Feb. 28, 1928. 1,660,821

W. H. SWEETLAND

THERAPEUTIC PERCUSSOR

Filed Aug. 4, 1924

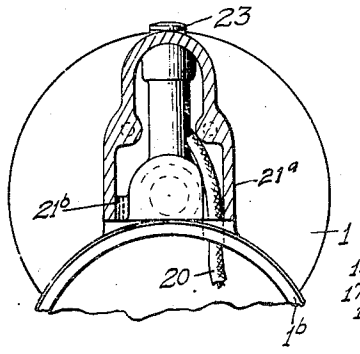


FIG. 3.

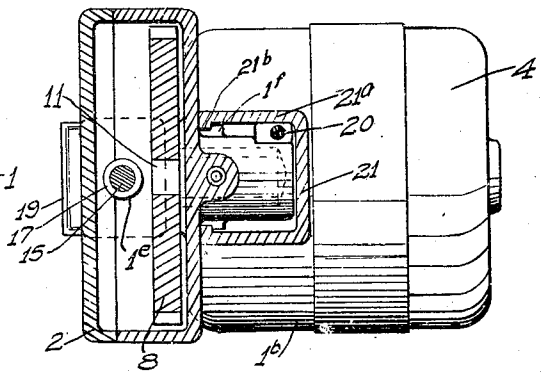
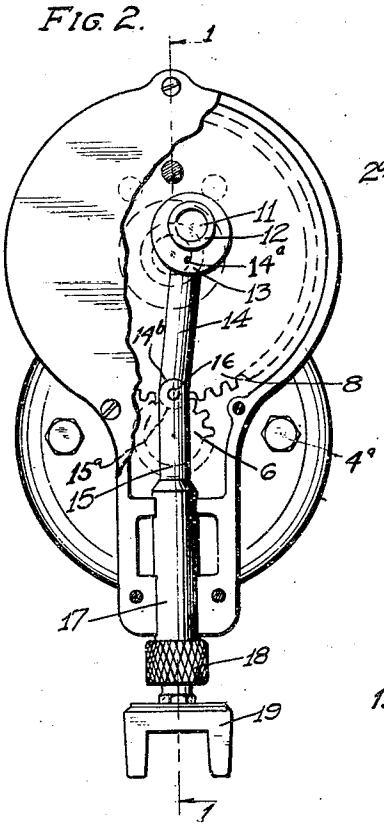


FIG. 4.

FIG. 2.



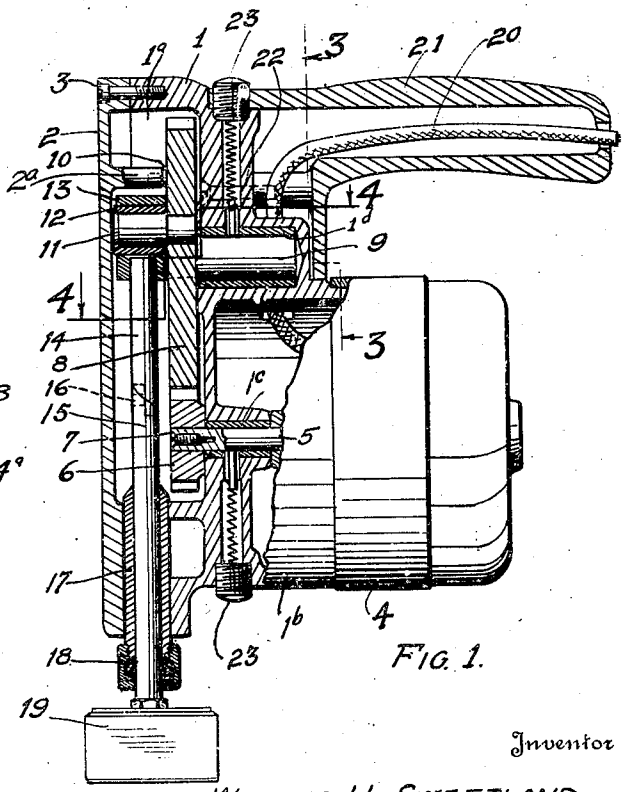


FIG. 1.

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UNITED STATES PATENT OFFICE.

WILLIAM H. SWEETLAND, OF SAN DIEGO, CALIFORNIA.

THERAPEUTIC PERCUSSOR.

Application filed August 4, 1924. Serial No. 730,083.

My invention relates to a therapeutic percussor for preparing patients prior to making chiropractic adjustments, and in general for stimulating the flow of blood and for stimulating the action and development of muscle and tissue, and the objects of my invention are: first, to provide a compact and efficient machine of this class which is particularly adaptable for the follow-up therapeutic work in connection with fractures, bruises and the like for stimulating blood circulation and the action and development of muscle and tissue; second, to provide a machine of this class which is substantially noiseless in its operation; third, to provide a machine of this class which has relatively few moving and wearing parts and in which the wearing parts may be easily removed when worn and replaced by others; fourth, to provide a novelly constructed connecting rod and plunger means whereby the positive blow is directed directly against the plunger and not on the means connecting the same with the connecting rod; fifth, to provide a machine of this class in which the power-blow transmitting members are loosely positioned within the casing and are so positioned therein that the same cannot fall out when the cover of the casing is removed; sixth, to provide a novelly constructed casing for a machine of this class; seventh, to provide a novel means for securing the supporting handle to the casing; eighth, to provide a machine of this class of such weight that the same may rest with its whole weight on the body or members of the patient to obtain the desired results, and which is merely guided over the body or members of the patient by the operator; ninth, to provide as a whole a novelly constructed therapeutic percussor, and tenth, to provide a machine of this class which is particularly simple and economical of construction, durable, and which will not readily deteriorate or get out of order.

With these and other objects in view, as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions, as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon, which form a part of this application, in which:

Figure 1 is a sectional elevational view of my therapeutic percussor, with the section taken through 1—1 of Fig. 2, certain parts and portions being shown in elevation to facilitate the illustration; Fig. 2 is a front elevational view thereof, with the cover of the casing partly broken away; Fig. 3 is a fragmentary sectional elevational view thereof, with the section taken through 3—3 of Fig. 1, and Fig. 4 is another sectional view thereof in plan, with the section taken at 4—4 of Fig. 1.

Like characters of reference refer to similar parts and portions throughout the several views of the drawings.

The casing 1, cover 2, screws 3, motor 4, motor shaft 5, drive pinion 6, screw 7, gear 8, gear supporting stud 9, gear positioning member 10, stud 11, roller 12, connecting rod bearing member 13, connecting rod 14, plunger 15, pin 16, bushing 17, stuffing box cap 18, body contact member 19, electric cable 20, handle member 21, screws 22, and the grease plugs 23, constitute the principal parts and portions of my therapeutic percussor.

The casing 1 of my machine is provided at its front side with a hollow portion 1^a in which is positioned the operating mechanism of the machine. At the front side of the casing and over the hollow portion thereof is secured a cover 2 by means of screws 3, which cover is adapted to retain the operating mechanism in position. The casing is provided at the lower portion of its back side with a backwardly extending, cylindrical portion 1^b, which serves as a partial housing for the motor 4, and against the outer portion of which the housing of the motor 4 is secured, preferably by means of bolts 4^a extending through the front of the casing. The shaft 5 of the motor is revolubly mounted in and extends through a bushing 1^c mounted in the wall of and in the lower portion of the casing 1. At the end of the shaft 5 extending into the hollow portion 1^a of the casing is secured a drive pinion 6 by means of a shaft-expanding screw 7. Meshing with the pinion 6 is a large drive gear 8, which is secured at the one end of a stud 9, preferably by being driven thereon, which stud is revolubly mounted at its opposite enlarged end in a bushing 1^d mounted in the wall of the casing 1. The gear 8 is preferably held in engagement with a boss

within the hollow portion of the casing by means of a gear positioning member 10, preferably made of fiber, which is secured at the end of a lug 2^a secured to and extending inwardly from the cover 2, as shown best in Fig. 1. At the side of the gear 8 opposite the stud 9 is driven another stud 11 at a spaced distance from the axis of rotation of the gear. Over the end of the stud 11 extending from the gear 8 is positioned a fiber roller 12, around which is positioned the bearing portion of the connecting rod bearing member 13, preferably of circular construction, with the bearing portion positioned off-center relatively to the axis of the bearing member 13. At the enlarged or thick portion of the member 13 is secured the one end of the connecting rod 14, preferably by means of a pin 14^a. The opposite end of the connecting rod 14 is pivotally connected by means of a pin 16 with the inner end of the plunger 15 reciprocally mounted in a bushing 17 clamped between the lower end of the casing 1 and cover 2.

It will be here noted that the pivotal connection between the connecting rod 14 and the plunger 15 is such that the force of the downward or outward stroke of the connecting rod is directed against the whole end of the plunger and not merely against the small pin 16 connecting the same. The strain on the pin 16 when the plunger moves inwardly is also negligible since the resiliency of the body upon which the machine is used and the resiliency of the body contact member 19 tends to force the plunger inwardly; therefore, the opposing forces at the joint, when the plunger moves inwardly, are substantially compression forces instead of tension. The connecting rod 14 and the plunger 15 are provided at their connected ends, respectively at their outer and inner sides, with circular recesses 14^b and 15^a, concentric with the axis of the pin 16. Into these circular recesses extend correspondingly rounded portions at the ends of the outer and inner sides of the plunger 15 and the connecting rod 14, respectively, thus forming large bearing surfaces and a compact and efficient, as well as durable, pivotal connection between said members.

The opening 1^e at the lower portion of the casing 1, through which the bushing 17 extends, is preferably more than semicircular, as shown best in Figs. 2 and 4 of the drawings, which structure prevents the bushing 17 from falling out sidewise when the cover is removed, and therefore prevents the plunger, the connecting rod and other members from falling out when the cover is removed.

The inner end of the bushing 17 is acutely beveled so as to catch any superfluous oil or grease and retain the same within the casing. The opposite end of the bushing 17 is provided with a stuffing box cap 18 to further prevent oil or grease from leaving the casing around the plunger. At the outwardly extended end of the plunger 15 is secured a body contact member 19 of any suitable or desired construction.

The motor of the machine is connected with a source of electrical energy by means of an electrical cable 20 which extends upwardly through the cylindrical portion 1^b of the casing and outwardly through the hollow handle member 21, as shown best in Fig. 1.

The handle member 21 is provided at its forward end with a downwardly extending enlarged portion 21^a, at the lower and forward end of which are provided oppositely disposed lugs 21^b, which are adapted to extend into slots 1^f at the back side of the casing 1, as shown in Figs. 3 and 4 of the drawings. To secure the handle member 21 to the casing 1, there are provided screws 22 which extend from the inner side of the casing 1 backwardly through the wall thereof into the handle member.

Any suitable means may be employed for lubricating the bearings of the studs and the motor shaft, such as the grease plugs 23, shown in Fig. 1.

It is obvious from this construction, as illustrated in the drawings and disclosed in the specification, that there is provided a therapeutic percussor as aimed at and set forth in the objects of the invention, and though I have shown and described a particular construction, combination and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement, but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

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

1. In a machine of the class described, a casing, a cover for said casing, a toothed drive pinion revolubly mounted within said casing, a toothed drive gear revolubly mounted within said casing and meshing with said drive pinion and provided with an outwardly extending bearing stud spaced from the axis of rotation of said gear, a connecting rod revolubly mounted and loosely positioned at its one end over said bearing stud, a removable stuffing box bushing positioned in a more than semicircular opening in said casing and clamped therein by said cover, and a plunger rod reciprocally mounted in said bushing and pivotally connected with the opposite end of said connecting rod.

2. In a machine of the class described, a casing, a cover for said casing, a drive pinion revolubly mounted within said casing, a

drive gear revolubly mounted within said casing and meshing with said drive pinion and provided with an outwardly extending bearing stud spaced from the axis of rotation of said gear, a connecting rod revolubly mounted and loosely positioned at its one end over said bearing stud, a removable stuffing box bushing positioned in a more than semicircular opening in said casing and clamped therein by said cover, and a plunger rod reciprocally mounted in said bushing and pivotally connected with the opposite end of said connecting rod in such a manner as to prevent the removal of the connecting rod from the bearing stud of the gear without removing said bushing.

3. In a machine of the class described, a casing, a cover for said casing, a drive pinion revolubly mounted within said casing, a drive gear revolubly mounted within said casing and meshing with said drive pinion and provided with an outwardly extending bearing stud spaced from the axis of rotation of said gear, a connecting rod revolubly mounted and loosely positioned at its one end over said bearing stud, a removable stuffing box bushing positioned in a more than semicircular opening in said casing and clamped therein by said cover, and a plunger rod reciprocally mounted in said bushing and pivotally connected with the opposite end of said connecting rod in such a manner as to prevent the removal of the connecting rod from the bearing stud of the gear without removing said bushing, the pivotal connection between said connecting rod and said plunger rod being such that the entire force of the downward stroke of the connecting rod is directed over the whole cross-sectional area of the inner end of the plunger rod.

4. In a machine of the class described, a long casing having a removable cover at its front side and a handle at its upper portion, a motor secured to the lower portion of the back side thereof and having its shaft extended into said casing, a pinion positioned within said casing and secured to said shaft, a gear positioned in the upper portion of said casing in mesh with said pinion and provided with a backwardly extending bearing stud whereby the same is loosely and readily removably mounted in said casing, said gear having at its outer side an outwardly extending bearing stud positioned eccentrically relative to the axis of the gear, said gear being retained in position by a bearing lug extending inwardly from said cover and positioned outside of the path of the eccentric bearing stud of said gear, a connecting rod provided with a large head loosely mounted over said eccentric stud, a bushing clamped between the casing and its cover at their normally lower ends, a plunger reciprocally mounted in said bushing, the inner end of said plunger and the free end of said connecting rod being loosely pivotally connected together whereby the connecting rod may be lifted from the plunger when the bushing is removed, the connecting rod being held in position by the engagement of the free end thereof by the inner end of said plunger.

In testimony whereof, I have hereunto set my hand at San Diego, California, this 22d day of July, 1924.

WILLIAM H. SWEETLAND.