

(No Model.)

C. L. BURDICK.
PNEUMATIC INK ERASER.

No. 463,619.

Patented Nov. 24, 1891.

Fig. I.

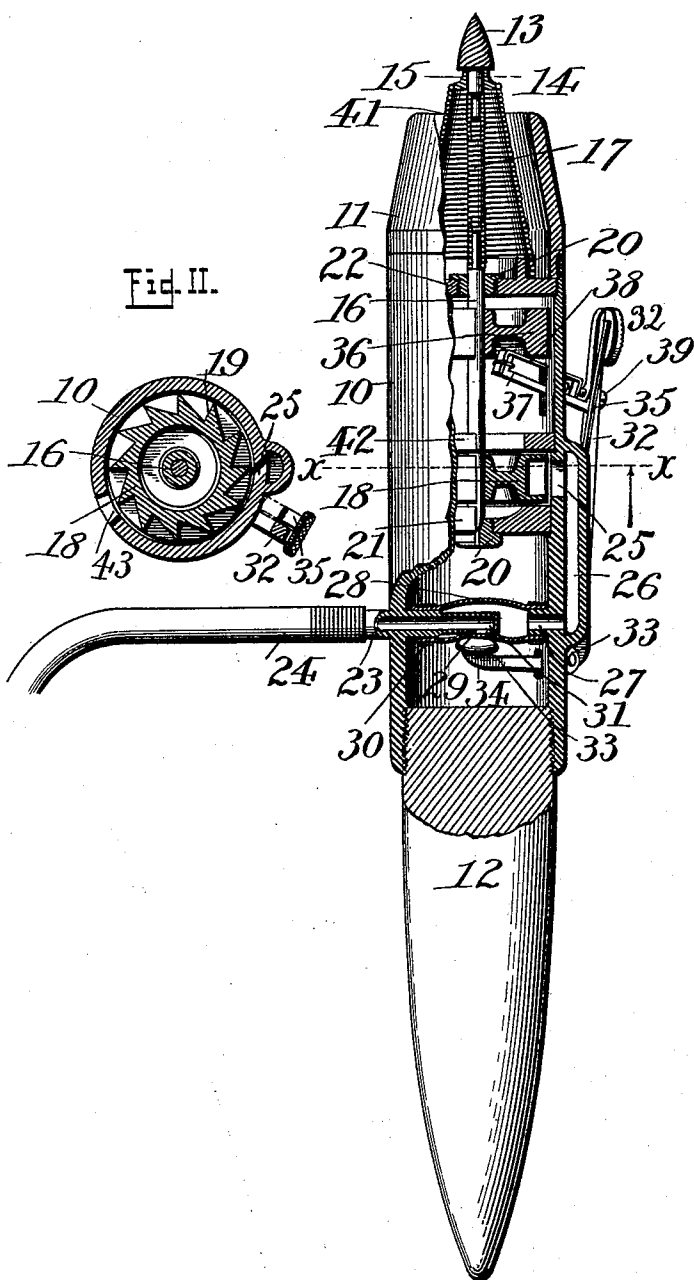
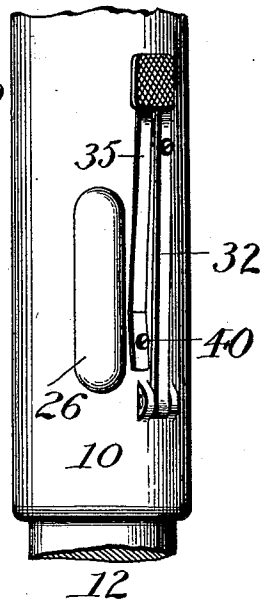


Fig. II.

Fig. III.



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PNEUMATIC INK-ERASER.

SPECIFICATION forming part of Letters Patent No. 463,619, dated November 24, 1891.

Application filed June 9, 1891. Serial No. 395,632. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. BURDICK, a citizen of the United States, residing at Madison, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Pneumatic Ink-Erasers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that class of devices by means of which ink may be erased from paper; and its object is to provide an instrument whose cutting or erasing tool shall be rotated through the medium of compressed air, either rapidly or slowly, at the will of the operator, and while it may be used for the general purpose of erasing ink it is more particularly intended as an artist's implement to be used in association with the modern spraying device known as the "air-brush." This spraying device delivers upon the paper ink in the form of spray, which may be directed evenly over a considerable surface as a cloud of fine dots, or it may be directed in lines of varying widths, either curved or straight, and this ink-eraser of mine is adapted to erase the ink evenly over any given surface or in dots or lines, instantly restoring the paper to its primitive whiteness at the points operated upon, thus greatly aiding the artist in manipulating with india-ink and water-colored paints, and it may still further be used in a similar manner by the crayon artist, producing results in each of these fields otherwise unattainable.

To this end my invention consists in the construction and combination of parts forming a pneumatic ink-eraser, hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure I is a side elevation, partly in longitudinal section, showing my ink-eraser on an enlarged scale. Fig. II is a transverse section of the same at the line *x* of Fig. I. Fig. III is a side elevation of a portion of the same.

10 represents a metallic shell having a removable extension 11, reduced to a somewhat conical form along its forward portion.

12 is a handle removably secured to the rear end of the shell.

13 is a cutter or the eraser proper, which is

corrugated spirally, forming a great many sharp edges and having a general sugar-loaf form with a sharp point, and provided with a cylindrical axle 14, fitted to revolve in a bearing 15, and having a flexible connection with the main driving-shaft 16 by means of a spiral spring 17.

18 represents the propeller, which has a series of circumferential buckets or blades 19, Fig. II. The shaft 16 is journaled in bearings 20, which are removably fitted to partitions 21 and 22, that are secured in the shell 10.

23 is an inlet-tube entering and made fast to the shell 10 and adapted to receive compressed air through a flexible pipe 24. The compressed air is directed against the blades 19 by means of the inlet-port 25, to which it is conducted by a passage 26 along the side of the shell from a tube 27, which is connected with the tube 23 by a section of a rubber pipe or other flexible tube 28. The inner end of the tube 23 is closed, and a port 29 is provided in its side about midway within the flexible tube 28. In this region the tube 23 is reduced in its external diameter in order that the pipe 28, when bound firmly at the point 30 upon the full-sized portion of the said tube, may not normally close the port 29—that is to say, the reduced portion 31 of the tube 23 is smaller than the internal diameter of the pipe 28. The pipe 28 is adapted to act as a throttle-valve upon the port 29 by means of a finger-lever 32, which is pivoted at 33 to projections upon the shell, and has an elbow-shaped arm extending through the shell, with a knob 34 on its inner end adapted to bear upon the pipe 28 to press it inward upon the said port 29.

35 is a spring acting between the shell and the outer arm of the finger-lever to press upon the pipe 28 and hold the port 29 normally closed.

36 is a balance-wheel rigidly fixed upon the shaft 16 to revolve therewith to have a steady-ing effect upon the speed of the shaft.

37 is a brake-arm attached to the outer arm of the finger-lever 32 and extending through the shell 10 and provided with a shoe 38, adapted to bear against the balance-wheel 36 by the action of the spring 35 when the latter moves the lever to close the port 29. The shoe 38 consists of a strip of leather fixed at

one end rigidly to the brake-arm 37 and at the other end adjustably attached to the same arm by means of a tension-screw 39, whereby the action of the brake upon the balance-wheel may be graduated relative to the closure of the port 29 by the spring 35, and more or less tension may be given to the spring 35 by means of its binding-screw 40. The cutter 13 is somewhat flexibly supported relative to the shell 10 or handle by having its bearing 15 connected with the shell by a stiff cone 41, of spiral wire, whose inner end is rigidly fixed to the partition 22. The wire cone 41 may be bent considerably in any direction before it rests against the conical portion 11 of the shell, so that this instrument may be applied with the greatest nicety of touch when delicate handling is required, and then when the cone 41 rests against the shell 11 the instrument may be forced with any degree of pressure upon the work. The flexible connection 17 readily communicates motion from the shaft 16 to the cutter 13 whatever the angle of the latter may be. The bearings 20 may be screw-threaded through the partitions 21 and 22 and be conically fitted to the shaft 16, so that the nicest adjustment may be made in case the shaft should become worn. The propeller 18 is incased between the partition 21 and an annular head 42 closely enough to prevent any appreciable loss of air and yet freely enough not to bind upon the propeller.

43, Fig. II, represents an exhaust-port through which the air escapes after having done service.

The operation is as follows: Compressed air is admitted to the instrument through the pipe 24; but it produces no effect until the operator presses upon the finger-lever 32. Then the port 29 is opened and the air drives through the passage 26 and the inlet-port 25 against the blades 19 of the propeller, whereby the shaft 16, the cutter 13, flexibly attached thereto, and the balance-wheel 36 are given a rotary motion. Now either the point or side of the cutter 13 may be brought to bear upon the paper and traversed around in any direction while being caused to revolve more or less rapidly by pressing more or less upon the lever 32 at the will of the operator.

I do not confine myself to the particular kind of cutter described, as that may be substituted by an erasing-rubber made of any suitable material, such as coarse stone, a stick of emery, sanded india-rubber, soft rubber, or even a burnishing-tool, according to the effect desired to be produced. A stiff rubber tube might be substituted for my wire cone 41, or any other similar elastic support for the outer bearing 15, without changing the nature of my invention. The handle 12 may be of hard rubber or wood inserted as described into the shell 10, or the shell itself may be extended and given any convenient form to serve as a handle. While the valve formed by the reduced portion of tube 31, the flexible pipe 28, and the finger-lever 32 is preferable,

as being simple and effective, yet any valve adapted to admit air by pressure of the finger upon a controlling-lever to rotate the propeller 18 would meet the requirements of my invention in this respect. The finger-lever connected with both the valve and brake actuates them to perform their respective services in harmony.

Having thus fully described my invention, what I believe to be new, and desire to secure by Letters Patent, is the following:

1. The combination, in an ink-eraser, of a shell provided with a handle, a cutter fitted to revolve in a bearing supported by the shell, a propeller mounted upon a shaft fitted to revolve in bearings within the shell and connected with the aforesaid cutter to communicate a rotary motion thereto, a tube adapted to receive compressed air, a communicating passage therefrom to a port of entry to the said propeller, a valve adapted to break said communication, and a finger-lever adapted to open said valve, substantially as described.

2. The combination of a guiding-handle or shell, an ink-eraser journaled to revolve in bearings supported thereby, a propeller-wheel adapted to rotate said journal, a tube connected with the handle and adapted to receive compressed air and communicating with the port of entry leading to the said propeller-wheel, a spring-valve adapted to normally break the communication between said tube and entry port, and a finger-lever adapted to open said valve.

3. The combination of an ink-eraser journaled to revolve in a handle, a propeller and a balance-wheel connected with the said journal, a compressed-air passage leading to the said propeller and a finger-valve therefor, and a brake to engage the said balance-wheel and connected with the said finger-valve, substantially as described.

4. The combination of an ink-eraser provided with a journal and means for revolving the same, a handle therefor, and flexible connections between the journal and the means of rotating it and between the journal-bearing and the handle, substantially as described.

5. The combination of an ink-eraser provided with a rotary journal and a bearing therefor, and a handle, and a flexible support for the bearing connecting the latter with the handle, substantially as described.

6. The combination of an ink-eraser provided with a rotary journal, a bearing for the said journal, a handle having an open forward extension, and a flexible connection between the said journal and handle surrounded and limited in its movement by the said open forward extension of the handle, substantially as described.

7. The combination of an ink-eraser journaled to revolve in a handle, a rotary propeller communicating motion to said journal, an air-passage in the said handle formed with an inlet-port to said propeller and having a tubular projection at its opposite end, another

10 tube secured to the handle and having a closed end of reduced diameter and a port in one side of the reduced portion, a flexible pipe freely surrounding the said reduced portion and secured upon the full-sized portion and also upon the said tubular projection, a finger-lever having one end fitted to close the said flexible pipe upon the said port, and a spring normally causing said closure, substantially as described.

8. An ink-eraser having sharp-edged spiral corrugations and a journal, substantially as described.

9. The combination of a rotary ink-eraser,

a propeller and an air-passage leading thereto 15 to rotate the eraser, a valve for the said passage, a brake acting upon the rotary mechanism, and a finger-lever connected with both the said brake and valve, whereby they may be harmoniously actuated, substantially as 20 described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES L. BURDICK.

Witnesses:

F. W. HALL,

A. G. WAITE.