To all whom it may concern:

Be it known that I, Herman W. Braunbeck, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Rotary Operating Mechanism, of which the following is a specification.

This invention relates to dental cleaners and has particular application to a rotary tooth brush.

The paramount characteristic of this invention resides in the provision of a device of this character having a combined swinging and rotary means for imparting a continuous rotary motion to the brush.

Another important object of this invention resides in the provision of a device of this character which may be operated by one hand, a lever being conveniently mounted upon the brush and adapted to be rocked by the fingers whereby continuous rotary motion will be imparted to the brush.

Another object of this invention is to provide a gum shield for the brush which is detachably mounted whereby the brush may be removed for cleaning or other purposes.

Other objects of the invention will appear as the specification is read in connection with the accompanying drawings, in which:

Figure 1 is a side elevation of the brush constructed in accordance with my invention. Fig. 2 is a side elevation of the brush showing the casing and parts of the mechanism in section. Fig. 3 is a detail view of one of the collars. Fig. 4 is a detail view of the shaft.

Referring to the drawings in detail 1 designates a cylindrical casing which is formed of any suitable metal and which has one of its ends closed as at 2. Journeled in the casing and extending longitudinally of the same is a shaft 3 which has one end thereof mounted within a bearing 4 formed on the inner face of the closed end of the casing, while the opposite end is journeled in a bearing 4' arranged at the open end of the casing. Keyed upon the opposite extremities of the shaft 3 are a pair of disks 5, the confronting faces of which are toothed as at 6. Loosely mounted upon the shaft are a pair of cylindrical sleeves 7 which have their outer surfaces provided with spirally arranged flanges 8, the flanges upon one sleeve being arranged clockwise, while the flanges upon the remaining sleeve are arranged anti-clockwise. The outer edges of each of the sleeves 7 are toothed as at 9 and are adapted to engage the teeth 6 upon the confronting faces of the disks. Encircling the shaft 3 and interposed between the confronting faces of the sleeves 7 is a coil retractile spring 10 which is adapted to exert its tension to move the sleeves in opposite directions upon the shaft so as to cause their toothed edges 9 to normally engage the toothed disks 5. Loosely mounted upon each of the sleeves 7 are a pair of cylindrical collars 11 which have their inner surfaces provided with spirally arranged grooves 12. These grooves 12 are adapted to receive the flanges 8 upon the respective sleeve so that when the collars 11 are moved longitudinally upon the sleeve a rotary motion will be imparted to the latter as will be understood. The collars 11 are each provided with a pair of alined ears 13, the ears on one collar receiving one extremity of a rod 14 while the ears upon the remaining collar engage the rod at a point adjacent its opposite end. Thus it will be seen that the collars are held against rotation by means of the rod so that when the collars are moved upon the sleeves as has been described the sleeves will rotate in opposite directions, while the collars will remain stationary as regards rotation. The rod 14 extends longitudinally of the casing and has its outer end terminating adjacent a slot 15 formed in the casing. Pivotedly connected to the outer end of the rod is one end of a bell crank lever 16, the lever being fulcrummed upon a pair of ears 17 formed on the outer wall of the casing. The bell crank lever 16 is so arranged upon the casing as to cause the free arm of the lever to extend rearwardly from the open end of the casing, the free end of the lever being provided with a finger guard 18 which extends radially from the casing.

It will be seen from this construction that when the lever 16 is rocked upon its pivot, a reciprocating motion will be imparted to the collars 11 from the medium of the rod 14 whereby the sleeves 7 will be caused to
rotate in opposite directions. Now assuming that the free end of the lever 16 has been moved outwardly from the casing the opposite end of the lever will be moved longitudinally of the casing to cause a longitudinal movement of the rod 14 thus imparting a similar movement to the collars 11 in a direction toward the closed end of the casing. Owing to the fact that the walls of the grooves 12 on each of the collars will frictionally engage the flanges 8, the sleeves will be moved in the same direction as the collars for a short distance so as to cause the toothed edge 9 of the inner sleeve to engage the teeth 6 upon the inner disk, while the remaining outer sleeve will be moved to cause its toothed edge to disengage the teeth in the other disk 5. Thus it will be seen that the inner sleeve being in engagement with the shaft that when the sleeve is rotated under the action of the adjacent collar, a similar movement will be imparted to the shaft. But the other sleeve although being rotated under the action of the adjacent collar, it not being in engagement with the adjacent disk will not hinder the operation of the remaining sleeve or shaft. It is to be understood that the outer sleeve is moved against the tension of the coil spring so that when a reversed motion is imparted to the lever 16 the coil spring will assist in moving the outer sleeve into engagement with the adjacent disk. The outer end of the shaft is provided with a threaded bore 19 which is adapted to threadedly receive one extremity of a brush shank 20, the bristles 21 of the brush extending radially from the shank as is clearly shown in the drawings. The outer end of the casing 23 has its inner face threaded at 22 to receive a shield 23, the shield being cylindrical and provided with an opening 24 through which the bristles 21 are adapted to extend. The outer end of the brush shank 20 is journaled within the outer end of the shield 23 so that it will thus be seen that the brush shank 20 may rotate with the shaft 3. It will be seen from this construction that the shield 23 may be removed from the casing to permit the removal of the brush whereby the latter may be cleaned or a new one substituted in case it has become worn or broken. In this embodiment of my invention I have shown the casing provided at convenient points with orifices 25 whereby the mechanism within the casing may be lubricated.

In practice the tooth brush is gripped by the casing which forms a handle, while certain of the fingers are passed through the finger guard 18 of the bell crank lever 16. Upon movement of the fingers, the bell crank lever will be rocked upon its pivot so as to cause a rotary motion of the sleeves 7 alternately, through the medium of the collars 11 and the rod 14 whereby a continuous rotary motion will be imparted to the shaft and consequently to the brush. The brush is inserted into the mouth in the usual manner, the shield 23 serving to prevent the brush from coming in contact with the gums, lips or tongue.

From the foregoing description it will be seen that I have provided a continuously rotating tooth brush, the mechanism being operated by a motion similar to that used in actuating shears, scissors or the like, and furthermore a tooth brush which will be effectively guarded to shield the mouth of the operator during the rotation of the brush.

It is thought from the foregoing taken in connection with the accompanying drawings that the construction and operation of my device will be apparent to those skilled in the art without further description, and that minor changes in size, shape, proportion and minor details of construction may be made without departing from the spirit and scope of the appended claims.

What I claim:

1. A mechanical movement a shaft mounted for rotary motion, clutch members mounted on said shaft, sleeves slidably mounted upon the shaft and engageable with said clutch members, a lever arranged adjacent said shaft, and means operable from said lever and mounted upon said sleeves for rotating and moving said sleeves to alternately engage the clutch members whereby a continuous rotary motion will be imparted to the shaft.

2. In a mechanical movement a casing, a shaft mounted for rotary motion journaled in the casing, clutch members keyed to the shaft at the opposite extremities thereof, spirally flanged sleeves loosely mounted on the shaft, the flanges upon one sleeve extending in a direction opposite to the flanges upon the remaining sleeve, a spring mounted upon said shaft and interposed between said sleeves, said sleeves adapted to normally engage said clutch members under the action of said spring, collars mounted on each of said sleeves and having their inner faces formed with spirally arranged grooves, said grooves receiving said flanges, and a lever fulcrumed exteriorly of the casing and connected to said collars.

3. In a mechanical movement a casing, a shaft mounted for rotary motion journaled in the casing, toothed disks rigidly mounted upon the opposite ends of the shaft, spirally flanged sleeves loosely mounted upon the shaft, the flanges of one sleeve extending in a direction opposite to the flanges of the remaining sleeve, teeth formed on the outer ends of each of said sleeves and engageable with said disks, a spring mounted upon the shaft and interposed between the confront-
ing ends of the sleeves, collars mounted upon each of said sleeves and having grooves formed therein adapted to receive said flanges, a rod connecting said collars, and a lever arranged exteriorly of the casing and projecting into the casing, said lever being pivotally connected to said rod.

In testimony whereof I affix my signature in presence of two witnesses.

HERMAN W. BRAUNBECK.

Witnesses:

WILSON LYFORD,
PETER FALCONER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."