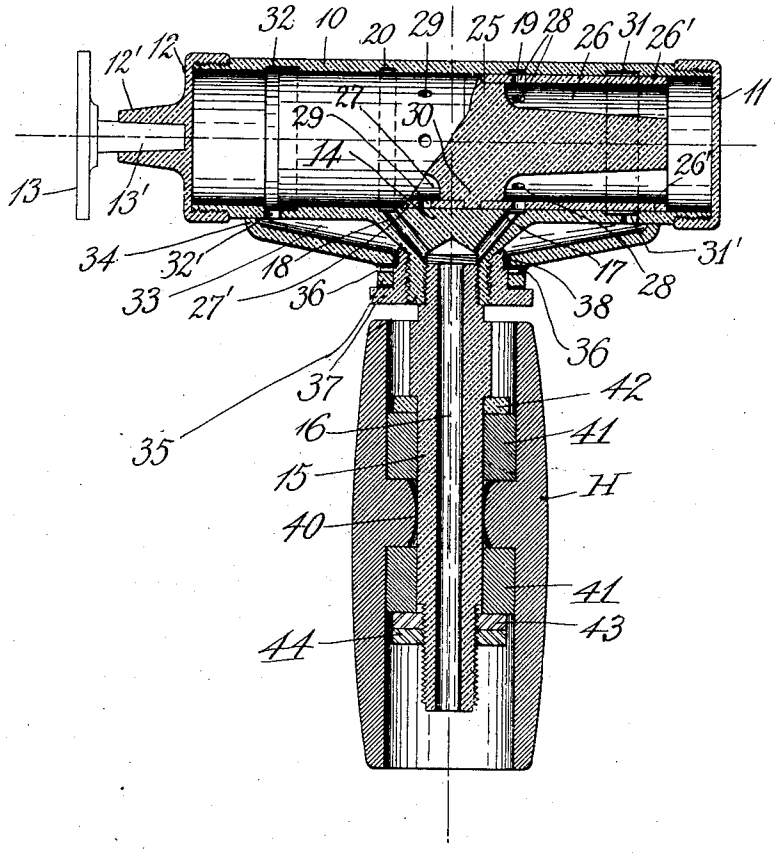
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C. H. RICHWOOD.

FLUID ACTUATED VIBRATOR.

APPLICATION FILED SEPT. 19, 1904.



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No. 786,050. Patented March 28, 1905.

UNITED STATES PATENT OFFICE.

CLARENCE H. RICHWOOD, OF DORCHESTER, MASSACHUSETTS.

FLUID-ACTUATED VIBRATOR.

SPECIFICATION forming part of Letters Patent No. 786,050, dated March 28, 1905.

Application filed September 19, 1904. Serial No. 224,951.

To all whom it may concern:

Be it known that I, CLARENCE H. RICHWOOD, a citizen of the United States of America, and a resident of Dorchester, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Fluid-Actuated Vibrators, of which the following is a full, clear, and exact description.

This invention relates to fluid-actuated vibrators, and more particularly massage implements; and it has for one of its objects the provision of such a device in which the efficiency of the blow may be regulated as desired by varying the size of the exhaust-passage.

My invention has, furthermore, for its object the improved construction of the movable head, which by its rapid reciprocatory motion reacts upon the casing and causes a tremulous movement of the latter.

My invention has, furthermore, for its object the improved organization of the pneumatic device, with the manipulating-handle, so that the vibration of the former will not be felt by the operator.

The accompanying drawing illustrates in central section a device of this character embodying my invention and comprising a cylindrical shell 10, closed at its ends by caps 11 12, the latter, 12, of which is provided with a hub 12′ to receive the shank 13′ of a massaging-disk 13 or other applicators.

The cylinder 10 has intermediate its ends a projection 14, which may be bored out and threaded, as shown, to receive a stem 15, having a longitudinal passage 16 for conducting air under pressure to the interior of said cylinder through a pair of oppositely-disposed ducts 17 18, which terminate in annular grooves 19 20, respectively, of the cylinder, the air-supply therein being constant. These ducts constitute air-supply chambers, from which air is admitted into either end of the cylindrical shell 10, as controlled by a piston-head 25, mounted for reciprocation in said cylinder and having at its ends chambers 26 27. The peripheral walls 26′ 27′ of the chambers are provided with a plurality of transversely-alined apertures or ports 28 29, respectively, and a central partition 30 serves to maintain said chambers entirely separate and independent of each other. The cylinder 10 has also a pair of annular grooves 31 32, which are in communication, through apertures 31′ 32′, respectively, with an exhaust-chambes 33, formed in a casing 34, surrounding the lug 14 and united with the cylinder-shell 10 in an air-tight manner. At its lower end the casing 34 is provided with a hub 35, having one or more apertures 36, which are in communication with the exhaust-chamber 33, but may be partially closed—as, for instance, by a plug 37 in screw-threaded engagement with the exteriorly-threaded portion of the lug 14. The upper end of the plug 37 is reduced in diameter to leave an annular space 38, through which the exhaust-air may find its way to the apertures 36, above mentioned, and it will be understood that the latter may be closed to any desired extent by the rotation of the plug 37.

In the drawing the piston is shown in its extreme right-hand position, and the ports 28 are in communication with the annular groove 19, therefore admitting air under pressure into the right end chamber 26 of the piston 25, while the air in the left end chamber 27 thereof may pass through the aperture 32′ into the exhaust-chamber 33. The air under pressure will now move the piston from right to left, thus at first shutting off the groove 32 from the chamber 27 and subsequently compressing the air in said chamber as the piston approaches the cylinder-cap 12 to form a cushion until the piston has moved toward the left sufficiently to bring the ports 29 of the chamber 27 into registry with the annular groove 20, which will result in admitting air under pressure into the left end chamber 27, while at the same time the air in the right end chamber may exhaust through the aperture 31′, as will be readily understood. Hence I obtain a very rapid reciprocation of the piston 25, the impulse of which is transferred, through the cushion effect above described, to the cylinder 10, which is comparatively light in weight when compared to the piston, and consequently has a tremulous motion imparted to it, resulting in similarly actuating the massaging implement 13. It is of course evident that this rapid action will necessarily produce

a strong vibration of the stem 15, and to obviate this vibration being felt by the operator my invention comprises as one of its features what may be termed an "antivibration-handle," whereby the instrument may be guided and manipulated.

In the construction shown the handle H is preferably made of a shell of hard rubber having a central contracted portion 40 flared so as to have substantially only a line-contact with the stem 15, which may move and swing freely therein. Disposed at opposite sides of the partition 40 and surrounding the stem 15 are cushions 41, of soft rubber, the upper one of which is confined between said partition 40 and a metallic washer 42 on the stem, while the lower cushion is confined between the lower face of the partition 40 and a nut 43, coöperating with a check-nut 44 to secure the several components of the handle in place on the stem.

From the description just given it is evident that the resiliency of the cushions 41 is perfectly equalized and that consequently the axis of vibration will be in the center of the partition 40, so that this motion will hardly be felt by the operator.

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

1. In a device of the character described, the combination with a vibrator and a stem secured thereto, of a hollow handle into which the stem is received, and means within the handle to support the stem at a point intermediate the ends of the latter to permit of a relative rocking movement between said stem and handle.

2. In a device of the character described, the combination with a vibrator and stem secured thereto, of a hollow handle into which the stem is secured, means within the handle to support the stem at a point intermediate the ends of the stem and cushioning devices disposed on opposite sides of said support and between the stem and the handle.

3. In a device of the character described, the combination with a vibrator and a stem secured thereto, of a hollow handle into which the stem is received; and means within the handle for supporting the stem to permit a rocking movement of the stem and handle relative to each other.

4. In a device of the character described, the combination with a vibrator and a stem secured thereto, of a hollow handle into which the stem is received, supporting means for the stem within the handle to permit a rocking movement of the stem and handle relative to each other, and cushioning means also within the handle.

5. In a device of the character described, the combination with a vibrator and a stem secured thereto, of a hollow handle into which the stem is received, a projection within the handle having a line edge upon which the stem is supported, and cushioning devices between the stem and handle and adjacent the support.

6. In a device of the character described, the combination with a vibrator and a stem secured thereto, of a hollow handle into which the stem is received, an annular projection within the handle having a line edge upon which the stem is supported, and cushioning devices between the stem and handle and adjacent the support.

7. In a device of the character described, the combination with a vibrator and a stem secured thereto, of a hollow handle into which the stem is received, an annular projection within the handle having a line edge upon which the stem is supported at a point intermediate its ends and cushioning means between the stem and handle and on opposite sides of the point of support of the stem.

8. In a device of the character described, the combination of a cylinder closed at its ends and having air-supply ducts, a piston mounted in the cylinder for reciprocation, means for closing the ducts in the cylinders alternately by the movement of said piston in opposite directions, an exhaust-chamber arranged exterior to the cylinder and having apertures communicating therewith, outlet-ports from the exhaust-chamber, and a screw-plug coöperating with said outlet-ports to vary the opening thereof.

9. In a device of the character described, the combination of a cylinder closed at its ends, and having a piston therein for reciprocation, a projection on the side of the cylinder having inlets therethrough into the cylinder, an exhaust-chamber carried by the cylinder and surrounding said projection and having communication with the cylinder, said chamber also having exhaust-ports, and a rotatable plug mounted on said projection and coöperating with the exhaust-ports to vary the size of the opening therethrough.

10. In a device of the character described, the combination of a cylinder closed at its ends, and having a piston therein for reciprocation, a projection on the side of the cylinder having inlets therethrough into the cylinder, an exhaust-chamber carried by the cylinder and surrounding said projection and having communications with the cylinder, said chamber also having exhaust-ports and a rotatable plug surrounding said projections and having screw-threaded connections therewith and provided with means coöperating with the exhaust-ports of the exhaust-chamber to vary the size of the opening therethrough.

11. In a device of the character described, the combination of a cylinder closed at its ends, and having a piston therein for reciprocation, a projection on the side of the cylinder having inlets therethrough into the cylinder, an exhaust-chamber carried by the cylinder and having a hub surrounding said projection, said chamber having communication with the cylinder, and having exhaust-ports through

the wall of the hub, and a rotatable plug arranged between said projection and hub and coöperating with the exhaust-ports to vary the size of the openings therethrough.

12. In a device of the character described, the combination of a cylinder closed at its ends and having a piston therein for reciprocation, a projection on the side of the cylinder having inlet-openings into the cylinder, said projection being provided with a hollow extension interiorly and exteriorly screw-threaded, an exhaust-chamber carried by the cylinder and provided with a hub surrounding said projection, said chamber having communication with the cylinder and exhaust-ports through the hub, a rotatable plug arranged between the extension of the cylinder and said hub being threaded to said extension and cooperating with the exhaust-port to vary the size of the opening therethrough, and a hollow stem threaded to the interior of said extension.

13. In a device of the character described, a cylinder, a piston therein for reciprocation, a hollow handle attached to said cylinder and having a fluid-supply passage communicating with the cylinder on opposite sides of the piston, said cylinder having exhaust-ports, and a cut-off for said ports rotatably mounted on the handle and having its axis of rotation coincident with the longitudinal axis of the handle.

14. In a device of the character described, the combination with a vibrator and a stem secured thereto, of a handle having a longitudinal opening therethrough of greater diameter than said stem and into which said stem is received, and means within the opening for supporting said stem for a rocking movement relative to the handle.

15. In a device of the character described, the combination with a fluid-operated vibrator and a stem secured thereto through which the fluid finds access to the vibrator, of a handle having a longitudinal opening of greater diameter than the stem and means within the opening for supporting the stem for a rocking movement relative to the handle.

Signed by me at Springfield, Massachusetts, in presence of two subscribing witnesses.

CLARENCE H. RICHWOOD.

Witnesses:

WM. S. BELLOWS,

G. R. DRISCOLL.