

May 3, 1949.

F. B. COOPER

2,469,261

TEETH CLEANING ASSEMBLY

Filed May 5, 1947

2 Sheets-Sheet 1

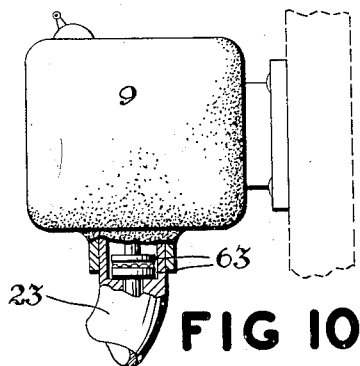


FIG 10

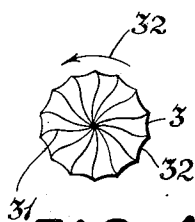


FIG 4

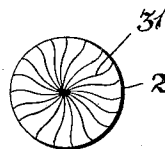


FIG 3

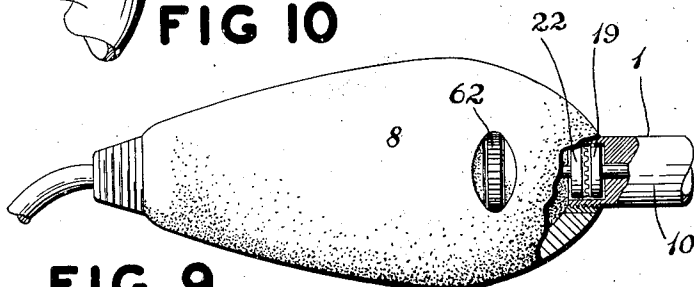


FIG 9

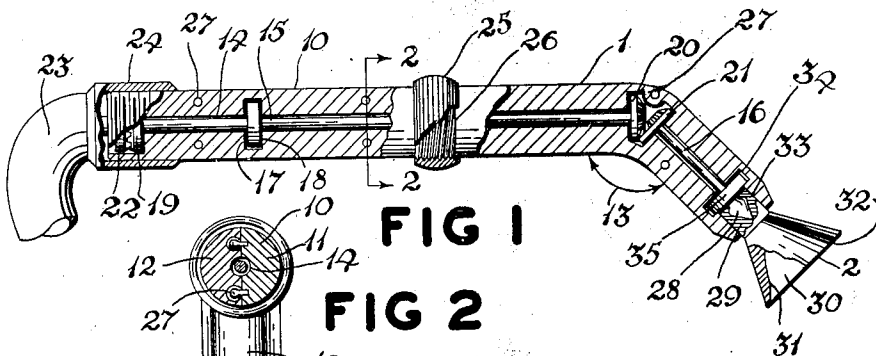


FIG 1

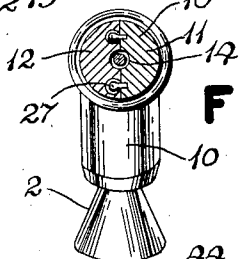


FIG 2

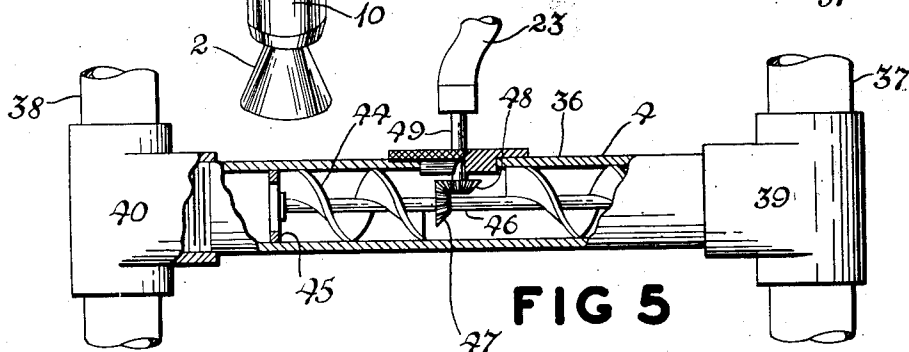


FIG 5

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2 Sheets-Sheet 2

FIG 6

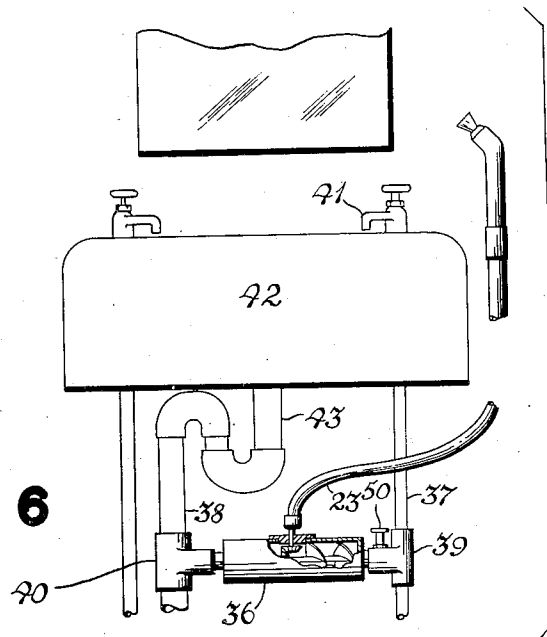


FIG 7

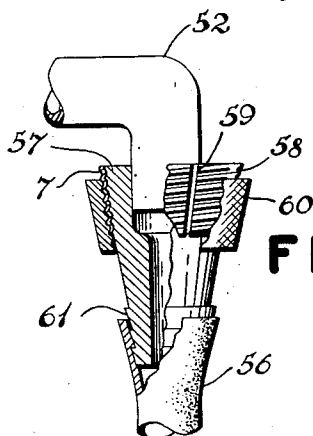
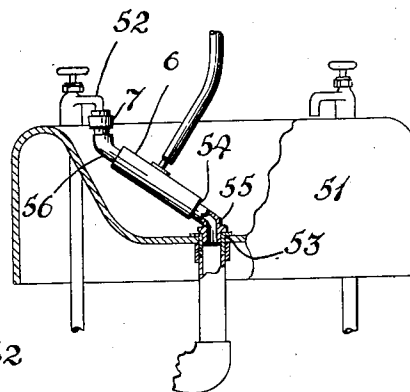


FIG 8

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## UNITED STATES PATENT OFFICE

2,469,261

## TEETH CLEANING ASSEMBLY

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Application May 5, 1947, Serial No. 746,111

4 Claims. (Cl. 32—59)

1

My invention relates to teeth cleaning assemblies, an object of the invention being to provide an assembly of the character herewithin described by means of which teeth may be more scientifically cleaned and stains and film removed therefrom than is the case with conventional cleaning methods.

A further object is to provide means for cleaning teeth by the use of which the fissures between adjacent teeth may be more satisfactorily cleaned, as well as under the free margin of the gums and without irritation thereto.

A further object is to provide means whereby a high lustre may be imparted to the teeth, and at the same time the removal of stains therefrom, and all without damage to the enamel or irritation of the gums so that the possibility of dental decay and mouth diseases may be materially reduced.

A further object is to provide means for cleaning the teeth which will materially reduce the quantum of manual effort involved, and which manual effort, as for example when expended in the use of a conventional tooth brush is generally misapplied in ways which not only fail adequately to clean the teeth, but are liable to damage the teeth.

With the foregoing objects in view, and such other objects and advantages as will become apparent to those skilled in the art to which this invention relates as this specification proceeds, my invention consists essentially in the arrangement and construction of parts all as hereinafter more particularly described, reference being had to the accompanying drawings in which:

Figure 1 is a sectional representation of my handpiece.

Figure 2 is a view of my handpiece on the line 2—2 of Figure 1.

Figure 3 is a basal projection of the applicating element depicted in Figure 1.

Figure 4 is a basal projection of an alternative form of applicating element.

Figure 5 is a predominantly sectional representation of my hydraulic turbine power-source.

Figure 6 illustrates the hydraulic turbine of Figure 5 in situ with respect to the plumbing arrangement of an associated wash basin.

Figure 7 is an illustration of a hydraulic turbine designed for location between a water faucet and discharge duct.

Figure 8 is a predominantly sectional representation of the faucet connector employed in connection with the embodiment of Figure 7.

Figure 9 is an illustration of a manually oper-

2

able electric motor to which the handpiece of Figure 1 may be directly attached.

Figure 10 is an illustration of a wall-mounted electric motor to which a flexible shaft may be connected leading to my handpiece as per Figure 1.

In the drawings like characters of reference indicate corresponding parts in the different figures.

My teeth cleaning assembly comprises the following main parts: The handpiece collectively designated 1 in the accompanying Figure 1, a rotary applicating element collectively designated 2 as depicted in Figures 1 and 3 with an alternative embodiment 3 depicted in Figure 4, the source of power in the form of a hydraulic turbine collectively designated 4 in Figure 5, or the alternative embodiment 6 thereof in Figure 7, and the faucet connector collectively designated 7 in Figure 8 for use with the embodiment of power source designated 6.

Alternatively to the turbines of Figures 5 and 7 I may employ either the manually operable electric motor collectively designated 8 in Figure 9, or the wall-mounted motor collectively designated 9 in Figure 10.

Proceeding first to described my handpiece 1, the same in detail is to be understood as comprising an elongated casing collectively designated 10, which is diametrically and longitudinally bisected into the parts 11 and 12. The aforesaid casing is angulated as designated by the arc 13 to 135 degrees, and has extending through the length thereof an open ended aperture 14 receivable within which are primary and secondary drive shafts 15 and 16 respectively.

An annular recess 17 is formed in the aforesaid casing concentrically with respect to aperture 14 to receive collar 18 which is secured for rotation to shaft 15. By the agency of recess 17 and collar 18 I am able to prevent shaft 15 from end-play. Upon one end of shaft 15 is a small crown gear 19, and at the other end a bevelled pinion 20, which latter meshes with a similar pinion 21 keyed to the secondary shaft 16.

Gear 19 meshes with a similar gear 22 connected to a conventional flexible shaft generally indicated by numeral 23 connected to a source of power. That end of the casing 10 to which flexible shaft 23 is connected is united as to the parts 11 and 12 thereof by the internally screw-threaded sleeve 24. Intermedially on the casing-length, an internally screw-threaded collar 25 is provided engageable with the external thread-stand portion 26 of my casing 10. The two parts 11 and 12 are thus sustained in symmetrical con-

3

tiguity, and additionally so by the pairs of aligning studs and mating recesses collectively designated 27.

To the opposite end of secondary shaft 16 to that to which pinion 21 is connected is secured a pointed element 28 attachable to which is what I designate as the combined attaching head and packing gland 29 of the applying element 2. This applying element consists of a nipple or cup portion 30 having a conoid and spirally striated crater 31, and is intended to be rotated in the direction of arrow 32 whereby it is to be understood that dentrifice within the crater is prevented from being thrown outwardly by centrifugal action.

In Figure 4 I have depicted a slightly modified form of applying element wherein the basal perimeter 32' is scalloped to accomplish, according to my belief, a better cleaning action between the teeth.

The head and gland portion 29 of my applying element which constitutes the apical end of the element is receivable within the annular recess 33 provided therefor in the end of casing 10, and it will be understood that in use, the resilient material of which the element 2 is formed—preferably rubber—will expand against the wall of recess 33 thus tending to prevent leakage of dentrifice into the interior of the casing. To facilitate such expansion so as to increase the frictional co-efficient between the gland 29 and the shaft to which it is attached, I provide within the annular recess 34 an annular metal platform or disc 35 which, with the pointed element 28 is secured rotatably to shaft 16. Thus the inner end surface of gland 29 will in use bear against the adjacent surface of disc 35 for the purpose aforesaid.

My hydraulic turbine for operating the aforesaid handpiece consists of an elongated cylindrical or tubular casing 36 connected at one end thereof with a fluid input duct 37, and at the other with a discharge duct 38 via the T unions 39 and 40. Duct 37 may be the type supplying water to faucet 41 of the bathroom fixture collectively designated 42, while duct 38 can be the waste pipe 43 of such fixture.

Rotatably mounted within the tube 36 is an Archimedean screw 44 which may be sustained against end-shifting by means of the rings 45 against which the ends of the flight of the aforesaid screw may bear as clearly depicted in the accompanying Figure 5. Upon the midpoint of the screw-core or shaft 46 is a bevelled gear 47 designed to mesh with a similar gear 48 keyed to shaft 49 projecting through tube 36 at right angles to the axis thereof and operatively united to flexible shaft 23 which I have already described in connection with my handpiece in Figure 1.

A petcock 50 may if desired be provided at any desired location such as I have illustrated in Figure 6 and from the foregoing it will be apparent that when the petcock is opened, water will flow through my turbine into the waste pipe or duct 38 thus operating the screw 44 and so imparting movement to flexible shaft 23, the shafts of my handpiece 1, and the teeth applying element 3 mounted thereon.

In Figure 7 I have illustrated a slightly modified form of hydraulic turbine capable of being quickly attached and detached within a bathroom wash basin 51 between a faucet 52 and the spaced aperture 53 of the basin. Structurally this embodiment is identical with that depicted in Figure 5, but the discharge end 54 is in this case

4

provided with a resilient fitment 55 leading into the aforesaid aperture 53 while a flexible nozzle 56 is provided at the input end to unite with the faucet connector of Figure 8 and which I have collectively designated 7.

The connector 7 in detail consists of an externally screw-threaded and conoid adaptor 57 of resilient material such as rubber, this adaptor being frictionally attachable to the faucet. Around the adaptor extends a screw-threaded and split thimble or shell 58 of thin and yieldable material such as brass, the split therein being indicated at 59. Designed to extend around the aforesaid thimble is a tightening ring 60, the interior surface whereof is screw-threaded and conoid to engage the aforesaid thimble whereby the large end of my adaptor may be progressively tightened on the faucet 52.

On the small end of the adaptor 57 I provide any conventional means such as the annularly ratchetted configuration 61 for the secure attachment of pipe 56 thereto. With such an arrangement as I have just described it will be apparent that I am able to attach the hydraulic turbine of Figure 7 to virtually any wash-basin faucet likely to be encountered, as it will be recognised that these differ widely as to shape and size etc.

In the accompanying Figure 9 I have indicated my handpiece 1 as being directly connected to the manually operable electric motor 8 via the gears 19 and 22 already described. This arrangement eliminates the use of a flexible shaft 23, and the motor may be quickly stopped and started by means of the thumb screw 62. In Figure 10 I have depicted a wall mounted motor wherein flexible shaft 23 is connected thereto by means of the pair of gears collectively designated 63.

Since many modifications can be made in the invention herein described and since the accompanying drawings have been prepared only to illustrate the relative arrangement and interaction of parts and not with regard to accuracy of dimensions for manufacturing purposes which in view of this disclosure I consider to entail merely mechanical skill together with the skill of the mechanical draftsman, and since many apparently widely different embodiments of this invention may be made within the spirit and scope of the accompanying claims without departing from such spirit and scope, it is intended that all matter contained in the accompanying specification shall be interpreted as illustrative only and not in a limiting sense and I desire only such limitations placed thereon as justice dictates.

What I regard as my invention is:

1. A teeth cleaning assembly comprising in combination with a source of power, a handpiece and a rotary applying element attached thereto, said handpiece embodying an elongated, longitudinally and diametrically bisected casing angulated as approximately 135 degrees towards one end thereof and having an open-ended aperture extending therethrough to receive a primary and secondary drive shaft, a collar on said primary drive shaft positioned within an angular recess formed in said casing, said collar and recess functioning to sustain said shaft against end-shifting, means for maintaining the two parts of said casing in symmetrical contiguity, said element being secured to the end of said secondary drive-shaft.

2. The assembly according to claim 1 which includes an annular recess in said casing adjacent the end of said secondary shaft and co-axial therewith, a disc around said secondary shaft

5

within said recess, a combined attaching head and packing gland on the apical end of said element, said head bearing against said disc during the teeth-cleaning operation to prevent the leakage of dentifrice therepast as herewithin set forth.

3. In combination, a teeth cleaning assembly comprising as a source of power an hydraulic turbine, a handpiece operatively connected thereto, and a rotary applicating element attached to the latter, said turbine embodying a tubular casing connected at one end with a fluid input duct and at the other with a discharge duct, an Archimedean screw rotatably positioned within said casing, a bevel gear carried by said screw, a second bevel gear in mesh therewith, a flexible shaft operatively connected to said second bevel gear, said flexible shaft being connected at the opposite end thereof to said handpiece, said handpiece embodying an elongated, longitudinally and diametrically bisected casing, angulated at approximately 135 degrees towards the one end thereof and having an open-ended aperture extending therethrough to receive a primary and secondary drive shaft, a collar on said primary drive shaft positioned within an annular recess formed in said casing, said collar and recess functioning to sustain said shaft against end-shifting, means for maintaining the two parts of said casing in sym-

6

metrical contiguity, said element being secured to the ends of said secondary drive shaft.

4. In combination with the assembly according to claim 3 a faucet connector consisting of an externally conoid adapter frictionally attachable to said faucet, a screw-threaded and split thimble on the large end thereof, a tightening ring, the interior surface of said ring being conoid and screw-threaded to engage said thimble whereby the large end of said adaptor may be progressively tightened on said faucet, and means on the small end of said adaptor for the attachment of said fluid input duct.

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#### REFERENCES CITED

The following references are of record in the file of this patent:

#### UNITED STATES PATENTS

| Number    | Name   | Date         |
|-----------|--------|--------------|
| 1,907,286 | Chott  | May 2, 1933  |
| 2,063,801 | Gano   | Dec. 8, 1936 |
| 2,202,299 | Pelkey | May 28, 1940 |

#### OTHER REFERENCES

"Dental Survey," for January 1934, page 81, advertisement of Wiseman Bros. Specialty Co.