J. E. DOYLE.

MEANS FOR PREVENTING OFFSET IN PRINTING.

APPLICATION FILED AUG. 17, 1918.

1,366,069.

Patented Jan. 18, 1921.

3 SHEETS—SHEET 1.

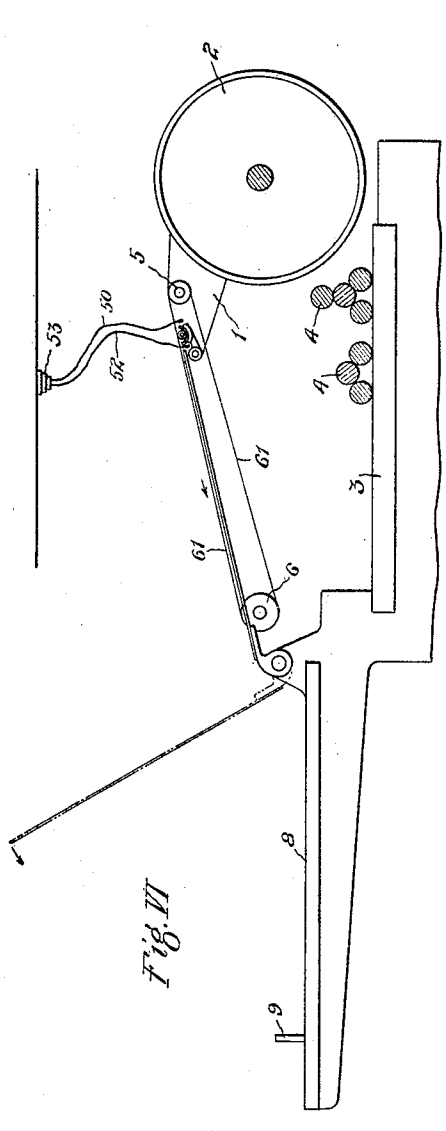


Fig. II

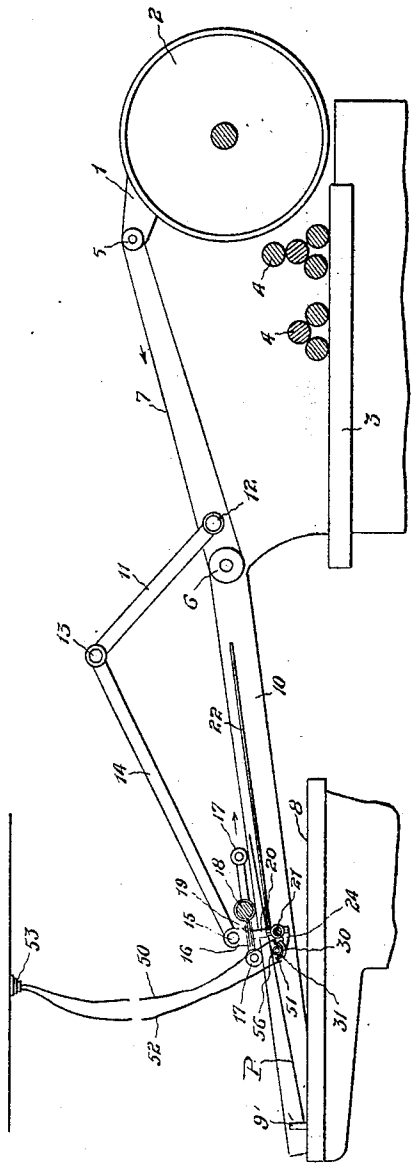


Fig. I

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3 SHEETS—SHEET 2.

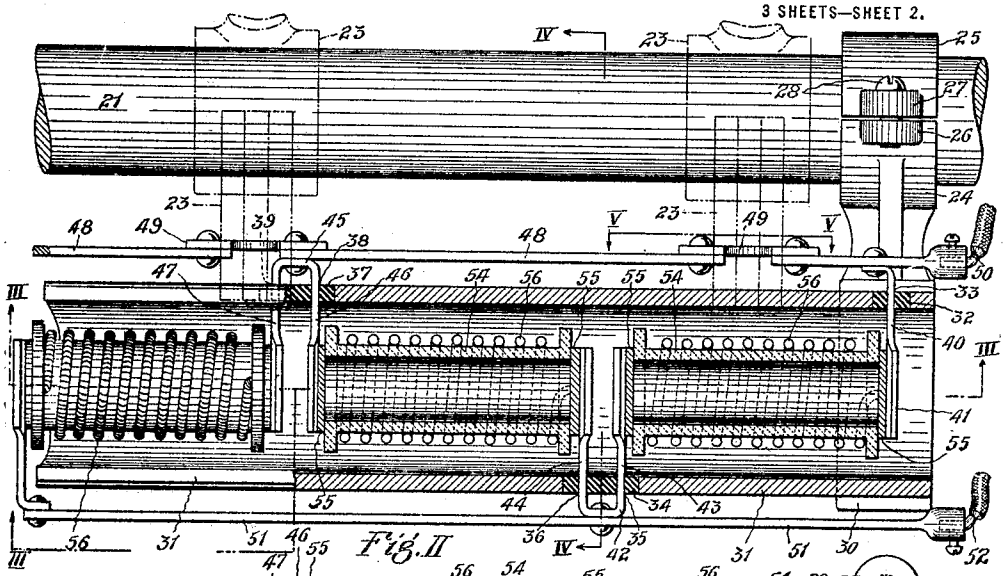


Fig. II

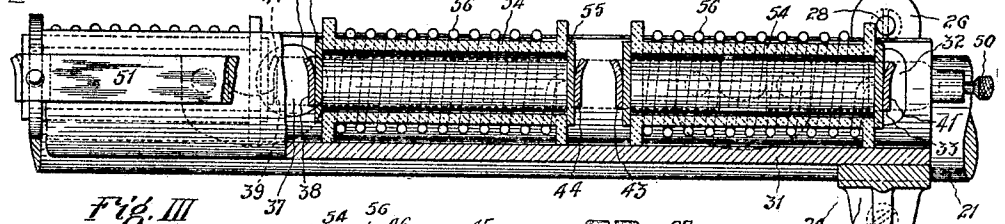


Fig. III

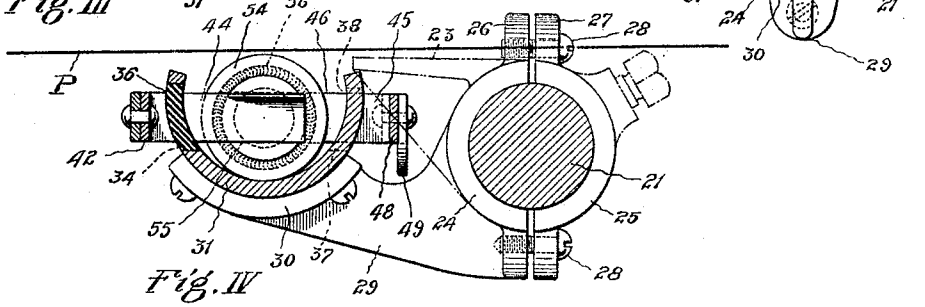


Fig. IV

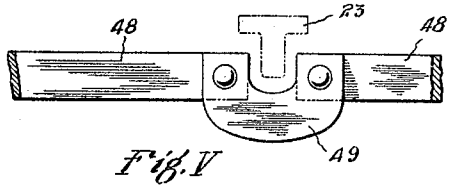


Fig. V

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3 SHEETS—SHEET 3.

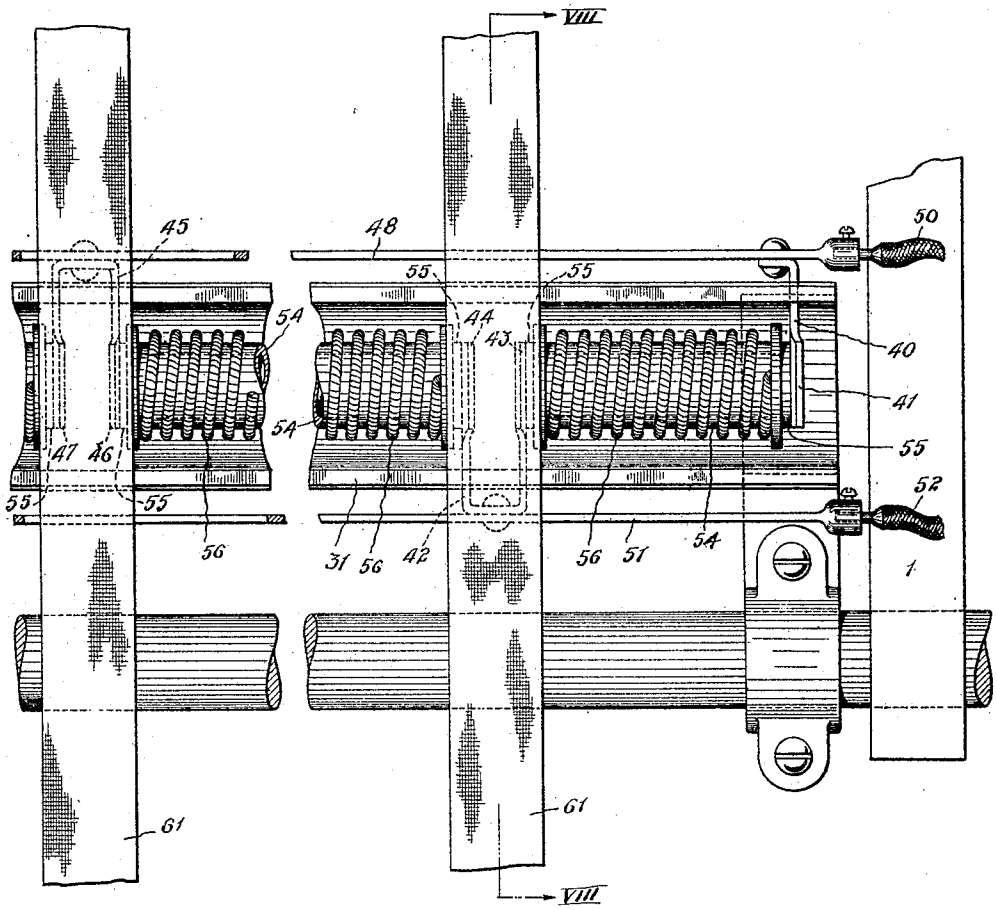


Fig. VII

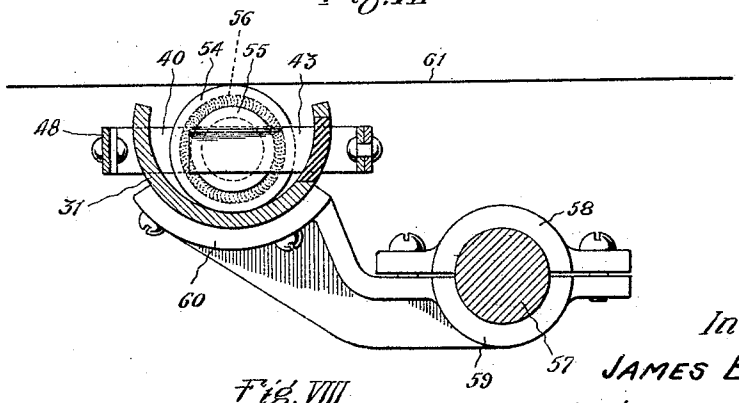


Fig. VIII

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UNITED STATES PATENT OFFICE.

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MEANS FOR PREVENTING OFFSET IN PRINTING.

1,366,069. Specification of Letters Patent. Patented Jan. 18, 1921.

Application filed August 17, 1918. Serial No. 250,391.

To all whom it may concern:

Be it known that I, JAMES E. DOYLE, a citizen of the United States, residing at Caxton Bldg., in the city of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Means for Preventing Offset in Printing, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

This invention relates to means for preventing offset and static electricity in printing and more particularly to the association of an electrical heating agency with a printing press so that paper sheets at the time of being delivered from the latter are caused to pass through a heated zone. The arrangement may be said to constitute an improvement over that shown, described and claimed in the domestic Patent No. 1,222,746 issued to me on April 17th, 1917. As in the case of the patent just identified this invention is exemplified by illustration in conjunction with what is known as a cylinder press and with but little modification is applicable alike to the use of an extension delivery and a fly bar, either of which may be alternatively employed upon the type of press just mentioned.

The object of my invention besides localizing heat in proximity to the line of travel of printed sheets during delivery, is to provide for a double adjustment of an electrical heating element or elements, namely, in a direction toward and away from the plane of movement of the sheets so as to regulate the intensity of the applied heat and also in a lateral direction so as to vary the points of greater or less concentration of heat from side to side depending upon the established requirements for some particular job. Having in mind the objects above stated, I have employed a row of separate electrical resistance units or heating coils extending across the path of movement of the sheets and below the line of travel thereof together with means whereby the energizing and hence the glow or incandescence of each electrical unit may be separately controlled and the capability afforded not only of varying the space therebetween but their elevation. Incidentally, the structural design is such that a particular unit may be readily removed and another substituted when occasion may require.

Adverting to the drawings:

Figure I is a diagrammatic view, partly in elevation and partly in section, showing one application of my invention to a cylinder press.

Fig. II is a greatly enlarged partial plan view of the attachment embodying my invention.

Fig. III is a longitudinal vertical section on line III—III of Fig. II.

Fig. IV is a vertical cross-section on line IV—IV of Fig. II.

Fig. V is a partial vertical section on line V—V of Fig. II.

Fig. VI is a view similar to Fig. I illustrating a modified application of my invention.

Fig. VII is an enlarged partial plan view of the particular means which embraces the principle of my invention.

Fig. VIII is a vertical cross-section on line VIII—VIII of Fig. VII.

Only cursory identification will be made of the essential supporting parts of the printing press and some other parts which aid in disclosing the method of applying my invention. That much of the frame of the printing press which is shown in Fig. I is designated by the numeral 1 and includes an extension above the cylinder 2. The platen 3 is shown below and upon the same a plurality of inking rolls 4 are visible. Rotatably mounted upon the overhanging portion 1 and a portion of the frame removed forwardly therefrom are a pair of rollers 5 and 6 respectively. These rollers actuate the conventional type of belt conveyer 7, the upper portion of which is designed to travel in a direction away from the cylinder. Positioned somewhat farther beyond and in the direction of travel of the conveyer 7 is a deposit table 8. The upper surface of this table is provided near its outer edge with an abutting rail 9. Disposed above the table 8 and inclined upwardly toward the cylinder are a pair of lateral supporting members 10 which incidentally answer as guides for the side edges of the moving paper sheets.

A gripping device whose function consists in carrying paper sheets forwardly beyond the location of the roller 6 will now be described. Generally speaking, it involves a traveling carriage provided with gripping

fingers and a pair of linked arms capable of reciprocating it when actuated in a manner not shown since common to the art. One arm 11 is pivotally mounted to the frame at 12. The free extremity of the arm 11 articulates through the medium of a pivot pin 13 with the second arm 14, and the extremity of this arm articulates in a similar manner through the medium of a pin 15 with the carriage 16. The carriage 16 involves in its construction forwardly and rearwardly disposed rollers 17 which are adapted to travel upon the members 10. Intermediately of the rollers 17 the carriage is provided with an oscillating rod 18 extending transversely to the direction which the paper sheet is to follow. The rod 18 supports a plurality of gripping fingers 19 which are in Fig. I shown in their elevated position. This position they assume automatically and in a manner also well known to such as are conversant with the art, when the carriage is returning, as indicated by the arrow, in the direction of the conveyer 7. The carriage 16 is provided with a depending bracket 20 which supports a rod 21 extending between the members 10. Secured along the rearward portion of the rod 21 and fixedly maintained in an inclined position are a plurality of alined arms 22. These arms constitute a movable table upon which the sheet of paper P is supported during transit. Supported in suitable spaced relation along the rod 21 so as to form supports for the moving sheets beyond the arms 22, with reference to the direction of travel, are a series of webbed fingers 23 shown in Figs. II, IV and V.

At other points along the rod 21 I support the structure embodying my present invention so as to in turn position it just beyond and at a somewhat lower level than the top surfaces of the fingers 23. Such supporting agencies consist of pairs of clamps 24 and 25 provided with flanges 26 and 27 respectively adapted to be drawn together by screws 28. The clamps 24 have extensions 29 formed with concave shelves 30. These shelves support a cylindrically shaped reflecting member 31 extending substantially across the press. The interior surface of this member is preferably formed of copper and highly polished in order to more effectively radiate the heat in a manner to become hereinafter evident. The reflecting member 31 is provided at one end with an insulating insert 32 having an opening 33 extending therethrough. A suitable distance along the member 31 and on the opposite side thereof is a similarly fitted insulation 34 provided with two openings 35 and 36. Diagonally opposite is another insulating part 37 provided with openings 38 and 39. It will be observed upon inspection of Fig. II that the insulations 32, 34 and 37 are in what might be termed a staggered arrangement and equally spaced with regard to each other. It should be understood that this arrangement continues across the entire width of the press over which the printed sheets are to travel. Inasmuch as a mere duplication is involved only so much as has been disclosed in Fig. II need be described. A post 40 extends through the opening 33 and has its inner end 41 about centrally located within the reflecting member 31 so as to be capable of yielding in a longitudinal direction. The upper edge of the end 41 is slightly bent aside, as may be seen in Fig. III, to facilitate the position of another part thereagainst as will hereinafter appear. The end 41 serves as an electrical terminal. Another post 42 is formed with a pair of forked extensions 43 and 44 which pass through the openings 35 and 36 respectively in the insulation 34. Each of the extensions carries a terminal shaped like and located as the terminal 41 with reference to the reflecting member 31. It should be understood that the terminals of the extensions 43 and 44 are adapted to be sprung toward and away from each other. Another post 45 corresponding in shape and function to the post 42 has extensions which pass through the openings 38 and 39 respectively and these likewise serve as interiorly positioned terminals 46 and 47.

A rigid bar construction 48 is secured to the posts 40 and 45 and such others as may be arranged along the same side of the member 31 and this bar structure is formed with depressed sections 49 where the fingers 23 are located in order to accommodate the webbed portions of the latter as may be seen in Figs. IV and V. The bar structure 48 is purposed to conduct an electric current and to this end has a lead wire 50 detachably associated with a socket provided in its end. A straight bar 51 connects the post 42 with all others which are positioned on the same side of the member 31 and is similarly provided in its end with a socket for the reception of another lead wire 52. The wires 50 and 52 lead to a wall socket 53 above as appears in Fig. I.

A series of insulating spools 54 of any suitable refractory material carry electrical contacts 55 at each of their ends. The spools are of such a length that their contacts 55 are spaced apart a distance slightly in excess of the normal spacing between the pairs of terminals 41 and 43 and 44 and 46 and so on, whereby each spool may be forced between a pair of the yielding terminals and held in place by the spring action thereof. Each of the spools 54 is wound with a coil of resistance wire 56 electrically connected with the contacts 55 and adapted when energized to glow and radiate heat.

As will now be readily understood my in-

vention makes possible the application of heat across the path of travel of a sheet moving over the fingers 23 and thence over the series of coils 56. It is also evident that I can control the disposition of heat by employing either the entire number of spools which can be accommodated or only some of them. For some jobs a less amount of heat is required and in such cases alternately arranged spools 54 could be removed. In other cases it might be desirable to have a heated zone only in line with certain portions of the sheet passing thereover. My invention enables therefore a regulation of heat in uniform divisions laterally across the sheet. Moreover, all of the heating elements may be together elevated or lowered at will so as to vary the intensity of the heat to be applied from below the moving sheet. This may be accomplished by loosening the clamps 24 and 25 and readjusting the position of the same about the rod 21.

In the modification disclosed in Figs. VI, VII and VIII the supporting rod 57 instead of being movable is fixed to an overhanging portion of the frame 1 near the rollers 5 and within the loop formed by the conveyer 7. With the exception of its location relative to the printing press the structural design of my invention is substantially unchanged as may be seen in Fig. VIII. A pair of flanged clamps 58 and 59 embrace the rod 57, the clamp 59 carrying an extension 60 corresponding to the extension 29. This modified form of my invention is adapted to the fly bar arrangement, a distinguishing feature of which is indicated by the dotted lines in Fig. VI and the arrow at the extremity thereof. The tapes 61 of the conveyer 7 are preferably arranged to move across the areas between the ends of adjacent spools so as not to travel directly over the heated coils.

I claim:

1. Means for preventing offset in printing upon sheets carried upon a printing press comprising a plurality of incandescent heating units exposed above and arranged below, so as to extend across, the path of movement of said sheets, and means whereby the functionating of said units may be separately controlled.

2. Means for preventing offset in printing upon sheets carried upon a printing press comprising a plurality of electrical heating units arranged beneath, so as collectively to extend across the path of movement of, the electrical connection of one or more of said units being subject to control.

3. Means for preventing offset in printing upon sheets carried upon a printing press comprising a plurality of individual heating units detachably supported adjacent the line of movement of said sheets, said units being separately detachable.

4. Means for preventing offset in printing upon sheets carried upon a printing press comprising a plurality of yielding supports in spaced relation across the path of travel of said sheets, and heating units fitted between adjacent pairs of said supports.

5. Means for preventing offset in printing upon sheets carried upon a printing press comprising a plurality of electrical terminals arranged across the path of movement of said sheets, and a plurality of electrical resistance elements mounted between positive and negative of said terminals.

6. Means for preventing offset in printing upon sheets carried upon a printing press comprising a plurality of electrical terminals all progressively arranged across the path of movement of said sheets, a plurality of spools having contacts at their ends adapted to be detachably fitted between pairs of said terminals respectively, and resistance coils wound about said spools and electrically connected with the contacts thereof.

7. Means for preventing offset in printing upon sheets carried upon a printing press comprising a supporting member, a plurality of posts provided with terminals, said posts being carried in substantial alinement by said member, and electrical resistance units detachably supported between pairs of said posts and means for simultaneously energizing such of said units as may be in position.

8. Means for preventing offset in printing upon sheets carried upon a printing press comprising a reflecting member below said sheets, a plurality of posts supported by said member, and electrical resistance units detachably supported between pairs of said posts and means for simultaneously energizing said units.

9. Means for preventing offset in printing upon sheets carried upon a printing press comprising a supporting member, a plurality of posts provided with terminals, said posts being yieldingly carried by said member, and electrical resistance units spring supported between pairs of said posts, means for simultaneously energizing said units and means for simultaneously adjusting the same toward and away from the line of travel of the sheet.

10. Means for preventing offset in printing upon sheets carried upon a printing press comprising a concave reflecting member below the line of movement of said sheet, posts extending therethrough in a row across said sheet and provided with ends adapted to serve as terminals and electrical heating elements detachably carried between different pairs of said posts.

11. Means for preventing offset in printing upon sheets carried upon a printing press comprising a concave reflecting member below the line of movement of said sheet,

resilient posts extending therethrough and provided with ends adapted to serve as terminals, and a spool having end contacts adapted to be yieldingly held between said terminals, and a coil of resistance wire upon said spool and connected with the end contacts thereof.

12. Means for preventing offset in printing upon sheets conveyed by a machine comprising posts extending across the line of movement of said sheet, pairs of said posts being adapted to serve as terminals for a plurality of distinct heating elements.

13. Means for preventing offset of freshly printed sheets conveyed upon a machine comprising, a plurality of pairs of terminals arranged across the path of movement of said sheets, a plurality of supports having pairs of positive and negative contacts adapted to engage pairs of said terminals respectively, and exposed resistance wires carried by said supports and electrically connected with the contacts thereof, whereby localization of heat across the path of movement of said sheets may be determined according to the dimensions and number of said distinct wires.

14. The method of conditioning sheets after printing thereon which consists in causing a heat of incandescence to be applied in proximity thereto while causing a relative movement of one past the other.

15. Means for preventing offset in printing upon moving sheets, comprising a support, a plurality of electrical terminals carried by said support and arranged across the path of movement of said sheets, and heating units so mounted between different pairs of said terminals that some may be energized while leaving unheated gaps therebetween or to either side thereof.

16. A device of the character described for heating sheets conveyed by a machine, comprising posts extending across the line of movement of said sheet, pairs of said posts being adapted to serve as terminals for an electrical element and means for effecting a detachable connection between said posts and element.

17. A device of the character described for heating a sheet carried upon a machine, an electrical heating unit arranged beneath, so as to extend crosswise the path of movement of said sheet, the electrical connection of said unit being subject to control and means for adjusting said unit relative to said path of sheet movement.

18. The method of conditioning a sheet by the application of heat thereto, which consists in causing the sheet to travel in a prescribed direction in close proximity to an incandescent body.

19. The method of conditioning sheets after printing thereon by the application of heat thereto, which consists in causing the sheets rapidly to travel in a prescribed direction over an incandescent body.

20. The method conditioning a sheet by the application of heat thereto, which consists in conveying the sheet in a prescribed direction, and causing a heat of incandescence to be continuously applied near the lower side of said sheet.

21. A device of the character described for heating a sheet conveyed by a machine, comprising a support, electrical terminals carried by said support, insulators detachably connected with said support, and resistance wires over said insulator and detachably connected with said terminals.

22. A device of the character described for heating a sheet conveyed by a machine, comprising a support, an insulator detachably connected with said support, and a resistance element connected with said insulator, and means for effecting said connections.

Signed by me this 13th day of June, 1918.

JAMES E. DOYLE.