(No Model.)

L. E. BATHRICK.

MEANS FOR DISSIPATING ELECTRICITY FOR PRINTING MACHINES.

No. 368,315. Patented Aug. 16, 1887.

Fig 1.

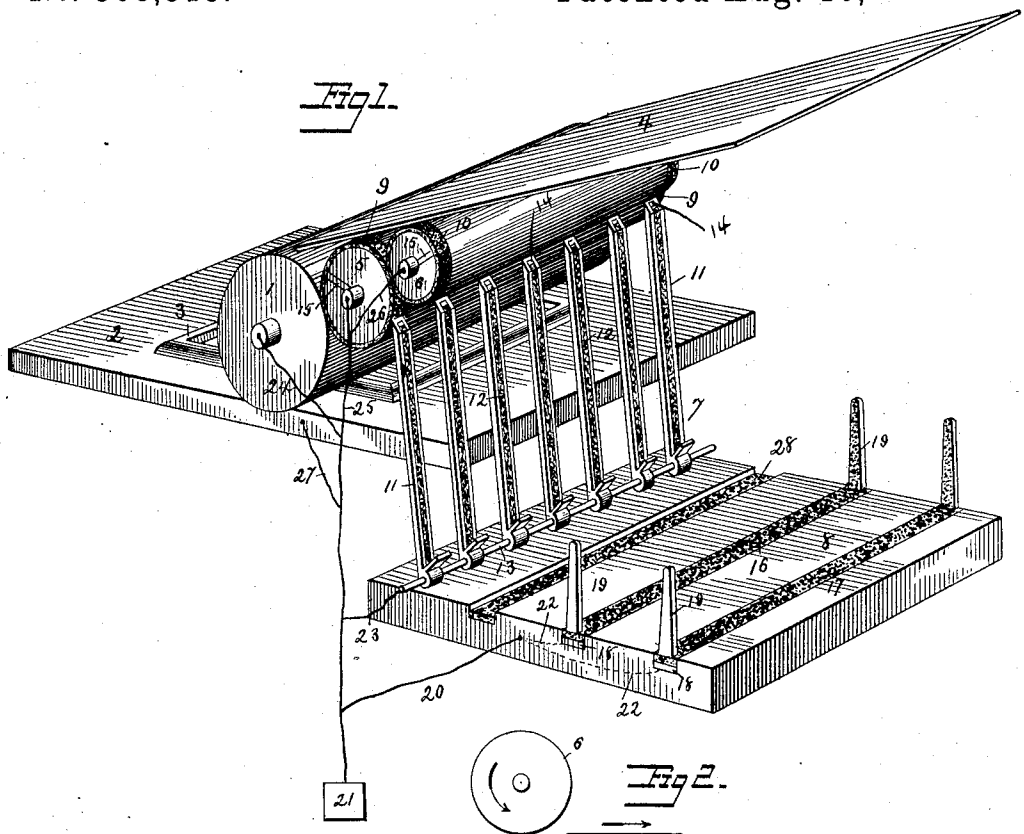


Fig 2.

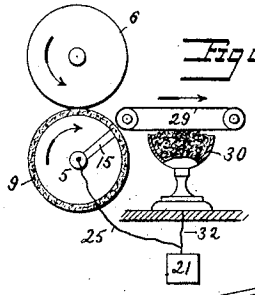
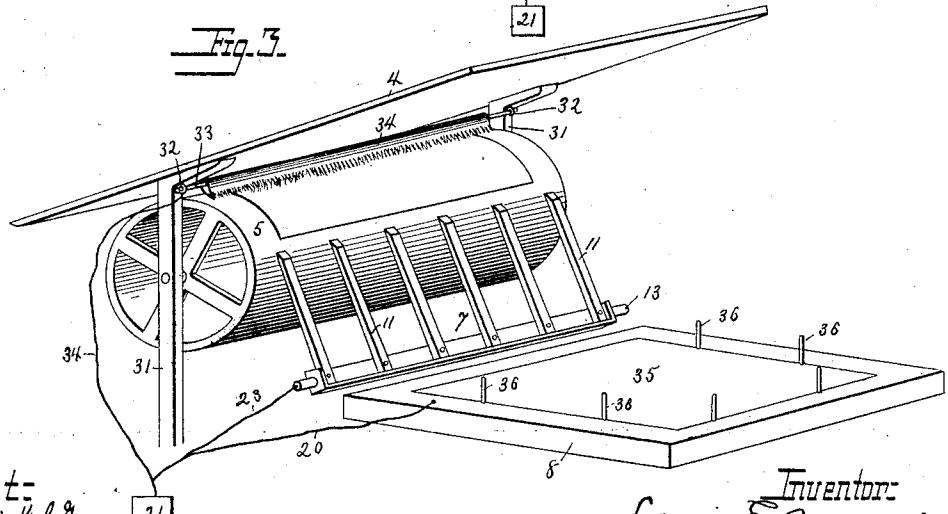


Fig 3.



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MEANS FOR DISSIPATING ELECTRICITY FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 368,315, dated August 16, 1887.

Application filed May 4, 1887. Serial No. 237,130. (No model.)

To all whom it may concern:

Be it known that I, LEWIS EMERSON BATHRICK, a citizen of the United States, residing at Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Means for Dissipating Electricity for Printing-Presses, of which the following is a specification.

It is a well-known fact that in the ordinary operation of printing upon sheets of paper, cloth, linen, cotton, or silk considerable charges of static electricity make their appearance upon the loose sheets, due to the friction or pressure upon these substances in their passage through the machines, which latter, being mounted upon dry and to some extent oily floors of the building, are effectually insulated from the ground. These electrical charges manifest themselves by the adherence of the printed sheets to their supports and to each other, caused by electrical attraction. While in this condition it is difficult to manage the printed sheets, especially when it becomes necessary to again feed them to the press to receive a second or third impression. This objectionable feature of the process of printing is well known to those familiar with the art; and it is the object of my invention to remove the same by placing a grounded conductor of electricity into the path of the paper or other material in such a manner as to cause the sheets operated upon to make good electrical contact with the same during their progress through the machine, whereby the accumulation of electrical charges is prevented. It is evident that the conductor thus placed in the path of the sheets, which conductor I shall call the "discharging-conductor," may be placed at any one or several points in the press, and that my invention is not limited to any particular location of the same; nor do I propose to confine myself to the use of my invention in connection with printing-presses, since it is applicable for use in connection with other machines which are designed to operate upon paper or any textile threads, fabrics, or fibrous threads or materials of any description. In all such machines the accumulation of electrical charges constitute a source of difficulty in their operations, and my invention effectually avoids these difficulties. There is a wide range of materials which may be used for the discharging-conductor, although the same is limited by the condition that it must be of a character that will insure good intimate contact with the material operated upon. I have found that conducting-fluids, like water, salt-water, alum-water, acidulated water, or similar conducting-fluids, are admirably fitted for establishing intimate contact with the material operated upon, and I use these fluids in preference to solids as discharging-conductors, although I do not confine myself absolutely to the use of fluids, since in some instances I use solid discharging-conductors with advantage. All this will more fully appear from the following detailed description and from the accompanying drawings, forming part thereof, in which I have illustrated specific forms of apparatus embodying my invention, and in which—

Figure 1 is a perspective view of so much of a cylinder-press as is necessary to show my invention applied thereto; Fig. 2, a diagram of a delivery apparatus with another form of my invention attached to the same, and Fig. 3 a perspective view of still another form of my invention.

In Fig. 1 the impression-cylinder 1 is shown in proper relation to the moving bed 2, which supports the form 3, as usual, and to the feed-board 4. The delivery-cylinders 5 and 6 are arranged below the feed-board, and the fly 7 receives the printed sheets and deposits the same upon the fly-table 8.

My invention may be applied to any part of the machine through which the sheets or strips operated upon pass or upon which they rest, and I have shown the same applied to the impression-cylinder, delivery-cylinders, the fly, and the fly-table. At each end of each delivery-cylinder portions 9 9 10 10 of the faces of the same are formed of some soft fibrous material, like cotton, woolen, linen, or other textile fabric; or in place thereof leather or other like material may be used. The material used must be an absorbent of moisture, but in all other respects it may have any characteristic whatever. It is of no consequence how the fibrous material is applied if it is in good electrical contact with the metal of the cylinders, or is so situated as to be brought into contact with the material operated on as it passes through the machine. If the cylinders be made

of non-conducting material and the fibrous material be applied thereto, as shown in Fig. 1, good electrical contact with the shaft of each cylinder should be secured.

The fly 7 is formed of a number of parallel slats or fingers, 11, which are made of metal, and each of these fingers is provided with a strip, 12, of fibrous material, which may be inserted into a groove in each finger, or may otherwise be applied thereto, care being taken to make good electrical contact between the metal fingers and the fibrous material. If the fingers should be constructed of non-conducting material, as is sometimes the case, good electrical contact with the shaft 13 of the fly should be established. This is easily done by placing a metal strip, 14, under each strip of fibrous material, and by connecting the same with shaft 13 metallically in any desired manner. A similar connection of rings 9 and 10, of fibrous material, with the shafts of the delivery-cylinders may be established by strips 15, as indicated in the drawings, if said cylinders should be of insulating material. A portion of the fly-table is also formed of strips 16 17, of fibrous material, and metallic posts 19, mounted upon the fly-table, are in electrical contact with said fibrous strips 16 17, as shown. By preference the fly-table is made of metal, and is by a wire, 20, connected with a ground-plate, 21, or with a water or gas distributing system, as is usually done, in order to obtain a good ground-connection; or it may be connected with any other suitable reservoir which will absorb or carry off the electricity discharged from the machine or material operated on. If the fly-table should be constructed of wood or other insulating material, a metal strip, 18, is placed under each fibrous strip 16 17, and such metallic strips are then connected by wires 22 22 with the ground-plate, as indicated by dotted lines.

Shaft 13 of the fly and the shafts of delivery-cylinders 5 6 are connected with the ground-plate by wires 23 25 26, respectively, and by preference the moving bed and the impression-cylinder are also grounded by wires 27 and 24, as shown. The various strips of fibrous material thus applied to the operating parts of the machine are dampened with any suitable conducting-fluid, such as above referred to, and are maintained in that damp condition as long as the machine is running. The means for imparting and maintaining that condition form no part of my present invention, for the purpose of which it is sufficient that suitable moisture should be applied in any desired manner—as, for instance, by a sponge dipped into the conducting-fluid and passed over and in contact with the fibrous strips. This may be repeated as often as necessary, and this simple mode of applying the discharging-conductor will be found sufficiently effective. If the press shown in Fig. 1 is set in operation, the printed sheets in passing through the delivery-cylinders will come into intimate contact at their edges with the discharging-conductors retained by the fibrous rings 9 10, and any electrical charge which may have been imparted to the sheets during the process of feeding and printing will be discharged by wires 25 26 to ground. The sheets then passing on the fly will slide down and in contact with the damp porous strips 12 on the fingers 11, and their electrical charge will continue to pass to ground by wire 23, connected with the shaft of the fly. Being then deposited upon the fly-table 8, the first sheet will be in immediate contact with the damp fibrous strips 16 17, and will continue to discharge by wire 20, connected either with the body of the fly-table or with wires 22 22, leading to metal strips 18 18. The following sheets will depend for the discharge of the remaining charge in a measure upon the contact of their edges with the standards 19, which, as indicated in the drawings, may have their inner faces covered with strips of damp fibrous material. It must be remarked, however, that after having passed the fly and in rubbing contact with the damp strips 12 there will be no great electrical charge in the sheets when arriving at the fly-table.

While I have shown the moving bed and the impression-cylinder both connected with the ground-plate, such connections are not absolutely necessary; nor is it necessary to apply the damp fibrous strips in all places where they are shown in the drawings. In many instances it is quite sufficient to use the discharging-conductor in connection with the fly alone or with the cylinders alone, or even with the fly-table alone.

While I have shown the fibrous strips retaining the discharging fluid conductor flush with the faces of the structures with which the sheets make contact, it is not really necessary that this be so, since the fibrous material may be depressed slightly below the faces of these structures, as indicated at 28 on the fly-table. By the continuous evaporation of the discharging conducting-fluid the vapors of the same will come into contact with the sheets, so that actual contact with the fluid will not be necessary.

In Fig. 2 only one of the delivery-cylinders, 5, is provided with dampened fibrous rings 9 on depressed portions of said cylinder, the other being left in its normal condition. Under the traveling delivery-tapes 29 there is placed a metallic receptacle, 30, filled with fibrous material of any description and dampened with a suitable discharging conducting-fluid. The receptacle 30 is so placed that it does not quite touch the tape 29; but the evaporation of the conducting-fluid is sufficient to establish a conducting-bridge between the receptacle and the tape, as will be readily understood by those skilled in the art. Delivery-cylinder 5 is connected with the ground-plate 21 by wire 25, as in the construction shown in Fig. 1, and receptacle 30 is grounded by wire 32.

It will be noticed that in this construction the sheets are not in physical contact with the

fibrous material saturated with the discharging-conductor, nor with the fluid itself in its liquid form; but there is always contact with the vapors of said fluid, which in this instance form a part of the discharging-conductor.

In Fig. 3 the cylinder 5, which receives the sheet in due course of operation, either for printing or delivery or for any other purpose, is surmounted by the feed-table 4, which is here shown supported by standards or parts 31, one at each end of the cylinder. A metal rod, 33, is supported above the cylinder and parallel thereto in metal supports 32, which latter may be of any desired construction. I have shown simple eyes screwed into the posts 31. Any fibrous material, like a sheet, 34, of cloth, felt, or cotton, is hung over rod 33, and hangs down from the same with its lower edge in contact, or nearly so, with the paper or other material which at this line passes through the machine. The cloth or other fibrous material is dampened with a fluid discharging-conductor, and is grounded by a wire, 34, connecting with one or both of the supports 32 of rod 33.

The fly-table, insteadof being provided with the strips of dampened fibrous material shown in Fig. 1, may be constructed with a metal top, 35, and in place of the peculiarly-constructed standards 19 in said figure of drawings, simple metal pins, 36, project vertically from the edges of the metal top of the table. The table, as well as the fly, is properly connected with the ground, as in Fig. 1.

The fluid discharging-conductor may also be applied with advantage to the "packing-paper" or "blanket" on the impression-cylinder in place of the oil usually used, and in this case I make sure that the prepared packing-paper or the blanket, or both, are electrically connected with the ground-wires, either through the grippers and cylinder, or in any other way.

In Fig. 1, where the impression-cylinder is shown connected with the ground-wire, the packing-paper or blanket are intended to be dampened with a fluid discharging-conductor. While I have described my invention as applied to a printing-press with reference to Fig. 1, and to a delivery apparatus of a specific form with reference to Fig. 2, it will be readily understood that the invention is not confined for use in connection with such machines, but may be applied to any machine in which the material operated upon receives an objectionable charge of electricity which it is desired to carry off to ground.

Having now fully described my invention and the manner in which the same may be practiced, what I claim, and desire to secure by Letters Patent, is—

1. In combination with a machine for operating upon sheets or strips of fibrous insulating material, a grounded fluid discharging-conductor arranged in the path of the sheets or strips, substantially as described.

2. In combination with a machine for operating upon sheets or strips of fibrous insulating material, a grounded fluid discharging-conductor held in a mass of fibrous material and arranged in the path of the sheets or strips, substantially as described.

3. In a printing-press, the combination of the delivery apparatus thereof with fibrous material arranged in relation thereto and a grounded fluid conductor held by said fibrous material in the path of the material operated upon, substantially as described.

4. In a printing-press, the combination, with the delivery apparatus thereof, of fibrous material secured to the same and a grounded fluid conductor held by said fibrous material in the path of the printed sheets or strips, substantially as described.

5. In an apparatus for delivering sheets or strips of insulating material after having received a charge of electricity, the combination of strips of fibrous material located in depressions below the surfaces of the apparatus, and in the paths of the sheets or strips, with a conducting-fluid held by the fibrous material, and ground-connections from the same, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LEWIS EMERSON BATHRICK.

Witnesses:

D. H. FOWLER,

WM. H. LEAK.