

[54] BATTERY OPERATED ERASER

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[63] Continuation-in-part of Ser. No. 874,895, Nov. 7, 1969, abandoned.

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[58] Field of Search 15/3.53, 4, 344, 15/DIG. 1

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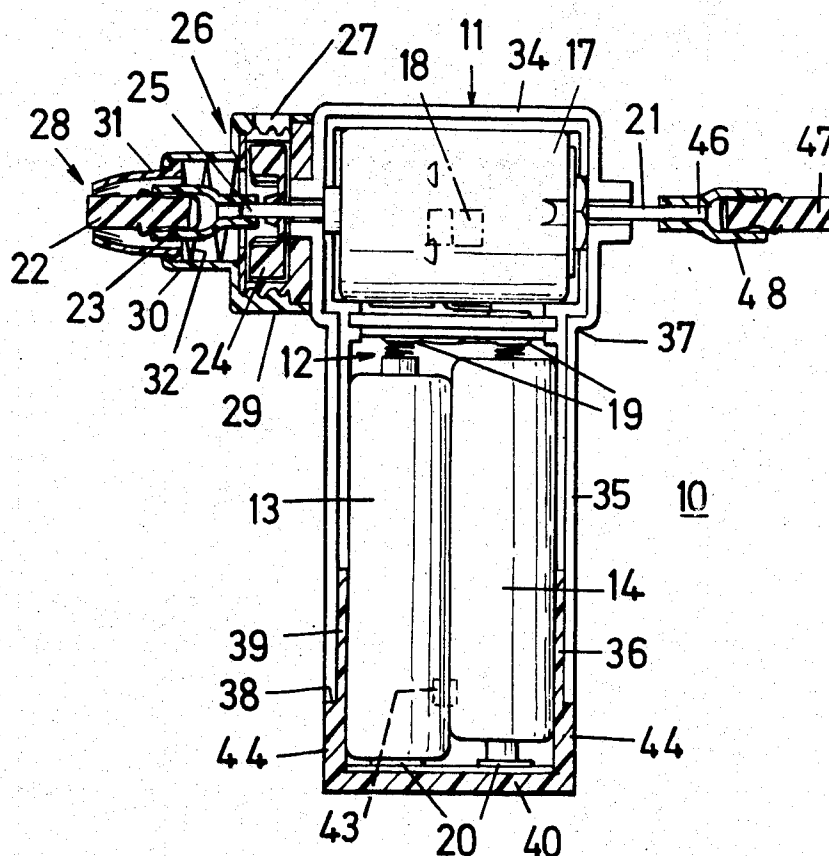
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[57] ABSTRACT

A portable electric eraser driven by a battery powered electric motor in which the motor has a driver shaft carrying an ink eraser at one end and a pencil eraser at the other end. A centrifugal fan is mounted on the shaft behind the pencil eraser and a sleeve around the fan provides suction near the pencil eraser for removing debris, with a retractable brush being on the end of the sleeve.

7 Claims, 2 Drawing Figures



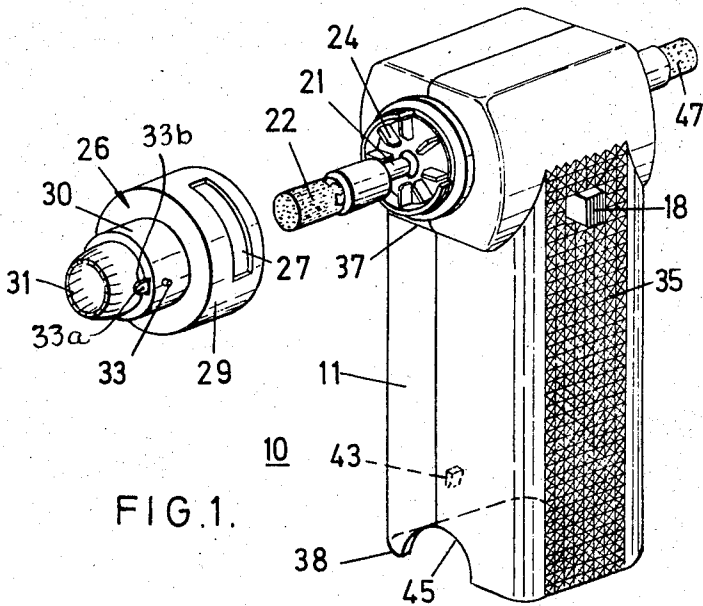


FIG. 1.

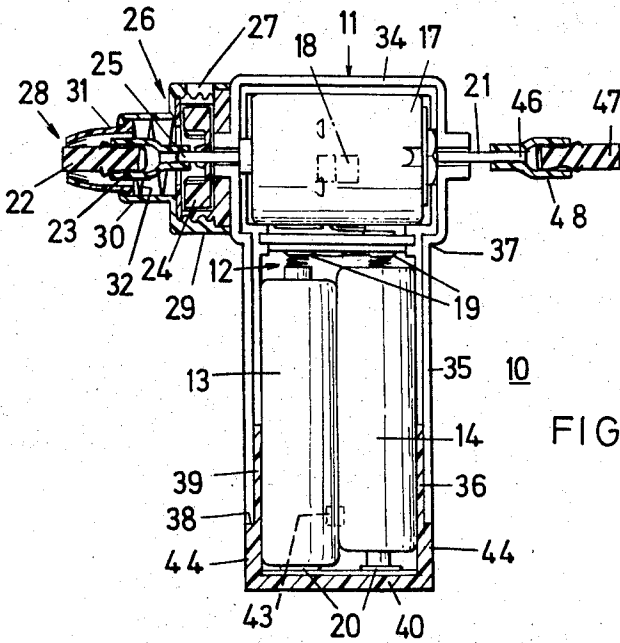
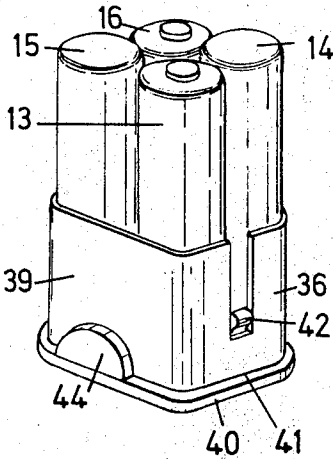


FIG. 2.



BATTERY OPERATED ERASER**CROSS REFERENCE TO RELATED APPLICATION**

This application is a continuation-in-part of my earlier co-pending application Ser. No. 874,895 filed Nov. 7, 1969 entitled "BATTERY OPERATED ERASER," now abandoned.

SUMMARY OF THE INVENTION

This invention provides a battery operated portable eraser device comprising: a casing having a space therein for at least one electric battery; a motor arranged within the casing; means including connection means and an electrical switch for making electrical connections between the at least one battery and the motor and for switching the motor on and off; the motor including a shaft which extends axially of the motor through the casing; an eraser and eraser-holder mounted on the shaft externally of the casing; and a fan mounted on the shaft to produce a draft of air whereby debris resulting from an erasure can be removed.

Preferably the eraser and eraser-holder are mounted on one end of the shaft, the fan is a centrifugal fan and is mounted on the shaft externally of the casing intermediate the eraser-holder and the casing and a sleeve is secured to the casing and surrounds the fan, the eraser-holder and the eraser, with an aperture in the sleeve for air outflow adjacent the fan, whereby the fan and the sleeve in combination produce suction in the region of the eraser for removal of debris. Preferably the sleeve is detachable from the casing and has a wide portion surrounding the fan and a narrow portion surrounding the eraser and eraser-holder.

Preferably the casing comprises a motor-encasing part, a first battery-encasing part and a second battery-encasing part, said first battery-encasing part formed as an outer sleeve of which one end is attached to said motor-encasing part and of which an opposite end is open, said second battery-encasing part comprising an inner sleeve and an end wall, said end wall being attached to an outer end of said inner sleeve, said inner sleeve being removably received within said outer sleeve.

Preferably an opposite end of the shaft protrudes through said casing and further comprising a further eraser and a further eraser-holder, wherein said further eraser and said further eraser-holder are mounted on said opposite end of said shaft.

An embodiment of the invention will be described by way of example with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is an exploded view of a battery operated portable eraser device forming a preferred embodiment of the invention, and four batteries; and

FIG. 2 is a section through the eraser device of FIG. 1, except that the motor and batteries are not sectioned.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1 and 2, the preferred embodiment of the invention is a battery operated portable eraser device 10 comprising a casing 11 having a space 12 therein for four electric batteries 13, 14, 15 and 16; a motor 17 arranged within the casing 11; means including an electrical switch 18, an upper group of four

contacts 19 and a lower group of four contacts 20 for making electrical connections between the four batteries 13 to 16 (in series) and the motor 17 and for switching the motor on and off; the motor 17 including a shaft 21 which extends axially of the motor 17 through the casing 11; an eraser 22 and eraser-holder 23 mounted on the shaft 21 externally of the casing 11; and a fan 24 mounted on the shaft 21 to produce a draft of air whereby debris (not shown) resulting from an erasure can be removed.

The eraser 22 and eraser-holder 23 are mounted on one end 25 of the shaft 21, while the fan 24 is mounted on the shaft 21 intermediate the eraser-holder 23 and the casing 11. The fan 24 is a centrifugal fan, and the device 10 further comprises a sleeve member 26 secured to the casing (as shown in FIG. 2) and surrounding the fan 24 and the eraser-holder 23. The sleeve member 26 has an aperture 27 therein adjacent the fan 24 for outflow of air, whereby the fan 24 and sleeve member 26 in combination produce suction in the region 28 of the eraser 22 for removing the debris. The sleeve member 26 is detachable from the casing 11, being screwed onto the casing 11, and includes a wide portion 29 surrounding the fan 24 and a narrow portion 30 surrounding the eraser-holder 23. The device 10 further comprises a brush 31 attached to the sleeve member 26 so as to surround the eraser 22 for brushing the debris. The brush 31 is retractable into the sleeve member 26 for exposing the eraser 22, and device 10 further comprises a spring 32 biasing the brush 31 outwardly of the sleeve member 26 and a catch device 33 for securing the brush 31 in retracted position against the spring 32. More specifically, the catch device 33 is an inwardly projecting member which engages a recess 33a in the outer end of a resilient leaf 33b. When the brush 31 is retracted away from the operative edge of the eraser, the end of the leaf 33b is just projecting so that if it is subsequently pressed downwardly by, for example, a finger nail or a pencil tip, the spring 32 would push the brush outwardly again to its operative position.

The casing 11 comprises a motor-encasing part 34, a first battery-encasing part 35 and a second battery-encasing part 36. Part 35 is formed as an outer sleeve of which one end 37 is attached to part 34 and of which an opposite end 38 is open. Part 36 comprises an inner sleeve 39 and an end wall 40. End wall 40 is attached to an outer end 41 of inner sleeve 39. Inner sleeve 39 is removably received within outer sleeve 35 and is retained by means of two projections on opposite sides of sleeve 39, (one projection being shown at 42), engaging corresponding recesses such as recess 43. Part 36 includes two segmentally-shaped portions such as portion 44 which enter cut-outs such as cut-out 45 in part 35 for gripping of part 36 and withdrawing it from part 35.

An opposite end 46 of shaft 21 from end 25 also protrudes from the casing 11 and device 10 also comprises a further eraser 47 and a further eraser-holder 48 mounted on the shaft end 46. Whereas eraser 47 is a hard eraser for use by typists, (stenographers,) eraser 22 is a soft eraser which can be used to clean up after eraser 47 has been used.

To use device 10 for erasing type-written words or letters, the brush 31 is retracted and is held by catch device 33. The user then operates switch 18 to switch the motor 17 on. He then erases the material, using first

the eraser 47 and then eraser 22. He then releases catch device 33 so that the brush 31 is extended by spring 32 and the user brushes the debris while the fan 24 and sleeve member 26 in combination such the debris away.

I claim:

1. A battery operated portable eraser device comprising: a casing having a space therein for at least one electric battery, a motor arranged within the casing, means including connection means and an electrical switch for making electrical connections between the at least one battery and the motor and for switching the motor on and off, the motor including a shaft which extends axially of the motor through the casing, an eraser and eraser-holder mounted on one end of the shaft externally of the casing, a centrifugal fan mounted on the shaft externally of the casing intermediate the eraser-holder and the casing, sleeve means secured to the casing and surrounding at least the fan and part of the eraser-holder, said sleeve means having aperture means therein adjacent the fan for outflow of air, whereby the fan and sleeve means in combination produce suction in the region of the eraser for removing the debris, and a brush attached to the sleeve means so as to surround the eraser for brushing the debris.

2. The eraser device as defined in claim 1 wherein said sleeve means is detachable from the casing.

3. The eraser device as defined in claim 1 wherein said sleeve means includes a wide portion surrounding the fan and a narrow portion surrounding the at least part of the eraser-holder.

4. The eraser device as defined in claim 1 wherein the brush is retractable into the sleeve means and further comprising spring means biasing the brush outwardly of the sleeve means and catch means for securing the brush in retracted position against the spring means.

5. The eraser device as defined in claim 1 wherein the casing comprises a motor-encasing part, a first battery encasing part and a second battery-encasing part, said first battery-encasing part formed as an outer sleeve of which one end is attached to said motor-encasing part and of which an opposite end is open, said second battery-encasing part comprising an inner sleeve and an end wall, said end wall being attached to an outer end of said inner sleeve, said inner sleeve being removably received within said outer sleeve.

6. The eraser as defined in claim 1 wherein said eraser and eraser-holder are mounted on one end of said shaft, wherein an opposite end of said shaft protrudes through said casing and further comprising a further eraser and a further eraser-holder, wherein said

further eraser and said further eraser-holder are mounted on said opposite end of said shaft.

7. A battery operated portable eraser comprising: a casing having a space therein for at least one electric battery;

a motor arranged within the casing, the motor including a shaft one end of which extends axially of the motor through the casing;

means including an electrical switch and connection means for making electrical connections between the at least one battery and the motor and for switching the motor on and off;

a first eraser and a first eraser-holder mounted on said one end of said shaft externally of said casing;

a centrifugal fan mounted on said shaft externally of said casing intermediate said first eraser-holder and said casing;

sleeve means detachably secured to said casing, said sleeve means including a wide portion surrounding said fan and a narrow portion surrounding at least part of said first eraser-holder, said wide portion of said sleeve means having aperture means therein adjacent said fan for outflow of air, whereby said fan and said sleeve means in combination produce a draft of air and produce suction in the region of said first eraser for removing debris resulting from an erasure;

a brush attached to said sleeve means so as to surround said first eraser for brushing the debris, said brush being retractable into said sleeve means;

spring means biasing the brush outwardly of said sleeve means;

catch means for securing the brush in retracted position against said spring means;

wherein said casing comprises a motor-encasing part, first battery-encasing part and a second battery-encasing part, said first battery-encasing part formed as an outer sleeve of which one end is attached to said motor encasing part and of which an opposite end is open, said second battery-encasing part comprising an inner sleeve and an end wall, said end wall being attached to an outer end of said inner sleeve, said inner sleeve being removably received within said outer sleeve;

wherein an opposite end of said shaft protrudes through said casing;

and further comprising a second eraser and a second eraser-holder wherein said second eraser and said second eraser-holder are mounted on said opposite end of said shaft.

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