and said press adapted to force the heated base and electro together to spread the glue uniformly between them.

4. In a machine for gluing an electro to a base, a heater to heat an electro, a glue pot at one edge of said heater, means for heating the

glue in said pot to maintain it liquid, a glue applying roller operating in said glue pot and extending above the glue therein, a doctor blade engaging said roller as the roller leaves the glue in said pot, said doctor blade having a notched edge engaging the roller whereby a portion of the glue is removed from the roller and the glue remaining on the roller is in the form of spaced ridges, means for pressing a surface of a heated electro against said roller whereby to apply glue in the form of spaced strips to the electro, supporting means receiving the glued electro from the roller, a second heater beyond said supporting means to heat a base, a press adjacent said second heater, a conveyor operating across said second heater to carry objects therefrom to the press, said conveyor adapted to remove a heated base having a glued electro thereon from the second heater into the press, and means to close the press to force the heated base and electro together to spread the glue uniformly between them.

5. In a machine for gluing an electro to a base, a heater to heat an electro, a glue pot at one edge of said heater, a glue applying roller operating in said glue pot and extending above the glue therein, a doctor blade engaging said roller as the roller leaves the glue in said pot, said doctor blade having a notched edge engaging the roller whereby a portion of the glue is removed from the roller and the glue remaining on the roller is in the form of spaced ridges, means for pressing a surface of a heated electro against said roller whereby to apply glue in the form of spaced strips to the electro, supporting means receiving the glued electro from the roller, said supporting means comprising spaced narrow edged rollers whereby not to spread the glue on the electro, a second heater beyond said supporting means to heat a base, a press adjacent said second heater, a conveyor operating across said second heater to carry objects therefrom to the press, said conveyor adapted to remove a heated base having a glued electro thereon from the second heater into the press, and means to close the press to force the heated base and electro together to spread the glue uniformly between them.

6. In a machine for gluing an electro to a base, a heater to heat an electro, a glue pot at one edge of said heater, a glue applying roller mounted to have its lower side pass through the glue in said pot, a presser roller mounted above said glue applying roller for pressing a heated electro against the glue applying roller whereby to apply glue to the electro, means driving said rollers, supporting means receiving the glued electro from the roller, a second heater beyond said supporting means to heat a base, a press adjacent said second heater, a conveyor operating across said second heater to carry objects therefrom to the press, said conveyor adapted to remove a heated base having a glued electro thereon from the second heater into the press, and said press adapted to force the heated base and electro together to spread the glue uniformly between them.

7. In a machine for gluing an electro to a base, a heater to heat an electro, a glue pot at one edge of said heater, a glue applying roller operating in said glue pot and extending above the glue therein, a doctor blade engaging said roller as the roller leaves the glue in said pot, said doctor blade having a notched edge engaging the roller whereby a portion of the glue is removed from the roller and the glue remaining on the roller is in the form of spaced ridges, a presser roller mounted above said glue applying roller for pressing a heated electro against the glue applying roller whereby to apply glue in the form of spaced strips to the electro, means for driving said rollers, supporting means receiving the glued electro from the glue applying roller, a second heater beyond said supporting means to heat a base, a press adjacent said second heater, a conveyor operating across said second heater to carry objects therefrom to the press, said conveyor adapted to remove a heated base having a glued electro thereon from the second heater into the press, and means to close the press to force the heated base and electro together to spread the glue uniformly between them.

8. In a machine for gluing an electro to a base, a heater to heat an electro, a glue pot at one edge of said heater, a roller operating in said glue pot and extending above the glue therein, means for pressing a surface of a heated electro against said roller whereby to apply glue to the electro, supporting means receiving the glued electro from the roller, a second heater beyond said supporting means to heat a base, a press adjacent said second heater, a conveyor operating across said second heater to carry objects therefrom to the press, said conveyor adapted to remove a heated base having a glued electro thereon from the second heater into the press, said press adapted to force the heated base and electro together to spread the glue uniformly between them, and said press including a yielding portion against which the print bearing surface of the electro is pressed.

9. In a machine for gluing an electro to a base, a heater to heat an electro, a glue pot at one edge of said heater, a glue applying roller operating in said glue pot and extending above the glue therein, a doctor blade engaging said roller as the roller leaves the glue in said pot, said doctor blade having a notched edge engaging the roller whereby a portion of the glue is removed from the roller and the glue remaining on the roller is in the form of spaced ridges, means for pressing a surface of a heated electro against said roller whereby to apply glue in the form of spaced strips to the electro, supporting means receiving the glued electro from the roller, a second heater beyond said supporting means to heat a base, a press adjacent said second heater, a conveyor operating across said second heater to carry objects therefrom to the press, said conveyor adapted to remove a heated base having a glued electro thereon from the second heater into the press, means to close the press to force the heated base and electro together to spread the glue uniformly between them, and means movably mounting said doctor blade whereby it may be moved to an inoperative position out of engagement with the roller.

10. In a machine for gluing an electro to a base, a heater to heat an electro, a glue pot at one edge of said heater, a glue applying roller operating in said glue pot and extending above the glue therein, a doctor blade engaging said roller as the roller leaves the glue in said pot, said doctor blade having a notched edge engaging the roller whereby a portion of the glue is removed from the roller and the glue remaining on the roller is in the form of spaced ridges, means for pressing a surface of a heated electro against said roller whereby to apply glue in the form of spaced strips to the electro, supporting means receiving the glued electro from the roller, a second heater beyond said supporting means to heat a base, and a press to receive a heated base from the second

heater and a glued electro thereon and press them together to spread the glue uniformly between them.

11. In a machine for gluing an electro to a base, a heater to heat an electro, a glue pot at one edge of said heater, a roller operating in said glue pot and extending above the glue therein, means for pressing a surface of a heated electro against said roller whereby to apply glue to the electro, supporting means receiving the glued electro from the roller, a second heater beyond said supporting means to heat a base, and a press to receive a heated base from the second heater and a glued electro thereon and force the heated base and electro together to spread the glue uniformly between.

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