

DESIGNER'S PERSPECTIVE



Syntactic Analysis

3 components

- Plastic body made of Polyethylene or Polypropylene
- Nylon 6-12 bristles
- metal staple to clamp the bristles together

Advantages:

- angled CrissCross bristles are more effective in plaque removal
- tongue cleaner on the back

Disadvantages

- no grip
- unstable form

4 components

- Plastic body made with Polyethylene or Polypropylene
- Nylon 6-12 bristles
- metal staple to clamp the bristles together

Advantages:

- suction cup to make it stand upright
- grip for stable usage

Disadvantages

- limited reach

3 components

- Bamboo body
- Nylon 6-12 bristles
- metal staple to clamp the bristles together

Advantages:

- Safer for the environment

Disadvantages

- Lesser life

Product attributes

User: intermediate/expert

Demography: 12 - 65 years.

Psychography: People with need for special gum care

Cultgraph: Toothbrushes are used in most cultures but few use fingers or twigs from the maswak tree as well

Physiognomy: Complex, sturdy, masculine

Physiography: 20.5 x 8.8 x 1.3 cm ; 81.6 g
2 separately manufactured parts, assembly required.

Usability: To brush teeth and maintain dental hygiene

Recyclability: Plastic handle recyclable (code 5), Nylon bristles (code 7) not easily recyclable .

Technicality: Its CrissCross bristles, which are angled at 15° attack plaque from the right angle. It is compliant with the requirements given in ISO 1942

Disposal: trashed or sent to terracyle because it is difficult for recycling centers to separate mixed materials.

aesthetics : ergonomics : functionality
0.2 : 0.4: 0.4

User: Novice

Demography: 5 - 7 years.

Psychography: Children who like minions

Cultgraph: Some cultures have varying beliefs about maintainance of oral hygiene in kids and hence refuse to use kids toothbrush

Physiognomy: Simple, playful, young
Physiography: 22.9x4.2x2.2 cm ; 18.1 g
2 separately manufactured parts, assembly required.

Usability: To brush teeth and maintain dental hygiene

Recyclability: Plastic handle (code 5) recyclable, Nylon bristles (code 7) and silicone grip not easily recyclable.

Technicality: Extra soft, multi-height bristles effectively clean big and small teeth, while the raised tip helps clean hard to reach back teeth. A suction cup at the base for easy upright storage. It is compliant with the requirements given in ISO 1942

Disposal: trashed orsent to terracyle because it is difficult for recycling centers to separate mixed materials.

aesthetics : ergonomics : functionality
0.2 : 0.4: 0.4

User: Intermediate

Demography: 12 - 65 years. Mostly in the higher income market segment.

Psychography: Families who are environmentally conscious.

Cultgraph: Toothbrushes are used in most cultures but few use fingers or twigs from the maswak tree as well

Physiognomy: Minimal, sleek, feminine
Physiography: 20 x 2.5 x 2 gm
2 separately manufactured parts, assembly required.

Usability: To brush teeth and maintain dental hygiene

Recyclability: Bamboo handle is biodegradable. Nylon bristles (code 7) not easily recyclable.

Technicality: Bristles designed to reach in between teeth. It is compliant with the requirements given in ISO 1942

Disposal: Using pliers, it is easy to remove the bristles from the head. Doing so will also remove the metal staple that is used to clamp the bristles to the handle. The handle can be upcycled or composted at home.

aesthetics : ergonomics : functionality
0.5 : 0.2 : 0.3

Semantic Analysis

Context: Everyday life, Dentist

Spirit: Dental Hygiene , cleanliness

Form analogy:

- The form looks sturdy but flexible.
- The handle resembles a lean human body. The head resembles sharp teeth and jaw.
- Analogous to wooden twigs which were used in earlier times for dental hygiene

Context: Everyday life, Dentist

Spirit: Dental Hygiene, cleanliness

Form analogy:

- The form looks very flexible and soft
- The form is more anthropomorphic due to the heavy base and smaller head as well as its ability to stand upright.
- Analogous to wooden twigs which were used in earlier times for dental hygiene

Context: Everyday life, Dentist

Spirit: Dental Hygiene , cleanliness, environmentally friendly

Form analogy:

- The form looks very hard and sturdy.
- The curves in the handle resembles waves.
- Analogous to wooden twigs which were used in earlier times for dental hygiene

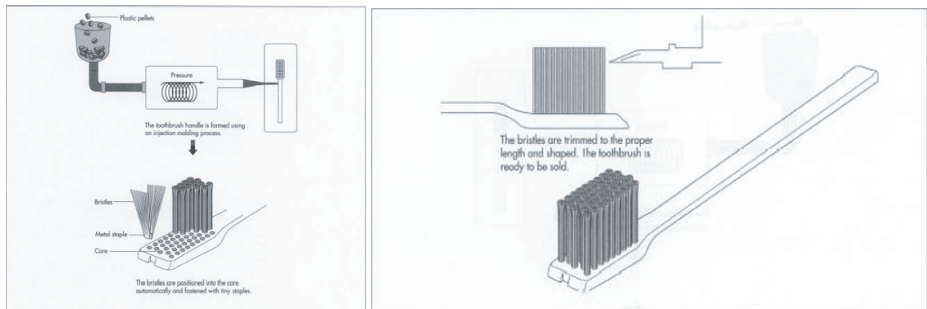
Manufacturing Process

Molding the handles

1. Plastic is mixed and shaped into pellets.
2. The pellets are then placed in an injection molding machine, which heats the plastic until it is melted.
3. A rotating screw or plunger forces the liquid plastic into the handle molds. The molds form the entire handle, including the small holes, called cores, into which the bristles are inserted.
4. The molds are securely clamped, and pressure is applied to the molds while the plastic cools. Once the molds have adequately cooled, the clamps are removed, and small pins push the handles out of the molds.

The filling machine

5. The bristles, which are usually made of nylon, are positioned into the core of the handle automatically.
6. The bristles are then stapled into the core with tiny metal staples.



Trimming the bristles

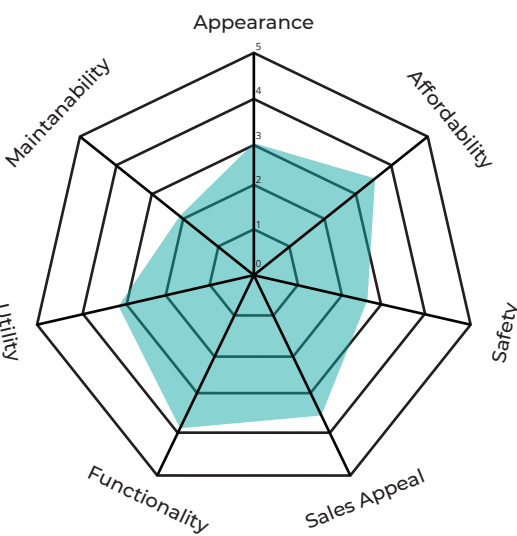
7. Next, the toothbrush passes through a trimming machine which slices the bristles to the correct length and shape for the particular design.

Packaging the toothbrush

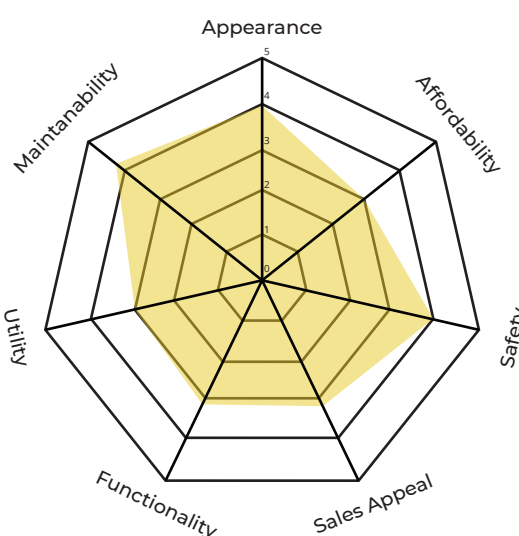
8. The toothbrushes are packaged into cardboard and/or plastic containers.
9. Labels are attached to the package, providing product information such as bristle hardness, as well as recommendations for usage.
10. Finally, the packaged toothbrushes are bundled into larger shipping boxes or crates and transported to distributors.

<http://www.madehow.com/>
<https://americasfavoriteitool.weebly.com/how-the-toothbrush-is-made.html>

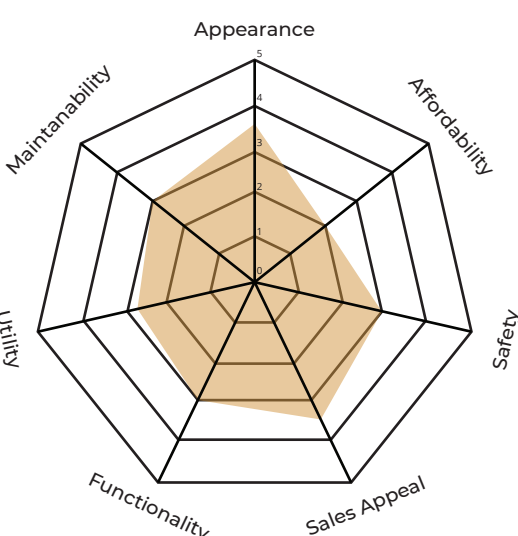
USER'S PERSPECTIVE



Oral-B Pro Health Gum Care



Colgate Kids Minion Toothbrush



Terra Bamboo Toothbrush

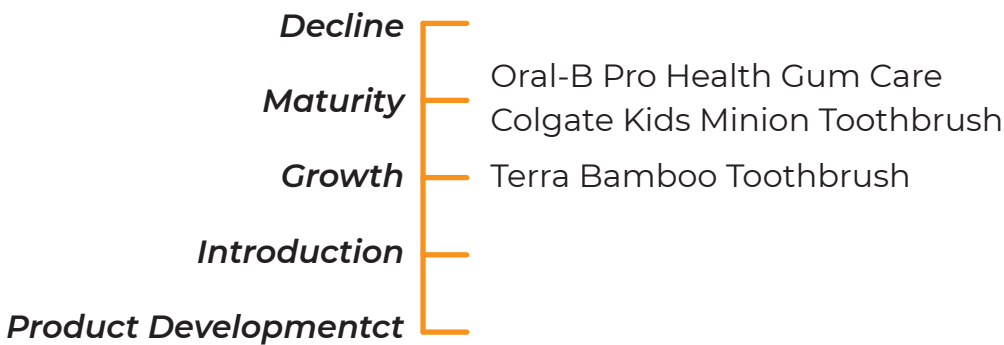
Pragmatic Analysis

1. Place small pea sized amount of toothpaste on the brush head.
2. Place the brush at 45 degree angle up into gum line with a little bit of pressure - your gum should blanch slightly. For top teeth angle up, and angle down for bottom teeth.
3. The brush should be moved in very small circular motions for around 3 to 5 seconds per tooth, then give the brush head a gentle flick down.
4. Move on to the next tooth and repeat.
5. Continue on the outside surface all the way around until you reach the back left.
6. Then repeat the process from back left, moving around the inside surfaces of the teeth.
7. Once at the back right, move on to lower teeth and repeat process.
8. The lower front teeth can also be cleaned with the tooth brush held vertically and flicked up.
9. Finally, scrub the biting surfaces.
10. Spit out but DO NOT rinse.

LEVEL OF PRODUCT



STAGE OF PRODUCT



<https://www.clinic95.com/how-to-use-a-manual-toothbrush.html>

BIRD'S EYE VIEW

Morphology

timeline



Tooth brushing tools date back to 3500-3000 BC when the Babylonians and the Egyptians made a brush by fraying the end of a twig. These chewing sticks were made out of Salvadora persica branches, which were believed to have healing and antiseptic qualities.



Around 1600BC, the Chinese developed "chewing sticks" which were made from aromatic tree twigs to freshen breath. The Chinese are believed to have invented the first natural bristle toothbrush made from the bristles from pigs' necks in the 15th century, with the bristles attached to a bone or bamboo handle.



Other designs in Europe used feathers. The first toothbrush of a more modern design was made by William Addis in England around 1780 – the handle was carved from cattle bone and the brush portion was still made from swine bristles. In 1844, the first 3-row bristle brush was designed.



Natural bristles were the only source of bristles until Du Pont invented nylon. The invention of nylon started the development of the truly modern toothbrush in 1938, and by the 1950s softer nylon bristles were being made, as people preferred these

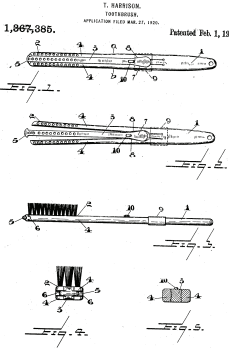


The first electric toothbrush was made in 1939. Today, both manual and electric toothbrushes are typically made of plastic molded handles and nylon bristles. The most recent models handles are straight, angled, curved, and contoured with grips and soft rubber areas, bristles are synthetic and come in different textures, heads range from very small larger sizes come in a variety of shapes.

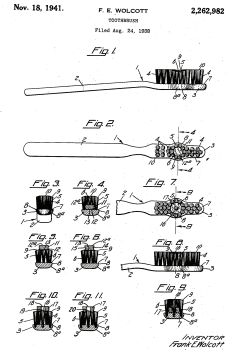


patents

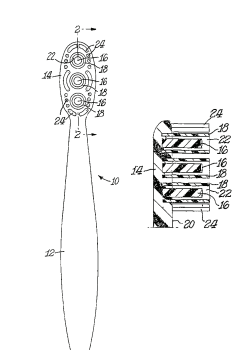
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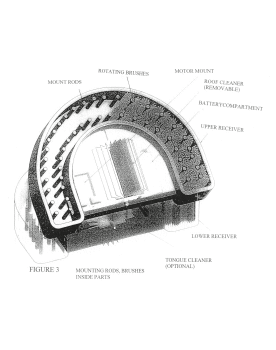
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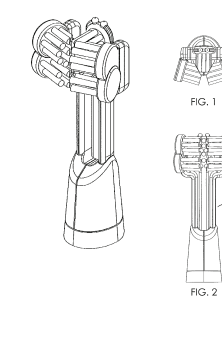
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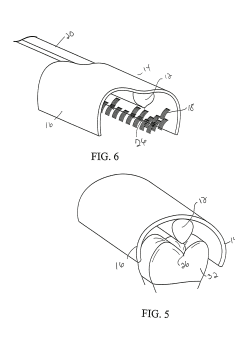
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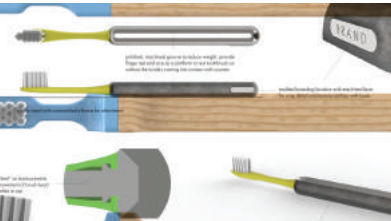
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research & development



<https://www.grin-brush.com/blog/news/86570369-designing-a-toothbrush-that-is-not-garbage>
A permanent toothbrush handle with replaceable brushes.



<https://www.sunstar.com/rd/story/gumplay>
The compact GUDIM PLAY attachment contains acceleration and Bluetooth sensors, which sends brushing data to your smartphone while you brush your teeth.



To be 100% percent safe that you don't pick up the bad bacteria , many doctors recommend sterilizing toothbrushes on a regular basis. The In & Out Toothbrush, a brush that is easy to travel with and use. The mechanism recharges via a USB port and has a protective cap with display.



DEWS is an upstanding toothbrush which makes use of a weight at the end of its rounded handle to create a center of gravity at the handle base. When the toothbrush is set down, it will sway momentarily until it reaches a position of balance – much like a tumble doll.



Safer than hard plastic toothbrushes
Bendable and soft
Develops good oral hygiene early, preventing cavities later
Non-allergic 100% highest quality silicone
Dishwasher and freezer friendly



CONCEPT GENERATION

