

(No Model.)

B. W. CHILD & M. A. REPLOGLE.

METHOD OF OVERCOMING ELECTRIC PHENOMENA IN GOODS, &c.

No. 579,738.

Patented Mar. 30, 1897.

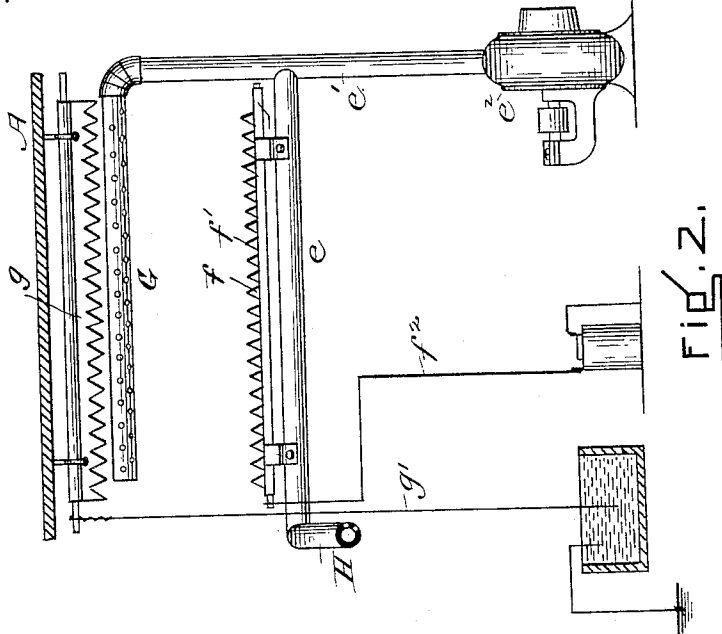


Fig. 2.

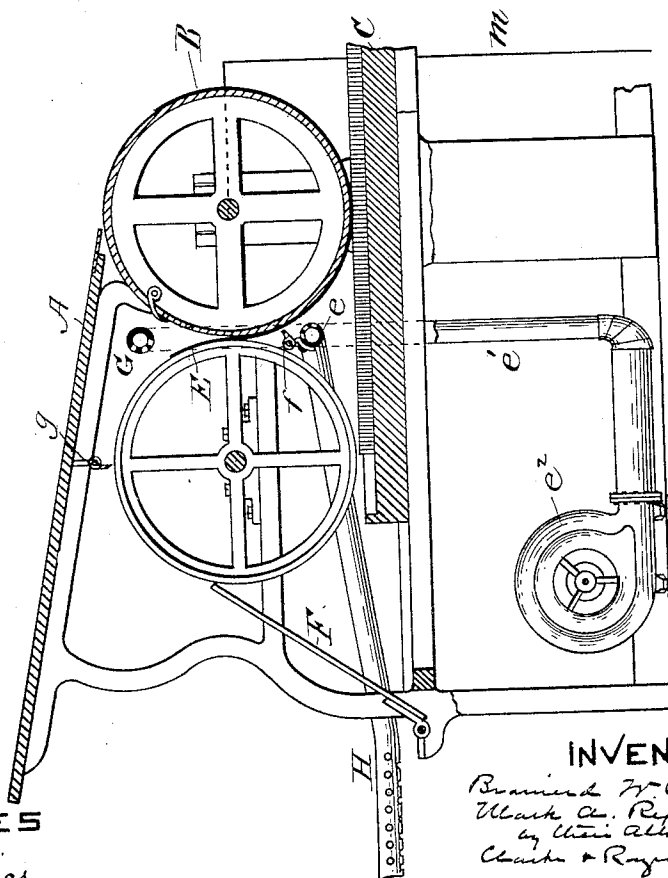


Fig. 1.

WITNESSES

J. W. Dolan.
J. W. Cummings.

INVENTORS

Bruno W. Child
Mark A. Replogle
by their atty.
Charles & Rayner

UNITED STATES PATENT OFFICE.

BRAINERD W. CHILD, OF BOSTON, MASSACHUSETTS, AND MARK A. REPLOGLE, OF CEDAR FALLS, IOWA.

METHOD OF OVERCOMING ELECTRIC PHENOMENA IN GOODS, &c.

SPECIFICATION forming part of Letters Patent No. 579,738, dated March 30, 1897.

Application filed July 26, 1893. Serial No. 481,545. (No model.)

To all whom it may concern:

Be it known that we, BRAINERD W. CHILD, of Boston, in the county of Suffolk and State of Massachusetts, and MARK A. REPLOGLE, of Cedar Falls, in the county of Black Hawk and State of Iowa, citizens of the United States, have invented a new and useful improvement in the method of electrically balancing or overcoming electric phenomena in goods in the process of manufacture and in machinery, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The electrical condition or state of various kinds of goods operated upon or in process of manufacture by machines is often disturbed. The reasons for such disturbance are not well known and may arise from a variety of causes. Such disturbances are especially noticed in paper being operated upon by printing-presses and other mechanism and in various fabrics in the process of manufacture, &c., and this liability of change in the electric condition is found in parts of machines and apparatus, like belts, for instance, and in fact it is a well-known condition and of a large range. In many machines and places this change in the electrical condition of the goods or things in question is detrimental to the best operation of the machine or of the processes employed upon such articles or things, and we would especially mention machinery which has to do with working or printing paper, and various attempts have been made to remedy the trouble caused by such electrical change with more or less success.

Efforts have heretofore been made to restore paper and other materials to a normal electrical condition after such electrical condition has been disturbed, and in some instances conductors have been applied adjacent to the moving paper or other material, such conductors extending to the earth or to any conducting-body, and currents of air have been directed upon the surface of paper or other material while moving from one place to another. We have found that peculiar electrical conditions often exist and

that the before-mentioned means are not adequate to the restoration of an equilibrium.

Paper as it is manufactured and rolled up is generally in a heated condition, and in addition to this the air is expelled in the winding operation, and before the roller is unrolled the temperature of the roll has generally changed considerably, and in these operations the electrical condition is considerably disturbed, and when a web of paper or sheets of paper have been run through a printing-press they are subjected to pressure and to a rapid movement adjacent to rollers or cylinders, and these tend to disturb the electric condition, so that it is difficult to handle the sheet of paper or other material in the various operations to which it is subjected.

We find that a current of air when used alone will not always restore the material or surfaces to a normal electrical condition, and that conductors are not always efficient in preventing difficulty from a disturbed electric condition.

One feature of our invention relates to the method of restoring a normal electrical condition to paper or other material while being moved from one place to another by directing upon such material currents of air and also exposing such material to the action of electric conductors, so that any peculiar electric condition that is not rendered normal by the currents of air will be rendered normal by the electric conductors.

We have also discovered that it is advantageous to place in the electric circuit an active electric force, such, for instance, as a battery, in order that the electric energy of the battery in the circuit may aid in restoring the normal condition of the paper.

Figure 1 represents a view, principally in vertical section, of a printing-press with which our process is employed; and Fig. 2 is a view principally in elevation to further illustrate the same.

The printing-press shown is used simply for convenience and is of the type known as "two-revolution cylinder." The paper is fed from the feed-table A to the cylinder B, between it and the press-bed C, and thence to the delivery-rolls and fly F and fly-table.

During the operation of the machine un-

der certain influences and upon certain qualities of paper especially the paper will show indications of this disturbance of its normal electrical condition, and we proceed to restore it to its normal condition by subjecting one or both surfaces of the paper after it has passed the press-bed or point where it has been subjected to pressure to a cooling action of any desired type, and in the drawings we have represented this as obtained by a cooling blast or current of air preferably delivered in a spray or sheet of uniform force or volume or effect from one edge of the paper to the other. This may be supplied to one surface of the paper or both surfaces, and the effect of this treatment is to cool the paper and neutralize any electrical disturbance that may result from changes in temperature and prepare the material to be more effectively acted upon by the electric conductors and the current supplied to the same.

Referring to the drawings, E represents a sheet of paper passing through the press.

e represents a perforated pipe extending lengthwise the cylinder B and close to it and supplied with air under pressure by means of the pipe *e'* from a blower *e²* or any source of supply.

Immediately above the pipe is a device *f* for supplying electricity to the paper and which is represented as comprising a number of points *f'*, which are held closely to the surface of the passing paper and which may be connected with a source of supply either natural or artificial.

In Fig. 2 we represent the supplying device *f* connected with a battery by means of the wire *f²*.

It will be understood, of course, that the points *f'* are of copper or iron or some other conductive material.

We have also shown in Fig. 1 a perforated pipe G, arranged upon the side of the paper opposite that upon which the pipe *e* is and connected with the supply-pipe *e'* and adapted to throw a cooling blast or current upon the side of the paper opposite that treated by the air from the pipe *e*, and we have also shown a device *g* for supplying electricity to the same surface of the paper, the paper passing closely to it or being brought into contact slightly with it as it is moved by it. It preferably is in the form of points, but not necessarily, and it may receive its electrical supply from a natural source or an artificial or positive source. In Fig. 2 we have represented this supplying device *g* as connected by wire *g'* with a body of water, which body of water may be in communication with the earth or other reservoir of electrical energy by any suitable metallic connections.

The devices for supplying electricity may also be connected with earth. It is not always necessary to use these additional means

for cooling the paper or material and supplying the electricity, and in some instances the device G may be used for supplying the electricity, as the air thrown upon the paper will carry with it more or less electricity. We would further remark that these devices may be employed to restore to a normal electric condition the pile of paper upon the fly-table or while it is being delivered to the fly-table, and in Fig. 1 we have represented a perforated pipe II, connected with the source of air-supply and arranged to distribute a current of air upon the paper, and in that way restore to a normal condition, or partially so, the atmosphere in immediate contact with the paper, so that the electric conductors in close proximity to the surface may be more effective.

In Fig. 1 we have represented the cylinder B as connected with earth by a wire *m*.

While we have in the drawings illustrated our method as applied to the treatment of paper, we do not confine our invention to any especial article or machine, as our process can be successfully used wherever it is necessary or desirable to quickly restore to normal electrical condition any goods or article in process of manufacture or any part of a machine or apparatus which is put out of electrical balance by its operation or the operation of any thing or device upon it.

It will be understood that we do not limit ourselves to the means herein specified for cooling the fabric, goods, or material, but may employ any device or means for accomplishing this end.

Having thus fully described our invention, we claim and desire to secure by Letters Patent of the United States—

1. The method herein specified of equalizing or rendering normal the electric condition of paper or other material, consisting in directing upon the same a current of atmospheric air and bringing into close proximity with the surface of such material, electric conductors, substantially as specified.

2. The method herein specified of restoring paper or other material to a normal electric condition while in motion, consisting in directing on the surface of such material a current of air and applying in close proximity to such material electric conductors included in an electric circuit containing a battery or other source of electric energy, substantially as specified.

BRAINERD W. CHILD.
MARK A. REPLOGLE.

Witnesses to Brainerd W. Child:

F. F. RAYMOND, 2d,
J. M. DOLAN.

Witnesses to Mark A. Replogle:

D. N. JOHNSON,
S. H. COOK.