March 1, 1966 A. S. RIFKIN 3,237,748

TYPEWRITER ERASER

Filed June 16, 1964 2 Sheets-Sheet 1

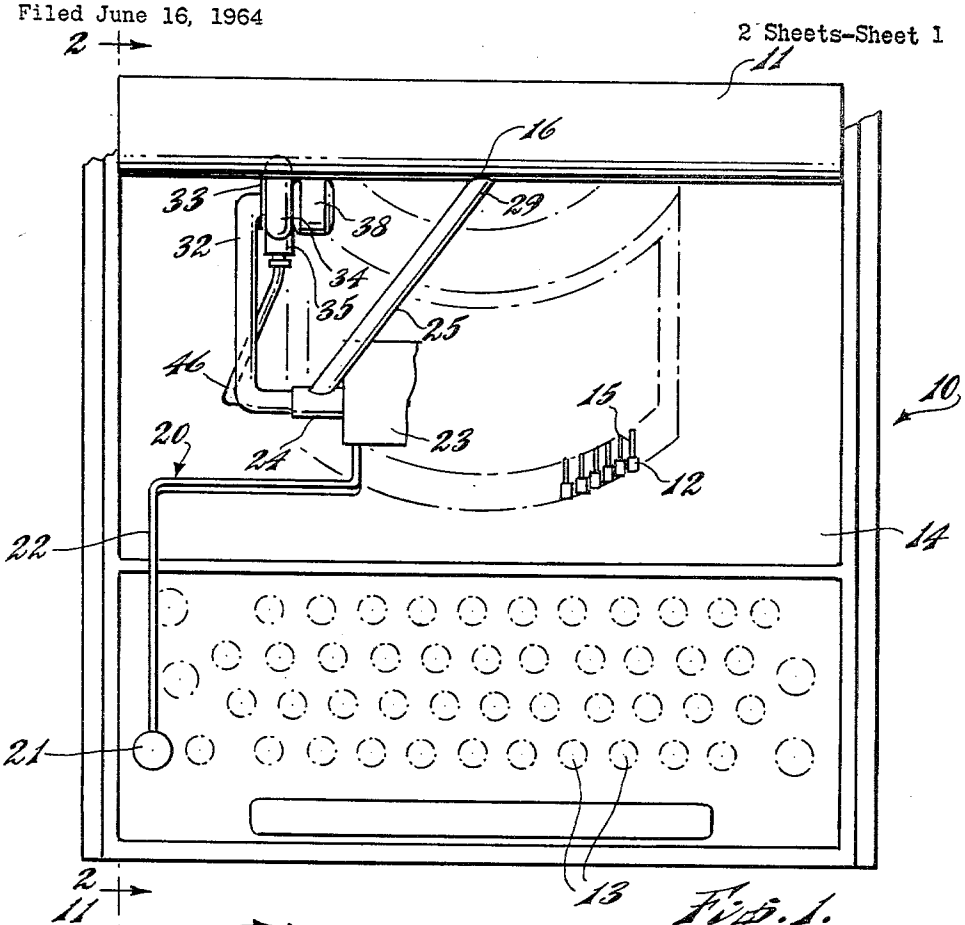


Fig. 1.

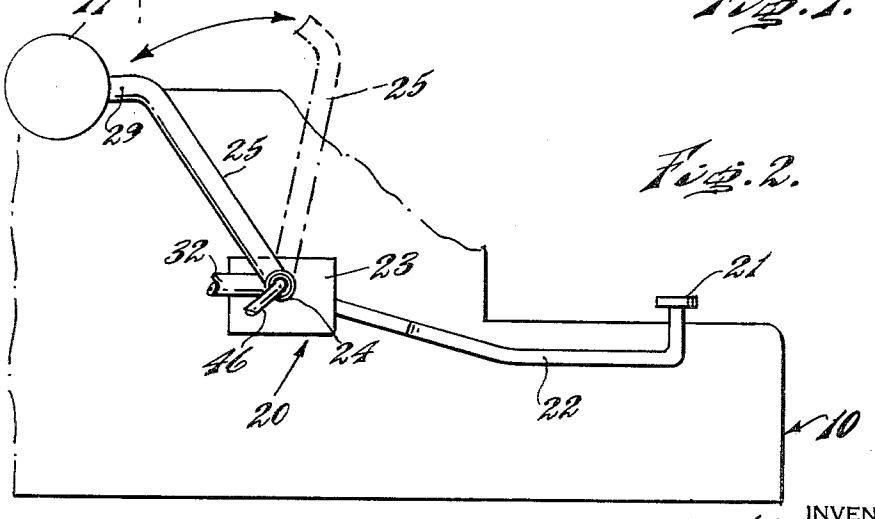


Fig. 2.

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TYPEWRITER ERASER

Filed June 16, 1964 2 Sheets-Sheet 2

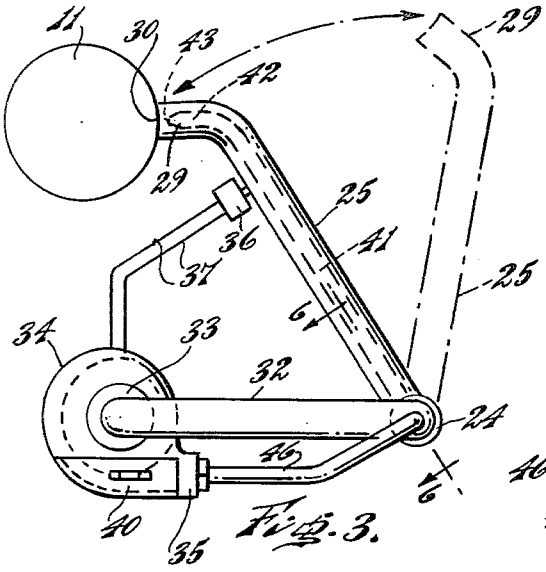


Fig. 3.

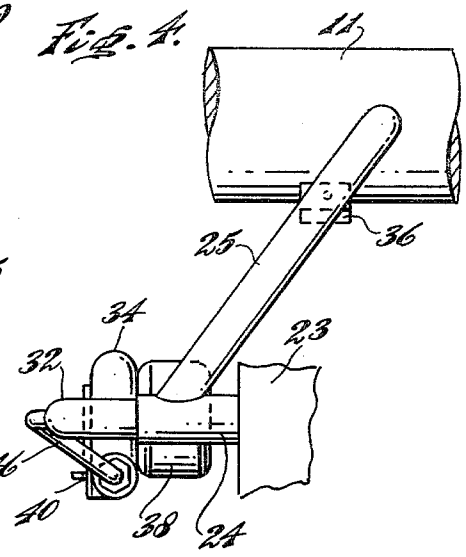


Fig. 4.

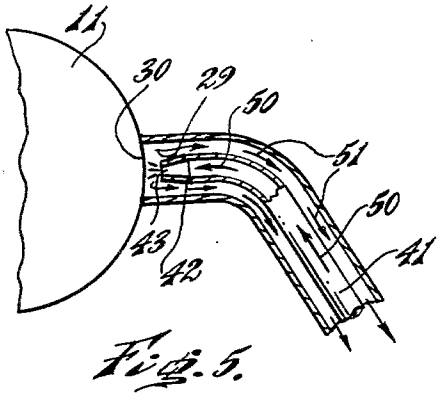


Fig. 5.

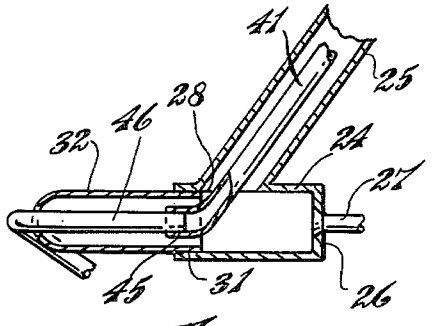


Fig. 6.

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TYPEWRITER ERASER

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9 Claims. (Cl. 197—181)

This invention relates generally to typewriters, and is especially concerned with improvements in typewriter erasers.

While it has been attempted in the past to incorporate automatic erasing in typewriters, the devices employed have been expensive, relatively complex, and generally unsatisfactory, and so have not found general acceptance.

Accordingly, it is an important object of the present invention to provide an eraser for incorporation in a typewriter which overcomes the above-mentioned difficulties, is extremely simple in construction, highly effective in operation, and entirely automatic, requiring only the actuation of a typewriter key, or the like.

It is a further object of the present invention to provide an eraser for incorporation in a typewriter, either as original or accessory equipment, which employs pneumatic means or fluid pressure for projecting abrasive against a desired location for eradicating a typed error.

It is still a further object of the present invention to provide a typewriter-eraser construction having the advantageous characteristics mentioned in the preceding paragraphs which is extremely simple in structure, durable and reliable throughout a long useful life, and which can be economically manufactured and incorporated in a typewriter for mass-market acceptance.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

In the drawings:

FIGURE 1 is a top plan view showing a typewriter having an eraser constructed in accordance with the teachings of the present invention, and illustrating the eraser in its operative condition;

FIGURE 2 is a sectional elevational view taken generally along the line 2—2 of FIGURE 1, the eraser being shown in phantom in its inoperative condition;

FIGURE 3 is a partial elevational view similar to FIGURE 2, and illustrating the device in greater detail;

FIGURE 4 is a front elevational view showing the structure of FIGURE 3, taken from the right side thereof;

FIGURE 5 is an enlarged fragmentary sectional view showing eraser operation at the location of impression; and

FIGURE 6 is a fragmentary sectional view taken generally along the line 6—6 of FIGURE 3.

Referring now more particularly to the drawings, and specifically to FIGURES 1 and 2 thereof, a typewriter is there generally designated 10, and may include a platen or roll 11 for carrying paper, a plurality of types 12 movable toward and away from the platen for imprinting paper carried thereby, and a plurality of keys 13 for actuating respective types. As thus far described, the typewriter 10 may be generally conventional. Of course, the typewriter 10 includes a frame or body 14 for mounting the platen 11, types 12 and keys 13 in their conventional arrangement. The types 12 may be movably carried by type bars 15 for movement toward and away from an impression location 16 of the platen 11.

In addition, an eraser mechanism 20 of the present invention may be incorporated in the typewriter 10, being carried by the frame 14, either as original or accessory equipment. The eraser mechanism 20 may include an operating member or key 21, adapted for finger actuation in the same manner as the type keys 13 and located adjacent thereto for convenient use by an operator. The eraser key 21 is connected by any suitable connection means or linkage 22 to an operator 23, such as a servo motor, or other suitable mechanism. A drive member 24 may be connected to the operator 23 for movement by the latter, and may carry an elongate arm 25 for swinging motion between an operative position toward the impression location of platen 11, and an inoperative position away from the platen.

As best seen in FIGURES 4 and 6, the drive element 24 may be of hollow tubular construction having one end closed at 26 and there connected to a drive shaft 27 of the operator 23. The arm 25 may be of elongate tubular construction having one end fixed to the drive tube 24 and opening into the interior thereof, as at 28. The tubular arm 25 extends from the drive tube 24 to an angulate distal end region 29 having its free end 30 open, as seen in FIGURES 3 and 5. The open end 30 of the tubular arm 25 is movable into and out of facing engagement with the impression location 16 of the platen 11 upon movement of arm 25 responsive to actuation of key 21.

The drive tube 24 is open remote from the closed end 26 and is there connected to a withdrawal tube 32, as by a slip joint 31, see FIGURE 6. The withdrawal tube 32 extends from the drive tube 24 to the suction opening or inlet fitting 33 of a blower 34. The blower 34 provides a source of vacuum or suction at its inlet 33, and provides a source of fluid pressure at its outlet 35. Suitable switch means 36 may be provided for actuating the blower 34, as by closing an electrical circuit through conductors 37. The switch 36 may be located in the path of movement of arm 25 for closure by the arm when the latter is moved to its operative position, shown in solid lines in FIGURE 3. That is, the blower or vacuum-pressure source 34 may be driven by a direct-coupled motor 38, or other suitable motive means, energized by suitable switch means 36. A lower region of the blower 34, say the lower outlet section 40, see FIGURE 3, may be removable, for a purpose appearing presently.

Interiorly of the tube arm 25, spacedly therewithin, may be a discharge conduit or tube 41, see FIGURES 5 and 6. The discharge conduit 41 is mounted in the tube arm 25 by any suitable means (not shown) for movement with the tube arm in a fixed relationship therewith. Located spacedly within the end portion 29 of arm 25 and connected to the outlet end of inner discharge tube 41 is a discharge nozzle 42. The discharge nozzle is advantageously located in spaced relation within the tubular-arm end portion 29, axially thereof, and has its discharge end 43 spaced inwardly from the open end 30 of the arm 25, see FIGURES 3 and 5.

At its inner or upstream end, the discharge tube 41 extends spacedly into the withdrawal tube 32, and is there connected by a swivel connection or slip fit 45 with one end of a fixed pressure conduit 46. The pressure conduit 46 extends from its connection with the discharge conduit 41 within the withdrawal conduit 32 to the exterior of the latter, and from there extends for connection to the blower outlet 35.

In operation, to erase a typed mistake on paper carried by platen 11, the operator merely depresses eraser key 21 to effect movement of arm 25 with its open end 30 against the paper at the location of typed error. If desired, the eraser key 21 may be connected to a backspace mechanism for automatically backspacing, for erasing the

previously typed impression. Upon swinging of arm 25 into position with its open end 30 against the platen-carried paper, the switch 36 is actuated to energize motor 38 and drive blower 34. The blower then passes fluid from its outlet 35 through conduit 46 and thence through conduit 41 for discharge from nozzle 42 against the platen-carried paper at the location of typed error, as indicated by arrows 50. The fluid carries abrasive material, such as particles of sand, rubber or other desired material which impinge upon the platen-carried paper for erasing the typed error. The rebounded abrasive particles, together with abraded particles of paper are simultaneously withdrawn through the tube arm 25, in the direction of arrows 51, for the subsequent passage through withdrawal conduit 32 to the inlet of blower 34.

It will now be understood that the open tube end 29 defines a shroud or enclosure about the region of discharge from nozzle 42 for receiving the rebounded abrasive and waste in a neat and efficient manner. The material returned to blower 34 through conduits 25 and 32 may be repeatedly reused, until the efficacy thereof is effectively lost. Thereupon, the used abrasive and waste may be removed from the blower, as by removal of blower section 40, and fresh abrasive may be replaced in the system.

From the foregoing, it is seen that the automatic erasing mechanism of the present invention fully accomplishes its intended objects, and is well adapted to meet practical conditions of manufacture, maintenance and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. The combination with a typewriter including a platen for carrying paper, type movable toward and away from the platen for imprinting paper carried by the platen, and keys associated with said type for actuating the latter, of an eraser comprising a nozzle mounted for movement toward and away from said platen, an eraser key operatively connected to said nozzle for effecting said nozzle movement, propulsion means connected to said nozzle for propelling abrasive from said nozzle toward a paper carried by said platen for abrading the same, and withdrawal means for collecting abrasive and waste from said paper.

2. The combination according to claim 1, said propulsion means comprising a fluid-pressure source for pneumatic propulsion of abrasive material to a paper carried by said platen.

3. The combination according to claim 1, said withdrawal means comprising a vacuum source for sucking away spent abrasive and waste.

4. The combination according to claim 3, said withdrawal means comprising an enclosure spacedly surrounding said nozzle for movement therewith upon actuation of said eraser key and having an opening in spaced surrounding relation with the discharge of said nozzle, said enclosure being connected to said vacuum source for effecting said collection.

5. The combination according to claim 4, said enclosure and nozzle being movable together into erasing position with said enclosure against a paper held by said platen and said nozzle spaced from said paper.

6. In a typewriter including a platen for carrying paper past an impression location, type movable toward and away from the platen for imprinting platen-carried paper at said impression location, and keys operatively connected to said type for effecting said type movement, the improvement comprising an eraser nozzle mounted for movement toward and away from facing spaced relation with respect to platen-carried paper at said impression location, fluid-pressure means connected to said nozzle for projection therefrom of abrasive material at said impression location to erase an imprint from said paper, and an erase key operatively connected to said nozzle for effecting said movement thereof.

7. The improvement according to claim 6, said fluid-pressure means comprising a blower, said nozzle being connected to the output of said blower.

8. The improvement according to claim 7, in combination with collection means associated with said nozzle for receiving spent abrasive and waste, said collection means being connected to the input of said blower.

9. The improvement according to claim 8, said collection means comprising a shroud spacedly surrounding said nozzle and movable therewith for receiving rebounded abrasive material and waste from said impression location.

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