UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COLGATE-PALMOLIVE COMPANY,
Petitioner

v.

NOBLE INNOVATIONS NC L.L.C.,
Patent Owner

U.S. Patent No. 8,881,332

DECLARATION OF TIMOTHY P. FLETCHER IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,881,332

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I, Timothy P. Fletcher, declare:

I. INTRODUCTION

1. My name is Timothy P. Fletcher. I am over the age of 18 and otherwise competent to make this declaration.

2. I have been retained by Colgate-Palmolive Company ("Colgate" or "Petitioner") to provide independent expert analysis in support of a Petition for *inter partes* review of U.S. Patent No. 8,881,332, which I refer to in my declaration as the "'332 Patent," owned by Noble Innovations NC L.L.C. ("Noble" or "Patent Owner"). Specifically, I have been asked to consider the validity of claims 1, 2, and 5-18 of the '332 Patent (the "Challenged Claims").

3. I understand that this declaration will be submitted in support of the Petitioner's *inter partes* review Petition.

4. I have personal knowledge of the facts and opinions set forth in this declaration, and believe them to be true. If called upon to do so, I would testify competently thereto. I have been warned that willful false statements and the like are punishable by fine or imprisonment, or both.

5. I am being compensated for my time at my standard consulting rate of $675 per hour. I am also being reimbursed for expenses that I incur during the course of this work. My compensation is not contingent upon the results or nature of my study, the substance of my opinions, or the outcome of any proceeding involving the

Challenged Claims. I have no financial interest in the outcome of this matter or on the pending litigation between Petitioner and Patent Owner.

6. I reserve the right to revise, supplement, and/or amend my opinions stated herein based on new information and on my continuing analysis of the materials already provided. To the extent that additional information becomes available to me subsequent to the date of this declaration, including orders from the Board, I reserve the right to consider that information and revise my opinions as appropriate to the additional information. I further reserve the right to revise my opinions to rebut any positions adopted by Patent Owner in expert declarations or filings, including specifically but without limitation any document responding to my analysis.

II. BACKGROUND AND QUALIFICATIONS

7. I offer statements and opinions on behalf of Petitioner generally regarding the prior art, anticipation and obviousness considerations, and understanding of a person of ordinary skill in the art ("POSITA") as it relates to the '332 Patent. Attached hereto as Appendix A, is a true and correct copy of my Curriculum Vitae describing my background and experience.

8. I am an industrial designer and president of One BusinessDesign, LLC in Pittsburgh, Pennsylvania. Industrial designers are graduates of schools of design either from a fine arts orientation or a product development orientation. I come from

the product development orientation. The Industrial Designers Society of America ("IDSA") defines industrial design as: "the professional service of creating and developing concepts and specifications that optimize the function, value and appearance of products and systems for the mutual benefit of both user and manufacturer." Appendix B.

9. I earned my Bachelor of Environmental Design Degree in Product Design from North Carolina State University in 1989 and my Master of Design Degree in Advanced Strategies at the Hong Kong Polytechnic University in 2008. Over the past 30 years I have worked as an industrial designer, product designer and developer, professor of industrial design courses, speaker, and consulting industrial designer. I am the named inventor on 17 design and utility patents in the United States as well as one patent in Europe and one patent in Australia.

10. I have been employed as an industrial designer and product development manager for the following consumer/commercial products companies: Stahlwood Manufacturing Co.; Gerber Products Company; DP; Evenflo Company, Inc; Elumens; DAKA Designs; and Performance Bike. I have seen both sides of the industrial design industry, both as an industrial designer working to design new products and as a product development manager working to develop products and improve the process of product development and creation. As an industrial design consultant, I have designed consumer/commercial products or new product

strategies for the following firms: Gamil Design, Daedalus, and One BusinessDesign. As a product development manager, I have sourced and inspected manufacturing plants in the United States, China and Thailand, and I have been involved in troubleshooting manufacturing issues in the development of consumer/commercial products.

11. My specific experience in toothbrushes/brushes and plastic overmolding is as follows:

a. At Evenflo Company, Inc., I designed two toothbrushes for use with infants and toddlers, as shown below:

Toothbrush and Gum Massager	Toothbrush
	

b. Also, at Evenflo Company, Inc., I designed other brush products, as shown below:

Comb and Brush Set	Comb and Brush Set
	

c. Also, at Evenflo Company, Inc., I designed and was involved in the manufacturing setup for an overmolded (TPE to Polypropylene plastic) pacifier, as shown below:

Comfort Mesh Pacifier

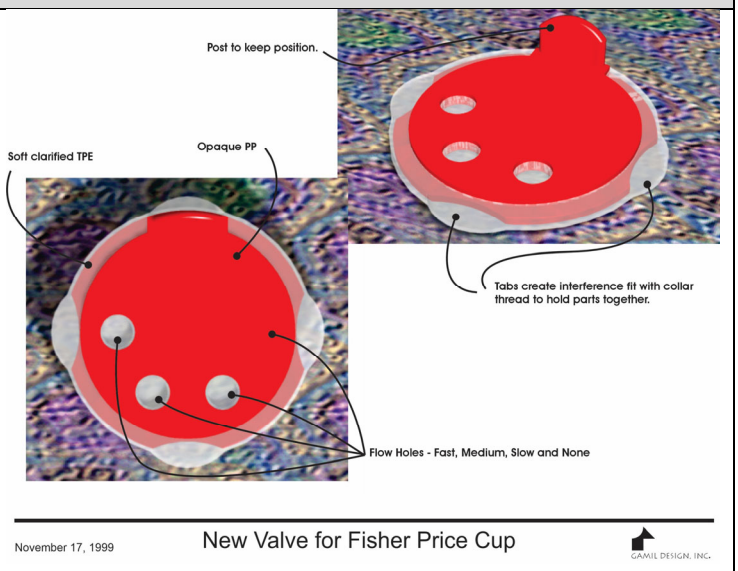

d. At Gamil Design, Inc., I designed bottle and nipple brushes, as shown below:

Bottle and Nipple Brushes

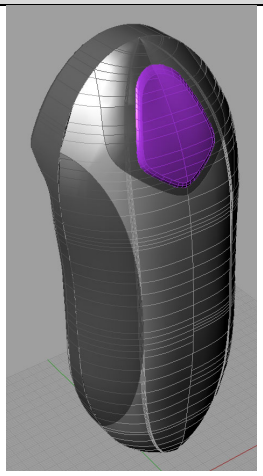


e. Also, at Gamil Design, Inc., I designed an overmolded variable flow system for toddler n-spill cups, as shown below:

Overmolded Variable Flow System



f. At DAKA Development, Ltd., I designed a can opener with overmolded gripping areas, as shown below:

Overmolded Grip Areas


12. Beginning with my work at Evenflo in March 1996, I have worked with attorneys to prepare drawings for U.S. design patents. At Gamil Design and Elumens, I was involved in the preparation of drawings and text for multiple U.S. and World Intellectual Property Organization ("WIPO") utility patent applications. I also have developed design patent drawings for clients.

13. I have taught industrial design courses at North Carolina State University, The Hong Kong Polytechnic University and Carnegie Mellon University. Courses include, but are not limited to, Manufacturing Materials and

Processes, Professional Practice and Industrial Design Studio Courses, the latter of which included material relating to the form and preparation of design drawings.

14. I was an invited speaker for the 2017 Design in Plastics conference put on by the Society of Plastics Engineers. My presentation was titled Visual Intellectual Property: The Value of Design Patents & Trade Dress. In the presentation, I gave a brief history of design patents and trade dress, followed by a more in-depth analysis of patent application strategies as well as an explanation of design patent and trade dress registration and litigation. In 2006, the Danish Patent and Trademark Office invited me to speak, and I provided a presentation titled IP as the Basis of Business for Innovative Companies in Asia. In this presentation, I used case studies to explain alternative methods of protecting intellectual property from copying manufacturers in China.

15. I was inducted into the IDSA Academy of Fellows in 2009. The criteria for induction are: the Board of Directors may confer, by a two-thirds majority vote, a fellowship membership to a member in good standing who has earned the special respect and affection of the membership through distinguished service to the industrial design profession.

16. Based on my education and experience as described above and as set out in my CV and list of publications, I believe I am qualified to render the opinions provided in this declaration.

17. My opinions in this declaration are based on my judgment, training, education, experience, and expertise in designing and developing consumer/commercial products.

18. Industrial designers develop concepts and specifications for new consumer products. In this role we are most focused on usability, but we must also understand, be conversant in, and implement feasibility, viability, and intellectual property ("IP").

19. In our main area of expertise, usability, we must understand the consumer, both mentally and physically. Mentally, we must consider the entire user experience and understand a user's needs and wants even if the consumer is unable to articulate them. We do this through design research tools and methods. Physically, we must understand the ergonomics of the human body in order to create a product that functions comfortably when a consumer is using it.

20. In regard to feasibility, we work together with engineers to make sure that current materials and manufacturing processes can be implemented to meet both quality and cost requirements. In regard to viability, we work with marketers to create a product that distributors and retailers will find acceptable.

21. In regard to IP, early in an industrial designer's career, we spend a lot of time reviewing and learning about prior art, typically design and utility patents, to assure that we are not duplicating others' rightfully protected property.

Throughout our careers, we work with attorneys as necessary to prepare patent applications on products for which we are credited as inventors. As we progress professionally and become senior industrial designers, managers and vice presidents of industrial design, we take a more strategic role regarding IP. In my own experience, for example, my role has transitioned from an entry level industrial designer to working with companies to analyze their prototypes and identify specific elements that might be crafted into a patentable form. An example would be where I analyzed specific parts of a product to assure that these parts were ornamental or design flourishes that could accordingly be protected by IP. These non-functional parts protect against complete copying of the product.

22. I have testified in multiple cases which are included as a list in my CV (Appendix A).

III. MATERIALS CONSIDERED

23. In forming my opinions and reaching the conclusions described in this Declaration, as shown in the table below, I have reviewed and considered the ’332 Patent and its prosecution history, as well as the other materials listed, and any other materials referenced in this Declaration. Each of these materials is a type of document that experts in my field would reasonably rely upon when forming their opinions. The materials I have reviewed and considered include:

No.	Exhibit Description
1001	U.S. Patent No. 8,881,332
1002	Prosecution File History of U.S. Patent No. 8,881,332 (Application No. 12/101,446)
1003	Prosecution File History of 11/840,627 (Parent Application to U.S. Patent No. 8,881,332)
1004	Prosecution File History of 14/535,442 (Continuation Application of U.S. Patent No. 8,881,332)
1005	Complaint, *Noble Innovations NC L.L.C. v. Colgate-Palmolive Company et al.*, Case No. 8:22-cv-03373-PX (D. Md.) (filed December 30, 2022)
1006	Summons and Proof of Service of Complaint on February 22, 2023. *Noble Innovations NC L.L.C. v. Colgate-Palmolive Company et al.*, Case No. 8:22-cv-03373-PX (D. Md.)
1007	Claim Listing
1009	U.S. Patent No. 2,262,982 (Wolcott)
1010	U.S. Patent No. 2,307,493 (Davidson)
1011	U.S. Patent No. 1,346,536 (Fitz-Gibbon)
1012	U.S. Patent No. 1,995,374 (Young)
1013	U.S. Patent No. 8,240,937 (Sorrentino)
1014	Joint Stipulation to Extend Time to Answer or Otherwise Respond, *Noble Innovations NC L.L.C. v. Colgate-Palmolive Company et al.*, Case No. 8:22-cv-03373-PX (D. Md.) (filed March 10, 2023)
1015	Scheduling Order, *Noble Innovations NC L.L.C. v. Colgate-Palmolive Company et al.*, Case No. 8:22-cv-03373-PX (D. Md.) (filed June 20, 2023)

IV. SOFTWARE USED FOR ANNOTATED IMAGES

24. Software Used. For the purposes of annotating images, I used the CorelDraw suite. This suite includes CorelDraw, which is a competitor to Adobe Illustrator, and Corel Photo, which is a competitor to Adobe Photoshop. CorelDraw offers certain features that are referenced below.

25. Annotated Figures. I followed the following method in creating my annotated figures, as is visually shown in this Declaration:

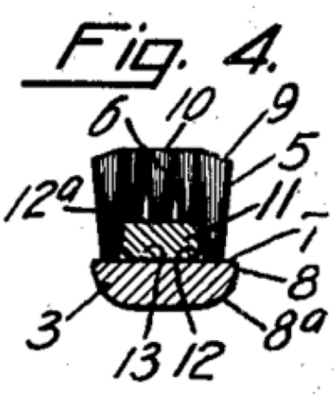
a. I captured the patent figure, from Adobe Acrobat, using the Snapshot tool. I then pasted this image into CorelDraw. This is the original image straight from the patent.

b. I used Edit Bitmap tool in CorelDraw which then opens the image in Corel Photo. I then used the Eraser tool to remove all the callouts and their leader lines. This new image was then Saved, which changes the image in CorelDraw to match. This step is to remove visual noise so that the patent figures can be better analyzed.

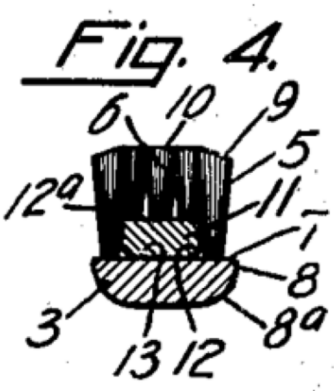
c. I then added annotated lines in CorelDraw.

26. These annotated Figures are shown below:

- Wolcott - FIG. 4 annotated to emphasize the angled bristles contacting the pellet:

Wolcott – Figure 4 from Patent	Figure 4 – No Callouts
	
Analysis	
	

- Wolcott - FIG. 4 annotated to emphasize the vertical bristles:

Wolcott – Figure 4 from Patent	Figure 4 – No Callouts
	
Analysis	
	

- Wolcott - FIG. 2 showing diametrically opposed pairs of bristles around the center pocket:

Wolcott – Figure 2 from Patent

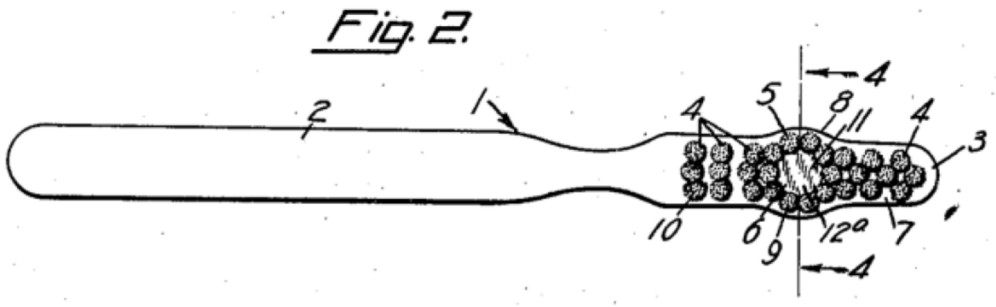
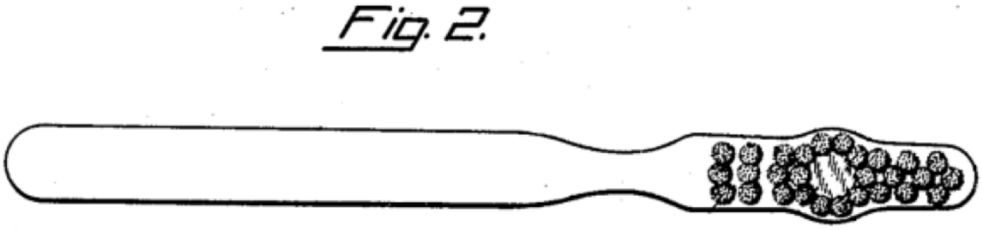
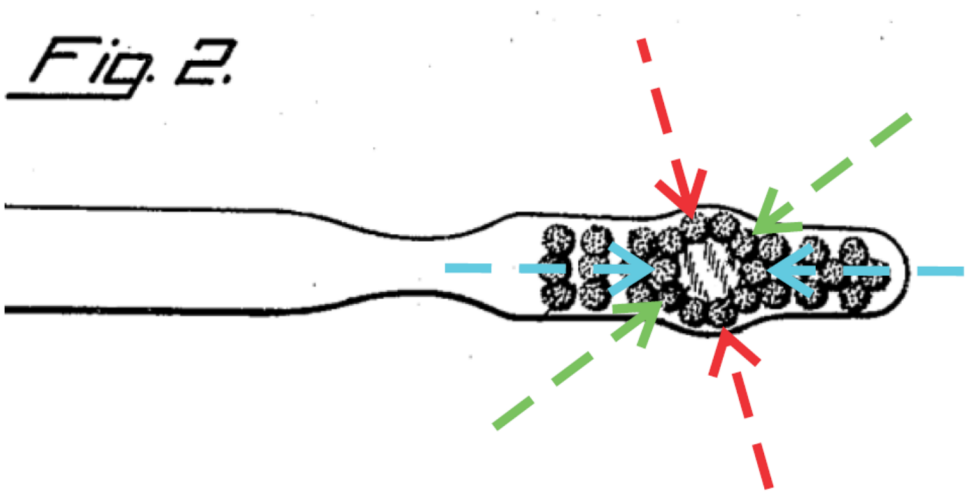


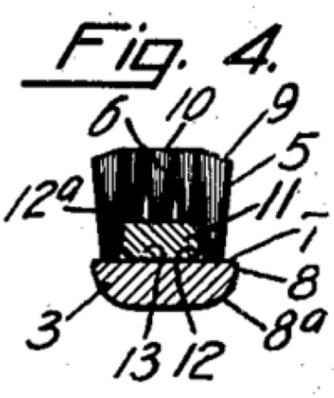
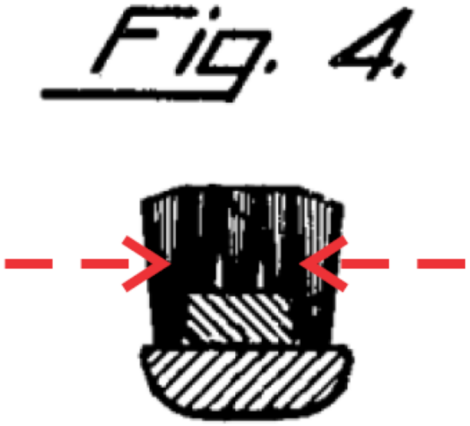
Figure 2 – No Callouts



Analysis - Enlarged



- Wolcott - FIG. 4 showing diametrically opposed pairs of bristles around the center pocket:

Wolcott – Figure 4 from Patent	Figure 4 – No Callouts
	
Analysis	
	

- Wolcott - FIG. 2 showing how the bristles around the center pocket are at least 108/144 degrees apart from another one:

Wolcott – Figure 2 from Patent

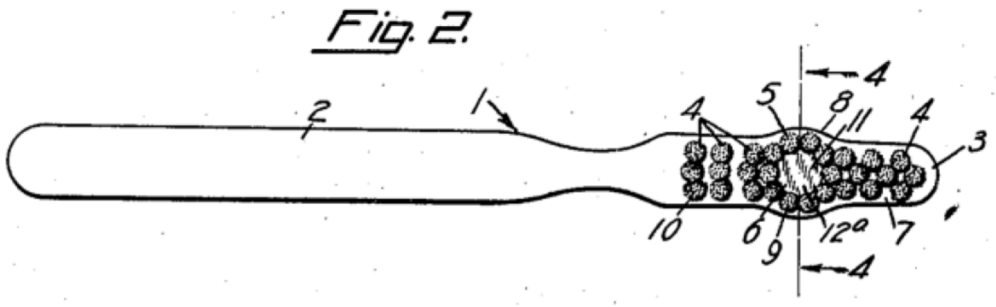
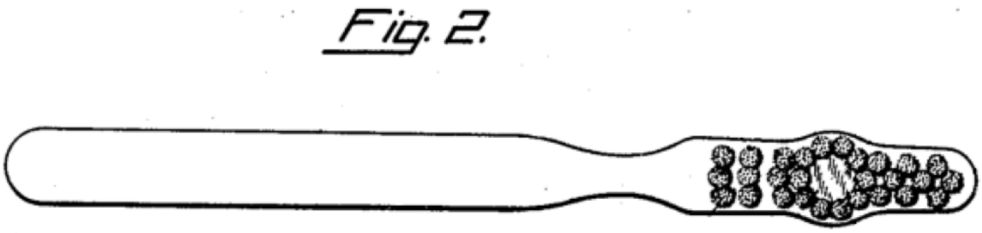
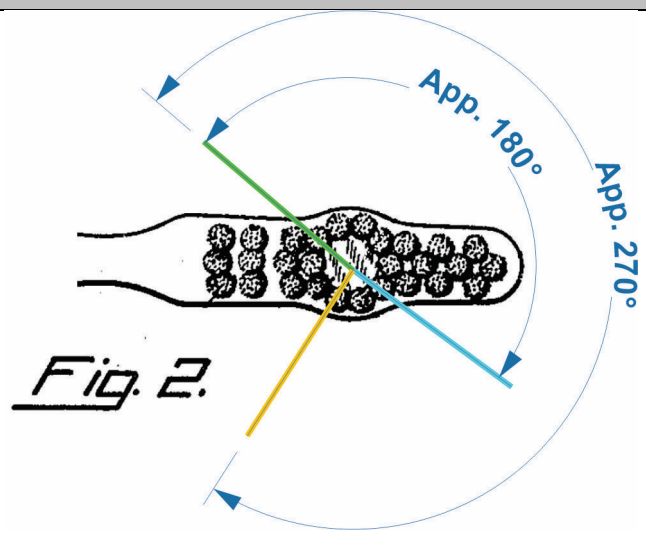


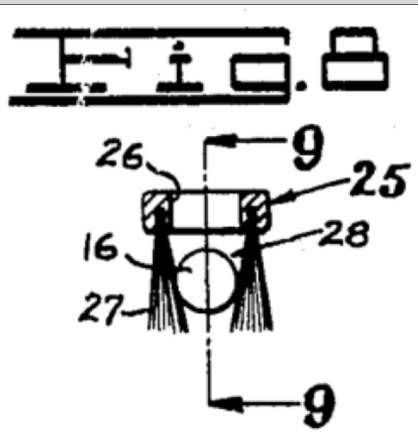
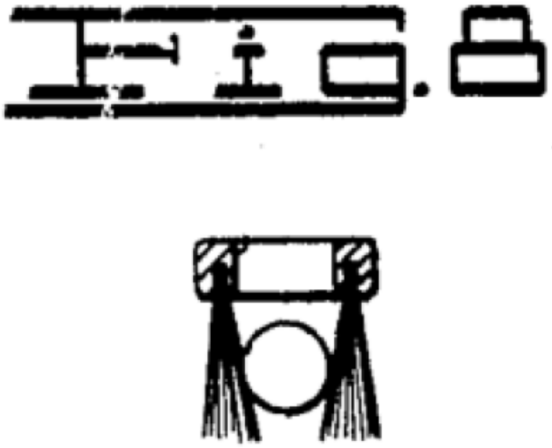
Figure 2 – No Callouts



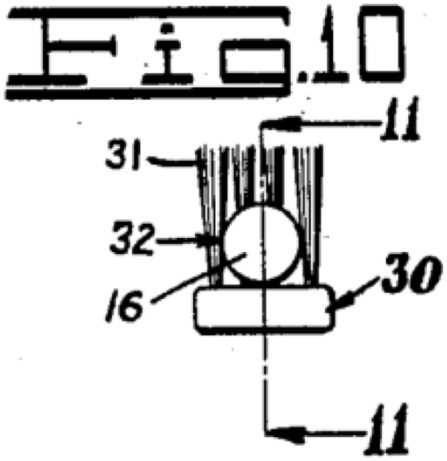
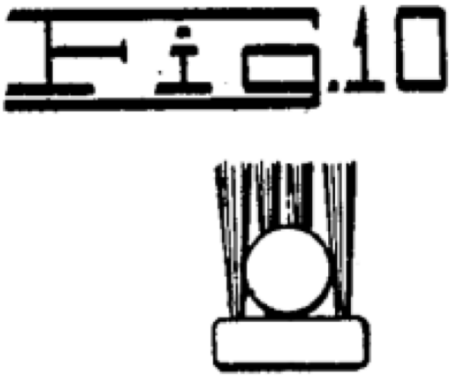
Analysis - Enlarged



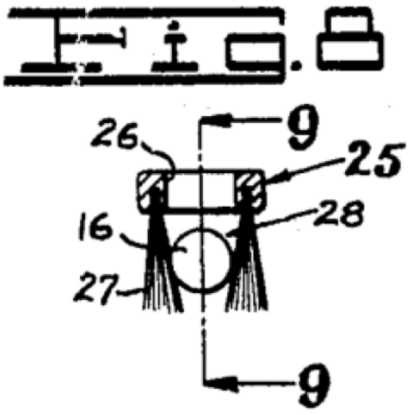
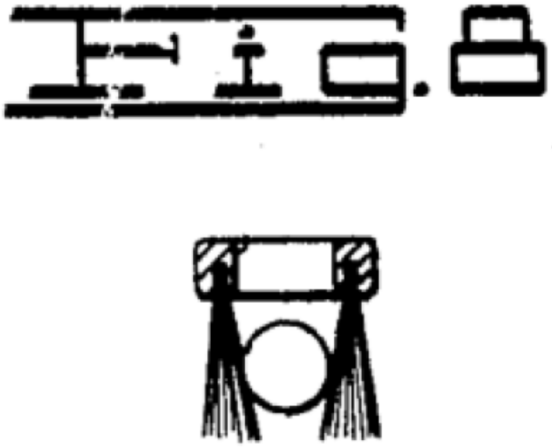
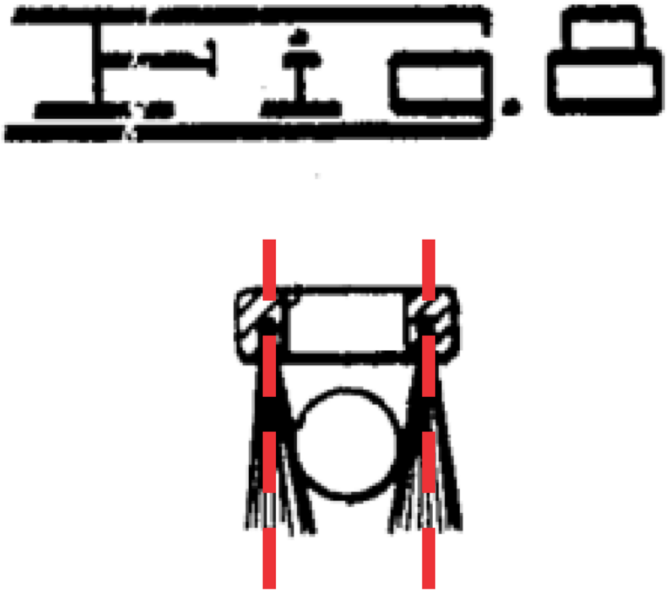
- Young - FIG. 8 annotated to emphasize the angled bristles contacting the pellet:

Young – Figure 8 from Patent	Figure 8 – No Callouts
	
Analysis	
	

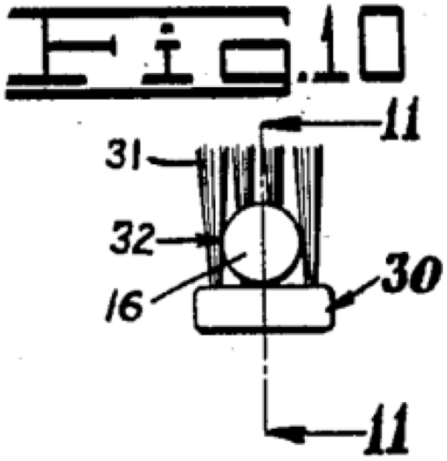
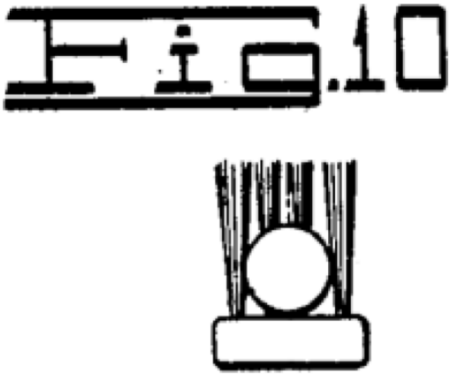
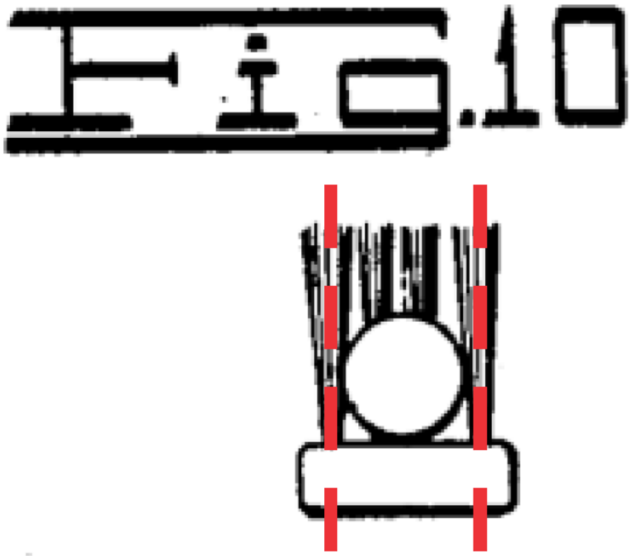
- Young - FIG. 10 annotated to emphasize the angled bristles contacting the pellet:

Young – Figure 10 from Patent	Figure 10 – No Callouts
	
Analysis	
	

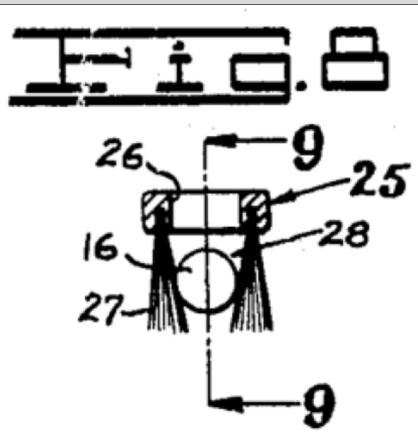
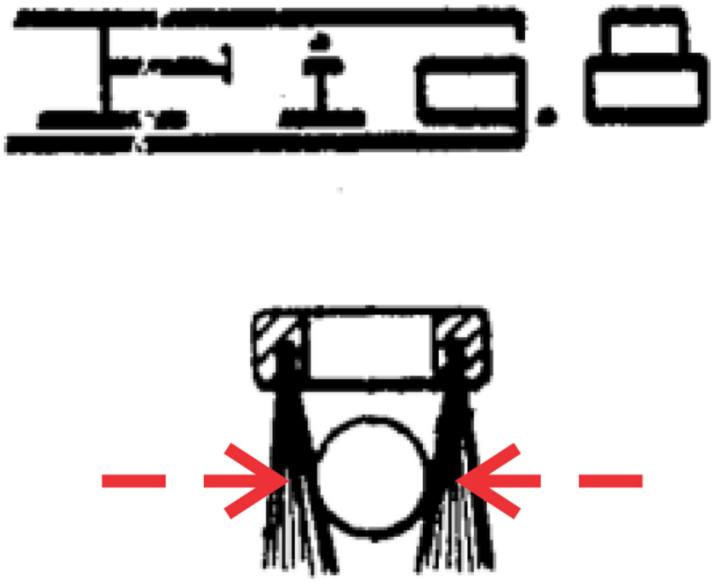
- Young - FIG. 8 annotated to emphasize the vertical bristles:

Young – Figure 8 from Patent	Figure 8 – No Callouts
	
Analysis	
	

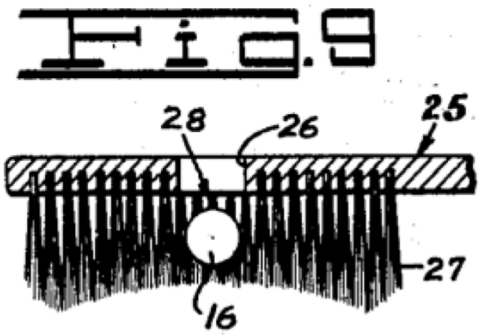
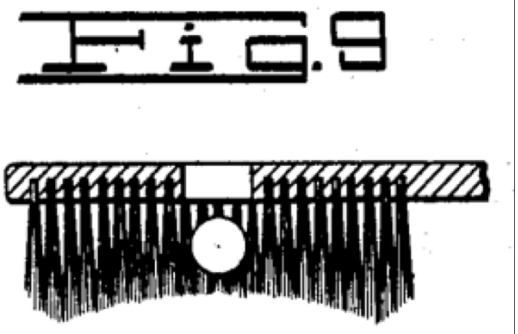
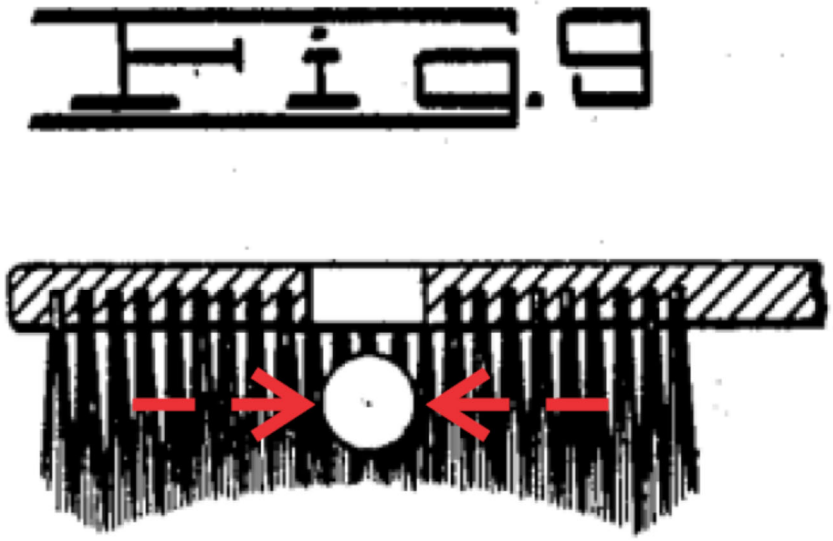
- Young - FIG. 10 annotated to emphasize the vertical bristles:

Young – Figure 10 from Patent	Figure 10 – No Callouts
	
Analysis	
	

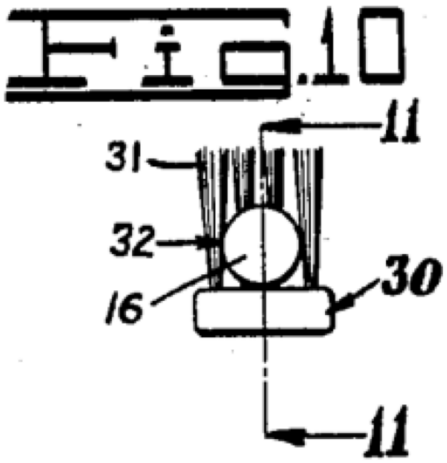
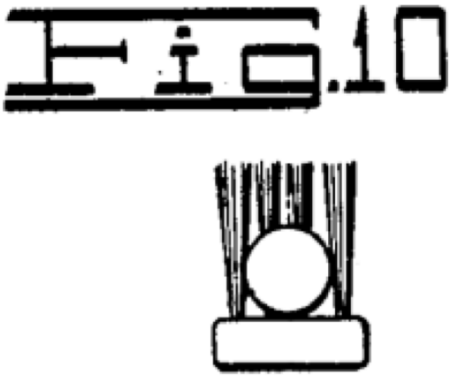
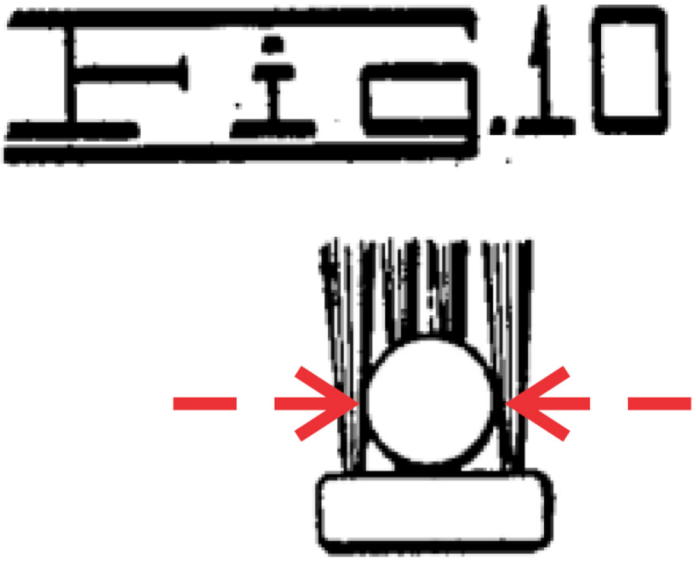
- Young - FIG. 8 annotated to show diametrically opposed pairs of angled bristles:

Young – Figure 8 from Patent	Figure 8 – No Callouts
	
Analysis	
	

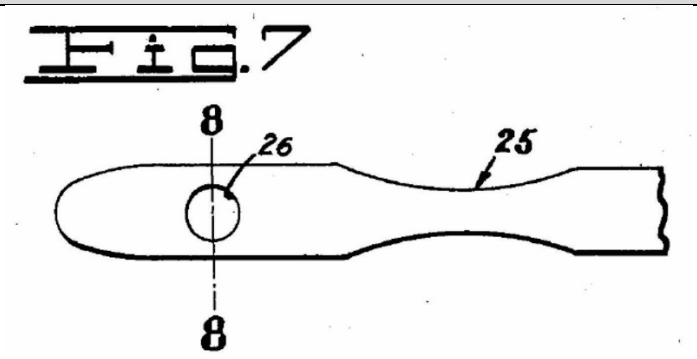
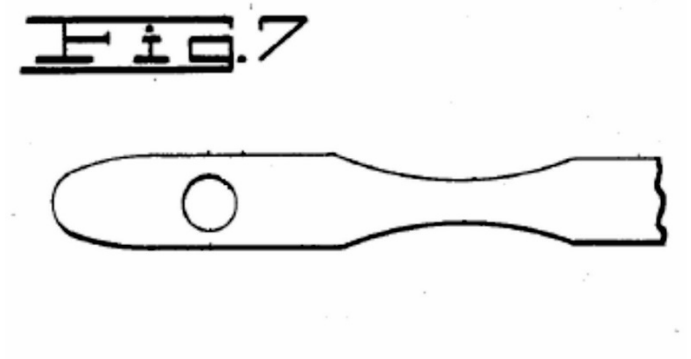
- Young - FIG. 9 annotated to show diametrically opposed pairs of angled bristles:

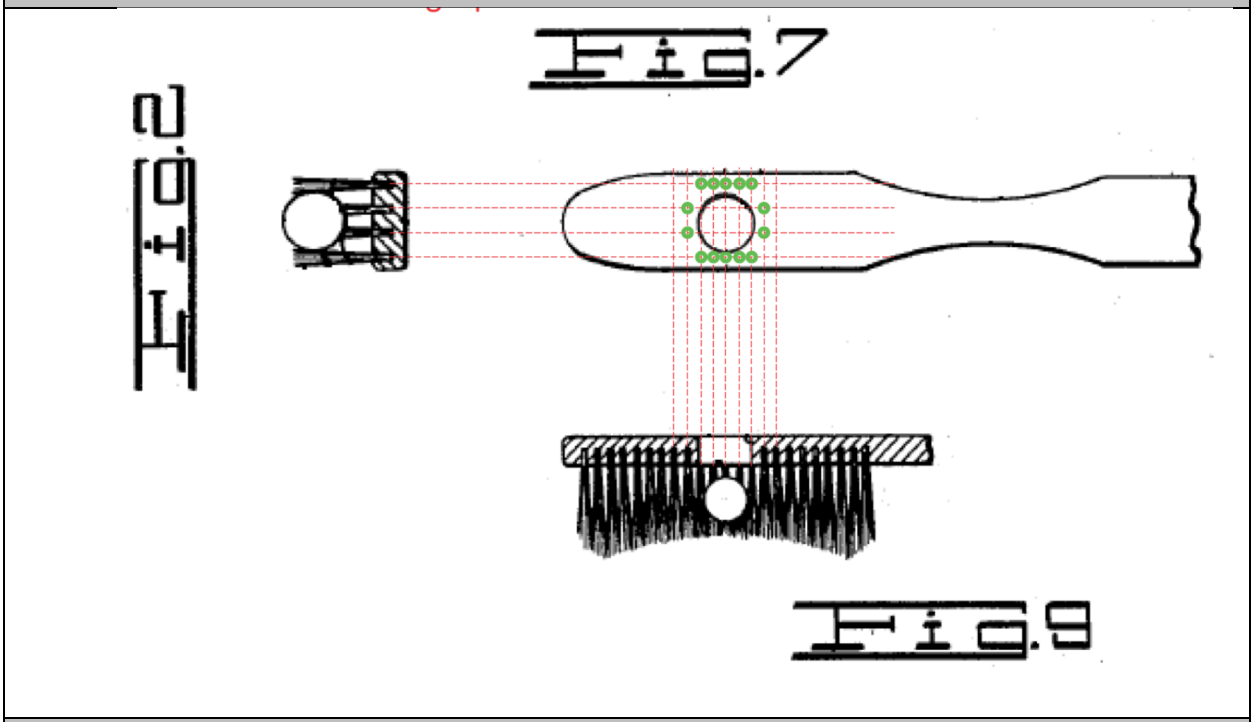
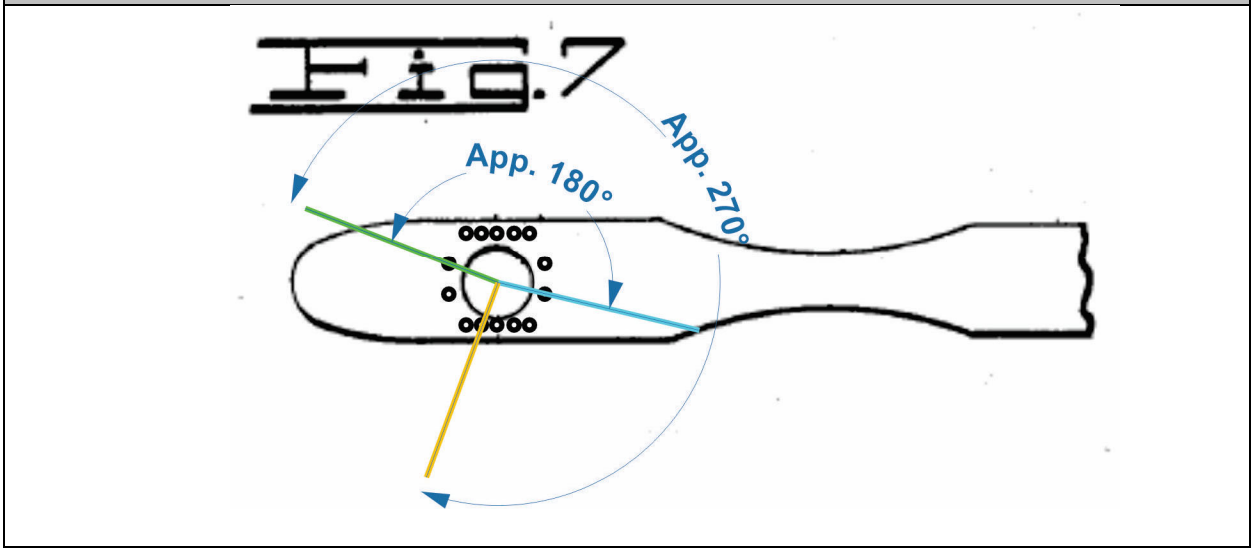
Young – Figure 9 from Patent	Figure 9 – No Callouts
	
Analysis	
	

- Young - FIG. 10 annotated to show diametrically opposed pairs of angled bristles:

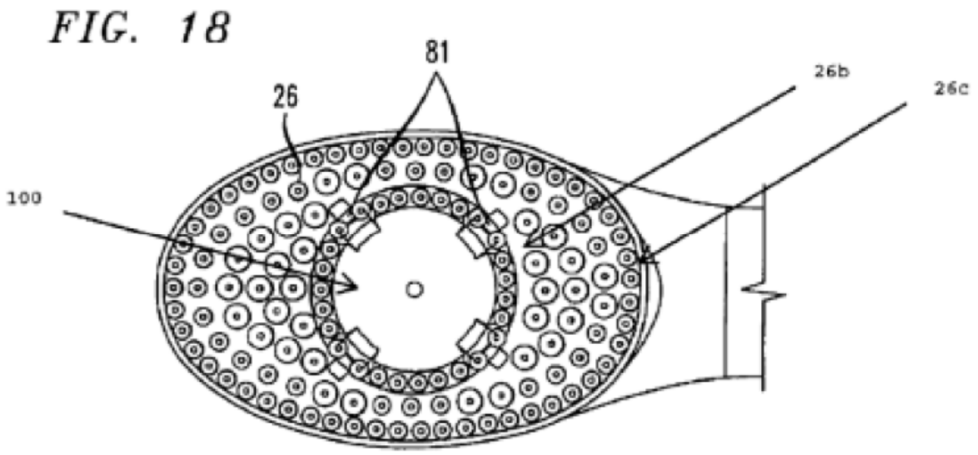
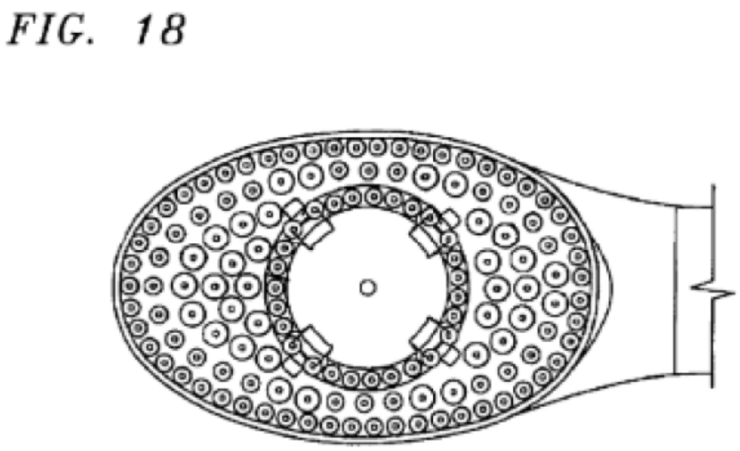
Young – Figure 10 from Patent	Figure 10 – No Callouts
	
Analysis	
	

- Young - FIG. 7 annotated to show how the bristles are around the center pocket and are at least 108/144 degrees apart from another one:

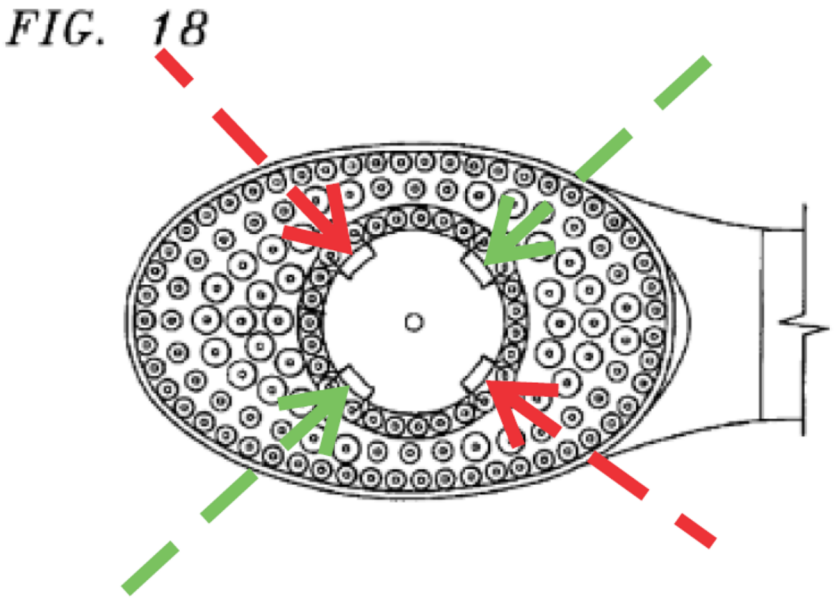
Young – Figure 7 from Patent

Figure 7 – No Callouts


Orthographic Projection for Bristle Positions

Analysis


- Sorrentino - FIG. 18 annotated to show pairs of diametrically opposed pairs of retaining elements:

Sorrentino – Figure 18 from Patent

Figure 18 – No Callouts


Analysis - Enlarged



- Sorrentino - FIG. 18 annotated to show how the retaining members are at least 108/144 degrees apart from another:

Sorrentino – Figure 18 from Patent

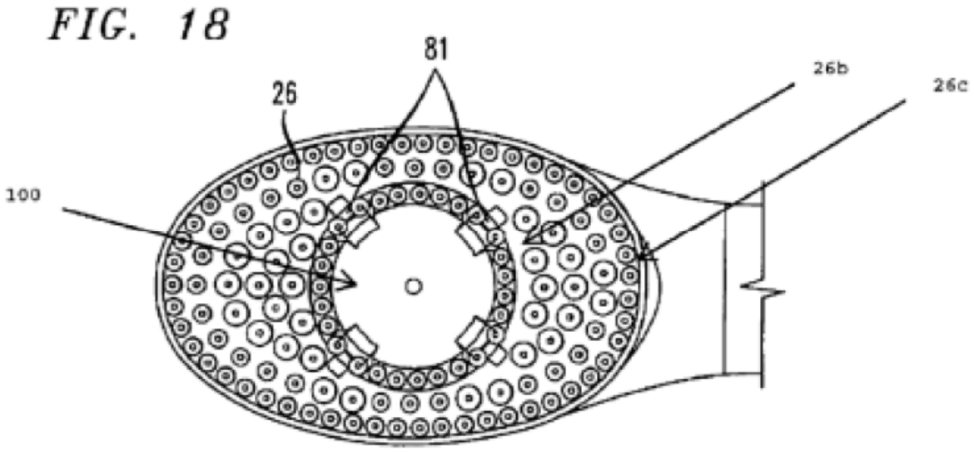
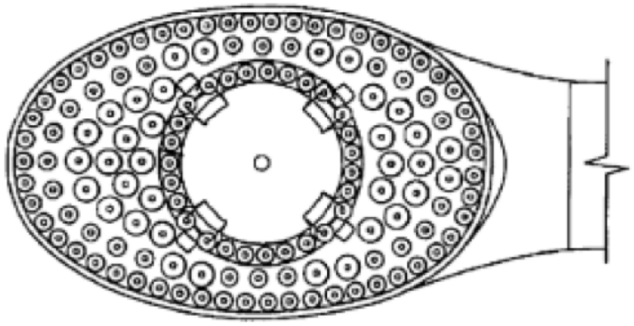
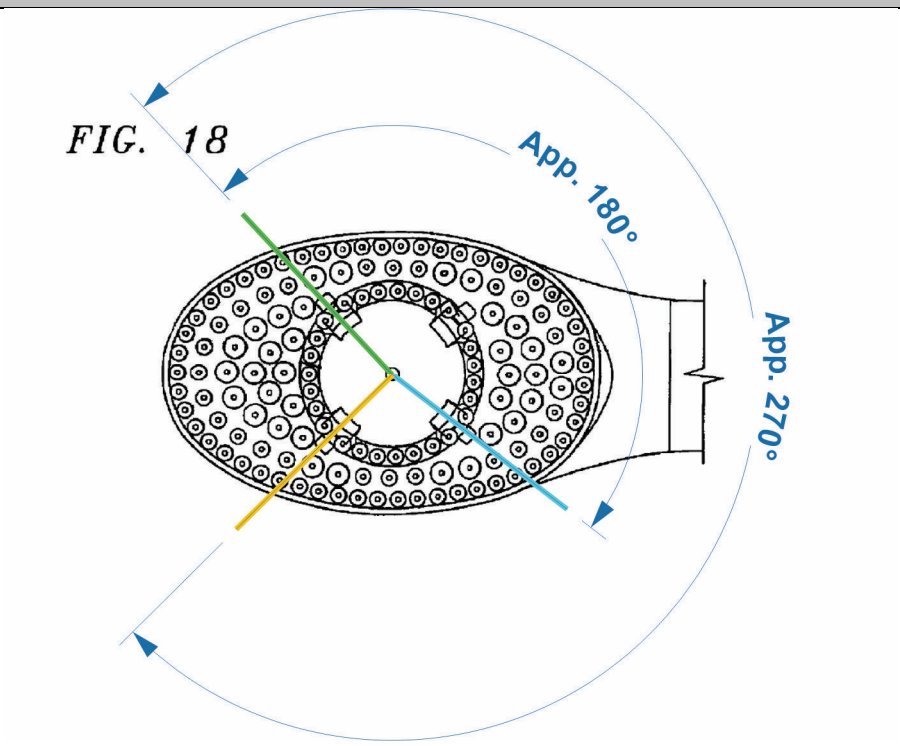


Figure 18 – No Callouts

FIG. 18



Analysis - Enlarged



V. LEGAL PRINCIPLES

27. In expressing my opinions and considering the subject matter of the claims of the ’332 Patent, I am relying upon certain basic legal principles of which I have been advised.

28. First, I understand that, for an invention claimed in a patent to be found patentable, it must be, among other things, new and not obvious from what was known before the invention was made.

29. I understand the information that is used to evaluate whether an invention is new and not obvious is generally referred to as “prior art” and generally includes patents and printed publications (*e.g.*, books, journal publications, articles on websites, product manuals, etc.). I have been advised that there are two criteria for determining whether prior art is analogous and thus can be considered prior art: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the patentee’s endeavor, whether the reference still is reasonably pertinent to the particular problem with which the patentee is involved. I have also been advised that the field of endeavor of a patent is not limited to the specific point of novelty, the narrowest possible conception of the field, or the particular focus within a given field. I have also been advised that a reference is reasonably pertinent if, even though it may be in a different field from that of the patentee’s endeavor, it is one which, because of the

matter with which it deals, logically would have commended itself to a patentee's attention in considering his problem.

30. I have been advised and understand that, for patents and patent applications filed prior to September 16, 2012, whether a publication is "prior art" is evaluated under 35 U.S.C. § 102 (pre-AIA). I understand that 35 U.S.C. § 102 (pre-AIA) operates under a "first to invent" framework, in which patents or patent application published, and publications published, prior to invention of the claimed subject matter in a patent or patent application are considered prior art under 35 U.S.C. § 102(a). I also understand that patent applications filed before, but published or issued after, invention of the claimed subject matter are considered prior art under § 102(e). I also understand that, under 35 U.S.C. 102(b), patents or printed publications published more than one year prior to the date of *filing* a patent application are considered prior art, regardless of the actual invention date.

31. I understand that there are two ways in which prior art may render a patent claim unpatentable. First, the prior art can be shown to "anticipate" the claim. Second, the prior art can be shown to have made the claim "obvious" to a person of ordinary skill in the art. My understanding of the "anticipation" and "obviousness" standards is set forth below.

A. Anticipation

32. I understand that a patent claim may be invalidated as anticipated if a single prior art publication or design discloses all features recited within the claims, arranged as they are in the claims, either expressly or inherently.

33. I understand that an "inherent" feature must necessarily be present within the product or process described by the prior art. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. I understand that inherency applies to both product/apparatus and process claims claimed in terms of functions, properties or characteristics.

B. Obviousness

34. I understand that a patent claim is invalid if the differences between the subject matter and the prior art are such that the subject matter as a whole would have been obvious to a POSITA at the time of the alleged invention. I further understand that an obviousness analysis involves a review of the scope and content of the asserted prior art; the differences between the prior art and the claims at issue; the level of ordinary skill in the pertinent art; and objective indicia of non-obviousness (i.e., secondary considerations), such as long felt but unsolved needs, failure of others, praise, commercial success, and skepticism of others in the field. I

am not aware of any objective indicia of non-obviousness relevant to the claims of the ’332 Patent.

35. In determining whether the subject matter as a whole would have been obvious at the time that the invention was made to a POSITA, I have been informed of and understand certain principles regarding the combination of elements of the prior art. A combination of familiar elements according to known methods is likely to be obvious when it yields predictable results. Any evidence that one or more of the references would have taught away from the claimed invention at the time of the invention must also be considered.

36. I have been informed and I understand that independently made, simultaneous inventions, made within a comparatively short space of time, are evidence that the claimed apparatus was the product only of ordinary mechanical or engineering skill.

37. I have also been informed that examples of factors that may support a conclusion of obviousness include:

(A) combining old and known elements, with no change in their respective functions, according to known methods to obtain predictable results;

(B) simply substituting one known element for another to obtain predictable results;

(C) using known techniques to improve similar devices (methods, or products) in the same way;

(D) applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;

(E) choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success—in other words, whether something is "obvious to try";

(F) using work in one field of endeavor to prompt variations of that work for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; and

(G) arriving at a claimed invention as a result of some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings.

I have also been informed that other rationales to support a conclusion of obviousness may be relied upon – for instance, that common sense (where substantiated) may be a reason to combine or modify prior art to achieve the claimed invention.

38. I further have been advised and understand that a person of ordinary skill attempting to solve a problem will not be led only to those elements of prior art

designed to solve the same problem. Familiar items may have obvious uses beyond the particular application being described in a reference, that if something can be done once it is obvious to do it multiple times, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. As such, the prior art considered can be directed to any need or problem known in the field of endeavor as of the priority dates of the '332 Patent and can provide a reason for combining the elements of the prior art in the manner claimed. In other words, the prior art does not need to be directed towards solving the same problem that is addressed in the patent. Further, the individual prior art references themselves need not all be directed towards solving the same problem.

39. I am also informed that a basis to combine teachings need not be stated expressly in any prior art reference. However, I understand that there must be some evidence showing an articulated reasoning with rational underpinnings to support a motivation to combine teachings and to support the legal conclusion of obviousness.

40. I have been informed that a determination of whether the claims of a patent are anticipated or rendered obvious by prior art is a two-step analysis: (1) determining the meaning and scope of the claims, and (2) comparing the properly construed claims to the prior art.

41. I have followed the above principles in my analysis below.

VI. PERSON OF ORDINARY SKILL IN THE ART

42. In addition to the above, I have been advised that claims of a patent are to be reviewed from the point of view of a hypothetical person of ordinary skill in the art ("POSITA") most closely related to the subject matter of the patent at the time of the invention or at the time of filing of the patent. A POSITA is presumed to have known the relevant art at the time of the invention or filing of the patent.

43. Factors that may be considered when determining the level of ordinary skill in the art include: (1) types of problems encountered in the art; (2) prior art solutions to those problems; (3) rapidity with which innovations are made; (4) sophistication of the technology; (5) educational level of active workers in the field; and (6) the educational level and experience of the inventor at the time of the invention.

44. The '332 Patent issued on November 11, 2014, from U.S. patent application No. 12/101,446 filed on April 11, 2008. The '332 Patent is a continuation-in-part of U.S. Patent Application No. 11/840,627 filed on August 17, 2007. Therefore, I understand the asserted effective filing date on the face of the '332 Patent to be August 17, 2007. It appears that the '332 Patent may not be entitled to the claimed priority date, however, in which case the effective filing date would be the actual filing date of the '332 Patent, April 11, 2008. All references in this Declaration are considered prior art under § 102(b), with the exception of

Sorrentino (Ex. 1013), which is considered prior art under § 102(e) if the '332 Patent is not entitled to the claimed priority date.

45. Based on my review of the '332 Patent and based on my experience, in my opinion, on or before August 17, 2007, or alternatively on or before April 11, 2008, a POSITA relating to the technology of the '332 Patent would have a minimum of a Bachelor's degree in Industrial Design, Mechanical Engineering, or related field and approximately 5 years of professional experience in the field of consumer product design and manufacturing. Additional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education.

VII. THE '332 PATENT

A. Overview

46. The '332 Patent relates generally to a toothbrush system utilizing an oral care capsule and an oral care capsule dispenser. The oral care capsule, containing dentifrice[1] (a paste or powder for cleaning the teeth), is retained within the boundaries of the toothbrush head. The system allows users to dispense the oral care capsule into the retaining area of the toothbrush head for the purposes of multiple use and multiple choices in the type of dentifrice to be used. The '332 Patent specifically is aimed at use by children, in an effort to make brushing easier for

[1] Note: The word "dentifrice" is mis-spelled as "dentrifice" in the '332 Patent.

children and avoid messes caused by children using toothpaste. *See* Ex. 1001, 1:21-2:56.

47. The toothbrush described in the ’332 Patent has an overall conventional toothbrush design with a “handle 14,” an “intermediate shaft 15,” and a “brush head 20.” Ex. 1001, 4:57-62. See FIGS. 1 and 2, below:

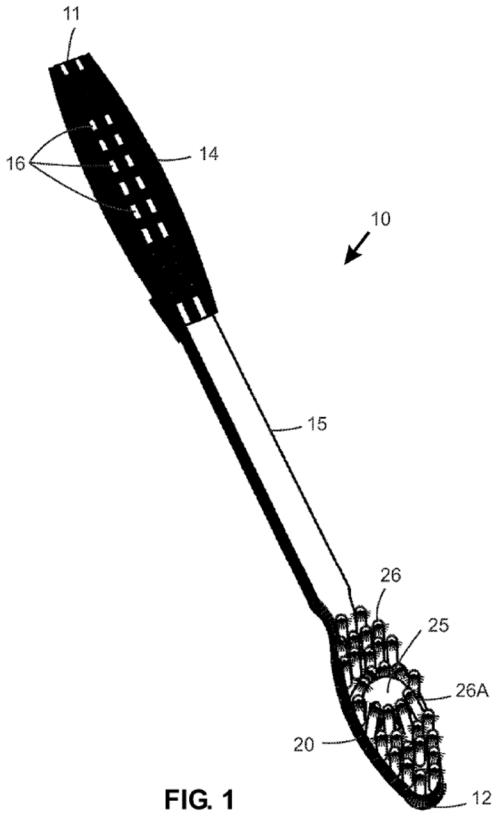


FIG. 1

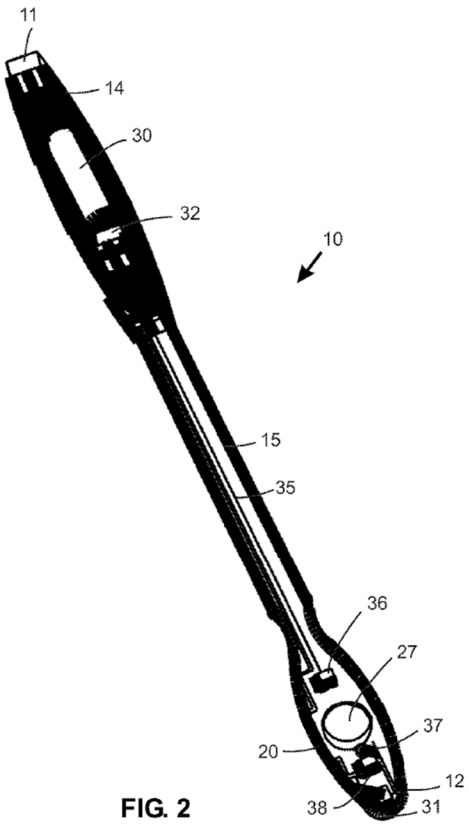


FIG. 2

48. The brush head 20 includes a “capsule receiving zone 25, such as may include a recess defined in the brush head 20, disposed within a plurality of angled bristles 26A.” Ex. 1001, 4:62-65. The angled bristles 26A are “preferably canted away from vertical in a direction toward the center of the capsule receiving zone, so as to retain an oral care capsule (not shown) insertable into the capsule receiving

zone 25." Ex. 1001, 4:65-5:1. The toothbrush also includes "conventional straight bristles 26." Ex. 1001, 5:8-9.

49. The claims of the '332 Patent recite these features, including "a plurality of vertical bristles," "a capsule receiving zone" including " a recess defined in the front surface and arranged to receive at least a portion of an oral care capsule inserted past the vertical bristles" and "angled capsule retaining elements that are elevated above the recess" and "configured to retain an oral care capsule in the capsule receiving zone."

50. Specifically, the Challenged Claims recite:

’332 Patent Claims
1. A toothbrush comprising a brush head that includes: a front surface; a back surface: a plurality of vertical bristles extending upward from the front surface; a capsule receiving zone sized to receive an oral care capsule, the capsule receiving zone including a recess defined in the front surface and arranged to receive at least a portion of an oral care capsule inserted past the vertical bristles; and at least one pair of angled capsule retaining elements that are elevated above the recess and configured to retain an oral care capsule in the capsule receiving zone, wherein each pair of the at least one pair angled capsule retaining elements includes a first and a second angled capsule retaining element arranged along diametrically opposing sides of an oral care capsule when present in the capsule receiving zone; and wherein at least a portion of each angled capsule retaining element of the at least one pair of capsule retaining elements is arranged to contact the oral care capsule.
2. The toothbrush of claim **1**, wherein the at least one pair of angled capsule retaining elements comprises multiple pairs of angled bristles canted away from vertical in a direction toward a center of the capsule receiving zone, and the brush head includes a flexural portion adapted to permit at least some bristles of the multiple pairs of angled bristles to be spread apart so as to enable an oral care capsule to be loaded into the capsule receiving zone.

5. The toothbrush of claim **1**, wherein each capsule retaining element of the at least one pair of angled capsule retaining elements comprises a retaining element canted away from vertical in a direction toward a center of the capsule receiving zone.
6. The toothbrush of claim **5**, wherein the at least one pair of angled capsule retaining elements comprises angled bristles canted away from vertical in a direction toward a center of the capsule receiving zone.
7. The toothbrush of claim **5**, wherein the at least one pair of angled capsule retaining elements is arranged between the plurality of vertical bristles and a center of the capsule receiving zone.
8. The toothbrush of claim **1**, including an oral care capsule retained by the at least one pair of capsule retaining elements in the capsule receiving zone, wherein the oral care capsule comprises one or more of the following: a dentrifice composition, a whitening composition, an anticalculus composition, and antibacterial composition, and a breath freshening com position.
9. A method comprising loading an oral care capsule into a capsule receiving zone of a toothbrush according to claim **1** by inserting at least a portion of the oral care capsule in a direction past the vertical bristles into the recess, and retaining the oral care capsule in the capsule receiving zone using the at least one pair of angled capsule retaining elements.

10. A toothbrush comprising a brush head that includes:

a front surface and a back surface that opposes the front surface;

a plurality of bristles extending upward from the front surface and arranged distal from a center of the front surface;

a capsule receiving zone including a recess defined in the front surface and arranged to receive at least a portion of an oral care capsule insertable past the bristles into the recess; and

at least three angled capsule retaining elements that are elevated above the recess, are configured to retain an oral care capsule in the capsule receiving zone, and are canted away from vertical in a direction toward a center of the capsule receiving zone, wherein each angled capsule retaining element of the at least three angled capsule retaining elements is arranged proximate to a perimeter of the capsule receiving zone at a position at least 108 degrees apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone; and wherein at least a portion of each angled capsule retaining element of the at least three angled capsule retaining elements is arranged to contact the oral care capsule.

11. The toothbrush of claim **10**, wherein the at least three angled capsule retaining elements are arranged between the plurality of bristles and a center of the capsule receiving zone.

12. The toothbrush of claim **10**, wherein the at least three angled capsule retaining elements comprise at least three angled bristles.

13. The toothbrush of claim **10**, including an oral care capsule retained by the at least three capsule retaining elements in the capsule receiving zone, wherein the oral care capsule comprises one or more of the following: a dentrifice composition, a whitening composition, an anticalculus composition, and antibacterial composition, and a breath freshening composition.
14. A method comprising loading an oral care capsule into a capsule receiving zone of a toothbrush according to claim **10** by inserting at least a portion of the oral care capsule in a direction past the bristles into the recess, and retaining the oral care capsule in the capsule receiving zone using the at least three angled capsule retaining elements.
15. The toothbrush of claim **1**, wherein the at least one pair of angled capsule retaining elements comprises multiple pairs of angled capsule retaining elements.
16. The toothbrush of claim **1**, wherein at least a portion of each angled capsule retaining element of the at least one pair of angled capsule retaining elements is arranged to overlap a portion of the recess of the capsule receiving zone.
17. The toothbrush of claim **10**, wherein at least a portion of each angled capsule retaining element of the at least three angled capsule retaining elements is arranged to overlap a portion of the recess of the capsule receiving zone.
18. The toothbrush of claim **10**, wherein each angled capsule retaining element of the at least three angled capsule retaining elements is arranged proximate to a perimeter of the capsule receiving zone at a position at least 144 degrees apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone.

51. The ’332 Patent describes that the dispenser allows for children to easily load the toothbrush with an oral care capsule while also protecting the oral care capsules from moisture. The ’332 Patent also explains that children may see the capsules as candy, and touts that the dispenser prevents children from accessing the capsules. Ex. 1001, 2:13-34. The dispenser is illustrated in FIGS. 4-6 of the ’332 Patent:

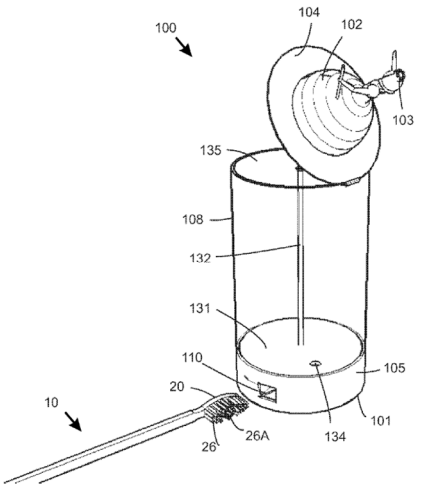


FIG. 4

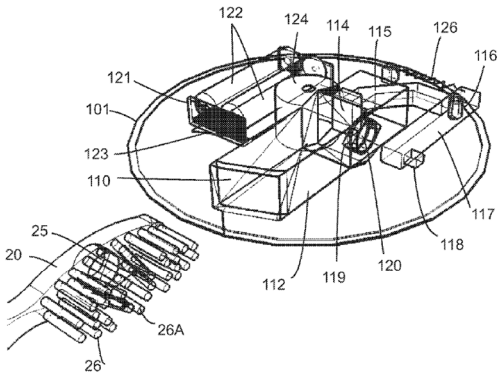


FIG. 5

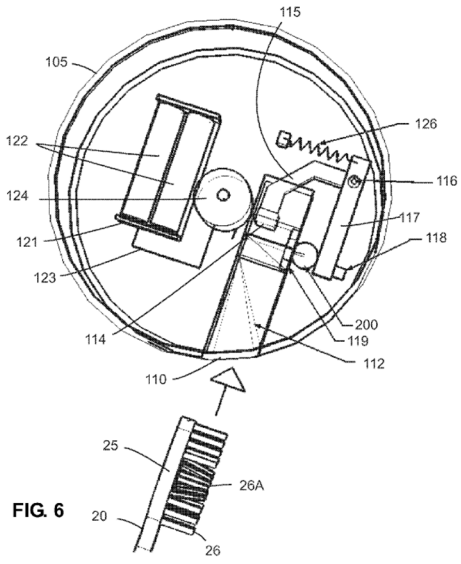


FIG. 6

52. The ’332 also describes two alternatives for loading a capsule into the toothbrush:

(1) The oral care capsule is front-loaded onto the toothbrush by the dispenser, where the toothbrush is inserted into a “guide tube 112.” A “bristle spreader 119” within the guide tube 112 “spreads apart the angled bristles 26A to prepare the brush head 20 to receive an oral care capsule.” Using a push bar 114, an arm 115, and a level 117, an oral care capsule 200 is then “pushed through a the [sic] aperture 120 of the bristle spreader 119, past the spread-apart angled bristles 26A and into the capsule receiving zone 25.” Then, “[u]pon removal of the brush head from the bristle spreader 119, the angled bristles 26A return to their relaxed position to contract around an oral care capsule disposed within the capsule receiving zone 25.” Ex. 1001, 7:8-42; and

(2) The oral care capsule is back-loaded through an “oral care capsule loading aperture” in the back of the toothbrush. The aperture is covered by a “moveable retaining element” that “may include a hinged or slidable portion (e.g., a cover). The moveable retaining element may be moved to an open position to expose an oral care capsule loading aperture” for loading a capsule, and then “returned to a closed position,” such that the capsule “is retained from behind by the retaining element, and preferable also from above by the angled bristles.” Ex. 1001, 6:8-25.

B. Prosecution History of the ’332 Patent

53. First, the parent application to the ’332 Patent (Application No. 11/840,627) was filed with claims directed to both (i) a toothbrush with “a capsule receiving zone” and “a plurality of angled bristles adapted to retain an oral care capsule in the capsule receiving zone” (Claims 1-6), and (ii) a dispenser device “for use with a brush head” having “a plurality of angled bristles” (Claims 7-21). Ex. 1003, 28-30. The parent application was expressly abandoned without an office action or any amendments being filed. Ex. 1003, 1-6.

54. The ’332 Patent application (Application No. 12/101,446) was filed with identical toothbrush claims as the parent application, and again with claims directed to a dispenser. *Compare* Ex. 1002, 361-64, *with* Ex. 1003, 28-30. During prosecution of the ’332 Patent, the examiner (Stephanie Newton/Berry) issued a restriction requirement requiring Patent Owner to select either the toothbrush claims or the dispenser claims for examination, and the Patent Owner selected the toothbrush claims without traverse (disagreement). Ex. 1002, 291-301. The dispenser claims were later filed in the continuation application (Application No. 14/535,442). Ex. 1004, 359-361.

55. The examiner issued four Office Actions rejecting the elected claims of the ’332 Patent. Ex. 1002, 81-92, 135-141, 187-194, 275-280. The Office Actions relied upon three prior art references: US 2006/0165473 (Hohlbein), US

2008/00140110 (Bartschi), and US 2007/0254260 (Alden). *Id.* In response to the first office action, patent owner amended the claims to change "a plurality of angled bristles adapted to retain an oral care capsule in the capsule receiving zone" to "a plurality of angled capsule retaining elements that are elevated above the recess and adapted to retain an oral care capsule in the capsule receiving zone." Ex. 1002, 224.

56. Patent Owner's arguments in support of patentability over the three prior art references focused primarily on that Hohlbein, "clearly indicates that the bristle block – *not* the plurality of bristles – performs the function of retaining a gel capsule," further stating that Hohlbein's "depression or socket in the bristle block" is "the only structure disclosed by Hohlbein that performs the function of retaining an oral care capsule," and that "no figure according to Hohlbein discloses any cleaning elements (e.g., bristles) that are angled and serve to retain an oral care capsule." Ex. 1002, 56-60, 230-233 (emphasis original).

57. Alden was cited as disclosing electronic signaling/sensor elements in dependent claims 3 and 4, which are not at issue here. Ex. 1002, 87-88. Bartschi was distinguished by Patent Owner, and subsequently dropped by the Examiner, in the first office action response. Patent Owner argued Bartschi disclosed a back or side cavity for inserting an oral care composition, but not claimed elements such as a recess to receive a capsule past the bristles or angled retaining elements elevated above the recess. Ex. 1002, 233-234.

58. The Notice of Allowance issued by the examiner stated the prior art of record did not disclose the claim elements, but also noted that, while Sorrentino (US 2008/0120798) does disclose all claim elements, Sorrentino was purportedly not available as prior art given the '332 Patent's claimed priority date of August 17, 2007. Ex. 1002, 30-38.

59. The prior art I have relied on in forming my opinions, including Wolcott (Exhibit 1009), Davidson (Exhibit 1010), Fitz-Gibbon (Exhibit 1011), and Young (Exhibit 1012), were not evaluated during prosecution of the '332 Patent either by Patent Owner or by the examiner. Although there is an indication in the prosecution history that Wolcott, Davidson, and Young came up as hits during the examiner's searching, the prosecution history is silent as to whether the examiner performed any evaluation of these prior art references. Ex. 1002, 39, 93, 96-101, 142, 146-150, 195, 202-203, 205-206, 281-283.

60. Young was evaluated in some detail in the continuation application, but the claims of the continuation application were directed to the dispenser, and not to the structure of the toothbrush, with Young only being cited in the continuation application for aspects of Young's pellet dispenser. Ex. 1004, 66-78. A different examiner (Rakesh Kumar) prosecuted the continuation application. *Id.* There is no indication that the examiners were aware of Fitz-Gibbon. In my opinion, had the

examiner closely evaluated this prior art, the claims of the ’332 Patent would likely not have been issued.

C. State of the Art by the Filing Date of the ’332 Patent

61. Conventional toothbrushes that retain an oral care capsule (also termed as a “pellet”, “tablet” or “other charge”) have existed for over eighty years, and over sixty years before the ’332 Patent was filed. In typical operation, the oral care capsule is retained by spreading apart the bristles and once in place is held there by angled bristles.

62. Among other references, in this Declaration I refer to various prior art references as part of my analysis, including:

- **Wolcott (Ex. 1009)**: U.S. Patent No. 2,262,982 to F. E. Wolcott, filed on August 24, 1938, and issued on November 18, 1941. Wolcott lists Frank E. Wolcott as the inventor. Wolcott is titled "Toothbrush";
- **Davidson (Ex. 1010)**: U.S. Patent No. 2,307,493 to N. J. Davidson, filed on February 17, 1941, and issued on January 5, 1943. Davidson lists Nathan J. Davidson as the inventor. Wolcott is titled "Toothbrush";
- **Fitz-Gibbon (Ex. 1011)**: U.S. Patent No. 1,346,536 to J. J. Fitz-Gibbon, filed on April 12, 1919, and issued on July 13, 1920. Fitz-Gibbon lists John J. Fitz-Gibbon as the inventor. Fitz-Gibbon is titled "Toothbrush";

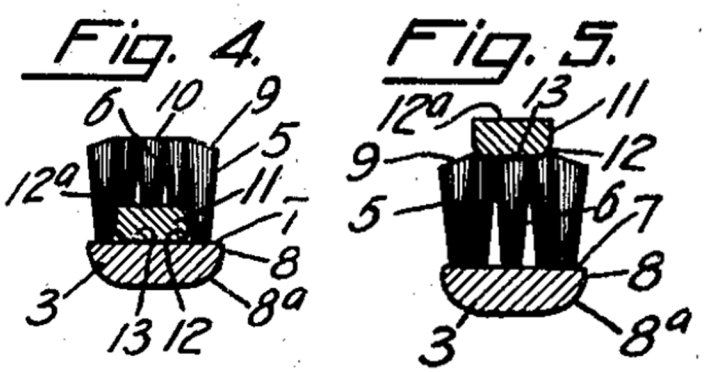
- **Young (Ex. 1012)**: U.S. Patent No. 1,995,374 to J. D. Young, filed on April 23, 1934, and issued on March 26, 1935. Young lists James D. Young as the inventor. Young is titled "Dentifrice Holding Toothbrush"; and
- **Sorrentino (Ex. 1013**): U.S. Patent No. 8,240,937 to Alan Sorrentino et al., filed January 24, 2008, and issued August 14, 2012. Sorrentino lists Alan Sorrentino, Douglas J. Hohlbein, and Al Sprosta as inventors. Sorrentino is titled “Oral Care Implement with Bead Retention.”

a) Oral Care Capsules

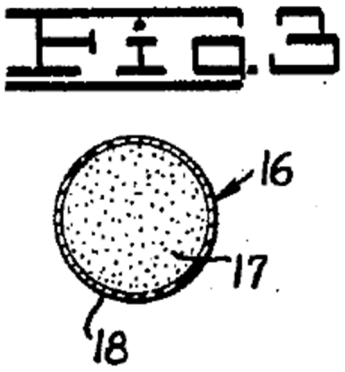
63. The ’332 Patent describes in the Background section that oral care capsules were already known before the ’332 Patent was filed, stating “oral care capsules, which avoid some of the mess associated with conventional toothpaste, are known.” The ’332 Patent provides examples of such oral care capsules: U.S. Patent Application Publication No. 2005/0260141, U.S. Patent Nos. 7,074,390 and 4,427,116. Ex. 1001, 1:51-2:12.

64. But oral care capsules go back even further than the examples listed in the ’332 Patent. For example, Wolcott, issued in 1941, describes a “dentifrice pellet” that “may be formed of any of various different dentifrices in powdered form, or even of hardened or enclosed tooth paste, but it will be understood that irrespective of the material used, it is adapted to break down relatively quickly when wet and

when subjected to the rubbing action incident to the use of the toothbrush in the mouth." Ex. 1009, 1:26-35, 2:38-45, 3:18-27. The dentifrice pellet of Wolcott is shown below:

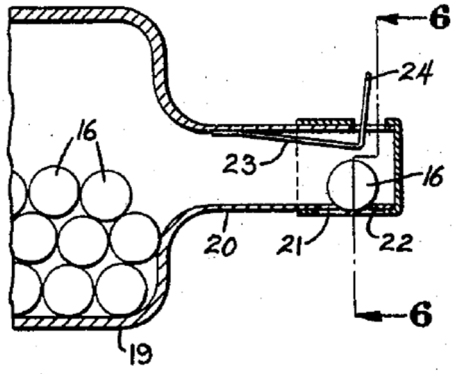


65. As another example, Young, issued in 1935, describes a "pellet of dentifrice" "comprising a central or core portion 17 which may be a powder or which may be plastic in the nature of a cream and a covering 18 which may be made of such material as starch, or any material having the desired insert or other properties and which is soluble in water." Ex. 1012, 1:50-2:4. FIG. 3 illustrates the pellet of Young:



66. Young, like the ’332 Patent, also discloses a dispenser that dispenses dentifrice pellets through an aperture 21 using an ejector 23. Ex. 1012, 2:5-14. Young’s dispenser is shown in FIG. 4 below.

FIG. 4



67. These known capsules, being water soluble, dissolve and spread to the teeth and gums through the back-and-forth movement of the toothbrush head within the mouth. Thus, oral care capsules provide a relatively easy to use, comfortable, and powerful means of dispersing their ingredients to the targeted teeth and gums. With children, this is especially important as children do not have the dexterity necessary to apply the toothpaste with one hand to the toothbrush head, oriented a distance away from the toothbrush handle in their other hand. See Ex. 1001, 1:35-39.

68. The above problems had been solved in the past through means similar if not the same as the ’332 Patent, as will be shown below.

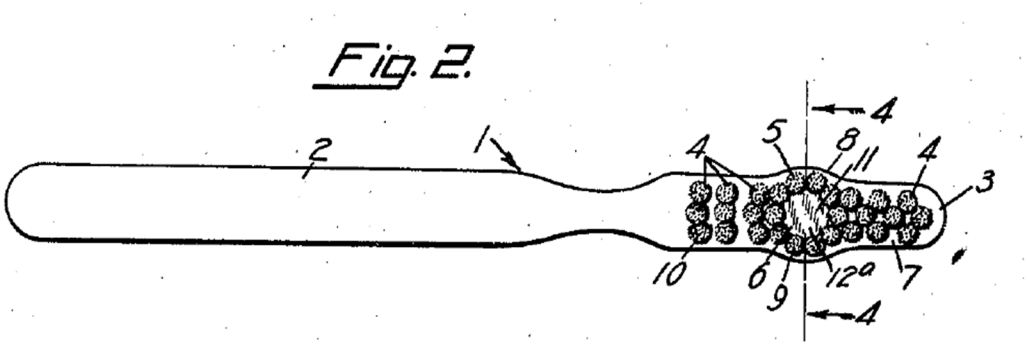
69. Other problems include the need for the capsule to remain fully retained within the toothbrush head until brushing occurs. Again, this problem has been previously solved in similar if not the same manner as the ’332 Patent, as will be shown below.

70. Thus, at the time of the invention of the ’332 Patent, toothbrush systems that utilized an oral care capsule were already well-known in the art.

b) Dentifrice Receiving Zones

71. Toothbrushes with specific areas or zones for receiving dentifrice onto the toothbrush were also known decades before the ’332 Patent.

72. For example, Wolcott provided an “improved toothbrush” that included a “dentifrice receiving pocket” (“a central pellet recess 6”) that was “adapted to receive a dentifrice pellet.” Ex. 1009, 1:26-35, 2:38-45. See FIG. 2 of Wolcott:



73. The “central pellet recess 6” or “dentifrice receiving pocket” was surrounded by a set of bristles 5 disposed circularly around the recess 6, with other “usual bristles 4” located elsewhere on the toothbrush head. 2:19-24, 2:38-45.

74. As another example, Davidson, issued in 1943, described a toothbrush with a "centrally located receiving area within the bristles and into which the powder or other dentifrice may be easily, quickly, and conveniently poured." Ex. 1010, 1:1-10. See FIGS. 1 and 2 of Davidson:

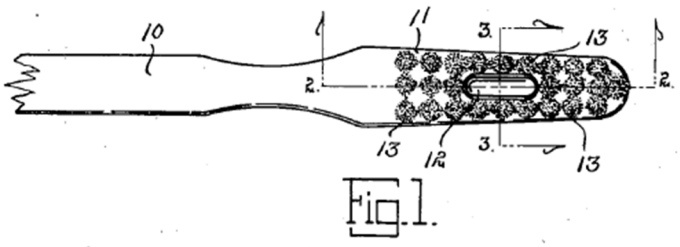


Fig. 1.

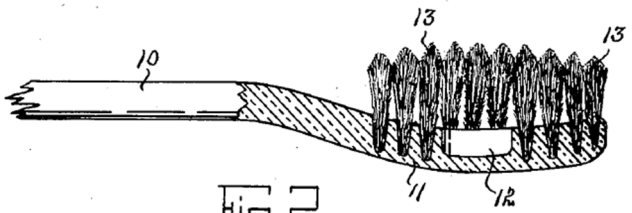


Fig. 2.

75. The "centrally located receiving area" included a well 12 "formed in the bottom of the head portion 11," which had a plurality of bristles 13 "surrounding the centrally located well 12." Ex. 1010, 1:51-55. Davidson describes that dentifrice such as "powder or granular dentifrice" can be poured into the central opening formed by the bristles 13 and into the well 12, the dentifrice "falling downwardly" and "received and held by the well 12." Davidson extends its disclosure to using any type of dentifrice, stating that "[b]y the well 12 being closed at all points except its

top, it will have a tendency to hold the dentifrice, regardless of the type of the dentifrice, by suction." Ex. 1010, 3:20-24.

76. As yet another example, Fitz-Gibbon, issued in 1920, provided "new and useful improvements in toothbrushes" and described a toothbrush "with a relatively large opening formed in the brush back or head and bristles associated therewith to provide a pocket for holding the dentifrice or sterilizing medium employed." Ex. 1011, 1:18-23. See FIGS. 3 and 5 of Fitz-Gibbon below.

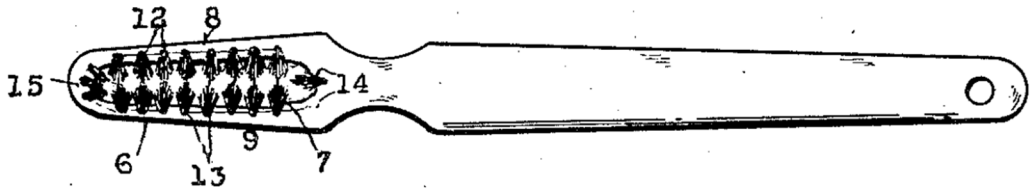


FIG. III

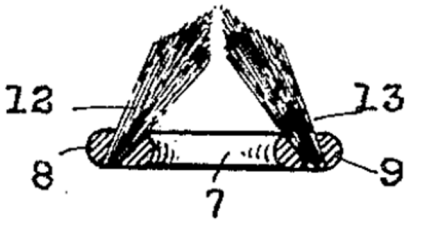
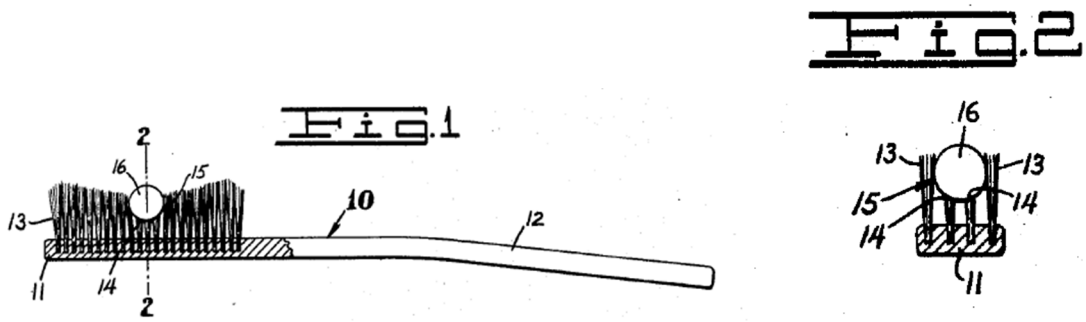


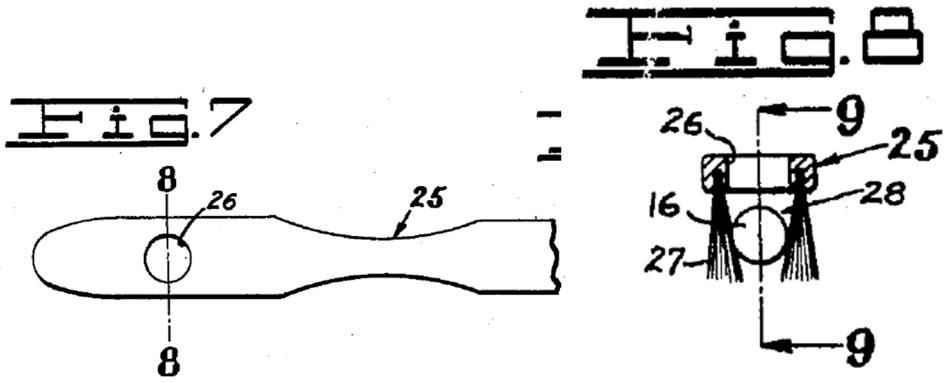
FIG. V

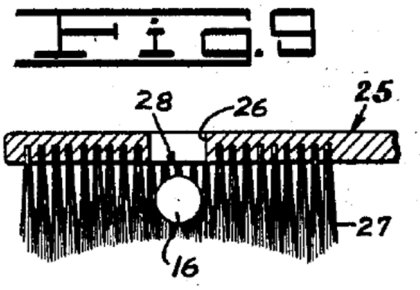
77. The angled bristles in Fitz-Gibbon "are so disposed on the brush head as to provide a dentifrice holding chamber or pocket," which Fitz-Gibbon describes as being "exceedingly valuable" for use with "dry dentifrice." Ex. 1011, 1:79-87.

78. As yet another example, Young described a "dentifrice holding toothbrush" with a "pocket" for holding a "pellet of dentifrice." Ex. 1012, 1:1-5, 1:45-50, 2:21-29, 2:30-34. Like the '332 Patent, Young's disclosure includes both front-loaded and back-loaded alternatives. Young describes one alternative design in which a "pocket 15" for the dentifrice pellet is created using shorter bristle tufts 14 and longer tufts 13. Ex. 1:45-50. See FIGS. 1 and 2 of Young:

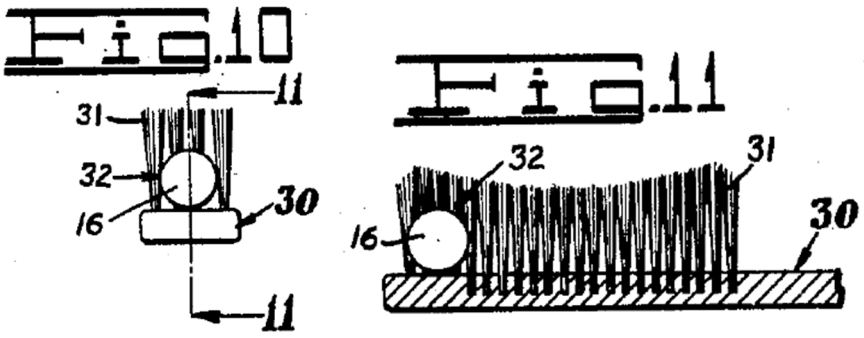


79. Another alternative design of Young includes a hole 26 in the brush head with the bristles around the hole 26 being "resilient and thus when a pellet is passed through the hole 26 it is engaged and retained by the bristles" and in "a pocket 28." Ex. 1012, 2:21-29. See FIGS. 7-9 of Young:





80. Young discloses yet another alternative in which the pellet 16 sits on the front surface of the brush head and the bristles surrounding this area create a "pocket 32" for the pellet. Ex. 1012, 2:30-34. See FIGS. 10 and 11 of Young:



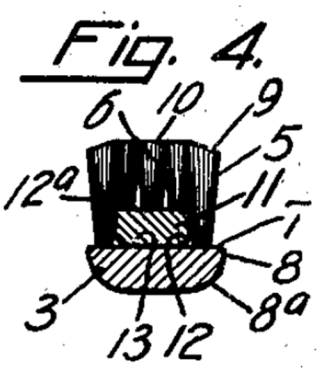
81. Therefore, the problem of providing a receiving zone to receive dentifrice, including dentifrice pellets or oral care capsules, had already been solved in the past through means similar if not the same as the '332 Patent, such as by providing a central area surrounded by retaining bristles and/or including a dentifrice recess/well in a front surface of the toothbrush.

82. Thus, at the time of the invention of the '332 Patent, toothbrush systems that utilized a dentifrice receiving zone were already well-known in the art.

c) Angled Retaining Elements

83. Toothbrushes with angled retaining elements for retaining dentifrice were also known decades before the ’332 Patent.

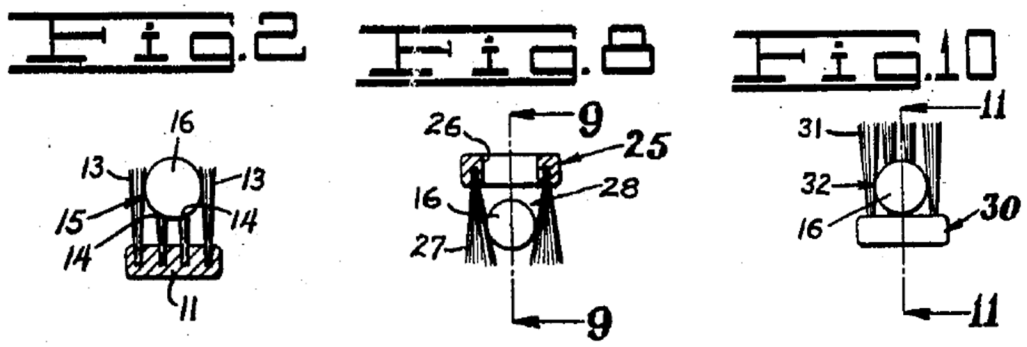
84. For example, Wolcott disclosed using angled bristles to retain the pellet on a flat surface 7 of the toothbrush head. See FIG. 4 of Wolcott:



85. As depicted in FIG. 4, the bristles 5 included both straight bristles and angled bristles, and the bristles 5 “extend clear around the pellet recess 6, in such a manner as thereby effectually to retain a pellet in said recess.” Ex. 1009, 2:49-3:1. Similar to the capsule loading process in the ’332 Patent, the pellet in Wolcott is also front-loaded by spreading the bristles 5, which then spring back to retain the pellet. Wolcott explains “[t]hus, when the pellet is inserted in that recess, it is definitely located therein, due to the location and resiliency of the bristles, which latter causes them to swing back to reduce the size of the mouth of the recess 6 after the insertion of the pellet, and further due to the engagement of the wider portion 12a of the pellet with the sides of the expanding bristles in the adjacent tufts.” Ex. 1009, 3:44-54.

Wolcott also explains "[a]s the pellet moves downward into the recess, the surfaces 12 on the pellet spring apart the bristles surrounding the recess, and these bristles then spring back in such manner as to securely position the pellet at the bottom of the recess, as shown in Figure 4." Ex. 1009, 3:61-67.

86. Similarly, Young's alternative designs each included bristles disposed at angles to hold the pellet 16, as shown below:



87. As yet another example, Fitz-Gibbon's toothbrush had angled "brush tufts or clusters 12" arranged on side portion 8 of the brush head and angled "brush tufts or clusters of bristles 13" on a side portion 9 of the brush head. Each of the angled brush tufts 12 had a corresponding brush tuft 13 on the opposing side of the brush head, such that "[t]he series 12 and the series 13 converge inwardly so that their tips are but slightly spaced from each other. Ex. 1011, 1:58-67. See FIGS. 3 and 5 of Fitz-Gibbon:

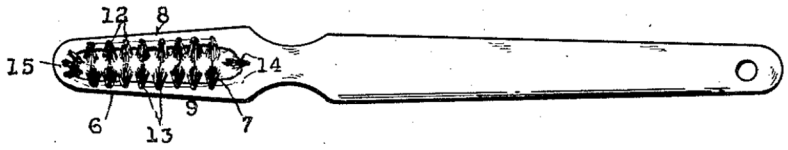


FIG. III

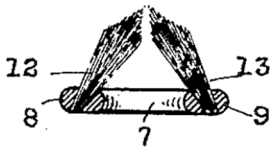


FIG. V

88. As explained above, the angled bristles in Fitz-Gibbon provided "a dentifrice holding chamber or pocket" and served to retain "dry dentifrice" provided through a back of the toothbrush head via opening 7. Ex. 1011, 1:79-87.

89. Therefore, the problem of providing retaining dentifrice, including dentifrice pellets or capsules, had already been solved in the past through means similar if not the same as the '332 Patent, such as by providing angled bristles surrounding a dentifrice receiving zone to hold or retain the dentifrice in place.

90. Thus, at the time of the invention of the '332 Patent, toothbrush systems that utilized angled retaining elements to retain dentifrice were already well-known in the art.

VIII. CLAIM CONSTRUCTION

91. I understand that the first step of assessing the validity of a patent claim is to interpret or construe the meaning of the claim.

92. I understand that, absent express definition within the patent, claim terms in an inter partes review proceeding are construed using the same claim construction standard that is used to construe the claim in a United States federal court. I am informed that that standard is the plain and ordinary meaning of such claim terms, consistent with the specification. I understand that the meaning of claim terms is considered from the viewpoint of one of ordinary skill in the art at the time of the alleged invention.

93. I have been informed and understand that in addition to the claims, specification, and prosecution history, other evidence may be considered to ascertain the meaning of claim terms, including textbooks, encyclopedias, articles, and dictionaries. I have been informed and understand that this other evidence is often less significant and less reliable than the claims, specification, and prosecution history.

94. I also have been informed and understand that claims terms can be subject to 35 U.S.C. § 112(f) (or 35 U.S.C. § 112, sixth paragraph (pre-AIA)), and are otherwise known as "means-plus-function" terms. I understand that 35 U.S.C. § 112(f) states that "[a]n element in a claim for a combination may be expressed as a

means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." I have been advised that, traditionally, the user of the word "means" or phrase "means for," coupled with functional language and without a recital in the claim of the structure, material, or acts that perform the function, triggers a means-plus-function interpretation, requiring a construction that covers "the corresponding structure, material, or acts described in the specification and equivalents thereof." I have also been advised that claim terms can be means-plus-function terms without using "means" or "means for" when the term uses a non-structural, generic placeholder term (a "nonce" word such as "element," "member," "module," "mechanism," "device," etc.), modified by functional language.

A. "angled capsule retaining elements"

95. Claims 1, 2, and 5-18 of the '332 Patent recite this term. I note that claims 2, 6, and 12 also briefly recite this term, but only to then limit the term to "angled bristles" specifically.

96. I understand this term to be a means-plus-function term under 35 U.S.C. § 112, sixth paragraph because it uses the non-structural, generic placeholder word "element" modified by functional language (*see, e.g.*, claim 1, "capsule retaining element" and "configured to retain an oral care capsule in the capsule receiving

zone"), and the claims do not recite sufficiently definite structure for performing the claimed function. Upon review of the '322 Patent, I believe the function of the angled capsule retaining elements to be retaining an oral care capsule in a capsule receiving zone, and I believe the structure, material, and acts corresponding to the functions of the angled capsule retaining elements recited in the claims to be "angled bristles" as the only structure disclosed as performing the claimed function, as described in the '322 Patent at 2:59-61, 2:65-67, 3:20-22, 4:64-5:13, 6:23-24, 6:26-30, 6:34-37, 7:19-23, 7:33-42, 9:61-10:1, 10:5-8; as well as angled bristles 26A in FIGS. 1, 4, 5, 6.

97. My above conclusion is based on that, when referring to claims 1, 2, and 5-18 separate from the specification, "capsule retaining element" has no commonly understood meaning in the art. The claims recite some placement and orientation descriptors regarding the capsule retaining elements such as that the retaining elements are angled, canted away from vertical towards a capsule receiving zone (claim 10), elevated above a recess, diametrically opposed (claim 1), 108 degrees apart (claim 10), and/or contact the oral care capsule. However, a POSITA reading claims 1, 2, and 5-18 would not know to what structure "angled capsule retaining element" refers without going outside the claim language, such as by reviewing the specification.

98. Therefore, in my opinion, and based on my understanding of the art, a POSITA would understand the structure of "angled capsule retaining elements" to be "angled bristles."

IX. CLAIMED PRIORITY DATE

99. I understand that a claim of priority to an earlier application is valid only if the earlier application, *inter alia* (among other things), provides adequate written description for the claims pursuant. I also understand that, for a priority claim to an earlier application to be valid, the critical inquiry is whether the applicant has provided a description that in a definite way identifies the claimed invention in sufficient detail that a POSITA would understand that the inventor was in possession of it at the time of filing.

100. I also understand that, where a claim term has broader scope than what is described in an earlier claimed priority application, the earlier application may not provide a description of sufficient detail such that a POSITA would understand that the inventor was in possession of such broader scope at the time of filing of the earlier application, especially where something is described as an essential element of the invention.

101. Upon review of the '332 Patent claims and the '332 Patent's parent application (U.S. Patent Application No. 11/840,627), I found multiple claim

elements not present in the parent application. These ’332 Patent claim elements include:

(1) “elevated above the recess” (claims 1 and 10);

(2) “a recess ... arranged to receive at least a portion of an oral care capsule inserted [or insertable] past the vertical bristles” (claims 1 and 10);

(3) “at least one pair of angled capsule retaining elements” (claim 1);

(4) “wherein each pair of the at least one pair angled capsule retaining elements includes a first and a second angled capsule retaining element arranged along diametrically opposing sides of an oral care capsule when present in the capsule receiving zone” (claim 1);

(5) “at least three angled capsule retaining elements” (claim 10);

(6) “wherein each angled capsule retaining element of the at least three angled capsule retaining elements is arranged proximate to a perimeter of the capsule receiving zone at a position at least 108 degrees apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone” (claim 10); and

(7) “wherein at least a portion of each angled capsule retaining element ... is arranged to contact the oral care capsule” (claims 1 and 10).

102. The ’332 Patent application was filed with identical claims 1-7 as the parent application. Then, in the first office action response filed October 5, 2012, the claims were amended to newly include “angled capsule retaining elements” (discussed further below), that are (1) “elevated above the recess.” Ex. 1002, 224. The claims were also amended to add (2) “a recess ... arranged to receive at least a portion of an oral care capsule inserted [or insertable] past the vertical bristles.” Ex. 1002, 224-27. New method claims 32 and 40 (issued claims 9 and 14) were also added reciting similar elements. Ex. 1002, 253-54. Upon review, I cannot find “elevated above the recess” in the parent application. *See* Ex. 1003, 16-31. I also cannot find that in the parent application that the recess is “arranged to receive at least a portion of the oral care capsule,” or that the capsule is “inserted past the vertical bristles.” *See* Ex. 1003, 16-31. I can only find that the parent application only describes that a capsule is inserted “past the spread-apart ***angled*** bristles” “into the “receiving zone,” and not a “recess” specifically. *See* Ex. 1003, 22, 25 (emphasis added).

103. Subsequently, in a second office action response filed April 29, 2013, claim 1 was amended to add (3) “at least one pair of angled capsule retaining elements,” and (4) “wherein each pair of the at least one pair angled capsule retaining elements includes a first and a second angled capsule retaining element arranged along diametrically opposing sides of an oral care capsule when present in the

capsule receiving zone," and claim 33 (now issued claim 10) was amended to add (5) "at least three angled capsule retaining elements," (6) "wherein each angled capsule retaining element of the at least three angled capsule retaining elements is arranged proximate to a perimeter of the capsule receiving zone at a position at least 108 degrees apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone." Ex. 1002, 166-168. Patent Owner also added new dependent claim 44 (issued as claim 18), reciting 144 degrees instead of 108 degrees. Ex. 1003, 169.

104. I cannot find support for any of these added elements (3)-(6) in the parent application. *See* Ex. 1003, 16-31. It appears that Patent Owner pointed to the drawings as support for these this new claim elements (Ex. 1002, 171), but, even while examining the drawings, I cannot find that there is definite support for these claim elements in the parent application in the specific detail recited in the '332 Patent claims. I note that it appears Patent Owner was aware of at least some deficiencies with their original parent application's disclosure, since Patent Owner also amended their specification to support the newly added claim elements. Ex. 1002, 170.

105. The claims were amended again in a third office action response filed December 2, 2013, to add (7) "wherein at least a portion of each angled capsule retaining element ... is arranged to contact the oral care capsule." Ex. 1002, 105-108.

I also cannot find this element in the parent application. *See* Ex. 1003, 16-31. Although the parent application describes that angled bristles retain an oral care capsule, the specification does not describe "at least a portion" contacting the capsule. *See* Ex. 1003, 22.

106. After reviewing the multiple new claim elements added during prosecution of the '332 Patent, and after reviewing the parent application in detail, I do not find that the parent application, in a definite way, identifies the claimed invention in sufficient detail that a POSITA would understand that the inventor was in possession of it at the time the parent application was filed.

107. Further, if "angled capsule retaining elements" is not interpreted as means-plus-function, I believe this would create even more reasons as to why the inventors were not in possession of the '332 Patent claims at the time the parent application was filed. As I explained above in Section VII(B), claim 1 of the parent application recited a "toothbrush comprising a brush head ... having a plurality of angled bristles adapted to retain an oral care capsule in the capsule receiving zone." Ex. 1003, 28. Likewise, the specification of the parent application only referred to "angled bristles" as the structure for retaining a capsule. The term "retaining element" only appears with reference to a moveable back cover for an embodiment in which the capsule is back-loaded through the brush head. Ex. 1003, 19, 22-25. During prosecution of the '332 Patent, Patent Owner amended the claims in response

to the first office action to newly recite "angled capsule retaining elements" instead of "angled bristles," specifically amending Claim 1 as follows: "a plurality of angled capsule retaining elements that are elevated above the recess and ~~bristles~~ adapted to retain an oral care capsule in the capsule receiving zone." Ex. 1002, 223-36.

108. As I also explained above in Section VII(B), the as-filed specification and claims of the parent application did not recite "capsule retaining elements." Rather, the specification and claims of the parent application only included "angled bristles." There is no other structure disclosed in the parent application, and thus there is nothing that would even remotely suggest to a POSITA that the inventors had possession of a toothbrush with structures other than "angled bristles" that could perform the claimed functionality. Rather, it appears from the parent application that the inventors considered "angled bristles" to be an essential element of their invention, given that they included "angled bristles" in claim 1 of the parent application, and that they described using only "angled bristles" throughout the parent application, even including a "bristle spreader 119" in their dispenser to cooperate with the angled bristles when loading the capsule onto the brush. Ex. 1003, 24-25, 28.

109. Therefore, if "angled capsule retaining elements" is not subject to a 35 U.S.C. § 112, sixth paragraph, means-plus-function, interpretation or otherwise restricted to mean "angled bristles," I believe the '332 Patent is not entitled to its

claimed priority date of August 17, 2007, but therefore would have a filing date of April 11, 2008.

X. DETAILED ANALYSIS

110. I have been asked to provide an opinion as to whether each of claims 1, 2, and 5-18 of the ’332 patent is invalid in view of the prior art. The discussion below provides a detailed invalidity analysis of how claims 1, 2, and 5-18 of the ’332 patent are obvious over the prior art references identified in Section VII(C).

111. I describe in detail below the scope and content of the prior art, as well as any differences between the alleged invention and the prior art, on an element-by-element basis for each of claims 1, 2, and 5-18 of the ’332 patent.

112. The prior art I describe below, and that I introduced in the State of the Art Section above, includes disclosure of prior art toothbrushes that contain dentifrice retaining methods. To the extent there are any differences between the identified prior art references and the alleged invention recited in any of claims 1, 2, and 5-18 of the ’332 patent, they are only minor differences that would be insubstantial and within the knowledge of a person of ordinary skill in the art, in my opinion.

113. In summary, it is my opinion that:

- Claims 1, 2, and 5-18 of the ’332 Patent are obvious under § 103 based on Wolcott (U.S. Patent 2,262,982) in view of Davidson (U.S. Patent 2,307,493).
- Claims 1, 2, and 5-18 of the ’332 Patent are obvious under § 103 based on Wolcott (U.S. Patent 2,262,982) in view of Davidson (U.S. Patent 2,307,493) and Fitz-Gibbon (U.S. Patent 1,346,536).
- Claims 1, 2, and 5-18 of the ’332 Patent are obvious under § 103 based on Young (U.S. Patent 1,995,374) in view of Davidson (U.S. Patent 2,307,493).
- Claims 1, 2, and 5-18 of the ’332 Patent are obvious under § 103 based on Young (U.S. Patent 1,995,374) in view of Davidson (U.S. Patent 2,307,493) and Fitz-Gibbon (U.S. Patent 1,346,536).
- Claims 1, 5, 7-11, and 13-18 of the ’332 Patent are obvious under § 103 based on Sorrentino (U.S. Patent 8,240,937), presuming the ’332 Patent is not entitled to its priority date and in the event the means-plus-function claim interpretation is not adopted.
- Claims 1, 2, and 5-18 of the ’332 Patent are obvious under § 103 based on Sorrentino (U.S. Patent 8,240,937) in view of Fitz-Gibbon (U.S. Patent 1,346,536), presuming the ’332 Patent is not entitled to its priority

date and in the event the means-plus-function claim interpretation is adopted.

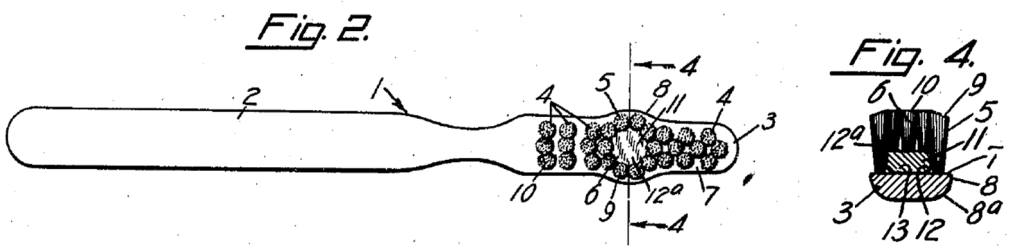
114. Below I describe in detail how claims 1, 2, and 5-18 of the '332 patent are obvious under § 103 based on each of the references or combinations of references in view of the teachings of the prior art as well as the knowledge of one having ordinary skill in the art at the time of the purported invention.

A. Obviousness based on Wolcott (U.S. Patent 2,262,982) in view of Davidson (U.S. Patent 2,307,493)

a) A POSITA Would Have Been Motivated to Combine Wolcott and Davidson

115. As I also explained in Section VII(C)(b), both Wolcott and Davidson disclose toothbrushes with dentifrice receiving zones. Wolcott discloses a "dentifrice receiving pocket" or "central pellet recess 6" that is "adapted to receive a dentifrice pellet" and is created by a circular arrangement of bristles 5, such that the pellet rests within the bristles 5 on a front surface of toothbrush head when the pellet is received by the toothbrush. Ex. 1009, 1:26-35, 2:38-45.

116. See FIGS. 2 and 4 of Wolcott, below:



117. A primary concern of Wolcott is effective retaining of the pellet within the pocket/recess. Wolcott emphasizes the importance of retaining the pellet, stating "for example, should the brush be accidentally inverted befor inserting in the mouth, the pellet will still remain in its recess, its portion 12a then engaging the wider expanded tuft portions or moving into engagement herewith." Ex. 1009, 4:4-9.

118. Davidson similarly discloses a "centrally located receiving area within the bristles" for receiving dentifrice. This "centrally located receiving area described in Davidson includes a "well 12" formed in a front surface of the toothbrush head with bristles "surrounding the centrally located well 12." Ex. 1010, 1:1-10, 1:51-55.

119. FIGS. 1-2 of Davidson illustrate the centrally located receiving area and the well 12:

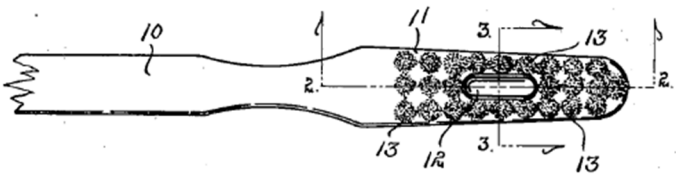


Fig. 1.

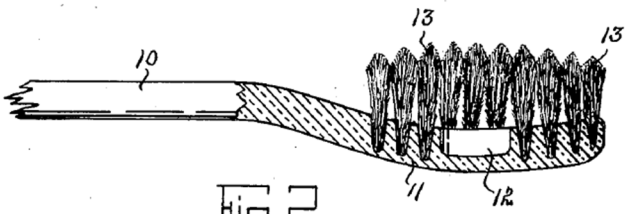


Fig 2.

120. Davidson describes the well 12 provides a distinct benefit, stating "[b]y the well 12 being closed at all points except its top, it will have a tendency to hold the dentifrice, regardless of the type of the dentifrice, by suction." Ex. 1010, 3:20-24.

121. Given that a primary concern in Wolcott is to maintain the pellet even if a user were to turn the brush upside down (invert the brush) before inserting the brush into the user's mouth, a POSITA would have been motivated to combine Wolcott and Davidson to increase the ability of Wolcott's toothbrush to retain a pellet by incorporating the well of Davidson to provide additional suction on the pellet, reducing movement of the pellet within the recess and chances of the pellet falling out of the recess.

122. The disclosures of Wolcott and Davidson include straightforward teachings that would have provided a POSITA with a predictable set of options for retaining dentifrice in a head of a toothbrush, and a POSITA would have been strongly motivated, and it would have been an obvious design choice, to combine these options to maximize the resulting toothbrush's ability to retain Wolcott's pellet. Combining Wolcott and Davidson, and particularly modifying Wolcott based on Davidson's disclosure, would require only ordinary skill to define a well in the front surface of Wolcott's toothbrush head, producing predictable results such as retaining Wolcott's dentifrice pellet within the well.

b) Claim Analysis

1. Independent Claims 1 and 10

123. Independent claims 1 and 10 recite substantially overlapping claim elements. Accordingly, I review the independent claims together.

[1.0] "**A toothbrush comprising a brush head that includes:**"
[10.0] "**A toothbrush comprising a brush head that includes:**"

[1.1] "**a front surface**"
[10.1] "**a front surface**"

[1.2] "**a back surface**"
[10.2] "**a back surface that opposes the front surface**"

124. Wolcott's toothbrush has a brush head with a front surface and a back surface that opposes the front surface. Wolcott's toothbrush is "a toothbrush, generally indicated at 1, and having a handle 2 and bristle carrying, or back, portion 3 carrying usual bristles 4." Ex. 1009, 2:19-24.

125. See FIGS. 1-2 below.

Fig. 1.

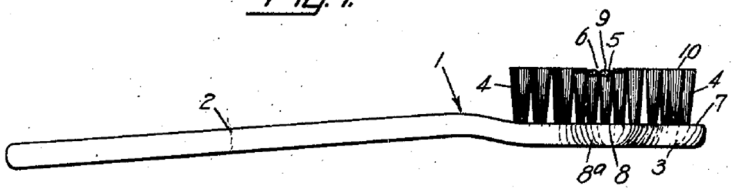
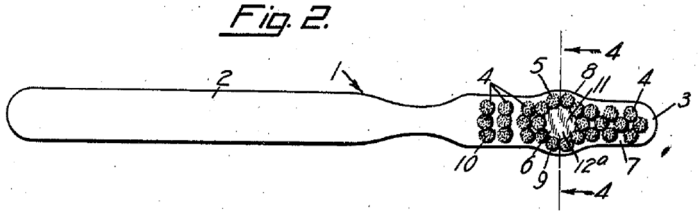


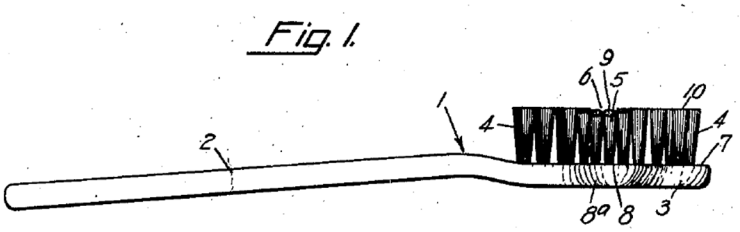
Fig. 2.



126. As shown above, Wolcott's brush head includes a front surface, which it refers to as the bristle carrying back portion 3, which is a surface from which the bristles extend from the toothbrush. As shown above, Wolcott's brush head also includes a back surface that opposes the front surface, that is, the back of the brush head.

> [1.3] "**a plurality of vertical bristles extending upward from the front surface**"
> [10.3] "**a plurality of bristles extending upward from the front surface and arranged distal from a center of the front surface**"

127. Wolcott's brush head carries "usual bristles 4" that are shown extending upward from the front surface of the brush head in FIG. 1. FIG. 1, shown below, also illustrates that these tufts of bristles 4 include many straight or vertical bristles Ex. 1009, 2:19-24.

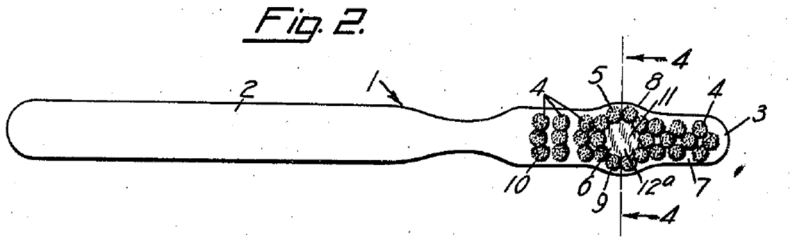


128. See also my annotated FIG. 4 of Wolcott showing the vertical bristles:



129. Therefore, the brush head in Wolcott has a plurality of vertical bristles extending upward from the front surface of the brush head.

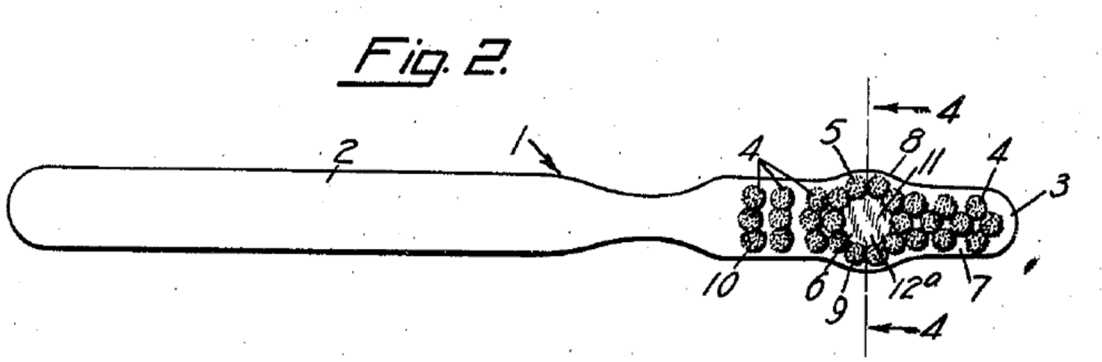
130. The bristles 4 are also arranged distal from a center of the front surface. See FIG. 2 of Wolcott:



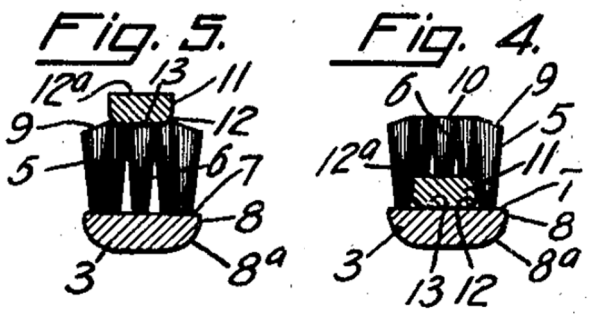
131. As shown in FIG. 2 and described in Wolcott, the bristles 4 are "at the front and rear ends" of the brush head, with the other types of bristles 5 that form the dentifrice pocket/recess being "intermediate the bristles 4." Ex. 1009, 2:33-39. Thus, at least these bristles 4, which include at least vertical bristles within the bristle tufts, are arranged distal from a center of the front surface of the brush head.

[1.4] "**a capsule receiving zone sized to receive an oral care capsule**"
[10.4] "**a capsule receiving zone**"

132. Wolcott's brush head has a "dentifrice receiving pocket" or "a central pellet recess 6" that is "adapted to receive a dentifrice pellet." Ex. 1009, 1:26-35, 2:38-45. See FIG. 2 of Wolcott, below.



133. As shown above, the central pellet recess 6 is surrounded by a set of bristles 5 disposed circularly around the recess 6 into which a dentifrice pellet 11 is inserted. Ex. 1009, 2:19-24, 2:38-45, 3:18-20. Wolcott further illustrates insertion of the pellet 11 within the capsule receiving zone in FIGS. 4 and 5 below:



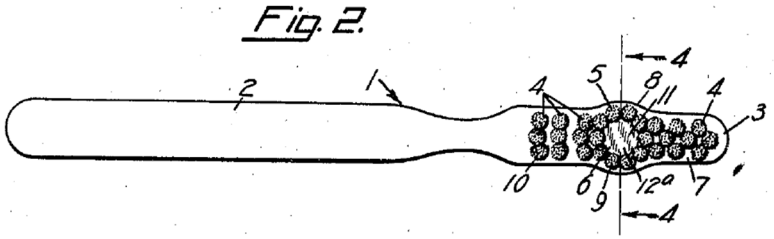
134. FIG. 5 shows "the pellet in process of being inserted in the pocket" and FIG. 4 shows the pellet "in position in the pocket in the bristles." Ex. 1009, 1:53-

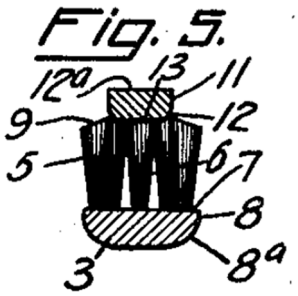
2:3. The dentifrice pellet in Wolcott is an oral care capsule because it "may be formed of any of various different dentifrices in powdered form, or even of hardened or enclosed tooth paste, but it will be understood that irrespective of the material used, it is adapted to break down relatively quickly when wet and when subjected to the rubbing action incident to the use of the toothbrush in the mouth." Ex. 1009, 3:18-27. To the extent the "capsule" in the claims of the '332 Patent is attributed any special meaning, as I explained in Section VII(C)(a), the background of the '332 Patent describes that oral care capsules were well known and cites to three prior patents disclosing capsules. It would have been obvious that the Wolcott-Davidson combination could be used with such known capsules without needing to materially alter the structure of the toothbrush.

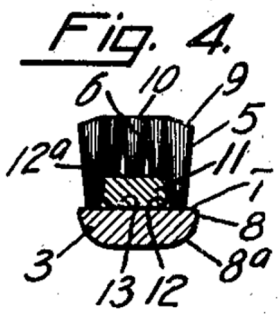
135. Therefore, Wolcott's brush head includes a capsule receiving zone sized to receive an oral care capsule.

> [1.5] "**the capsule receiving zone including a recess defined in the front surface and arranged to receive at least a portion of an oral care capsule inserted past the vertical bristles**"
> [10.5] "**including a recess defined in the front surface and arranged to receive at least a portion of an oral care capsule insertable past the bristles into the recess**"

136. As I explained above, Wolcott describes a capsule receiving zone described as a "central pellet recess 6" formed by a circular arrangement of bristles 5 into which a pellet 11 is inserted past the vertical bristles, such that the pellet 11 rests on a flat surface 7 of the brush head. See FIGS. 2, 4, and 5 below.







137. Davidson similarly discloses a "centrally located receiving area within the bristles" for receiving dentifrice, comprising a well 12 formed in a front surface of the toothbrush head and surrounded by bristles. Ex. 1010, 1:1-10, 1:51-55. See FIGS. 1-2 of Davidson, below.

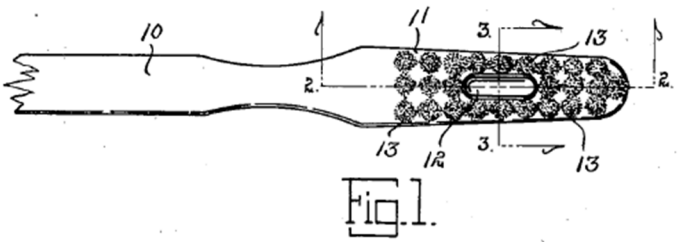


Fig. 1.

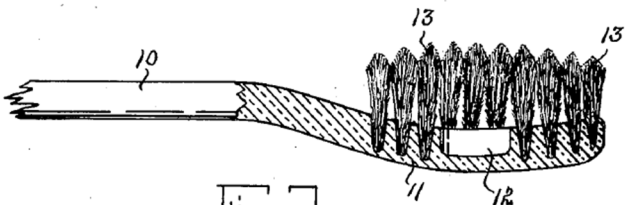


Fig. 2.

138. The structures of the brush heads in Wolcott (a pocket in a central portion of the brush head with a surrounding circular arrangement of bristles) and Davidson (a receiving area in a central portion of the brush head with a well formed as a carved out portion in the front surface) are strikingly similar to the structure of the toothbrush claimed by the '332 Patent, which has a capsule receiving zone 25 that has a recess in a central portion of the front surface of the brush head and that is surrounded by bristles, as shown in FIGS. 1 and 5 of the '332 Patent below.

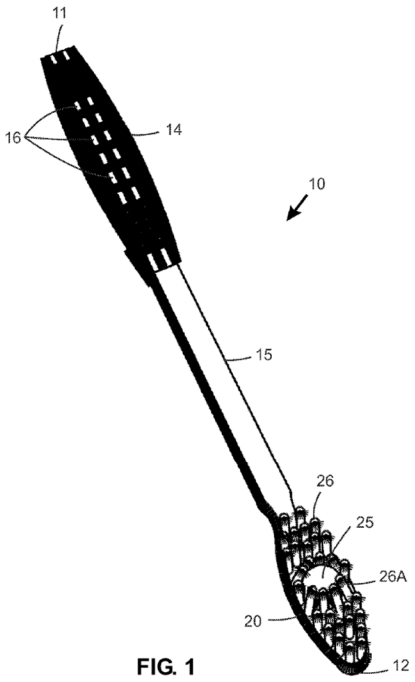


FIG. 1

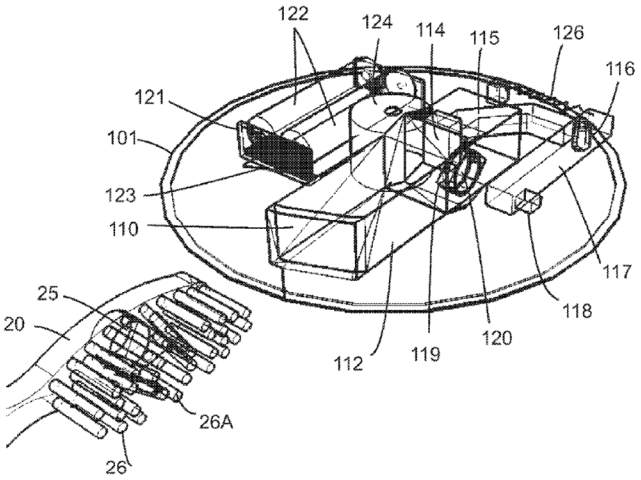


FIG. 5

139. The combination of Wolcott and Davidson, as I described in my analysis of the motivations to combine, provides a toothbrush head with a capsule receiving zone including a recess defined in the front surface and arranged to receive at least a portion of an oral care capsule inserted past the vertical bristles into the

recess, as recited in claims 1 and 10 of the ’332 Patent. Particularly, Wolcott alone already discloses receiving a pellet past the bristles into a central receiving zone and thus including a well as taught by Davidson would provide a recess defined in the front surface of the brush head that is arranged to receive at least a portion of the oral care capsule inserted past the vertical bristles and into the well.

140. As described in Section X(A)(a), given that a primary concern in Wolcott is to maintain the pellet even if a user were to turn the brush upside down, a POSITA would have been motivated to combine Wolcott and Davidson to increase the ability of Wolcott’s toothbrush to retain a pellet by incorporating the well of Davidson, because Davidson describes that “[b]y the well 12 being closed at all points except its top, it will have a tendency to hold the dentifrice, regardless of the type of the dentifrice, by suction.” Ex. 1010, 3:20-24. Although the shapes of the dentifrice receiving areas in Davidson and Wolcott differ, in my opinion, the shape of the well would have been an obvious design choice based on the type of dentifrice to be held in the receiving areas.

[1.6] "**at least one pair of angled capsule retaining elements that are elevated above the recess and configured to retain an oral care capsule in the capsule receiving zone**"
[10.6] "**at least three angled capsule retaining elements that are elevated above the recess, are configured to retain an oral care capsule in the capsule receiving zone, and are canted away from vertical in a direction toward a center of the capsule receiving zone**"

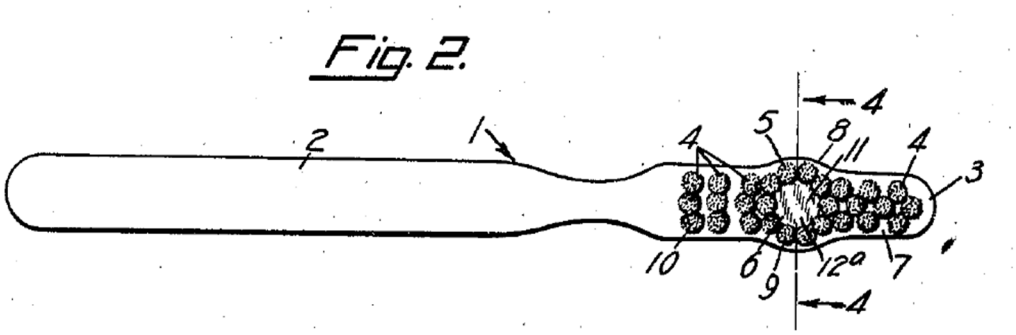
141. The bristles 5 of the brush head of Wolcott include angled capsule retaining elements in the form of angled bristles. These angled bristles are elevated above the "dentifrice receiving pocket" and "extend clear around the pellet recess 6, in such manner as thereby effectively retain a pellet in said recess." Ex. 1009, 2:49-3:1.

142. See, for example, annotated FIG. 4 of Wolcott:



143. As shown above, the bristles 5 include within the bristle tufts not only straight/vertical bristles, but also angled bristles adjacent the pellet 11 that are canted away from vertical toward the "dentifrice receiving pocket" and contact the pellet to "thereby effectively retain a pellet in said recess." Ex. 1009, 2:49-3:1.

144. The angled bristles in Wolcott also include at least one pair of angled bristles (Claim 1) and/or three angled bristles (Claim 10). See FIG. 2 of Wolcott:



145. As shown in FIG. 2, many tufts of bristles 5 surround the receiving zone in a circular arrangement, and, as also shown in FIG. 4, each tuft of bristles 5 has at least one angled bristle canted towards the receiving zone. Thus, on Wolcott's brush head, there are multiple diametrically opposed pairs of angled bristles, and at least three angled bristles, relative to a center of the recess that are also elevated above the recess.

146. Wolcott, as modified in view of Davidson, would still include these features, as defining a recess/well in the front surface of the brush head, as taught by Davidson, would still provide that the bristles 5 of Wolcott are elevated above the recess and still serve to retain the pellet. As shown in FIG. 1 and 3 of Davidson, below, its bristles are similarly arranged around the well, and thus Wolcott would be readily modified to include a similar well with surrounding angled bristles.

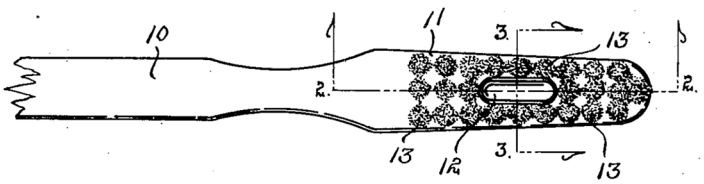


Fig. 1.

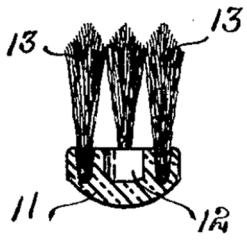


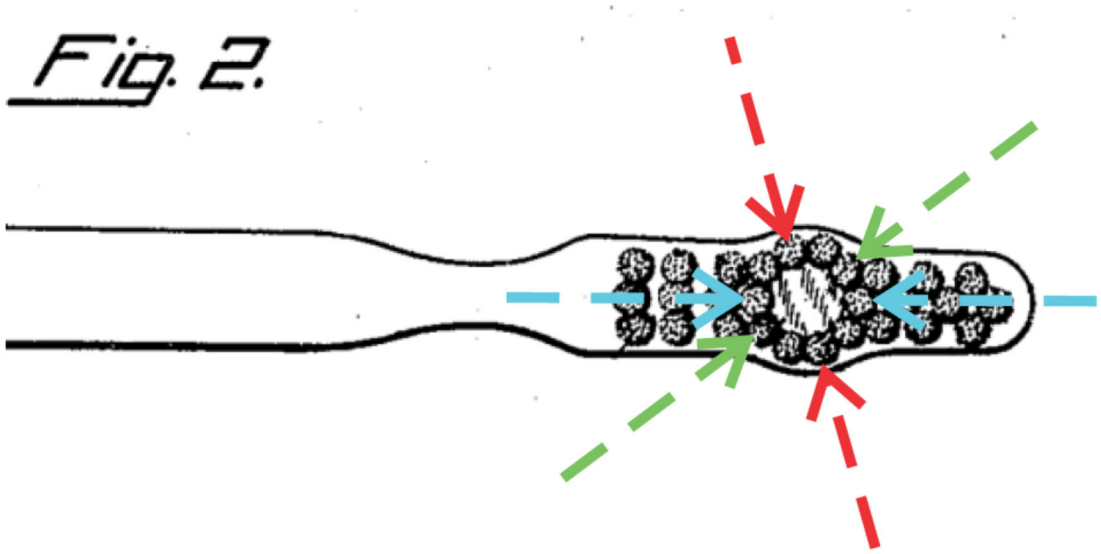
Fig. 3.

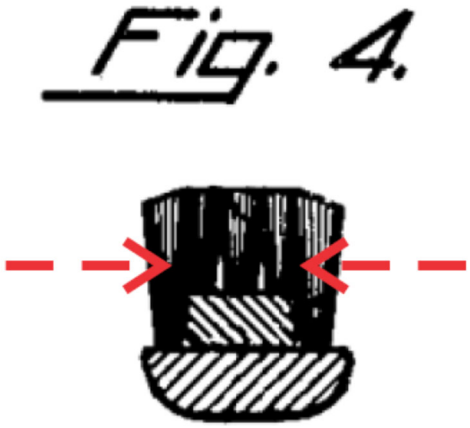
147. Therefore, in my opinion, the combination of Wolcott and Davidson clearly provides both at least one pair, and at least three, angled capsule retaining elements as recited in claims 1 and 10.

> [1.7] "**wherein each pair of the at least one pair angled capsule retaining elements includes a first and a second angled capsule retaining element arranged along diametrically opposing sides of an oral care capsule when present in the capsule receiving zone**"
> [10.7] "**wherein each angled capsule retaining element of the at least three angled capsule retaining elements is arranged proximate to a perimeter of the capsule receiving zone at a position at least 108 degrees apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone**"

148. As I explained, Wolcott's brush head has bristles 5 arranged in a circle around the receiving pocket or recess. Due to the arrangement of the bristles 5 circularly around the recess, Wolcott's brush head thus has at least one pair of angled

bristles that is diametrically opposed (and in fact includes multiple pairs of diametrically opposed angled bristles). See my annotated FIGS. 2 and 4 of Wolcott below showing diametrically opposed bristle pairs:





149. As shown above, the tufts of bristles 5 are circularly arranged around the pellet pocket, and thus angled bristles within the tufts that are adjacent the pellet pocket form diametrically opposite pairs of angled retaining elements. Therefore, in

my opinion, the combination of Wolcott and Davidson thus meets this element of claim 1.

150. It should be noted that Davidson provides a similar structure including bristle tufts surrounding the elliptical well 12. See FIGS. 1 and 3 of Davidson:

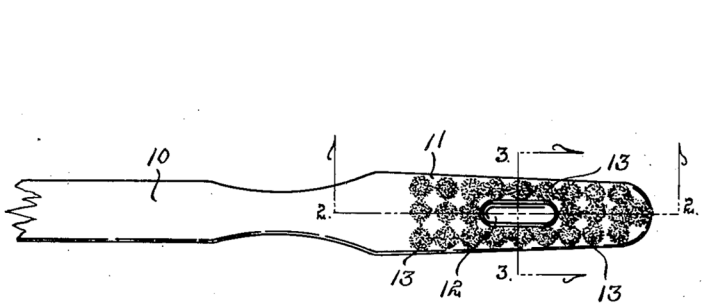


Fig. 1.

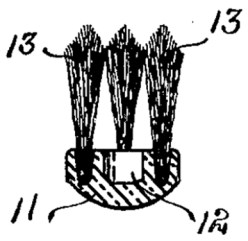
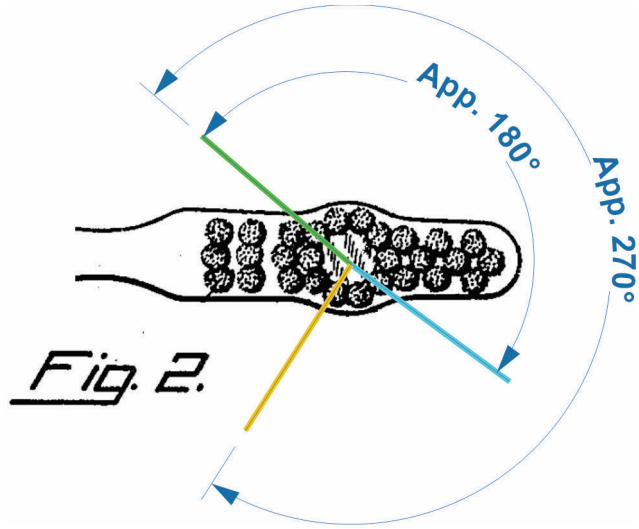


Fig. 3.

151. The combination of Wolcott and Davidson also meets this element of claim 10. The angled bristles in Wolcott include at least three angled bristles that are circularly arranged proximate to a perimeter of the capsule receiving zone, that is they directly surround the recess 6. Additionally, each angled bristle is at a position at least 108 degrees apart from at least one other angled capsule retaining element relative to a center of the capsule receiving zone, as required by claim 10.

152. My annotated FIG. 2 of Wolcott, below, shows how three of Wolcott's angled bristles are each at least 108 degrees apart from another angled bristle relative to a center of the recess:

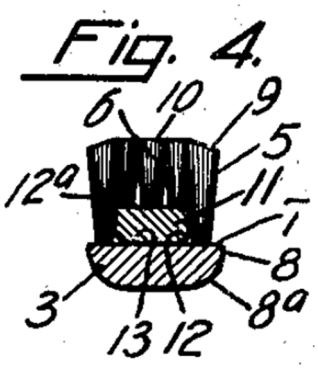


153. As shown in the annotated figure above, a first angled bristle in a first tuft of bristles 5 (green) is more than 108° apart from another angled bristle in a another tuft of bristles 5 (blue), a second angled bristle in a second tuft of bristles 5 (yellow) is more than 108° apart from another angled bristle in a another tuft of bristles 5 (green), and a third angled bristle in a third tuft of bristles 5 (blue) is more than 108° apart from another angled bristle in another tuft of bristles 5 (green).

154. In my opinion, even without an explicit disclosure of specific degrees in Wolcott and Davidson, the specific degrees recited in claim 10 would be obvious based on the disclosure of Wolcott and Davidson, and specifically given the arrangement of bristles surrounding the circular dentifrice pocket/recess/well in Wolcott and Davidson. In my opinion, the combination of Wolcott and Davidson thus meets this element of claim 10.

[1.8] "**wherein at least a portion of each angled capsule retaining element of the at least one pair of capsule retaining elements is arranged to contact the oral care capsule.**"
[10.8] "**wherein at least a portion of each angled capsule retaining element of the at least three angled capsule retaining elements is arranged to contact the oral care capsule.**"

155. It is apparent that Wolcott's angled bristles contact the pellet 11. See FIG. 4 of Wolcott:



156. This is also clear from the specification of Wolcott, which describes that the pellet is also front-loaded by spreading the bristles 5, which then spring back to contact and retain the pellet. Wolcott specifically states that "when the pellet is inserted in that recess, it is definitely located therein, due to the location and resiliency of the bristles, which latter causes them to swing back to reduce the size of the mouth of the recess 6 after the insertion of the pellet, and further due to the engagement of the wider portion 12a of the pellet with the sides of the expanding bristles in the adjacent tufts." Ex. 1009, 3:44-54. Wolcott also describes that "[a]s the pellet moves downward into the recess, the surfaces 12 on the pellet spring apart the bristles surrounding the recess, and these bristles then spring back in such manner

as to securely position the pellet at the bottom of the recess, as shown in Figure 4." Ex. 1009, 3:61-67.

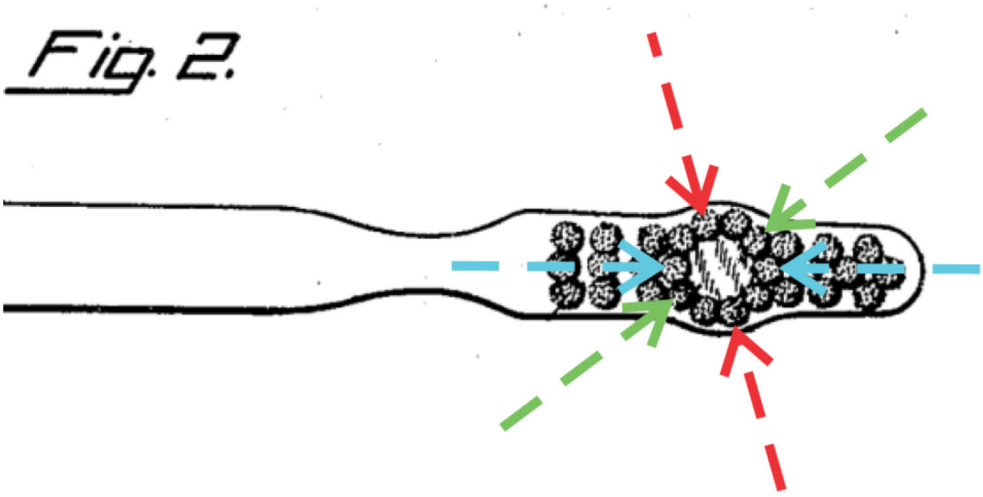
157. Based on the above, in my opinion, claims 1 and 10 are obvious based on the combination of Wolcott and Davidson.

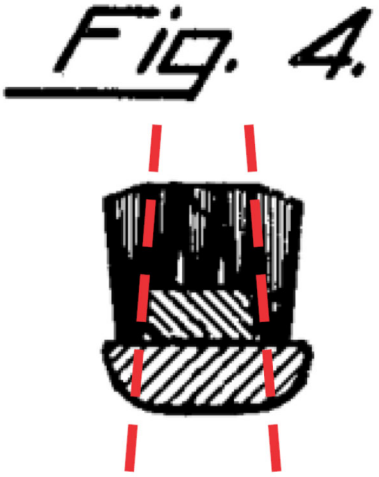
2. Claims 2 and 15

158. Claim 2 recites: "The toothbrush of claim 1, wherein the at least one pair of angled capsule retaining elements comprises multiple pairs of angled bristles canted away from vertical in a direction toward a center of the capsule receiving zone, and the brush head includes a flexural portion adapted to permit at least some bristles of the multiple pairs of angled bristles to be spread apart so as to enable an oral care capsule to be loaded into the capsule receiving zone."

159. Claim 15 recites: "The toothbrush of claim 1, wherein the at least one pair of angled capsule retaining elements comprises multiple pairs of angled capsule retaining elements."

160. As I also explained above with respect to Claim 1, Wolcott has multiple pairs of angled bristles canted away from vertical towards the receiving zone, as recited in claim 2. Wolcott also has multiple pairs of angled capsule retaining elements, as recited in claim 15. See my annotated FIGS. 2 and 4 below:

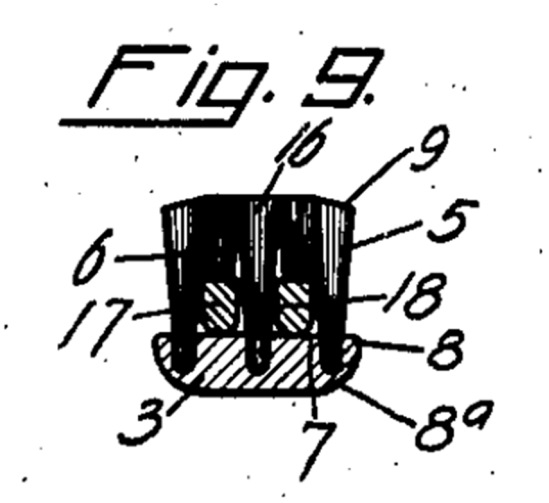




161. As shown above, Wolcott's bristle tufts (which each include angled bristles) surround the dentifrice receiving pocket, and thus there is not only one pair of angled bristles (or angled capsule retaining elements), but multiple pairs.

162. As shown above, Claim 2 also requires that the "brush head includes a flexural portion adapted to permit at least some bristles of the multiple pairs of angled bristles to be spread apart so as to enable an oral care capsule to be loaded into the capsule receiving zone." In my opinion, Wolcott's discloses or suggests this

element of claim 2, and thus claim 2 is obvious. Wolcott discloses or suggests its brush head includes a flexural portion to permit the bristles to spread apart when loading a capsule, because the bristles "spring apart," and, "due to the location and resiliency of the bristles," then "spring back" to "securely position the pellet at the bottom of the recess." Ex. 1009, 3:44-54, 3:61-67. FIG. 9 shows how the bristles are embedded in the brush head:



163. As such, Wolcott's brush head is flexural and allows the bristles to be spread apart, as recited in Claim 2.

164. Based on the above, in my opinion, claims 2 and 15 are obvious.

3. Claim 5

165. Claim 5 recites: "The toothbrush of claim 1, wherein each capsule retaining element of the at least one pair of angled capsule retaining elements comprises a retaining element canted away from vertical in a direction toward a center of the capsule receiving zone."

166. As I described above with respect to claims 1 and 10, the bristles 5 of Wolcott include within bristle tufts not only straight/vertical bristles, but also angled bristles adjacent the pellet 11 that are canted away from vertical toward the pocket/recess and contact and retain the pellet 11 within the pocket/recess. See my annotated FIG. 4 of Wolcott:



167. Based on the above, in my opinion, claim 5 is obvious.

4. Claims 6 and 12

168. Claim 6 recites: "The toothbrush of claim 5, wherein the at least one pair of angled capsule retaining elements comprises angled bristles canted away from vertical in a direction toward a center of the capsule receiving zone."

169. Claim 12 recites: "The toothbrush of claim 10, wherein the at least three angled capsule retaining elements comprise at least three angled bristles."

170. Claims 6 and 12 merely narrow "capsule retaining elements" to "angled bristles." As described above, Wolcott uses bristles, and specifically angled bristles

that are canted away from vertical in a direction toward a center of the capsule receiving zone, to retain a capsule, as again shown below:



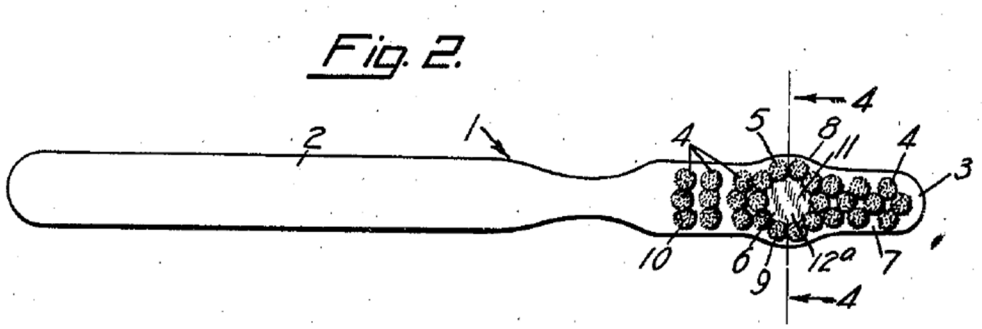
171. Based on the above, in my opinion, claims 6 and 12 are obvious.

5. Claims 7 and 11

172. Claim 7 recites: "The toothbrush of claim 5, wherein the at least one pair of angled capsule retaining elements is arranged between the plurality of vertical bristles and a center of the capsule receiving zone."

173. Claim 11 recites: "The toothbrush of claim 10, wherein the at least three angled capsule retaining elements are arranged between the plurality of bristles and a center of the capsule receiving zone."

174. See FIG. 2 of Wolcott:



175. As shown for example in FIG. 2 of Wolcott, above, Wolcott's toothbrush includes "usual bristles 4" at "the front and rear ends" of the brush head, such that the angled bristles within the tufts of bristles 5 adjacent the pocket/recess are "intermediate the bristles 4." Ex. 1009, 2:23-24, 2:33-39. In other words, the angled bristles in tufts 5 are situated between (1) the vertical bristles included in bristles 4 and (2) a center of the dentifrice pocket 6.

176. Based on the above, in my opinion, claims 7 and 11 are obvious.

6. Claims 8 and 13

177. Claim 8 recites: "The toothbrush of claim 1, including an oral care capsule retained by the at least one pair of capsule retaining elements in the capsule receiving zone, wherein the oral care capsule comprises one or more of the following: a dentrifice composition, a whitening composition, an anticalculus composition,[2] and antibacterial composition, and a breath freshening composition."

[2] Note: calculus is a hard, mineralized formation which forms on the teeth.

178. Claim 13 recites: "The toothbrush of claim 10, including an oral care capsule retained by the at least three capsule retaining elements in the capsule receiving zone, wherein the oral care capsule comprises one or more of the following: a dentrifice composition, a whitening composition, an anticalculus composition, and antibacterial composition, and a breath freshening composition."

179. Wolcott's pellet 11 is an oral care capsule that is a dentifrice composition. Wolcott discloses "[s]till further objects of my invention are to provide an improved dentifrice pellet having improved means adapted to cooperate with my improved brush and to be readily inserted in and subsequently positioned in, said dentifrice receiving pocket," and that the dentifrice pellet "may be formed of any of various different dentifrices in powdered form, or even of hardened or enclosed tooth paste, but it will be understood that irrespective of the material used, it is adapted to break down relatively quickly when wet and when subjected to the rubbing action incident to the use of the toothbrush in the mouth." Ex. 1009, 1:26-31, 3:18-27.

180. Based on the above, in my opinion, claims 8 and 13 are obvious.

7. Claims 9 and 14

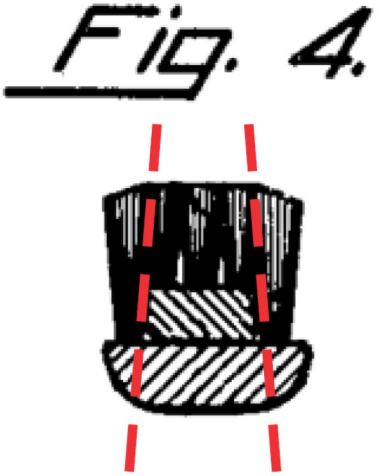
181. Claim 9 recites: "A method comprising loading an oral care capsule into a capsule receiving zone of a toothbrush according to claim 1 by inserting at least a portion of the oral care capsule in a direction past the vertical bristles into the

recess, and retaining the oral care capsule in the capsule receiving zone using the at least one pair of angled capsule retaining elements."

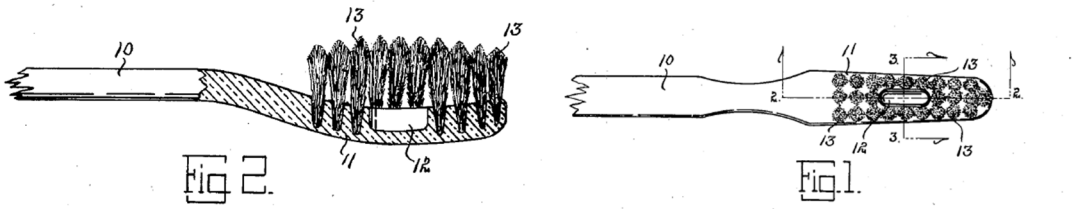
182. Claim 14 recites: "A method comprising loading an oral care capsule into a capsule receiving zone of a toothbrush according to claim 10 by inserting at least a portion of the oral care capsule in a direction past the bristles into the recess, and retaining the oral care capsule in the capsule receiving zone using the at least three angled capsule retaining elements."

183. The combination of Wolcott and Davidson provides a method of loading an oral care capsule into a receiving zone by inserting the capsule past vertical bristles into a recess and retaining the capsule by angled capsule retaining elements, as recited in claims 9 and 14. Like claims 9 and 14, Wolcott and Davidson both disclose a front-loading process.

184. Wolcott describes that the pellet is front-loaded past the bristles into the receiving zone and retained by the angled bristles, stating "[a]s the pellet moves downward into the recess, the surfaces 12 on the pellet spring apart the bristles surrounding the recess, and these bristles then spring back in such manner as to securely position the pellet at the bottom of the recess, as shown in Figure 4." Ex. 1009, 3:61-67. As described above regarding the independent claims, the bristles 5 in Wolcott include angled bristles that retain the dentifrice pellet, as shown in my annotated FIG. 4 below.



185. Based on the modification of Wolcott with the well taught in Davidson, the method would also include that the pellet is loaded into a well or recess. The well of Davidson is shown again, below.



186. Davidson also discloses a front-loading process in which dentifrice is provided into the well and past the bristles, stating "[o]bviously the bristles provide sides and ends to this receiving area in the bristles, and the powder or granular dentifices may fall downwardly and be received and held by the well 12." Ex. 1010, 2:11-27.

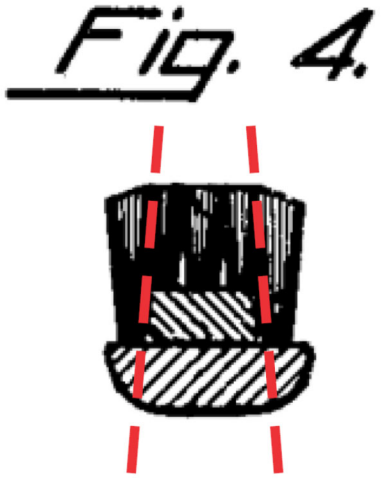
187. Based on the above, in my opinion, claims 9 and 14 are obvious.

8. Claims 16 and 17

188. Claim 16 recites: "The toothbrush of claim 1, wherein at least a portion of each angled capsule retaining element of the at least one pair of angled capsule retaining elements is arranged to overlap a portion of the recess of the capsule receiving zone."

189. Claim 17 recites: "The toothbrush of claim 10, wherein at least a portion of each angled capsule retaining element of the at least three angled capsule retaining elements is arranged to overlap a portion of the recess of the capsule receiving zone."

190. Since the angled bristles in Wolcott are angled towards a center of the pocket/recess 6, clearly at least a portion of these angled bristles overlap a portion of the pocket/recess 6, as shown in my annotated FIG. 4 of Wolcott below.



191. This would remain the case for the combination of Wolcott and Davidson, as the well would retain the pellet 11 in position within the angled bristles that extend over the well to contact the pellet 11.

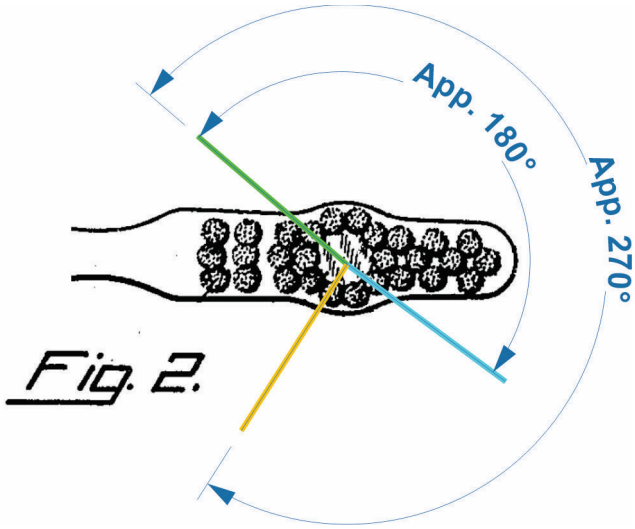
192. Based on the above, in my opinion, claims 16 and 17 are obvious.

9. Claim 18

193. Claim 18 recites: "The toothbrush of claim 10, wherein each angled capsule retaining element of the at least three angled capsule retaining elements is arranged proximate to a perimeter of the capsule receiving zone at a position at least 144° apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone."

194. As I explained above with respect to claim 10, in Wolcott, the angled bristles include at least three angled bristles that are circularly arranged proximate to a perimeter of the capsule receiving zone, because the bristles 5 in Wolcott directly surround the recess 6. Additionally, the angled bristles in Wolcott are each at a position not only at least 108° apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone, but also at least 144° apart as recited in claim 18.

195. To illustrate this, please see my annotated FIG. 2 of Wolcott:



196. As shown in the annotated figure above, a first angled bristle in a first tuft of bristles 5 (green) is more than 144° apart from another angled bristle in a another tuft of bristles 5 (blue), a second angled bristle in a second tuft of bristles 5 (yellow) is more than 144° apart from another angled bristle in a another tuft of bristles 5 (green), and a third angled bristle in a third tuft of bristles 5 (blue) is more than 144° apart from another angled bristle in another tuft of bristles 5 (green).

197. In my opinion, even without an explicit disclosure of specific degrees in Wolcott and Davidson, the specific degrees recited in claim 18 would be obvious based on the disclosure of Wolcott and Davidson, and specifically given the arrangement of bristles surrounding the circular dentifrice pocket/recess/well in Wolcott and Davidson.

198. Based on the above, in my opinion, claim 18 is obvious.

B. Obviousness based on Wolcott (U.S. Patent 2,262,982) in view of Davidson (U.S. Patent 2,307,493) and Fitz-Gibbon (U.S. Patent 1,346,536)

a) A POSITA Would Have Been Motivated to Combine Wolcott, Davidson, and Fitz-Gibbon

199. As I also explained in Section VII(C), Fitz-Gibbon, like Wolcott and Davidson, is concerned with retaining dry dentifrice (as opposed to paste) prior to brushing. Fitz-Gibbon discloses a toothbrush with sets of angled bristles 12 and 13 that are highly tilted over an opening 7.

200. See FIGS. 3 and 5 of Fits-Gibbon:

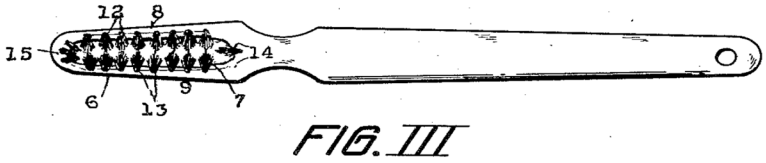


FIG. III

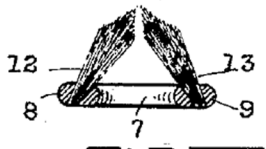
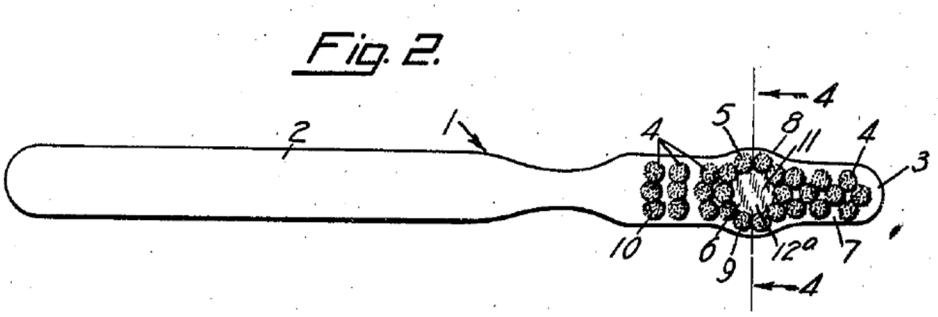


FIG. V

201. Fitz-Gibbon explains that the angled bristles 12 and 13 "are so disposed on the brush head as to provide a dentifrice holding chamber or pocket," which is "exceedingly valuable" for use with "dry dentifrice." Ex. 1011, 1:79-87.

202. A primary concern of Wolcott is effective retaining of the pellet within its pocket/recess. See FIG. 2 of Wolcott:

Fig. 2.



203. Wolcott explains that "for example, should the brush be accidentally inverted befor inserting in the mouth, the pellet will still remain in its recess, its portion 12a then engaging the wider expanded tuft portions or moving into engagement herewith." Ex. 1009, 4:4-9.

204. As indicated above, Wolcott is concerned with preventing the pellet from falling off the brush if a user inverts the brush to be brush-side down prior to brushing. Fitz-Gibbon is also concerned with preventing dry dentifrice from falling off the toothbrush while the toothbrush is held brush-side down. Thus, in addition to including a well as taught in Davidson to provide suction on the dentifrice pellet (Ex. 1010, 3:20-24), a POSITA would have been motivated to tilt the tufts of bristles 5 of the toothbrush of the Wolcott-Davidson combination to further enhance the pellet retaining strength of the toothbrush. This would require simply tilting the tufts of bristles 5 in the Wolcott-Davidson combination towards the center dentifrice receiving area of the brush head, as shown in FIGS. 3 and 5 of Fitz-Gibbon, below.

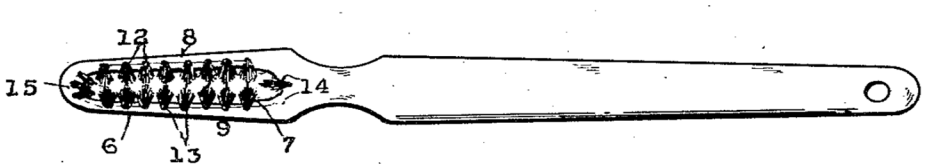


FIG. III



FIG. V

205. Additionally, based on the disclosure in Wolcott that a pellet is front-loaded by spreading the bristles 5 apart during insertion, which then spring back to retain the pellet (Ex. 1009, 3:44-54, 3:61-67), tilting the bristles 5 as taught by Fitz-

Gibbon would still allow for front-loading of the pellet. As shown in FIGS. 3 and 5 of Fitz-Gibbon above, the opposing sets of angled bristles include a space in between that would allow a user to spread the bristles to load a capsule.

206. It should be noted that, as I explained in Section VII(A), the angled bristles described in the '332 Patent are also spread apart when a capsule is being inserted. Wolcott's toothbrush as modified by Davidson and Fitz-Gibbon would function in the same or similar manner.

207. The disclosures of Wolcott, Davidson, and Fitz-Gibbon include straightforward teachings that would have provided a POSITA with a predictable set of options for retaining dentifrice in a head of a toothbrush, and a POSITA would have been strongly motivated, and it would have been an obvious design choice, to combine these options to maximize the resulting toothbrush's ability to retain Wolcott's dentifrice pellet. Combining Wolcott, Davidson, and Fitz-Gibbon, and particularly modifying Wolcott based on Davidson's and Fitz-Gibbon's disclosures, would require only ordinary skill to define a well in the front surface of Wolcott's toothbrush head and tilt Wolcott's bristle tufts around the well, producing predictable results such as retaining Wolcott's dentifrice pellet within the well with the assistance of the angled bristle tufts.

b) Claim Analysis

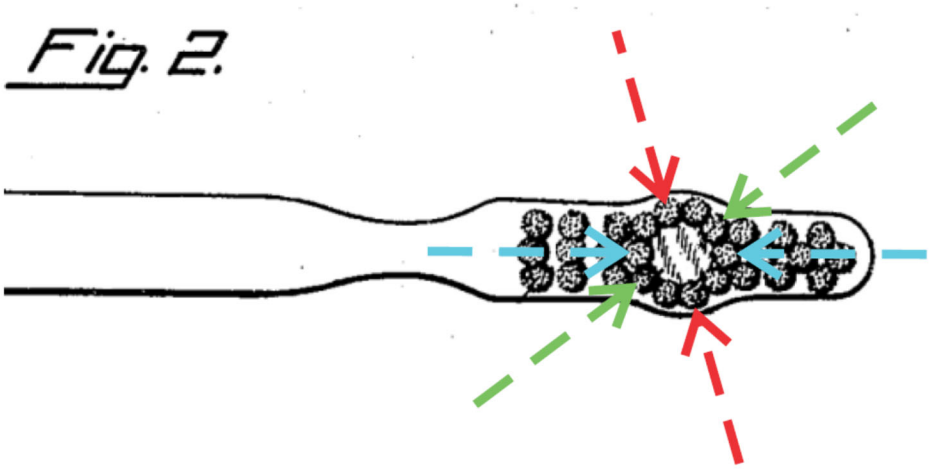
1. Independent Claims 1 and 10

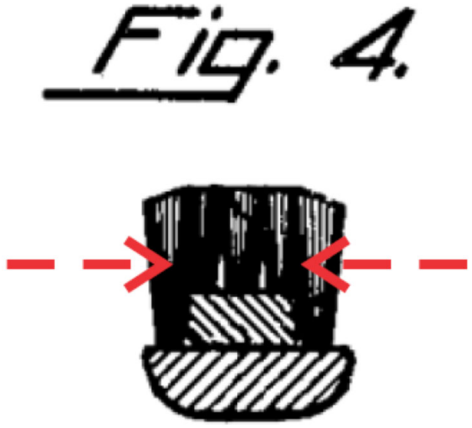
208. In my opinion, claim elements [1.0]-[1.5] and [10.0]-[10.5] are met for the same reasons regarding the combination of Wolcott and Davidson in Section X(A), because, as I explained, the combination of Wolcott and Davidson provides a toothbrush comprising a brush head with a front and back surface, a plurality of vertical bristles extending upward from the front surface and arranged distal from a center of the front surface, a capsule receiving zone sized to receive an oral care capsule, and that the capsule receiving zone includes a recess/well defined in the front surface of the brush head, as taught by Davidson, that would receive an oral care capsule past the vertical bristles and into the recess, as recited in claims 1 and 10. Further combining Fitz-Gibbon with a toothbrush resulting from a combination of Wolcott and Davidson by tilting the bristle tufts surrounding the well/recess at an angle would not change my analysis of claim elements [1.0]-[1.5] and [10.0]-[10.5].

> [1.6] "**at least one pair of angled capsule retaining elements that are elevated above the recess and configured to retain an oral care capsule in the capsule receiving zone**"
> [10.6] "**at least three angled capsule retaining elements that are elevated above the recess, are configured to retain an oral care capsule in the capsule receiving zone, and are canted away from vertical in a direction toward a center of the capsule receiving zone**"

209. As I described in Sections VII(C) and X(A), Wolcott discloses a circular arrangement of bristles 5 around a dentifrice pocket/recess 6. The bristles 5 include pairs of bristles and at least three bristles.

210. See my annotated FIGS. 2 and 4 of Wolcott, below, showing pairs of bristles.





211. As also shown above, the circular arrangement of bristles 5 around the pocket/recess include at least three bristles.

212. Fitz-Gibbons discloses a brush with tilted bristles 12 and 13 on opposing sides of a receiving zone, as shown FIGS. 3 and 5, below.

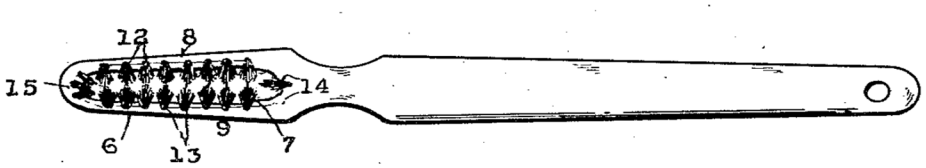


FIG. III

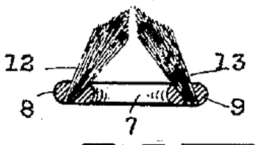


FIG. V

213. The Wolcott-Davidson-Fitz-Gibbon combination thus includes these elements of claims 1 and 10. Wolcott's tufts of bristles 5, as modified based on the teachings of Fitz-Gibbon, would be angled towards the center of the capsule receiving zone, such that the angled bristles contact and retain the capsule within the recess. Therefore, the angled bristles 5 include at least a pair of angled capsule retaining elements configured to retain an oral care capsule, and at least three angled retaining elements that are canted away from vertical in a direction toward a center of the capsule receiving zone.

214. In my opinion, these elements of claims 1 and 10 are met by the combination of Wolcott, Davidson, and Fitz-Gibbon.

> [1.7] "**wherein each pair of the at least one pair angled capsule retaining elements includes a first and a second angled capsule retaining element arranged along diametrically opposing sides of an oral care capsule when present in the capsule receiving zone**"
> [10.7] "**wherein each angled capsule retaining element of the at least three angled capsule retaining elements is arranged proximate to a perimeter of the capsule receiving zone at a position at least 108 degrees apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone**"

215. As I described above and in Sections X(A)(b) and X(B)(a), the angled bristles provided by the combination of Wolcott, Davidson, and Fitz-Gibbon include

a pair of angled bristles in which first and second angled bristles are on diametrically opposing sides of the capsule in the receiving zone. This is emphasized by my annotated FIGS. 2 and 4 of Wolcott, below:

Fig. 2.

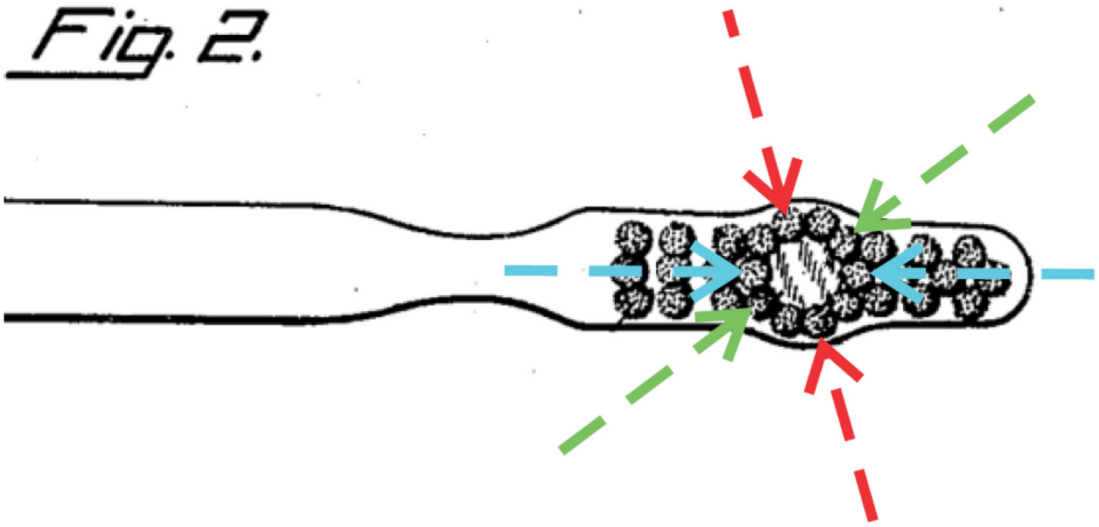
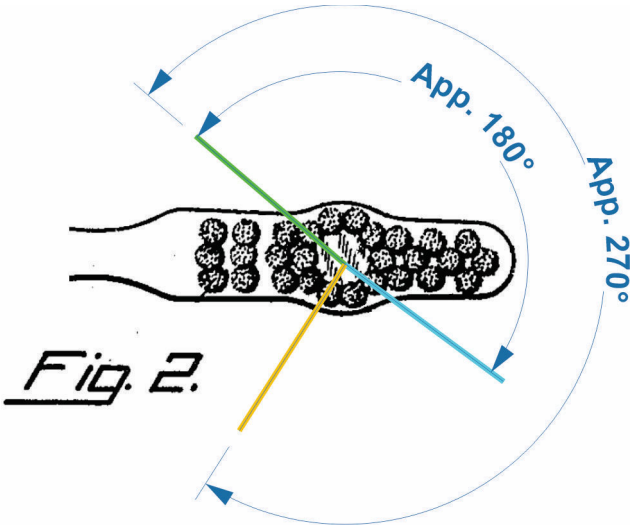


Fig. 4.



216. Further, the angled bristles provided by the combination of Wolcott, Davidson, and Fitz-Gibbon also include at least three angled bristles that are at least 108° apart. This is emphasized by my annotated figure 2 of Wolcott, below:

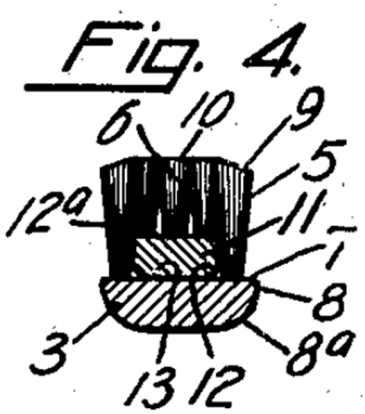


217. Tilting the bristles 5 in Wolcott as taught by Fitz-Gibbon would not change the circular arrangement of the bristles in Wolcott.

218. In my opinion, these elements of claims 1 and 10 are met by the combination of Wolcott, Davidson, and Fitz-Gibbon.

> [1.8] "**wherein at least a portion of each angled capsule retaining element of the at least one pair of capsule retaining elements is arranged to contact the oral care capsule.**"
> [10.8] "**wherein at least a portion of each angled capsule retaining element of the at least three angled capsule retaining elements is arranged to contact the oral care capsule.**"

219. As I explained in Section VII(C), Wolcott describes that a pellet is front-loaded by spreading the bristles 5 apart during insertion, which then spring back to retain the pellet. Ex. 1009, 3:44-54, 3:61-67. It is clear from this disclosure, and based on FIG. 4 of Wolcott shown below, that the bristles 5 of Wolcott contact the pellet.



220. Tilting the bristles 5 as taught by Fitz-Gibbon would still allow for front-loading of the pellet. As shown in FIG. 3 and 5 of Fitz-Gibbon below, the opposing sets of angled bristles include a space in between that would allow a user to spread the bristles to load a capsule, in a similar manner as described in the '332 Patent.

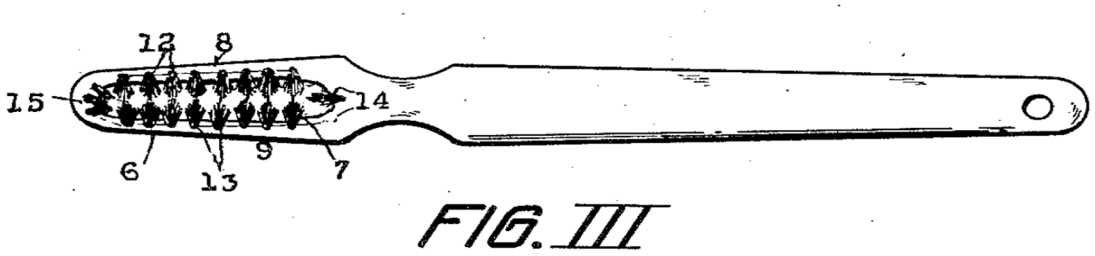


FIG. III

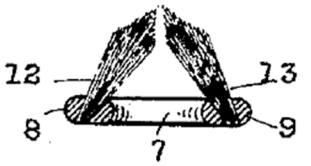


FIG. V

221. When tilting the bristles 5 of Wolcott as taught in Fitz-Gibbon, the bristles would still contact the pellet and retain the pellet within the recess.

222. In my opinion, these elements of claims 1 and 10 are met by the combination of Wolcott, Davidson, and Fitz-Gibbon.

223. In my opinion, dependent claims 7, 8, 11, 13, 15, and 18 are met for the reasons above and for the same reasons as I explained regarding the combination of Wolcott and Davidson in Section X(A)(b). The further combination of angled bristle tufts as disclosed in Fitz-Gibbon would not substantially change my analysis regarding claims 7, 8, 11, 13, 15, and 18.

2. Claims 2, 6, and 12

224. Claims 2, 6, and 12 narrow "capsule retaining elements" to "angled bristles." As I described above, the Wolcott-Davidson-Fitz-Gibbon combination has angled bristles. For the same reasons I described in Section X(A)(b), the other elements of Claims 2, 6, and 12 are also met.

3. Claim 5

225. Claim 5 recites: "The toothbrush of claim 1, wherein each capsule retaining element of the at least one pair of angled capsule retaining elements comprises a retaining element canted away from vertical in a direction toward a center of the capsule receiving zone."

226. As described above, Fitz-Gibbons discloses a brush with tilted bristles 12 and 13 on opposing sides of a receiving zone, as shown in FIGS. 3 and 5 of Fitz-Gibbons, below.

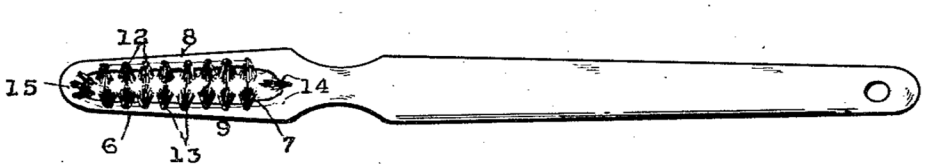


FIG. III

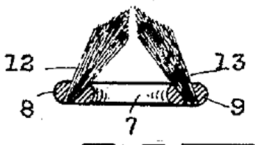


FIG. V

227. As modified using the teachings of Fitz-Gibbons to tilt the bristles towards a center of a receiving zone, the bristles 5 of Wolcott would thus include angled retaining elements that are canted away from vertical in a direction toward a center of the capsule receiving zone.

228. Based on the above, in my opinion, claim 5 is obvious.

4. Claims 9 and 14

229. Claim 9 recites: "A method comprising loading an oral care capsule into a capsule receiving zone of a toothbrush according to claim 1 by inserting at least a portion of the oral care capsule in a direction past the vertical bristles into the recess, and retaining the oral care capsule in the capsule receiving zone using the at least one pair of angled capsule retaining elements."

230. Claim 14 recites: "A method comprising loading an oral care capsule into a capsule receiving zone of a toothbrush according to claim 10 by inserting at least a portion of the oral care capsule in a direction past the bristles into the recess, and retaining the oral care capsule in the capsule receiving zone using the at least three angled capsule retaining elements."

231. The combination of Wolcott and Davidson provides a method of loading an oral care capsule into a receiving zone by inserting the capsule past vertical bristles into a recess and retaining the capsule by angled capsule retaining elements, as recited in claims 9 and 14. Like claims 9 and 14, Wolcott and Davidson both disclose a front-loading process.

232. Wolcott describes that the pellet is front-loaded past the bristles into the receiving zone and retained by the angled bristles, stating "[a]s the pellet moves downward into the recess, the surfaces 12 on the pellet spring apart the bristles surrounding the recess, and these bristles then spring back in such manner as to securely position the pellet at the bottom of the recess, as shown in Figure 4." Ex. 1009, 3:61-67. Based on this disclosure in Wolcott that a pellet is front-loaded by spreading the bristles 5 apart during insertion, which then spring back to retain the pellet, as I explained in Sections VII(C) and X(B)(b)(1), tilting the bristles 5 as taught by Fitz-Gibbon would still allow this front-loading of the pellet, which meets the method recited in claims 9 and 14.

233. Based on the modification of Wolcott with the well taught in Davidson, the method would also include that the pellet is loaded into a well or recess. The well of Davidson is shown again, below.

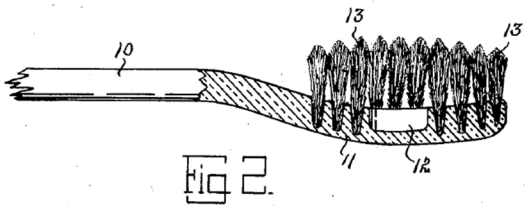


Fig. 2.

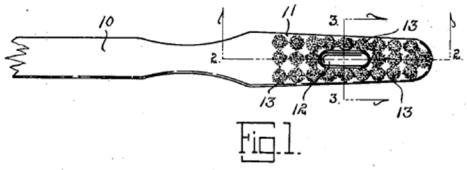


Fig. 1.

234. Davidson also discloses a front-loading process in which dentifrice is provided into the well and past the bristles, stating "[o]bviously the bristles provide sides and ends to this receiving area in the bristles, and the powder or granular dentifrices may fall downwardly and be received and held by the well 12." Ex. 1010, 2:11-27.

235. Based on the above, in my opinion, claims 9 and 14 are obvious.

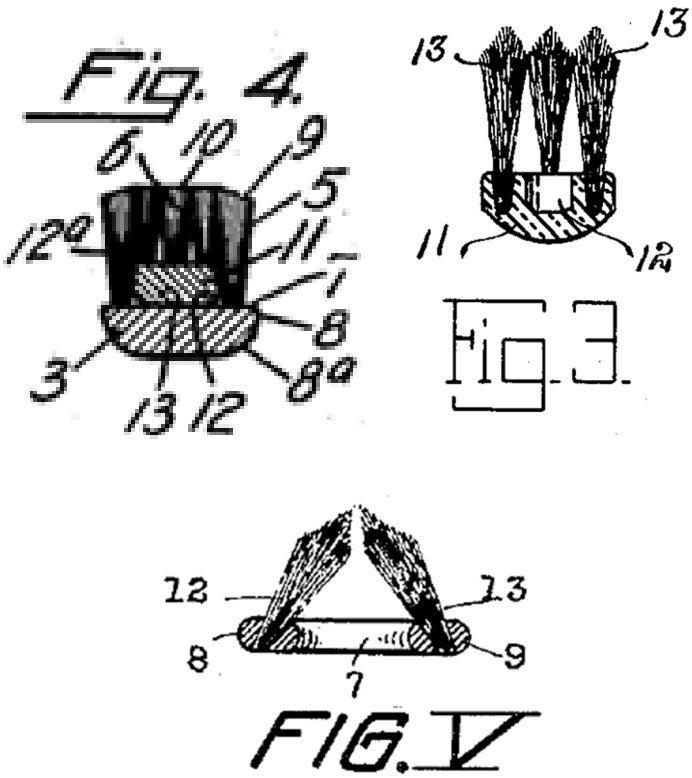
5. Claims 16 and 17

236. Claim 16 recites: "The toothbrush of claim 1, wherein at least a portion of each angled capsule retaining element of the at least one pair of angled capsule retaining elements is arranged to overlap a portion of the recess of the capsule receiving zone."

237. Claim 17 recites: "The toothbrush of claim 10, wherein at least a portion of each angled capsule retaining element of the at least three angled capsule retaining elements is arranged to overlap a portion of the recess of the capsule receiving zone."

238. Tilting the bristles 5 in Wolcott based on Fitz-Gibbon would cause the bristles to be angled over the pocket/recess (including the well as taught in Davidson) towards a center of the pocket/recess. Tilting the bristles over the pocket/recess

would obviously cause the angled bristles to overlap the recess/well. This result is apparent when viewing, for example, FIG. 4 of Wolcott, FIG. 3 of Davidson, and FIG. 5 of Fitz-Gibbon side by side.



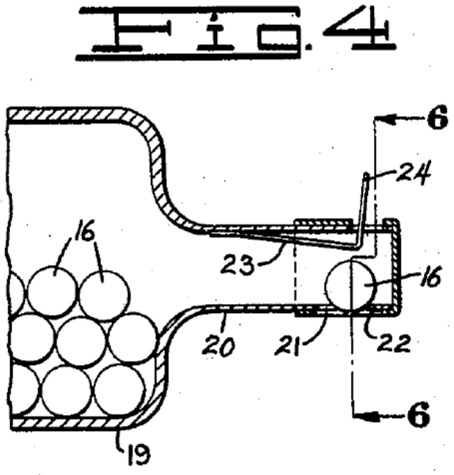
239. Again, angling the bristles 5 shown in FIG. 4 of Wolcott above, which in this combination also includes a well/recess in the front surface of the brush head as shown in FIG. 3 of Davidson above, to be over the pocket/recess as shown in FIG. 5 of Fitz-Gibbon above, causes the bristles 5 (which include both at least one pair and at least three bristles) to overlap a portion of the recess of the capsule receiving zone, as recited in claims 16 and 17.

240. Based on the above, in my opinion, claims 16 and 17 are obvious.

C. Obviousness based on Young (U.S. Patent 1,995,374) in view of Davidson (U.S. Patent 2,307,493)

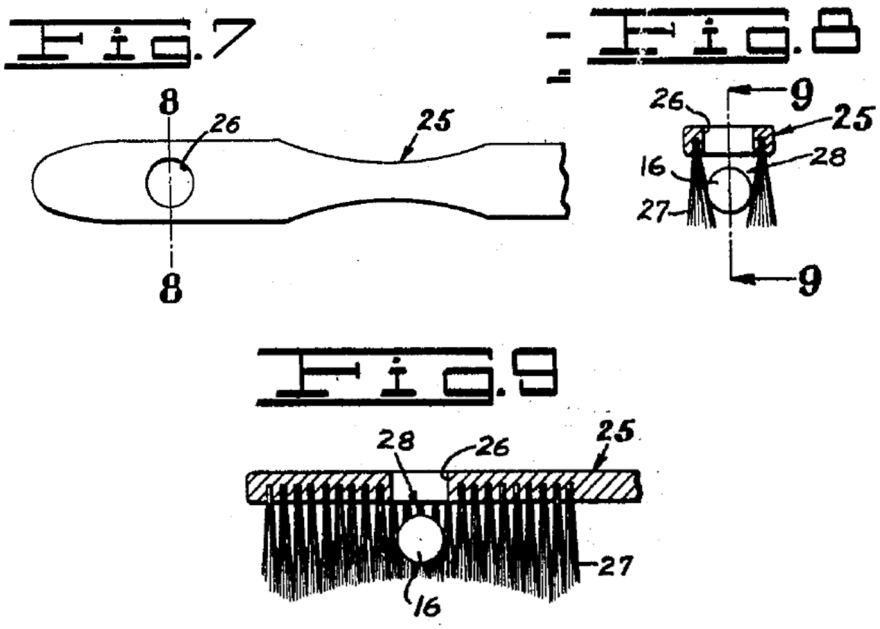
a) A POSITA Would Have Been Motivated to Combine Young and Davidson

241. As I also explained in Section VII(C), both Young and Davidson disclose toothbrushes with dentifrice receiving zones. Young discloses a dispenser for dispensing dentifrice pellets 16 into bristles of a toothbrush. See FIG. 4 of Young showing the dispenser:

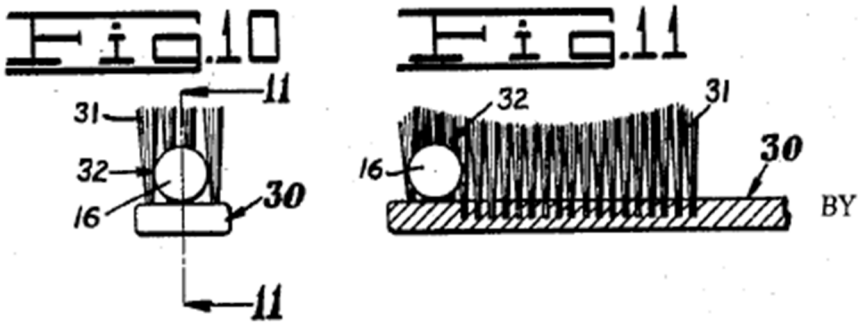


242. Young also discloses multiple embodiments of the toothbrush including:

(1) an embodiment in which a pellet 16 is back-loaded through a hole 26 in the back of the brush head, the bristles 27 surround the hole 26 to form a pocket 28, and the pellet 16 is "engaged and retained by the bristles" (Ex. 1012, 2:21-29), as shown in FIGS. 7-9:



and (2) an embodiment in which the pellet 16 is front-loaded through the bristles and rests on a front surface of the brush head, with the surrounding bristles 31 "forming a pocket 32 in which the pellet 16 will be retained in place by the resiliency of the bristles" (Ex. 1012, 2:30-34), as shown in FIGS. 10 and 11:



243. The primary concerns of Young are to "provide a tooth brush with means for receiving a dentifrice pellet" and to "provide a tooth brush including bristles wherein a portion of the bristles are arranged to form a pocket for the reception of a pellet of dentifrice." Ex. 1012, 3-9.

244. Davidson similarly discloses a "centrally located receiving area within the bristles" for receiving dentifrice. This "centrally located receiving area described in Davidson includes a "well 12" formed in a front surface of the toothbrush head with bristles "surrounding the centrally located well 12." Ex. 1010, 1:1-10, 1:51-55.

245. FIGS. 1-2 of Davidson illustrate the centrally located receiving area and the well 12:

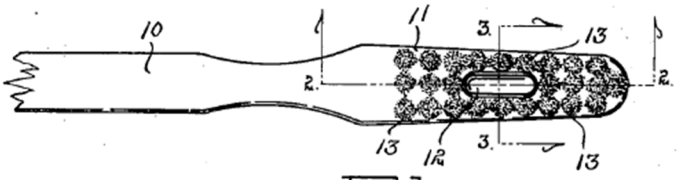


Fig. 1.

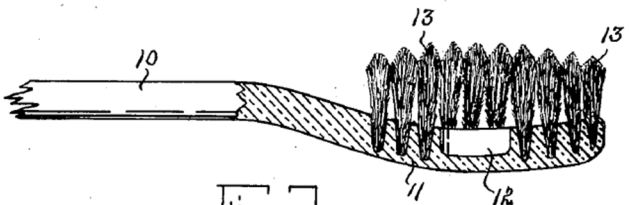


Fig 2.

246. Davidson describes the well 12 provides a distinct benefit, stating "[b]y the well 12 being closed at all points except its top, it will have a tendency to hold

the dentifrice, regardless of the type of the dentifrice, by suction." Ex. 1010, 3:20-24.

247. Given that a primary concern in Young is to provide a toothbrush that can receive and effectively retain a dentifrice pellet, a POSITA would have been motivated to combine Young and Davidson to increase the ability of Young's toothbrush to retain a pellet by incorporating the well of Davidson to provide additional suction on the pellet. This would reduce movement of the pellet within Young's dentifrice pocket and reduce the chances of the pellet falling out of the pocket, such as if the toothbrush is turned upside down.

248. For example, to more effectively maintain the pellet based on the disclosure of the well in Davidson, a POSITA would have been motivated to modify the embodiment of Young, shown in FIGS. 10 and 11, in which the pellet is front-loaded through the bristles to rest on the front surface of the brush head by moving the pocket 32 to a center of the brush head, and to include a well in the center of the brush head, as taught in Davidson, to allow for more effective retaining of the pellet.

249. Alternatively, a POSITA would have been motivated to modify the embodiment of Young shown in FIGS. 7-9 by replacing the hole 26 with a well as taught by Davidson. Although this particular embodiment of Young includes back-loading the pellet, it is clear that Young (consistent with the disclosure of Davidson)

also considers front-loading the pellet to be easily achievable since the other two embodiments in Young include front-loading the pellet.

250. The disclosures of Young and Davidson include straightforward teachings that would have provided a POSITA with a predictable set of options for retaining dentifrice in a head of a toothbrush, and a POSITA would have been strongly motivated, and it would have been an obvious design choice, to combine these options to maximize the resulting toothbrush's ability to retain Young's dentifrice pellet. Combining Young and Davidson, and particularly modifying Young based on Davidson's disclosure, would require only ordinary skill to define a well in the front surface of Young's toothbrush head, producing predictable results such as retaining Young's dentifrice pellet within the well.

b) Claim Analysis

1. Independent Claims 1 and 10

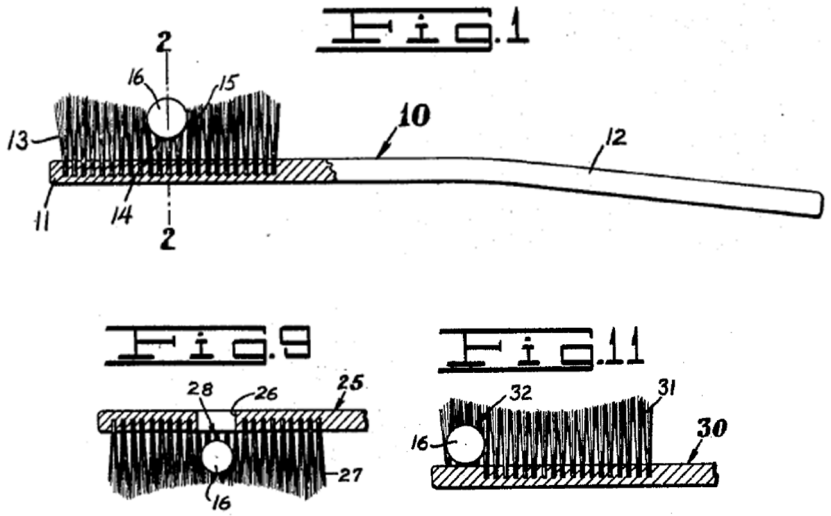
251. Independent claims 1 and 10 recite substantially overlapping claim elements. Accordingly, I review the independent claims together.

[1.0] "**A toothbrush comprising a brush head that includes:**"
[10.0] "**A toothbrush comprising a brush head that includes:**"

[1.1] "**a front surface**"
[10.1] "**a front surface**"

[1.2] "**a back surface**"
[10.2] "**a back surface that opposes the front surface**"

252. Young discloses embodiments of a toothbrush that all include a brush head with a front surface and a back surface that opposes the front surface. Young specifically discloses a toothbrush with "a head 11 and a handle 12," the head having "a plurality of bristle tufts 13," as shown for example in FIGS. 1, 9, and 11, below. Ex. 1012, 1:36-40.



253. As shown in the above figures, the brush head of the embodiments of Young includes a front surface, shown as a surface from which the bristles extend from the toothbrush, as illustrated in FIGS. 9 and 11. The brush head also includes

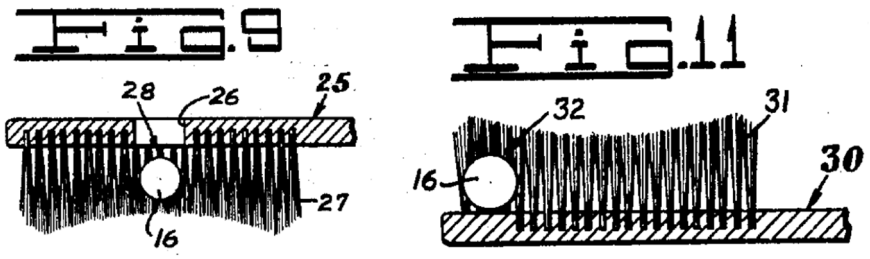
a back surface, shown as a surface that opposes the front surface of the toothbrush, as illustrated in FIGS. 9 and 11, for example, above.

> [1.3] "**a plurality of vertical bristles extending upward from the front surface**"
> [10.3] "**a plurality of bristles extending upward from the front surface and arranged distal from a center of the front surface**"

254. The embodiments of Young include a plurality of vertical bristles extending upward from the front surface that are arranged distal from a center of the front surface. For example, as shown in annotated FIGS. 8-10 of Young, below, the tufts of bristles include straight/vertical bristles (as well as some angled bristles for retaining the pellet 16).



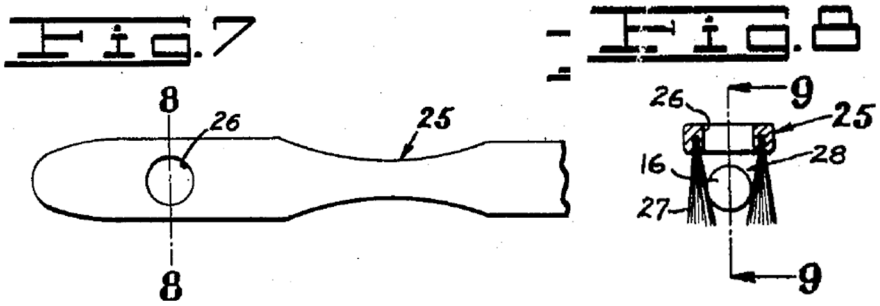
255. Young also has vertical bristles that are arranged distal from a center of the front surface of the brush head, as shown in the above annotated figures and in FIGS. 9 and 11 below.

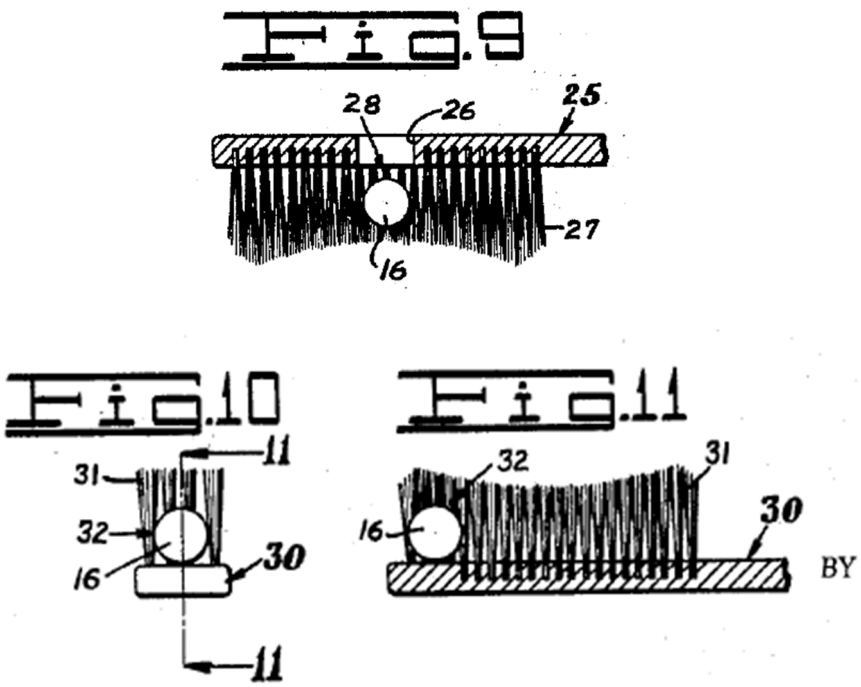


[1.4] "**a capsule receiving zone sized to receive an oral care capsule**"
[10.4] "**a capsule receiving zone**"

256. Young's embodiments include "bristles wherein a portion of the bristles are arranged to form a pocket for the reception of a pellet of dentifrice." Ex. 1012, 1:3-9.

257. In one embodiment of Young (see FIGS. 7-9 below) bristles 27 surround a hole 26 to form a pocket 28, and the pellet 16 is "engaged and retained by the bristles (Ex. 1012, 2:21-29), and in another embodiment (see FIGS. 10 and 11 below) surrounding bristles 31 form "a pocket 32 in which the pellet 16 will be retained in place by the resiliency of the bristles" (Ex. 1012, 2:30-34).





258. The dentifrice pellet in Young is an oral care capsule because it "comprises a central or core portion 17 which may be a powder or which may be plastic in the nature of a cream and a covering 18 which may be made of such material as starch, or any material having the desired inert or other properties and which is soluble in water." Ex. 1012, 1:50-2:4. To the extent the "capsule" in the claims of the '332 Patent is attributed any special meaning, as I explained in Section VII(C), the background of the '332 Patent describes that oral care capsules were well known and cites to three prior patents disclosing capsules. It would have been obvious that the Young-Davidson combination could be used with such known capsules without needing to materially alter the structure of the toothbrush.

259. Therefore, Young's brush head includes a capsule receiving zone sized to receive an oral care capsule.

> [1.5] "**the capsule receiving zone including a recess defined in the front surface and arranged to receive at least a portion of an oral care capsule inserted past the vertical bristles**"
> [10.5] "**including a recess defined in the front surface and arranged to receive at least a portion of an oral care capsule insertable past the bristles into the recess**"

260. As I explained above, Davidson discloses a "centrally located receiving area within the bristles" for receiving dentifrice, comprising a well 12 formed in a front surface of the toothbrush head with bristles "surrounding the centrally located well 12." Ex. 1010, 1:1-10, 1:51-55. See FIGS. 1-2 of Davidson, below.

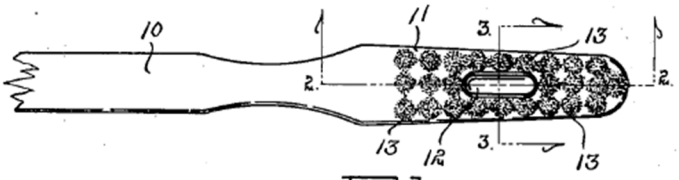


Fig. 1.

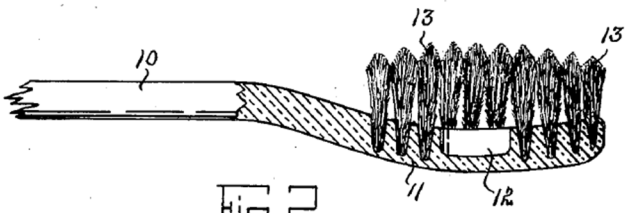
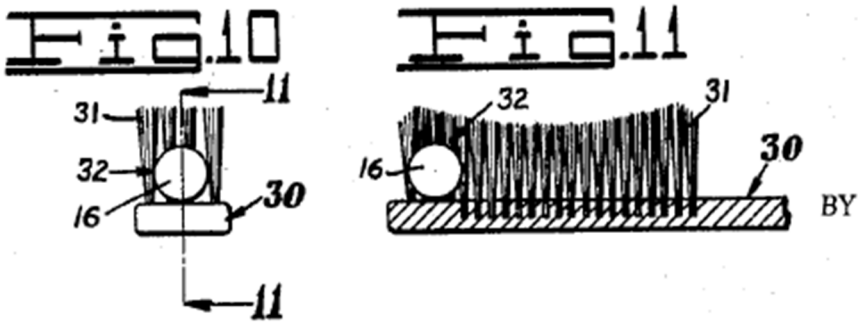


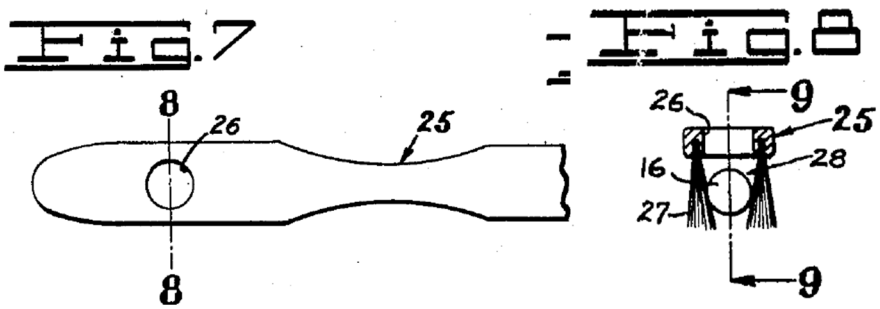
Fig 2.

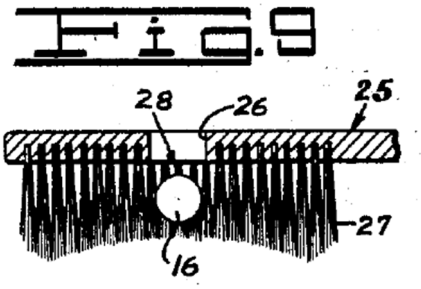
261. As I described above in Section X(C)(a), a POSITA would have been motivated to combine Young and Davidson to increase the ability of Young's toothbrush to retain a pellet (such as if the toothbrush is turned upside down) by

incorporating the well of Davidson to further hold the pellet "by suction" (Ex. 1010, 3:20-24), reducing movement of the pellet within the recess and chances of the pellet falling out of the recess. As I explained, to more effectively retain the pellet by the toothbrush, a POSITA would have been motivated to modify the embodiment in Young, shown in FIGS. 10 and 11, below, in which the pellet is front-loaded through the bristles to rest on the front surface of the brush head by moving the pocket 32 to a center of the brush head, and to include a well in the center of the brush head.



262. Alternatively, a POSITA would have been motivated to modify the other embodiment of Young shown in FIGS. 7-9 by replacing the hole 26 with a well as taught by Davidson as taught by Davidson.





263. The structures of the brush heads in Young (a dentifrice pocket in a central portion of the brush head surrounded by bristles) and Davidson (a receiving area in a central portion of the brush head with a well formed as a carved out portion in the front surface) are strikingly similar to the structure of the toothbrush claimed by the ’332 Patent, which has a capsule receiving zone 25 that has a recess in a central portion of the front surface of the brush head and that is surrounded by bristles, as shown in FIGS. 1 and 5 of the ’332 Patent below.

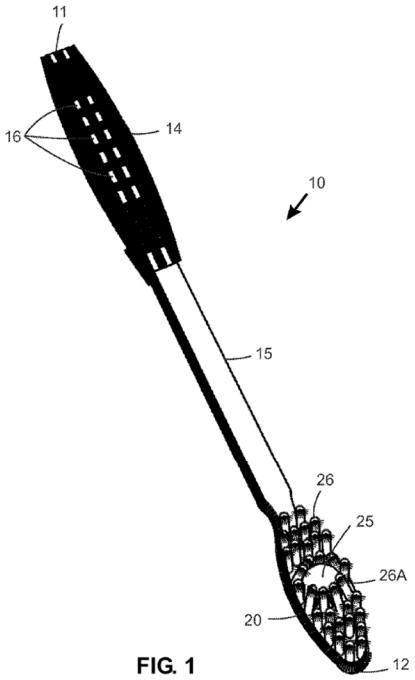


FIG. 1

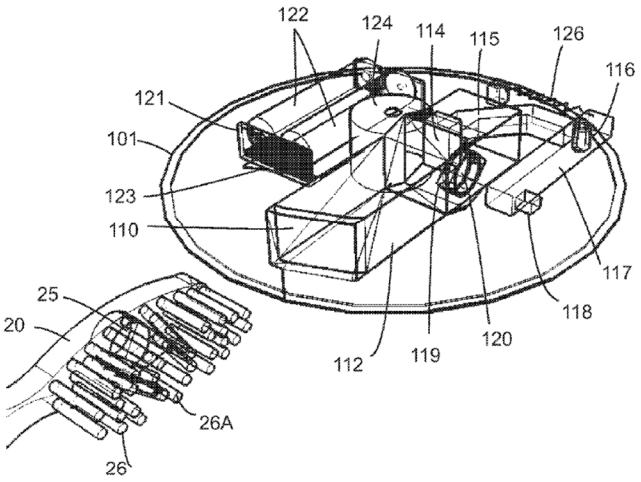


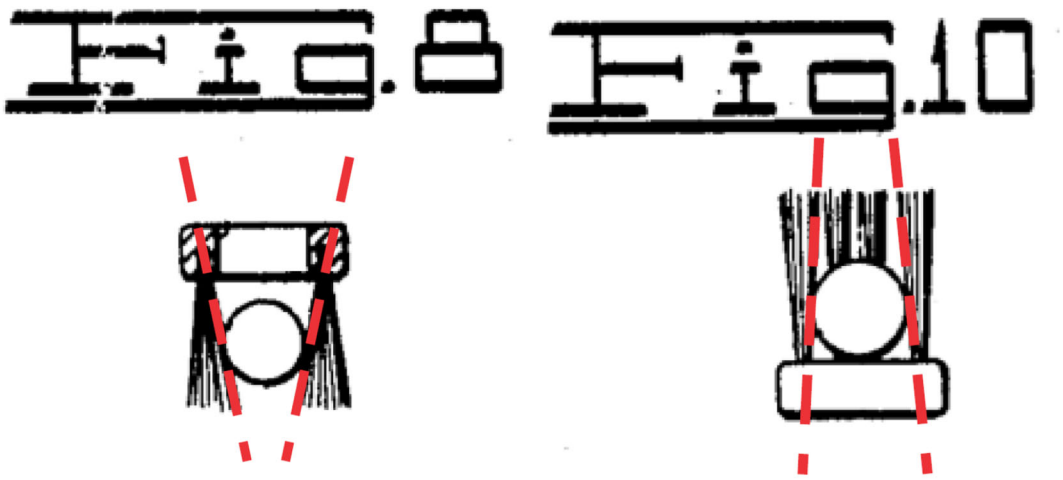
FIG. 5

264. The combination of Young and Davidson discloses these elements of claims 1 and 10, because Young, as modified to include a well as disclosed in Davidson, would provide a recess defined in the front surface of the brush head that is arranged to receive at least a portion of an oral care capsule inserted past the vertical bristles.

265. Although the shapes of the dentifrice receiving areas in Davidson and Young differ, in my opinion, the shape of the well would have been an obvious design choice based on the type of dentifrice to be held in the receiving areas.

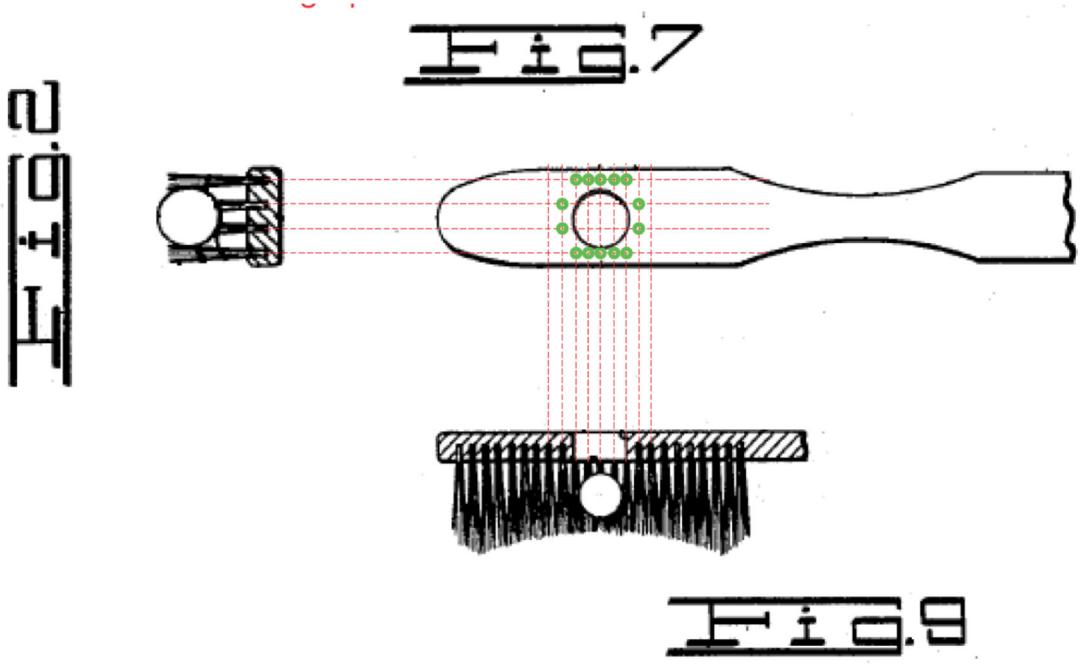
[1.6] "**at least one pair of angled capsule retaining elements that are elevated above the recess and configured to retain an oral care capsule in the capsule receiving zone**"
[10.6] "**at least three angled capsule retaining elements that are elevated above the recess, are configured to retain an oral care capsule in the capsule receiving zone, and are canted away from vertical in a direction toward a center of the capsule receiving zone**"

266. In the embodiments of Young, the bristles of the brush head include angled capsule retaining elements in the form of angled bristles. These angled bristles are elevated above a capsule receiving zone, a dentifrice "pocket," and an oral care capsule is "engaged and retained" by the angled bristles. Ex. 1010, 1:6-9, 2:21-29. See my annotated FIGS. 8 and 10 of Young emphasizing the angled bristles:



267. As shown above, the bristles include within bristle tufts not only straight/vertical bristles, but also angled bristles adjacent the pellet 16 that are canted away from vertical toward the dentifrice pocket and contact and retain the pellet 16 within the pocket/recess.

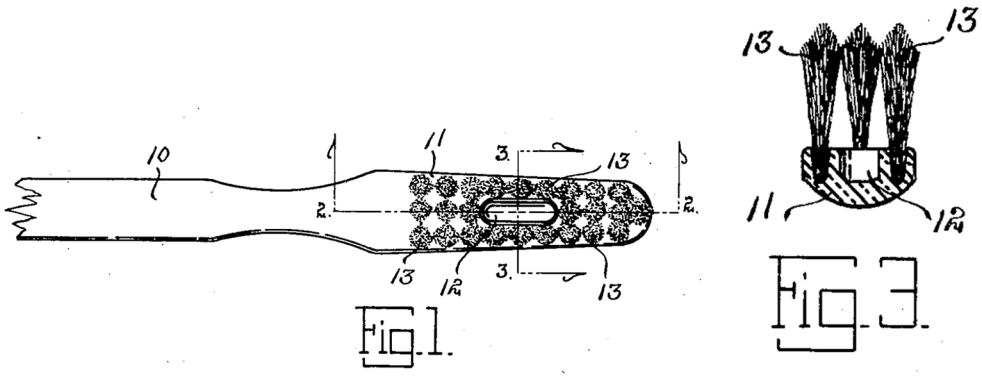
268. Further, the angled bristles in Young include at least one pair of angled bristles (Claim 1) and/or three angled bristles (Claim 10). See my annotated Figure of Young below.



269. In Young, as shown above, the bristle tufts are disposed "to form a pocket" (Ex. 1012, 2:25-26, 2:31-34), which is circular, to hold the spherical pellet, and thus there are many (at least three) angled retaining elements around the pocket that retain the pellet.

270. Young, as modified in view of Davidson, would still include these features, as including a recess/well in the front surface of the brush head, as taught by Davidson, would still provide that the bristles of Young are elevated above the recess and still serve to retain the pellet. As shown in FIG. 1 and 3 of Davidson,

below, its bristles are similarly arranged around the well, and thus Young would be readily modified to include a similar well with surrounding angled bristles.

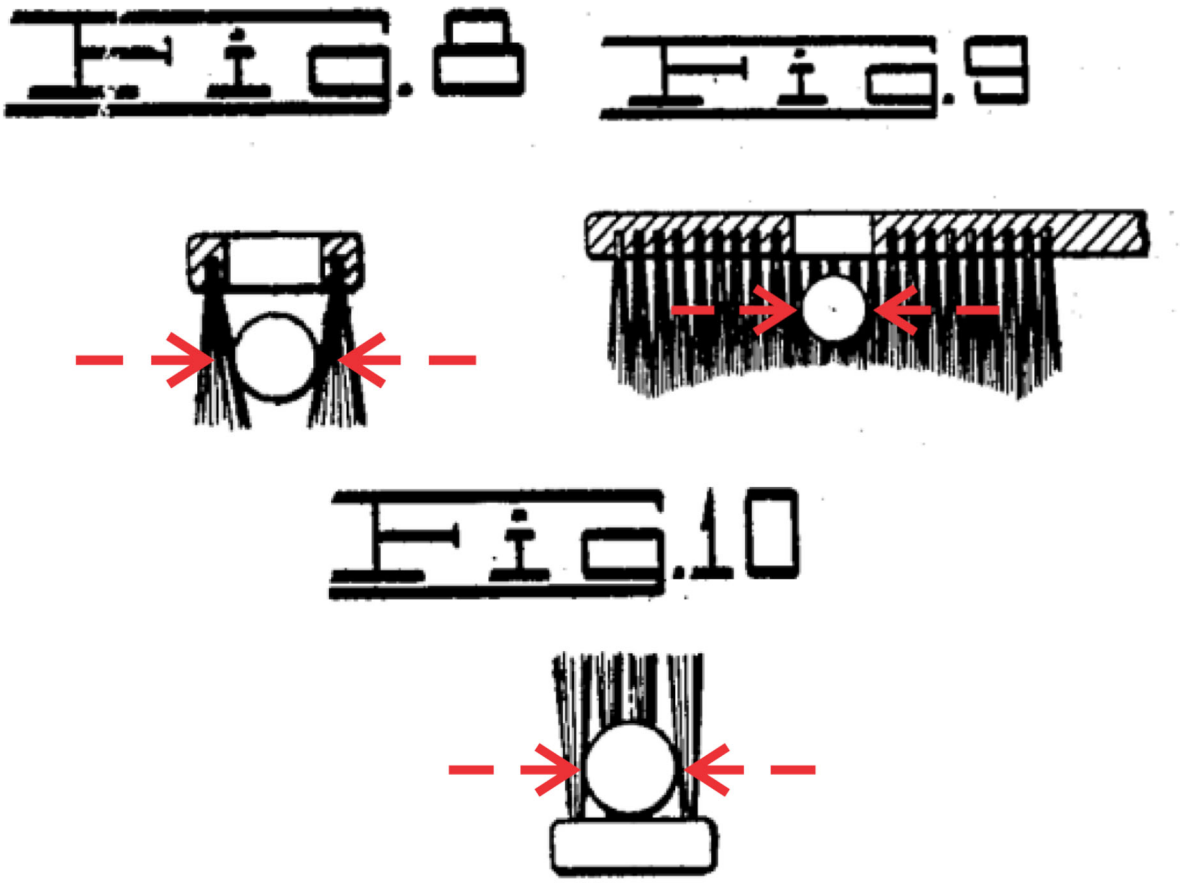


271. Therefore, the combination of Young and Davidson has both at least one pair of angled bristles, and at least three angled bristles canted away from vertical, that are configured to retain an oral care capsule, as recited in claims 1 and 10.

> [1.7] "**wherein each pair of the at least one pair angled capsule retaining elements includes a first and a second angled capsule retaining element arranged along diametrically opposing sides of an oral care capsule when present in the capsule receiving zone**"
> [10.7] "**wherein each angled capsule retaining element of the at least three angled capsule retaining elements is arranged proximate to a perimeter of the capsule receiving zone at a position at least 108 degrees apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone**"

272. As explained above, FIGS. 8-11 of Young demonstrate that the bristles are arranged around the circular dentifrice pocket, such that Young includes at least one pair of diametrically opposed angled bristles.

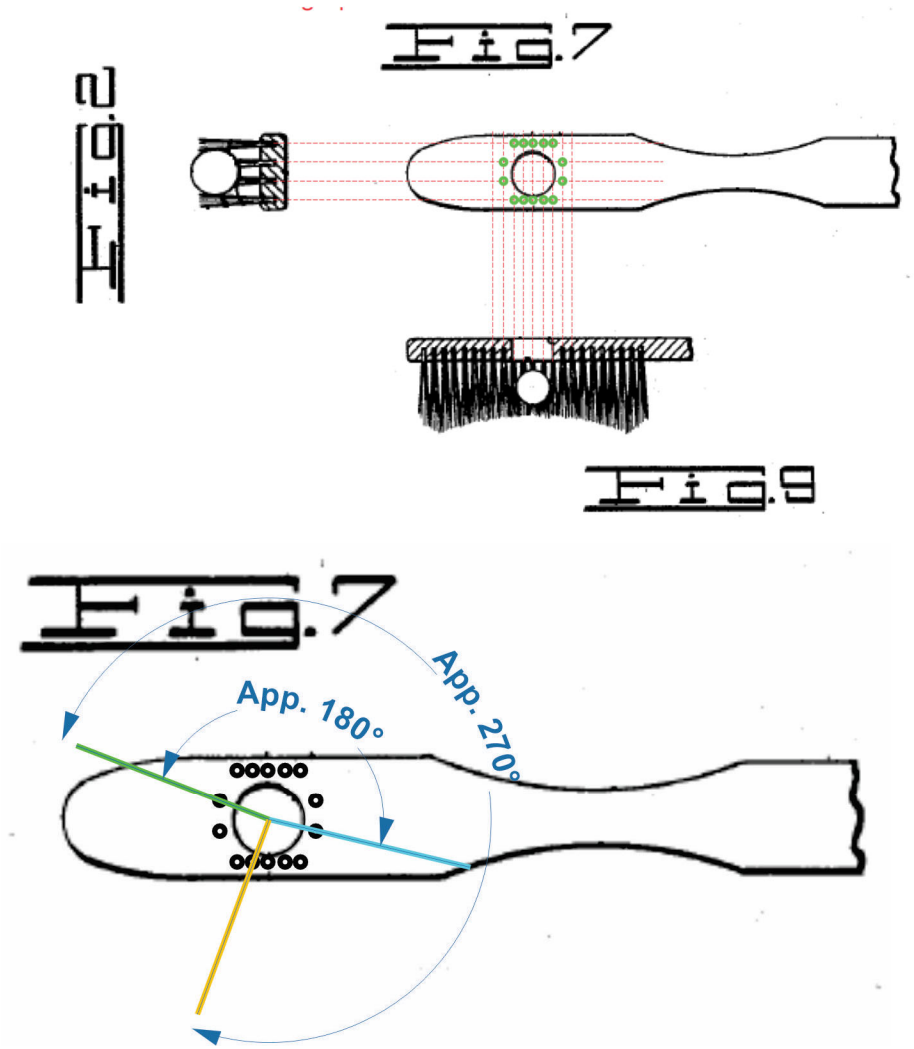
273. See also my annotated FIG. 8-10 below showing a pair of diametrically opposed angled bristles:



274. As shown above, the tufts of bristles are circularly arranged around the pellet pocket, and thus angled bristles within the tufts that are adjacent the pellet pocket form diametrically opposite pairs of angled retaining elements. Therefore, in my opinion, the combination of Young and Davidson meets this element of claim 1.

275. Additionally, since the angled bristles are arranged around a circular pocket, each angled bristle is also 108° apart from at least one other angled bristle. Although Young does not provide a top view of the brush head, it is clear Young

includes these features, as shown in my annotated versions (using standard orthographic projection method) of the bottom view of FIG. 7, below:



276. As shown in the annotated figure above, a first angled bristle in a first tuft of bristles (green) is more than 108° apart from another angled bristle in a another tuft of bristles (blue), a second angled bristle in a second tuft of bristles (yellow) is more than 108° apart from another angled bristle in a another tuft of bristles (green), and a third angled bristle in a third tuft of bristles (blue) is more than 108° apart from at least one other angled bristle in another tuft of bristles (green).

277. Davidson provides a similar structure including bristle tufts surrounding the elliptical well 12, as shown below.

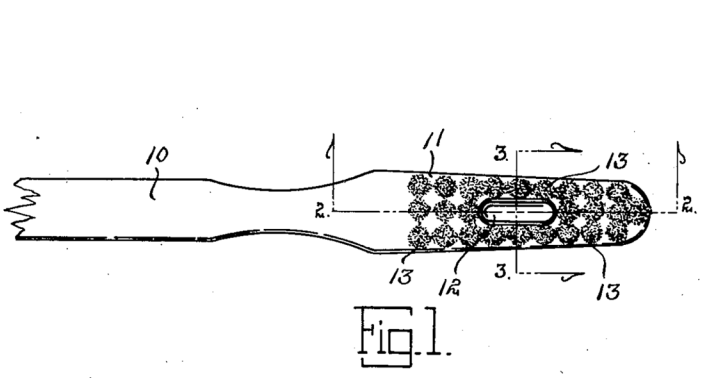


Fig. 1.

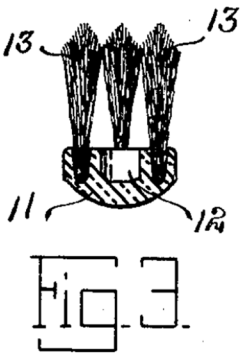
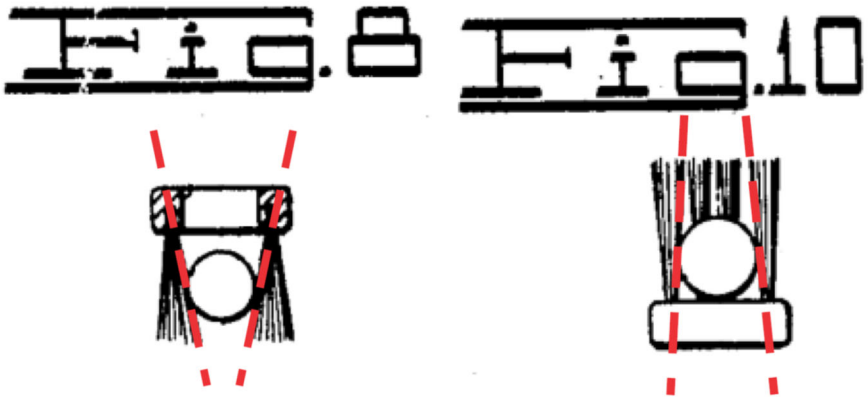


Fig. 3.

278. In my opinion, even without an explicit disclosure of specific degrees in Young and Davidson, the specific degrees recited in claim 10 would be obvious based on the disclosures of Young and Davidson, and specifically given the arrangement of bristles surrounding the dentifrice pocket/recess/well in Young and Davidson. In my opinion, the combination of Young and Davidson thus meets this element of claim 10.

> [1.8] "**wherein at least a portion of each angled capsule retaining element of the at least one pair of capsule retaining elements is arranged to contact the oral care capsule.**"
> [10.8] "**wherein at least a portion of each angled capsule retaining element of the at least three angled capsule retaining elements is arranged to contact the oral care capsule.**"

279. In the embodiments of Young, it is apparent that at least a portion of the angled bristles (angled capsule retaining elements) contact the pellet (an oral care capsule). See my annotated FIGS. 8 and 10, below



280. This is also clear from the specification of Young, which specifically discloses that the pellet is "engaged and retained by the bristles." Ex. 1012, 2:26-29, 2:31-34.

281. Based on the above, in my opinion, claims 1 and 10 are obvious based on the combination of Young and Davidson.

2. Claims 2 and 15

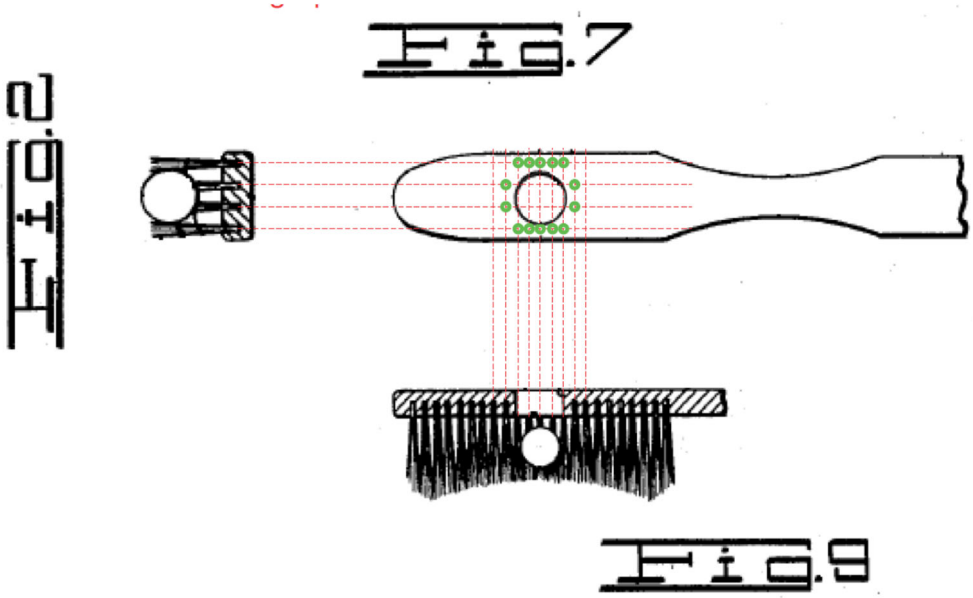
282. Claim 2 recites: "The toothbrush of claim 1, wherein the at least one pair of angled capsule retaining elements comprises multiple pairs of angled bristles canted away from vertical in a direction toward a center of the capsule receiving zone, and the brush head includes a flexural portion adapted to permit at least some bristles of the multiple pairs of angled bristles to be spread apart so as to enable an oral care capsule to be loaded into the capsule receiving zone."

283. Claim 15 recites: "The toothbrush of claim 1, wherein the at least one pair of angled capsule retaining elements comprises multiple pairs of angled capsule retaining elements."

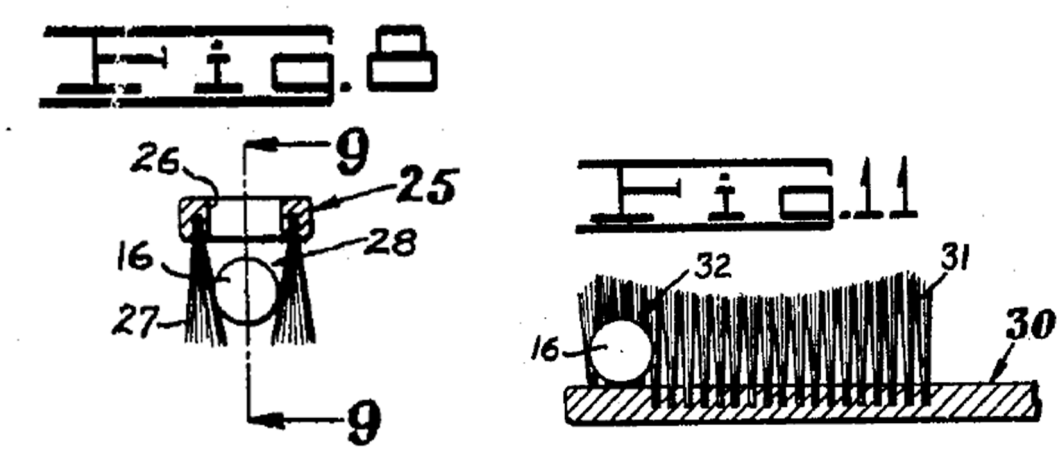
284. As I also explained with respect to claim 1, Young includes multiple pairs of angled bristles as recited in claim 2, or angled capsule retaining elements as recited in claim 15. See my annotated FIGS. 8 and 10, showing a pair of angled bristles:



285. As the dentifrice pocket is formed by, and embedded within, the surrounding bristles (see my annotated figures below), there are multiple pairs arranged around the pocket.



286. Further, Young discloses or suggests its brush head includes a flexural portion, as recited in claim 2, to permit the bristles to spread apart when loading a capsule, because, as shown for example in FIGS. 8 and 11, below, the bristles are embedded in the brush head such that a POSITA would understand them to be flexible and spreadable:



287. In my opinion, using a flexural portion to permit spreading of the bristles is obvious based on Young .

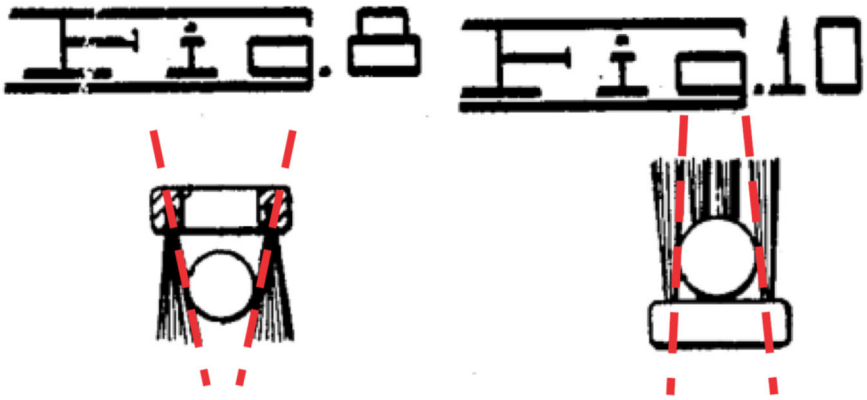
288. Based on the above, in my opinion, claims 2 and 15 are obvious.

3. Claim 5

289. Claim 5 recites: "The toothbrush of claim 1, wherein each capsule retaining element of the at least one pair of angled capsule retaining elements comprises a retaining element canted away from vertical in a direction toward a center of the capsule receiving zone."

290. As I described above with respect to claims 1 and 10, Young's bristles include within bristle tufts not only straight/vertical bristles, but also angled bristles adjacent the pellet 16 that are canted away from vertical toward the dentifrice pocket and that contact and retain the pellet 16 within the pocket/recess. Ex. 1012, 2:26-29, 2:31-34.

291. See my annotated FIGS. 8 and 10 below:



292. Based on the above, in my opinion, claim 5 is obvious.

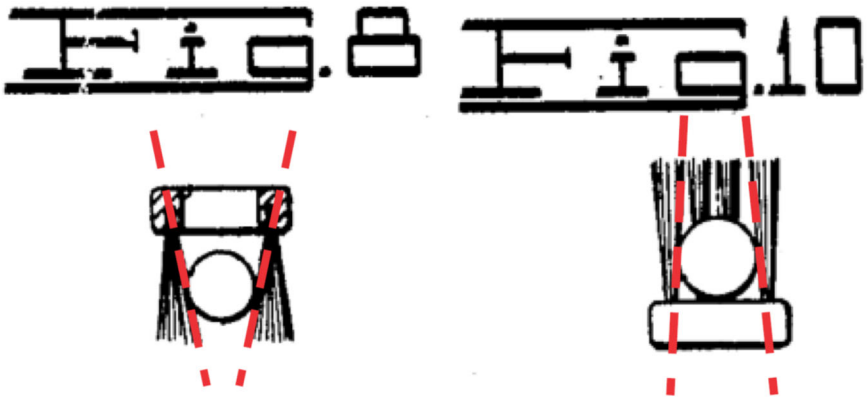
4. Claims 6 and 12

293. Claim 6 recites: "The toothbrush of claim 5, wherein the at least one pair of angled capsule retaining elements comprises angled bristles canted away from vertical in a direction toward a center of the capsule receiving zone."

294. Claim 12 recites: "The toothbrush of claim 10, wherein the at least three angled capsule retaining elements comprise at least three angled bristles."

295. Claims 6 and 12 merely narrow "capsule retaining elements" to "angled bristles." As described above, Young uses bristles, and specifically angled bristles

that are canted away from vertical in a direction toward a center of the capsule receiving zone, to retain a capsule, as again show below:

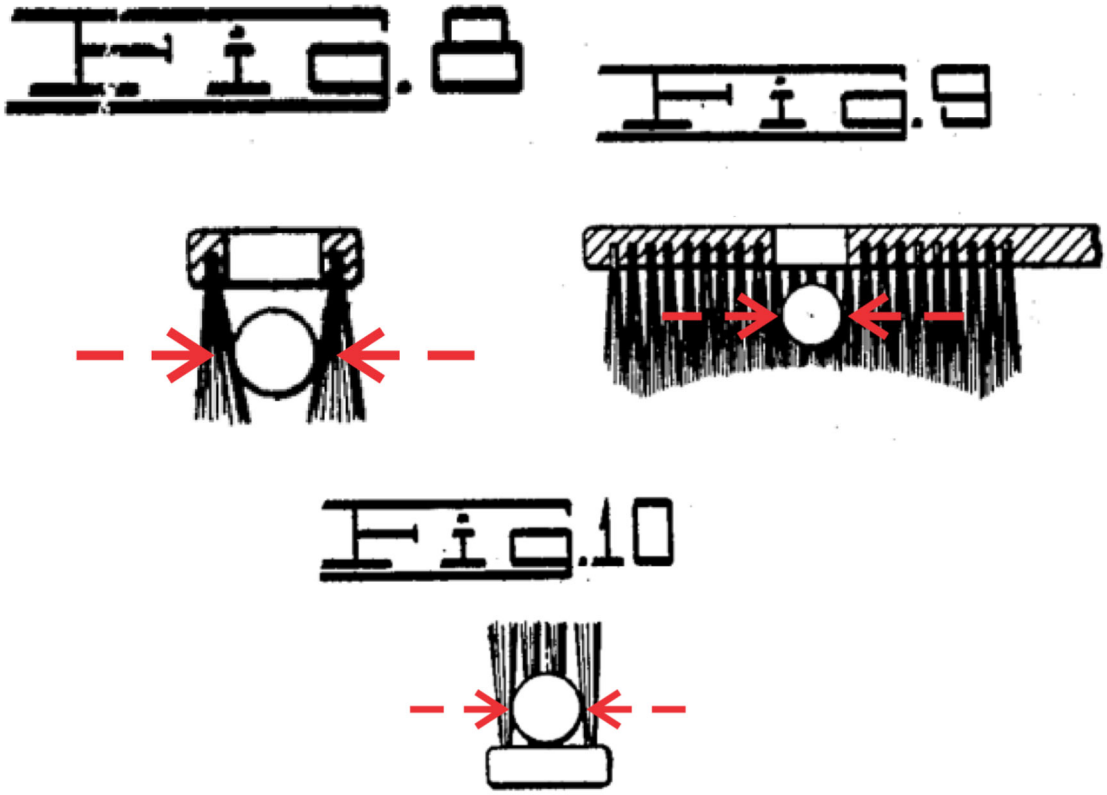


296. Based on the above, in my opinion, claims 6 and 12 are obvious.

5. Claims 7 and 11

297. Claim 7 recites: "The toothbrush of claim 5, wherein the at least one pair of angled capsule retaining elements is arranged between the plurality of vertical bristles and a center of the capsule receiving zone."

298. See my annotated FIGS. 8-10 below:



299. As shown for example in annotated FIG. 9 of Young, above, Young's toothbrush includes bristles arranged distal from the dentifrice pocket in the center of the brush head, and also, as shown in annotated FIGS. 8 and 10, above, there are angled bristles between the pocket and other vertical bristles within the tufts. Therefore, Young includes angled capsule retaining elements that are arranged between the plurality of vertical bristles and a center of a capsule receiving zone.

300. Based on the above, in my opinion, claims 7 and 11 are obvious.

6. Claims 8 and 13

301. Claim 8 recites: "The toothbrush of claim 1, including an oral care capsule retained by the at least one pair of capsule retaining elements in the capsule

receiving zone, wherein the oral care capsule comprises one or more of the following: a dentrifice composition, a whitening composition, an anticalculus composition, and antibacterial composition, and a breath freshening composition."

302. Claim 13 recites: "The toothbrush of claim 10, including an oral care capsule retained by the at least three capsule retaining elements in the capsule receiving zone, wherein the oral care capsule comprises one or more of the following: a dentrifice composition, a whitening composition, an anticalculus composition, and antibacterial composition, and a breath freshening composition."

303. Young's pellet 16 is an oral care capsule that is a dentifrice composition. The dentifrice pellet in Young is a "pellet of dentifrice" that "comprises a central or core portion 17 which may be a powder or which may be plastic in the nature of a cream and a covering 18 which may be made of such material as starch, or any material having the desired inert or other properties and which is soluble in water." Ex. 1012, 1:6-9, 1:50-2:4. This is clearly a capsule that includes a dentifrice composition.

304. Based on the above, in my opinion, claims 8 and 13 are obvious.

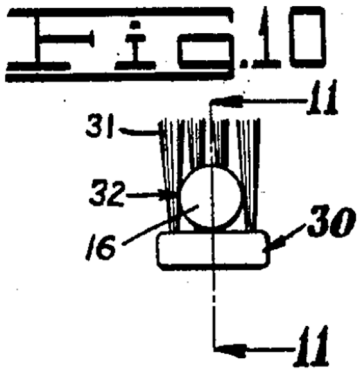
7. Claims 9 and 14

305. Claim 9 recites: "A method comprising loading an oral care capsule into a capsule receiving zone of a toothbrush according to claim 1 by inserting at least a portion of the oral care capsule in a direction past the vertical bristles into the

recess, and retaining the oral care capsule in the capsule receiving zone using the at least one pair of angled capsule retaining elements."

306. Claim 14 recites: "A method comprising loading an oral care capsule into a capsule receiving zone of a toothbrush according to claim 10 by inserting at least a portion of the oral care capsule in a direction past the bristles into the recess, and retaining the oral care capsule in the capsule receiving zone using the at least three angled capsule retaining elements."

307. The combination of Young and Davidson provides a method of loading an oral care capsule into a receiving zone by inserting the capsule past vertical bristles in a recess and retaining the capsule by angled capsule retaining elements, as recited in claims 9 and 14. Like claims 9 and 14, Young and Davidson both disclose a front-loading process. Young includes embodiments in which a pellet is front-loaded into the receiving zone and retained by angled bristles, as shown in FIG. 10 of Young below.



308. Modifying Young in the alternative manners as I explained previously in Section X(C)(a) to include the well/recess of Davidson would obviously necessitate front-loading the capsule past the vertical bristles and into the well to be retained by the angled bristles, as recited in claims 9 and 14. The well of Davidson is shown again, below.

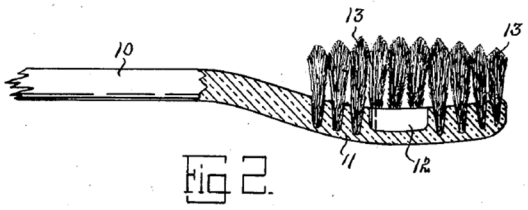


Fig. 2.

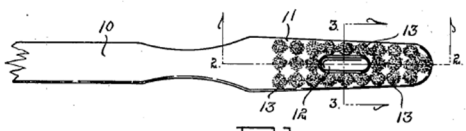


Fig. 1.

309. Davidson also discloses the well is front-loaded with dentifrice, stating "[o]bviously the bristles provide sides and ends to this receiving area in the bristles, and the powder or granular dentifices may fall downwardly and be received and held by the well 12." Ex. 1010, 2:11-27.

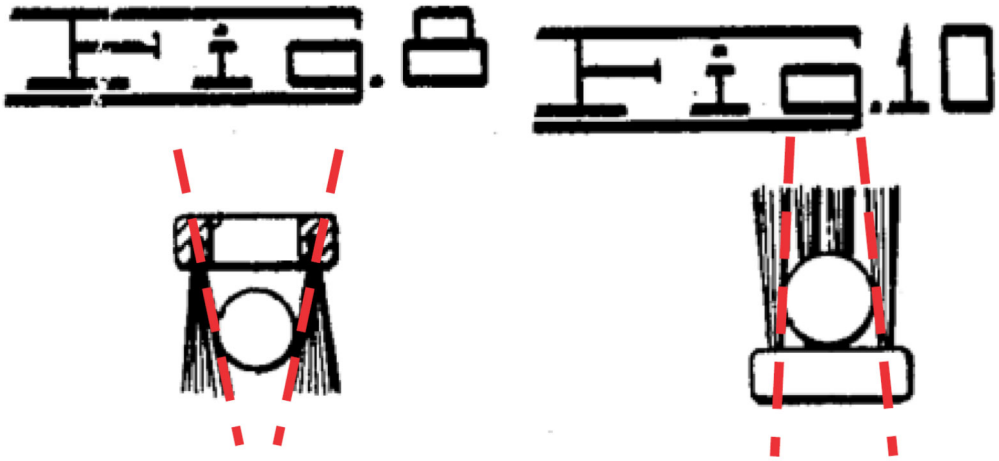
310. Based on the above, in my opinion, claims 9 and 14 are obvious.

8. Claims 16 and 17

311. Claim 16 recites: "The toothbrush of claim 1, wherein at least a portion of each angled capsule retaining element of the at least one pair of angled capsule retaining elements is arranged to overlap a portion of the recess of the capsule receiving zone."

312. Claim 17 recites: "The toothbrush of claim 10, wherein at least a portion of each angled capsule retaining element of the at least three angled capsule retaining elements is arranged to overlap a portion of the recess of the capsule receiving zone."

313. Since the angled bristles in Young are angled towards a center of the dentifrice pocket, clearly at least a portion of these angled bristles overlap a portion of the pocket, as shown in my annotated FIGS. 8 and 10 below.



314. This would remain the case for the combination of Young and Davidson, as the well would retain the pellet 16 in position within the angled bristles that extend over the well to contact the pellet 16.

315. Based on the above, in my opinion, claims 16 and 17 are obvious.

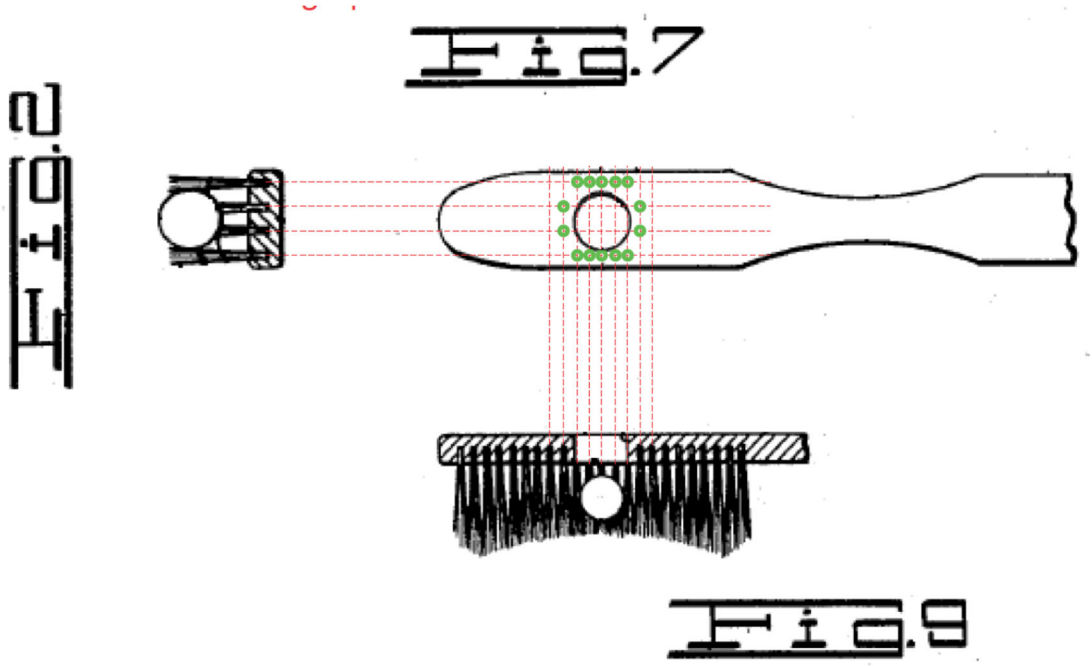
9. Claim 18

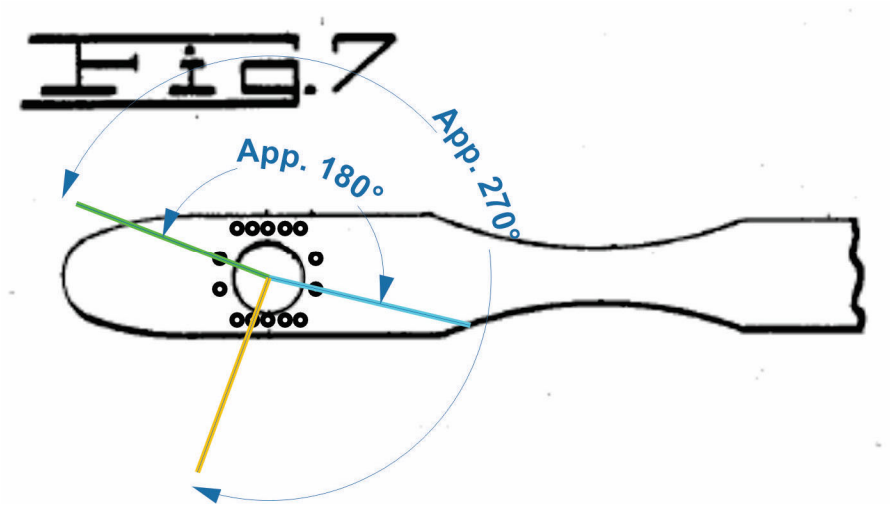
316. Claim 18 recites: "The toothbrush of claim 10, wherein each angled capsule retaining element of the at least three angled capsule retaining elements is

arranged proximate to a perimeter of the capsule receiving zone at a position at least 144° apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone."

317. As I explained above with respect to claim 10, in Young, the angled bristles include at least three angled bristles that are arranged proximate to a perimeter of the capsule receiving zone, because the angled bristles directly surround the pocket. Additionally, the angled bristles are each at a position not only at least 108° apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone, but also at least 144° apart as recited in claim 18.

318. To illustrate this, please see my annotated versions of FIG. 7 of Young, below:





319. As shown in the annotated figure above, a first angled bristle in a first tuft of bristles (green) is over 144 degrees apart from another angled bristle in another tuft of bristles (blue), a second angled bristle in a second tuft of bristles (yellow) is over 144 degrees apart from another angled bristle in a another tuft of bristles (green), and a third angled bristle in a third tuft of bristles (blue) is over 144 degrees apart from at least one other angled bristle in another tuft of bristles (green).

320. In my opinion, even without an explicit disclosure of specific degrees in Young and Davidson, the specific degrees recited in claim 18 would be obvious based on the disclosure of Young and Davidson, and specifically given the arrangement of bristles surrounding the dentifrice pocket/recess/well in Young and Davidson.

321. Based on the above, in my opinion, claim 18 is obvious.

D. Obviousness based on Young (U.S. Patent 1,995,374) in view of Davidson (U.S. Patent 2,307,493) and Fitz-Gibbon (U.S. Patent 1,346,536)

a) A POSITA Would Have Been Motivated to Combine Young, Davidson, and Fitz-Gibbon

322. As I also explained in Section VII(C), Fitz-Gibbon, like Young and Davidson, is concerned with retaining solid or dry dentifrice prior to brushing. Fitz-Gibbon discloses a toothbrush with sets of angled bristles 12 and 13 that are highly tilted over an opening 7.

323. See FIGS. 3 and 5 of Fitz-Gibbon:

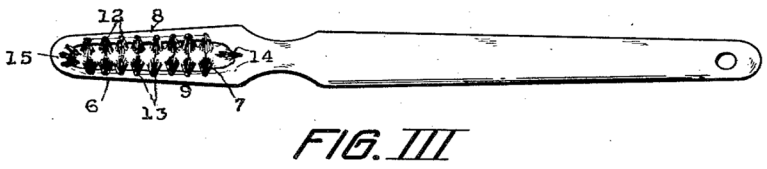


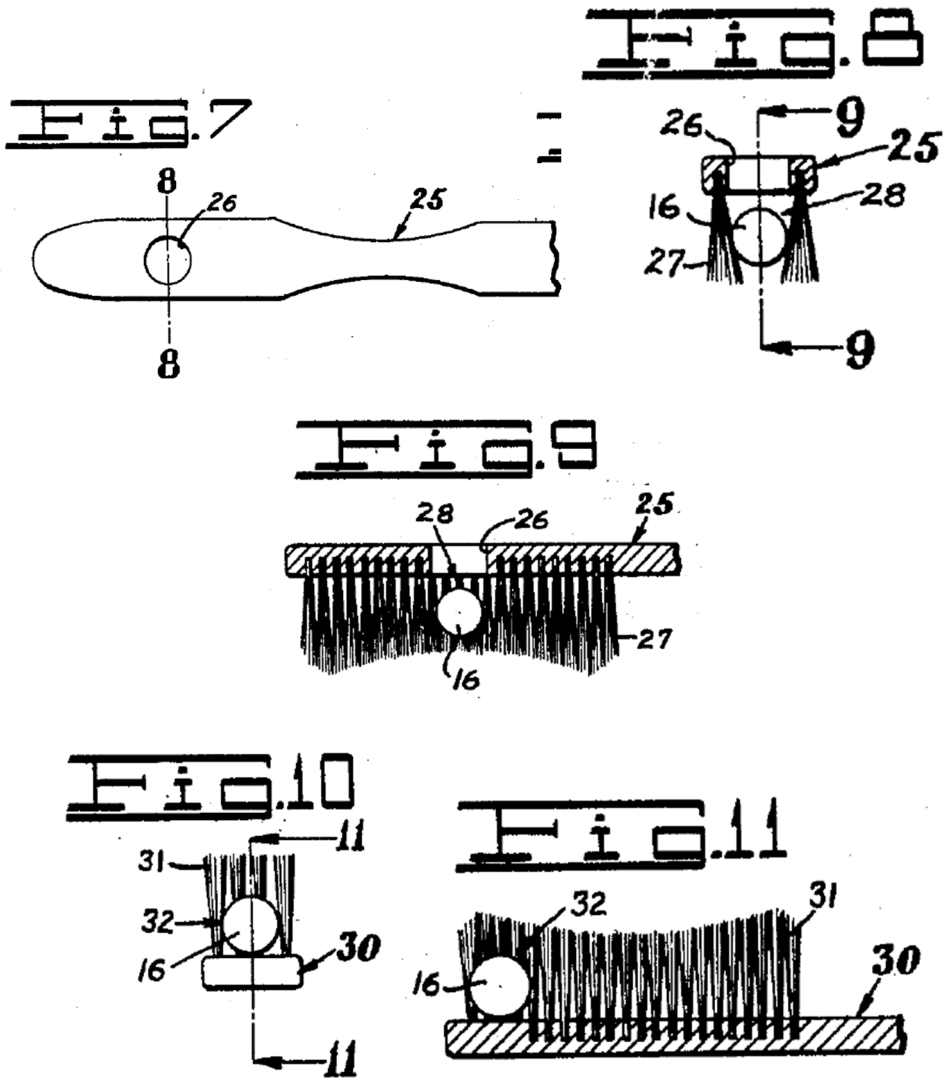
FIG. III



FIG. V

324. Fitz-Gibbon explains that the angled bristles 12 and 13 "are so disposed on the brush head as to provide a dentifrice holding chamber or pocket," which is "exceedingly valuable" for use with "dry dentifrice." Ex. 1011, 1:79-87.

325. The primary concerns of Young are to "provide a tooth brush with means for receiving a dentifrice pellet" and to "provide a tooth brush including bristles wherein a portion of the bristles are arranged to form a pocket for the reception of a pellet of dentifrice." Ex. 1012, 3-9. The dentifrice pockets of Young are shown below.



326. Young describes that the pellet 16 "will be retained in place by the resiliency of the bristles." Ex. 1012, 2:30-34.

327. As indicated above, Young is concerned with preventing a dentifrice pellet from falling off the brush, and seeks to retain the pellet on the brush head. Fitz-Gibbon is also concerned with preventing dry dentifrice from falling off the toothbrush while the toothbrush is held brush-side down. Thus, in addition to including a well as taught in Davidson to provide suction on the dentifrice pellet (Ex. 1010, 3:20-24), a POSITA would have been motivated to tilt the tufts of bristles of the toothbrush of the Young-Davidson combination to further enhance the pellet retaining strength of the toothbrush, such as if the user turns the toothbrush bristle-side down prior to brushing. This would require simply tilting the bristle tufts surrounding the dentifrice pocket of the Young-Davidson combination towards a center of the dentifrice pocket, as demonstrated in FIGS. 3 and 5 of Fitz-Gibbon, below.

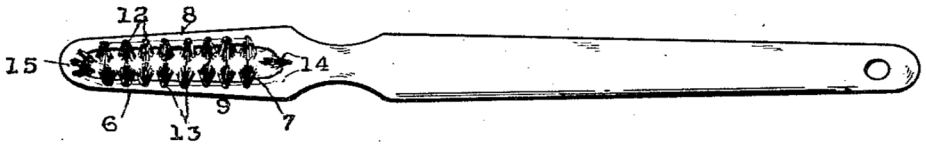


FIG. III

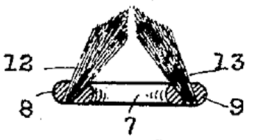


FIG. V

328. Additionally, based on the embodiments of Young in which a pellet is front-loaded by inserting the pellet into a pocket of bristles (Ex. 1012, 1:45-50, 2:30-34, FIGS. 1, 2, 7-9), tilting the bristles as taught by Fitz-Gibbon would still allow for front-loading of the pellet. As shown in FIGS. 3 and 5 of Fitz-Gibbon above, the

opposing sets of angled bristles include a space in between that would allow a user to spread the bristles to load a capsule.

329. It should be noted that the angled bristles described in the ’332 Patent are also spread apart when a capsule is being inserted, and Young’s toothbrush as modified by Davidson and Fitz-Gibbon would function in the same or similar manner.

330. The disclosures of Young, Davidson, and Fitz-Gibbon include straightforward teachings that would have provided a POSITA with a predictable set of options for retaining dentifrice in a head of a toothbrush, and a POSITA would have been strongly motivated, and it would have been an obvious design choice, to combine these options to maximize the resulting toothbrush’s ability to retain Young’s dentifrice pellet. Combining Young, Davidson, and Fitz-Gibbon, and particularly modifying Young based on Davidson’s and Fitz-Gibbon’s disclosures, would require only ordinary skill to define a well in the front surface of Young’s toothbrush head and tilt Young’s bristle tufts around the well, producing predictable results such as retaining Young’s dentifrice pellet within the well with the assistance of the angled bristle tufts.

b) Claim Analysis

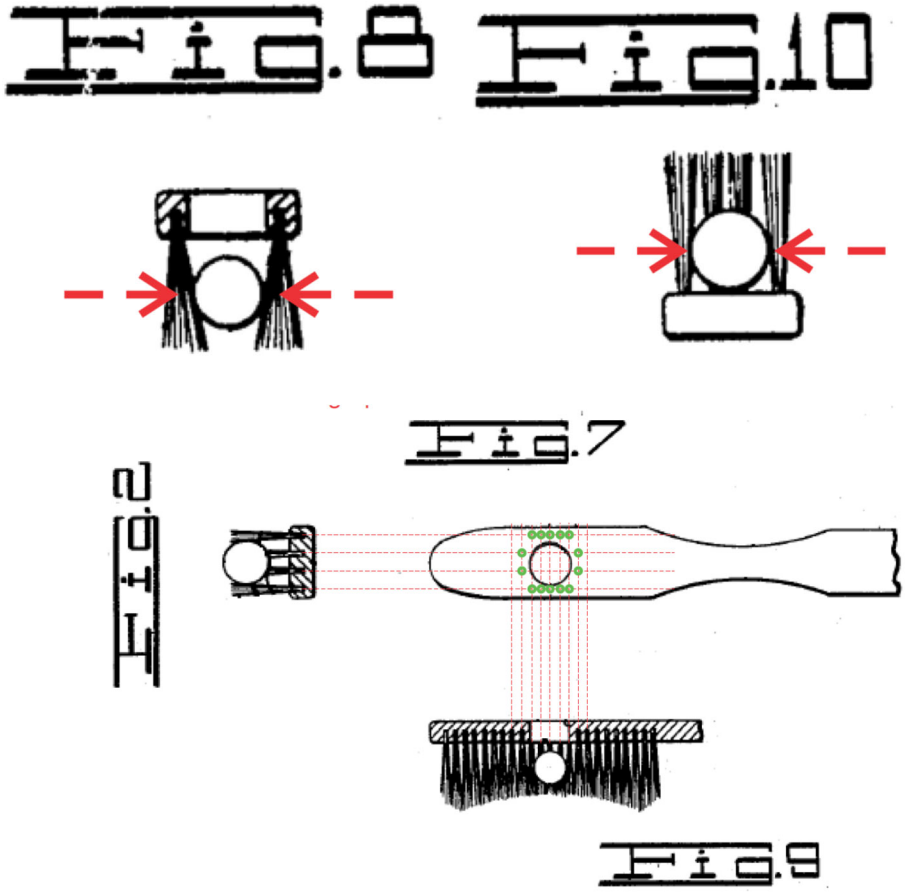
1. Independent Claims 1 and 10

331. In my opinion, claim elements [1.0]-[1.5] and [10.0]-[10.5] are met for the same reasons regarding the combination of Young and Davidson in Section X(C), because, as I explained, the combination of Young and Davidson provides a toothbrush comprising a brush head with a front and back surface, a plurality of vertical bristles extending upward from the front surface and arranged distal from a center of the front surface, a capsule receiving zone sized to receive an oral care capsule, and that the capsule receiving zone includes a recess/well defined in the front surface of the brush head, as taught by Davidson, that would receive an oral care capsule past the vertical bristles and into the recess, as recited in claims 1 and 10. Further combining Fitz-Gibbon with a toothbrush resulting from a combination of Young and Davidson by tilting the bristle tufts surrounding the well/recess at an angle would not change my analysis of claim elements [1.0]-[1.5] and [10.0]-[10.5].

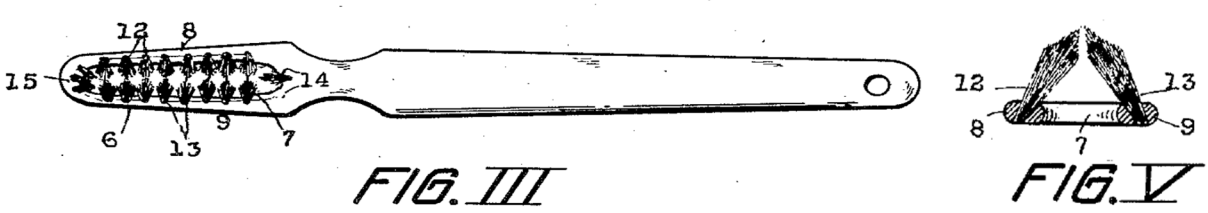
> [1.6] "**at least one pair of angled capsule retaining elements that are elevated above the recess and configured to retain an oral care capsule in the capsule receiving zone**"
> [10.6] "**at least three angled capsule retaining elements that are elevated above the recess, are configured to retain an oral care capsule in the capsule receiving zone, and are canted away from vertical in a direction toward a center of the capsule receiving zone**"

332. As I explained in Sections VII(C) and X(C), Young discloses an arrangement of bristles around a circular dentifrice pocket, as shown in annotated

FIGS. 7, 8, and 10 of Young, below, including pairs of bristles and at least three bristles.



333. Fitz-Gibbons discloses a brush with tilted bristles 12 and 13 on opposing sides of a receiving zone, as shown in FIGS. 3 and 5 of Fitz-Gibbons, below.

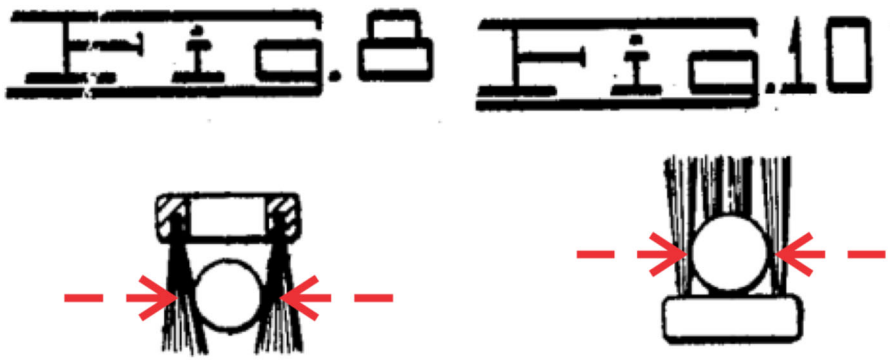


334. The Young-Davidson-Fitz-Gibbon combination discloses these elements of claims 1 and 10 because Young, as modified, includes bristles angled towards the center of the receiving zone, as taught by Fitz-Gibbon. Therefore, the angled bristles include at least a pair of angled capsule retaining elements configured to retain an oral care capsule, and at least three angled retaining elements that are canted away from vertical in a direction toward a center of the capsule receiving zone.

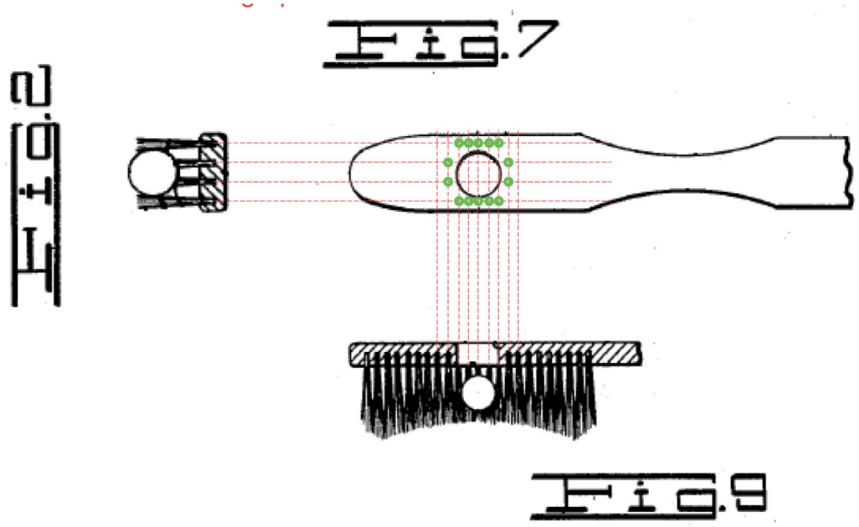
335. In my opinion, these elements of claims 1 and 10 are met by the combination of Young, Davidson, and Fitz-Gibbon.

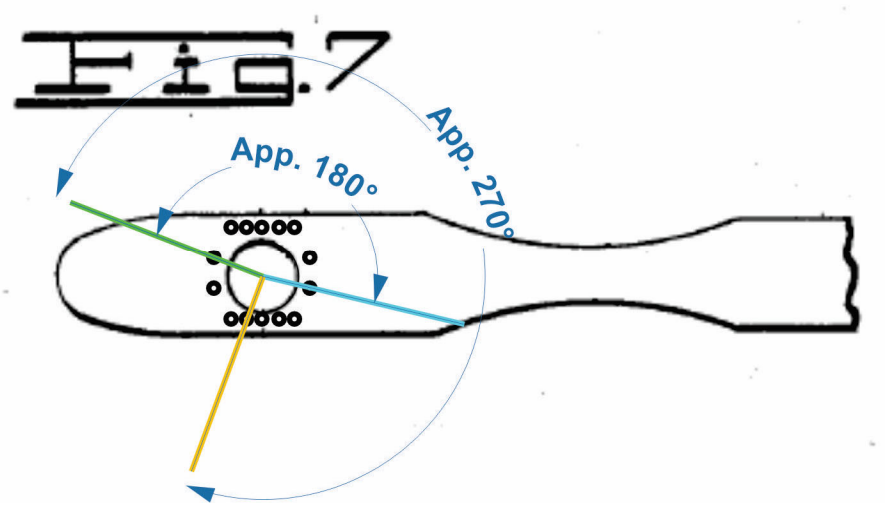
> [1.7] "**wherein each pair of the at least one pair angled capsule retaining elements includes a first and a second angled capsule retaining element arranged along diametrically opposing sides of an oral care capsule when present in the capsule receiving zone**"
> [10.7] "**wherein each angled capsule retaining element of the at least three angled capsule retaining elements is arranged proximate to a perimeter of the capsule receiving zone at a position at least 108 degrees apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone**"

336. As I explained in Sections X(C)(b) and X(D)(a), angled bristles of the Young-Davidson-Fitz-Gibbon combination include a pair of angled bristles in which first and second angled bristles are on diametrically opposing sides of the capsule in the receiving zone. This is emphasized by my annotated FIGS. 8 and 10 of Young, below.



337. Further, the angled bristles of the Young-Davidson-Fitz-Gibbon combination also include at least three angled bristles that are at least 108° apart. This is emphasized by my annotated FIG. 7 of Young, below:



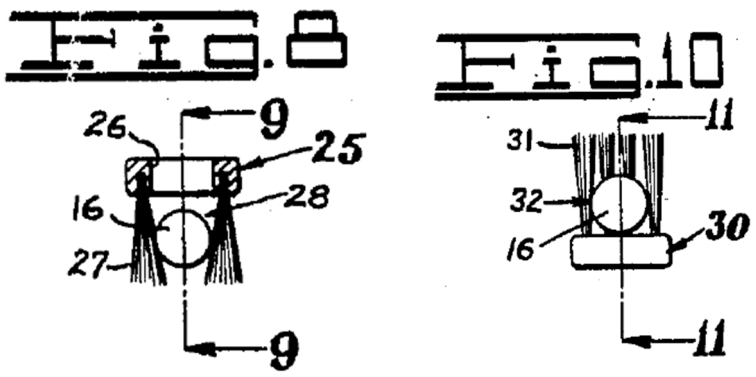


338. Tilting the bristles in Young that surround the dentifrice pocket as taught by Fitz-Gibbon would not change this arrangement of the bristles around the pocket in Young.

339. In my opinion, these elements of claims 1 and 10 are met by the combination of Young, Davidson, and Fitz-Gibbon.

> [1.8] "**wherein at least a portion of each angled capsule retaining element of the at least one pair of capsule retaining elements is arranged to contact the oral care capsule.**"
> [10.8] "**wherein at least a portion of each angled capsule retaining element of the at least three angled capsule retaining elements is arranged to contact the oral care capsule.**"

340. As I explained in Sections VII(C) and X(C), Young specifically discloses that the pellet is "engaged and retained by the bristles." Ex. 1012, 2:26-29, 2:31-34. It is clear from this disclosure of Young, and based on FIGS. 8 and 10 shown below, that the bristles of Young contact the pellet.



341. Tilting the bristles 5 as taught by Fitz-Gibbon would still allow for front-loading of the pellet. As shown in FIG. 3 and 5 of Fitz-Gibbon below, the opposing sets of angled bristles include a space in between that would allow a user to spread the bristles to load a capsule, in a similar manner as described in the '332 Patent.

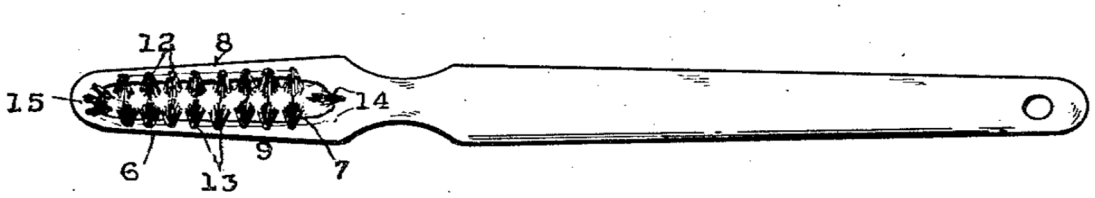


FIG. III

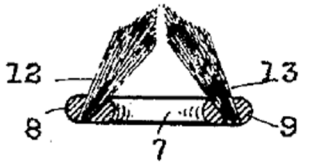


FIG. V

342. When tilting the bristles of Young that surround the dentifrice pocket, as taught in Fitz-Gibbon, the bristles would still contact the pellet residing in the well as taught by Davidson and retain the pellet within the well.

343. In my opinion, these elements of claims 1 and 10 are met by the combination of Young, Davidson, and Fitz-Gibbon.

344. In my opinion, dependent claims 7, 8, 11, 13, 15, and 18 are met for the reasons above and for the same reasons as I explained regarding the combination of Young and Davidson in Section X(C). The further combination of angled bristle tufts as disclosed in Fitz-Gibbon would not substantially change my analysis regarding claims 7, 8, 11, 13, 15, and 18.

2. Claims 2, 6, and 12

345. Claims 2, 6, and 12 narrow "capsule retaining elements" to "angled bristles." As I described above, the Young-Davidson-Fitz-Gibbon combination has angled bristles. For the same reasons I described in Section X(C)(b), the other elements of Claims 2, 6, and 12 are also met.

3. Claim 5

346. Claim 5 recites: "The toothbrush of claim 1, wherein each capsule retaining element of the at least one pair of angled capsule retaining elements comprises a retaining element canted away from vertical in a direction toward a center of the capsule receiving zone."

347. As described above, Fitz-Gibbons discloses a brush with tilted bristles 12 and 13 on opposing sides of a receiving zone, as shown in FIGS. 3 and 5 of, below.

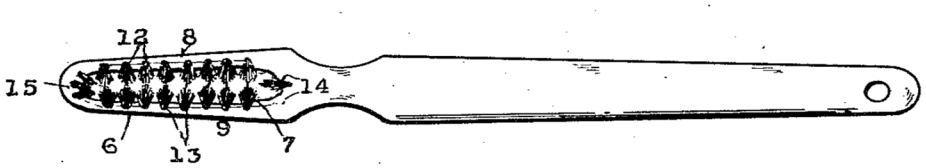


FIG. III

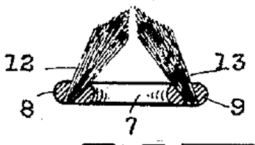


FIG. V

348. As modified using the teachings of Fitz-Gibbons to tilt the bristles towards a center of a receiving zone, the bristles of Young would thus include angled retaining elements that are canted away from vertical in a direction toward a center of the capsule receiving zone, that is, towards a center of Young's dentifrice pocket.

349. Based on the above, in my opinion, claim 5 is obvious.

4. Claims 9 and 14

350. Claim 9 recites: "A method comprising loading an oral care capsule into a capsule receiving zone of a toothbrush according to claim 1 by inserting at least a portion of the oral care capsule in a direction past the vertical bristles into the recess, and retaining the oral care capsule in the capsule receiving zone using the at least one pair of angled capsule retaining elements."

351. Claim 14 recites: "A method comprising loading an oral care capsule into a capsule receiving zone of a toothbrush according to claim 10 by inserting at least a portion of the oral care capsule in a direction past the bristles into the recess, and retaining the oral care capsule in the capsule receiving zone using the at least three angled capsule retaining elements."

352. The combination of Young and Davidson provides a method of loading an oral care capsule into a receiving zone by inserting the capsule past vertical bristles in a recess and retaining the capsule by angled capsule retaining elements. Like claims 9 and 14, Young and Davidson both disclose that dentifrice can be loaded using a front-loading process. Based at least on the multiple embodiments disclosed in Young that a pellet is front-loaded into the dentifrice pocket (Ex. 1012, 1:45-50, 2:30-34, FIGS. 1, 2, 7-9), and based on the tufts in Fitz-Gibbon include a space in between tufts, tilting the bristles as taught by Fitz-Gibbon would still allow this front-loading of the pellet.

353. Based on the modification of Young to include the well taught in Davidson, the method would also include that the pellet is loaded into a well/recess. The well of Davidson is shown again, below.

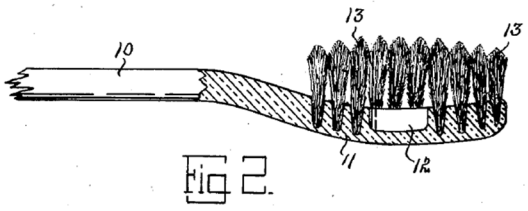


Fig 2.

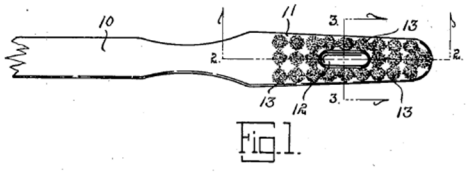


Fig. 1.

354. Davidson also discloses a front-loading process in which dentifrice is provided into the well and past the bristles, stating "[o]bviously the bristles provide sides and ends to this receiving area in the bristles, and the powder or granular dentifices may fall downwardly and be received and held by the well 12." Ex. 1010, 2:11-27.

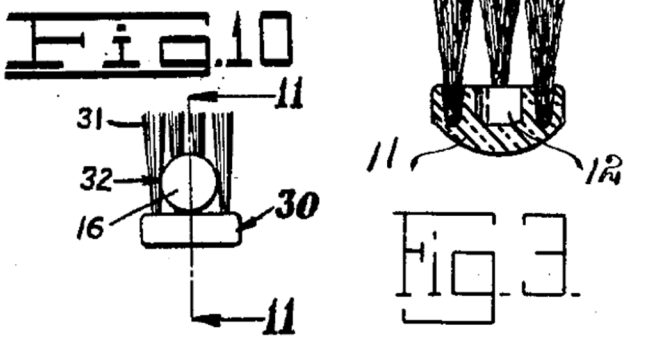
355. Based on the above, in my opinion, claims 9 and 14 are obvious.

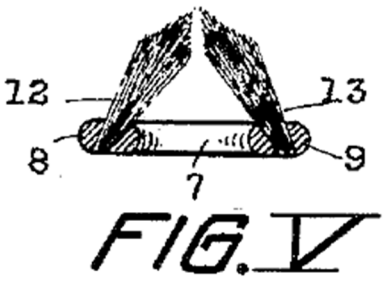
5. Claims 16 and 17

356. Claim 16 recites: "The toothbrush of claim 1, wherein at least a portion of each angled capsule retaining element of the at least one pair of angled capsule retaining elements is arranged to overlap a portion of the recess of the capsule receiving zone."

357. Claim 17 recites: "The toothbrush of claim 10, wherein at least a portion of each angled capsule retaining element of the at least three angled capsule retaining elements is arranged to overlap a portion of the recess of the capsule receiving zone."

358. Tilting the bristles in Young based on Fitz-Gibbon would cause the bristles to be angled over the dentifrice pocket (including the well as taught in Davidson) towards a center of the pocket/well, causing the angled bristles to overlap the pocket/well. This result is apparent when viewing, for example, FIG. 10 of Young, FIG. 3 of Davidson, and FIG. 5 of Fitz-Gibbon side by side:





359. Again, angling the bristles of Young shown above, which in this combination also includes a well/recess in the front surface of the brush head as shown in FIG. 3 of Davidson above, to be over the pocket/recess as shown in FIG. 5 of Fitz-Gibbon above, cause the bristles (which include both at least one pair and at least three bristles) to overlap a portion of the recess of the capsule receiving zone, as recited in claims 16 and 17.

360. Based on the above, in my opinion, claims 16 and 17 are obvious.

E. Obviousness based on Sorrentino (U.S. Patent 8,240,937)

a) Overview

361. As I analyzed in Section IX, if the '332 Patent cannot claim the benefit of the filing date of its parent application, then its filing date is April 11, 2008, and Sorrentino, filed January 24, 2008, is thus available as prior art. If the means-plus-function interpretation is not adopted, in my opinion, Sorrentino alone meets all claim elements described below.

362. Sorrentino provided a toothbrush with "a head or carrier 80" and "a series of retaining members 81" to hold "an oral care dispenser, such as a bead of packed dentifrice or capsule ... in place prior to use" within a "cavity" or "basin" 100. Ex. 1013, 11:35-40. See FIGS. 17-20:

FIG. 20

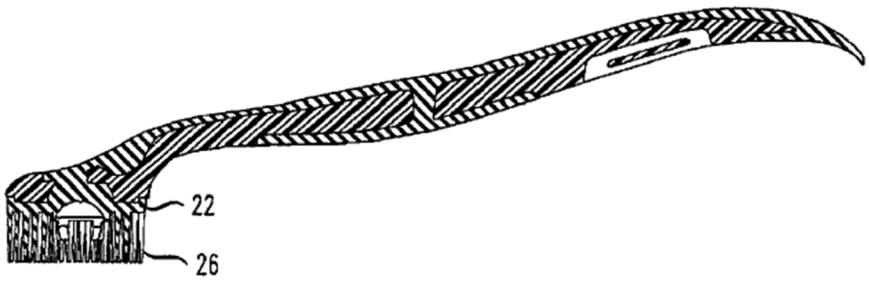


FIG. 17

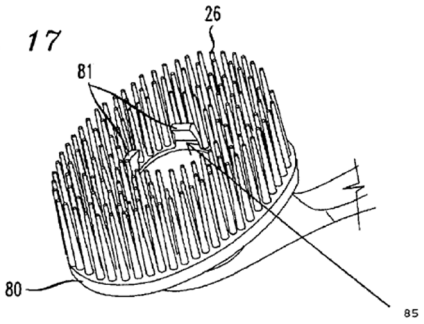


FIG. 18

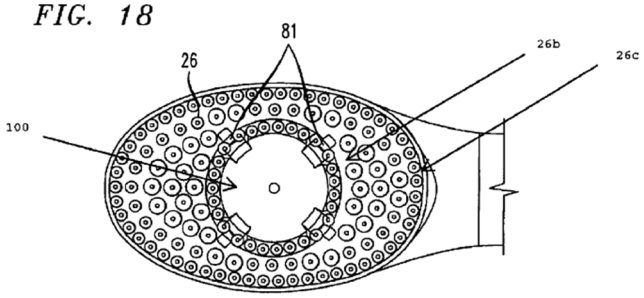
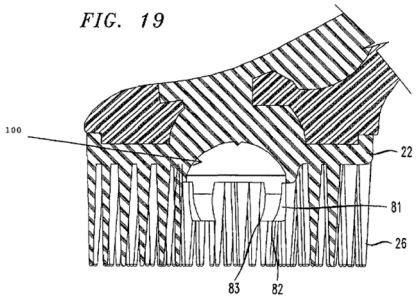


FIG. 19



363. Retaining members 81 "extend upwardly from the carrier 80" and "curve inwardly to further assist in holding the bead or capsule in place." Ex. 1013, 12:51-56.

364. Sorrentino describes using these "curved retaining members 81" to provide "a compressive force to hold the dispenser 32 in place." Ex. 1013, 12:61-63. Sorrentino explains that the "inwardly disposed engaging surface 85 is generally

smooth to reliably resist prematurely rupturing the dispenser 32 before use" and "the smooth and curved characteristic of engaging surface 85 provides for a generally uniform distribution of pressure on the surface of the dispenser 32." Ex. 1013, 12:63-13:1. Sorrentino explains that "this construction thus reduces thin wall stress on the surface of the dispenser 32 to reliably resist prematurely rupturing the dispenser 32 before use," and "[f]or example, shock forces acting on the toothbrush can be dissipated during transport operations." Ex. 1013, 13:1-5.

b) Claim Analysis

1. Independent Claims 1 and 10

365. Independent claims 1 and 10 recite substantially overlapping claim elements. Accordingly, I review the independent claims together.

[1.0] "**A toothbrush comprising a brush head that includes:**"
[10.0] "**A toothbrush comprising a brush head that includes:**"

[1.1] "**a front surface**"
[10.1] "**a front surface**"

[1.2] "**a back surface**"
[10.2] "**a back surface that opposes the front surface**"

366. Sorrentino discloses a toothbrush with "a head mounted to one end of the handle containing a plurality of oral care elements," including bristles 26, as shown, for example, in FIGS. 17 and 20, below . Ex. 1013, Abstract, 11:45-50.

FIG. 17

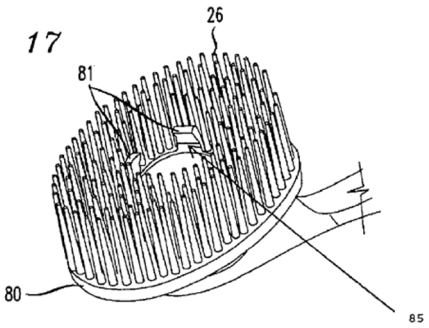
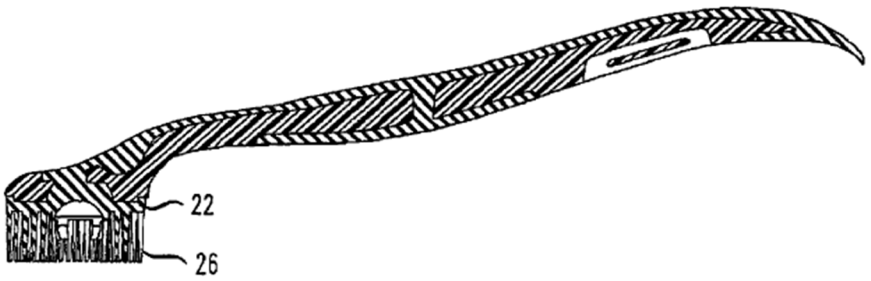


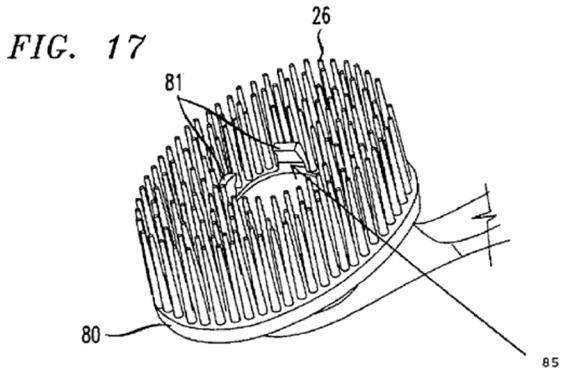
FIG. 20



367. As shown above, Sorrentino's brush head includes a front surface, from which the bristles 26 extend. As shown above, Sorrentino's brush head also includes a back surface that opposes the front surface, that is, the back of the brush head.

> [1.3] "**a plurality of vertical bristles extending upward from the front surface**"
> [10.3] "**a plurality of bristles extending upward from the front surface and arranged distal from a center of the front surface**"

368. Sorrentino discloses a toothbrush with "a head mounted to one end of the handle containing a plurality of oral care elements," including "bristles 26." Ex. 1013, Abstract, 11:45-50. See FIG. 17:



369. As shown in FIG. 17, the bristles 26 are distal, that is, spaced away, from the center of the front surface.

[1.4] "**a capsule receiving zone sized to receive an oral care capsule**"
[10.4] "**a capsule receiving zone**"

370. Sorrentino has a capsule receiving zone sized to receive an oral care capsule. Sorrentino explains, "with reference to FIGS. 17-20, in one construction, a basin, or cavity 100 is provided in carrier 80 below the dispenser 32." Ex. 1013, 12:38-40. Note that Sorrentino's "dispenser 32" is an "oral care dispenser, such as a bead of packed dentifrice or capsule." Ex. 1013, 11:38-40.

FIG. 17

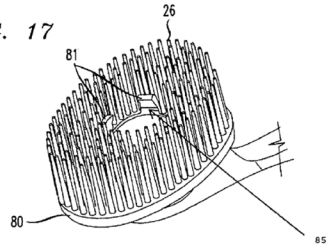


FIG. 18

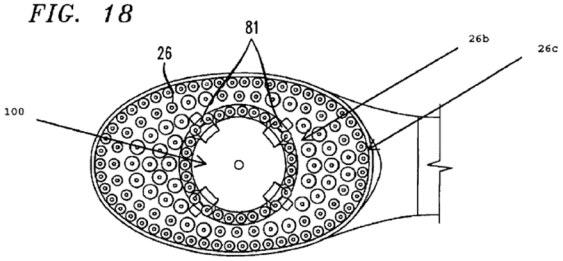
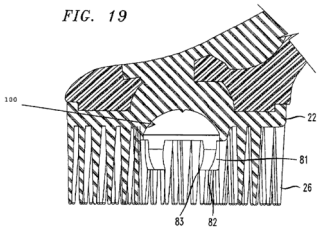


FIG. 19



371. As shown in FIGS. 17-19, the "basin 100 can be a concaved structure or hemispherical structure disposed in the interior area, beneath and between the retaining members 81." The "basin 100 serves to retain a portion of the oral care material from the dispenser 32 to extend the beneficial cleaning effects of the oral care material during brushing." Ex. 1013, 12:38-48.

> [1.5] "**the capsule receiving zone including a recess defined in the front surface and arranged to receive at least a portion of an oral care capsule inserted past the vertical bristles**"
> [10.5] "**including a recess defined in the front surface and arranged to receive at least a portion of an oral care capsule insertable past the bristles into the recess**"

372. The cavity 100 of Sorrentino is a recess defined within the front surface and is arranged to receive an oral care capsule. See FIGS. 17-19:

FIG. 17

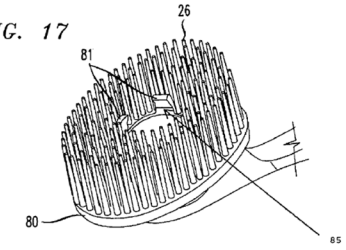


FIG. 18

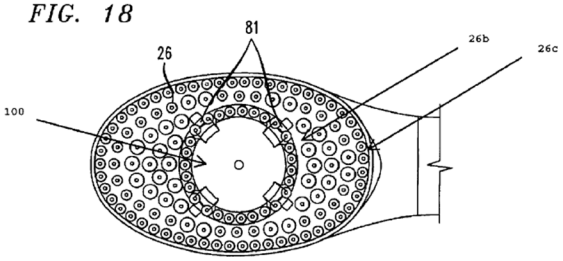
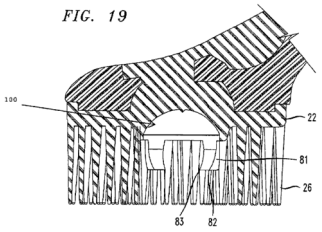


FIG. 19



373. The cavity 100 is a "concaved structure or hemispherical structure disposed in the interior area, beneath and between the retaining members 81," and that can "retain a portion of the oral care material. Ex. 1013, 12:40-48.

374. Sorrentino's oral care material can be a "dispenser," "bead," or "capsule 32" that is retained "beneath the distal ends of the bristles 26" and "submerged within the field of bristles 26." Ex. 1013, 11:40-50.

> [1.6] "**at least one pair of angled capsule retaining elements that are elevated above the recess and configured to retain an oral care capsule in the capsule receiving zone**"
> [10.6] "**at least three angled capsule retaining elements that are elevated above the recess, are configured to retain an oral care capsule in the capsule receiving zone, and are canted away from vertical in a direction toward a center of the capsule receiving zone**"

375. Sorrentino's brush head includes "curved retaining members 81," "such as prongs or biasing members, to hold an oral care dispenser." Ex. 1013, 11:36-37, 12:51-65. See FIGS. 17 and 18:

FIG. 17

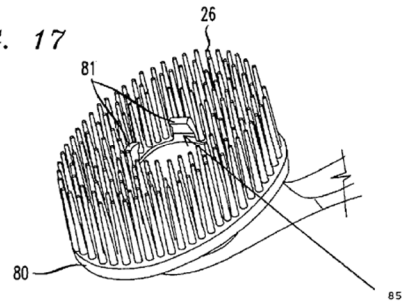
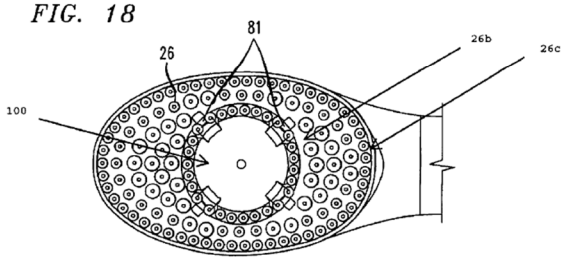


FIG. 18



376. As shown in the figures above, the retaining members are also elevated above the recess, and are configured to retain an oral care capsule. Sorrentino describes using "curved" retaining members because "[t]he combination of retaining members 81 provides a compressive force to hold the dispenser 32 in place" while "[t]he inwardly disposed engaging surface 85 is generally smooth" to "reliably resist prematurely rupturing the dispenser 32 before use," and "reduce thin wall stress on the surface of the dispenser" by providing "for a generally uniform distribution of pressure on the surface of the dispenser 32." Ex. 1013, 12:61-13:1.

377. Although the retaining members 81 are "curved" rather than specifically "angled" or "canted away from vertical" as recited in the claims of the '332 Patent, it would have been obvious to a POSITA based on Sorrentino's disclosure that angled retaining elements that are leaned/angled/canted against a capsule such as described in the'332 Patent (*see, e.g.*, FIG. 1) could also be used.

378. Specifically, if "angled capsule retaining elements" is not a means-plus-function term, and thus has broader scope than just angled bristles, then Sorrentino's

capsule "retaining members" clearly meet the '332 Patent's "capsule retaining elements" because Sorrentino's curved retaining members are also "elevated above the recess and configured to retain an oral care capsule in the capsule receiving zone," as recited in Claims 1 and 10.

379. As further shown below in FIGS. 17 and 18, Sorrentino includes at least one pair of retaining members, and at least three retaining members. Specifically, FIGS. 17 and 18 show four retaining members equally spaced around the cavity 100.

FIG. 17

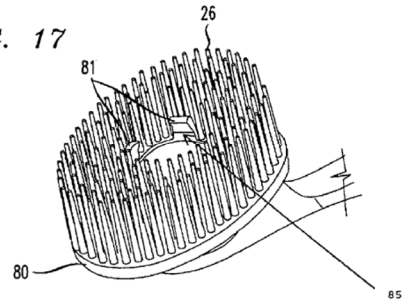
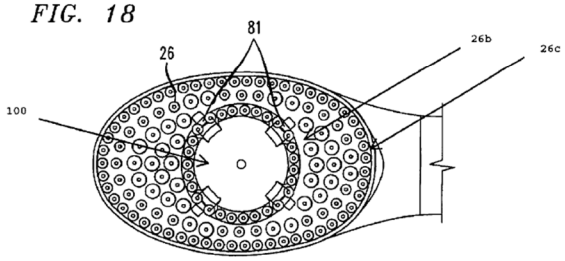


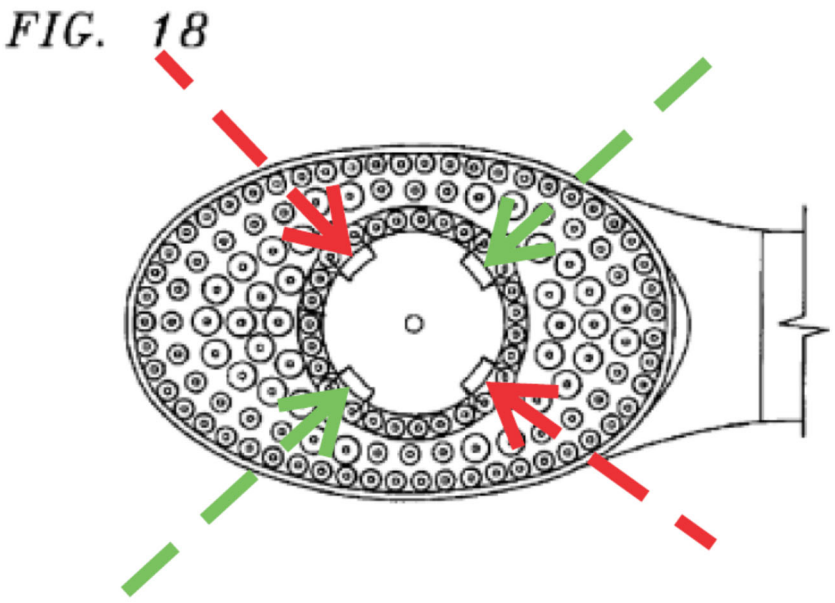
FIG. 18



380. Sorrentino further describes other numbers of retaining members, such as "three retaining members 81 at triangular points around the perimeter, while other embodiments might use five, six, or more prongs around the perimeter." Ex. 1013, 11:56-67.

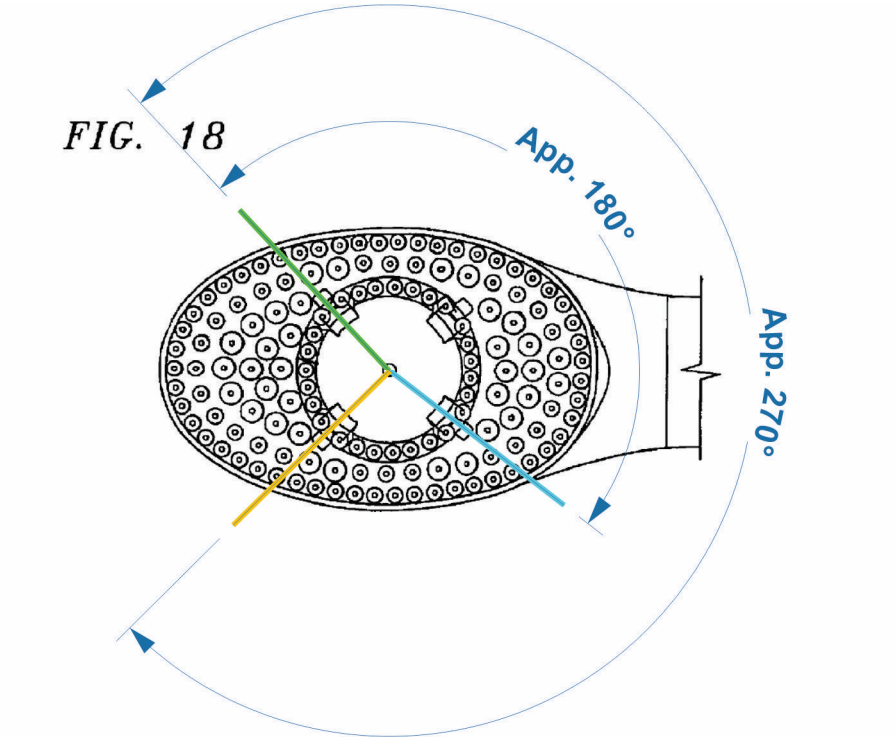
[1.7] "**wherein each pair of the at least one pair angled capsule retaining elements includes a first and a second angled capsule retaining element arranged along diametrically opposing sides of an oral care capsule when present in the capsule receiving zone**"
[10.7] "**wherein each angled capsule retaining element of the at least three angled capsule retaining elements is arranged proximate to a perimeter of the capsule receiving zone at a position at least 108 degrees apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone**"

381. As shown in annotated FIG. 18 of Sorrentino, below, the brush head includes pairs of retaining elements 81 that are on diametrically opposing sides of the cavity 100. See my annotated FIG. 18 of Sorrentino below:



382. Sorrentino's brush head also includes at least three retaining members that are proximate to the capsule receiving zone and that are each at least 108° apart

from another one of the retaining members. See my other annotated FIG. 18 of Sorrentino below:

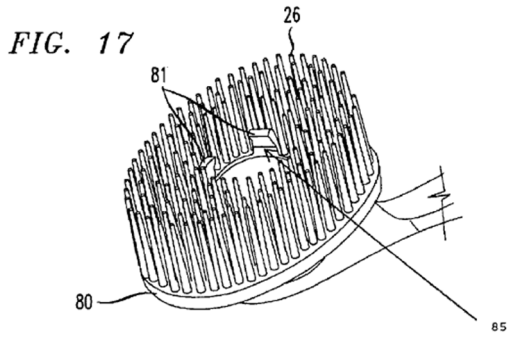


383. As shown above, a first retaining member (green) is over 108° apart from another retaining member (blue), a second retaining member (yellow) is over 108° apart from another retaining member (green), and a third retaining member (blue) is around over 108° apart from another retaining member (green).

384. In my opinion, even without an explicit disclosure of specific degrees in Sorrentino, the specific degrees recited in claim 10 would be obvious based on the disclosure of Sorrentino, and specifically given the arrangement of Sorrentino's retaining members 81 surrounding the cavity 100. In my opinion, Sorrentino thus meets this element of claim 10.

[1.8] "**wherein at least a portion of each angled capsule retaining element of the at least one pair of capsule retaining elements is arranged to contact the oral care capsule.**"
[10.8] "**wherein at least a portion of each angled capsule retaining element of the at least three angled capsule retaining elements is arranged to contact the oral care capsule.**"

385. Sorrentino's retaining members 81 clearly contact the oral care capsule.



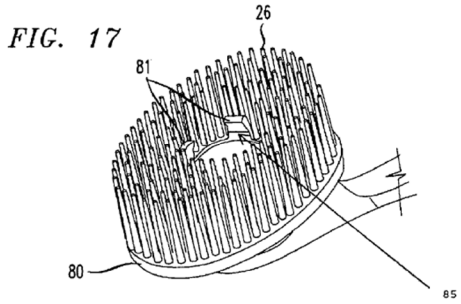
386. As explained in Sorrentino, the "curved retaining members 81" provide "a compressive force to hold the dispenser 32 in place." Ex. 1013, 12:61-63. Sorrentino explains that the "inwardly disposed engaging surface 85 is generally smooth to reliably resist prematurely rupturing the dispenser 32 before use" and "the smooth and curved characteristic of engaging surface 85 provides for a generally uniform distribution of pressure on the surface of the dispenser 32." Ex. 1013, 12:63-13:1. Sorrentino explains that "this construction thus reduces thin wall stress on the surface of the dispenser 32 to reliably resist prematurely rupturing the dispenser 32 before use," and "[f]or example, shock forces acting on the toothbrush can be dissipated during transport operations." Ex. 1013, 13:1-5.

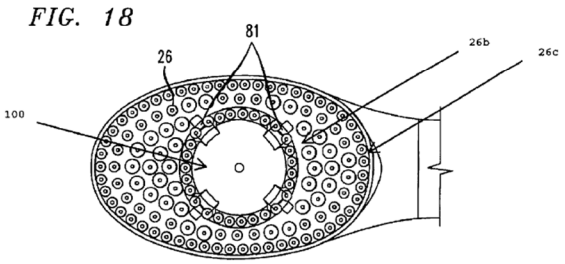
387. Based on the above, in my opinion, claims 1 and 10 are obvious.

2. Claim 5

388. Claim 5 recites: "The toothbrush of claim 1, wherein each capsule retaining element of the at least one pair of angled capsule retaining elements comprises a retaining element canted away from vertical in a direction toward a center of the capsule receiving zone."

389. As I explained with respect to the independent claims, Sorrentino discloses "curved retaining members 81." Ex. 1013, 12:56. FIGS. 17-18 of Sorrentino show the curved retaining members 81:





390. As I also explained, although the retaining members 81 are "curved" rather than specifically "angled" or "canted away from vertical" as recited in the claims of the '332 Patent, it would have been obvious to a POSITA based on Sorrentino's disclosure that angled retaining elements that are leaned/angled/canted against a capsule such as described in the'332 Patent (*see, e.g.*, FIG. 1) could also be used.

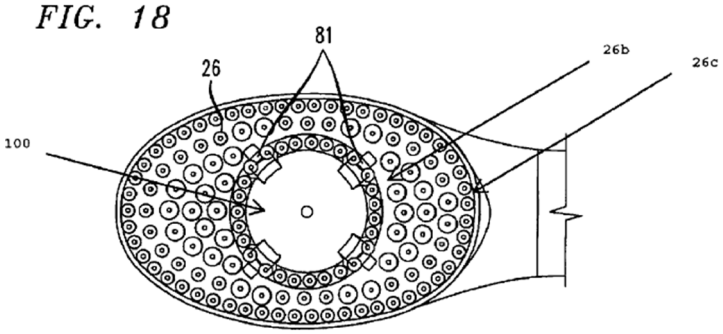
391. Based on the above, in my opinion, claim 5 is obvious.

3. Claims 7 and 11

392. Claim 7 recites: "The toothbrush of claim 5, wherein the at least one pair of angled capsule retaining elements is arranged between the plurality of vertical bristles and a center of the capsule receiving zone."

393. Claim 11 recites: "The toothbrush of claim 10, wherein the at least three angled capsule retaining elements are arranged between the plurality of bristles and a center of the capsule receiving zone."

394. See FIG. 18 of Sorrentino:



395. As shown above, the retaining members 81 of Sorrentino are each arranged between the vertical bristles and the cavity. That is, the retaining members are directly adjacent to the cavity while vertical bristles are disposed further away from the cavity.

396. Based on the above, in my opinion, claims 7 and 11 are obvious.

4. Claims 8 and 13

397. Claim 8 recites: "The toothbrush of claim 1, including an oral care capsule retained by the at least one pair of capsule retaining elements in the capsule receiving zone, wherein the oral care capsule comprises one or more of the following: a dentrifice composition, a whitening composition, an anticalculus composition,[3] and antibacterial composition, and a breath freshening composition."

398. Claim 13 recites: "The toothbrush of claim 10, including an oral care capsule retained by the at least three capsule retaining elements in the capsule receiving zone, wherein the oral care capsule comprises one or more of the following: a dentrifice composition, a whitening composition, an anticalculus composition, and antibacterial composition, and a breath freshening composition."

399. Sorrentino discloses that its capsule can be at least a "dentifrice composition," "antibacterial composition," and/or "breath freshening composition," and thus meets the elements of Claims 8 and 13. Specifically, Sorrentino states that the capsule can be an "oral care dispenser, such as a rupturable gel capsule 32" that "holds and applies a mouth care solution ... that may be a toothpaste, a gel, a mouthwash, or similar dentifrice or oral hygiene product, or a combination of the same." Ex. 1013, 5:26-28, 5:55-59.

400. Based on the above, in my opinion, claims 8 and 13 are obvious.

[3] Note: calculus is a hard, mineralized formation which forms on the teeth.

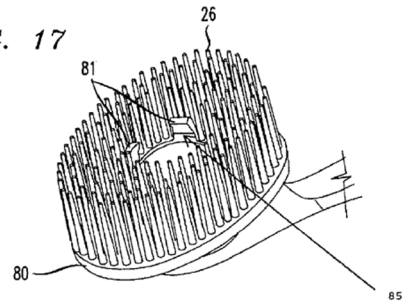
5. Claims 9 and 14

401. Claim 9 recites: "A method comprising loading an oral care capsule into a capsule receiving zone of a toothbrush according to claim 1 by inserting at least a portion of the oral care capsule in a direction past the vertical bristles into the recess, and retaining the oral care capsule in the capsule receiving zone using the at least one pair of angled capsule retaining elements."

402. Claim 14 recites: "A method comprising loading an oral care capsule into a capsule receiving zone of a toothbrush according to claim 10 by inserting at least a portion of the oral care capsule in a direction past the bristles into the recess, and retaining the oral care capsule in the capsule receiving zone using the at least three angled capsule retaining elements."

403. As described above, Sorrentino's brush head includes "retaining members 81 ... to hold an oral care dispenser ... beneath the distal ends of the bristles 26" in a "cavity 100 ... beneath and between the retaining members." Ex. 1013, 11:36-39, 12:38-43. See FIGS. 17-19 of Sorrentino:

FIG. 17



404.

FIG. 18

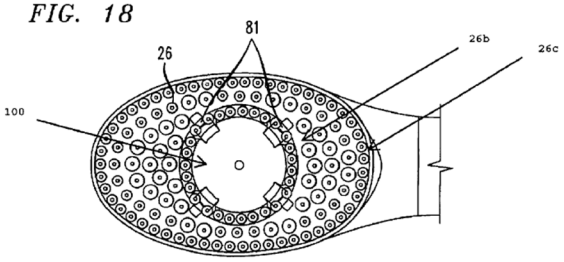
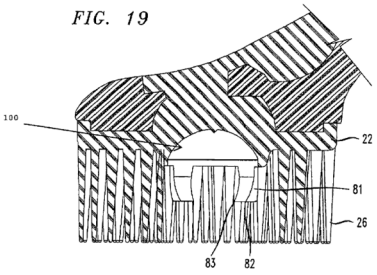


FIG. 19



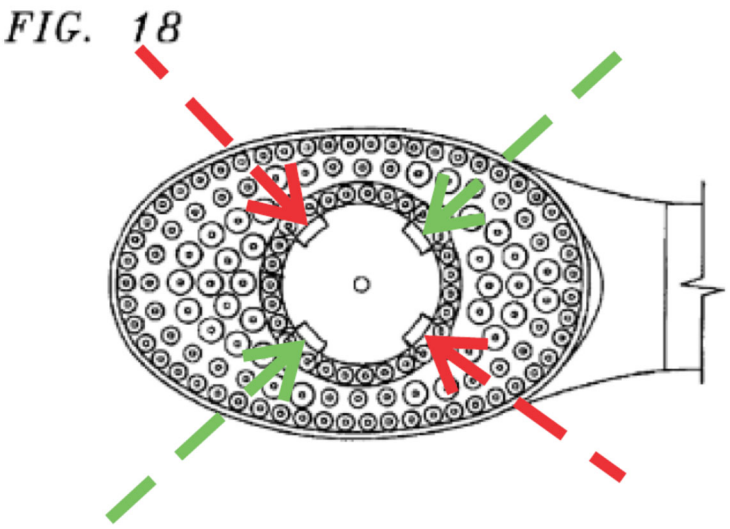
405. Thus, in my opinion, Sorrentino meets claims 9 and 14 because the capsule in Sorrentino is installed past the vertical bristles 26 and in the recess/cavity 100, and the capsule is retained in the recess/cavity by retaining members, of which there is both at least one pair of, and at least three, retaining members.

406. Based on the above, in my opinion, claims 9 and 14 are obvious.

6. Claim 15

407. Claim 15 recites: "The toothbrush of claim 1, wherein the at least one pair of angled capsule retaining elements comprises multiple pairs of angled capsule retaining elements."

408. Sorrentino includes multiple pairs of retaining elements because Sorrentino discloses. My annotated FIG. 18, below, shows two pairs of retaining elements 81:



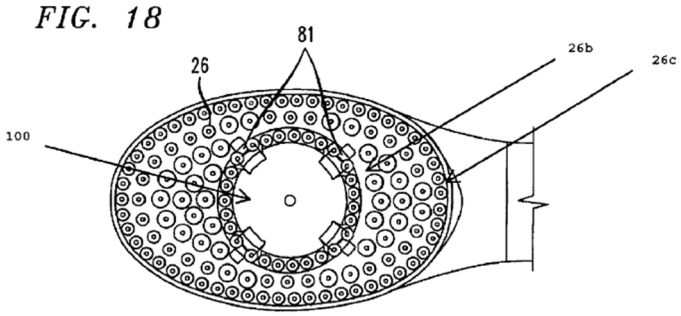
409. Based on the above, in my opinion, claim 15 is obvious.

7. Claims 16 and 17

410. Claim 16 recites: "The toothbrush of claim 1, wherein at least a portion of each angled capsule retaining element of the at least one pair of angled capsule retaining elements is arranged to overlap a portion of the recess of the capsule receiving zone."

411. Claim 17 recites: "The toothbrush of claim 10, wherein at least a portion of each angled capsule retaining element of the at least three angled capsule retaining elements is arranged to overlap a portion of the recess of the capsule receiving zone."

412. Sorrentino discloses all the elements of claims 16 and 17 because, as shown in FIG. 18 below, at least a portion of each retaining member 81 in Sorrentino overlaps a portion of the recess/cavity 100.



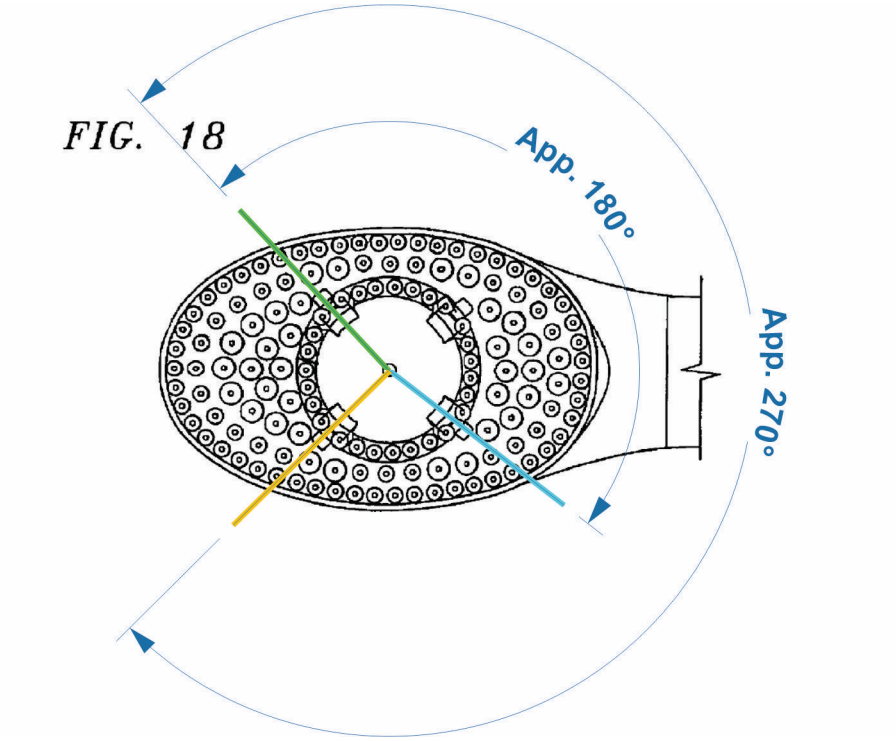
413. Based on the above, in my opinion, claims 16 and 17 are obvious.

8. Claim 18

414. Claim 18 recites: "The toothbrush of claim 10, wherein each angled capsule retaining element of the at least three angled capsule retaining elements is arranged proximate to a perimeter of the capsule receiving zone at a position at least 144° apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone."

415. As I explained above with respect to claim 10, Sorrentino's retaining members 81 include at least three retaining members that each are at a position not only at least 108° apart from at least one other capsule retaining element of the at least three capsule retaining elements relative to a center of the capsule receiving

zone, but also at least 144° apart as recited in claim 18, as shown in annotated FIG. 18 of Sorrentino, below.



416. In my opinion, even without an explicit disclosure of specific degrees in Sorrentino, the specific degrees recited in claim 18 would be obvious based on the disclosure of Sorrentino, and specifically given the arrangement of Sorrentino's retaining members 81 surrounding the cavity 100. In my opinion, Sorrentino thus meets this element of claim 18.

417. Based on the above, in my opinion, claim 18 is obvious.

F. Obviousness based on Sorrentino (U.S. Patent 8,240,937) and Fitz-Gibbon (U.S. Patent 1,346,536)

a) A POSITA Would Have Been Motivated to Combine Sorrentino and Fitz-Gibbon

418. As I analyzed in Section X(E)(a), Sorrentino provided a toothbrush with "a head or carrier 80" and "a series of retaining members 81" to hold "an oral care dispenser, such as a bead of packed dentifrice or capsule ... in place prior to use" within a "cavity" or "basin" 100. Ex. 1013, 11:35-40. See FIGS. 17-20:

FIG. 17

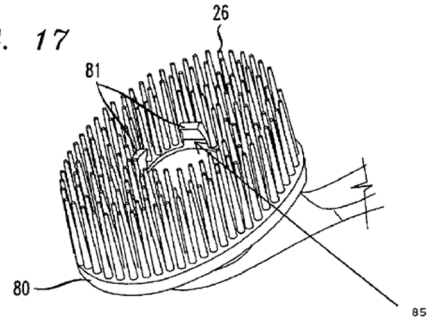


FIG. 18

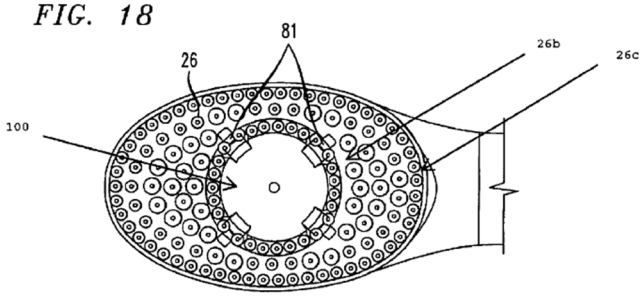
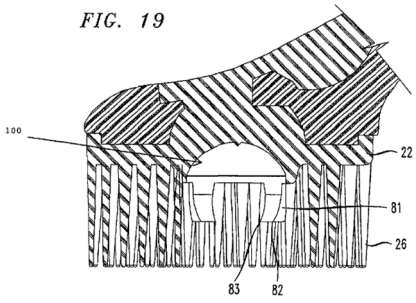


FIG. 19



419. As I also explained in Section VII(C), Fitz-Gibbon, like Sorrentino, is concerned with retaining dry dentifrice (as opposed to paste) prior to brushing. Fitz-Gibbon discloses a toothbrush with sets of angled bristles 12 and 13 that are highly tilted over an opening 7.

420. See FIGS. 3 and 5 of Fits-Gibbon:

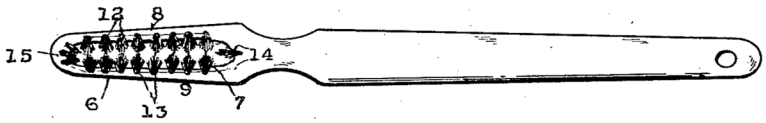


FIG. III

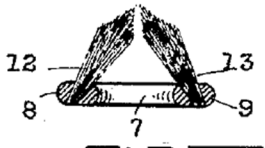


FIG. V

421. Fitz-Gibbon explains that the angled bristles 12 and 13 "are so disposed on the brush head as to provide a dentifrice holding chamber or pocket," which is "exceedingly valuable" for use with "dry dentifrice." Ex. 1011, 1:79-87.

422. Sorrentino uses its curved retaining members because "[t]he combination of retaining members 81 provides a compressive force to hold the dispenser 32 in place" while "[t]he inwardly disposed engaging surface 85 is generally smooth" to "reliably resist prematurely rupturing the dispenser 32 before use," and "reduce thin wall stress on the surface of the dispenser" by providing "for a generally uniform distribution of pressure on the surface of the dispenser 32." Ex. 1013, 12:61-13:1. Sorrentino achieves this because the entire bristle block including the concave cavity, prongs (retaining members), and bristles is injection molded as one piece. Ex. 1013, 6:59-63. A POSITA, however, would have been motivated to replace the curved prongs with angled bristles as disclosed decades before in Fitz-Gibbon, and replace the molded vertical bristles with traditional vertical bristles, using stapled nylon bristles, adhesives, or thermal welding to create a cheaper, more conventional, version of Sorrentino's toothbrush.

423. The disclosures of Sorrentino and Fitz-Gibbon include straightforward teachings that would have provided a POSITA with a predictable set of options for retaining dentifrice in a head of a toothbrush, and a POSITA would have been strongly motivated, and it would have been an obvious design choice, to combine these options to create a cheaper, more conventional, toothbrush that still retains Sorrentino's dentifrice capsule. Combining Sorrentino and Fitz-Gibbon, and particularly modifying Sorrentino based on Fitz-Gibbon's disclosure, would require only ordinary skill to replace Sorrentino's retaining members with angled bristles, producing predictable results such as retaining Sorrentino's dentifrice capsule within the cavity with the assistance of the angled bristle tufts.

b) Claim Analysis

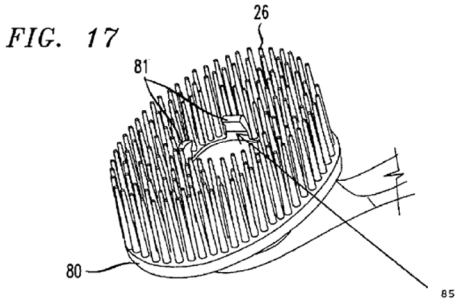
1. Independent Claims 1 and 10

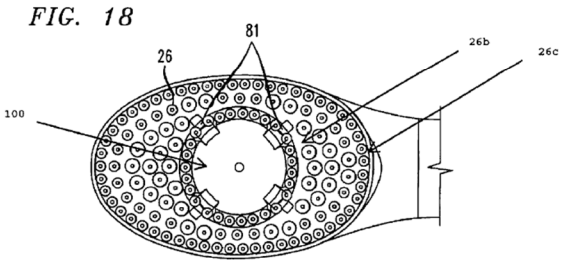
424. Independent claims 1 and 10 recite substantially overlapping claim elements. Accordingly, I review the independent claims together. In my opinion, claim elements [1.0]-[1.5] and [10.0]-[10.5] are met for the same reasons regarding Sorrentino alone as described in Section X(E), because, as I explained, Sorrentino provides a toothbrush comprising a brush head with a front and back surface, a plurality of vertical bristles extending upward from the front surface and arranged distal from a center of the front surface, a capsule receiving zone sized to receive an oral care capsule, and that the capsule receiving zone includes a recess/well defined

in the front surface of the brush head, that would receive an oral care capsule past the vertical bristles and into the recess, as recited in claims 1 and 10. Further combining Fitz-Gibbon with the toothbrush of Sorrentino by replacing the retaining members surrounding the well/recess with angled bristles would not change my analysis of claim elements [1.0]-[1.5] and [10.0]-[10.5].

> [1.6] "**at least one pair of angled capsule retaining elements that are elevated above the recess and configured to retain an oral care capsule in the capsule receiving zone**"
> [10.6] "**at least three angled capsule retaining elements that are elevated above the recess, are configured to retain an oral care capsule in the capsule receiving zone, and are canted away from vertical in a direction toward a center of the capsule receiving zone**"

425. As I explained in Section X(E)(b)(1), Sorrentino's brush head includes "curved retaining members 81," "such as prongs or biasing members, to hold an oral care dispenser." Ex. 1013, 11:36-37, 12:51-65. See FIGS. 17 and 18:





426. As described in Section X(E)(b)(1), and as shown in the figures above, the retaining members are also elevated above the recess, and are configured to retain an oral care capsule. Although the retaining members 81 are "curved" rather than

specifically "angled" or "canted away from vertical" as recited in the claims of the '332 Patent, it would have been obvious to a POSITA based on Sorrentino's disclosure that angled retaining elements that are leaned/angled/canted against a capsule such as described in the'332 Patent (*see, e.g.*, FIG. 1) could also be used.

427. Specifically, if "angled capsule retaining elements" is found to be a means-plus-function term, it would be obvious to a POSITA based on Sorrentino's and Fitz-Gibbon's disclosures to use other structures such as angled bristles to retain the capsule in a "dentifrice holding chamber or pocket" created by the angled bristles, as specifically taught/suggested by Fitz-Gibbon. See FIGS. 3 and 5 of Fitz-Gibbon:

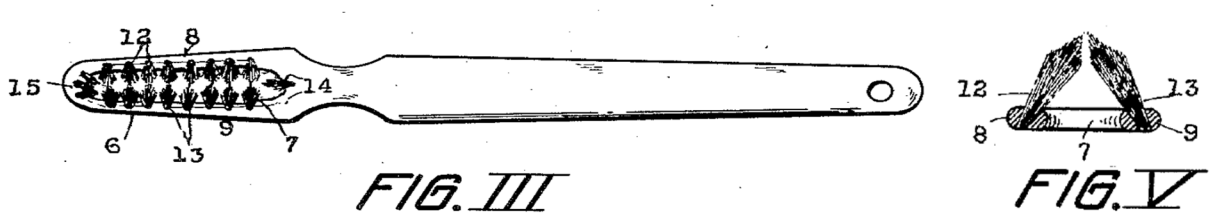


FIG. III FIG. V

428. Since the angled bristles in the Sorrentino-Fitz-Gibbon combination would be disposed in the same positions as Sorrentino's retaining members, the angled bristles would include at least one pair of retaining members, and at least three retaining members, as I described in Section X(E)(b)(1), and as shown below in FIGS. 17 and 18 of Sorrentino.

FIG. 17

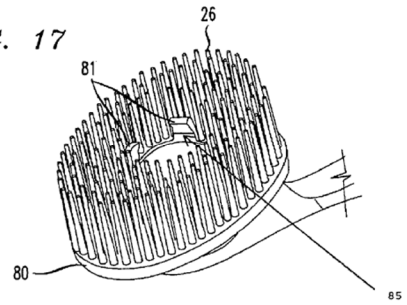
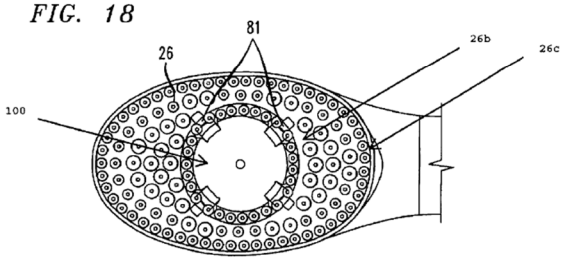


FIG. 18

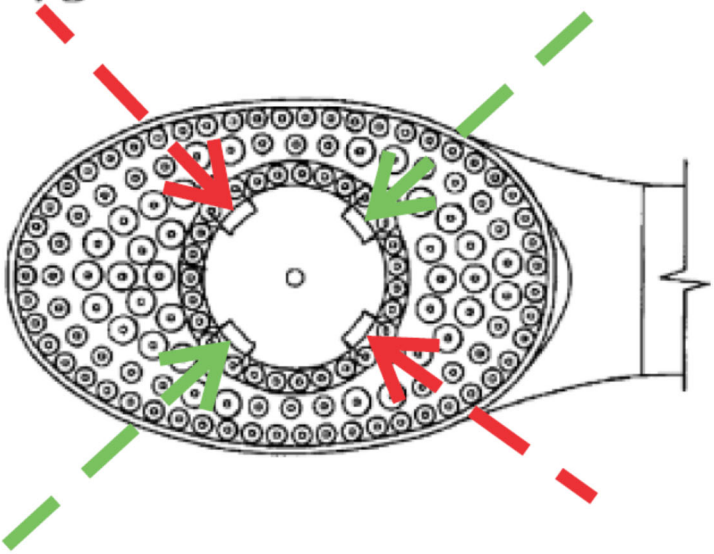


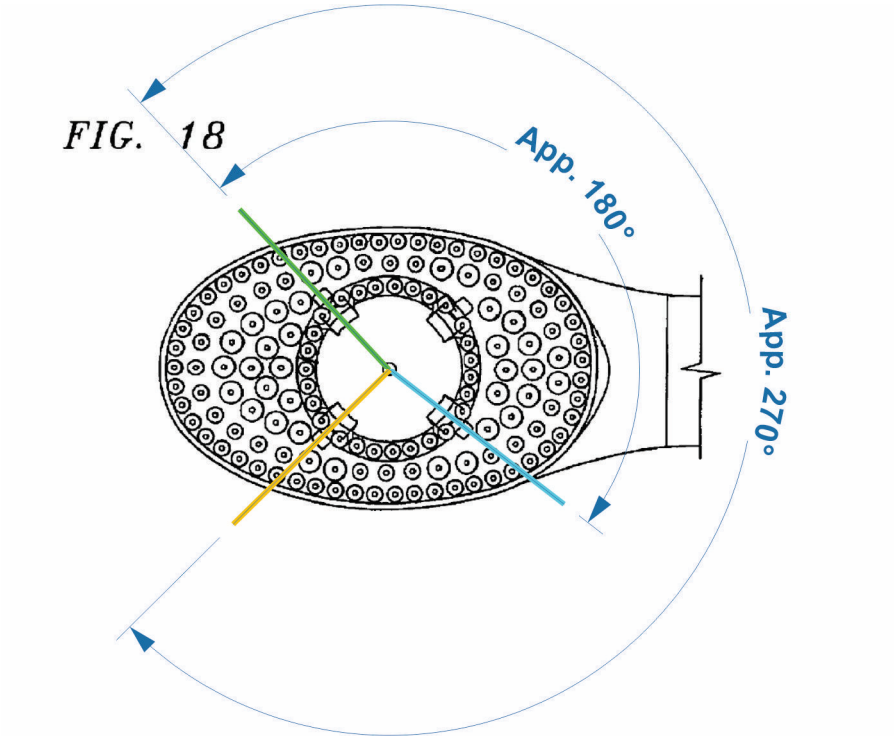
429. Sorrentino further describes other numbers of retaining members, such as "three retaining members 81 at triangular points around the perimeter, while other embodiments might use five, six, or more prongs around the perimeter." Ex. 1013, 11:56-67.

> [1.7] "**wherein each pair of the at least one pair angled capsule retaining elements includes a first and a second angled capsule retaining element arranged along diametrically opposing sides of an oral care capsule when present in the capsule receiving zone**"
> [10.7] "**wherein each angled capsule retaining element of the at least three angled capsule retaining elements is arranged proximate to a perimeter of the capsule receiving zone at a position at least 108 degrees apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone**"

430. Since the angled bristles in the Sorrentino-Fitz-Gibbon combination would be disposed in the same positions as Sorrentino's retaining members, the angled bristles would be on diametrically opposing sides of the cavity 100, and at least at least 108° apart, as I explained in Section X(E)(b)(1), and as shown in annotated FIGS. 18 of Sorrentino, below.

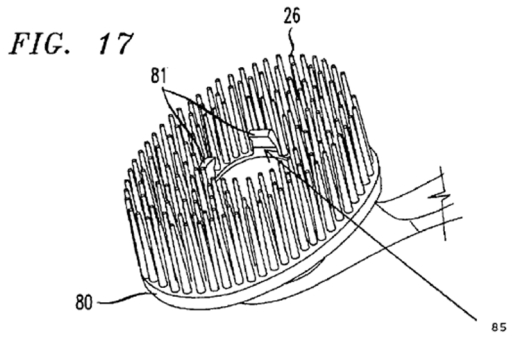
FIG. 18





[1.8] "**wherein at least a portion of each angled capsule retaining element of the at least one pair of capsule retaining elements is arranged to contact the oral care capsule.**"
[10.8] "**wherein at least a portion of each angled capsule retaining element of the at least three angled capsule retaining elements is arranged to contact the oral care capsule.**"

431. Since the angled bristles in the Sorrentino-Fitz-Gibbon combination would be disposed in the same positions as Sorrentino's retaining members, the angled bristles would contact the capsule, as I explained in Section X(E)(b)(1), and as evidenced by FIG. 17 of Sorrentino and FIG. 3 of Fitz-Gibbon:



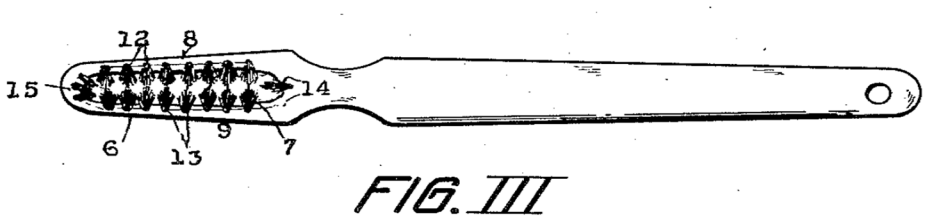


FIG. III

432. Based on the above, in my opinion, claims 1 and 10 are obvious.

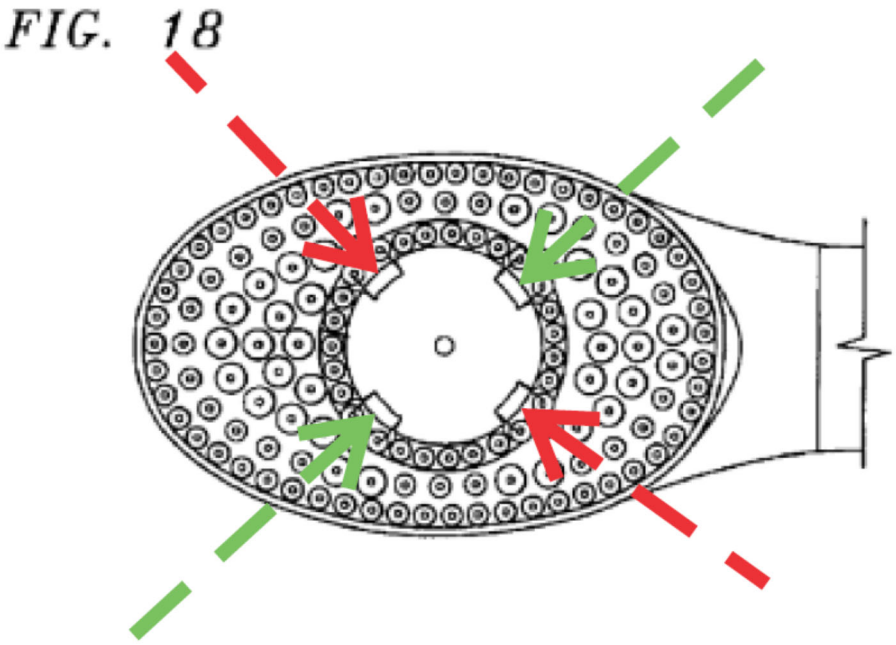
433. In my opinion, dependent claims 5, 7-9, 11, and 13-18 are met for the reasons above and for the same reasons as I explained regarding Sorrentino alone in Section X(E)(b). The further combination of angled bristle tufts as disclosed in Fitz-

Gibbon would not substantially change my analysis regarding claims 5, 7-9, 11, and 13-18.

2. Claim 2

434. Claim 2 recites: "The toothbrush of claim 1, wherein the at least one pair of angled capsule retaining elements comprises multiple pairs of angled bristles canted away from vertical in a direction toward a center of the capsule receiving zone, and the brush head includes a flexural portion adapted to permit at least some bristles of the multiple pairs of angled bristles to be spread apart so as to enable an oral care capsule to be loaded into the capsule receiving zone."

435. Since the angled bristles in the Sorrentino-Fitz-Gibbon combination would be disposed in the same positions as Sorrentino's retaining members, the Sorrentino-Fitz-Gibbon combination discloses multiple pairs of angled bristles canted away from vertical towards the receiving zone:



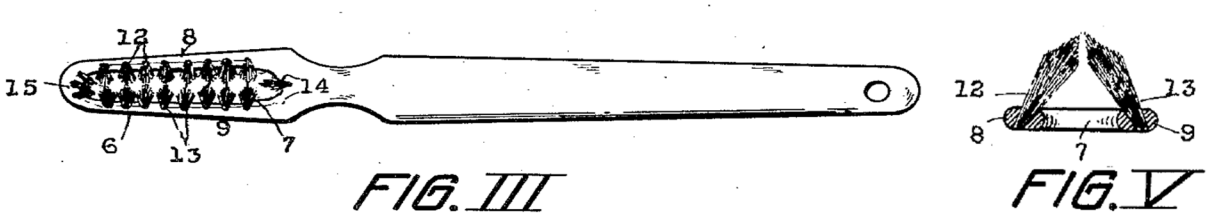


FIG. III FIG. V

436. Further, Sorrentino discloses or suggests its brush head includes a flexural portion to permit bristles to spread apart, because the "cleaning elements may be in the form of bristles made from conventional materials, such as nylon" and "could be made of a flexible resilient material" (Ex. 1013, 7:51-55), and "the bristles ... are independently flexible" (*Id.*, 12:15-17). Modifying Sorrentino's retaining elements to be angled bristles as taught by Fitz-Gibbon would naturally include using the same or similar materials as Sorrentino's vertical bristles to provide the same flexibility.

437. Based on the above, in my opinion, claim 2 is obvious.

3. Claims 6 and 12

438. Claim 6 recites: "The toothbrush of claim 5, wherein the at least one pair of angled capsule retaining elements comprises angled bristles canted away from vertical in a direction toward a center of the capsule receiving zone."

439. Claim 12 recites: "The toothbrush of claim 10, wherein the at least three angled capsule retaining elements comprise at least three angled bristles."

440. Claims 6 and 12 narrow "capsule retaining elements" to "angled bristles." As I described above, it would be obvious to a POSITA based on Sorrentino's and Fitz-Gibbon's disclosures to use other structures such as angled bristles (which as I have analyzed throughout this declaration were commonly used to hold dentifrice), to retain the capsule.

441. Based on the above, in my opinion, claims 6 and 12 are obvious.

XI. CONCLUSION

442. In summary, it is my opinion that claims 1, 2, and 5-18 of the '332 Patent are obvious in light of the prior art references as discussed above and the knowledge of one of ordinary skill in the art, as described in this Declaration.

443. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code.

Executed this 26th day of July, 2023 in Pittsburgh, PA.



Timothy P. Fletcher

APPENDIX A

Tim P. Fletcher

321 Hallock Street, Pittsburgh, PA 15211 USA; Cell: +1 (412) 952-3755; email: tim.fletcher@onebusinessdesign.com

Summary

Innovator with over 30 years' experience developing and managing the development of a wide variety of products for diverse industries. Proven management success in process development and innovation strategies in both private industry and volunteer-based professional organization. Career long experience working with many different professions in many different countries and cultures.

Professional Experience

President/ Design Thinking Facilitator & Trainer

One BusinessDesign, LLC, Pittsburgh, PA, USA **November 2014 – Present**

- Innovation training and facilitation using Design Thinking methods. Areas include products and services, business model design and organizational change.
- Design patent and trade dress expert witness.
- Design Strategy Advisor - a) Develop culture of design thinking within your organization. b) Develop a highly functioning design department within your organization. c) Improve the quality of output you get from your design consultancies. d) Institutionalize a high level design look and feel across your organization (products, graphics, service and strategy).
- Chief Design & Technology Officer – Revolutionary Electronic Design, LLC (January 2018 to Present) - startup
- Outreach:
  - Advocate and co-author - Industrial Designer's Society of America letter of support for The Counterfeit Goods Seizure Act of 2019 to U.S. Senators.
  - Panelist - *After Hoop, what constitutes design patent inventorship and should it be based on utility patent "conception" principals?* Design Day 2022, Washington DC, October 26, 2022.
  - Webinar Presentation - Visual IP - The Value of Design Patents Trade Dress and Copyright – Catalyst Connection, Pittsburgh, PA, Jan. 16, 2019.
  - Presentation – *Visual Intellectual Property: The Value of Design Patents & Trade Dress*. Design in Plastics conference, Detroit, MI, Nov. 6-8, 2017.
  - Cited in *The Other Side of Patents: What Design Can Gain from Looking Beyond the Lawsuits* by Michael Hages. Design Management Review; Volume 27, Issue 4. pp. 20 - 29.
  - Juror and Presenter – Design Turkey Awards and *Design and Business*, Design Week Turkey, Istanbul, Oct. 18-19, 2016
  - Interview - *Making the Connection: The Importance of Linking Manufacturers with Designers* and *It's All in the JAM*. Made in PA magazine. Winter 2016, Vol 7, Issue 1.
  - Presentation – *Design Matters: Changing Your Business Model By Design*, Pittsburgh Technology Council, Pittsburgh, PA, August 25, 2016
  - Board Member/Secretary - Design House, http://www.designhousechicago.org/, Oct. 2015 to Dec. 2018.
  - Presentation – *Design Patent and Trade Dress Overview*. Meetup, Pittsburgh, PA, July 16, 2015.
  - Participant and Moderator - *Design Your Business: Panel Discussion*. CREATE 2015 Festival, Pittsburgh, PA, June 12, 2015.
  - Presentation – *Design Thinking*. Young Presidents Organization meeting, Orlando, FL, March 25, 2015.
  - Teaching – Career Planning for Integrated Innovators. Carnegie Mellon University. Integrated Innovation Institute. Fall 2015 to 2017 semesters. Business Model Development. Carnegie Mellon University. Integrated Innovation Institute. Fall 2016 semester.

Business Development Manager

Daedalus, Pittsburgh, PA USA **November 2009 to March 2015**

- Responsible for new business sales and marketing for the firm. Employee growth increased by 54%.
- Co-developed and facilitated Design Thinking methods in client projects.
- Strategic planning with clients; including voice of the customer, roadmapping, business model design and idea generation.

Tim P. Fletcher

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- Expert Witness – Design patent and trade dress infringement cases.
- Outreach:
  - Juror and Jury Chairperson – Sichuan-Taiwan Industrial Design Awards, Chengdu, China. Dec. 4, 2013.
  - Interview – *Five Minutes with Tim Fletcher* (article about doing business in China). Pittsburgh Business Times. June 5-21, 2011.
  - Juror – Core 77 Design Awards – Research & Strategy category. Rochester, NY. June 4, 2012
  - Advisory Panel – Pittsburgh Technology Council's Creative Technology Network. March 2011 to Dec. 2012.
  - Juror – Red Star Design Awards, Beijing, China. September 27, 2011.
  - Presentation – *Industrial Design in Commercial Markets*. Sino-US Exchange of Industrial Design, F518 Bao'an District, Shenzhen Creative Industry Association, Shenzhen, China. Sept. 22, 2011.
  - Interview - *College Prowler soars after making switch to business model*. Pittsburgh Business Times August 12-18, 2011.
  - Presentation – *Design Thinking; What it is, What it is not and Why it is important*. LKK Design office (Beijing), ZTE headquarters (Shanghai) May 18 and May 27, 2011, Arriba Software (Pittsburgh, PA) April 17, 2013, Wuxi Design Conference (Wuxi, China) May 25, 2013 and Sichuan-Taiwan Industrial Design Awards (Chengdu, China) Dec. 4, 2013.
  - Teaching – Practicing Design (Professional Practices). Carnegie Mellon University. School of Design. Fall 2010 - 2011 semesters.
  - Presentations & Workshops: *Design Thinking*. Carnegie Mellon University, Engineering, Master's Degree in Engineering and Technology Innovation Management. 2011 and 2013; and Tepper School of Business, Entrepreneurship for High Growth Opportunities class. 2010, 2012 and 2013.
  - Presentations & Workshops: *Idea Generation and User Research*. Carnegie Mellon University, Tepper School of Business, Entrepreneurial Boot Camp. 2010 and 2012.
  - Presentation: *A Sheep in Wolf's Clothing: How to be a Design Thinker in an Analytical World*. IDSA Mideast District Conference. Grand Rapids, MI. April, 31, 2010 and IDSA Southern District Conference. Atlanta. April 21, 2012.

Assistant Professor

The Hong Kong Polytechnic University, School of Design, Hong Kong **August 2006 to November 2009**

- Taught Industrial Design courses for Bachelor level students in Industrial Design and Engineering.
- Developed sales tools to introduce School of Design Research Labs and Centres to US corporations.
- Operations Manager for School of Design Annual (Graduation) Show for 2007 & 2008.
- Consultant on product development management in the University and with external clients.
- Outreach:
  - Presentation - *Design Thinking as a Solution to Strategic Planning* at the following conferences:
    - 2009 Shenzhen Industrial Design Forum. Shenzhen, China. June 14, 2009.
    - 2008 6th China (Wuxi) International Industry Design Expo. Wuxi, China. December 8, 2008.
    - 2008 China International Consumer Electronics Show – Industrial Design Forum. Qingdao, China. July 11, 2008.
    - 2008 First China (Shenzhen) World Industrial Design Forum. Shenzhen, China. May 17, 2008.
  - Interview – Various design topics for ATOP design web site. Shenzhen, China. December 5, 2008.
  - Panel Discussion: *Design*. Education USA-Careers Day. Hong Kong. November 22, 2008.
  - Interview – *Design Expert: Be in China to Assure Quality*. Plastics News; April 22, 2008.
  - Presentation - *Panel Discussion: Appreciating Differences: Teaching International Students*. IDSA Educational Conference. San Francisco, CA, USA. October 20, 2007.
  - Presentation - *We Think Differently; How to Better Communicate with Your Hong Kong/China Partners*. IDSA National Conference. Austin, Texas, USA. September 19, 2006.
  - Moderator (Master of Ceremony) of the Business of Design Week Conference, Hong Kong. 2006, 2007 & 2008.
  - First Round Judge for the Hong Kong Design Centre's *Design for Asia Award* (DFA) 2007.
  - First Round Judge for the *Hong Kong Young Design Talent Awards* 2006.
  - Article – *It's Socrates vs. Confucius*. Plastics News; October 9, 2006.

Tim P. Fletcher

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Director of Design

DAKA Development, Ltd., Hong Kong (Consumer Electronic Company) **September 2005 to April 2006**

- Managed a department of five Industrial Designers and three Graphic Designers.
- Developed company's first Roadmap of new products including launch dates by season and team members by project.
- Developed Industrial Design process guidelines, which improved quality of output.
- Liaised with DAKA Engineering in China and the UK on a daily basis to creatively solve product development issues and maintain schedules.
- Outreach:
  - Presentation: *IP as the Basis of Business for Innovative Companies in Asia*. Danish Patent and Trademark Office. Copenhagen, Denmark. April 26, 2006.
  - Presentation: *Integrating Concepts, Technologies and Design*. HK Design Association's Design Entrepreneur Programme. March 25, 2006.
  - Presentation: *Strategies for Driving New Product Innovation*. Hong Kong Electronic Appliance Manufacturers Association. November 25, 2005.
  - Interview: *Out of the Box*. Hong Kong Trade Development Council. April 10, 2006.
  - Presentations of products to judging panels for design competitions.

Director of Product Development

Elumens Corp., Durham, NC USA (Simulator Product Company) **October 2001 to August 2005**

- Managed the business model change from selling standard product to selling custom solutions from the Product Development aspect.
- Developed concepts and component costs for custom simulator projects for commercial and military applications in US, Europe and Asia. Customers include The Museum of World Religions (Taipei, Taiwan R.O.C.) and US Army 160th SOAR.
- Technical Sales both at Trade Shows and on-site for customers worldwide. Worked to understand customer requirements and communicate how Elumens can meet their needs.
- Developed and maintained a vendor database for components in order to speed up the quoting process for custom projects.
- Researched and tested "off the shelf" materials to reduce costs. An example is finding a suitable Polypropylene for use as a front projection screen that reduced the cost of materials from $60 per square foot to $5 per square foot.
- Reviewed existing product lines for cost and part count reductions. Reduced inventory of Projector Stands by 73%.

Vice President/Partner

Gamil Design, Inc.; Raleigh, NC USA (Design Consulting Firm) **June 1998 to March 2001**

- Managed new product development from initial concept sketches through manufacturing for a variety of clients.
- Shared the duties of Office Management, Sales and Marketing of the firm. Brought in new clients located in US, Asia and Europe. Raised International projects from 30% to 50% of total business.
- Co-developed highly detailed quoting, project timeline and customer requirements documentation.
- Designed and developed Sporting Goods, Infant Products, Electronic Equipment and Packaging.
- Outreach:
  - Teaching - Materials and Processes for the Industrial Design program. NC State University College of Design. Spring 1999 semester.

Manager of Product Development – Feeding Division

Evenflo Company, Inc., Piqua, OH USA (Infant Products) **March 1996 to May 1998**

Tim P. Fletcher

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- Designed and developed 7 lines of new products from initial concepts to production. Created timelines, evaluated international and domestic vendors and communicated with all departments as well as vendors. Managed 50 new Disney licensed products into the product line in one year.
- Hired and managed one direct report. Managed projects with 2-4 outside design consultancies a year.
- Developed and managed a $750K department budget.
- Utilized research being conducted by universities, independent researchers and internal R&D staff in the areas of child development.
- Evaluated concepts from outside sources for inclusion in product lines.
- Developed ISO 9001 procedures for product development, in a team environment. Served as an ISO internal auditor.
- Brought ProE CAD system into the department.

Industrial Designer

Roadmaster, Inc.; Opelika, AL USA (Exercise Equipment) **October 1995 to March 1996**

- Designed and developed a new line of higher end treadmills.

Industrial Designer

Performance, Inc.; Carrboro, NC USA (Bicycle Catalog) **October 1994 to October 1995**

- Designed and developed new Bicycle Accessories, such as tire pumps, automobile rack systems, and water bottle cages as well as packaging structures.
- Managed product development schedules based on introduction in five catalogs per year.

Senior Product Development Specialist – International Division

Gerber Products Company; Fremont, MI USA (Infant Products) **August 1991 to September 1994**

- Designed and developed new infant feeding products from concept to production for both International and Domestic Markets.
- Managed the flow of information regarding new products between manufacturing, product supply and marketing to produce a complete product in a timely manner.
- Evaluated International and Domestic manufacturers.

Design Coordinator

Stahlwood Mfg. Co., Inc.; Youngsville, NC USA (Infant Products) **July 1989 to December 1990**

- Designed new infant products.
- Managed timelines and international and domestic vendor communication.

Professional Development

US Government Liaison Officer (appointed position)

Industrial Designers Society of America (IDSA) May 2011 to July 2014

- Research US Government for mutually beneficial design connections and build relationships.
- Work with IDSA National Staff to build programs with the US Government.

International Liaison Officer - Asia (appointed position)

Industrial Design Society of America (IDSA) January 2007 to November 2009

- Wrote newly approved IDSA By-Laws to allow for and manage International Chapters.
- Worked with stakeholders to begin the IDSA China Chapter. The first chapter outside of North America.

Tim P. Fletcher

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- Built relationships and mutually beneficial collaborations between IDSA and Asian design organizations. Including: Promotion of IDEA awards competition to Chinese firms and Design-centered US trips for Chinese manufacturers and brands.
- Interview - *Made In China: IDSA Launches First Asian Chapter*. Design Perspectives. Nov/Dec 2009.
- Interview - Various design topics for the Culture Talk show on CCTV-3. Beijing, China. November 7, 2009.
- Interview - *Industrial design group begins vote to add China chapter*. Plastics News. October 7, 2008.

Chapter VP (elected position)
Industrial Design Society of America (IDSA) January 2005 to December 2006

- Developed management training and seminars for the 28 Chapters in the US and Canada.
- Set up and moderated two Chapter Council meetings per year. The Chapter Council acts as a legislative body that develops policies from the grass roots to be presented to the Board.
- As an IDSA Board Member, I work in a team environment to develop policies for the entire organization.

Southern District VP (elected position)
Industrial Design Society of America (IDSA) January 2003 to December 2004

- Developed management training and seminars for the five Chapter Chairs, covering the states of NC, SC, GA, FL, TN, AL, MS, LA & TX. Through this training and a constant mentorship we have been able to create a very strong IDSA brand in the South.
- Developed and implemented two (2) IDSA Southern District Conferences with an average budget of $65,000. Duties included developing the conference theme, appointing volunteers to manage areas such as Graphics, Web Site, Treasury, etc. Secured sponsors that contributed $20,000 to the total budget. Searched and coordinated with an average of 17 speakers per conference.

Carolina Chapter Chair (elected position)
Industrial Design Society of America (IDSA) January 1999 to December 2002

- Managed events and information transfer for the Members in North and South Carolina. Events included a first ever exhibit of the entire Industrial Design process at the Mint Museum of Craft + Design in Charlotte, NC.
- Worked with individual Members to solve IDSA issues and other professional needs.
- As a result membership increased from 78 to 108 members.
- Organized The Designers Life Process' Presentations - a separate "conference within the conference" with presentations and discussions on issues that affect all designers during their professional life, such as unemployment, retiring, changing from profession to teaching and starting your own business. IDSA Southern District Conference 2002.
- Interview - *Fun and Function-Consumer Design Redefines High Style*. Tuscaloosa News. June 25 2000.

Computer Experience

Business – Word, Excel, Project, Access, PowerPoint. Freemind.
Design – Pro Engineer, Rhino, Fusion 360, Illustrator, and Corel Draw.

Travel Experience

Professional: Hong Kong/China, Japan, Northern Ireland, South Korea, Sweden, Switzerland, Taiwan (R.O.C.), Thailand, UK, and extensive US travel.

Personal: Australia, Austria, Belize, British Virgin Islands, Cambodia, Canada, China, Costa Rica, Cuba, Czech Republic, Dominican Republic, Ecuador/Galapagos Islands, Germany, Ghana, Greece, Hungary, India, Italy, Lichtenstein, Lithuania, Malaysia(Borneo), Malta, Mexico, Nicaragua, Northern Cyprus, Panama, Peru, Philippines, Sri Lanka, Switzerland, Thailand, Turkey, UAE, Vietnam, Yugoslavia(1988) and extensive US travel.

Tim P. Fletcher

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Patents

US Design patents – 14; Utility patents – 3. **Europe** Utility patents – 1. **Australia** Utility Patent – 1. **WIPO** Utility patents - 2

Education

IDSA Continuing Education Seminar – How to Serve as an Expert Witness in Design Patent Litigation, April 2015
Masters of Design – Advanced Strategies, Hong Kong Polytechnic University, Kowloon, Hong Kong, November 2008
Bachelor of Environmental Design in Product Design, North Carolina State University, Raleigh, NC, July 1989

Memberships

Industrial Design Society of America (IDSA) 1989 to Present
Intellectual Property Owners Association (IPO) 2017 to Present
The Design Thinking Association – 2020 to Present
Product Development and Management Association (PDMA) 2011 to 2015
Hong Kong Designers Association 2006 to 2009
Design Management Institute 2008 to 2011

Honors

Inducted into the Academy of Fellows, Industrial Designers Society of America, September 2009

Tim P Fletcher's Expert Witness Cases - Complete List

Date	Case Name (underlined notes my client)	Case Number	Client IP Owner	Report	Depo.	Markman Case	Trial/ Hearing	Firms & Attorneys
2023	A&A Global Imports, Inc. v. Lerman Container Corporation (Design Patent)	Inter Parties Review No. : N/A		Yes	No	N/A	No	Petitioner: Blank Rome, LLP (Dipu Doshi and Jonathan England)
2023	Shenzhenshi Borunxing Wujin You Xian Gong Si v. The Individuals, Partnerships and Unincorporated Associations Identified on Schedule A (Design Patent)	United States District Court for the Northern District of Illinois, Eastern Division, Civ. A. No. 23-cv-01946	X	Yes	No	No	No	Plaintiff - Glacier Law, LLP (Wei Wang, Ruoting Men, Tao Liu) Defendant - AU LLC (Adam E. Urbanczyk)
2023	Siddhi, LLC.v. OPS Labs, LLC. (Utility Patent)	American Arbitration Association AAA Case Number - 01-22-0002-2881	**X**	Yes	No	N/A	No	Claimant: Ward & Smith, P.A. (Joseph A. Shouten), Respondent: Gravis Law, PLLC (Paul H. Beattie)
2022	Hydrow, Inc.v. iFit Health & Fitness, Inc. (Design Patent and Trade Dress)	United States District Court for the District of Delaware, Case, No.1:22-cv-00195-CFC	**X**	Yes	No	N/A	No	Plaintiff: Burns & Levinson LLP (Howard J. Susser & Christopher S. Schultz)
2022	Glam and Glits Nail Design, Inc.vs. IGEL Beauty. LLC, et al (Design Patent)	United States District Court for the Central District of California, Southern Division, Case, No.8:20-cv-88-JVS (DFMx)	**X**	Yes	Yes	N/A	TBD	Plaintiff: Lapple Ubell IP Law, LLP - Matthew C. Lapple Defense: Fox Rothchild, LLP - John Shaeffer
2021	Gentex Corporation v. Galvion Ltd., and Galvion, Inc. (Design Patent)	United States District Court for the District of Delaware, Case, No. 1:19-cv-00921-MN	**X**	Yes	Yes	N/A	No	Plaintiff: Morgan, Lewis & Bockius LLP - Scott D. Sherwin Defense: Shaw Keller LLP, Jason W. Balich
2021	Munchkin, Inc. v TOMY International, Inc. (Utility Patent & Design Patent)	United States District Court for the Northern District of Illinois, Eastern Division, Case, No. 1:18-cv-6337	**X**	Yes	Yes	N/A	TBD	Plaintiff: Lathrop GPM LLP - Luke Meriwether Defense: Husch Blackwell LLP - Thomas P. Heneghan
2021	Think Green Limited d/b/a Haakaa, v. Medela AG and Medela LLC (Design Patent & Trade Dress)	United States District Court for the Northern District of Illinois, Eastern Division Case, No. 1:21-CV-05445	**X**	Yes	Yes	N/A	Yes	Plaintiff: Dunlap Bennett & Ludwig PLLC - Robert P. Greenspoon Defense: Marshall, Gerstein & Borun LLP - Michael R. Weiner
2021	J.R. Simplot Company v. McCain Foods USA, Inc. (Design Patent)	United States District Court, District of Idaho, Case No. 1:16-cv-00449-DCN	**X**	Yes	Yes	N/A	TBD	Plaintiff: Parsons Behle & Latimer - Christopher Cuneo Defense: Jones Day - John C. Evans
2021	Ideavillage Products Corp, v. Koninklijke Philips N.V. (Design Patent)	Ex Parte Reexamination, Case: PGR2021-00116		Yes	No	N/A	No	Petitioner: Delarosa and Associates - Emil Braca and McAndrews, Held & Malloy, Ltd. - Chris Carani
2021	Certain Batteries and Products Containing Same - for Complainants (Design Patent)	US International Trade Commission Investigation No. 337-TA-1244	**X**	Yes	No	N/A	N/A	Complainant: Morgan, Lewis & Bockius LLP - Ehsun Forghany
2021	Certain Percussive Massage Devices - for certain Respondents (Design Patent)	US International Trade Commission Investigation No. 337-TA-1206		Yes	Yes	N/A	N/A	Complainant: Lewis Brisbois Bisgaard & Smith LLP - Joshua Curry Respondents: Dentons US LLP - Benjamin Harbuck
2020	J.R. Simplot Company/Simplot Canada (II) Limited - and - McCain Foods Limited (Industrial Design Registration)	Federal Court of Canada, Court File No. T-569-17	**X**	Yes	N/A	N/A	No	Plaintiff: Smart & Biggar - Daniel Hnatchuk Defense: Norton Rose Fulbright Canada LLP/ Jones Day
2020	Golden Eye Media USA, Inc. v. Trolley Bags UK, Ltd and Berghoff International, Inc. (Design Patent)	United States District Court, Southern District of California, Civ. A. No. 3:18-cv-02109-BEN-LL		Yes	Yes	N/A	No	Plaintiff: Insight, LLP. - Cody LeJeune Defense: Honigman LLP, Matthew Mrkonic
2020	Simplehuman, LLC, v. Itouchless Housewares and Products, Inc. (Trade Dress)	United States District Court, Central District of California, Civ. A. No. 2:19-cv-02351-MWF		Yes	Yes	N/A	No	Plaintiff: Knobbe, Martens, Olson & Bear, LLP. - William Adams Defense: Foley & Lardner LLP - Victor de Gyarfas
2019	Good L Corporation v. Fasteners for Retail, Inc. d/b/a FFR Merchandising (Trade Dress)	US District Court, Middle District of Tennessee, Civil Action No. 3:18-cv-000489	**X**	Yes	Yes	N/A	No	Plaintiff: Patterson Intellectual Property Law, P.C. - Scott Douglass Defense: Honigman LLP - Mary Hyde
2019	Zuru, LLC (Petitioner) v. LEGO (Patent Owner) (Design Patent)	Ex Parte Reexamination, Ctrl. No. 90/014,339		Yes	N/A	N/A	N/A	Petitioner: Dentons US LLP - Kevin Greenleaf
2018	Pavo Solutions, LLC v. Kingston Technology Company, INC., (Utility Patent)	US District Court of Central California, Civil Action No. 8:14-cv-01352-JLS-KES		Yes	Yes	Yes	No	Plaintiff: Russ August & Kabat - Minna Y. Chan Defense: Fish & Richardson - Maria Elena Stiteler
2018	AJB Enterprises, LLC, v. Backjoy Orthotics, LLC, (Trade Dress)	US District Court of Connecticut, Civil Action No. 3:16-cv-00758 (VAB)		Yes	Yes	N/A	No	Plaintiff: Handal & Morofsky - Anthony Handal Defense: Perkins Coie LLP - Jonathan Goddard & William Rava
2018	Shenzhen Kean Silicone Product CO., LTD (Petitioner) v. PKOH NYC, LLC (Patent Owner) (Utility Patent)	Inter Parties Review No. IPR2017-01327	**X**	Yes	No	No	No	Petitioner: Stratum Law LLC - Xiyan Zhang Patent Owner: Sills Cummis & Gross P.C. - Scott Stimpson & Tod M. Melgar
2012	Luv N' Care Ltd. et al. v. Mayborn USA, Inc. (Design Patent)	U.S. District Court, Southern District of New York, Civil Action No. 11-2460		Yes	Yes	No	No	Plaintiff: Goldberg & Cohen - Morris Cohen & Lee Goldberg Defense: Alston and Bird - James Grant & Elizabeth Helmer
2011	Luv N' Care Ltd. et al. v. Jackel International , Ltd. et al (Design Patent & Trade Dress)	State of Louisiana Parish of Quachita 4th Judicial District Court, Case No. 10-1891		Yes	Yes	No	No	Plaintiff: Goldberg & Cohen - Morris Cohen & Lee Goldberg Defense: Alston and Bird - James Grant & Elizabeth Helmer

APPENDIX B

What is Industrial Design? (/what-is-industrial-design)



Industrial Design Defined

Industrial design (ID) is the professional service of creating and developing concepts and specifications that optimize the function, value and appearance of products and systems for the mutual benefit of both user and manufacturer.

Industrial designers develop these concepts and specifications through collection, analysis and synthesis of data guided by the special requirements of the client or manufacturer. They are trained to prepare clear and concise recommendations through drawings, models and verbal descriptions.

Industrial design services are often provided within the context of cooperative working relationships with other members of a development group. Typical groups include management, marketing, engineering and manufacturing specialists. The industrial designer expresses concepts that embody all relevant design criteria determined by the group.

The industrial designer's unique contribution places emphasis on those aspects of the product or system that relate most directly to human characteristics, needs and interests. This contribution requires specialized understanding of visual, tactile, safety and convenience criteria, with concern for the user. Education and experience in anticipating psychological, physiological and sociological factors that influence and are perceived by the user are essential industrial design resources.

Industrial designers also maintain a practical concern for technical processes and requirements for manufacture; marketing opportunities and economic constraints; and distribution sales and servicing processes. They work to ensure that design recommendations use materials and technology effectively, and comply with all legal and regulatory requirements.

In addition to supplying concepts for products and systems, industrial designers are often retained for consultation on a variety of problems that have to do with a client's image. Such assignments include product and organization identity systems, development of communication systems, interior space planning and exhibit design, advertising devices and packaging and other related services. Their expertise is sought in a wide variety of administrative arenas to assist in developing industrial standards, regulatory guidelines and quality control procedures to improve manufacturing operations and products.

Industrial designers, as professionals, are guided by their awareness of obligations to fulfill contractual responsibilities to clients, protect the public safety, respect the environment and observe ethical business practices.

Related articles:

Now that you have an idea of what Industrial Design is why not explore some more?

Go to the IDSA Design of the Decade Gallery to see what products won the Design of the Decade award this year and how design contributes to business and society by clicking here. (http://www.idsa.org/dod)

Every year the IDSA runs an award to promote the development of design excellence. This award, the International Design Excellence Award (IDEA) is juried by an independent international group of well recognized designers who work with a set of criteria that have been developed over the 30 years that the IDEA has been running. These criteria are not static because design is not static, it is a young developing profession and as the world changes and requires designers to produce more responsible and more sustainable products so the criteria for excellence shift to reflect these changes in expectations. To see the products that have been awarded over the past 10 years click here. (http://www.idsa.org/Awards)

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