Jan. 29, 1924. 1,482,352

C. F. DAUSMANN

PRINTING PRESS

Original Filed Aug. 6, 1919 2 Sheets-Sheet 1

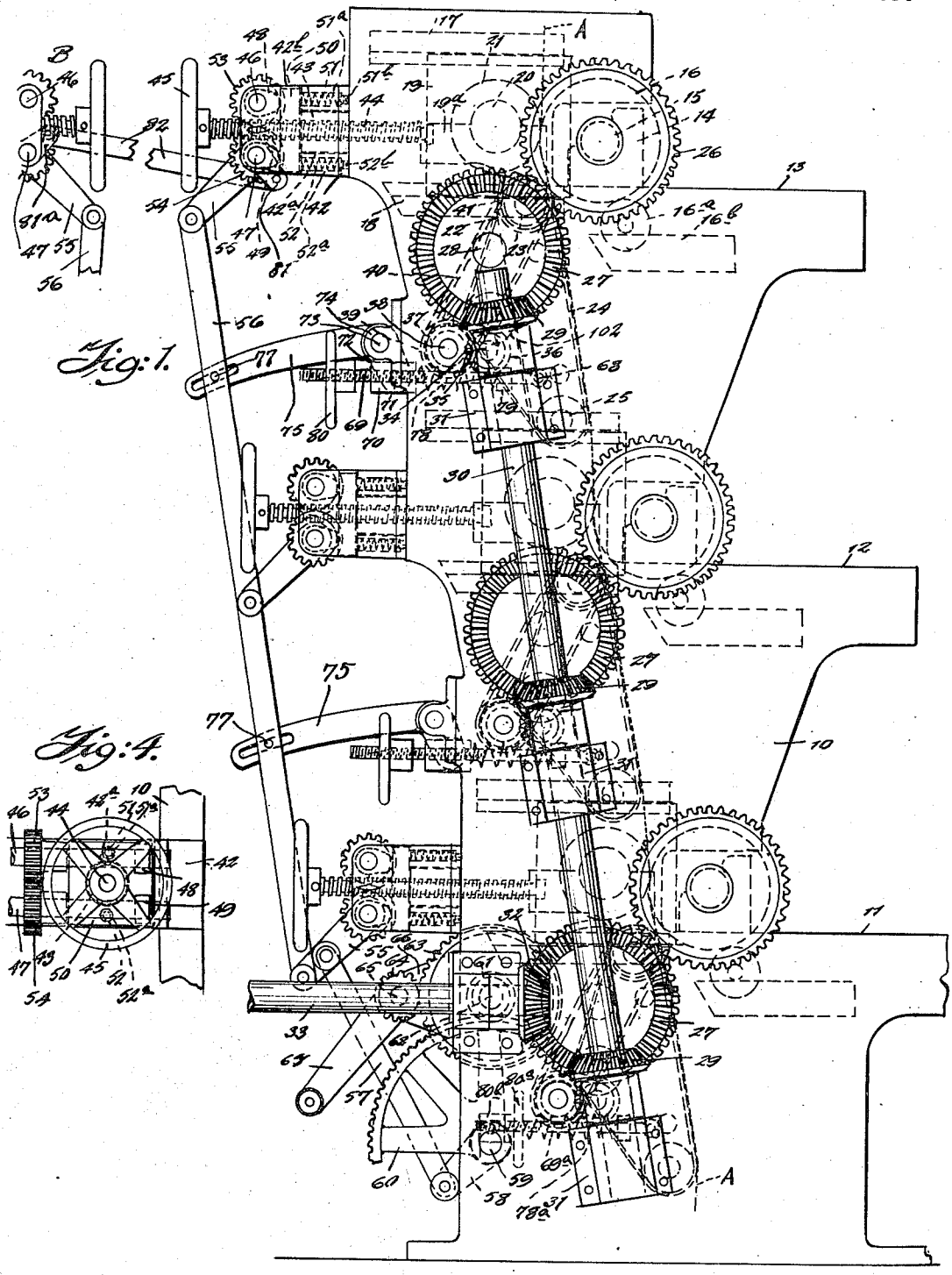


Fig. 1.

Fig. 4.

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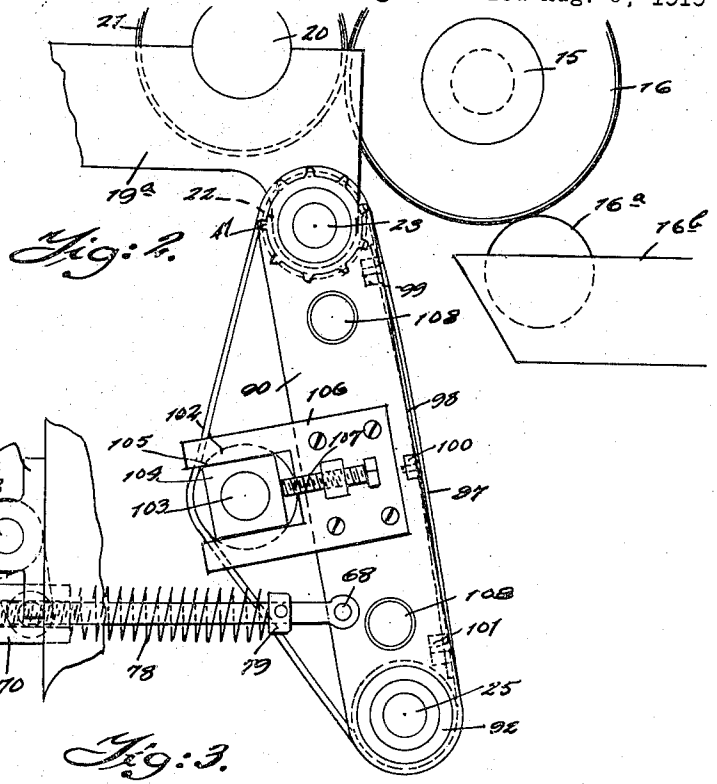
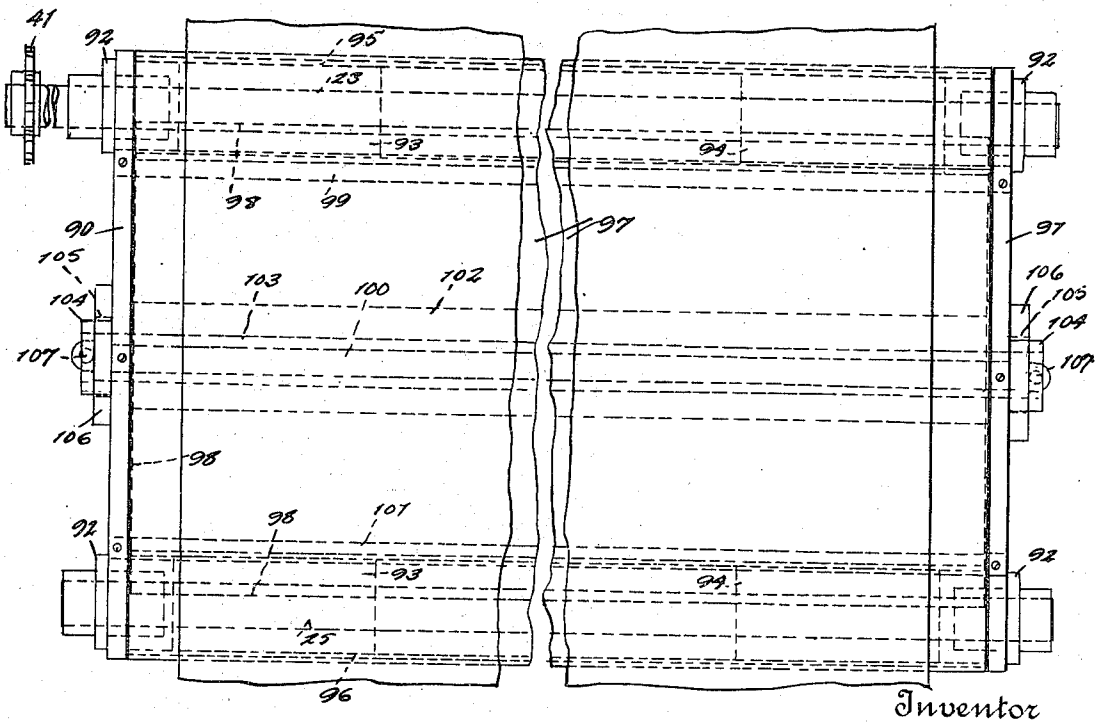


Fig: 2.

Fig: 3.



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UNITED STATES PATENT OFFICE.

CHARLES F. DAUSMANN, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE PRISMATONE CO., INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PRINTING PRESS.

Application filed August 6, 1919, Serial No. 315,603. Renewed February 7, 1921. Serial No. 443,226.

To all whom it may concern:

Be it known that I, CHARLES F. DAUSMANN, a citizen of the United States, and a resident of the borough of Brooklyn, county of Queens, city and State of New York, have invented certain new and useful Improvements in Printing Presses, of which the following is a specification.

The present invention relates to improvements in printing presses, and particularly printing presses intended especially for rotary gravure color printing. An object of the invention is to provide in such a press, means for accurately maintaining the register of colors between the prints, such means being adjustable so as to enable the imparting of several colors upon the paper or web passing through the press in such manner that the colors will be precisely superimposed. To this end I propose to provide in the present embodiment of my invention, a plurality of spaced print and impression rollers adapted respectively to impart a single color to the paper or web and between these a color registering blanket continuously moving with the web and adapted to tension the same, and more particularly I propose to provide for such a blanket a support of brass or other suitable material, of convex shape constantly moving the blanket over the same under pressure, the friction between the support and the rubber inducing static electricity in the rubber for the purpose of attracting to the blanket the paper or web passing over the same so that the web will cling to the blanket and the direction of the web through the press will thereby be maintained and guided so that the printed portions will not shift as they move from one printing roller to another. A further object of the invention is to enable the release of the impression rollers and the blankets so that the tension upon the web will be relieved and the inserting of a new web in the press will be facilitated. I further propose to provide means for simultaneously, by a single manual operation, releasing all of the blankets and impression rollers, either of one printing couple or of two in the case of printing on both sides of a sheet.

With these and other objects in view, an embodiment of my invention is shown in the accompanying drawings, and this embodiment will be hereinafter more fully described with reference thereto and the invention will be finally pointed out in the claims.

In the accompanying drawings,

Fig. 1 is a side elevation of a printing press showing one embodiment of my invention incorporated therein, certain well known parts of the press being omitted for the sake of clearness;

Fig. 2 is an end view of the blanket and support;

Fig. 3 is a front elevation thereof; and

Fig. 4 is a detail front view of the impression roller throw-off mechanism.

Similar reference characters indicate corresponding parts throughout the several figures of the drawings.

Referring to the drawings, and more particularly to Fig. 1 thereof, the press shown therein, comprises two side supports or standards 10 having a plurality of stepped horizontal shelf portions 11, 12 and 13 upon which are slidably mounted the bearings 14 in which the ends of the shafts 15 of the printing cylinders 16 are journaled. In the present disclosure I have shown three printing sets adapted successively to impart three colors in superimposed relation upon the web A passing through the press. This is merely for illustrative purposes however, and two, four or any desired number of printing sets may be provided as will be understood.

Upon the inner sides of the standards 10 and at one side of the printing cylinder there are secured slide bearing gibs 17 and 18 in which block members 19 are slidable, said block members having cast thereon bearings 19^a in which are journaled the ends of the shaft 20 of an impression roller 21 which bears upon the printing cylinder. The printing cylinder, it will be understood, is preferably of copper and has an etched intaglio printing surface, the impression roller cooperating therewith having a rubber covering yieldingly engaging the same. Ink is supplied to the printing cylinder by means of an inking roller 16^a rotating in an ink reservoir 16^b.

The bearing 19^a extends into a secondary bearing portion 22 in which is journaled the shaft 23 over which one end of the continuous blanket 24 passes, the other end passing over a shaft 25, the blanket extending from the

pass between the impression and printing cylinder of one set to the pass of the impression and printing cylinder of the next set.

The shaft 15 of the printing cylinder of each set is provided at its end with a gear 26 which meshes with the spur teeth of a combined spur and beveled gear 27 journaled upon a stud shaft 28, the beveled teeth being engaged by a series of beveled pinions 29 mounted upon a shaft 30 journaled in bearings 31 and extending uprightly of the standard 10 at one side, the said shaft being driven from the lowermost combined spur and beveled gear which in turn is driven by the beveled pinion 32 of the horizontal driving shaft 33. Thus the printing cylinders are simultaneously and equally driven.

The spur teeth of the combined spur and beveled gear 27 are engaged by a pinion gear 34 provided upon the outer end of a shaft 35 journaled in the standard 10, the other end of the said shaft being provided with a pinion gear 36 meshing with a pinion gear 37 provided upon a stud shaft 38 and upon which shaft 38 there is provided a sprocket gear 39 connected by a sprocket chain 40 with a sprocket gear 41 mounted upon the end of the shaft 23 of the blanket, this transmission adapted to continuously move the blanket in the direction of movement of the web and at the same speed therewith through the press.

Upon the inner end faces of the standards there are mounted brackets 42 extending between the standards and having at each end cylindrical passages 42^a in which are slidably mounted nuts or blocks 43 through which are threaded screws 44 connected at one end to the slide bearing 19 and provided at their other ends with hand wheels 45. Upon parallel shafts 46 and 47 extending between the upstanding end portions 42^b of the brackets, there are provided cams 48 and 49, the outer face portion 50 of the nut 43 being held constantly in engagement with the said cams by means of springs 51 and 52, disposed in sockets 51^a and 52^a formed in the brackets above and below the passages 42^a, the said springs being adjustable as to tension by means of set screws 51^b and 52^b. The said cams are provided with concentric portions of greatest distance from the axis of rotation, the said portions when engaged with the face portions 50 of the nut adapted to hold the impression roller in a predetermined constant position at any point of the engagement of said concentric portions with said face portions. Intermeshing pinions 53 and 54 are provided upon the respective shafts 46 and 47 and the lower shaft 47 has mounted thereon an arm 55 which, upon being raised, will through the rotation of the shafts 47, turn the cams 48 and 49 so that the springs 51 and 52 force the nut 43 carrying the screw 44 outwardly and thereby withdraw the bearing blocks 19 and the impression roller carried thereby out of engagement with the printing cylinder, the upper end of the blanket being also moved outwardly by this operation, the lower end being also moved at the same time by means that will be presently more fully described.

The respective arms 55 of the printing sets are connected by a rod 56 so that movement of one of the arms will cause corresponding movement of the other and the throw-off of all of the impression rollers will be simultaneous and equal. The lowermost arm 55 is connected by a rod 57 to an arm 58 provided upon the shaft 59 of a segment gear 60 which meshes with a pinion 61 provided upon the shaft 62 of a gear 63, a pinion 64 provided upon a shaft 65 mounted in a bracket 66 meshing with the gear 63, a handle 67 being provided upon the shaft 65. By turning the handle 67, the train of gears 64, 63, 61 and 60 will swing the arm 58 upwardly thereby raising the rod 57 and the rod 56, causing the arms 55 to be swung and the cams 48 and 49 to be turned to release the impression roller.

The blanket is pivotally connected at 68 to a pressure screw 69 having its threaded portion extending through the plane bore of a poppet head 70 pivotally supported at 71 upon an arm 72 mounted upon a shaft 73 journaled in brackets 74, a lever 75 provided upon the shaft 73 having its slotted end 76 engaging a pin 77 of the connection rod 56. A spring 78 is disposed on the screw between the poppet head and a collar 79 and yieldingly holds the blanket in engagement with the web. A hand nut 80 engages the threaded end of the pressure screw 69 and is normally spaced from the poppet head. Turning of the hand nut 80 regulates the space between the nut and the poppet head. Upon movement of the rod 56, the lever 75 is swung upwardly thereby moving the head 70 outwardly, first releasing the tension upon the spring 78 and upon engagement with the nut 80 disengages the blanket from the web, this movement being simultaneous and substantially equal to the movement of the impression roller away from the printing cylinder. By turning the hand nut against the poppet head, tension on the web may be released as desired.

The press so far described is adapted for the printing upon one side of a web of paper. Upon occasion the paper is printed upon both sides by a continuous process which consists in providing in opposed relation to one press a similar press from which the web is carried in such manner that the unprinted surface of the paper issuing from one press is printed in the other press, and I have indicated at B a small portion of an-

other press arranged in this relation. Upon the shafts 47 of the two presses there are provided respectively a downwardly extending arm 81 and an upwardly extending arm 81ª connected by means of a connection rod 82 so that operation of the rod 56 of one of the presses will simultaneously and equally operate the other so that the impression rollers and the blankets of all of the sets of both presses will be simultaneously and equally moved away from the printing cylinders to release the web. In carrying out this operation the rod 57 of one press is disconnected.

The lowermost blanket not being above the pass of a printing set, is not swung outwardly at its lower end upon operation of the rod 56, but is independently provided with a pressure screw 69ª, a spring 78ª being provided thereon, which is adjustable as to tension by a hand nut 80ª pivotally supported in a bracket 80ᵇ.

Referring particularly to Figs. 2, 3 and 4 of the drawings, the blanket according to the present embodiment of my invention, comprises a pair of side plates 90 and 91 rounded at their ends and connected at their ends by means of the shafts 23 and 25, the said shafts having mounted thereon adjacent the side plates 90 and 91 and outwardly thereof, flanged bushings 92, the flanges engaging the plates at their outer sides, and upon the shafts adjacent the inner sides of the plates there are provided sleeves 93 and 94 upon which are mounted the respective cylindrical rollers 95 and 96 over which a continuous covering 97 of rubber passes, and which I will hereinafter refer to as the blanket. The portion of the blanket engaging the web is supported at its under side by means of a plate 98 of brass or other suitable material, this plate being mounted upon bars 99, 100 and 101 connected at their ends to the side plates 90 and 91. The plate 98 is longitudinally convexed, this being brought about by projecting the bar 100 forwardly of the bars 99 and 101 so that the highest point of the convexity is longitudinally in the center of the blanket. As the blanket moves over the brass support, static electricity is set up in the rubber which attracts to the blanket the paper web passing over the same so that the web is caused to cling to the blanket and is thereby guided in its travel from one of the printing sets to the other, and the colors imparted by the different sets are caused to accurately register in superimposed relation with each other due to the absence of any shifting of the web. The blanket is wider than the full width of the web passing over the same.

Any slack in the blanket may be taken up by means of an adjustable roller 102 over which the blanket passes at the rear, the said roller having its shaft 103 journaled in blocks 104 slidable in the cut-outs 105 of brackets 106 secured to the side slots, and adapted to be adjusted by set screws 107.

Steam pipes 108 extend between the side supports and heat the blanket support and blanket, thereby drying the paper as it passes over the blanket.

With my improvements any desired tension may be produced upon the web between the printing sets and by adjusting this tension to the desired degree, the colors may be made to register with precision, the adhesion of the web and the blanket caused by the production of static electricity in the blanket preventing any displacement of the web. The impression rollers and the blankets may be simultaneously released from the web with facility.

I have illustrated and described a preferred and satisfactory embodiment of my invention but it is obvious that changes may be made therein within the spirit and scope thereof as defined in the appended claims.

I claim:

1. In a multicolor press, mechanism for maintaining registration of a web between spaced printing couples including a blanket yieldingly urged against one side of the web, and means for moving the blanket.

2. In a multicolor press, web registering mechanism including a support of convex shape and a blanket movable upon the convex support whereby static electricity is induced in the blanket structure, a part of the moving blanket being disposed in juxtaposition to the web whereby the web is subjected to the influence of the static electricity and caused to cling to the blanket surface, thereby guiding the web in its movement between spaced color printing couples of the press.

3. In a multicolor press, spaced sets of print and impression rollers, a movable blanket supported between the spaced printing sets and having a part thereof disposed in juxtaposition to the web extending between the printing sets, means acting upon the blanket to engage the same with the unprinted side of the web whereby the web is placed under tension, and means for moving the blanket.

4. In a multicolor press, web registering means including a plate extending the full width of the web, said plate having a convex surface longitudinally of the web with its highest point at the central region of the plate, an endless blanket movable over and upon the convex surface of the plate, and means for urging said plate and blanket towards the web to frictionally engage the blanket with one side of the web.

5. In a multicolor press, web registering means including a blanket support having a convex surface opposed to the web, a blanket movable over and in contact with said convex surface of the support whereby

static electricity is induced in the structure of the blanket and the opposed web subjected to the attractive influence thereof to cause the web to closely cling to the surface of the blanket whereby the web is guided between the spaced printing couples of the press, and means for adjusting the blanket to regulate its frictional pressure upon the convex surface of the support.

6. In a multicolor press having a plurality of print and impression rollers, a relatively long and wide member between prints pressed against the web to place it under tension and engaging the same at the unprinted side thereof along the major portion of its surface between prints, and yieldably maintain it under tension to register colors.

7. In a multicolor press having a plurality of print and impression rollers, a relatively long and wide blanket between prints pressed against the web to place it under tension to maintain it under tension to register colors and engaging the same at the unprinted side thereof along the major portion of its surface between prints.

8. In a multicolor press, means for maintaining registers of colors between prints consisting of a relatively long and wide blanket yieldably pressed against the web and engaging the same at the unprinted side thereof along the major portion of its surface between prints.

9. In a multicolor press, a plurality of printing couples, each comprising a printing and an impression roller, a relatively long and wide blanket interposed between the printing couples and engaging the web along the major portion of its surface between the printing couples, means for pressing the blanket yieldably against the web, and means for operating the blanket to move the web between the printing couples.

10. In a multicolor press, a plurality of printing couples, each comprising a printing and an impression roller, and mechanism for moving the web between the printing couples comprising a blanket engaging the web and a support for the blanket, and means for pressing the blanket against the web to cause the web to cling to the blanket with sufficient power to prevent relative movement between the blanket and the aligned portions of the web.

11. In a multicolor press, a plurality of printing couples, each comprising a printing and an impression roller, and means for registering the web with the printing couples including traction devices for inducing static electricity to cause the web to cling to said means.

12. In a multicolor press, a plurality of printing couples, each comprising a printing and an impression roller, and mechanism for registering the web with the printing couples comprising a blanket engaging the web along the major portion of its surface between the printing couples, means for operating the blanket, and means for yieldably pressing the blanket against the web, said mechanism being constructed to cause the web to cling to the blanket with sufficient strength to prevent relative movement between the blanket and the aligned portions of the web.

13. Means for maintaining registration of a web with a printing surface comprising a friction surface movable with the web, a stationary part, and means on one side of said friction surface frictionally coacting with said stationary part to induce an electrostatic charge on the friction surface, said charge exerting an attractive influence on the web to hold the same in close contact with the friction surface for movement as a unit therewith.

14. Means for registering a web with a printing surface, comprising a fixed part, a flexible member frictionally engaging said fixed part to induce an electrostatic charge, and a surface of high frictional material carried by said member and opposed to the web whereby said web is drawn by the attractive influence of the electrostatic charge into close contact with said surface for movement as a unit therewith.

15. In combination with a printing press having a plurality of spaced printing sets, means arranged in the spaces between the printing sets for producing electrostatic charges and co-operating with the opposed section of the paper web extending between the printing sets to accurately register the web with the printing surfaces, and means for simultaneously relieving the spaced sections of the web from the influence of the electrostatic charges.

16. In combination with a printing press having a plurality of spaced printing sets, means arranged in the spaces between the printing sets for producing electrostatic charges and co-operating with the opposed section of the paper web extending between the printing sets to accurately register the web with the printing surfaces, and means for simultaneously shifting all of the electrostatic charge producing means bodily with respect to the web to relieve the latter from the influence of the electrostatic charges.

17. In combination with a printing press having a plurality of vertically spaced printing couples, means arranged in the spaces between said printing couples for producing electrostatic charges and co-operating with the opposed sections of the web extending between the printing couples to register the web with the printing surfaces and means for simultaneously relieving the

sections of the web extending between the printing couples from the influence of the electrostatic charges.

18. In combination with a printing press having a plurality of vertically spaced printing couples, each consisting of a printing cylinder and an impression roller, means arranged in the spaces between the printing couples for producing electrostatic charges acting by their attractive influence over substantially the entire area of the sections of paper web extending between the printing couples to maintain register of the web with the printing cylinders.

In testimony that I claim the foregoing as my invention, I have signed my name hereunder.

CHARLES F. DAUSMANN.