Feb. 7, 1933. L. J. LIPPETT 1,896,731

POWER OPERATED TOOTHBRUSH

Filed Nov. 2, 1927

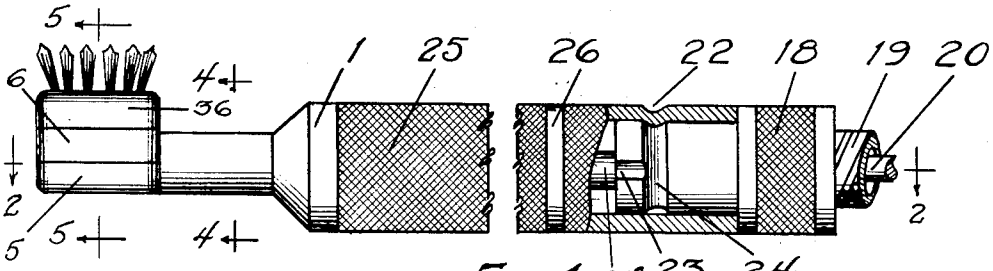


Fig. 1.

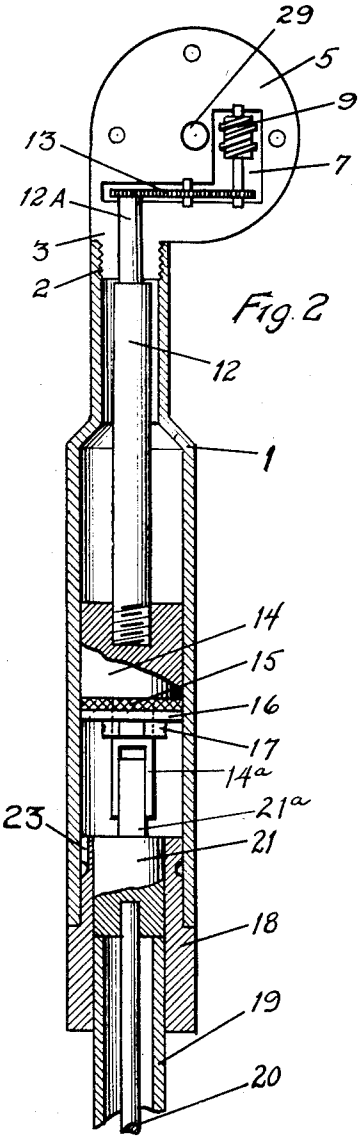


Fig. 2

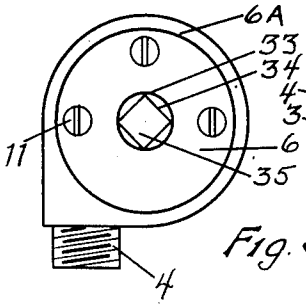


Fig. 3

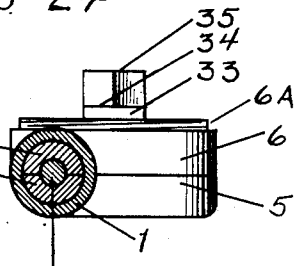


Fig. 4

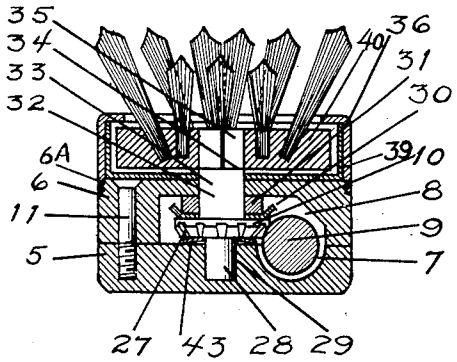


Fig. 5

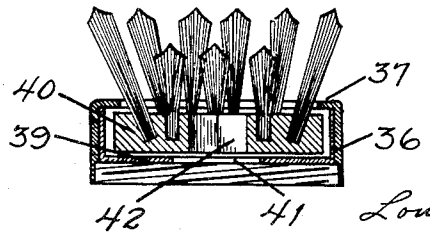


Fig. 6

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Patented Feb. 7, 1933 1,896,731

UNITED STATES PATENT OFFICE

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POWER OPERATED TOOTHBRUSH

Application filed November 2, 1927. Serial No. 230,543.

This invention relates to improvements in power operated tooth-brushes, and it is the object of this invention to provide an instrument which may be held in the hand at any angle or position, the instrument of operation being in itself a detachable unit adapted to be detachably connected to a remote driving unit, and a locking feature forming a part thereof for the purpose of attaching one or more handles to the driving device.

It is a further object of this invention to provide for a large ratio of gear reduction within the handle unit by means of the use of a worm and worm-wheel.

It is also a further object of this invention to provide a tangentially offset gear case so that the inside of the lower front teeth may become more easily accessible; by means of this offset it is possible to place the brush within the mouth behind the lower front teeth and in a position parallel to the ground with the bristles protruding outwardly thereby enabling the user to clean this hitherto inaccessible point in the mouth with certainty and ease.

It is still a further object of this invention to provide a disc brush whose base is completely housed to such an extent that the bristles only, protrude, and can come into contact with the oral cavity and that can be detached from the handle portion as a unit. The base of the disk brush is completely surrounded by a housing which contains a means of attachment to the handle of the device.

A further object of this invention is to provide a device that will accommodate a plurality of handles, each distinctively marked so that one individual may discern his handle from that of another person, these handles being so constructed as to be interchangeable.

In order to more clearly describe my invention, so that its construction and mode of operation can be understood, reference will now be made to the accompanying drawing in which the invention has been illustrated, and in which,

Fig. 1 is a side elevation of the invention partly broken away.

Fig. 2 is an axial section on the line 2—2 of Fig. 1.

Fig. 3 is a plan view of the gear case with the brush and its housing removed.

Fig. 4 is a transverse section on the line 4—4 of Fig. 1 with the brush and its housing removed.

Fig. 5 is a transverse section on the line 5—5 of Fig. 1.

Fig. 6 is a view similar to Fig. 5 but showing only the brush and its housing.

Numeral 1 is a handle portion of several diameters, its smaller end internally threaded at 2 and adapted to receive a threaded boss composed of the semi-cylindrical lugs 3 and 4. The gear case or head-housing is composed of two complemental parts 5 and 6 both of which are internally recessed as shown by numerals 7 and 8 forming thereby a chamber within which are journalled a worm 9 and a wormwheel 10; one or more screws 11 hold complemental parts 5 and 6 in alignment.

The worm 9 is driven by shaft 12A which is the small portion of a shaft 12 journalled in handle 1, the driving connection being shown as comprising one or more pinions 13. The shaft 12 is threaded to receive a combination bearing and clutch member 14. This clutch member 14 rotates within handle portion 1 and has upon its outward end a felt washer 15, a metal washer 16, and a packing nut 17 to prevent grease from exuding therefrom. A flexible shaft housing 19 has an end 18 adapted for detachable connection to the rear end of handle 1, and within housing 19 a flexible shaft 20 is journalled by bearing clutch member 21 which includes a clutch element 21^a adapted to engage a cooperating clutch element 14^a on the clutch member 14 so as to form a driving connection for shaft 12.

The handle portion 1 has an indentation or inwardly directed projection 22 which is adapted for reception in a longitudinal slot 23 in the housing 19, and the inner end of this slot communicates with an annular groove 24 in clutch member 21, which groove is adapted

to receive the indentation 22 so that relative turning of handle 1 and the flexible shaft housing 19 will lock these parts in assembled relation.

The handle portion 1 is knurled or otherwise decorated as shown by numeral 25 and designating annular bands or designs 26 are left in a pattern or patterns to act as designating or distinguishing marks. The worm wheel 10 is a circular disc with teeth 27 cut in its underside which mesh with teeth in worm 9. Placed under the worm wheel is a spring 43 which tends to force the worm wheel upwards and compresses felt washer 31 to form a grease tight seal. Projecting downwards from the worm wheel, and being an integral part thereof, is a bearing member 28 which is journalled in recess 29. Upon the upper side the worm wheel abuts against a metal washer 30 and a felt washer or packing washer 31 for the purpose of grease proofing the head-housing. A shaft 32 integral with the worm wheel projects upwardly therefrom through washers 30—31 and has a round portion 33, a square portion 35 and a shoulder 34 formed by the square portion 35 and circumscribed by the round portion 33 as shown in Figs. 3 and 4. The part 6 of the gear case has an externally threaded projection 6*a* adapted to engage a rush housing 36, Figs. 5 and 6. A cup 39 is mounted in the brush housing, the latter of which is flanged as shown at 37 in order to hold the brush backing 40 and brush in place in the housing, the bristles of the brush being projected through an opening in the housing 36. The cup 39 has a concentric hole 41 in its web or bottom portion to allow for the insertion of the square portion of the drive shaft 32 which protrudes thru the head-housing.

The operation of my device is very simple, the remote driving unit (not shown on drawing) furnishes a rotating power thru the medium of the flexible shaft 20 extending thru housing 19 and terminating in the clutch member 21 which in turn engages the cooperating clutch member 14 for rotating shaft 12. This shaft in turn rotates worm 9 by means of the gears 13, with the worm 9 rotating the worm wheel 10 of which drive shaft 32 is an integral part, so that when a square hole 42 in the backing disc 40 is received over the square portion 35 of the drive shaft and the brush housing is connected to the gear case by the threaded engagement 6A, the entire structure forms an operative unit adapted for rotation of the projecting bristles of the brush when power is applied to the flexible shaft 20.

From the above description it becomes apparent that I have produced a construction by means of which a very compact brush construction is obtained and which is therefore exceedingly well adapted for cleaning the teeth. By means of this construction access may be had to the inside of the upper and lower front teeth as well as the rearmost molars; the tangential alignment feature permits of perfect cleaning of the lower front teeth in particular, and is a decidedly new and novel feature, as is also the completely housed detachable brush base unit.

I would state in conclusion that, while the illustrated example constitutes a practical embodiment of my invention, I do not limit myself to the exact details herein illustrated, since manifestly the same can be considerably varied without departing from the spirit of the invention as defined by the appended claims.

Now having described my invention what is claimed as new is:

1. In a rotary brush, a hollow handle, a casing tangentially offset at one end of the hollow handle, a drive shaft journaled in the casing and projecting therebeyond substantially at right angles to the direction of offset of the casing, a brush mounted on the projecting end of the drive shaft, and a driving connection for the drive shaft mounted in the casing and extending into the hollow handle.

2. In a rotary brush, a casing, a drive snaft journaled in the casing and projecting therebeyond, a brush including a brushing element and a backing, said backing being adapted for axial reception on the projecting end of the drive shaft and adapted for rotation thereby, a housing overlying said brush backing and detachably connected to the casing, said housing providing means for retaining said brush backing on the drive shaft, said brush backing being movable axially of said housing on the shaft, the brush housing having an opening, the brushing element being extended through the opening, and means in the casing for rotating the drive shaft.

3. In a rotary brush, a hollow handle. a casing tangentially offset at one end of the hollow handle, a worm wheel journaled in the casing, a drive shaft projecting therefrom beyond the casing substantially at right angles to the direction of offset of the casing, a brush adapted for mounting on the projecting end of the drive shaft, a worm in the casing operatively engaging the worm wheel, a driving connection for the worm extending into the hollow handle, and means for rotating said driving connection.

4. In a rotary brush, the combination of a brushing element, a housing in which said brush element is rotatably mounted, said housing having an opening arranged axially of the brush through which the bristles of the brush extend, said housing having inwardly projecting annular means for rotatably holding the brush within said housing, and means for attaching said housing to a casing containing driving means for said brush.

5. In a device of the class described, the combination of a brush housing, a brush rotatably arranged therein, said housing having an opening through which the bristles of said brush project, means for rotatably holding said brush within said housing, said means including an element of the brush and an element of the housing and a member extending transversely across the opening, brush housing and brush, the element of said brush being located between said element of said housing and said member, said transverse member having an opening through which a member of a driving means for the brush may be projected to provide a driving connection between said driving means and brush.

6. In a brushing device, the combination of a casing, a member providing a brush housing having an opening through which the bristles of the brush protrude and in which opening the bristles of the brush rotate, said member having means at one end for detachably securing said member to said casing, and said member having means located adjacent said opening for engaging said brush and rotatably holding the brush in said brush housing.

7. In a brushing device, the combination of a casing, a brush and a cylindrical member having an opening arranged axially of said member through which the bristles of the brush project and providing a housing and a support for the brush, said cylindrical member having means at one end for attaching said cylindrical member to said casing by rotation of said member, said cylindrical member having means for holding said brush and said cylindrical member in unitary rotatable relation with each other, driving means for said brush provided in said casing, said brush having means for separably connecting said driving means and brush, said cylindrical member being rotatable relatively to said casing and said brush with the latter in connected relation with said driving means to thereby connect and disconnect said brush and cylindrical member and casing.

8. In a brushing device, the combination of a casing, a brush and a cylindrical member providing a housing for said brush and having an opening axially thereof through which the bristles of said brush project, said cylindrical member having means providing a support for the brush, said brush having a circular back which cooperates with said supporting means, means for holding the brush and cylindrical member in unitary rotatable relation, said cylindrical member having means for attaching said cylindrical member to said casing, driving means for the brush provided in said casing, and said brush having means for completing a connection between said brush and driving means.

9. In a brushing device, the combination of a brush having a circular back, and a cylindrical housing for said brush, said cylindrical housing having annular means at one end for rotatably supporting the brush relatively to said housing and means extending transversely of said cylindrical member cooperating with said annular means to thereby hold said brush and housing in unitary and rotatable relation, said housing having means for attaching the housing to a casing, and said brush having means for connecting said brush with driving means.

10. A mounting for a brush having a disc-like back, said mounting comprising a cylindrical housing rotatably enclosing and supporting said back and having an axial opening through which the bristles of said brush project, and means for rotating said brush.

In testimony thereof I affix my signature hereto.

LOUIS J. LIPPETT.