

[54] **TREATMENT APPLIANCE FOR TEETH AND THE LIKE**

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[51] **Int. Cl.**.....**A46b 13/02**

[58] **Field of Search**.....15/22 R, 23, 24, 15/28, 29, 34, 36, 77, 88, 167 A

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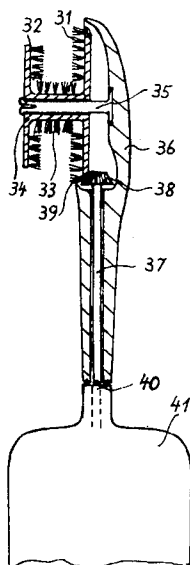
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[57] **ABSTRACT**

The present invention has reference to a treatment appliance and like tool, especially for treating teeth of human beings and generally for simultaneously applying said tool to a variety of treatment surfaces. The appliance is equipped to this end with various brush or polishing bristles which are prearranged in a specific pattern to and for cooperation with each other. An array of disk- or plate-shaped carrier or carriers together with one or more roller-shaped carriers, both retaining bristles thereon, is provided which facilitates access to various faces of a tooth or like object in one operational step, said brushes being continuously driven to efficiently clean and brush without any dexterity and skill on the part of the operator.

4 Claims, 3 Drawing Figures



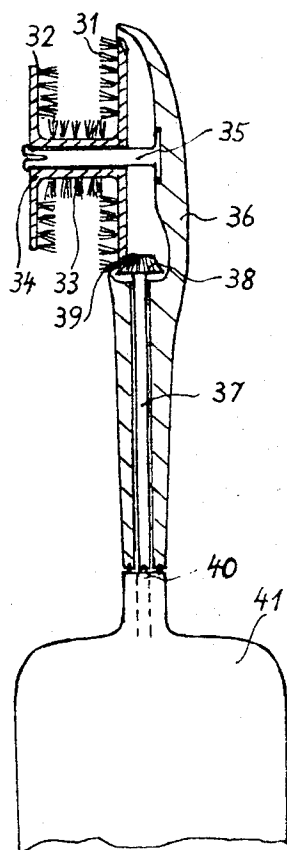


Fig 3

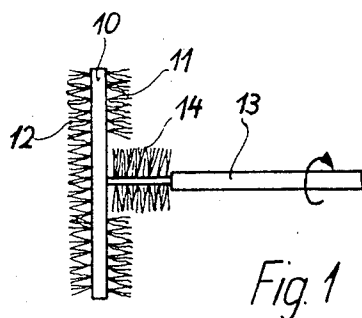


Fig 1

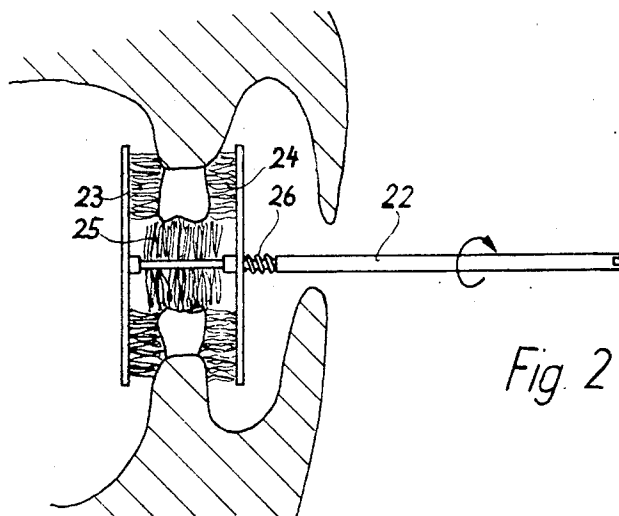


Fig 2

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TREATMENT APPLIANCE FOR TEETH AND THE LIKE

BACKGROUND OF THE INVENTION

The present invention relates to treatment appliances for teeth and other suitable objects. For cleaning teeth are used as a rule brushes primarily designed for the cleaning operation during the horizontal movement of the brush. Electrically operated devices are also known where the brush performs an oscillating movement permitting a cleaning operation in vertical direction relative to the teeth. In all these devices, however, only the outside of the teeth is treated, while the cleaning of the teeth from the oral cavity of the inner mouth part is neglected. Since there do not exist any special brushes for a universal and comprehensive cleaning or treatment, caries and germ diseases continue to spread as the treatment of the gums and like parts of the mouth of a human being remains unsatisfactory.

Treatment devices with rotary brushes are already known in which rotary brushes roll along the tooth surfaces aided by manual movement of the device or where the brushes are driven by a motor. These appliances are so complex, unhandy and bulky due to the employed cylindrical brush bodies and their movement transmission means that they cannot be operated in a convenient and suitable manner inside the mouth.

SUMMARY OF THE INVENTION

The present invention aims at preventing and overcoming these and other known disadvantages and inconveniences in that it proposes an appliance, which is characterized by an array of a roller-shaped brush and of at least one disk-shaped brush, the latter of said brushes being operatively connected to a driven axis common to both said brushes.

This appliance has at least two disk-shaped or rotary brushes so arranged, that the disk-shaped brushes carry bristles in confronting relation to and at a predetermined distance from each other, so that the roller-shaped brush is located within the space created by and between said disk-shaped brushes and adjacent to the same.

It is one of the important features of the invention to provide means resulting in a compact, sturdy and economical unitary frame structure, which may be power-driven or hand-operated, selectively, said structure carrying an array of bristles on a flange-shaped or spool-like carrier or frame, which is interchangeably attachable to the toothbrush body via an axle.

Other details and advantages of the invention will result from the claims, the ensuing specification and annexed drawing, which shows various embodiments of the invention to be considered exemplary and explanatory of the invention, but not restrictive thereof.

In the drawing:

FIG. 1 shows an appliance pursuant to the invention having a rotary driven cylindrical or roller-shaped brush and a disk-shaped brush provided on both sides with bristles, both brush types being arranged on a common driven shaft.

FIG. 2 illustrates a side view of another embodiment of the invention, carrying two disk-shaped brushes and a cylindrical or roller type brush between these disk-shaped brushes and adjacent to the latter.

FIG. 3 shows a further embodiment according to the invention, presenting a similar brush arrangement as in

FIG. 2 and equipped with a gear drive for moving the brushes from a motor-driven shaft at right angles to the axis of the brush array.

Referring more specifically to the drawing, there has been disclosed a tooth treatment appliance (FIG. 1) which has a flange-shaped carrier or body 10 which is provided on two faces with any selected type of bristles 11 and 12, the body 10 being secured to one end of a driven shaft 13. On the shaft 13 itself is arranged a cylindrical or roller-type brush 14 located adjacent carrier 10. This brush 14 is designed to be pressed against the masticatory surface of a tooth and at the same time the bristles 11 of brush carrier 10 are structured to bear on the rear surfaces of the teeth, namely, simultaneously on the teeth of both the upper jaw and the lower jaw. Shaft 13 extends with the rotary brush 14 rotating between the masticatory surfaces of preferably two opposite teeth of the upper jaw and of the lower jaw from the oral cavity to the outside in order to be driven by a driving unit serving at the same time as a handle 41. The bristles 12 on the outside of carrier 10 serve to clean the front sides of the teeth and the like, the appliance being also pressed from the outside against the two closed jaws, as may be well apparent from the drawing.

FIG. 2 shows the position of the device or appliance inside the oral cavity of the mouth. It can be seen how the brushes bear on the upper and lower rows of teeth of the upper and lower jaws. In this embodiment two disk-shaped brushes 23 and 24 are arranged on and driven from a shaft 22 with the bristles confronting or otherwise facing each other, a cylindrical brush 25 being arranged on the same shaft 22 between the two disk-shaped brushes 23, 24 and adjacent to the latter. The bristles of brushes 23 and 24 bear at the same time on the rear and the front surfaces of the teeth of the upper and lower jaw. The cylindrical brush 25 engages at the same time the masticatory surfaces of the teeth of the upper and lower jaw. One of the disk-shaped brushes, say, 24, is elastically or yieldably mounted for movement in axial direction toward the other brush for adaptation to the different thickness of molar and cutting teeth. To this end a small coil spring 26 or like element is provided on shaft 22 which bears on a shoulder arranged on the shaft 22 and which presses with its other end against brush 24 of the frame-like spool. Shaft 22 is preferably connected at its free end by means of a plug coupling with the shaft end of a driving unit (not shown), which rotates the shaft and serves at the same time as a handle.

Another embodiment of the invention according to FIG. 3 has the same design as the embodiment according to FIG. 2 as far as the brushes are concerned. There are disclosed two disk-shaped holders with brushes 31 and 32 provided with bristles confronting each other. Between these brushes there extends a cylindrical brush 33, which form together a constructional unit. The disk-shaped brushes are arranged on a hub-shaped or frame-like spool body 34 which forms at the same time the brush support for the cylindrical brush 33, the hub-shaped body 34 having a central bore for rotatably mounting same on a shaft 35 passing through said central bore. On one end of this shaft is non-rotatably mounted a flat housing 36, which has a bore extending at right angles to shaft 35. A drive shaft 37 extends through said latter bore and terminates in a pinion or bevel gear 38. The plate of brush 31 has on its rear side

a toothing or tooth formation 39 which meshes with gear 38 so that the disk-shaped brush 31 and the brushes 32 and 33 coact rigidly together, while during this rotation drive shaft 37 is driven. The end of drive shaft 37 can be coupled with a shaft butt 40 of a motor and like driving unit 41, the housing 36 being connected with the driving unit which serves at the same time as a handle for the appliance or device. Due to the use of the gearing (mitre or bevel gears) with the shafts arranged at right angles to each other, a device has been provided which can be guided and manipulated very easily up to the rearmost teeth in the oral cavity without the need of special means necessary for driving the rotary brushes which may be hindering the movement of the device in the oral cavity.

The constructional unit consisting of the three brushes 31, 32, 33 may be built with interchangeable parts. To this end the rigid shaft 35 carries on its front end a mechanism for retaining the brush unit attached on the shaft, for example, a snap mechanism known per se, by means of which the brush unit can be easily detached from the shaft 35. To this end shaft 35 is slotted longitudinally at the front end, for example, so that it can be compressed at this end elastically and sufficiently, but carries at that end also a bead against which the brush unit can abut or bear when the shaft is allowed to spread again, after the brush unit has been attached.

It can thus be seen, that there has been provided pursuant to this invention especially a toothbrush appliance which is characterized in that it comprises two opposite and spaced apart, flange-shaped carriers 31, 32, an intermediate member 33 between said carriers and forming together a unitary brush frame structure 34, each of said flange-shaped carriers being provided on at least one of their faces with bristles which confront each other, said member being further provided with rows of circumferentially disposed bristles spaced from the bristles on said carrier faces, an axle 35 or 22 rotatably supporting said frame structure with said bristles, and yieldable means at 35 or 26 associated with said axle and acting on said frame structure in axial direction of said member 33. A support for said axle forms

a housing-shaped holder 36 encasing at least partly an adjacent portion of one of said flange-shaped carriers.

It is well understood that the driving unit required for actuating the brushes can be constituted in all embodiments by a mains- or battery-fed motor, spring motor and the like. The invention in its broader aspects is therefore not limited to the specific embodiments herein shown and described, but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What is claimed is:

1. A toothbrush appliance comprising two opposite and spaced apart flange-shaped carriers, an intermediate member between said carriers and forming together a brush frame structure, each of said flange-shaped carriers being provided on at least one of their faces with bristles, which confront each other, said member being further provided with rows of circumferentially disposed bristles located adjacent the bristles on said carrier faces, an axle rotatably supporting said frame structure with said bristles, a support for said axle and forming a part of a housing-shaped holder for one of said flange-shaped carriers, a driven shaft passing through an extension of said holder, and interengageable means on one end of said shaft and adjacent said frame structure to mesh with each other and to cause rotation of said structure relative to said holder and said shaft.

2. An appliance according to claim 1, said shaft extending beyond said extension of said holder for connection with a drive motor having a housing which forms a handle.

3. An appliance according to claim 1, said driven shaft and said axle for said bristle carrying structure are angularly directed to each other, said holder projecting somewhat toward the adjacent flange-shaped carrier.

4. An appliance according to claim 1, said axle having a rearward end and a forward end which latter includes a portion to retain said frame structure in position on said axle, the rearward end of said axle being joined to said holder from which said axle projects.

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