[54] DENTAL CLEANING APPARATUS

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[57] ABSTRACT

Apparatus for cleaning and polishing teeth and particularly the interproximal surfaces and gingival crevices thereof wherein a mouthpiece adapted to fit over at least a portion of the dentition and scalably engage the gums includes a plurality of interiorly disposed spaced inlet and exhaust ports in communication with a source of fluid or other cleansing material and an evacuation pump, respectively, such that the cleansing material is turbulently drawn against, between and around the teeth by suction to remove small food particles, bacteria and bacterial plaque, bacterial mott or organized bacteria and polish all exposed tooth surfaces to promote recalcification by normal defense mechanisms of the body without the cleansing materials and foreign matter being forced into or entrapped under the soft tissues of the mouth.

13 Claims, 5 Drawing Figures
DENTAL CLEANING APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention pertains to the cleansing of dentition and more particularly to a dental cleaning apparatus in which fluids, gases, desiccating air and/or particulate cleansing materials are drawn about the teeth by suction.

2. Description of the Prior Art

With the rise in recent years of the general level of education of research scientists, dentists and the general public in this and other countries, people are becoming increasingly aware of the mechanism of oral diseases and the benefits to be derived from effective personal hygiene. This has created a demand for new and modern approaches in the design of health appliances of all types and, specifically, devices which more readily and more efficiently clean the dentition and serve as part of a progressive program of dental care based upon recent research findings relating to the immunization and reparative ability of salivary precipitation which occurs in the absence of organized bacteria. The demand for such appliances can be seen in the number of dental cleaning devices which have recently been placed on the market to supplement or supplant the conventional approaches of regular brushing and periodic medical checkups. Many of these products utilize high pressure pulsating sprays of fluent materials which are directed against the surfaces of the teeth and gums for the removal of food particles and/or the simulation of the gingival tissues to prevent or reduce caries or periodontal disease.

The prior art, as exemplified by U. S. Pat. Nos. 3,379,192, 3,380,446, 3,489,141 and 3,527,218 is generally cognizant of devices of this general type wherein a number of teeth are simultaneously cleaned by means of high pressure water sprays which are directed against the surfaces of the teeth and gums. For the most part, these appliances have not received widespread commercial acceptance since it has been discovered that the removal of plaque and bacteria from the interproximal surfaces of the teeth, where an adjunct to normal toothbrushing is most needed, requires such a high pressure of fluid as to cause serious tissue damage in many cases. On the other hand, low pressure devices of this type often require frequent use throughout the day, which is inconvenient, sometimes impossible and generally ineffective. It has also been found that the use of pressurized fluid often forces foreign matter into the gingival crevices where it becomes entrapped under the tissues and often causes extensive damage to the oral tissues. Furthermore, modern research in the field of oral hygiene has established a direct correlation between dental health and the disorganization or removal of bacterial plaque, bacterial mat or organized bacteria, and typical prior art devices of the above type generally do not perform this newly recognized important function.

Thus, while the need for modern dental care appliances has existed for some time and while many basic discoveries as to the origin of tooth decay and periodontal disease have been made in the recent past, a simple and effective cleansing device which puts these discoveries into practice and efficiently removes organized bacteria from areas of the mouth which are particularly difficult to clean, without causing damage to the hard or soft tissues of the oral cavity, has heretofore been unavailable.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to efficiently remove bacterial plaque or organized bacteria and foreign matter from the dentition through the use of fluent materials without damaging the soft tissues of the mouth.

The present invention is summarized in that a dental cleaning apparatus includes a supply assembly adapted to receive a fluent material, a mouthpiece defining a channel for receiving at least a portion of the dentition and adapted to sealably engage the gums, with the mouthpiece including an inlet circuit connected with the supply assembly and communicating with the channel, and an outlet circuit communicating with the channel, and an evacuation pump connected with the outlet circuit of the mouthpiece for drawing fluent material from the supply assembly through the channel under suction and for maintaining the mouthpiece in sealed engagement with the gums whereby fluent material is caused to turbulent flow about the interproximal surfaces and gingival crevices of the dentition to effectively remove bacterial plaque, bacteria, and other foreign matter therefrom.

Another object of this invention is to clean and polish teeth by drawing fluent materials across interproximal surfaces thereof by suction.

The present invention has a further object in the construction of dental cleaning apparatus in the form of a closed system which inherently precludes cleaning material leakage into the mouth of a user.

Another object of the present invention is to safely, effectively and conveniently clean the dentition of small children and to construct dental cleaning apparatus which may be easily used by children without parental assistance.

A further object of this invention is to construct a closed fluid cleansing system for dentition in which a mouthpiece is maintained about the teeth by the suction created by fluid drawn therethrough.

The present invention is advantageous over the prior art in that interproximal surfaces and gingival crevices of the teeth are efficiently cleaned without damaging the soft tissues of the mouth, that a liquid dentrifice is prevented from leaking into the mouth of a user, that a cleansing mouthpiece is positively sealed about the dentition to provide a closed fluid system, that a plurality of teeth may be simultaneously cleaned, that the use of dental floss is obviated, and that teeth having orthodontic appliances, space maintainers, dental bridges and other appliances semipermanently attached thereto may be efficiently cleaned and polished.

Further objects and advantages of the present invention will become apparent from the following description of the preferred embodiment when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagramatic view of a preferred embodiment of a dental cleaning apparatus according to the present invention;

FIG. 2 is a sectional view taken on line 2—2 of FIG. 1;
FIG. 3 is a sectional view taken on line 3—3 of FIG. 1;
FIG. 4 is a sectional view of a detail of the mouthpiece of the apparatus of FIG. 1 taken on line 4—4 of FIG. 3; and
FIG. 5 is an elevational view of an interior wall of the mouthpiece of FIG. 1 taken on line 5—5 of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Fig. 1, a preferred embodiment of dental cleaning apparatus according to the present invention includes a fluent material supply assembly, indicated generally at 10, having a plurality of receptacles 12, 14 and 16 which are each adapted to receive a fluent material, such as water, desiccating alcohol, particulate cleansing material or the like, and which may be open at their upper ends or may be provided with suitable covers. The receptacles are mounted atop a control valve assembly 18, with each receptacle being connected at its lower end to feed a conduit 20—22—24 which is coupled through a manually and/or electrically controlled valve 26—28—30 to an outlet port 32 of the control valve assembly 18. An automatic control network 34 is connected with the control valve assembly 18 so as to automatically sequence the opening and closing of valves 26, 28 and 30 in accordance with any desired sequence of operation.

Automatic control network 34 may be of any suitable design, and, for example, may include a conventional timed electrical stepping switch interconnected with the electrical operator for each of the valves 26, 28 and 30 so that for a particular sequence, valve 26 may be opened for a first interval of time to supply fluid such as desiccating alcohol from receptacle 12 through conduit 20 to outlet port 32. After the first interval has elapsed, automatic control network 34 may close valve 26 and simultaneously open valve 28 for a second interval. With valve 28 open, a fluent material such as a dentifrice will be fed from receptacle 14 through conduit 22 to the outlet port 32. Likewise, a third interval may be provided by the automatic control network 34 at which time valves 26 and 28 will be closed and valve 30 will be opened to feed a suitable rinsing fluid, such as a mouthwash, from receptacle 16 through conduit 24 to the control assembly outlet port 32.

It should be understood, of course, that any number of fluid receptacles and control valves may be provided in fluid supply assembly 10 and that any desired sequence of operation may be accomplished either by appropriate wiring of automatic control network 34 of by manual manipulation of the various control valves. Three receptacles and valves are illustrated herein solely for purposes of clarity in describing one exemplary form of the cleaning apparatus according to the present invention.

Outlet port 32 of valve assembly 18 is connected to a main intake conduit 36 which feeds common port 38 of an electrically operated three-way valve 40. Valve 40 has first and second outlet ports 42, 44, respectively, and in a first position connects common port 38 with port 42, in a second position connects common port 38 with port 44, and in a third position connects common port 38 with both ports 42 and 44. Valves of this general type are well known and will not be described in detail for the sake of brevity. Valve 40 is connected with automatic control network 34 which may contain additional electrical switching circuits designed and programmed to provide suitable operation of the valve as will be described below. Ports 42 and 44 of valve 40 are respectively connected to facial and lingual intake lines 46 and 48 of a four-section flexible hose 50. Hose 50 also includes lingual and facial exhaust lines 52 and 54, respectively, which are connected to ports 56 and 58 of another electrically controlled three-way valve 60 which is also controlled by control network 34. Valve 60 operates identically to valve 40 and has a common port 62 which is connected by a main exhaust conduit 64 to an evacuation or suction pump 66 at port 68 thereof. An outlet port 70 of pump 66 is connected to a conduit 72 for the disposal of waste matter from the system.

The other end of flexible hose 50 terminates in a connecting plug 74 having four fluid coupling members 76 which communicate with fluid lines 46, 48, 52 and 54. Plug 74 may be of any suitable design and may be constructed of molded plastic which is rigidly bonded to the end of flexible hose 50. A mating coupling member 78 for plug 74 includes fluid channels 80, 82, 84 and 86 which are adapted to cooperate with coupling elements 76 for providing an air-tight interconnection therebetween. Coupling member 78 is molded with or otherwise attached to a generally U-shaped mouthpiece 88 which is designed to be positioned within the mouth about the dentition.

Referring to FIGS. 1—5, mouthpiece 88 is constructed of a semi-rigid, resilient material which is molded or shaped to define a U-shaped channel 90 which conforms to the upper and lower dental arches and surrounds the teeth 92. For purposes of illustration, mouthpiece 88 is shown in place over the mandibular teeth with the peripheral edges 94 and 96 of the mouthpiece in engagement with the gum 98. As shown in FIGS. 2 and 3, edges 94 and 96 are tapered in cross-section in order to provide sufficient flexibility for assuring a positive seal between the mouthpiece and the gums during operation. A latex sleeve (not shown) also may be utilized to provide an effective seal and is especially well suited for mass produced mouthpieces. It should be understood that mouthpiece 88 may be specially designed to fit either the maxillary or the mandibular teeth or may be shaped to interchangeably fit both the upper and lower sets of teeth. Furthermore, the mouthpiece may define two channels so as to receive all 32 teeth simultaneously, may be provided with sufficient clearance for orthodontal applications, may be made small enough for use by children, and may be made in sections which clean only a few teeth at a time. Thus, as will become more apparent below, the particular size or shape of the mouthpiece may vary to suit any number of different applications without detracting from the advantageous operation and unusual cleaning ability resulting from the evacuation-fluid-flow cleansing action provided by the present invention.

From a comparison of FIGS. 2 and 3, it can be seen that the cross sectional width of the mouthpiece is substantially constant while that of the channel 90 varies from a relatively wide opening in the area of the molars to a somewhat more narrow opening in the area of the incisors. Accordingly, the width of lateral walls 100 and
3,731,675

102 of mouthpiece 88 is greatest at the front of the mouthpiece to accommodate internal connections between fluid conduits 80, 82, 84 and 86 of connecting member 78 and the interior of the channel.

Molded or formed within lateral walls 100 and 102 of the mouthpiece are a facial intake manifold 104 and a parallel aligned facile exhaust manifold 106, and a lingual intake manifold 108 and a parallel aligned lingual exhaust manifold 110, respectively. At the front of the mouthpiece, the facial and lingual intake manifolds 104 and 108 are connected with fluid lines 80 and 82, respectively, from connecting member 78 (FIG. 2). Likewise, facial and lingual exhaust manifolds 106 and 110 are connected with fluid lines 86 and 84, respectively, from the connecting member 78. A plurality of linearly aligned spaced inlet ports 112 in wall 100 of mouthpiece 88 communicate with facial exhaust manifold 104 while a plurality of linearly aligned spaced exhaust ports 114 communicate with facial exhaust manifold 106, with the intake and exhaust ports 112 and 114 being staggered from each other as illustrated in FIG. 5. Similar inlet and exhaust ports 116 and 118 in wall 102 communicate with manifolds 108 and 110, respectively, with inlet ports 112 and 116 staggered from exhaust ports 118 and 114, respectively, as visualized in FIG. 4.

The floor of channel 90 is shaped or molded to conform to the occlusal surfaces of the teeth either by custom fitting of the mouthpiece itself or, preferably, by disposing a mass of a suitable material such as a soft acrylic 120 into the channel while in a semi-liquid form, inserting the mouthpiece into the mouth, and biting down gently to make an occlusal impression in the acrylic. Once the acrylic sets or cures, the mouthpiece will fit perfectly over the teeth with the custom-formed occlusal insert 120 nesting with the teeth 92 as shown in FIGS. 2 and 3. In the preferred embodiment the occlusal insert 120 is designed to be removable so that the occlusal surfaces of the teeth, as well as the lateral and interproximal surfaces thereof will be cleaned of any collected organizes bacteria. The insert 120 provides a somewhat fluid-tight seal between the facial and lingual sides of the teeth so as to increase the turbulence of the fluid flowing laterally across the interproximal surfaces of the teeth for more effective cleaning action.

In operation, the mouthpiece 88 is inserted in the mouth and positioned about the dentition. Due to the flexible tapered edges 94 and 96 of the mouthpiece, a fluid-tight seal is provided with the gum 98 to provide a closed washing chamber within channel 90 for the teeth 92. Fluid receptacles 12, 14, 16 and 18 may be filled with suitable cleansing solutions with receptacle 12, for example, filled with desiccating alcohol, receptacle 14 filled with an abrasive in suspension, a detergent in emulsion, a fluoride solution and/or any other desired dentifrice, and with receptacle 16 filled with a rinsing solution which may be water or a desired mouthwash. It is noted that the dentifrice solution in receptacle 14 may be agitated if necessary by any well-known apparatus.

With the fluid receptacles filled and the mouthpiece 88 in position over the teeth, suction pump 66 is energized and valve 26 is opened whereupon the desiccating solution in receptacle 12 will be drawn through inlet control valve 40 which is controlled by control network

34 so as to alternately supply fluid to inlet lines 46 and 48 for feeding respectively the facial and lingual intake manifolds 104 and 108 of mouthpiece 88. Fluid will then be drawn into the channel 90 through inlet ports 112 and 116, alternately, whereupon it will turbulently flow about the teeth and in particular across the interproximal surfaces thereof. The fluid will then be exhausted into the exhaust ports 114 and 118 and thence through exhaust manifolds 106 and 110 fluid conduits 86 and 84, fluid lines 54 and 52, valve 60 and suction pump 66 to line 72 where it is disposed of in any suitable manner. Valve 60 is also controlled by network 34 for alternate operation of valve 40 as will be described below. It can be appreciated, that the interior of the mouthpiece is placed under suction by the action of evacuation pump 66 which causes the flexible edges 94 and 96 of the mouthpiece to securely seat against the gums so as to enhance the provision of a fluid-tight seal therebetween.

Referring to FIGS. 2-5, it can be seen that due to the staggered relationship between the inlet and exhaust ports on either side of the teeth, a turbulent flow of fluid is established about the teeth for cleansing those surfaces which are notoriously the most difficult to clean. More specifically, when control network 34 places valves 40 and 60 in their first positions, common port 38 is placed in communication with port 42 only, and similarly, common port 62 is placed in communication with port 56 only. Fluid material is thus drawn through lines 46 and 80 to facial intake manifold 104, across the teeth from the facial to the lingual sides thereof (as shown schematically by the solid arrows in FIGS. 2-4) and thence into lingual exhaust manifold 110, lines 84 and 52, valve 60 and suction pump 66 to line 72 where it is suitably discharged. When valves 40 and 60 are placed in their section positions, common ports 38 and 62 are placed in communication only with ports 44 and 58, respectively, such that fluent material is drawn through lines 48 and 82 to lingual intake manifold 108. The fluent material is then drawn across the teeth from the lingual to the facial sides thereof (as shown by the dashed arrows in FIGS. 2-4) whereupon it is exhausted through facial exhaust manifold 106, lines 86 and 54, valve 60 and pump 66. In this manner, a pulsating or alternating flow is established first in a facial-to-lingual direction and then in a lingual-to-facial direction under the control of network 34 and valves 40 and 60.

Thus, a pulsating flow of fluid is established from side to side within the channel and between and around the teeth for removing accumulated dental plaque or organized bacteria and other foreign matter from the interproximal surfaces where the development of caries and periodontal disease is generally most prevalent. As shown in FIG. 4 and due to the staggered relationship of the inlet and exhaust ports of mouthpiece 88, the flow system generated by the apparatus of the present invention causes the fluent material to circulate between and around the lateral sides of the teeth to breakdown the organized bacteria and sweep the gingival crevices of any waste material which might accumulate therein. Of course, this flow not only cleans the teeth and gingival crevices of organized bacteria but, in addition, thereby enables the natural defense mechanism of the body, acting by means of blood cells,
saliva and other body fluids, to effectively function so as to maintain the oral cavity free from disease.

The above described action follows in like manner for circulating the dentifrice solution from receptacle 14 and subsequently the mouthwash or rinse solution from receptacle 16 about the teeth and, as noted above, such application of the various fluids may be controlled manually by valves 26, 28, 30 or may be accomplished automatically be actuation of the control network 34. Furthermore, after the interproximal surfaces and gingival crevices have been cleaned, as noted above, the occlusal insert 120 may be removed and valves 40 and 60 actuate to their third positions to permit fluid flow through all four manifolds simultaneously whereby the occlusal surfaces of the teeth will be cleaned and the entire dentition rinsed.

After the cleaning operation is completed, suction pump 66 may be turned off and the mouthpiece readily removed for storage. The mouthpiece may be thereafter separated from the rest of the system by disconnecting plug 74 whereupon the mouthpiece may be washed or sterilized prior to being stored for subsequent use. Since mouthpiece 88 is removable, the dental cleaning apparatus of the present invention is particularly well suited for use by families since only one aesthetically pleasing and compact fluid control assembly 10 and pump 66 need be provided, with each family member having one or more personalized mouthpieces for their individual use.

The dental cleaning apparatus according to the present invention is considered to represent a material advance in the field of oral hygiene for a number of important reasons. First, since no fluid is pumped under pressure against the teeth and gums, a danger of tissue damage resulting therefrom is entirely eliminated thereby overcoming a serious deficiency in conventional dental cleaning appliances. Second, since the fluid is drawn into the mouthpiece by the action of pump 66, a closed system is required in order to establish flow across the channel 90. In other words, the mouthpiece 88 must be securely seated against the gums prior to the establishment of any flow about the teeth. Of course, the suction pump 66 creates a vacuum which normally assures such a positive seal. More importantly, should this seal be broken as by the mouthpiece being inadvertently displaced during use, the flow of fluid will immediately cease to prevent the various cleansing solutions from entering the oral cavity. This makes possible the administration of high concentrations of materials such as fluoride since only minute amounts thereof would ever be permitted to enter the alimentary canal. Third, all of the teeth may be efficiently cleaned simultaneously and orthodontic bands, fixed bridge work, space maintainers, and the like do not detract from or decrease the cleaning ability of the apparatus in use. Fourth, the teeth of small children may be safely, effectively and conveniently cleaned with little or no parental supervision. Fifth, the drawn fluid will provide a degree of cleansing between the teeth and about the gum line which has heretofore only been possible by the use of dental floss. Likewise, the cleaning action of the present invention will remove organized bacteria and their nourishment lodged under fractured fillings to promote recalcification and to avoid further deterioration of the teeth.

Thus, it can be appreciated that the dental cleaning apparatus according to the present invention is highly efficient in operation, is simple in construction and provides a degree of cleaning which has not been attainable in the past. In addition, the present apparatus will perform all of the aforementioned advantages simply and conveniently and without producing any damage to either the hard or soft tissues of the mouth.

Inasmuch as the present invention is subject to many variations, modifications and changes in detail, it is intended that all matter contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. Dental Cleaning apparatus comprising a mouthpiece defining a channel for receiving at least a portion of the dentition and adapted to engage sealably the gums, supply means adapted to receive a fluent material, said mouthpiece including inlet means connected with said supply means and communicating with said channel, and evacuation means connected with said outlet means of said mouthpiece for drawing fluent material from said supply means through said channel solely under suction and for maintaining said mouthpiece in sealed engagement with the gums whereby fluid is caused to flow turbulently about the interproximal surfaces and gingival crevices of the dentition to remove effectively bacterial plaque, bacteria and other foreign matter therefrom.

2. Dental Cleaning apparatus comprising a mouthpiece defining a channel for receiving at least a portion of dentition and adapted to engage sealably the gums, supply means adapted to receive a fluent material, said mouthpiece including inlet means connected with said supply means and communicating with said channel, and evacuation means connected with said outlet means of said mouthpiece for drawing fluent material from said supply means through said channel solely under suction and for maintaining said mouthpiece in sealed engagement with the gums whereby fluid is caused to flow turbulently about interproximal surfaces and gingival crevices of the dentition to remove effectively bacterial plaque, bacteria and other foreign matter therefrom.

3. The invention as recited in claim 1 wherein said evacuation means comprises a suction pump.

4. The invention as recited in claim 1 wherein said supply means includes container means for a plurality
of fluent materials and valve means connected with said container means to selectively feed each of said plurality of fluent materials to said inlet means of said mouthpiece.

5. The invention as recited in claim 1 wherein said inlet and outlet means communicate with said supply means and said evacuation means, respectively, through separate ones of a plurality of flexible fluid conduits.

6. Dental Cleaning apparatus comprising
a mouthpiece defining a channel for receiving at least a portion of the dentition and adapted to engage sealably the gums,
supply means adapted to receive a fluent material,
said mouthpiece including inlet means connected with said supply means and communicating with said channel, and outlet means communicating with said channel,
said inlet means including a plurality of inlet apertures defined by said mouthpiece and opening into lateral sides of said channel, and said outlet means including a plurality of outlet apertures defined by said mouthpiece and opening into said lateral sides of said channel, said inlet and outlet apertures being disposed in staggered relationship about the interior of said channel, and
evacuation means connected with said outlet means of said mouthpiece for drawing fluent material from said supply means through said channel under suction and for maintaining said mouthpiece in sealed engagement with the gums whereby fluid is caused to flow turbulently about the interproximal surfaces and gingival crevices of the dentition to remove effectively bacterial plaque, bacteria and other foreign matter therefrom.

7. The invention as recited in claim 6 wherein said inlet apertures are linearly aligned, and wherein said outlet apertures are linearly aligned in spaced relationship with said inlet apertures.

8. The invention as recited in claim 1 wherein said inlet means includes facial inlet means in a first interior wall of said mouthpiece opening into said channel and lingual inlet means in a second opposite interior wall of said mouthpiece opening into said channel, and wherein said outlet means includes facial outlet means in said first interior wall of said mouthpiece opening into said channel and lingual outlet means in said second wall of said mouthpiece opening into said channel.

9. The invention as recited in claim 8 wherein said fluent material supply means includes supply valve means alternately supplying fluent material to said facial inlet means and said lingual inlet means, and wherein said evacuation means includes exhaust valve means synchronized with said supply valve means for alternately exhausting fluent material from said lingual outlet means and said facial outlet means when said supply valve means is supplying fluent material to said facial inlet means and said lingual inlet means, respectively.

10. The invention as recited in claim 9 wherein each of said inlet and outlet means include a manifold disposed internally of said mouthpiece and having a plurality of spaced apertures opening into said channel.

11. Dental Cleaning apparatus comprising
a mouthpiece defining a channel for receiving at least a portion of the dentition and adapted to engage sealably the gums,
supply means adapted to receive a fluent material,
said mouthpiece including inlet means connected with said supply means and communicating with said channel, and outlet means communicating with said channel,
said inlet means including facial inlet means in a first interior wall of said mouthpiece opening into said channel and lingual inlet means in a second opposite interior wall of said mouthpiece opening into said channel, and wherein said outlet means includes facial outlet means in said first interior wall of said mouthpiece opening into said channel and lingual outlet means in said second wall of said mouthpiece opening into said channel,
said fluent material supply means including valve means alternately supplying fluent material to said facial inlet means and said lingual inlet means, and wherein said evacuation means includes exhaust valve means synchronized with said supply valve means for alternately exhausting fluent material from said lingual outlet means and said facial outlet means when said supply valve means is supplying fluent material to said facial inlet means and said lingual inlet means, respectively,
evacuation means connected with said outlet means of said mouthpiece for drawing fluent material from said supply means through said channel under suction and for maintaining said mouthpiece in sealed engagement with the gums whereby fluid is caused to flow turbulently about the interproximal surfaces and gingival crevices of the dentition to remove effectively bacterial plaque, bacteria and other foreign matter therefrom,
each of said inlet and outlet means including a manifold disposed internally of said mouthpiece, and
a plurality of apertures in said manifold opening into said channel,
said apertures being equally spaced from each other with inlet apertures on one side of said channel staggered from outlet apertures on the opposite side of said channel.

12. An automatic dental cleaning system for removing plaque and foreign matter from a person's dentition comprising
a mouthpiece having wall means to define a flow channel adapted to receive at least a portion of the person's dentition,
said wall means including a pair of walls spaced from each other and being in spaced relation to adjacent surfaces of the dentition,
means on said pair of walls adapted to engage the person's gum areas and seal said channel,
said mouthpiece having inlet and outlet means communicating with said channel,
said fluent material supply means,
feed conduit means extending from said fluent material supply means to said inlet means,
exhaust conduit means extending from said outlet means,
vacuum pump means communicating with said exhaust conduit means causing fluent material to
flow from said feed conduit means through said inlet means, said flow channel and said outlet means to said exhaust conduit means solely under suction whereby a positive seal for said channel is assured, said inlet means including a plurality of inlet apertures spaced from each other on one of said walls and said outlet means including a plurality of outlet aperture spaced from each other on the other of said walls whereby the fluent material under suction contacts interproximal surfaces and giv-cal crevices of the dentition causing removal of plaque and foreign matter therefrom.

13. The invention as recited in claim 12 wherein said fluent material supply means includes a supply of desiccating fluid, a supply of dentifrice and a supply of rinsing fluid, and wherein an automatic control network selectively controls delivery of the desiccating fluid dentifrice and rinsing fluid to the feed conduit means.

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