May 1, 1928. 1,668,049

M. A. CLINTON ET AL

DEELECTROLIZER

Filed May 20, 1922

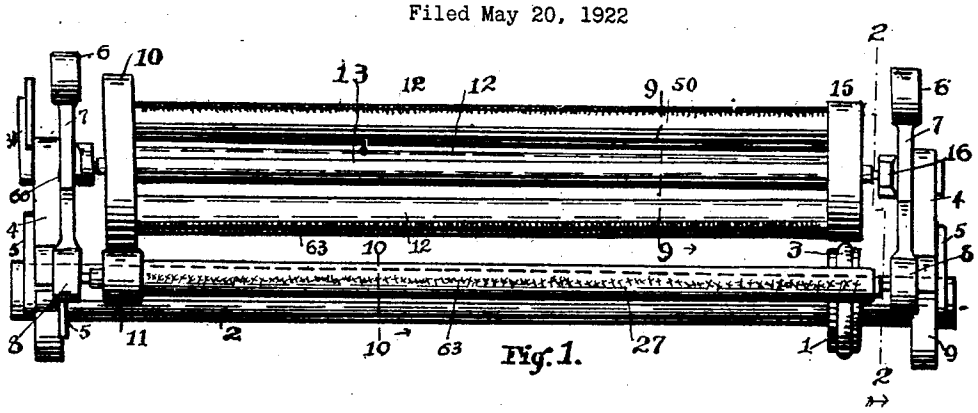

Fig. 1.

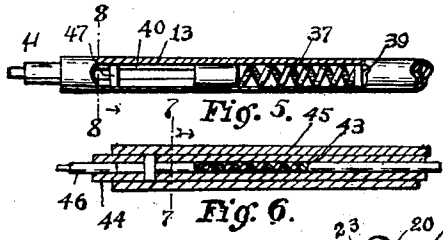

Fig. 5.

Fig. 6.

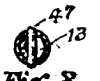

Fig. 8.

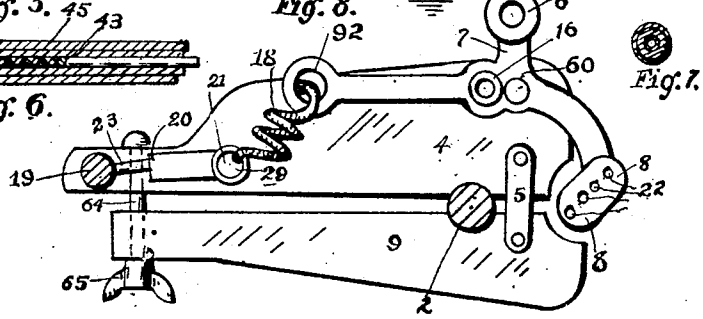

Fig. 2.

Fig. 7.

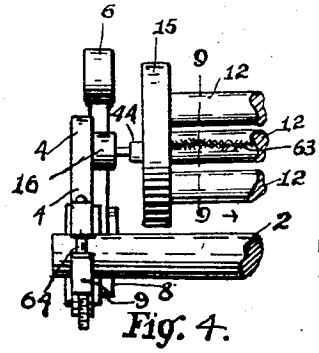

Fig. 4.

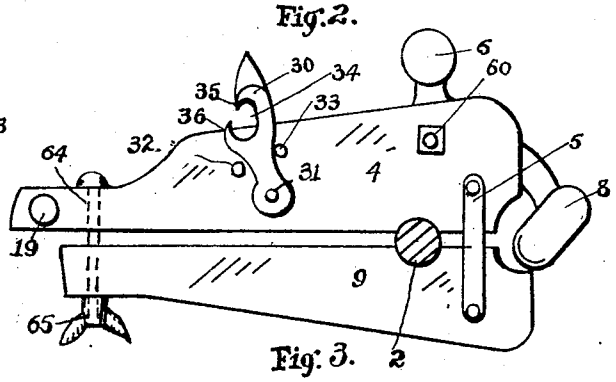

Fig. 3.

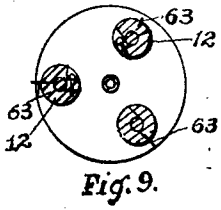

Fig. 9.

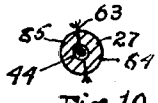

Fig. 10.

Michael A. Clinton
and Mark W. Collet
by their atty
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Patented May 1, 1928. 1,668,049

UNITED STATES PATENT OFFICE.

MICHAEL A. CLINTON AND MARK W. COLLET, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO CLINTON PRINTERS ACCESSORIES COMPANY.

DEELECTROLIZER.

Application filed May 20, 1922. Serial No. 562,514.

Our device belongs to that general type of de-electrolizers used to remove charges of static electricity, i. e., charges of electricity, collected upon dielectric material, or insulated conductors, and specifically to that used to remove charges of electricity collected upon individual sheets of paper (a dielectric material) in the process of printing. It contains a pair of conductors, placed one on each side of the sheet of paper, and uses them especially in conjunction with mechanism for giving the paper and the conductors in electrical connection with each other and a movement relative to each other, so that the conductors electrically connected to each other will sweep over both sides of the sheet of paper, making a sufficient contact therewith to remove the electric charge from it. This they will do, as the charges on the opposite side of the sheet are opposite in polarity, and, as these conductors are grounded, any residual charge resulting from the existence of a greater charge on one side of the paper than on the other, will flow into the ground. The mechanism requires generally a particular construction, owing to the problems presented by the printing press, especially when the paper is freed from the electrical charge at the delivery end of the press, because the paper's movement then is likely to be stopped or retarded by a stationary conductor in electrical contact with it, even if of flexible material. Smearing of the printing also may occur under such conditions. We have devised therefore, as well as the positioning of the conductors, a form of translation mechanism whereby the conductors move so that the portion of these conductors or certain of them contacting electrically with the paper, move in the same direction and substantially at the same speed as the paper does. The substantial character of the de-electrolizer always remains the same, but the details of construction by which it is adapted to various forms of presses varies. We will therefore now describe the best form in which, as we are now aware, our invention can be embodied so as to be used with a direct, constant delivery printing press.

Fig. 1 is an elevation of the back of the de-electrolizer as it will appear when mounted on a press. Fig. 2 is an elevation of the inside of one of the supporting clamps and its attachments viewed from a plane containing the line 2—2 and lying parallel to the clamps. Fig. 3 is an elevation of the outside of the other clamp looking toward the side of the machine. Fig. 4 is a fragmentary elevation of a portion of one side of the machine as attached to a press and viewed from the back, the stationary conductor being omitted. Fig. 5 is a view partly in a longitudinal section of one end of the spindle of the upper conductor. Fig. 6 is a longitudinal section on an end of the revolving lower conductor. (Figs. 5 and 6 on an enlarged scale). Fig. 7 is a section on line 7—7 of Fig. 6. Fig. 8 is a section on line 8—8 of Fig. 5. Fig. 9 is a section on line 9—9 of Fig. 4. Fig. 10 is a section on line 10—10 of Fig. 1.

The upper de-electrolizing conductor, marked as a whole 50, revolves above the path of the electrically charged paper, and should be of sufficient diameter to insure that the paper will not rise above its axis of revolution. Frequently paper rises slightly from the tapes of the delivery table. The conductor 50 consists, in the form illustrated, of rods, 12, substantially parallel to each other, and supported by hubs, 15 and 10, which can be utilized to perform other functions, as will be below described. These rods, 12, carry conducting material, 63, preferably in the form of tinsel projecting radially therefrom, which is found in practice an excellent material on account of its flexibility and pointedness, to make the electrical contact between the conductor and the sheet of paper to be freed from the electrical charge. These hubs, 15, and 10, are carried by a spindle, 13, carried by bearings, 16, from the standards, 7, 7. An electrical connection is maintained between the entire length of the conducting material, 63, and the bearings, 16, or one of them. The conductor, 50, can be rotated in any convenient manner, but should follow the speed of the press. We have shown it with the hub, 15, resting on a tape, 3, which passes around

the pulley, 1, of the delivery table. Such tapes are largely used in printing presses, and as the power needed to drive the conductor, 50, is very small, the friction of the tape on the outside of the hub, 15, will be enough to drive the revolvable conductor, 50. The standards, 7, are carried by the wooden or other insulating supports, 4, 4, and can turn slightly in bearings 60 therein. The standard, 7, also carries the conductor, 27, which comes in the head with the lower side of the sheet of paper. This conductor preferably revolves also, and is carried by one of the bearings 22, 22, in the heads, 8, 8. The bearings, 22, 22, 22, are each at the same distance from the bearing, 16:—namely, substantially the sum of the radii of the friction pulley, 11, and the hub, 10. A friction drive is quite as good as gearing to drive the lower conductor. The lower conductor, 29, can be mounted in any of the bearings, 22, 22, 22, changing the particular bearing, 22, to suit the paper.

The supports, 4, 4, serve as a jaw of a clamp that carries the entire device. In a number of varieties of presses the delivery table has a stationary transverse rod, 2, to which the support, 4, can be clamped. 9 is the opposing jaw of the clamp, the two jaws being connected by the link, 5. This rod, 2, also carries the pulley, 1, as a loose pulley, in a form of press we have illustrated as being that to which our device is attached, and when our device is used with this press, the distance from the axis of this rod to the centre of the bearing, 16, equals the sum of the radius of the pulley, 1, with the belt, 3, on it, and the radius of the hub, 15.

Various details of construction are shown in the accompanying drawings that are used by us in practice. The conductors, 50, and 27, are removable without removing the supports, 4, 4, from the printing press. In the conductor 50 we make the spindle, 13, tubular, (see particularly Fig. 5), and provide it with the journal, 41, having a shoulder which fits into the tube forming the spindle. It is pressed outward by the spring, 37, that is supported by the abutment, 39. A slot, 40, in conjunction with a pin 47 limits the journal's movement. This mechanism need be placed at one end only of the spindle. 13. In the lower conductor 27, a shouldered spindle, 46, reciprocates in a socket, 44, which we can make from a piece of tubing, and is urged outward by the spring, 45, that rests on the abutment, 43. The rods, 12, we can make of two "half-rounds", (see Fig. 6) clamping the tinsel 63 between them and held together by the screws, 26. The lower conductor 27 has two half rounds, 84 and 85, clamping tinsel between them and clamping upon the tube, 44. (See Fig. 10.)

The device has also several additional elements that we find extremely useful in its practical operation. A third conductor, 19, can be placed where it will contact with the lower side of the sheet of paper and is held in place by the pin, 23, and the spring, 20, that is clamped to the support, 4, by the stud 21. The hook, 30, catches on a keeping means and holds up the device and also can hold up the discharge table. This hook is pivoted at 31, and is free to vibrate between the stops, 32, and 33, and has the peculiarly shaped recess between the points, 35, and 36, the latter point projecting outward sufficiently to make sure that the keeping means will go into the pocket, 34, and the movement stopped. The reversal of this movement will bring the keeping means beneath the point, 35 so that no matter how carelessly the delivery bed is lifted it will be stopped and held, and the de-electrolizer protected from injury. The stud, 21, may have a retainer, 29, by which a spring 18, is retained which forms the conductor between the stud, 21, and the standard 7. This spring catches on an arm, 92, of the standard 7, and puts a tension on the frictional pulleys.

The electrical connections are made as follows:—between the conductors, 50, and 27, through the bearings, 16, and 22 and the standards 7 and 8; between these conductors and the conductor, 19, through the conductor, 18, connecting electrically the stud, 21, and the standard, 7, the stud, 21, holding and being in electrical connection with the spring, 20, which in turn makes electrical connection with the pin, 23, and conductor, 19. The ground unit 93 leads off from the socket, 6, in the standard, 7. The insulation of the conductors, 50, 27 and 19 from the press is accomplished by making the support, 4 of wood or other nonconductor.

A bolt 64 provided with the wing nut 63 may serve to tighten the jaws 4 and 9 of the clamp forming the support for the standard 7.

We claim:—

1. In a device for discharging charges of electricity collected upon sheets of paper in the course of printing upon it, the combination of mechanism giving the paper a motion along a substantially horizontal path, conductors positioned opposite each of the faces of the paper, above and below the path traversed thereby and extending across the path traversed by it, said conductors making electrical connection with each face of the paper, the upper of said conductors rotating at such a speed that its circumferential portions in electrical contact with the upper face of the paper will move at the same rate of speed as the horizontal translation movement of the paper.

2. The device, as defined in claim 1, with the following additional element in combination therewith:—"the conductors passing

over substantially the entire surface of each side of the paper".

3. The device as defined in claim 1, with the following additional element:—"the conductors being insulated from the press".

4. The device as defined in claim 1, with the following adidtional elements in combination therewith:—"the conductors passing over substantially the entire surface of each side of the paper and being in electrical connection with a lead off conductor and insulated from the press".

5. In a device for discharging charges of electricity collected upon sheets of paper in the course of printing upon it, the combination of mechanism giving the paper a motion along a substantially horizontal path, conductors positioned opposite each of the faces of the paper above and below the path traversed thereby and extending across the path traversed by it, said conductors making electrical connection with each face of the paper, each of said conductors rotating at a speed such that the circumferential portion of each in electrical contact with the faces of the paper will move at the same rate of speed as the movement of the paper.

6. In a device for removing charges of electricity from the faces of freshly printed paper, the combination with delivery mechanism giving a horizontal movement to the paper being discharged from the press and supporting the lower face of said paper, of a revolvable conductor positioned above the path of said paper, a conductor positioned below the lower face of the paper, said conductors being in electrical connection with the upper and lower faces of said paper respectively and extending across the path of the same and mechanism driven from the press mechanism and timed therewith giving to said revolving conductor a speed of rotation such that the portion thereof in mechanical contact with the face of the paper will move at the speed of the translation movement of the paper.

7. The device as defined in claim 6 with the following additional elements:—"the said upper and lower conductors being in electrical connection with each other and with a ground conductor".

8. The device as defined in claim 6 with the following additional element:—"the said driving mechanism being driven through by mechanism of the press".

9. The device as defined in claim 6 with the following additional elements:—"the said upper conductor being positioned above the path traversed by the paper being provided with tinsel for making the electrical connection with the paper."

10. The device as described in claim 6 with the following additional elements:—"the said revolvable conductor having its axis sufficiently above the path of the paper to prevent the latter from rising above the height of this axis."

11. The combination in a device for removing charges of electricity from the surfaces of freshly printed paper, of rotatable conductors positioned on each side of the path of the sheet of paper and making electrical connection therewith, mechanism giving these conductors a rotation such that their peripheries will move at substantially the same speed and in the same direction as the paper, and electrical connections between the conductors.

12. The device as defined in claim 11 with the following additional element:—"the said conductors being provided with radially projecting, pointed and pliable conducting material for making the electrical connections with the faces of the paper".

13. The device as defined in claim 11 with the following additional element:—"the said conductors being mounted on standards carried by and insulated from the press".

14. The device as defined in claim 11 with the following additional elements:—"the said conductors being mounted on standards clamped to the press, and being insulated from the press".

15. The device as defined in claim 11 with the following additional element:—"and an additional conductor making electrical contact with the paper, and coming into contact therewith, before it contacts with the revolvable rollers, said conductor being in electrical connection with said revolvable conductors".

16. In a device for discharging charges of electricity from sheets of paper, the combination of a revolving conductor, positioned above the path of the paper and in electrical connection therewith, standards having bearings for the revolving conductor, another conductor positioned beneath the path of said paper also having bearings in said standards and means for changing the positions of the bearings for the conductor positioned below the path traversed by the paper without changing the distance between the said conductors.

17. The device as defined in claim 16 with the following additional element:—"the conductor positioned beneath the path traversed by the paper being revolvable and driven from the conductor positioned above the path of the paper".

18. The device as defined in claim 16 with the following additional element, namely, "and a hook for holding the device in an elevated position, having retaining means for preventing its accidental disengagement".

19. The device as defined in claim 16 with the following additional element:—"and an outwardly lengthwise springing journal for said revolving conductor".

20. The combination in a device for dis-

charging charges of electricity from the surfaces of sheets of paper, comprising revolvable conductors positioned on both sides of the sheet of paper, mechanism for revolving said conductors at substantially the same speed as the speed of revolution of the peripheries of the conductors.

21. The device as defined in claim 20 with the following additional elements:—"the said conductors being electrically connected to each other and to a ground conductor".

22. The device as defined in claim 20 with the following additional element, namely, "the said conductors being electrically connected to each other and to a ground conductor and being insulated from the press".

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