CLAIMS

What is claimed is:

[Claim 1] A toothbrush comprising:

a bristle implanting portion configured of a plurality of bristle bundles;

a head section provided with the bristle implanting portion on a bristle implanting surface;

a neck section extending from the head section; and

a handle section extending from the neck section,

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

wherein the neck section has a minimum width and a minimum thickness of 3.0 mm to 4.5 mm,

wherein the neck section is provided with a curved surface on a side of the bristle implanting surface on a rear end side of the neck section, the curved surface having a center position disposed on the side of the bristle implanting surface and having a concave arc contour on the side of the bristle implanting surface in a side view,

wherein the handle section is provided with a second curved surface on the opposite side of the bristle implanting surface on the front end side of the handle section, the second curved surface having a center position disposed on the opposite side of the bristle implanting surface and having a convex arc contour on the side of the bristle implanting surface in a side view,

wherein an angle formed between a plane that configures the bristle implanting surface and a straight line connecting a center point of the handle section in a thickness direction at a grip center position of the toothbrush and a center point of the head section in the thickness direction at a center position of the bristle implanting portion is 5.0° to 10.0°, and

wherein the head section, the neck section and the handle section each have a hard portion made of a hard resin,

wherein the hard resin is selected from polypropylene, polyethylene terephthalate, polybutylene terephthalate, polycyclohexylenedimethylene terephthalate, polyacetal polyethylene naphthalate, polystyrene, acrylonitrile butadiene styrene resin, cellulose propionate, polyarylate, polycarbonate, or acrylonitrile styrene copolymer resin,

wherein the hard portion of the head section, the hard portion of the neck section and the hard portion of the handle section are integrally molded and molded bodies made of one kind of the hard resin material alone.

[Claim 2] The toothbrush according to claim 1,

wherein a configurational material of the neck section has a flexural modulus of 1,000 MPa to 2,200 MPa.

[Claim 3] The toothbrush according to claim 1 or 2,

wherein the configurational material of the neck section is a polypropylene resin.

[Claim 4] The toothbrush according to any one of Claims 1 to 3,
wherein when a plane including the bristle implanting surface in a side view is used as a boundary, the ratio of the thickness on the side of the bristle implanting surface above the flat plane at a boundary position on the side of the bristle implanting surface to between the neck section and the handle section to the thickness of the neck portion at the boundary position is 45% or higher and 95% or lower.

[Claim 5] The toothbrush according to any one of Claims 1 to 4,
wherein the neck section the neck gradually increases in both width and thickness toward the side of the handle section in the region where the concave arc contour surface is formed.

[Claim 6] A toothbrush comprising:
a bristle implanting portion configured of a plurality of bristle bundles;
a head section provided with the bristle implanting portion on a bristle implanting surface;
a neck section extending from the head section; and
a handle section extending from the neck section,
wherein the head section has a thickness of 2.0 mm to 4.0 mm,
wherein the neck section has a minimum width and a minimum thickness of 3.0 mm to 4.5 mm,
wherein configurational materials of the neck section is selected from polyacetal, polybutylene terephthalate and polyethylene naphthalate,
wherein the neck section gradually increases in diameter from a front end side toward a rear end side,
wherein the neck section is provided with a curved surface on a side of the bristle implanting surface on a rear end side of the neck section, the curved surface having a center position disposed on the side of the bristle implanting surface and having a concave arc contour on the side of the bristle implanting surface in a side view,
wherein an angle formed between a plane that configures the bristle implanting surface and a straight line connecting a center point of the handle section in a thickness direction at a grip center position of the toothbrush and a center point of the head section in the thickness direction at a center position of the bristle implanting portion is 5.0° to 8.0°,
wherein in the side view, the curved surface is formed above the bristle implanting surface of the head section, and in the side view, the handle section is located above the bristle implanting surface of the head section, and
wherein the distance defined as the grip center point height between the plane that configures the bristle implanting surface and the center point of the handle section in the thickness direction at the grip center position of the toothbrush is 6.0-11.0 mm.

[Claim 7] The toothbrush according to claim 6,
wherein a distance a from the base end of the head section to a front end of a finger rest portion is 53 mm to 70 mm.

[Claim 8] The toothbrush according to claim 6 or 7,
wherein a length of the entire toothbrush is 100 mm to 200 mm,
wherein a length of the head section is 10 mm to 33 mm.

[Claim 9] The toothbrush according to claim 6,
wherein when D represents the thickness of the neck section, D11 represents a thickness of the neck section on an upper side of the plane with the plane including the bristle implanting surface as a boundary in a side view, D12 represents a thickness on a lower side of the plane, D12 ＞ D11 in the region between the boundary K1 of the neck section and head sections and a position separated by 10 mm from the boundary position K1 toward the rear end side.

[Claim 10] The toothbrush according to claim 6,
wherein when D represents the thickness of the neck section, D11 represents a thickness of the neck section on an upper side of the plane with the plane including the bristle implanting surface as a boundary in a side view, a ratio of the thickness D11 on the upper side to the thickness D at a position separated by 10 mm from a boundary K2 on the rear end side of the neck section to the tip side is 40% to 90%.

[Claim 11] The toothbrush according to claim 6,
wherein when D represents the thickness of the neck section, D11 represents a thickness of the neck section on an upper side of the plane with the plane including the bristle implanting surface as a boundary in a side view, a ratio of the thickness D11 on the upper side to the thickness D at a position separated by 20 mm from a boundary K2 on the rear end side of the neck section to the tip side is 40 ± 10%.

[Claim 12] A toothbrush comprising:
a bristle implanting portion configured of a plurality of bristle bundles;
a head section provided with the bristle implanting portion on a bristle implanting surface;
a neck section extending from the head section; and
a handle section extending from the neck section,
wherein the head section has a thickness of 2.0 mm to 4.0 mm,
wherein the neck section has a minimum width and a minimum thickness of 3.0 mm to 4.5 mm,
wherein the neck section is flat on a side of the bristle implanting surface on a front end side of the neck section in a side view,
wherein the neck section is provided with a first curved surface on a side of the bristle implanting surface on a rear end side of the neck section that the first curved surface has a center position disposed on the side of the bristle implanting surface and has a concave arc contour on the side of the bristle implanting surface in a side view,
wherein the neck section is provided with a second curved surface on the opposite side of the bristle implanting surface on the rear end side of the neck section that the second curved surface has a center position disposed on

the side of the bristle implanting surface and has a concave arc contour on the side of the bristle implanting surface in a side view,

wherein a curvature of the second curved surface is smaller than a curvature of the first curved surface,

wherein the handle section is provided with a third curved surface on the side of the bristle implanting surface on the front end side of the handle section that the third curved surface has a center position disposed on an opposite side of the bristle implanting surface and has a convex arc contour on the side of the bristle implanting surface in a side view,

wherein the handle section is provided with a fourth curved surface on the opposite side of the bristle implanting surface on the front end side of the handle section that the fourth curved surface has a center position disposed on the opposite side of the bristle implanting surface and has a convex arc contour on the side of the bristle implanting surface in a side view,

wherein the distance between a plane that configures the bristle implanting surface and a center point of the handle section in the thickness direction at a grip center position of the toothbrush is 6.0 mm or larger and 11.8 mm or smaller,

wherein an angle formed between the plane that configures the bristle implanting surface and a straight line connecting the center point of the handle section in the thickness direction at a grip center position of the toothbrush and the center point of the head section in the thickness direction at a center position of the bristle implanting portion is 5.0° to 10.0°, and

wherein when D represents the thickness of the neck section, D11 represents a thickness of the neck section on an upper side of the plane with the plane including the bristle implanting surface as a boundary in a side view, D12 represents a thickness on a lower side, the ratio of the thickness D11 on the upper side to the thickness D at a boundary between the neck section and the handle section is 45% or higher and 95% or lower.

[Claim 13] The toothbrush according to claim 12,

wherein a configurational material of the neck section has a flexural modulus of 1,000 MPa to 2,200 MPa.

[Claim 14] The toothbrush according to claim 12 or 13,

wherein the configurational material of the neck section is a polypropylene resin.

[Claim 15] The toothbrush according to claim 12 or 13,

Wherein the neck section gradually increases in diameter in both width and thickness toward the handle section in the curved surface area of the concave arc contour of the neck section.