

[54] **PROPHY ATTACHMENT FOR DENTAL CONTRA-ANGLE**

[76] Inventor: **John J. Condon**, N. 5901
Lidgerwood, Spokane, Wash. 99207

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[58] Field of Search **32/27, 28, 58, 59**

[56] **References Cited**

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Primary Examiner—Louis G. Mancene

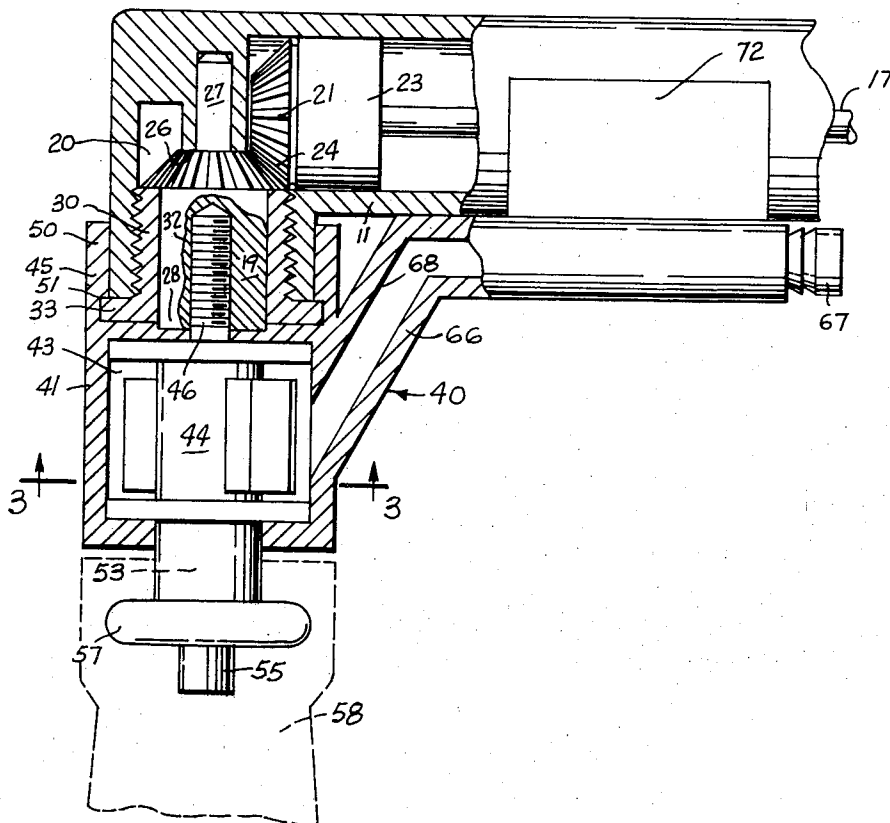
Assistant Examiner—J. Q. Lever

Attorney—Greek Wells et al.

[57] **ABSTRACT**

A prophy attachment is described for snapping onto a contra-angle for enabling the dentist to polish or abrasively clean a patient's teeth. The prophy attachment has a cavity formed therein for receiving prophy paste from a source. A prophy shaft extends through the cavity with one end connectable to the output shaft of the contra-angle and the other end for receiving a hollow prophy paste cup. A passageway extends through the attachment shaft with an opening in the cavity and another opening at the hollow prophy paste cup. Vanes are affixed to the attachment shaft for forcing prophy paste into the passageway and into the prophy cup as the shaft is rotated by the contra-angle.

6 Claims, 7 Drawing Figures



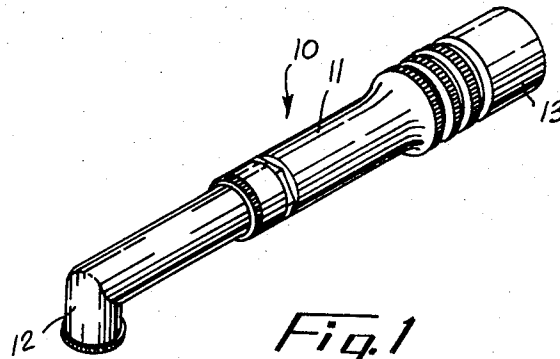
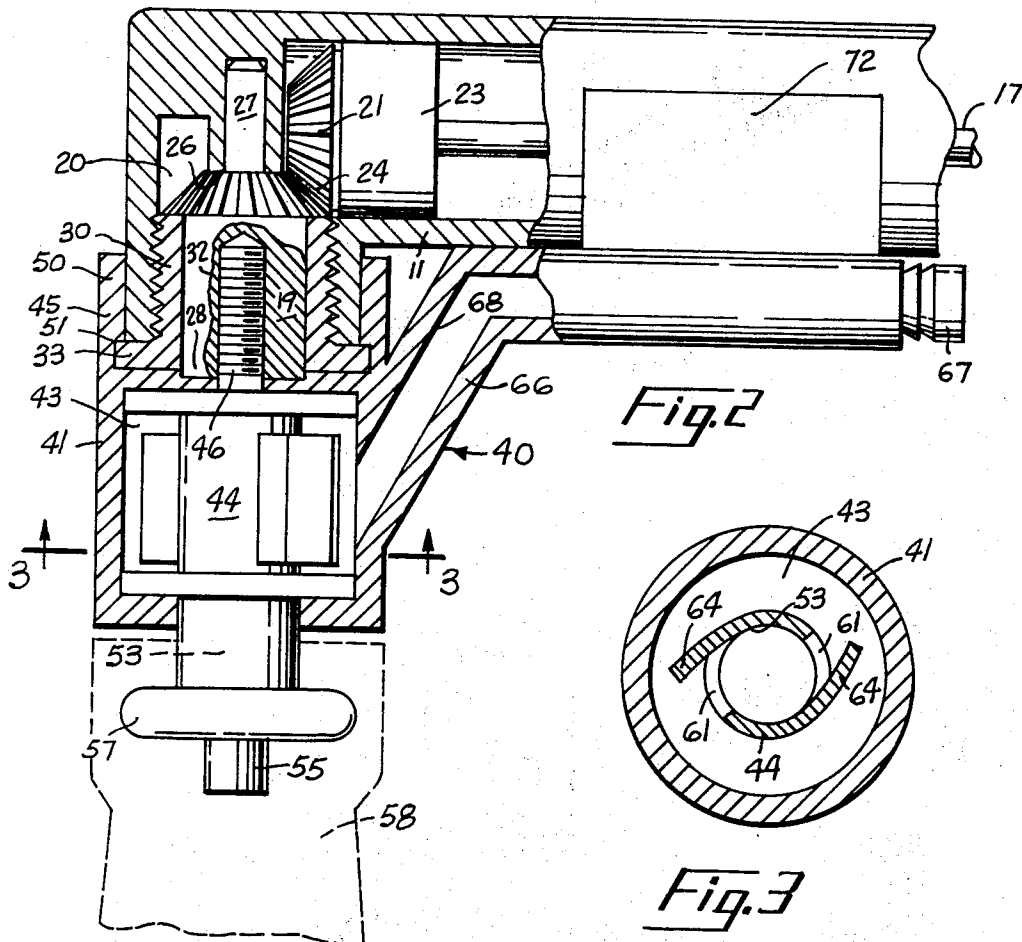
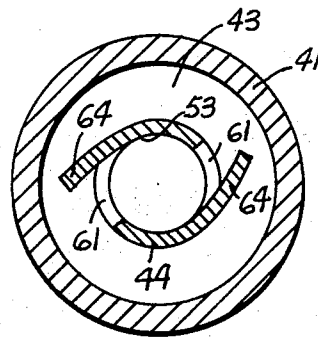


Fig. 4

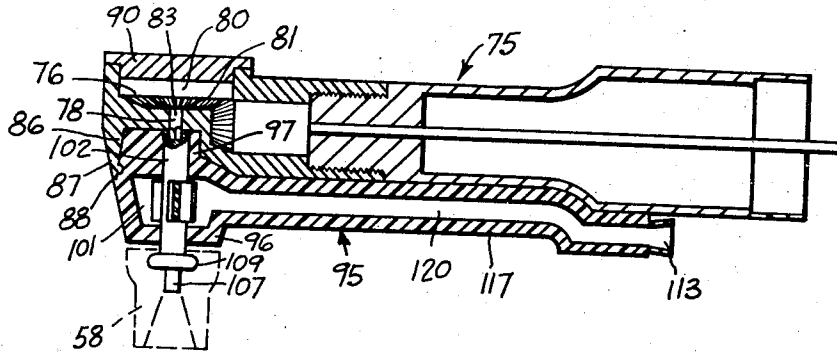
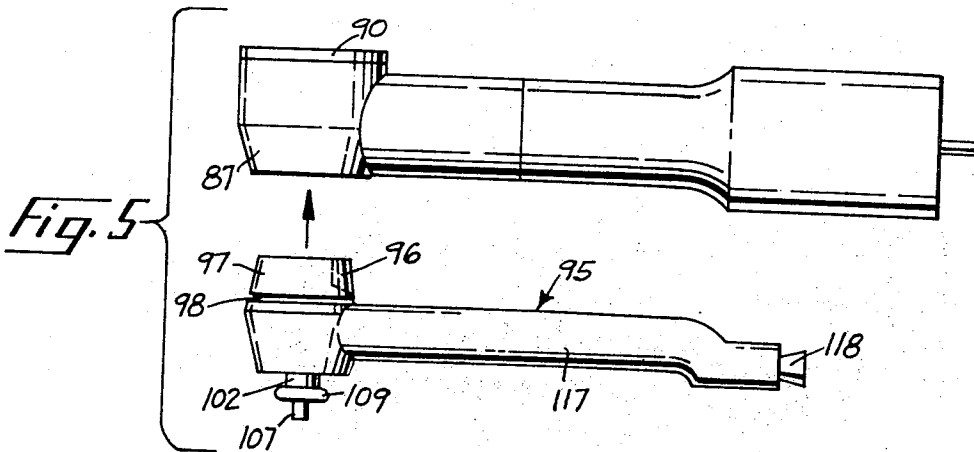
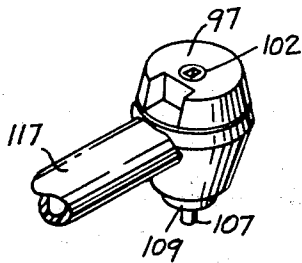


Fig. 6

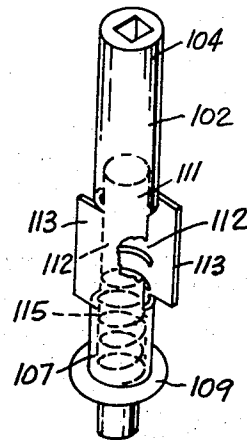


Fig. 7

PROPHY ATTACHMENT FOR DENTAL CONTRA-ANGLE

BACKGROUND OF THE INVENTION

This invention relates to dental contra-angles and more particularly to prophy attachments attachable to the contra-angles for polishing teeth.

Most teeth polishing and cleaning procedures are accomplished utilizing a tool that includes a prophy contra-angle mounted on a standard dental handpiece with a flexible prophy cup mounted on the prophy contra-angle to receive prophy paste. Generally, a batch of the prophy paste composition or abrasive material is made up for each patient and placed in a prophy paste container. The dentist or assistant dips the end of the flexible prophy cup into the container to scoop up some of the prophy paste. The operator then inserts the tool into the mouth of the patient with the prophy cup bearing against the surface of the tooth. The handpiece is then operated to rotate the prophy in a lapping fashion to polish and abrasively clean the teeth or the tooth surface. As need be, additional amounts of the prophy paste are scooped out of the container. Usually the tooth polishing and cleaning operation requires two persons to perform the operation. The dentist has an assistant to hold either the prophy container or a vacuum tube which is utilized to remove saliva and excess paste from the patient's mouth. The dentist will hold the handpiece with one hand and the vacuum line with the other while his assistant is holding the prophy container. If the dentist is short of help, he may call upon the patient himself to hold the prophy container to alleviate the need for the assistant being present. When the patient holds the prophy container, the procedure becomes somewhat awkward. When additional prophy paste is needed, the dentist must lay down the vacuum tube with one hand and pick up the prophy container and dip the end of the prophy contra-angle into the cup to replenish the prophy cup with the prophy paste. He then puts down the prophy container to free one hand to be able to pick up the vacuum tube before continuing the prophy procedure. Not only is this a rather awkward procedure, but is quite time consuming.

Furthermore, it is generally necessary for the dentist to purchase a number of special contra-angles for each particular use. The contra-angles are rather expensive because of the precision machinery required to endure the high speeds at which they operate.

One of the principal objects of this invention is to provide a prophy attachment for a contra-angle that overcomes the above mentioned problems.

An additional object of this invention is to provide a prophy attachment that may be attached to conventional contra-angles thereby eliminating the necessity of purchasing special purpose contra-angles.

A further object of this invention is to provide a prophy attachment for a contra-angle that is easily attachable to the contra-angle and easily removed.

An additional object of this invention is to provide a unique prophy attachment having mechanisms for pumping the prophy paste into the interior of a prophy cup mounted thereon.

These and other objects and advantages of this invention will become apparent upon the reading of the following detailed description of a preferred embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred and alternate embodiment of this invention is illustrated in the accompanying drawings, in which:

FIG. 1 is a perspective view of a conventional contra-angle for attaching to a dental handpiece in which the contra-angle has a right angle drive;

FIG. 2 is a fragmentary vertical cross-sectional view through an end of the contra-angle illustrating the affixment of a prophy attachment thereto embodying the principal features of this invention;

FIG. 3 is a cross-sectional view taken along line 3—3 in FIG. 2 illustrating the interior of a portion of the prophy attachment;

FIG. 4 is a vertical cross-sectional view of an alternate embodiment illustrating an alternate prophy attachment for attaching to an alternate type contra-angle;

FIG. 5 is an exploded side view of the contra-angle and prophy attachment illustrated in FIG. 4 with the prophy attachment being separated from the contra-angle;

FIG. 6 is a fragmentary perspective view of a portion of the prophy attachment illustrated in FIGS. 4 and 5; and

FIG. 7 is a fragmentary perspective view of a prophy attachment shaft that is a portion of the prophy attachment illustrated in FIGS. 4 and 5.

DETAILED DESCRIPTION OF THE PREFERRED AND ALTERNATE EMBODIMENT

Referring now in detail to the drawings, there is illustrated in FIG. 1 a conventional contra-angle 10 having a barrel housing 11 with a front end 12 and a rear end 13. The contra-angle 10 is mountable to a dental handpiece (not shown). Specifically, the contra-angle is mounted to the dental handpiece at the rear end 13. The contra-angle 10 has an input shaft 17 and an output shaft 19. The shafts 17 and 19 extend into a right angle cavity 20 that has a right angle drive 21. The input shaft has an enlarged shaft section 23 with a beveled gear 24 formed on the face thereof. A beveled gear 26 is formed on the output shaft 19 in meshing engagement with the beveled gear 24. Input and output shafts 17 and 19 are at right angles to each other. The output shaft 17 has a stud support shaft 27 extending upward from the beveled gear 26. The output shaft 19 has an end 28 that extends from the bottom of the contra-angle housing 11. The output shaft 19 is rotatably supported in a retaining collar 30 that is threadably mounted to the barrel housing as illustrated in FIG. 2.

The output shaft end 19 has a threaded bore 32 formed therein to receive various dented tools. The retaining collar 30 has enlarged annular should 33 that extends radially outward slightly beyond the periphery of the barrel housing 33.

The principal feature of this invention is a prophy attachment 40 for attaching to the contra-angle 10 to enable the dentist or his assistant to utilize the contra-angle for polishing or abrasive cleaning patient's teeth. The prophy attachment 40 has a body or housing 41 with a cavity 43 formed therein. A prophy attachment shaft 44 is rotatably mounted in the body 41 extending through the cavity 43. The shaft 44 has a reduced end 46 that is threaded for being received in the threaded bore 32 of the output shaft of the contra-angle 10.

The body 41 has a socket 45 for receiving the bottom of the contra-angle and particularly the enlarged annular collar 33. The socket 45 includes a flexible annular skirt 50 that extends upward from the body 41. An annular groove 51 is formed on the interior of the skirt 50 to receive the enlarged shoulder 33 to enable the prophylactic paste attachment to be snapped onto the contra-angle and to prevent the prophylactic attachment 40 from being inadvertently removed.

The prophylactic attachment shaft 44 has an axial passageway 53 formed therein that extends from the cavity 43 to a projecting end 55 that extends from the body 41. The projecting end 55 has an enlarged shoulder section 57 that extends radially outward for receiving a hollow prophylactic cup 58 illustrated in dotted line thereon.

The shaft 44 has a plurality of radial openings 61 formed therein communicating between the axial passageway 53 and the cavity 43 to permit prophylactic paste to flow through the radial opening 61 and the axial passageway 53 into the interior of the prophylactic cup 58. Vanes 64 are fixed to the shaft 44 adjacent the radial opening 61 to direct prophylactic paste into the openings as the shaft 44 is rotated. The vanes 64 extend outward and forward in the direction of rotation to serve as a pump mechanism for pulling prophylactic paste through the prophylactic attachment.

The prophylactic paste attachment body 41 has a conduit section 66 that extends along the barrel housing 11 of the contra-angle terminating at a supply end 67 that is connected to a prophylactic paste supply (not shown). A passageway 68 is formed in the conduit section 66 extending from the supply end 67 to the cavity 43.

In addition to the flexible socket 48, the prophylactic attachment has a releasable clip 72 formed therein to assist in releasably securing the prophylactic attachment 40 to the contra-angle.

An alternate embodiment is illustrated in FIGS. 4-7. The alternate embodiment illustrates a contra-angle along the output shaft. The contra-angle 75 has a right angle drive cavity 76 formed therein that is open at the top. The contra-angle 75 has an output shaft 78 removably mounted in the cavity 76. The output shaft 78 has an enlarged section 80 with a beveled gear face 81. The output shaft has a reduced section 83 that extends downward from the beveled gear face 81 terminating in the square cross-section that projects from the contra-angle 75. The contra-angle 75 has a socket 86 with a flexible annular tapered skirt 87 that extends downward and inward about the end of the output shaft 78. The skirt 78 has an annular rib 88 formed on the interior thereof.

The cavity 76 enclosed by a removable top cap 90 that encloses the cavity and prevents the output shaft 78 from moving axially.

The alternate embodiment includes a prophylactic attachment 95 having a body or housing 96. The body 96 has an upper projecting section 97 that is complementary to the socket 86. An annular groove 98 is formed in the upper section 97 to receive the annular rib 88 and to secure the prophylactic attachment 95 to the contra-angle. The body 96 is tapered downward in cross-section to reduce the size of the prophylactic cup 58.

The prophylactic attachment 95 has a cavity 101 formed therein. A prophylactic attachment shaft 102 is rotatably mounted in the body extending through the cavity 101. The prophylactic attachment shaft 102 has an upper end 104 for operatively connecting to the output shaft 78 of the

contra-angle. The end 104 has a recess formed therein with a square cross-section to accommodate the projecting end of the output shaft 78 as illustrated in FIG. 4. The prophylactic attachment shaft 102 extends downward from the end 104 through the cavity 101 to a projecting end 107. The projecting end 107 has an enlarged shoulder 109 for receiving the prophylactic cup 58. An axial passageway 111 extends axially through the shaft from the cavity 101 through the projecting end 107 having an open end into the prophylactic cup. A plurality of openings 112 are formed in the shaft communicating with the cavity 101 and the axial passageway 111 to permit the flow of prophylactic paste from the cavity 111 through the openings 112 and through the axial passageway 111 into the interior of the prophylactic cup 58.

Vanes 113 are formed on the prophylactic attachment shaft 102 and extend outward into the cavity and into the direction of rotation to direct prophylactic paste through the openings 112 as the shaft is rotated. The vanes 113 and the shaft 102 serve as a pump in drawing prophylactic paste through the cavity 101 and into the prophylactic cup 58. Spiral grooves 115 are formed on the wall of the axial passageway 111 in the direction of rotation for assisting the flow of the prophylactic paste through the axial passageway 111 and into the prophylactic cup.

The prophylactic attachment body 96 has a stem 117 that extends outward along the body of the contra-angle 75. The stem 117 is contoured to fit snugly against the contra-angle terminating in an end 118. A supply passageway 120 extends from the end 118 and opens into the cavity 101. The end 118 connects to a supply source (not shown) of prophylactic paste.

When the dentist desires to polish the patient's teeth, he merely attaches the prophylactic paste attachment to the contra-angle connecting the output shaft of the contra-angle to the attachment shaft and connects a supply to the prophylactic attachment. The prophylactic paste is rather viscous material and is difficult to flow. However, because of the assistance of the pump mechanism in the prophylactic attachment, this problem is minimized. The prophylactic paste is ejected into the prophylactic paste cup and lapped on the tooth surface as the prophylactic shaft is rotated by the contra-angle.

It should be understood that the above described embodiment are simply illustrative of the principles of this invention and numerous other embodiments may be readily devised by those skilled in the art without deviating therefrom. Therefore, only the following claims are intended to define this invention.

What is claimed is:

1. A prophylactic attachment for a dental contra-angle having a housing with an input shaft and an output shaft interconnected through a right angle drive, said prophylactic attachment comprising:

a body attachable to the contra-angle housing;
a prophylactic shaft rotatably mounted in the body having one end operatively connectable to the contra-angle output shaft for rotating the prophylactic shaft in response to the rotation of the output shaft; said prophylactic shaft having an opposite end extending from the body for receiving a hollow prophylactic cup thereon; and

said prophylactic shaft having a passageway formed therein having an opening for communicating with the hollow prophylactic cup to enable prophylactic paste to flow therethrough into the interior of the hollow prophylactic cup.

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2. The prophylactic attachment as defined in claim 1 wherein the body has a cavity formed therein for receiving prophylactic paste and wherein the prophylactic shaft passageway has a radially extending opening communicating with the body cavity to enable prophylactic paste to flow from the cavity through the passageway to the interior of the prophylactic cup.

3. The prophylactic paste attachment as defined in claim 2 further comprising means responsive to the rotation of the output shaft for pumping the prophylactic paste from the body cavity into the passageway.

4. The prophylactic paste attachment as defined in claim 3 wherein the directing means includes a vane affixed

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to the prophylactic paste shaft adjacent the passageway opening communicating with and projecting into the cavity for directing prophylactic paste from the cavity into the passageway as the prophylactic shaft is rotated.

5. The prophylactic paste attachment as defined in claim 2 wherein the body has a supply passageway formed therein communicating with the body cavity for supplying prophylactic paste from a source to the cavity.

6. The prophylactic paste attachment as defined in claim 1 wherein the body has a resilient socket for receiving a portion of the housing to enable the attachment to be removably snapped onto the contra-angle.

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