CLAIMS

What is claimed is:

1. A toothbrush comprising:

a head section which is disposed at a front end side and in which a bristle bundle is implanted in a bristle implanting surface;

a neck section extending from a rear end side of the head section; and

a handle section extending from a rear end side of the neck section,

wherein the head section has a thickness of 2.0 to 4.0 mm,

wherein the neck section is formed such that a minimum value of a width of the neck section in a direction that is parallel to the bristle implanting surface and orthogonal to a length direction of the handle section is 3.5 mm to 4.5 mm, and the width is constant or gradually increases toward the rear end side from a position at which the neck section has the minimum value,

wherein, when the width of the neck section is W mm, and a thickness of the neck section in the direction orthogonal to the bristle implanting surface is D mm,

the position of the minimum value is set as an origin when the width of the neck section gradually increases toward the rear end side from the position of the minimum value, the position of the minimum value on a front-most end side of the neck section is set as an origin when the width of the neck section is constant toward the rear end side from the position of the minimum value, a value obtained by D/W at a position separated by 10 mm toward the rear end side in parallel with the bristle implanting surface is 0.7 to 2.5, a difference between a value obtained by D/W at a position of the origin, at which the minimum value of the width is measured, and a value obtained by D/W at a position separated by 20 mm from the position of the origin toward the rear end side is equal to

or larger than 0.05, and D/W at the position separated by 20 mm from the position of the origin toward the rear end side is larger than 1.0,

wherein a change rate of D/W from the position separated by 10 mm from the position of the origin toward the rear end side to the position separated by 20 mm from the position of the origin toward the rear end side is higher than 1.0,

a change rate of D/W from the position separated by 20 mm from the position of the origin toward the rear end side to the position separated by 30 mm from the position of the origin toward the rear end side is higher than 1.0, and

wherein a deflection coefficient M (mm^4) = $W \times D^3$ at the position separated by 10 mm toward the rear end side from the position of the origin, at which the minimum value of the width is measured, is 165 mm^4 to 625 mm^4.

2. The toothbrush according to claim 1,

wherein the neck section is formed by a resin material, and

wherein a flexural modulus of the resin material is 1,000 MPa to 2,200 MPa.

3. The toothbrush according to claim 1 or 2,

wherein the neck section is formed by a polypropylene resin.

4. The toothbrush according to claim 1 or 2,

wherein a change rate of the deflection coefficient at a position separated by 10 mm from a position of a reference toward the rear end side is 1.3 to 1.8 with the position separated by 10 mm toward the rear end side from the position of the origin, at which the minimum value of the width is measured, as the reference.

5. The toothbrush according to claim 1 or 2,

wherein a difference between the value obtained by D/W at the position of the origin, at which the minimum value of the width is measured, and the value obtained by D/W at the position separated by 20 mm from the position toward the rear end side is equal to or smaller than 0.07.

6. The toothbrush according to claim 1 or 2,

wherein a value obtained by D/W at a position separated by 20 mm from the position of the origin toward the rear end side is 1.05 to 1.3,

a value obtained by D/W at a position separated by 30 mm from the position of the origin toward the rear end side is 1.05 to 1.5.

7. The toothbrush according to claim 5,

wherein a difference between the value obtained by D/W at the position of the origin, and the value obtained by D/W at the position separated by 20 mm from the position of the origin toward the rear end side is equal to or larger than 0.06.

8. The toothbrush according to claim 1 or 2,

wherein a difference between the value obtained by D/W at the position of the origin, and the value obtained by D/W at the position separated by 20 mm from the position of the origin toward the rear end side is 0.1 to 0.2.

9. The toothbrush according to claim 1 or 2,

wherein when R01 represents a change rate of D/W from the position of the origin to the position separated by 10 mm from the position of the origin toward the rear end side, R02 represents a change rate of D/W from the position of the origin to the position separated by 20 mm from the position of the origin toward the rear end side, and R03 represents a change rate of D/W from the position of the origin to the position separated by 30 mm from the position of the origin toward the rear end side, the change rates R01, R02, and R03 satisfy a relationship of $R01 < R02 < R03$.

10. The toothbrush according to claim 1 or 2,

wherein when R01 represents a change rate of D/W from the position of the origin to the position separated by 10 mm from the position of the origin toward the rear end side, R12 represents a change rate of D/W from the position separated by 10 mm from the position of the origin toward the rear end side to the position separated by 20 mm from the position of the origin toward the rear end side, R23 represents a change rate of D/W from the position separated by 20 mm from the position of the origin toward the rear end side to the position separated by 30 mm from the position of the origin toward the rear end side, the change rates R12 and R23 satisfy a relationship of $R01 \leq R12 \leq R23$, and at least one of the change rates R12 and R23 is higher than the change rate R01.

11. The toothbrush according to claim 1 or 2,

wherein a change rate of D/W from the position separated by 10 mm from the position of the origin toward the rear end side to the position separated by 20 mm from the position of the origin toward the rear end side is lower than 1.2,

a change rate of D/W from the position separated by 20 mm from the position of the origin toward the rear end side to the position separated by 30 mm from the position of the origin toward the rear end side is lower than 1.3.