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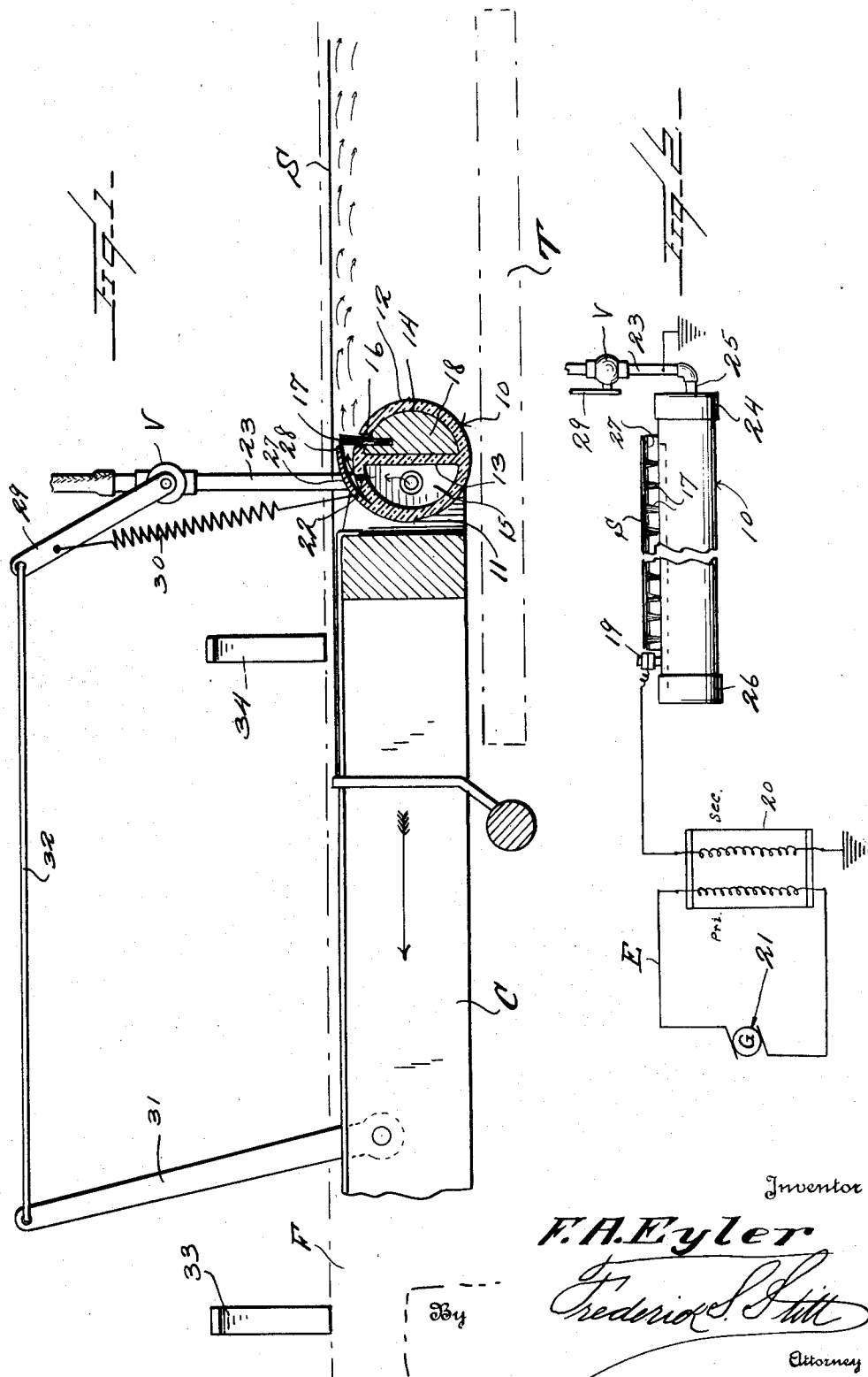
F. A. EYLER

1,940,536

STATIC ELIMINATOR AND PRINTED SHEET FLOATING DEVICE

Filed Sept. 25, 1930

2 Sheets-Sheet 1



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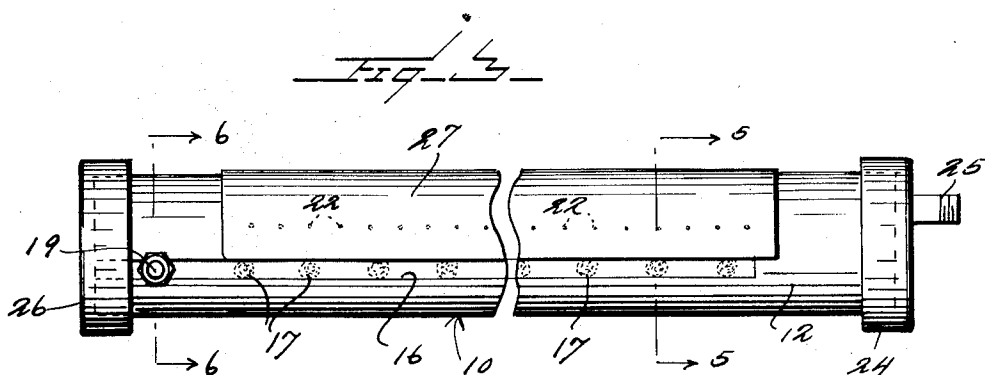
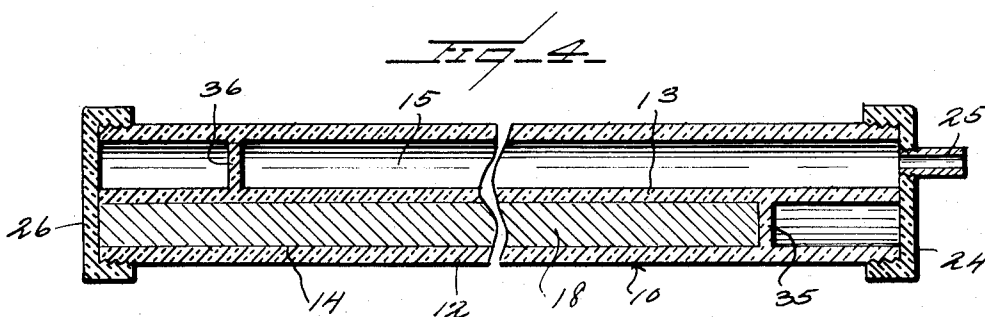
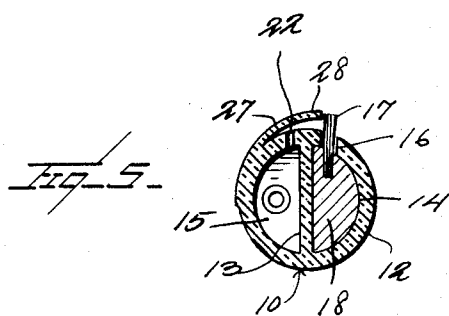
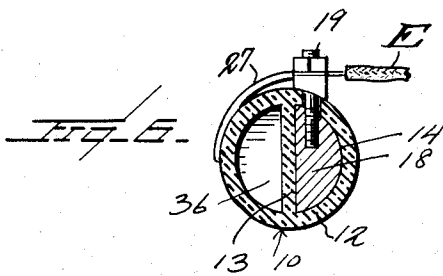
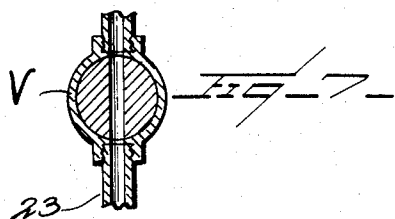
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STATIC ELIMINATOR AND PRINTED SHEET FLOATING DEVICE

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2 Sheets-Sheet 2



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STATIC ELIMINATOR AND PRINTED SHEET
FLOATING DEVICEFrank A. Eyler, Harrisburg, Pa., assignor of one-
third to Charles A. Clouser, Harrisburg, Pa.Application September 25, 1930
Serial No. 484,412

14 Claims. (Cl. 271—34)

The present invention relates to improvements in printing presses and more particularly to improvements having for an object thereof the discharge of the static electricity coincident with the delivery of the printed paper on the discharge table.

Another object of this invention is to provide a static remover which is adapted to engage the moving paper at the discharge end of the printing press, the remover being connected to a high frequency discharge current.

A further object of this invention is to provide in combination with a static remover, means for cushioning the delivery of the paper on the delivery board so as to permit the stacking of the printed paper in a relatively even stack.

Another object of this invention is to provide means by which the cushioning portion of the device is rendered inoperative during one movement of the reciprocating carriage of the press and to render the device operative on the other movement of the carriage.

A still further object of this invention is to provide a device of this character which may be readily attached to any printing press having a reciprocating carriage and also to any printing press wherein the delivery of separate sheets of paper is accomplished at one end of the press.

A further object of this invention is to eliminate the fire hazard which is present in presses using the flame for discharge of the static.

The above and various other objects and advantages of this invention will in part be described and in part be understood from the following detailed description of the present preferred embodiment, the same being illustrated in the accompanying drawings wherein:—

Figure 1 is a sectional view partly in detail of a device constructed according to the preferred embodiment of this invention mounted on a printing press delivery carriage;

Figure 2 is a diagrammatic view of the device;

Figure 3 is a fragmentary top plan view of the device;

Figure 4 is a longitudinal horizontal section substantially through the center of the device;

Figure 5 is a sectional view of the device taken on the line 5—5 of Figure 3;

Figure 6 is a sectional view taken on the line 6—6 of Figure 3; and

Figure 7 is a vertical sectional view taken substantially through the valve and showing the valve in open position.

Referring to the drawings wherein like characters of reference designate corresponding parts

throughout the several views, the letter C designates generally a reciprocal delivery carriage of a conventional sheet printing machine which reciprocates on an elongated guide or frame F. The carriage C is adapted to receive the printed sheet from the cylinder of the press and discharge the printed sheet on a discharge table T.

In the presses at present available, various means have been devised for removing static or the like from the printed sheet designated S, these means embodying in some instances an elongated burner which is adapted to project a flame onto the bottom of the moving sheet S, the burner being interposed in an electrical discharge circuit. The burner method of removing static presents a fire hazard, particularly when the carriage C is stopped at any point in its line of travel with the sheet S partially projecting out of the forward end thereof. In order to eliminate this fire hazard and in addition thereto to eliminate the static from the delivered sheet and also to provide a cushioning means by which the sheet which is delivered from the carriage will be delivered to the delivery table T in such manner that it will readily stack in an even pile I have provided a combination static eliminator and sheet cushioning or floating member which is generally designated as 10 and is adapted to be mounted on the forward end of the carriage C by means of straps 11 or any other desired clamping means.

The static eliminator and cushioning member 10 comprises an elongated tubular body 12 which is provided with a longitudinally disposed partition 13 dividing the interior of the body 12 into a pair of longitudinally disposed compartments 14 and 15. The compartment 14 is provided with a longitudinally disposed slot 16 through which a plurality of brushes 17 are adapted to project, the brushes 17 being preferably of metal construction and secured to a brush body 18 which is disposed in the compartment 14 of the tubular member 12. The brush holder or body 18 is provided at one end thereof with a terminal 19 which is connected to an electric discharge circuit designated generally as E and in which is interposed a high frequency coil 20. The high frequency coil is connected to a source of electric supply 21 and one side of the electric circuit E is grounded as is also one side of the frame F of the printing press so that a complete electric discharge circuit will be provided by means of which the static electricity present in the sheet S will be discharged. One side of the secondary circuit of the coil 20 is grounded preferably to the frame

of the press so that a complete secondary discharge circuit will be provided.

The cylinder 10 is also provided with a plurality of spaced apertures 22 in the chamber 15 which communicate with the atmosphere and the chamber 15 is connected by means of a pipe connection 23 to a source of air pressure so that air under pressure may be forced into the chamber 15 and be discharged through the spaced apertures 22. One end of the tubular member 12 is provided with a cap 24 and a restricted pipe 25 is secured to the cap 24, the tube 23 being mounted on the pipe 25. The opposite end of the elongated body 12 is also provided with a closed cap 26. The body 12 together with the partition 13 is preferably constructed of insulating material such as bakelite, hard rubber or the like, and a hood 27 is secured at one edge to the periphery of the body 12 and has one edge thereof free, the free edge being disposed in spaced relation to the body of the tubular member 12 and disposed over the outlet apertures 22 so that the air projected outwardly through the apertures 22 will strike the hood 27 and be deflected in a plane substantially parallel with the plane of the discharged sheet S.

The brushes 17 are positioned in such manner that the upper ends thereof are slightly below the hood 27 so that as the sheet S passes over the free end 28 of the hood 27, the sheet S will electrically engage the brushes 17. If desired, the device herein disclosed may be mounted on the carriage C and arranged so that the air under pressure will be discharged through the apertures 22 during the entire time that the printing press is in operation. However, in order to provide means by which the air under pressure will be discharged against the lower surface of the sheet S only during the time that the carriage is returning so as to receive a new sheet I have provided a valve V which is interposed in the pipe connection 23, the valve V having a rockable valve arm 29, and a spring 30 is connected at one end to the valve arm 29.

The spring 30 is connected at the opposite end to the tubular member 12 or to the frame F, the connection at the lower end of the spring being substantially in alignment with the axis of the valve V so that when the valve arm 29 is swung in one direction, the spring 30 will constantly hold the arm 29 so that the valve V will be open and when the arm 29 is swung in the opposite direction or when the carriage is moving forwardly, the arm 29 will be held so as to close the valve. This spring 30 is secured at one end at a point closely adjacent the conduit 23 and the other end of the spring is secured to the valve lever 29 at a point adjacent the upper or free end thereof so that when the valve is in either closed or opened position, the spring 30 will have its upper end disposed to one side of the valve V and will constantly hold the valve lever 29 in either closed or open position until the position is changed by engagement of the arm 31 with either of the tripping members 33 or 34.

A rockable arm 31 is pivotally secured at one end to the carriage C at a point spaced rearwardly from the valve V and the opposite end of the rockable arm 31 is connected to the valve 29 by means of a link 32.

A tripping member 33 is mounted on the frame F of the printing press in a position where it will strike the rockable arm 31 when the carriage has reached the substantially complete movement in its return in the frame F so as to receive a new

sheet of paper, thereby moving the arm 31 forwardly and coactively moving the valve arm 29 forwardly and closing the valve V so that when the carriage C moves outwardly toward the discharge table no air will be projected through the air discharging chamber 15. When the carriage C arrives at a point adjacent the outer end of the frame F and has practically completed its outward movement, the rockable valve operating arm 31 will strike a second tripping member 34 which is mounted on the frame F and projected into the path of the arm 31 so as to swing the arm rearwardly and coactively swing the valve arm 29 rearwardly and open the valve V, thereby permitting the air to pass through the valve V and outwardly through the air discharge chamber 15 and onto the bottom of the sheet S as the carriage moves rearwardly so as to receive another sheet of paper.

This discharge of air on the bottom of the sheet continues during the entire rearward movement of the carriage C and provides an air cushion between the sheet which is being discharged and the sheet which has already been discharged on the table T.

The tube 12 may also be provided with transverse partitions 35 and 36, the partition 35 being positioned in the air chamber 14 adjacent one end thereof and the end of the brush member 18 is adapted to engage against the transverse wall 35, the wall 35 limiting the inward movement or the insertion of the brush body 18 in the tubular body 12. The transverse partition 36 is positioned in the compartment 15 and is positioned at a point inwardly from the end of the tubular body 12 so as to permit the cap 26 to be removed from the body 12 without disturbing the means for floating the sheet of paper, and in like manner, the cap 24 may be removed from the body 12 without affecting the operation of the static brush.

It will be obvious from the foregoing that the proper application of air to the printed sheet as it is being delivered by the carriage will place a cushion of air between the delivered sheet and the sheets positioned on the delivery board so as to prevent offset of one sheet from the other, this offset being commonly termed "smudging" and that the sheets positioned on the delivery board will not be packed as tightly as they would be without the use of the air cushion. Furthermore, the use of air under pressure on the bottom of the sheet also serves as a drying medium and through the elimination of the static as the sheet passes over the brushes, the sheets do not have the tendency to stick together and a relatively thin film of air is retained by each sheet as it drops on the delivery board.

Furthermore, in the static eliminating devices at present available the static eliminators are positioned above the moving sheet and it is necessary to place these eliminators a considerable distance from the sheet so as to allow sufficient clearance for the sheet to pass between the end of the carriage and the static eliminator. Through the combination herein disclosed, it is possible to position the static eliminator extremely close to the moving sheet, the hood 27 holding the sheet out of contact with the brushes 17. It will therefore be obvious that the distance between the bottom of the moving sheet and the ends of the brushes 17 may be varied as desired without coming into contact with the moving sheet by adjusting the tube 12 with respect to the bottom of the sheet while mounted on the

carriage. This manner of positioning the brushes 17 in extremely close proximity to the moving sheet permits the use of a stronger discharge current and effects a more even discharge of the static electricity.

It is, of course, understood that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims:

What is claimed is:—

1. In a printing press having a reciprocal delivery carriage, an elongated air nozzle secured to said carriage transversely of the movement thereof, said nozzle being adapted to horizontally project a column of air beneath the printed sheet simultaneous with and during the period of the release of the sheet from the carriage.

2. In a printing press having a reciprocal delivery carriage, an elongated tubular member secured to the forward end of the carriage and positioned transversely of the movement of the carriage, said tubular member having a plurality of apertures therethrough, means for connecting the tubular member to a source of air under pressure, said tubular member being adapted to project a column of air beneath the printed sheet during the outward movement of the sheet from the delivery carriage.

3. In a printing press and in combination with a delivery carriage, means mounted on the carriage whereby to project a column of air in a plane parallel to the plane of the printed sheet during the release thereof from the carriage whereby to cushion the downward vertical movement of the sheet on the delivery table.

4. In a printing press having a reciprocal delivery carriage, an elongated tubular member having a plurality of spaced apertures therethrough, means for connecting the tubular member to a source of air supply, means for mounting the tubular member on the reciprocal delivery carriage, and deflecting means mounted on the tubular member and adapted to project a column of air outwardly of the press in a substantially horizontal plane beneath a sheet during the discharging operation of the sheet from the carriage.

5. In a printing press having a reciprocal delivery carriage, an elongated hollow body secured to one end of said carriage, said hollow body having a plurality of spaced apertures therethrough, means for connecting the body to a source of air supply, and a deflecting hood secured to the body and overlying the apertures whereby to project a column of air beneath the printed sheet upon outward movement of the sheet from the carriage, said hood projecting the air in a plane parallel to the plane of the delivered sheet during the discharging operation of the sheet from the carriage.

6. In a printing press having a reciprocal delivery carriage, an elongated tubular body mounted on one edge of the carriage and adapted for movement therewith, said tubular body having a plurality of apertures therethrough, means for connecting said tubular body to a source of air supply, a valve interposed in said connecting means, and means interposed in the path of the valve whereby to move the valve into closed position upon movement of the carriage in one direction and to move the valve into open position upon movement of the carriage in the opposite direction, said tubular body projecting air out-

wardly of the carriage and beneath the sheet in a plane parallel to the sheet during the discharge operation of the sheet from the carriage.

7. A printed sheet cushioning member of the character described comprising a hollow body having a plurality of vertically disposed apertures therethrough, means for connecting the hollow body to a source of air supply, and an elongated arcuate hood secured to the hollow body and overlying the apertures whereby to deflect the air in a horizontal plane the air deflected by said hood cushioning the sheet during the discharge operation.

8. In combination with a reciprocal printing press carriage, a printed sheet cushioning member and static eliminator of the character described comprising an elongated hollow body having a plurality of longitudinally disposed apertures therethrough, means for connecting the hollow body to a source of air supply, a deflector secured to the hollow body and adapted to deflect the air projected through the apertures in a plane parallel with the plane of the printed sheet, and a metallic brush element carried by the hollow body and adapted for electrical engagement with the printed sheet.

9. In combination with a reciprocal printing press delivery carriage, an elongated hollow body having a plurality of longitudinally spaced apertures, means for connecting the hollow body to a source of air supply, means for projecting a column of air through the apertures in a plane parallel to the plane of the delivered sheet, an electric discharge circuit, and a brush element carried by the hollow body and interposed in the discharge circuit, said brush element being adapted to electrically engage the printed sheet for discharge of the static electricity therefrom through said discharge circuit.

10. In combination with a printing press having a reciprocal carriage, an elongated hollow body, means for mounting the body on one end of the carriage, connecting means for connecting the hollow body to a source of air supply, said hollow body having a plurality of longitudinally spaced vertically disposed apertures therethrough, an air deflector mounted on the body and overlying the apertures whereby to project the air in a plane parallel to the plane of the discharged sheet and coactively cushion the downward movement of the sheet on the delivery table, a high frequency electrical discharge circuit, and a metallic brush element carried by the hollow body and adapted for electrical engagement with the sheet whereby to discharge the static electricity from the sheet coincident with the delivery of the sheet from the carriage.

11. In combination with a printing press having a reciprocal delivery carriage, an elongated hollow insulated body, a longitudinally disposed partition in said body dividing said body into a pair of elongated chambers, said hollow body having a plurality of longitudinally spaced vertically disposed apertures communicating with one of said chambers, means for connecting said one chamber with a source of air supply, an insulated hood mounted on the body and overlying the apertures whereby to project the air in a horizontal plane beneath the delivered sheet, said hollow body having an elongated slot communicating with the other of said chambers, a brush member disposed in said other chamber and projecting outwardly through the slot, said brush member being adapted to electrically engage the moving sheet delivered by the carriage, and an

electrical discharge circuit connected to said brush member whereby to discharge the static electricity from the moving sheet upon electrical contact of the brush member with the sheet.

- 5 12. A static eliminator and printed sheet floating means comprising an air projecting member adapted to be mounted on a reciprocal printing press carriage, said member having means whereby a column of air may be projected in a plane
10 parallel to the plane of the sheet during the discharging operation of the sheet, and electric discharge means disposed in a position beneath the sheet for removing the static electricity from the sheet simultaneously with the floating
15 thereof.

13. A static eliminator and printed sheet floating means comprising air projecting means for projecting a column of air beneath the sheet in a plane parallel to the plane of discharge of
20 the sheet, means for cutting off the column of

air simultaneous with the completion of the discharge operation, a metallic member disposed closely adjacent the lower surface of the sheet during the discharging operation, and an electric discharge circuit connected to the member
80 whereby to set up an electrical field between the member and the sheet for discharging the static electricity present in the sheet.

14. A printed sheet floating means adapted to be mounted on a printing press having a reciprocal sheet delivery carriage comprising air projecting means for projecting a column of air beneath the sheet in a plane parallel to the sheet for floating the discharged portion thereof, and means for cutting off the provision of the column
90 of air following the release of the discharged sheet from the printing press sheet delivery carriage.

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