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(54) **Toothbrush-shaped object with edible head**

(57) Toothbrush-shaped object suitable for placement in the oral cavity, comprising a rigid handle and an edible head wherein the head comprises an outer layer enclosing at least one inner core comprising a sensation

providing substance. The effect of the toothbrush-shaped object according to the invention is that it promotes brushing and promotes brushing for a certain amount of time.

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Description

Field of invention

[0001] The present invention relates to a toothbrush-shaped object comprising a handle and an edible head, wherein the edible head comprises an outer layer enclosing an inner core comprising incentive.

Background of the invention

[0002] Oral hygiene is important to keep the mouth (e.g. teeth, gums and tongue) healthy and clean. An important instrument to maintain oral hygiene is the toothbrush, which is typically used in combination with toothpaste. Regular brushing is considered important to maintain/improve teeth and gum health and to prevent/reduce bad breath. In particular, brushing after each of the main meals of the day (i.e. breakfast, lunch and dinner) is considered important for oral health. Most people brush after breakfast and dinner, however brushing after lunch is often skipped.

[0003] This is not surprising since breakfast and dinner are typically taken at home where (clean) bathrooms and also toothbrushes and toothpaste are readily available. Lunch on the other hand is typically taken at work or school without such (clean) facilities or equipment nearby. In addition, the time available for lunch can be relatively short compared to the time available for breakfast or dinner. This not only further deters from brushing after lunch at all, but also deters from brushing for a sufficient amount of time after lunch.

[0004] US2012/0096664 A1 discloses a single use disposable toothbrush comprising a handle offering dental hygiene benefits. A drawback is that there is no mechanism in said disposable toothbrush which stimulates brushing for a sufficient amount of time.

[0005] US2012/0048287 discloses a device for cleaning teeth comprising a cavity shaped to receive at least a portion of a tongue.

[0006] US2005/0260027 discloses a disposable or edible toothbrush for cleaning teeth between meals, which is completely inserted into the mouth upon use. The toothbrush comprises a cavity holding a substance which is released by the act of chewing.

[0007] DE 19609086 discloses a chewable edible toothbrush, which is completely inserted into the mouth upon use. The toothbrush is made from a saliva-soluble material and may comprise additives.

[0008] A drawback of said edible cleaning devices which are completely inserted in the mouth is that due to limited dexterity of the tongue, cleaning of certain areas of the mouth, such as wisdom teeth in the back of the mouth, can be inefficient. In addition these cleaning devices also have no mechanism to stimulate brushing for a sufficient amount of time.

Summary of the invention

[0009] It is an object of the present invention to provide a means for brushing the oral cavity (e.g. teeth, gums and tongue), which does not require bathroom facilities or toothpaste and in particular does not require oral rinsing, and which is suitable to efficiently brush areas in the back of the oral cavity. It is another object of the present invention to provide a brushing means which stimulates brushing for a certain amount of time.

[0010] These objectives are met by a toothbrush-shaped object comprising an edible head wherein the head comprises an outer layer enclosing at least one inner core. In particular, the outer layer is a semi-solid to solid gel, which deteriorates after placement in the oral cavity; and wherein the inner core comprises a substance which upon release from the edible head in the oral cavity provides a sensation. The toothbrush-shape and rigid handle allows the object according to the invention to be handled like a conventional toothbrush and enables the edible head to be moved efficiently in brush-like fashion against the teeth, gum and tongue to provide cleansing.

[0011] After placement of the toothbrush-shaped object according to the invention in oral cavity, the outer layer initially shields the substance which provides a sensation from being perceived by the consumer or at least from being strongly perceived. Only after the outer layer has sufficiently deteriorated (which will take some time) will the majority of the substance be released and perceivable by the consumer. The deterioration may be due to dissolving and/or by mechanical wear (e.g. by brushing) of the outer layer. The sensation providing substance preferably elicits a pleasurable and/or surprising reaction from the consumers, for example by having a desirable taste.

[0012] The presence of the sensation providing substance, initially shielded by the outer layer, stimulates use of the object according to the invention, such as after lunch (e.g. as a treat). In addition the object stimulates brushing for a sufficient amount of time as only after some time the substance which provides a sensation is strongly perceived. In addition, by virtue of the head being edible, no rinsing and no separate bathroom facilities are required. This makes use of the toothbrush-shaped object according to the invention easy and convenient, further stimulating its use.

[0013] Therefore in a first aspect the invention relates to a toothbrush-shaped object suitable for placement in the oral cavity, comprising a rigid handle and an edible head wherein the head comprises an outer layer enclosing at least one inner core,

- wherein the outer layer is a semi-solid to solid gel, which deteriorates after placement in the oral cavity; and
- wherein the inner core comprises a substance which upon release from the edible head in the oral cavity provides a sensation.

[0014] In a further aspect the invention relates to a process to manufacture the toothbrush-shaped object according to the invention by use of a mould to shape the edible head comprising a top- and bottom part.

[0015] In a further aspect the invention relates to the use of the toothbrush-shaped object according to the invention to brush after lunch.

Detailed description

[0016] The 'length', 'width' and 'height' of a body as mentioned herein refer to the x, y and z dimensions of the body as measured in a three-dimensional Cartesian coordinate system, wherein the 'length' refers to the longest dimension of a body. For example, the 'length', 'width' and 'height' are (measured) perpendicular with respect to each other.

[0017] Examples of the present invention will now be described with reference to the accompanying drawings, in which;

Figure 1 is a longitudinal cross section through a toothbrush-shaped object according to the invention; Figure 2 is a top-view of the toothbrush-shaped object of Fig. 1;

Figure 3 is a cross-sectional view of a bottom part of a mould which can suitably be used in the process according to the invention to manufacture the toothbrush-shaped object according to the invention; Figure 4 is a cross-sectional view of the bottom part of the mould of Figure 3, as used in the process of manufacture according to the invention at step 'd' as explained below.

Figure 5 is a cross-sectional view of the bottom- and top part of the mould of Figure 3, as used in the process of manufacture according to the invention at step 'f' as explained below.

Figure 6 is a cross-sectional view of a bottom part of a mould of Figure 3, as used in the process of manufacture according to the invention at step 'h' as explained below.

[0018] A first general preferred but not exclusive embodiment of the toothbrush-shaped object according to the invention is shown in Fig. 1, which is characterized by its overall resemblance to a conventional toothbrush-shape, comprising a rigid handle consisting of a grip (1), a neck (2) and a mount (3). The edible head comprises an outer layer (4) and encloses an inner core (5), wherein the outer layer (4) is provided with surface ridges (6) resembling clustered toothbrush bristle hairs.

[0019] Fig. 2 shows a top-view of the object according to Fig. 1 facing the surface ridges (6).

[0020] The embodiment shown in Fig. 1 and Fig. 2 clearly conveys the overall shape of a conventional toothbrush.

Rigid handle

[0021] The rigid handle of the toothbrush-shaped object according to the invention can suitably be made of any non-toxic material (e.g. rigid plastic, wood) and preferably is non-edible.

[0022] Preferably the rigid handle is made of a natural and biodegradable material, such as wood.

[0023] The handle may be simple, but preferably comprises a distinct grip (1), neck (2) or mount (3) or a combination thereof.

[0024] In particular, the grip (1) of the handle provides a suitable area for a human hand to grab and manipulate the toothbrush-shaped object according to the invention.

[0025] In particular, the neck (2) of the handle may for example improve the ergonomic shape of the toothbrush-shaped object according to the invention. This for example may facilitate brushing the edible head against teeth placed farther back in the mouth, such as wisdom teeth. Typically the neck (2) area of the handle is distinct by being part of the handle which is at a slanted angle in relation to the gripping part (1) and/or the mount (3).

[0026] In particular, the mount (3) of the handle is that part of the handle which is in contact with the edible head to provide a stable connection. Typically the mount (3) is at least partly inserted into the edible head to provide a stable connection and may even be in contact with the inner core (5).

[0027] Also in the case of a simple handle, part of the handle (i.e. a handle-end) is connected to the edible head and typically (partly) inserted therein. However in case the handle comprises a mount (3), this area of the handle is recognisable, typically by being part of the handle which is at a slanted angle with respect to the neck (2) and/or gripping part (1).

Head

[0028] The outer shape of the edible head of the toothbrush-shaped object according to the invention will typically be determined by the shape of the outer layer (4). The edible head of the object of the present invention has a shape which gives the general impression of the contours of a conventional toothbrush head comprising clustered bristles hairs.

[0029] Preferably the surface of the edible head is provided with one or more surface indentations, protrusions or a combination thereof and more preferably with one or more ledges (6). Even more preferably said surface is provided with at least two parallel ledges (6) arranged such to provide an overall impression of the outline of (rows of) clustered toothbrush bristle hairs of a conventional toothbrush. For example providing ledges (6) in parallel on only one side of the head as shown in Fig. 1 and Fig. 2 improves the impression of 'clustered bristle hairs'.

[0030] Providing the surface of the edible head with said indentations and/or protrusions also improves oral

cleaning, for example by improving abrasive action and/or by improving the dislodging of food particles from (between) the teeth.

[0031] The head of the object according to the invention is made of edible material. Edible material is material which is non-toxic and generally considered as food grade by the skilled person. For example, soluble and/or insoluble dietary fibres are considered edible materials.

[0032] To have a toothbrush-shaped appearance, the length of the edible head (LH) should have a certain relationship with the total length (L) of the object according to the invention. Preferably the length of the edible head (LH) is from 5 to 20 % of the total length (L) of the toothbrush-shaped object according to the invention.

[0033] Preferably the length of the edible head (LH) is from 1.5 to 6 cm, more preferably from 2 to 5 cm and even more preferably from 2.5 to 4 cm.

[0034] Preferably the total length (L) of toothbrush-shaped object according to the invention is from 10 to 30 cm, more preferably from 12 to 25 cm and even more preferably from the 15 to 20 cm.

[0035] Preferably the height of the edible head (HH) is from 0.5 to 3 cm, more preferably from 0.8 to 2 cm and even more preferably about 1.5 cm.

[0036] Preferably the width of the edible head (WH) is from 0.3 to 2.5 cm, more preferably from 0.5 to 2 cm and even more preferably about 1 cm.

[0037] Preferably the toothbrush-shaped object according to the invention resembles a conventional toothbrush shape.

Outer-layer

[0038] The outer layer (4) according to the invention encloses at least one inner core (5) comprising a substance which upon release from the edible head in the oral cavity provides a sensation. The outer layer (4) prevents initial detection of at least the major part of the substance comprised by the inner core (5) by the sensory system. Thus at a certain time point after the initial placement of the toothbrush-shaped object according to the invention in the oral cavity (e.g. after some time of brushing) the substance comprised by the inner core (5) will more strongly be perceived by the user (e.g. increase in taste) as a result of deterioration of the outer layer (4). For example, some incentive may be perceived already at the initial moment of the head entering the oral cavity, but followed by a strong taste release (e.g. taste 'explosion') after passage of a certain amount of time.

[0039] The outer layer (4) of the toothbrush-shaped object according to the invention should eventually deteriorate to allow an increased detection of the sensation providing substance comprised by the inner core (5). Said (progressive) deterioration may stem from the outer layer (4) dissolving over time (e.g. in the saliva and/or by activity of oral enzymes) and/or as a result of break-up due to mechanical forces (e.g. as a result of brushing). For example, by the act of brushing, small pieces may

break-off of the outer layer (4) which will eventually expose the inner core (5) and release the (major part of the) sensation providing substance in the oral cavity.

[0040] The time between the head entering the mouth and the strongest perception of a predetermined incentive comprised by the inner core (5) is considered the deterioration time. The deterioration time of the outer layer (4) may depend on the type of gelling agent used and/or the thickness of the outer layer (4). However, the deterioration time can easily be determined by the skilled person by placing the toothbrush-shaped object according to the invention in the mouth and making typical brushing movements.

[0041] Preferably the outer layer (4) has a deterioration time of at least 10 seconds, more preferably of at least 20 seconds, even more preferably of at least 30 seconds, still even more preferably of at least 60 seconds and still even more preferably of at least 90 seconds.

[0042] Preferably the outer layer (4) has a deterioration time of at most 600 seconds, more preferably of at most 300 seconds, even more preferably of at most 180 seconds, still even more preferably of at most 150 seconds and still even more preferably of at most 120 seconds.

[0043] When the edible head is mounted on the handle as shown in Fig. 1 and Fig. 2, the outer layer (4) encloses the inner core (5). Thus the outer layer (4) encloses the inner core (5) when the outer layer (4) prevents initial detection of at least the major part of the sensation providing substance comprised by the inner core (5).

[0044] The outer layer (4) is a semi-solid to solid gel which is suitable to resist at least immediate deterioration (e.g. break-up) in the mouth as a consequence of typical toothbrush-like brushing movements against teeth, gums and/or tongue. Preferably the outer layer (4) is a solid gel.

[0045] One way to characterize the resistance to deterioration of a gel is by measuring its storage modulus (G'). Preferably the outer layer (4) has a storage modulus (G') at 37 degrees Celsius of 10^4 to 10^9 Pa, more preferably of 10^5 to 10^8 Pa and even more preferably of 10^6 to 10^7 Pa.

[0046] The storage modulus (G') can be measured according to the following method: A rotational rheometer (such as an ARES, AR, Kinexus or Physica MCR model) is used to measure the small angle oscillatory shear rheology of a batch of outer layer material at 37 degrees Celsius. A quantity of outer layer material sufficient to completely fill the gap is placed on a 25 mm parallel plate fixture and the gap is initially closed until material extends beyond the periphery of the fixture. Excess material is trimmed from the plate edges. The gap is then typically closed slightly to ensure that the outer layer material completely fills the gap. The gap is then closed to 1.0 to 2.0 mm and any excess material is again removed before testing. In instances where the outer layer material is insufficient to fill the above configured plate fixture, or where the outer layer material is too hard at 37 degrees Celsius causing transducer compliance problems, an 8 mm plate may be substituted. The instrument is set as

follows: (Strain: 0.1 % (or less if a strain sweep at 37 degrees Celsius indicates that 0.1 % is outside the linear viscoelastic region); Oscillation: 10 radians/second; Normal force: 0 to 0.1 Newtons; Temperature: 37 degrees Celsius; Auto strain adjustment On; Adjustment: 20%; Minimum strain 0.01 %; Maximum strain 1.0%; Minimum torque 10 micronewton*m; Maximum torque 1000 micronewton*m); Axial force adjustment On; Force 0.0N; Sensitivity 0.1 N)

[0047] The semi-solid to solid gel of the outer layer (4) according to the invention can be made using one or more food grade gelling agents known in the art. Typically the firmness of a gel can be varied by changing the amount and/or type of gelling agent in the outer layer (4). Varying the amount of the gelling agent will typically also vary the deterioration time of the outer layer (4). For example increasing the amount of gelling agent may transform a semi-solid gel into a (more) solid (i.e. more firm) gel.

[0048] Preferably the outer layer (4) comprises one or more gelling agents selected from the list consisting of gelatine, gum arabic, gum ghatti, gum karaya, gum tragacanth, locust bean gum, guar gum, psyllium seed gum, quince seed gum, tamarind seed gum, agar, alginates, carrageenan or furcelleran, pectins (e.g. low methoxyl or high methoxyl-type pectins), sodium carboxymethyl cellulose, microcrystalline cellulose, methyl cellulose, methylcellulose, hydroxypropyl cellulose, hydroxypropylmethyl cellulose, dextran, xanthan, β -1,3-glucan and any combination thereof.

[0049] Preferably the outer layer (4) is a water-based semi-solid to solid gel and more preferably comprises from 5 to 95 wt. % of water, based on the total weight of the outer layer (4).

[0050] Preferably the edible head comprises from 5 to 95 wt. % of water, based on the total weight of the edible head.

Inner Core

[0051] The at least one inner core (5) may be comprised of the same general material as the outer layer (4) but with at least a higher concentration of sensation providing substance. The inner core (5) may also be of a different material and need not be a semi-solid to solid gel. For example, the inner core (5) material may also be crystalline, a liquid and/or gaseous (e.g. gas bubbles). Furthermore, the inner core (5) may essentially consist of the sensation providing substance.

[0052] The inner core (5) is thus a region of the edible head which holds a higher concentration of the sensation providing substance compared to the surrounding outer layer (4). For example, an edible head may be provided comprising of a single type of matrix material, but wherein a sensation providing substance is injected in the centre. In case this results in an inner region having a relatively high concentration of incentive compared to the enclosing layer of the head, such a head may form the edible

head according to the invention.

[0053] In case the edible head according to the invention comprises more than one inner core (5) comprising sensation providing substance, most should be enclosed by the outer layer (4), and more preferably all are enclosed by the outer layer (4).

Sensation providing substance

[0054] The sensation providing substance can be any substance or (a group of substances) which can be distinctly perceived by the consumer and which preferably elicits a pleasurable and/or surprising reaction from the consumer. Examples are substances having a desirable taste, desirable flavour, substances providing a colour release (e.g. a resulting in temporary blue tongue) and/or substances which provide a surprising hot (e.g. peppery) or cold (e.g. minty) feeling in the mouth. Other examples include substances which give a sound (e.g. a popping sound) when coming into contact with saliva.

[0055] Preferably the sensation providing substance is a desirable tastant (e.g. candy flavour), and more preferably has a fruit, chocolate, mint, pepper, sweet or sour flavour.

[0056] Preferably the outer layer (4) comprises a different colour than the at least one inner core (5).

[0057] Preferably the at least one inner core (5) comprises more than one type of sensation providing substance.

[0058] In case the sensation providing substance is a tastant, the outer layer (4) has an overall taste and flavour (at least when initially placed in the mouth), which is different from that of the inner core (5) comprising the sensation providing substance. Preferably the outer layer (4) comprises an overall taste which is perceived as less strong (e.g. intense) than the overall taste of the inner core (5).

[0059] The outer layer (4) preferably at least retards the free diffusion of the sensation providing substance from the inner core (4). For example, preferably an inhomogenous distribution of the sensation providing substance over the outer layer (4) and inner core (5) is maintained during the shelf life of the toothbrush-shaped object according to the invention. The rate of free diffusion typically depends on the amount and/or type of the gelling agent of the outer layer (4) and/or on the type of material of the inner core (5) and/or of the type of sensation providing substance, as known to the skilled person.

[0060] At the moment the toothbrush-shaped object according to the invention initially enters the oral cavity, the concentration of sensation providing substance in the outer layer (4) is lower than in the at least one inner core (5).

[0061] Preferably the outer layer (4) comprises at most 40 wt. %, more preferably at most 30 wt. % even more preferably at most 20 wt. % and still even more preferably at most 10 wt. % of the total amount of the sensation providing substance comprised by the edible head.

[0062] Preferably the one or more inner cores (5) comprise at least 60 wt. %, more preferably at least 70 wt. % even more preferably at least 80 wt. % and still even more preferably at least 90 wt. % of the total amount of the sensation providing substance comprised by the edible head.

Optional ingredients

[0063] Preferably the toothbrush-shaped object according to the invention, more preferably the head, comprises little or no ingredients which are known to have adverse oral effects, such as tooth decay and bad breadth. For example, glucose and fructose are believed to promote the formation of cavities and are preferably not formulated in the edible head.

[0064] Many non-tooth decay promoting tastants are commercially available. For example, non-nutritive sweeteners, such as aspartame, acesulfame K, neotame, saccharin, and sucralose may provide a (strong) sweet taste and are known to not promote tooth decay.

[0065] Preferably the inner core (5) according to the invention comprises one or more sensation providing substances selected from the list consisting of aspartame, acesulfame K, neotame, saccharin and sucralose.

[0066] Preferably the edible head and more preferably the outer layer (4) comprises one or more abrasives suitable to provide mild abrasion and even more preferably (mild abrasive) baking soda, hydrated silica, calcium carbonate or a combination thereof.

[0067] Preferably the edible head and more preferably the outer layer (4) comprises one or more cavity prevention agents and more preferably one or more cavity prevention agents such as xylitol, stevia, sodium fluoride or a combination thereof.

[0068] Preferably the edible head and more preferably the outer layer (4) comprises one or more medicinal ingredients and even more preferably fungicides, antiseptics, such as thymol, menthol, tea tree oil or a combination thereof.

[0069] Preferably the edible head and more preferably the outer layer (4) comprises one or more odour absorbing ingredients and even more preferably one or more odour absorbing ingredients such as copper gluconate, hydrogenated vegetable oils, sodium bicarbonate or a combination thereof.

[0070] Preferably the edible head and more preferably the outer layer (4) comprises one or more tartar control ingredients and even more preferably the tartar control ingredient tetrapotassium pyrophosphate.

[0071] Preferably the edible head and more preferably the outer layer (4) comprises one or more plaque control ingredients.

[0072] Preferably the edible head and more preferably the outer layer (4) comprises one or more tooth whitening ingredients.

[0073] All ingredients, which maintain or promote oral health are used in an effective amount and below any

toxic levels as known to the skilled person.

Process of manufacture

[0074] The toothbrush-shaped object according to the present invention can be made according to techniques and methods known in the art.

[0075] In a further aspect the invention relates to a process for the manufacture of the toothbrush-shaped object according to the invention, comprising the following steps:

- a. Providing a mould of the edible head comprising a bottom part (7) and a top part (13), wherein the mould comprises an opening or recess (8) suitable to insert a handle-end (10) into the interior of the mould;
- b. Filling the bottom part (7) of the mould with outer layer material (11) in liquid form;
- c. Optionally gelating the outer layer material provided at step 'b';
- d. Adding a handle-end (10) and inner core material comprising the substance which upon release from the edible head in the oral cavity provides a sensation (12); onto the outer layer material provided at step 'c';
- e. Placing the top part (13) of the mould onto the bottom part (7);
- f. Adding more outer layer material (11) in liquid form, optionally via a channel (14) in the top part of the mould (13), to enclose the handle-end (10) and the inner core material comprising said substance (12);
- g. Gelating any remaining non-gelated outer layer material (11) to provide a toothbrush-shaped edible head;
- h. Removing the toothbrush-shaped object according to the invention from the mould.

[0076] Depending on the gelling agent, to provide liquid outer layer material (11) at step 'b' and 'f' the gelling agent may be freshly dissolved (typically in water) and added before setting and/or heated to liquefy. Typically, the gelation at step 'c' and 'g' can be accomplished by allowing the outer layer material (11) to sufficiently cool and/or to leave for a suitable amount of time.

[0077] In case of liquid or gaseous inner core material comprising sensation providing substance (12), suitably first a solid outer layer in the shape of a toothbrush head can be provided into which said inner core material (12) is injected at or after step 'g' (i.e. instead of being added at step 'd').

[0078] The top part (13) and bottom part (7) of the mould of the edible head should at least confer a rough overall shape of a toothbrush to the edible head. Suitably, further shaping, for example to improve the resemblance to a conventional toothbrush, may be done by using another mould or even by hand.

Use

[0079] In a further aspect the invention relates to the use of the toothbrush-shaped object according to the invention to brush the oral cavity and preferably teeth, gums or a combination thereof.

[0080] Preferably the toothbrush-shaped object according to the invention is used to brush the oral cavity for at least 10 seconds, more preferably 20 seconds, even more preferably 30 seconds, still even more preferably at least 60 seconds and still even more preferably at least 90 seconds.

Claims

1. Toothbrush-shaped object suitable for placement in the oral cavity, comprising a rigid handle and an edible head wherein the head comprises an outer layer (4) enclosing at least one inner core (5),

- wherein the outer layer is a semi-solid to solid gel, which deteriorates after placement in the oral cavity; and
- wherein the inner core (5) comprises a substance which upon release from the edible head in the oral cavity provides a sensation.

2. Toothbrush-shaped object according to claim 1, wherein the outer layer comprises one or more gelling agents selected from the list consisting of gelatine, gum arabic, gum ghatti, gum karaya, gum tragacanth, locust bean gum, guar gum, psyllium seed gum, quince seed gum, tamarind seed gum, agar, alginates, carrageenan or furcelleran, pectins, sodium carboxymethyl cellulose, microcrystalline cellulose, methyl cellulose, methylethyl cellulose, hydroxypropyl cellulose, hydroxypropylmethyl cellulose, dextran, xanthan, β -1,3-glucan and any combination thereof.

3. Toothbrush-shaped object according to claim 1 or claim 2, wherein the handle is non-edible and preferably is made from wood and more preferably comprises a distinct grip (1), neck (2) or mount (3) or a combination thereof.

4. Toothbrush-shaped object according to any one of claims 1 to 3, wherein the surface of the edible head is provided with one or more surface indentations, protrusions or a combination thereof, preferably one or more ledges (6) and more preferably at least two parallel ledges (6).

5. Toothbrush-shaped object according to any one of claims 1 to 4, wherein the length (LH) of the head is from 5 to 20 % of the total length (L) of the toothbrush-shaped object.

6. Toothbrush-shaped object according to any one of claims 1 to 5, wherein the outer layer (4) has a deterioration time of at least 10 seconds, preferably of at least 20 seconds, more preferably of at least 30 seconds, even more preferably at least 60 seconds and still even more preferably of at least 90 seconds.

7. Toothbrush-shaped object according to any one of claims 1 to 6, wherein the outer layer (4) has a storage modulus (G') at 37 degrees Celsius of 10^4 to 10^9 Pa, more preferably of 10^5 to 10^8 Pa and even more preferably of 10^6 to 10^7 Pa.

8. Toothbrush-shaped object according to any one of claims 1 to 7, wherein the one or more inner cores (5) comprise at least 60 wt. %, preferably at least 70 wt. %, more preferably at least 80 wt. % and even more preferably at least 90 wt. % of the total amount of the sensation providing substance comprised by the edible head.

9. Toothbrush-shaped object according to any one of claims 1 to 8, wherein the sensation providing substance is a desirable tastant and preferably has a fruit, chocolate, mint, pepper, sweet or sour flavour.

10. Toothbrush-shaped object according to any one of claims 1 to 9, wherein the inner core (5) comprises one or more sensation providing substances selected from the list consisting of aspartame, acesulfame K, neotame, saccharin and sucralose.

11. Toothbrush-shaped object according to any one of claims 1 to 10, wherein the edible head comprises one or more abrasives suitable to provide mild abrasion, preferably baking soda, hydrated silica, calcium carbonate or a combination thereof.

12. Process to manufacture a toothbrush-shaped object according to any one of claims 1 to 11 comprising the following steps:

- a. Providing a mould of the edible head comprising a bottom part (7) and a top part (13), wherein the mould comprises an opening or recess (8) suitable to insert a handle-end (10) into the interior of the mould;
- b. Filling the bottom part (7) of the mould with outer layer material (11) in liquid form;
- c. Optionally gelating the outer layer material provided at step 'b';
- d. Adding a handle-end (10) and inner core material comprising the substance which upon release from the edible head in the oral cavity provides a sensation (12); onto the outer layer material provided at step 'c';
- e. Placing the top part (13) of the mould onto the bottom part (7);

- f. Adding more outer layer material (11) in liquid form, optionally via a channel (14) in the top part of the mould (13), to enclose the handle-end (10) and the inner core material comprising said substance (12); 5
- g. Gelating any remaining non-gelated outer layer material (11) to provide a toothbrush-shaped edible head; 10
- h. Removing the toothbrush-shaped object according to the invention from the mould. 10
- 13.** Use of the toothbrush-shaped object according to any one of claims 1 to 11 to brush the oral cavity and preferably to brush the teeth, gums or a combination thereof. 15
- 14.** Use according to claim 13, wherein the toothbrush-shaped object according of the invention is used to brush the oral cavity for at least 10 seconds, more preferably 20 seconds, even more preferably 30 seconds, even more preferably at least 60 seconds and still even more preferably at least 90 seconds. 20

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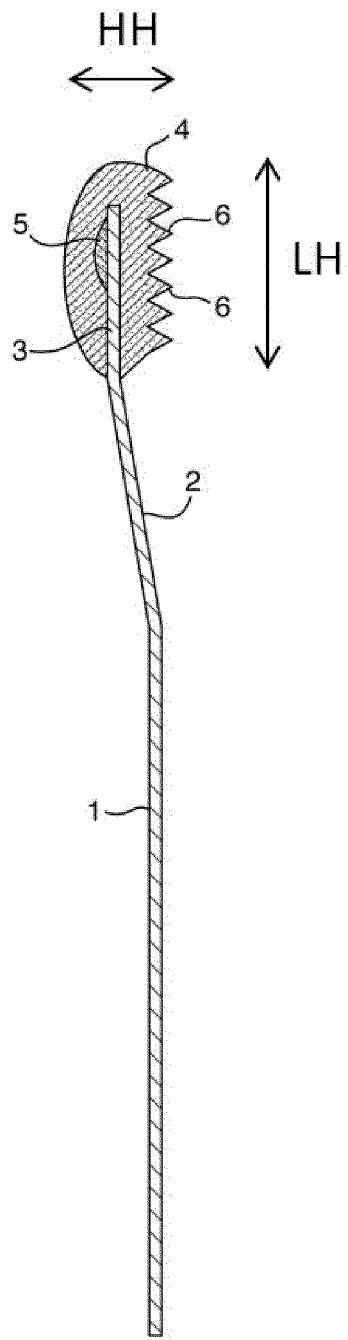


Fig. 1

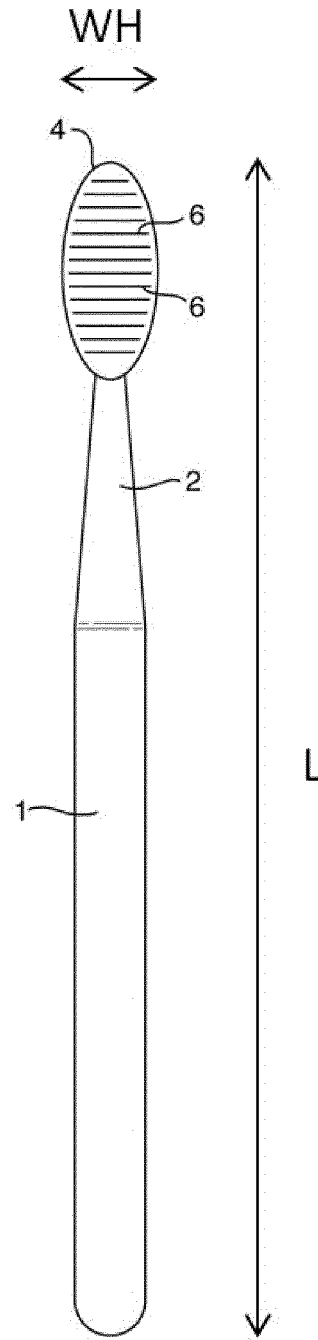


Fig. 2

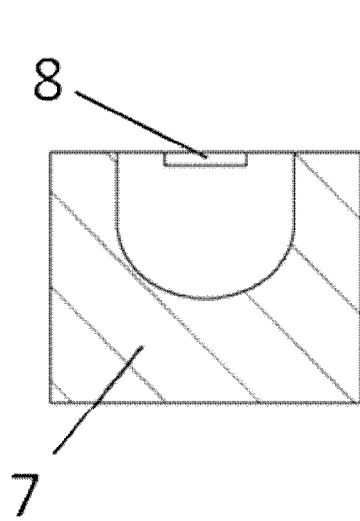


Fig. 3

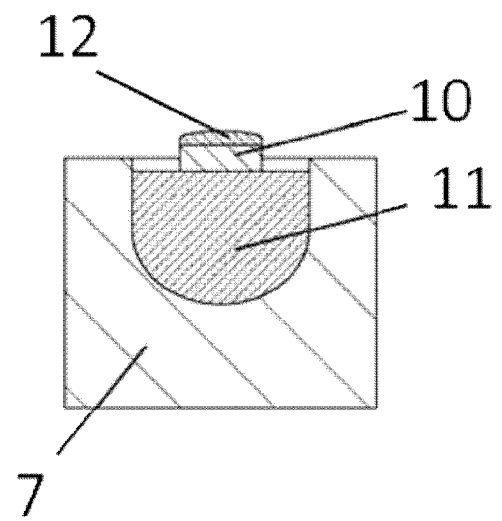


Fig. 4

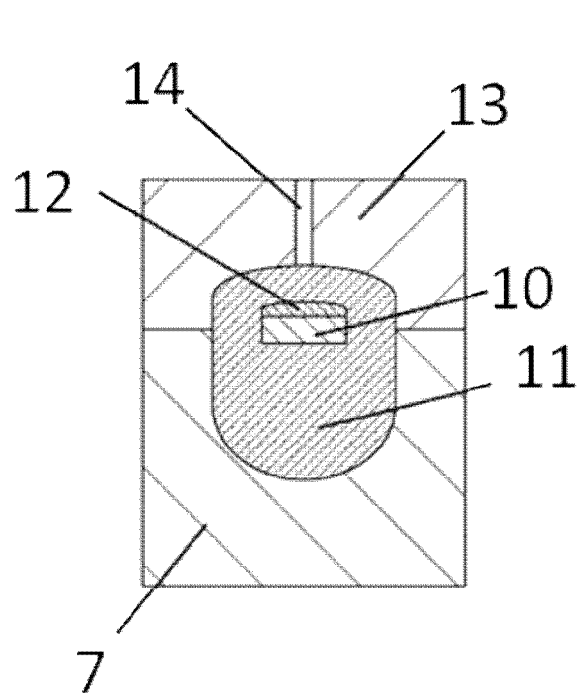


Fig. 5

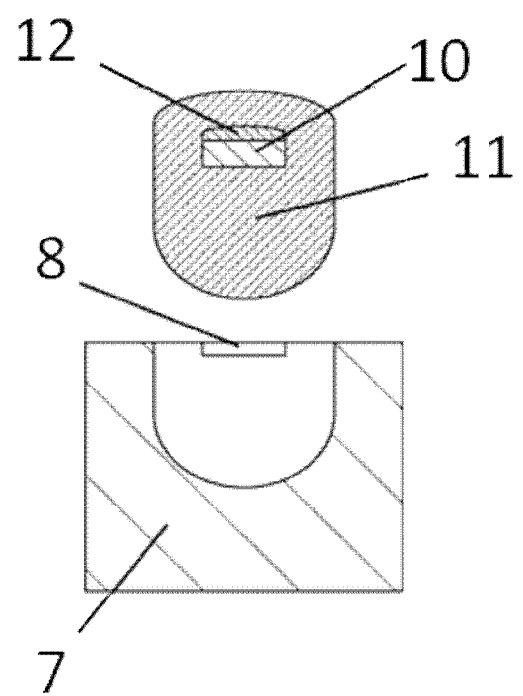


Fig. 6



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Application Number
EP 12 19 6809

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