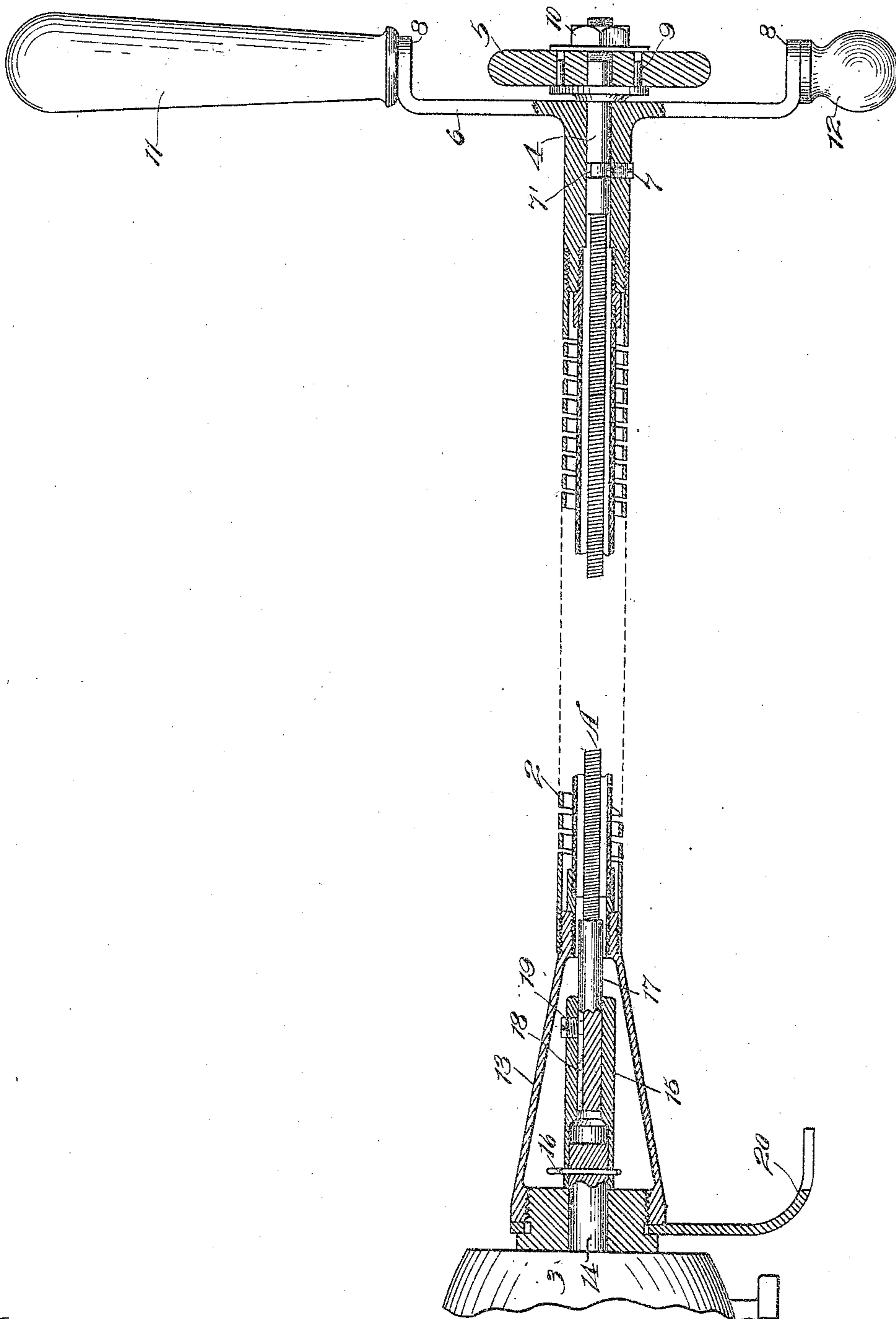


No. 877,348.

PATENTED JAN. 21, 1908.

F. W. LIERMAN.
ERASING MACHINE.

APPLICATION FILED AUG. 21, 1907.



Witnesses:

G. E. Maynard.
G. H. Jones

Inventor:
Frank W. Lierman;
By *Geo. H. Strong,*
attorney

UNITED STATES PATENT OFFICE.

FRANK W. LIERMAN, OF SAN FRANCISCO, CALIFORNIA.

ERASING-MACHINE.

No. 877,348.

Specification of Letters Patent.

Patented Jan. 21, 1908.

Application filed August 21, 1907. Serial No. 389,474.

To all whom it may concern:

Be it known that I, FRANK W. LIERMAN, citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Erasing-Machines, of which the following is a specification.

My invention relates to erasers, or devices for removing pencil and other marks from paper. Its object is to provide a simple, practical machine for the use of draftsmen and others, in rapidly cleaning paper or removing pencil or other marks; the invention being particularly designed for use in drafting-rooms, where considerable time is now lost in erasing or cleaning by hand.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which the figure illustrates a longitudinal sectional view partially in elevation, of an erasing machine embodying my invention.

A is a flexible shaft of any suitable description having the usual flexible casing 2 and operated from any suitable source of power, as, for instance, the motor 3. One end of this flexible shaft is secured to the arbor 4, which carries the rubber disk or eraser 5.

The arbor 4 is turned in a bearing in a cross-head or frame 6, to which one end of the flexible casing 2 is secured. Displacement of the arbor and shaft is prevented by suitable means, as the screw 7 in the frame 6 engaging an annular groove 7' in the arbor.

While the frame 6 may be of any appropriate description, I prefer to make it in the form herein shown, with the end flanges 8, and open at one side to permit the ready putting on or taking off of an erasing disk 5 at any time.

The disk is held to the arbor by any suitable means, as the pins 9 on the arbor passing through corresponding perforations in the disk, and the washer and clamp-nut 10, screwed on to the threaded outer end of the arbor.

One end of the frame or cross-head 6 is provided with a handle, as 11, and the opposite end is furnished with the guiding device 12, which may be made detachable.

The motor end of the flexible casing 2 is attached to a thimble 13 secured to the motor casing.

The flexible shaft A is connected with the motor shaft 14, and arrangement is made for the lengthwise adjustment of the flexible shaft by the following means: A sleeve 15 is secured to the end of the motor shaft 14 by a key 16. The end of the flexible shaft is fixedly secured to a short rod section 17 fitting the sleeve 15 and having a feather-way 18, in which the guide screw 19 carried by the sleeve 15 engages. Thus, while the sleeve 15 and flexible shaft will turn in unison with the motor shaft, the flexible shaft is permitted all necessary lengthwise movement in the sleeve.

In operation, the flexible shaft being set in motion, the tool is grasped in one hand by the handle 11. By allowing the knob or guiding end 12 of the tool to come into contact first with the paper, enables the operator to bring the eraser carefully down on to the paper and bear with any desired pressure. The flexible connections with the source of power permit the device to be moved in any direction, and the great rapidity with which the erasing disk revolves enables a large area to be cleaned in a very short space of time, and without any appreciable effort on the part of the operator.

Whenever one rubber disk is worn out, it takes but a moment to renew it.

The device is very light, occupies but a small amount of room, and when not in use may be supported on the bifurcated hook 20.

It is possible that various changes or modifications may be made in the invention, without departing from the principle thereof.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In an erasing machine, a rotary eraser, a frame in which the eraser is mounted for rotation, said frame having a hand hold and a guiding device for contact with the surface to be cleaned, said hand-hold and guiding device being disposed at opposite sides of the axis of the eraser, and means for rotating the eraser.

2. In an erasing machine, a rotary eraser, a frame in which the eraser is mounted for rotation, said frame open at one side, a handle at one end of the frame, a guiding device on the other end of the frame for contact with the paper to be cleaned, and means for rotating the eraser.

3. In an erasing machine, the combination of a flexible shaft, a flexible casing therefor, a

cross-head to which one end of the flexible casing is secured, and an erasing device having an arbor portion journaled in said cross-head and connecting with the flexible shaft, 5 said cross head having a handle at one end and a guiding device at the opposite end.

4. In an erasing machine, the combination of a flexible shaft, a flexible casing therefor, a cross-head to which one end of the flexible casing is secured, an erasing device having an arbor portion journaled in said cross-head and connecting with the flexible shaft, said cross-head having a handle at one side of the axis of the erasing device and having a guiding device at the other side of said axis, and a drive-shaft with which the opposite end of the flexible shaft is connected, said last-named connections comprising a sleeve secured to the drive-shaft, a rod section fixed 20 to the flexible shaft and fitting the sleeve,

said rod section having a lengthwise extending groove, and a screw carried by the sleeve and fitting said groove.

5. In an erasing machine, the combination of a flexible shaft, a flexible casing therefor, a cross-head to which one end of the flexible casing is secured, an erasing device having an arbor portion journaled in said cross-head and connecting with the flexible shaft, said cross-head having laterally extending end flanges, a handle secured to one of the flanges, and a guiding device connected with the other flange. 30

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses. 35

FRANK W. LIERMAN.

Witnesses:

S. H. NOURSE,

FREDERICK E. MAYNARD.