The invention is directed to a toothbrush head (4) with a bristle support (6) to which a plurality of preferably tuft-shaped cleaning elements (8) are affixed, said bristle support (5) including at least one movable rocker (10, 11) having a first end (13) attached to it.
(57) Abridged (suite) / Abstract (continued):
on the side remote from a handpiece-side end of the toothbrush head (4) and having a free second end (14) which is on the side close to the handpiece-side end of the toothbrush head (4), said rocker (10, 11) carrying at least one row of cleaning elements (8). The invention relates in addition to a preferably manual toothbrush having such a toothbrush head (4). According to the invention, at least the cleaning elements (8) arranged on the rocker (10, 11) furthest from a longitudinal center plane (14) of the toothbrush head (4) have their free ends (14) inwardly tilted towards said longitudinal center plane (15) at an acute angle.
Title: TOOTHBRUSH

Abstract: The invention is directed to a toothbrush head (4) with a bristle support (6) to which a plurality of preferably tuft-shaped cleaning elements (8) are affixed, said bristle support (6) including at least one movable rocker (10, 11) having a first end (13) attached to it on the side remote from a handpiece-side end of the toothbrush head (4) and having a free second end (14) which is on the side close to the handpiece-side end of the toothbrush head (4), said rocker (10, 11) carrying at least one row of cleaning elements (8). The invention relates in addition to a preferably manual toothbrush having such a toothbrush head (4). According to the invention, at least the cleaning elements (8) arranged on the rocker (10, 11) furthest from a longitudinal center plane (14) of the toothbrush head (4) have their free ends (14) inwardly tilted towards said longitudinal center plane (15) at an acute angle.
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TOOTHBRUSH

This invention relates to a toothbrush head with a bristle support to which a plurality of preferably tuft-shaped cleaning elements are affixed, with the bristle support including at least one movable rocker having a first end attached to it on the side remote from a handpiece-side end of the toothbrush head and having a free second end which is on the side close to the handpiece-side end of the toothbrush head, said rocker carrying at least one row of cleaning elements. In addition the present invention relates to a preferably manual toothbrush having such a toothbrush head.

With toothbrushes it is desirable for the bristle cluster to be elastically mounted relative to the edge part with which the toothbrush is guided so that the toothbrush head and the bristle cluster adapt themselves to the contour of the row of teeth or gingiva being cleaned, and errors in the angle of application are automatically compensated for and excessive contact pressures are reduced by yielding. For this purpose it is known for the bristle support carrying the bristle tufts to be elastically mounted. In this context the term "bristle support" does not mean necessarily that the support actually carries "real" bristles or tufts of bristles but also includes the possibility of other cleaning elements, for example, in the form of elastomer strips or interproximal tips or other massage elements being affixed to the bristle support instead of or in addition to bristle tufts. For example, U.S. Pat. No. 6,178,582, U.S. Pat. No. 5,052,071, U.S. Pat. No. 6,073,299 and U.S. Pat. No. 5,465,450 disclose various embodiments of toothbrush heads whose bristle supports are configured to be elastic in some regions so that different sections of the bristle support can twist relative to each other. This is accomplished according to the above-cited documents in that flexible sections of elastomer are incorporated in a conventional plate-shaped bristle support so that parts of the bristle cluster separated from the handpiece or the toothbrush neck by such an elastomer section can flex away under the applied cleaning pressure. As a rule, this causes a part of the bristle cluster facing away from the toothbrush neck or handpiece to flex away, which in turn results in making it difficult to clean teeth at the hard-to-reach rear end of the oral cavity because the section of the bristle cluster penetrating deepest into the oral cavity always flexes away.

Already proposed therefore was a toothbrush head with a different elasticity or movability, on which the sections of the bristle cluster at the brush head tip, i.e., those sections most distant
from the toothbrush neck or handpiece, are mounted for least compliance, while those sections of the bristle cluster arranged closer to the handpiece neck are allowed to comply or flex away more intensively. For this purpose, provision is made on the toothbrush head for a rocker which protrudes rearwardly, i.e., it is attached to the toothbrush head with its end remote from the toothbrush neck while projecting towards the toothbrush neck with its free end. While this free end close to the toothbrush neck is allowed to rock up and down, enabling the bristle tufts or cleaning or massage elements affixed thereto to resiliently spring away under the applied cleaning pressure, the bristle tufts or cleaning or massage elements arranged at the tip of the brush head are mounted without such a rocking effect so that they are unable to yield in like manner.

Such a toothbrush head with rearwardly protruding rockers is disclosed, for example, in U.S. Patent Application No. 2008/0184511 A1. In concrete terms, two rockers are provided which form the legs of a U and are joined together by a common middle section by means of which said rockers are attached to the body of the toothbrush head. The free ends of the rockers extend towards the toothbrush neck part so that the bristle tufts mounted thereon are able to rock up and down. In this arrangement, the two rockers are spaced apart from each other and extend to the right and left of a bristle support central section which is rigidly connected to the body of the toothbrush head so that the lateral sections of the bristle cluster formed by the rockers are able to rock up and down relative to the bristle support central section.

Such a toothbrush head may well feature superior kinematics and hence improved adaptation of the contour of the bristle cluster to tooth contours with a high cleaning efficiency also in difficult-to-reach areas of the oral cavity, however the width of the bristle support in a direction transverse to the toothbrush longitudinal direction increases because said rockers require a certain distance from the central region of the bristle support in order to ensure the desired movability while permitting the bristle tufts to be fastened. Up to now this has impaired the desired population density of the bristle cluster on the whole and the desired compactness for facilitating penetration into inaccessible areas. At the same time the balance achieved so far between the compliance of the bristle cluster section mounted on the rockers and the stationary part of the bristle cluster is worthy of improvement.

In addition, EP 18 34 605 A1 discloses a toothbrush head having a soft plastic rocker carrying rubber elastic cleaning elements.
Proceeding from the foregoing, it is an object of the present invention to provide an improved toothbrush head and an improved toothbrush of the type referred to, which prevent the disadvantages of the prior art while developing the art further in advantageous manner. Preferably, high flexibility and adaptability of the bristle cluster to different contours should be accompanied by improved control over the cleaning movement for easier cleaning of difficult-to-reach areas.

This object is accomplished according to the present invention by a toothbrush head according to claim 1 and by a toothbrush according to claim 14. Preferred embodiments of the invention are the subject-matter of the dependent claims.

To obtain a compact and densely packed cluster of bristles or of cleaning and/or massage elements in spite of a movable rocker or wing arrangement it is proposed arranging the cleaning elements in the edge regions or outer lying sections of the rocker at an inclination towards the center of the bristle support or toothbrush head, such that the working surface area of the cluster of bristles or cleaning elements defined by the free ends of the cleaning elements is smaller than the base area of the bristle support within which said cleaning elements are affixed to the bristle support with their lower ends. This results in not only a smaller appearance of the brush head but also better control of the cleaning movement because a smaller, more compact area stands in direct contact with the teeth or gingiva, i.e., more bristles or cleaning elements are active where the user wants them to be active. According to the invention, at least the cleaning elements arranged on the rocker furthest from a longitudinal center plane of the toothbrush head have their free ends inwardly tilted towards said longitudinal center plane at an acute angle. Said longitudinal center plane is understood to be a plane containing the toothbrush longitudinal axis and extending parallel to the main direction of the bristle tufts or cleaning elements. In spite of the wide bristle support, the inwardly inclined free ends of the outermost bristle tufts or cleaning elements provide a compact bristle cluster. In spite of the movability of the rocker the cluster of bristles or cleaning elements is able to hold application substances such as dentifrice efficiently on the working surface and prevent the dentifrice from easily wandering into spaces on the bottom of the bristle support.

The inwardly inclined arrangement of the rocker’s outer tufts is an advantage in particular when the bristle support includes a movable pair of rockers which are arranged on the right and left essentially symmetrically relative to the longitudinal center plane of the toothbrush and/or form
outer edge sections of the bristle support. In this arrangement, at least the cleaning elements or bristle tufts arranged furthest from the longitudinal center plane have their free ends tilted inwardly towards the longitudinal center plane, resulting in a reduced width of the working surface defined by the free ends. The cleaning elements of the left and right rocker are therefore inclined in opposite directions towards each other.

In a further aspect of the invention, provision can be generally made for all the cleaning elements on the movable rockers to be tilted inwardly at like angles, including however also the possibility for only some of the cleaning elements on the rockers to be inclined. Alternatively to such a uniform inclination of the cleaning elements it is also possible in an advantageous further aspect of the invention to provide for various cleaning elements on a rocker to be variously steeply inclined at different angles of tilt. Advantageously, cleaning elements arranged further to the outside, i.e., further from the longitudinal center plane, may be more steeply inclined inwardly than cleaning elements arranged further to the inside on the rocker.

The inclination of the cleaning elements on the rockers can be generally effected at variously large angles. In order to obtain the desired smaller working surface and the desired compactness of the cluster of working elements without having to suffer from the disadvantage that the cleaning elements yield excessively due to too great an inclination, an advantageous further aspect of the invention provides for the inclined cleaning elements to be arranged at an angle of tilt of 1° to 30°, preferably 5° to 20°, approximately, relative to the longitudinal center plane. In this arrangement, it has proven to be an advantage for the outermost cleaning elements, i.e., those arranged furthest from the longitudinal center plane, to be tilted with their longitudinal axes at an angle of 10° to 20° relative to the longitudinal center plane, while cleaning elements further inside, i.e., those spaced a smaller distance from the longitudinal center plane, are inclined on the rockers at an angle of just 5° to 15° relative to the longitudinal center plane.

In an arrangement including two rockers or wings having cleaning elements arranged on them it is possible to provide between the two rockers a central bristle support section which advantageously is rigidly connected to a body of the toothbrush head so that during the up and down rocking movement the rockers are moved relative to the central bristle support section. On said central bristle support section is it likewise possible to affix cleaning elements, in particular bristle tufts and/or elastomer strips, and said central cleaning elements can be arranged advantageously without being tilted, i.e., parallel to the longitudinal center plane. However, the
cleaning elements affixed to the central bristle support section can be tilted in said longitudinal center plane, i.e., forwardly or rearwardly in the toothbrush longitudinal direction, preferably at an acute angle relative to a perpendicular drawn upon the toothbrush longitudinal axis. In an alternative embodiment of the invention, it is also possible however to dispense with such a central bristle support section, i.e., another bristle support section is omitted between the rockers arranged on the right and the left and/or said rockers adjoin each other directly.

The cleaning elements arranged on the rockers have, with regard to the point of attachment or fulcrum of the rocker, a different lever arm depending on the distance from the free end of the rocker, i.e., a cleaning element converts the applied cleaning pressure more or less easily into a deflection movement of the rocker depending on where on the rocker said cleaning element is arranged. To make use of this effect and obtain better control of the deflection movement of the rocker, in accordance with another aspect of the present invention a cleaning element is provided towards the free end of the rocker which is more solid and in particular more resistant to kinking. In particular the last cleaning element at the free end of a rocker is configured to be more solid and in particular more resistant to kinking than the cleaning elements arranged in a central section of the rocker and/or further towards the first end of the rocker, with said more solid bristle tuft or cleaning element being advantageously at least as high as the cleaning elements arranged further towards the first end. The force which acts to move the flexible rockers during cleaning is introduced in a more directionalized way by the last larger cleaning element or elements, as a result of which the deflection movement of the rocker is controlled more precisely. Small, thin bristle tufts would tend to break away out of control. On the other hand it is possible, depending on the angle at which the user holds the brush, to exert considerable pressure on the last cleaning elements arranged at the free ends of the rocker. By providing the last cleaning element or elements with greater solidity and/or better resistance to kinking and/or larger cross section, the cleaning element is prevented from twisting or yielding and distributes the acting force over a larger area. This results in a more agreeable cleaning experience and reduces pricking on the gingiva.

Advantageously, said cleaning elements on the free end of the rockers are higher than the adjoining cleaning elements and/or the cleaning elements arranged in a central section of the rockers so that the first flexion of the rockers or introduction of force at the beginning of the flexion is adopted in controlled manner. Not until the rocker performs a certain deflection
movement do the adjoining cleaning elements and/or the bristle tufts arranged in a central section of the rocker come into play and distribute the load uniformly for an optimum cleaning experience without local overloading.

In order on the one hand to enable sufficient adaptation to different contours through yielding of the rockers but on the other hand to enable cleaning forces sufficiently high for penetration into interproximal spaces, it is desirable for the rockers to yield in a predesigned manner under a defined cleaning force and to obtain a controlled response of the rockers to cleaning pressure. In this regard it has proven to be particularly advantageous in accordance with another aspect of the present invention for the rockers to be configured such that, given an applied force in the range of 1 N to 5 N, approximately, with which the toothbrush head acts against the teeth and/or gingiva, the free ends of the rockers perform a deflection movement of a minimum of 1 mm and a maximum of 6 mm, preferably in the range of 2 to 3.5 mm (this applies to the deflection movement of the rockers alone - the head end is assumed to be in fixed position). This achieves a good compromise between light-footed adaptation to different elevations in the contour on the one hand and good controllability of the cleaning movement on the other hand.

The desired compliance of the rockers can be generally achieved in a variety of ways. For example, the rockers can be movably mounted while at the same time being supported as by an elastic spring element. However, in an advantageous further aspect of the invention, the rockers have their first ends non-rotatably attached to a body part of the toothbrush head and for themselves are configured for elastic deformation, such that the previously mentioned actuating or deflecting movement of the rockers is obtained by applying the customary forces during cleaning. In other words, the rockers are elastically constructed such that the desired deformation of the rockers occurs under normal cleaning pressures.

In order to obtain the desired compliance with rocker dimensions which are easy to manufacture but on the other hand compact, a further aspect of the invention provides for rockers with a free length in the range of 20 mm to 70 mm, approximately, and preferably 30 to 50 mm, approximately, to have a modulus of elasticity in the range of 300 to 700 MPa, with a particularly favorable compromise between adaptation to different contours on the one hand and controllability of the cleaning movement on the other hand being obtained by a modulus of elasticity in the range of 350 to 500 MPa. According to an advantageous further aspect of the invention, the rockers may be comprised of a mixture of polyethylene and polypropylene, in
which advantageously TPE amounts to 10% to 30%, preferably 20%, and PP to 70% to 90%, preferably 80%, approximately.

The rockers can be generally manufactured from the same material as the body of the toothbrush head and/or the neck part of the toothbrush. For example, the rockers can be integrally injection-molded directly onto the body of the toothbrush head as a one-piece construction.

Alternatively, the rockers can also be comprised of a different material than the body of the toothbrush head and/or the neck part. This enables not only visual differentiation and hence functional highlighting but also the component properties to be matched to the respective function optimally.

Said rockers can be generally connected in a variety of ways to the body of the toothbrush head. For example, the rockers can be joined by positive engagement, for example by snap action, or by bonding materials to each other as by welding or molding on, or also by frictional engagement as by adhesion. Subsequent connection enables the pertinent components to be manufactured separately.

To obtain a connection which is particularly strong and secure against inadvertent disconnection, it can be provided in accordance with another aspect of the present invention that the rockers are securely attached to the body part of the toothbrush head by means of a connection established by positive engagement and material bonding. In particular, said body part of the toothbrush head can have a fastening section formed as an undercut and equipped preferably with opposing notched undercuts onto which the rockers are injection-molded so that the rocker material engages into said notches.

The resilient springing away of the rockers under the customary cleaning pressures applied changes the angle of inclination of the rocker, as a result of which the angle of application of the working surface section, which is formed by the free ends of the cleaning elements affixed to the rockers, also changes. As this is desired to a limited degree only, another aspect of the present invention provides for an elastic movability of the toothbrush head and/or the neck part formed thereon in opposite direction. In particular a neck part connectable to the bristle support can be configured to be elastically movable under cleaning forces in the range of 1 N to 5 N on the toothbrush head. For this purpose, said neck part can have, at a distance from the bristle support
and/or at a distance from the rockers, a reduced cross-section preferably in the form of a window-like opening. In particular said opening through the neck part can be provided in a vertical direction, i.e., parallel to the longitudinal center plane. Through a resilient springing-back motion of the rockers on the one hand and the neck part on the other hand it is possible to compensate for the change in the angle of application caused by the resilient springing-back motion of the rockers. At the same time the different leverage ratios cause the deflection movements to occur in multiple stages. While the rockers effect a fine adaptation, a resilient springing-away movement of the entire toothbrush head through deformation of the neck part enables a coarser adaptation movement to be achieved.

These and further features which, when used singularly or in any combination and irrespective of their summary in the claims, may form the subject-matter of the present invention will become apparent not only from the claims and the preceding description but also from the accompanying drawings and the subsequent description of preferred embodiments. In the drawings,

FIG. 1 is a schematic perspective view of a toothbrush having a bristle support including two rockers according to an advantageous embodiment of the invention;

FIG. 2 is a schematic end view of the toothbrush head of the toothbrush of FIG. 1 showing an obliquely inwardly inclined arrangement of the bristle tufts positioned on the rockers;

FIG. 3 is a top plan view of the brush head of FIG. 2 showing the extension of the lateral rockers and the arrangement of the bristle tufts affixed thereto;

FIG. 4 is a side view of a toothbrush head having two lateral rockers similar to the preceding Figures, but with different bristles being provided on the rockers and no further bristle support part and no further bristle tufts being provided between the rockers;

FIG. 5 is a top plan view of the toothbrush head of FIG. 4 showing the arrangement of the bristle tufts and their configuration on the rockers;

FIG. 6 is a sectional view taken along the line A-A of FIG. 5 showing the connection between the rockers of the bristle support and the body of the toothbrush head; and
FIG. 7 is a schematic side view of a toothbrush head with lateral rockers of the bristle support similar to the preceding embodiments to illustrate the movability of the lateral rockers of the bristle support.

The toothbrush illustrated in FIG. 1 is a manual toothbrush absent a drive mechanism, including a handpiece 2 preferably injection-molded from plastics, which forms a grip of the toothbrush 1 and is of an essentially elongated, approximately rod-shaped configuration.

Said handpiece 2 is connected by way of a neck part 3 to a toothbrush head 4 which can be integrally molded on the handpiece 2 and/or the neck part 3 as a one-piece construction. Alternatively, said toothbrush head 4 can also be detachably connected to the neck part 3.

Said toothbrush head 4 comprises in the illustrated embodiment a body part 5 which is securely connected to the neck part 3 and on whose upper side a bristle support 6 is arranged.

The - roughly speaking - plate-shaped bristle support 6 carries a bristle cluster 7 comprising a plurality of bristle tufts 8 which form, where applicable with additionally arranged elastomer strips, the cleaning elements of the toothbrush 1.

Said bristle support 6 may be formed of a plurality of pieces, comprising in particular two laterally arranged rockers 10, 11 extending - roughly speaking - essentially parallel to the toothbrush longitudinal direction 9. Said rockers 10 and 11 may enclose between them a central, elongated bristle support section 12 which may be rigidly connected to said body part 5 of the toothbrush head 4, and it will be understood, of course, that the rigid connection may be configured to be detachable in order to be able to replace this part of the bristle support 6 as well. Alternatively, as shown in FIG. 5, the lateral rockers 10 and 11 may have no bristle support section in between so that no further bristle tufts are provided between the bristle tufts 8 positioned on the rockers 10 and 11.

Said rockers 10 and 11 are attached with their first front ends 13, which lie at the tip of the toothbrush head 4 and/or on the side remote from the neck part 3, to the body part 5 of the toothbrush head 4, while the freely protruding other ends 14 of the rockers 10 and 11 point towards the neck part 3 and/or extend up to the end of the toothbrush head 4 on the side close to the neck part. Accordingly, the rockers 10 and 11 are of an on the whole elongated and, roughly speaking, beam-shaped or wing-shaped configuration and protrude, so to speak, freely from the
front end of the toothbrush head 4 rearwards to the handpiece 2, thereby enabling said free ends 14 to rock freely up and down at the end of the toothbrush head 4 close to the handpiece. In this arrangement, said rockers 10 and 11 are configured for movement such that said rockers 10 and 11 are able to rock up and down, cf. FIG. 7, essentially parallel to the longitudinal center plane 15, cf. FIG. 2, with the longitudinal center plane 15 of FIG. 7 corresponding to the plane of projection.

In the embodiment shown in FIGS. 2 and 3 and FIGS. 4 and 5, the two rockers 10 and 11 are interconnected at their first, attached ends 13 by a connecting and/or mounting section 16 so that said rockers 10 and 11, in combination with the connecting and/or mounting section 16, form a U-shaped structure.

At said mounting section 16 the rockers 10 and 11 are fastened to the body part 5. The connection to the body part 5 can be generally configured in a variety of ways, as initially explained. In the embodiment shown in FIG. 6, the connection can be advantageously established by positive engagement and by frictional engagement or material bonding. In particular the body part 5 of the toothbrush head 4 may comprise an undercut fastening section 17 embedded into the injection-molded material of the rockers 10 and 11 or the mounting section 16. In the embodiment shown in FIG. 6, the fastening section 17 of the body part 5 comprises a flange section which protrudes to the upper side of the toothbrush head 4 or to the bristle support 6 and has opposing groove-shaped constrictions or undercuts 18 that can be worked into the body part 5 in the manner of a longitudinal groove.

In the embodiment shown in FIG. 6, the mounting section 16 of the rockers 10 and 11 is molded on said fastening section 17 of the body part 5 by the two-component injection molding process so that a connection is obtained by positive engagement and by material bonding or frictional engagement. This can reliably prevent unintentional disconnection of the rockers 10 and 11, on the other hand the rockers 10 and 11 can be formed from the best possible material for the elasticity of the rockers 10 and 11, independently of the material of the neck part 3 and/or the body part 5.

The geometry of the rockers 10 and 11 may generally vary and be adapted to the desired properties of the bristle cluster sections. In the illustrated embodiments, the rockers 10 and 11 have a free length L - that is, the length protruding from the mounting section 16 - of 30 to 50
mm, approximately. Advantageously, the cross section and the material for the rockers 10 and 11 are selected such that the rockers 10 and 11 experience a vertical deflection $x$ of 2 to 3.5 mm, approximately, at their free ends 14 under normal cleaning forces. According to an advantageous embodiment of the invention, this can be achieved in that the rockers 10 and 11 have in the region of their free length $L$ an approximately unchanging cross section and a modulus of elasticity in the range from 350 to 500 MPa so that an on the whole neat bending curve of the rockers is obtained. Said deflection $x$ occurs advantageously under customary cleaning forces acting on the toothbrush head 4 in the range of 1 to 5 N, approximately, and in particular 3 N, approximately, said cleaning force being symbolized in FIG. 7 by the arrow 19. Furthermore, said deflection $x$ is related to a sole deformation of the rockers 10 and 11 - the free head end being fixed.

As the embodiment of FIGS. 2 and 3 shows, tufting of the rockers 10 and 11 may advantageously comprise an inclined arrangement of the bristle tufts 8 according to which the bristle tufts 8 are tilted at an acute angle relative to the longitudinal center plane 15. In particular said bristle tufts 8 on the rockers 10 and 11 may be inwardly tilted towards the center of the bristle cluster 7 so that the working surface of the bristle cluster 7, which is defined by the free ends of the bristle tufts 8, is smaller than the area at the foot of the bristle tufts, which is described by the envelope curve around the tufts on the bristle support.

As FIG. 2 shows, the bristle tufts 8 on the rockers 10 and 11 may be inwardly tilted at different angles, with bristle tufts 8a positioned further on the outside advantageously being more steeply inwardly tilted than bristle tufts 8b positioned further on the inside, i.e., closer to the longitudinal center plane 15. Bristle tufts lying directly on the longitudinal center plane 15 are advantageously not tilted relative to said longitudinal center plane 15. As FIG. 2 shows, the outermost bristle tufts 8a may be tilted at an angle $\alpha_2$ of 15°, approximately, while bristle tufts 8b lying further on the inside but still at a distance from the longitudinal center plane 15 may be tilted at an angle of 10°, approximately.

As the embodiment of FIGS. 4 and 5 as well as the embodiment of FIG. 1 show, the free end 14 of the rockers 10 and 11 may be provided with an enlarged and/or more solidly constructed bristle tuft 8c which compared to the bristle tufts 8 positioned in the neighborhood and/or in a central region of the rockers 10 and 11 and/or further towards the point of attachment of the rockers may have a larger cross section and/or a greater height and/or a greater resistance to
kinking so that said bristle tuft 8c arranged on the free end 14 forms, so to speak, a control tuft that controls the rocking movement of the rockers 10 and 11. In particular the area of cross section of said bristle tuft 8c on the free end 14 of the rockers 10 and 11 may be about 4/3 to 6/3 of the average area of cross section of the other bristle tufts 8 on the rockers 10 and 11. The height may equal approximately 110% to 150%, preferably approximately 120% to 140%, of the neighboring bristle tufts 8. As a result, said bristle tufts 8c on the free ends 14 urge the rockers 10 and 11 downwardly on contact with the teeth or gingiva, whereby the resulting pressure is better distributed over the larger area and the following bristle tufts do not engage until after an initial pressing down of the rockers 10 and 11, thus resulting in an on the whole agreeable cleaning experience.

In the embodiment shown in FIG. 5, the bristle tufts 8 on the rockers 10 and 11 may have advantageously different cross-sectional shapes, with bristle tufts with round cross sections alternating with bristle tufts with elongated, flattened cross sections in the illustrated embodiment, the latter being oriented in a direction transverse to the longitudinal direction of the rockers.

As FIG. 7 shows, the rockers 10 and 11 in the non-deflected initial position can be arranged approximately parallel to the longitudinal axis and/or parallel to a transversal plane containing the longitudinal axis which is perpendicular to the plane of projection of FIG. 7. In the depressed position, which is drawn with a dashed line in FIG. 7, the rockers 10 and 11 may extend with a slightly downward gradient towards the neck part 3.
What is claimed is:

1. A toothbrush head with a bristle support (6) to which a plurality of preferably tuft-shaped cleaning elements (8) are affixed, said bristle support (6) including at least one rocker (10, 11) having a first end (13) attached to it on the side remote from a handpiece-side end of the toothbrush head (4) and having a free second end (14) which is on the side close to the handpiece-side end of the toothbrush head (4), said rocker (10, 11) carrying a row of cleaning elements (8), characterized in that at least the cleaning elements (8) arranged on the rocker (10, 11) furthest from a longitudinal center plane (15) of the toothbrush head have their free ends inwardly tilted towards said longitudinal center plane at an acute angle.

2. The toothbrush head according to the preceding claim wherein at least one pair of movable rockers (10, 11) are provided which have a respective first end attached in said manner and which have a respective free end on the side close to the handpiece-side of the toothbrush head, each of said rockers (10 and 11) carrying at least one row of cleaning elements (8) and being preferably arranged symmetrically relative to the longitudinal center plane (15).

3. The toothbrush head according to any one of the preceding claims wherein on the at least one rocker (10, 11) cleaning elements (8) are tilted inwardly towards the longitudinal center plane (15) at different angles ($\alpha_1$, $\alpha_2$), with cleaning elements (8a) arranged further to the outside, at a greater distance from the longitudinal center plane (15), being more steeply tilted than cleaning elements (8b) arranged closer to the longitudinal center plane (15).

4. The toothbrush head according to the preceding claim wherein all the cleaning elements (8) spaced from the longitudinal center plane (15) on the at least one rocker (10, 11) are arranged at an angle of tilt of 1° to 30°, preferably 5° to 20°, relative to the longitudinal center plane (15).
5. The toothbrush head according to any one of the preceding claims wherein the bristle support (6) includes a central section (12) which lies between the rockers (10, 11) and carries at least one row of cleaning elements (8) arranged substantially parallel to the longitudinal center plane (15), said central section (12) of the bristle support (6) being preferably rigidly connectable to the toothbrush head (4).

6. The toothbrush head according to the preamble of claim 1 or any one of the preceding claims wherein the free end (14) of the at least one rocker (10, 11) mounts a cleaning element (8c) which has a greater resistance to kinking and/or a larger area of cross-section than cleaning elements (8) affixed in a rocker central section.

7. The toothbrush head according to the preceding claim wherein the cleaning element (8c) affixed to the free end (14) of the rocker (10, 11) has a greater height than the cleaning elements positioned closer to the first end (13) of the rocker (10, 11).

8. The toothbrush head according to the preamble of claim 1 or any one of the preceding claims wherein the at least one rocker (10, 11) is configured such that, given a cleaning force applied by the toothbrush head (4) against the teeth and/or the gingiva in the range of 1 N to 5 N, the free end (14) of the rocker (10, 11) performs a deflection movement of a minimum of 1 mm and a maximum of 6 mm, preferably in the range of 2 to 3.5 mm.

9. The toothbrush head according to the preceding claim wherein the rocker (10, 11) has its first end (13) non-rotatably attached to a body part (5) of the toothbrush head (4) and is configured to be elastic, said rocker (10, 11), given a free length L in the range of 20 mm to 70 mm, preferably 30 mm to 50 mm, having a modulus of elasticity in the range of 300 MPa to 700 MPa, preferably 350 MPa to 500 MPa.

10. The toothbrush head according to the preceding claim wherein the rocker (10, 11) is made of a different material than a central section of the bristle support (6) and/or a body part (5) of the toothbrush head (4) carrying the bristle support.

11. The toothbrush head according to any one of the preceding claims wherein a neck part (3) connectable to the bristle support (6) is configured to be elastically movable under the application of cleaning forces in the range of 1 N to 5 N to the toothbrush head (4), said
neck part (3), at a distance from the bristle support (6), having a reduced cross-section preferably in the form of a window-like opening, such that in the presence of said cleaning forces both the neck part (3) and the rocker (10) experience an elastic deformation.

12. The toothbrush head according to the preamble of claim 1 or any one of the preceding claims wherein the rocker (10, 11) is securely attached to a body part (5) of the toothbrush head (4) by means of a connection established by positive engagement and material bonding.

13. The toothbrush head according to the preceding claim wherein the body part (5) includes a fastening section (17) formed as an undercut and equipped preferably with opposing notched undercuts (18) onto which the rocker (10, 11) is injection-molded.

14. A toothbrush having a toothbrush head (4) according to any one of the preceding claims.