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(54) **INTERDENTAL BRUSH**

(57) The embodiments of the present invention relate to the field of oral cleaning technology, and disclose an interdental brush. The interdental brush comprises: a brush head and a brush rod; two ends of the said brush rod are respectively a first rod end and a second rod end; the said brush head is disposed at the said first rod end; and a brush handle, one end of the said brush handle is a neck configured with a orifice, and the said neck is configured with a conduit in communication with the said orifice, the interior of the said brush handle is configured with a lumen in communication with the said conduit; the said second rod end is inserted into the said lumen through the said orifice and the said conduit; the wall thickness of the said neck adjacent to the said orifice is 0.1 mm to 0.3 mm.

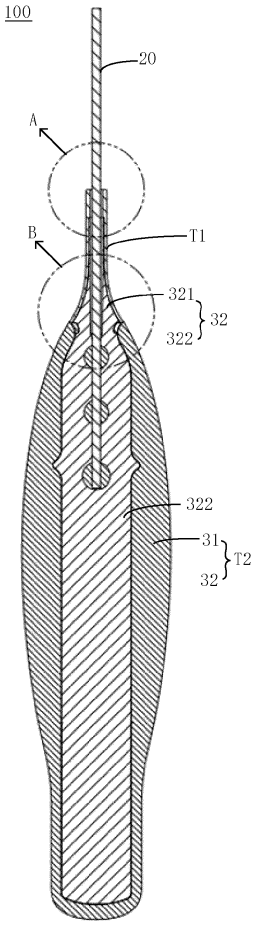

FIG. 2

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Description

Technical Field

[0001] The present invention relates to the field of oral cleaning technology, in particular to an interdental brush.

Background

[0002] "Interdental brush", also known as crevice brush, gap brush, complementary to a toothbrush, is a specially designed small toothbrush for cleaning the gap between the teeth (where are not accessible by common toothbrushes).

[0003] The interdental brush comprises a brush head for brushing the dental surface, a brush handle for the user to hold, and a brush rod connected between the brush head and the brush handle, the brush head being disposed on the end of the brush rod away from the brush handle. When in use, the user holds the handle to deliver the brush head into the oral cavity of the user, and moves the brush head back and forth in the gap between the two teeth to brush the dental surface. Currently, interdental brushes on the market have little or no bending of the brush rod in use, and such interdental brushes have poor flexibility in use not only to go against the user's ability to hold the interdental brush at different angles to deliver the brush head into the oral cavity, but also to easily damage the teeth and gums due to the high rigidity of the brush rod, affecting the use experiences.

Summary

[0004] In view of this, it is necessary to provide an interdental brush with a simple structure and good flexibility in use, aiming at the problems existing in the conventional interdental brush.

[0005] An interdental brush. The said interdental brush comprises: a brush head and a brush rod; two ends of the said brush rod are respectively a first rod end and a second rod end; the said brush head is disposed at the said first rod end; and a brush handle, one end of the said brush handle is a neck configured with a orifice, and the said neck is configured with a conduit in communication with the said orifice, the interior of the said brush handle is configured with a lumen in communication with the said conduit; the said second rod end is inserted into the said lumen through the said orifice and the said conduit; the wall thickness of the said neck adjacent to the said orifice is 0.2 mm to 0.5 mm.

[0006] In some embodiments, the wall thickness of the said neck adjacent to the said orifice is 0.3 mm.

[0007] In some embodiments, the radial dimension of the said conduit is greater than the radial dimension of the said brush rod; the gap between the inner wall of the said conduit and the outer surface of the said brush rod is set from 0.2 mm to 0.3 mm.

[0008] In some embodiments, the said brush handle comprises a handle shell, the said handle shell is formed of a soft rubber material; and a handle core formed of a hard rubber material; the said handle core comprises a grip base, and the said handle shell is sleeved on the said grip base to form a grip portion of the said brush handle.

[0009] In some embodiments, the said neck comprises a neck base and a neck sleeve formed from soft plastic injection molding, the said neck sleeve is sleeved on the said neck base; the said neck base is the portion of the said handle core that extends beyond the said handle shell.

[0010] In some embodiments, the length of the said neck sleeve is greater than the length of the said neck base, so that the said neck sleeve covers the said neck base and some parts of the surface of the said brush rod.

[0011] In some embodiments, the said grip base is configured with the said lumen for inserting and fixing the said second rod end, the said lumen within the said grip base extends along the length of the said handle core to the direction away from the said neck.

[0012] The beneficial effect of the interdental brush provided by the embodiments of the present invention is: due to the neck of the brush handle provided by the embodiments of the present invention is thinner for covering the brush rod, such design is conducive to weakening the restraint of the neck on the bending deformation of the brush rod and improving the bending flexibility of the brush rod, so that the user may adjust the brushing angle according to the brushing situation during the process of using the interdental brush to brush the teeth, which cleans the dental surface more thoroughly.

Brief Description of the Drawings

[0013] One or more embodiments are illustrated exemplarily by the corresponding drawings, which are not intended to limit the embodiments, and the elements with the same reference numerals in the drawings represent similar elements, unless otherwise specified, the figures in the drawings do not constitute a scale limitation.

FIG. 1 is a schematic structural view of an interdental brush according to an embodiment of the present invention;

FIG. 2 is a cross-sectional view of an interdental brush according to an embodiment of the present invention;

FIG. 3 is an enlarged view of section A of FIG. 2, showing the structure of the conduit;

FIG. 4 is an enlarged view of section B of FIG. 2, showing the structure of the lumen.

[0014] The description of the reference numerals in the drawings:

100. interdental brush; 10. brush head; 20. brush rod; D 1. radial dimension of the brush rod; 30. brush handle; 31. handle shell; 32. handle core; T1. neck; P. orifice;

R1. conduit; D2. radial dimension of the conduit; B. wall thickness of the neck; T2. grip portion; 321. neck base; 322. grip base; R2. lumen; D3. radial dimension of the lumen; 323. arc groove; 33. neck sleeve.

Embodiments

[0015] The present invention will be described in detail below with reference to specific embodiments, it should be emphasized that, the following descriptions are merely exemplary, and are not intended to limit the scope and application of the present invention.

[0016] It should be noted that, unless otherwise explicitly stated and defined, the terms "center", "longitudinal", "transverse", "upper", "lower", "vertical", "horizontal", "inner", "outer" and the like, as used in this specification, refer to an orientation or position relationship that is based on the orientation or position relationship shown in the drawings, and is only for the convenience of describing the present invention and simplifying the description, rather than indicating or implying that the device or element being referred to is required to have a particular orientation, be constructed and operated in a particular orientation, therefore, it should not be construed as limiting of the invention. The terms "configure", "communicate", "connect", "fix" and the like should be understood in a broad sense, for example, it may be a fixed connection, a detachable connection, or an integral connection; it may be a mechanical connection or an electrical connection; it may also be a direct connection or an indirect connection through an intermediate medium. In addition, the terms "first" and "second" are only used for descriptive purposes, and should not be understood as indicating or implying relative importance or implying the number of technical features being referred to; therefore, the features defined with "first" and "second" may expressly or implicitly include one or more of the features; "plurality" defines two or more; "and/or" includes any and all combinations of one or more of the related listed items. For those of ordinary skilled in the art, the specific definition of the above terms in the present invention can be understood according to specific situations.

[0017] As shown in FIG. 1, the interdental brush 100 provided by the embodiments of the present invention may comprise: a brush head 10, a brush rod 20, and a brush handle 30. In the embodiments of the present application, both the brush rod 20 and the brush handle 30 are rod-shaped components with a certain length.

[0018] Herein, the "brush head 10" is a component configured with bristle (not shown), used to extend into the oral cavity and brush the dental surface by reciprocating movement relative to the teeth.

[0019] The "brush rod 20" is connected between the brush head 10 and the brush handle 30 as a connecting component, which is allowed to have a certain elastic bending during actual use. The elastic deformation of the brush rod 20 facilitates switching the brushing angle when using the interdental brush 100 to brush the teeth, so as to avoid damages to the gums, and achieve a good brushing effect.

[0020] The "brush handle 30" is the object on the interdental brush 100 to which the user directly applies force, as the grip portion of the interdental brush 100 for the user. The user drives the brush head 10 to rub back and forth in the gap (or called "dental crevice") between the two teeth by holding the brush handle 30, thereby brushing the dental surface between the two teeth.

[0021] Further referring to FIG. 1, two ends of the brush rod 20 are respectively a first rod end and a second rod end. The brush head 10 is disposed at the first rod end, and the bristle of the brush head 10 are distributed along the length of the brush rod 20.

[0022] Referring to FIG. 2, FIG. 3 and FIG. 4 together, one end of the brush handle 30 is a neck T1 with an opening formed on the end surface thereof, for the convenience of description in the specification, the opening is defined as the orifice P.

[0023] In the neck T1, a conduit R1 in communication with the orifice P is extended from the orifice P in a direction along the length of the neck T1 toward the brush handle 30 away from the other end of the neck T1. The part of the brush handle 30 other than the neck T1 is a grip portion T2 of the brush handle 30, and the interior of the grip portion T2 is configured with a lumen R2 in communication with the conduit R1. The radial dimension D1 of the lumen R2 is slightly greater than the radial dimension D1 of the brush rod 20 and smaller than the radial dimension D2 of the conduit R1, so that the second rod end may be inserted and fixed into the lumen R2 through the orifice P and the conduit R1.

[0024] As shown in FIG. 3, in some embodiments, the wall thickness B of the portion of the length of the neck T1 adj acent to the orifice P may be set from 0.2 mm to 0.5 mm, preferably 0.3 mm. Between the neck T1 and the grip portion T2, the radial dimension of the neck T1 gradually increases, so as to be consistent with the radial dimension of the grip portion T2.

[0025] The advantageous aspects of the brush handle 30 provided by the embodiments of the present application are: compared to the prior art interdental brush 100, due to the neck T1 of the brush handle 30 provided by the embodiments of the present application is thinner for covering the brush rod 20, such design is conducive to weakening the restraint of the neck T1 on the bending deformation of the brush rod 20 and improving the bending flexibility of the brush rod 20, so that the user may adjust the brushing angle according to the brushing situation during the process of using the interdental brush 100 to brush the teeth, which cleans the dental surface more thoroughly.

[0026] As shown in FIG. 1, the brush handle 30 comprises a handle shell 31 and a handle core 32. As shown in FIG. 2, the handle core 32 comprises a neck base 321 and a grip base 322, one end of the grip base 322 is connected to the neck base 321, and the grip base 322 and the neck base 321 may be one-piece designed com-

ponents.

[0027] The handle shell 31 may be formed of a soft rubber material with a softer texture, and the handle core 32 may be formed of a hard rubber material with a harder texture. The soft handle shell 31 covers the grip base 322 of the handle core 32, which forms the grip portion T2 of the brush handle 30 with good feel. As shown in FIG. 4, the neck sleeve 33 formed of a soft rubber material covers the neck base 321 of the handle core 32 to be the above-described neck T1, and when the neck T1 is forced to bend, the neck sleeve 33 may cushion the bending of the neck base 321, reduce the fracture of the neck base 321 due to the excessive bending degree of the neck T1, and make the neck T1 have better bending strength and good bending flexibility, thereby better accommodating the necessary elastic deformation of the brush rod 20 when the interdental brush 100 is in use. It can be understood by those skilled in the art, in some embodiments, the neck sleeve 33 may also be of a one-piece injection molded design with the handle shell 31 to achieve the same functions described above.

[0028] As shown in FIG. 3, in some embodiments, the length of the neck sleeve 33 formed of a soft rubber material may be set to be greater than the length of the neck base 321, so that the neck sleeve 33 may cover the entire neck base 321 and some parts of the surface of the brush rod 20. The advantageous aspect of the design is, if the brush head 10 accidentally moves along the brush rod 20 during the process of using the interdental brush 100, the portion L of the brush rod 20 covered by the neck sleeve 33 may generate a good cushion function to the brush head 10 due to the soft rubber property, avoiding the hard neck base 321 or brush head 10 from impacting the gums (or teeth), and providing better protection function to the oral cavity of the user.

[0029] Further referring to FIG. 4, an arc groove 323 transitions between the neck base 321 of the handle core 32 and the grip base 322, the end edge of the neck sleeve 33 away from the orifice P is fitted in the arc groove 323, and the handle shell 31 abuts against the edge of the neck sleeve 33 fitted in the arc groove 323, so as to form a curved transition surface in a circular arc shape on the outer surface of the brush handle 30 located in the connecting portion between the neck T1 of the handle core 31 and the grip portion T2. The above design facilitates to increase the connection strength of the neck sleeve 33 on the neck base 321 and the end strength of the neck T1 away from the orifice P, thereby avoiding the stress concentration at the connecting portion between the neck T1 and the handle shell 31 during the process of using the interdental brush 100, and effectively reducing the fracture of the neck T1.

[0030] As shown in FIG. 3, the conduit R1 extends along the length of the neck base 321 toward one side of the grip base 322. The radial dimension D2 of the conduit R1 is greater than the radial dimension D1 of the brush rod 20, so as to avoid that under the situation of the large deflection and bending deformation of the brush rod 20, the gap between the inner wall surface of the conduit R1 and the outer surface of the brush rod 20 may be a compensation amount for the deformation of the neck T1 in the radial direction, and reduce the situation of the fracture of the neck T1, so that the neck T1 may remain effective at all times. In the embodiments of the present application, the gap between the brush rod 20 and the conduit R1 is designed to be 0.2 mm to 0.3 mm, so as to ensure optimum bending flexibility of the brush rod 20 while preventing the fracture of the neck T1.

[0031] As shown in FIG. 4, the grip base 322 of the handle core 32 is covered by the handle shell 31, the grip base 322 is configured with the above described lumen R2 in communication with the conduit R1 along the length of the handle core 32, and the lumen R2 functions as a fixing structure of the interdental brush 100 for fixing the above described brush rod 20. Specially, the second rod end of the brush rod 20 may be inserted and fixed into the lumen R2 through the orifice P of the neck T1 and the conduit R1.

[0032] The above content is a further detailed description of the present invention in combination with specific / preferred embodiments, and it cannot be considered that the specific embodiments of the present invention is limited to these descriptions. For those of ordinary skilled in the art, some modifications and improvements can be made without departing from the concept of the present invention, all of which belong to the protection scope of the present invention.

Claims

1. An interdental brush, **characterized in**, comprising:

   A brush head and a brush rod; two ends of the said brush rod are respectively a first rod end and a second rod end; the said brush head is disposed at the said first rod end;
   And a brush handle, one end of the said brush handle is a neck configured with a orifice, and the said neck is configured with a conduit in communication with the said orifice, the interior of the said brush handle is configured with a lumen in communication with the said conduit; the said second rod end is inserted into the said lumen through the said orifice and the said conduit;
   The wall thickness of the said neck adjacent to the said orifice is 0.2 mm to 0.5 mm.

2. The said interdental brush according to claim 1, **characterized in**, the wall thickness of the said neck adjacent to the said orifice is 0.3 mm.

3. The said interdental brush according to claim 1, **characterized in**, the radial dimension of the said conduit is greater than the radial dimension of the said brush rod; the gap between the inner wall of the

said conduit and the outer surface of the said brush rod is set from 0.2 mm to 0.3 mm.

4. The said interdental brush according to claim 1, **characterized in**, the said brush handle comprises a handle shell, the said handle shell is formed of a soft rubber material;
And a handle core formed of a hard rubber material; the said handle core comprises a grip base, and the said handle shell is sleeved on the said grip base to form a grip portion of the said brush handle.

5. The said interdental brush according to claim 4, **characterized in**, the said neck comprises a neck base and a neck sleeve formed from soft plastic injection molding, the said neck sleeve is sleeved on the said neck base; the said neck base is the portion of the said handle core that extends beyond the said handle shell.

6. The said interdental brush according to claim 5, **characterized in**, the length of the said neck sleeve is greater than the length of the said neck base, so that the said neck sleeve covers the said neck base and some parts of the surface of the said brush rod.

7. The said interdental brush according to claim 5, **characterized in**, the said grip base is configured with the said lumen for inserting and fixing the said second rod end, the said lumen within the said grip base extends along the length of the said handle core to the direction away from the said neck.

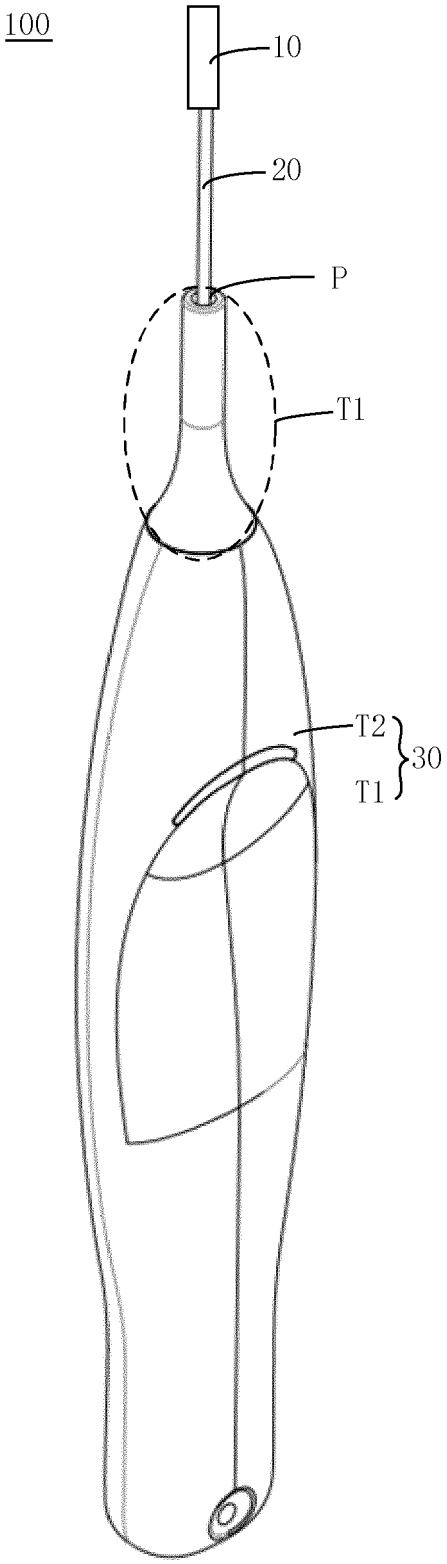

FIG. 1

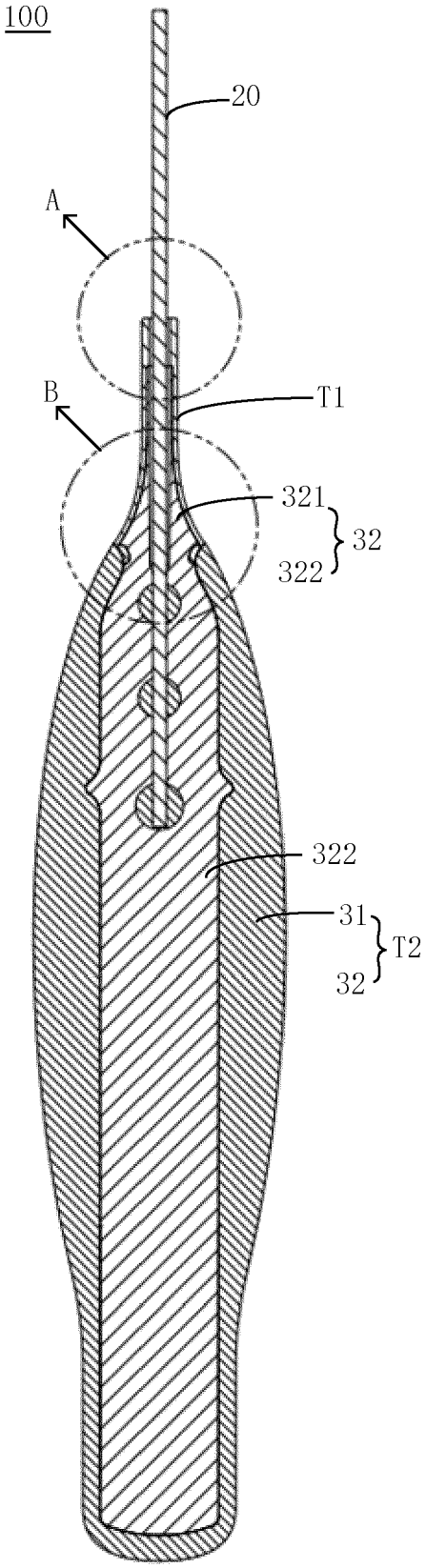

FIG. 2

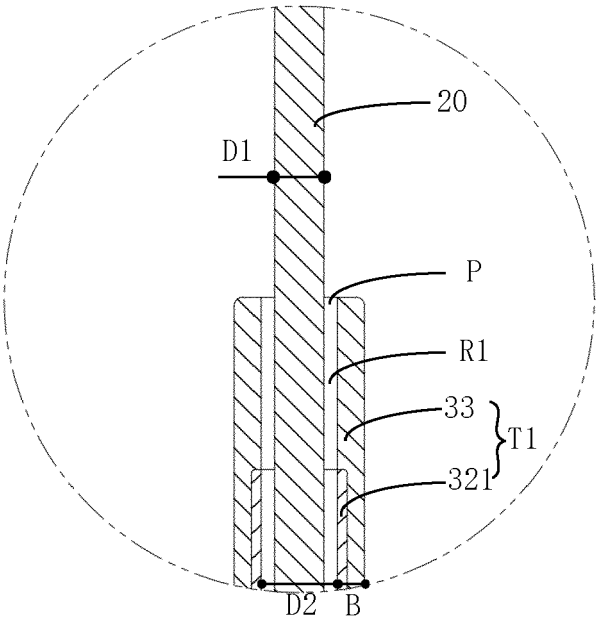

FIG. 3

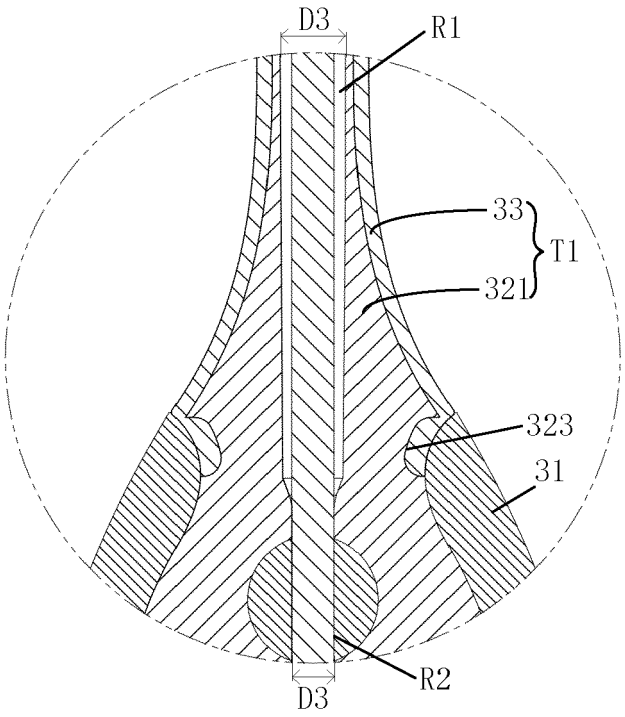

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 23 16 4628

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

A46B
A46D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	13 November 2023	Kun, Karla

CATEGORY OF CITED DOCUMENTS

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