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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TROVE BRANDS, LLC

Petitioner

v.

CAMELBAK PRODUCTS, LLC

Patent Owner

IPR2024-01137

Patent

10,676,255

**DECLARATION OF GLENN E. VALLEE, PH.D.
IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 10,676,255**

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1. I, Glenn Vallee, Ph.D., am making this declaration at the request of Trove Brands (“Petitioner”) in support of its Petition for *Inter Partes* Review (“IPR”) of U.S. Patent No. 10,676,255 (“the ’255 patent”). I understand that this declaration will be submitted as Exhibit 1003 to the IPR petition.

2. I am being compensated at my customary hourly rate for my work in this matter, and I am being reimbursed at cost for my reasonable expenses. My compensation does not depend in any way on the outcome of this proceeding. I have no financial interest in any of the parties to this proceeding.

3. In conducting the analysis and forming the opinions set forth in this Declaration, I considered, in addition to my knowledge and expertise in the relevant field, the following materials, which I understand will be submitted as Exhibits to the IPR petition:

Exhibit No.	Description
1001	U.S. Patent No. 10,676,255 (“the ’255 patent”)
1002	Ex Parte Reexamination Certificate No. 10,676,255 C1
1004	Certified English Translation of Japanese Patent Publication No. 2002-211613 (“Nakajima”)
1005	U.S. Patent No. 6,070,767 (“Gardner”)
1006	Certified English Translation of International Publication No. WO 2004/063042 (“Ribarits”)
1007	U.S. Patent No. 4,485,963 (“Panicci”)

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Exhibit No.	Description
1008	U.S. Patent No. 5,203,468 (“Hsu”)
1009	Certified English Translation of Korean Patent Publication No. KR 200282506 Y1 (“Park”)
1010	U.S. Patent No. 6,523,711 (“Hughes”)
1011	Excerpts of the File History of the ’255 Patent
1012	Excerpts of the Reexamination of the ’255 Patent
1013	CamelBak Infringement Contentions for the ’255 patent dated December 21, 2023, in <i>Trove Brands, LLC v. CamelBak Products, LLC, et al.</i> , No. 5:23-cv-04267-PCP (N.D. Cal. Feb. 14, 2024)
1014	Order Setting Case Schedule in <i>Trove Brands, LLC v. CamelBak Products, LLC, et al.</i> , No. 5:23-cv-04267-PCP (N.D. Cal. Feb. 14, 2024)

4. I have also reviewed and considered the U.S. Patent & Trademark Office’s file history of the ’255 patent and the reexamination of the ’255 patent. Exhibits 1011 and 1012 are excerpts of the ’255 patent file history and reexamination.

I. BACKGROUND

A. Professional Background

5. I am employed by Western New England University as an Associate Professor and Chair of Mechanical Engineering. My background is in the areas of mechanical engineering, design, product development, and quality assurance. I have a Ph.D. in Mechanical Engineering from the University of Rhode Island and my Ph.D. dissertation research focused on the use of elastomeric materials in pneumatic nailers. I teach courses in Mechanical Design, Kinematics, Vibrations, Mechanics of Materials, and a Product Development and Innovation (PDI) course where students design consumer products having commercial potential. Six utility patents have been filed for student inventions developed in the course. I have also served as the faculty advisor to over 100 capstone senior design projects, many of which deal with fluid flow and methods of sealing. In fact, I was retained by a local inventor to serve as an advisor to a project involving the development of a novel two-part beverage bottle. Many other capstone projects dealt with fluid containment and methods of sealing, such as the design of a bicycle driven water purification system, the development of a deflation proof air mattress, the design of a recoil reduction device for pneumatic nailers, the development of a drive piston retaining device in pneumatic nailers, and the development of a biodiesel fuel generation system.

6. I also teach undergraduate engineers how to design products used to contain fluids which require methods of sealing, and I teach laboratory courses where students utilize a variety of electrical transducers and data acquisition systems. I also serve as a consultant in the areas of mechanical engineering design, product development, numerical stress analysis, and mechanical testing, as well as serving as a technical expert in product liability litigation. I am a member of the American Society of Mechanical Engineers (ASME member no. 1259837), and I am a licensed Professional Engineer (RI Lic. No. 6765).

7. As set forth in more detail in my curriculum vitae (Appendix A), I have substantial expertise in the areas of mechanical engineering, consumer product design and development, quality assurance, mechanical testing, and the design of a wide variety of products utilizing fluid flow and sealing components. Prior to joining Western New England University, I served as the Director of Engineering and Quality Assurance, Worldwide for the Remington Products Company, L.L.C., in Bridgeport, CT, from 1997 until 2002. Remington Products Company is a major manufacturer of consumer products, including electric shavers, beard trimmers, and hair dryers. My responsibilities included directing the activities of Design and Product Engineering, Quality Assurance, and Manufacturing departments in the U.S., U.K., and Asia, responsible for the design and development of international

consumer products, and for focusing new product engineering toward continuously improving customer satisfaction through improved product design, performance, and quality.

8. Prior to my employment at Remington Products, I served as the Manager of the Engineering Laboratories at the Stanley Bostitch Company, now a division of Stanley/Black & Decker. Stanley Bostitch is a leading manufacturer of pneumatic nailers and staplers, a variety of hand tools such as hammer tackers and staplers, and a number of other office products. I was employed by Stanley Bostitch from 1985 until 1997, serving first as a Technician, then Test Engineer, then Product Design/Development Engineer, and was promoted to Manager of the Engineering Laboratories in 1995. During my employment at Stanley Bostitch, I acquired extensive experience in the design and testing of a variety of mechanical, pneumatic and electromechanical products, including pneumatic fastening tools, electric trackers and staplers, and electric pencil sharpeners. My work as a Technician and then Test Engineer allowed me to acquire experience in conducting and developing test methodologies for all products. My work as a Product Design/Development Engineer involved designing and developing products from conception through manufacture and quality control, most of which required the design of fluid containment systems and methods of sealing. As the Manager of the Engineering

Laboratories, I managed the largest of the Engineering Laboratories in Stanley Works and supervised 18 employees. This position required that I coordinate testing and allocate resources to meet stringent scheduling requirements of the Product Development, Manufacturing, and Marketing departments.

9. I am an inventor on nine patents, some of which involve fluid flow and methods of sealing in products such as pneumatic nailers and a bicycle driven water purification device. Other patented devices are related to hand tools, electrical and surgical devices. I have reviewed many patents as I worked with patent attorneys to file the patent applications discussed above. I have given deposition testimony eight times and I have testified in court four times, each such instance related to product liability litigation where I testified as a technical expert. I have also given deposition testimony in cases involving a Petition for Inter Partes Review (“IPR”) for patents related to hole saws, accessories for mobile phones, hoverboards, and cases involving patent infringement and/or non-infringement related to products requiring the containment of fluids such as pneumatic and gas spring-powered nailers, e-cigarettes, and air mattresses with embedded air pumps. Other products for which I was retained as a technical expert include beveling miter saws, and a number of consumer products, including spring-loaded desktop staplers and toy car and track systems.

10. Appendix A to this declaration is a copy of my curriculum vitae, which further expands on my qualifications and expertise and includes a list of my publications and prior testimony.

B. Relevant Legal Standards

11. I have been asked to provide my opinion as to whether certain claims of the '255 patent were anticipated by the prior art and/or would have been obvious to a person of ordinary skill in the art at the time of the claimed invention—which I will refer to as a “person of skill in the art” or “one skilled in the art” throughout this declaration—in view of the prior art.

12. I am an engineer, a scientist, and an academic by training and profession. My opinions in this declaration come from applying my technical education, knowledge, training, and experience to evaluate certain prior art with respect to the '255 patent.

13. While I have experience acting as an expert in patent proceedings, I am not a lawyer or expert in patent law. Therefore, Trove Brands' attorneys from Knobbe, Martens, Olson & Bear, LLP advised me as to the legal principles to be applied in this case. The following paragraphs express my understanding of how I must apply these principles in forming my opinions.

1. Claim Construction

14. I understand that, in assessing the patentability of a patent claim, the language of the claim generally should be given its plain and ordinary meaning as would be understood by a person having ordinary skill in the art at the time of the patented invention consistent with the patent specification and prosecution history.

2. Anticipation

15. I understand that a claim is “anticipated” by an item of prior art if the prior art describes, either expressly or inherently, each and every limitation of the claim.

16. I understand that the description of the invention in the anticipating prior art must be recognizable to one skilled in the art at the time of the invention, such that the prior art described the invention in such terms that one skilled in the art could make and use the claimed invention.

17. I understand that the prior art inherently teaches a limitation if that limitation necessarily flows from the disclosure of the prior art. I understand that the fact that a certain result or characteristic *may be* present in the prior art is not sufficient to establish inherency. If the result or characteristic is necessarily present based upon the explicit disclosure in the prior art, it is inherent in the prior art and is therefore disclosed.

3. Obviousness

18. I understand that a claim is “obvious” if the subject matter of the claim as a whole would have been obvious to one skilled in the art at the time of the claimed invention. I understand that a determination of obviousness takes into account the scope and content of the prior art, the differences between the claimed subject matter and the prior art, and the level of ordinary skill in the art at the time of the invention. I understand that an obviousness analysis also considers whether there are additional factors that would indicate that the invention would not have been obvious. Such factors include whether the invention satisfied a long-felt need in the industry; whether the invention produced any unexpected results; whether the invention was met with skepticism by those in the relevant field; whether the prior art taught away from the invention; whether the invention was a commercial success; and whether the invention was praised or copied by others.

19. I understand that, in determining the scope and content of the prior art, a reference is considered analogous (i.e., appropriate) prior art if: (1) it falls within the field of the inventor’s endeavor; or (2) it is reasonably pertinent to the particular problem the inventor was involved with. I have been informed that a reference is reasonably pertinent if it logically would have commended itself to an inventor’s attention in considering the problem—put another way, if one skilled in the art would

reasonably have consulted those references and applied their teachings in seeking a solution to the problem that the inventor was attempting to solve. I understand that, if a reference relates to the same problem as the claimed invention, that supports use of the reference as prior art in an obviousness analysis.

20. I understand that, to assess the differences between prior art and the claimed subject matter, the claimed invention is to be considered as a whole, such that one skilled in the art at the time of invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the elements from the prior art and combined them in the claimed manner.

21. I understand that the Supreme Court has recognized several rationales for combining references or modifying a reference to show obviousness of claimed subject matter, including:

- combining prior art elements according to known methods to yield predictable results;
- simple substitution of one known element for another to obtain predictable results;
- a predictable use of prior art elements according to their established functions;
- applying a known technique to a known device (method or product) ready for improvement to yield predictable results;

- choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; and
- some teaching, suggestion, or motivation in the prior art that would have led one skilled in the art to modify the prior art reference or to combine the prior art reference teachings to arrive at the claimed invention.

22. I understand that the obviousness analysis is performed from the perspective of one skilled in the art at the time of the patented invention. To avoid using impermissible hindsight in my analysis, I have not used the claims of the patent as a road map for obviousness.

C. Person Having Ordinary Skill in the Art

23. I understand that when interpreting the claims of the '255 patent and evaluating the prior art, I must do so based on the perspective of a person having ordinary skill in the art at the relevant priority date of the '255 patent. I have been asked to assume that the priority date for claims 1-8, 10, 11, 13-23 is April 11, 2005, and the priority date for claims 9 and 12 is December 20, 2005. However, my opinions, including as to the qualifications of one skilled in the art, do not change depending on which of the two dates are used. I have been informed that all of the references relied upon in this declaration qualify as prior art under either priority date.

24. I understand that the person of skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. I understand it is a person of ordinary creativity and is not an automaton.

25. I understand that, in determining the level of ordinary skill in the art, several factors are considered, including: the type of problems encountered in the art; prior art solutions to those problems; the rapidity with which innovations are made; the sophistication of the technology; and the educational level of active workers in the field. I understand that one skilled in the art must be capable of understanding the scientific and engineering principles applicable to the pertinent art.

26. The '255 patent describes the use of well-known technologies for designing reusable, portable drink containers. Based on my review of the '255 patent, it is my opinion that one skilled in the art would have had an undergraduate degree in mechanical engineering or equivalent coursework, as well as one or more years of experience in designing, prototyping, and/or manufacturing fluid containers or similar products. More work experience may substitute for less education, and vice versa.

27. It is my opinion that the above definition of one skilled in the art is not necessary to reach the same opinions I have in this declaration. I believe that under

any reasonable definition for one skilled in the art, the claims would be anticipated and/or obvious from the perspective of one skilled in the art at the time of the alleged invention.

28. I have based my opinions on the qualifications of one of skill in the art on my review of the '255 patent, the relevant prior art, and my experience. In the early 2000s, I was familiar with design principles common in the mechanical arts. I frequently worked with and supervised engineering students and junior engineers who had the requisite knowledge and experience to make and use the articles described in the '255 patent. Based on my experience and knowledge, I believe that people of the above-defined level of education and skill would have the capability to interpret and understand the invention claimed in the '255 patent and the scientific and engineering principles applicable to the pertinent art.

II. THE '255 PATENT

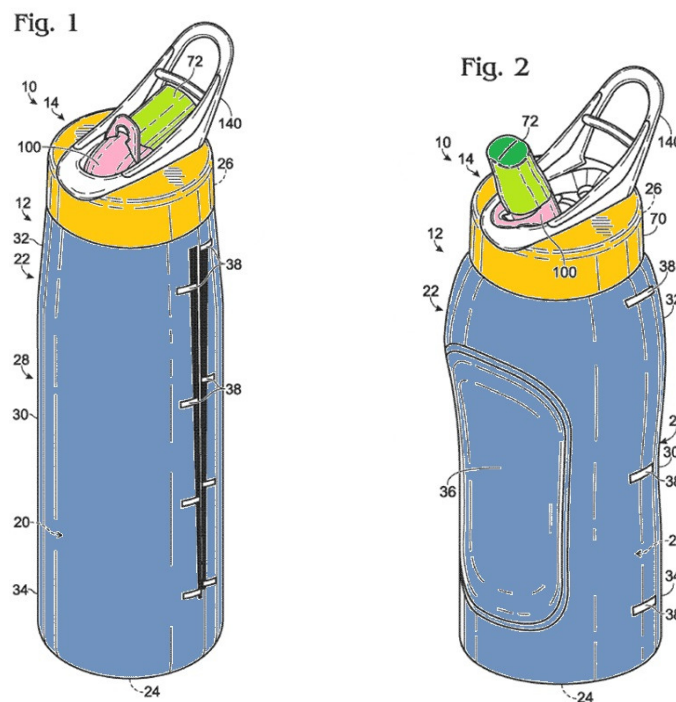
A. Overview of the '255 patent

29. The '255 patent is titled, “Drink Bottles,” and discloses “drink containers with cap assemblies” that include “drink spout[s]” that are “pivotally coupled to a base of the cap assembly.” Ex. 1001, Abstract. In some embodiments, the drink spouts include “a self-sealing and/or bite-actuated mouthpiece” and “a manual on/off valve to selectively restrict flow of drink fluid from the drink

container regardless of the drink spout's and/or mouthpiece's configuration.” Ex. 1001, Abstract. Below I provide a brief summary of the specification, figures, and claims of the '255 patent.

1. Specification and Figures

30. Exemplary embodiments of the drink containers and cap assemblies disclosed in the '255 patent are shown in Figures 1 and 2, which I have reproduced below with coloring added¹:



Ex. 1001, Figs. 1, 2. Figure 1 shows the cap assembly wherein the mouthpiece is pivoted to a closed configuration. Figure 2, by contrast, shows the cap assembly

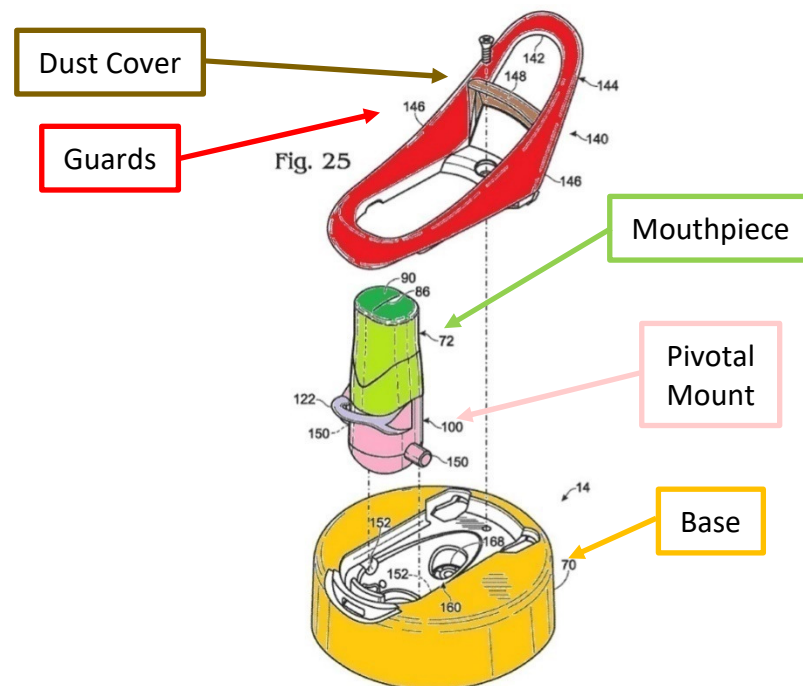
¹ Throughout this declaration, I have added coloring and annotations to otherwise black and white patent figures to improve clarity and understanding.

wherein the mouthpiece is pivoted to an open configuration. According to the '255 patent:

In FIG. 2, the cap assembly is shown with the mount in a dispensing configuration in which the mouthpiece is oriented in a suitable position from which a user may draw drink fluid from the drink bottle through mouthpiece 72 ... In FIG. 1, the illustrative example of a cap assembly 14 is shown with the mount in a stowed configuration, in which the mouthpiece is positioned closer to the base of the cap than in the dispensing configuration, with the stowed configuration typically corresponding to an orientation in which the mouthpiece is not suitably positioned for a user to bite upon the mouthpiece to configure the mouthpiece to a dispensing configuration.

Ex. 1001, 3:21-34.

31. Figure 25 shows an exploded isometric view of the exemplary cap assembly shown in Figures 1 and 2:



Ex. 1001, Fig. 25. Figure 25 depicts “a suitable pivotal mounting mechanism for mount 100,” which pivots along an axis defined by “lateral projections 150 that are received into sockets 152” located in the “base 70” of the cap assembly. Ex. 1001, 16:57-61. According to the ’255 patent:

The projections are rotatable within the sockets, and thereby function as rotatable supports, or axles, upon which the mount and any attached mouthpiece may be pivotally moved relative to the base of the cap assembly, such as between stowed and dispensing configurations

Ex. 1001, 16:61-67.

32. Although the patent figures, including Figure 25, depict “suitable configurations for bite-actuated, self-sealing mouthpieces 72” for use with the disclosed drink containers (Ex. 1001, 9:32-35), the specification identifies several prior art patents that provide further “illustrative examples of suitable bite-actuated mouthpieces” that may be used, including U.S. Patent Nos. 6,070,767 and 6,032,831. As discussed in more detail below, U.S. Patent Nos. 6,070,767 is among the prior art references that I rely on to support my opinions that the ’255 patent is obvious over the prior art.

33. As shown above, Figure 25 also depicts an embodiment of the cap assembly that includes a pair of lateral guards and a dust cover to protect the mouthpiece when in the stowed configuration. As the ’255 patent explains:

In the illustrated example, handle 140 provides a pair of lateral guards 146 that extend on opposing sides of the mouthpiece, as well as a dispensing face guard, or cover, 148 that is adapted to protect the dispensing face of the bite-actuated mouthpiece when the mouthpiece is in its stowed configuration. For example, guard 148 may provide a form of dust cover that protects the dispensing face, and thus the slit of other opening formed therein, from being contacted by dirt, grime, and other substances when the mouthpiece is in the stowed configuration.

Ex. 1001, 17:8-18.

34. The '255 patent also discloses various mechanisms that can serve as a manual on/off valve in the disclosed cap assemblies. One such mechanism is shown in Figures 28 and 29, wherein “the on/off valve includes a flexible tube, or conduit 124” that “collapses or otherwise compresses or crimps” in the stowed configuration, “thereby preventing the flow of drink fluid from the container, through the fluid conduit, and out of the mouthpiece, regardless of the configuration of the mouthpiece.” Ex. 1001, 18:20-30.

2. Claims

35. The '255 patent includes 23 claims. Of these, claims 1 and 20 are the only independent claims. I understand that a claim that depends from another claim includes all the limitations of the claim from which it depends and the additional limitations of that dependent claim.

36. Independent claim 1 of the '255 patent, as amended during reexamination, is set forth below (with bracketed labels added for reference and the

main elements of the drink container bolded):

Claim 5	
Preamble	A drink container, comprising:
1[a]	a fluid container having a neck with an opening and having an internal compartment sized to hold a volume of potable drink fluid;
1[b]	a cap assembly removably coupled to the fluid container to cover the opening, wherein the cap assembly defines a fluid conduit for drink fluid to flow from the fluid container and through the cap assembly to a user, wherein the fluid conduit includes an inlet through which drink fluid from the fluid container may enter the fluid conduit, and a dispensing outlet through which drink fluid in the fluid conduit may be dispensed from the cap assembly to a user, and further wherein the cap assembly comprises:
1[b][1]	a cap assembly base removably coupled to the neck of the fluid container, wherein the cap assembly base is configured to be selectively and repeatedly decoupled from and re-coupled to the neck of the fluid container;
1[b][2]	a pivotal mount coupled to the cap assembly base for pivotal movement relative to the cap assembly base, the pivotal mount comprising a mount outlet, wherein the pivotal mount includes a pair of lateral projections, wherein the cap assembly base defines a pair of sockets into which the pair of lateral projections extend;
1[b][3]	a resilient mouthpiece engaged with the mount outlet and removably coupled to the pivotal mount for pivotal movement with the pivotal mount relative to the cap assembly base,

Claim 5	
1[b][3][i]	wherein the resilient mouthpiece is pivotal about an axis defined by the pair of lateral projections as the pair of lateral projections rotate within the pair of sockets;
1[b][3][ii]	wherein the resilient mouthpiece defines a portion of the fluid conduit, including the dispensing outlet;
1[b][3][iii]	wherein the resilient mouthpiece and the pivotal mount are configured to be selectively pivoted between a stowed position and a dispensing position, and further in the dispensing position, the dispensing outlet is positioned further away from the cap assembly base than when the resilient mouthpiece and the pivotal mount are in the stowed position
1[b][3][iv]	wherein the resilient mouthpiece is adapted to resiliently compress responsive to compressive forces applied to the resilient mouthpiece by a user's teeth; and
1[b][4]	a manual on/off valve having a closed configuration, in which the manual on/off valve obstructs the fluid conduit to restrict drink fluid from flowing between the inlet and the dispensing outlet, and an open configuration, in which the manual on/off valve permits drink fluid to flow through the fluid conduit from the inlet to the dispensing outlet;
1[b][4][i]	wherein the manual on/off valve includes a flexible tube that defines a portion of the fluid conduit;
1[b][4][ii]	wherein when the manual on/off valve is in the closed configuration, the tube is crimped to obstruct the flow of drink fluid through the fluid conduit; and
1[b][4][iii]	wherein when the manual on/off valve is in the open configuration, the tube is not crimped and does not

Claim 5	
	obstruct the flow of drink fluid through the fluid conduit.

37. Independent claim 20, which was added during reexamination, is identical to claim 1, but adds the following limitation:

a dust cover configured to at least partially cover the dispensing outlet when the mouthpiece and pivotal mount are in the stowed position, wherein the dust cover remains stationary when the mouthpiece and the pivotal mount are selectively pivoted between the stowed position and the dispensing position.

Ex. 1002, 2:60-65.

B. Priority Date

38. For the purposes of this analysis, I have been asked to assume that the priority date for claims 1, 3-5, 11, 13, and 19 is April 11, 2005, and the priority date for claims 9 and 12 is December 20, 2005. I note that these priority dates are consistent with the priority dates identified by CamelBak in its Infringement Contentions in co-pending district court litigation. Ex. 1013 at 3. For the remaining claims discussed herein, I have assumed a priority date of April 11, 2005.

C. Claim Construction

39. Unless otherwise noted, I have given claim terms their plain and ordinary meaning.

40. I understand that CamelBak—who I may also refer to herein as the “Patent Owner”—has asserted the claims I am analyzing in a patent infringement lawsuit in district court. I understand CamelBak has asserted that the patent claims cover Trove Brands’ Owala Flip (For Kids) product. *See* Ex. 1013 (the infringement contentions). In certain instances, CamelBak’s assertions demonstrate a scope for the claims that is pertinent in applying the claims to the prior art. I therefore have applied the prior art to the ’255 patent based on Patent Owner’s assertions regarding the scope of the ’255 patent. As I discuss in detail below, if Patent Owner is correct in its assertion that the claims of the ’255 patent cover particular aspects of the Owala Flip (For Kids) product, then the claims are obvious over the prior art, in view of the knowledge of a POSA. To the extent I have applied Patent Owner’s assertions regarding claim construction in my analysis, doing so should not be read as an agreement with those assertions.

41. That said, my opinions herein do not depend on any particular claim construction beyond the plain and ordinary meaning of the claim terms. It is my opinion that, under any reasonable construction, each claim at issue is rendered anticipated and/or obvious by the prior art.

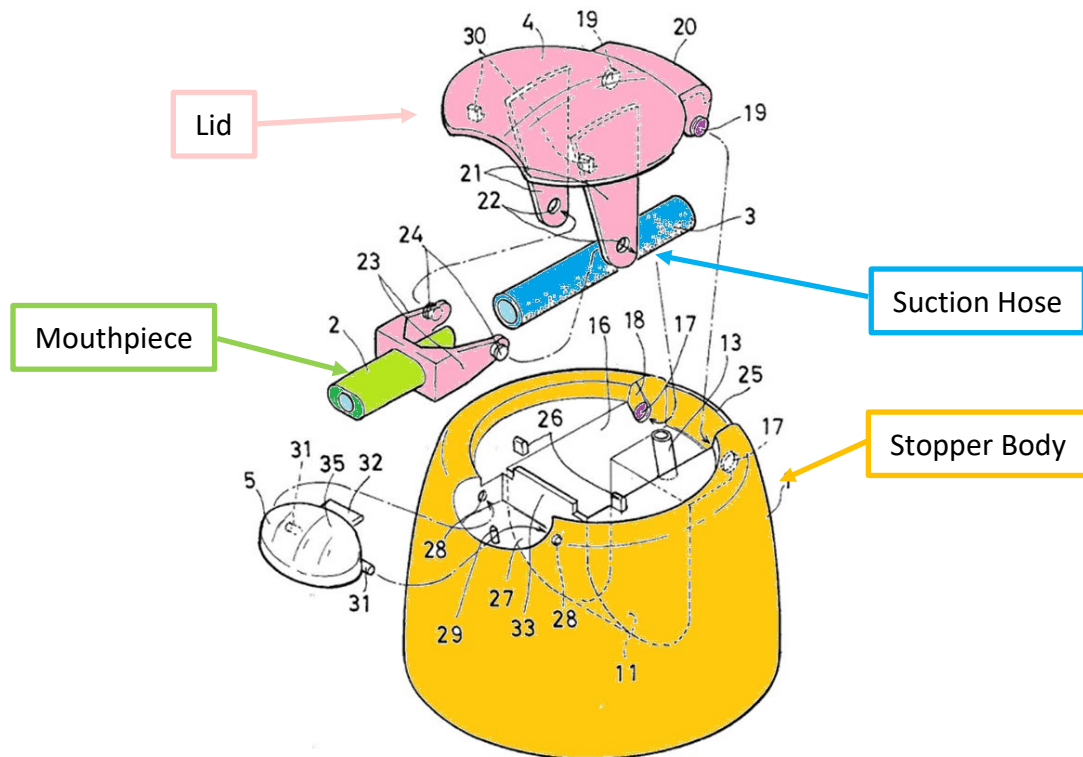
III. PRIOR ART BEVERAGE/DRINK CONTAINERS

42. Drink container with removable caps have, of course, long been known. And drink cap assemblies with the features claimed in the '255 patent (e.g., base, pivoting mount, resilient mouthpiece, and on/off valve) have also been known since before the '255 patent's priority date. I briefly summarize several references below, each of which would have been known to a POSA and would have informed a POSA's knowledge of the structure, components, and materials that could be used in the design of drink containers and drink container cap assemblies. I note, however, that these references are merely exemplary, and are not exhaustive of the prior art that would have been known to and relied upon by a person of ordinary skill in the art in the design of drink containers and drink container cap assemblies.

A. Nakajima

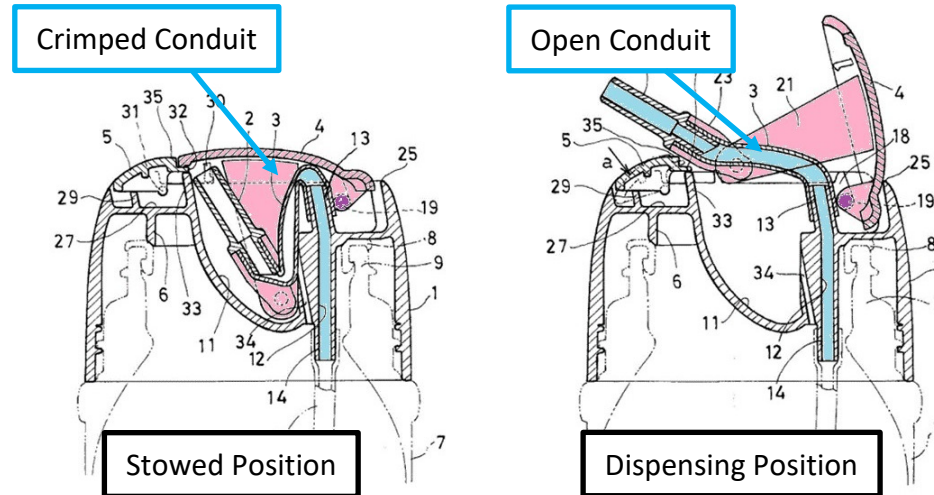
43. Nakajima (Ex. 1004), which is titled "Stopper with Mouthpiece for Liquid Container," discloses a cap assembly for a drink bottle that includes a lid and mouthpiece that are removable for easy cleaning. *See* Ex. 1004, Abstract. Nakajima describes the "problem to be solved by the present invention" as "to provide a stopper with a mouthpiece in which the lid can be easily removed without destroying it when it needs to be cleaned, etc., while remaining difficult to remove under normal conditions of use." *Id.* at ¶[0006].

44. An exemplary embodiment is shown in Figure 1 of Nakajima:



Ex. 1004, Fig. 1. As shown above, “the stopper with a mouthpiece ... is composed of a combination of a stopper body 1, a mouthpiece 2, a suction hose 3, a lid 4, and a button 5 serving as a disengaging means.” *Id.* at ¶[0012]. I note that Nakajima uses the term “stopper” generally to describe the cap assembly of a drink bottle, and the term “stopper body” to describe the base of the cap assembly.

45. Figures 2 and 3 show the internal structure of Nakajima’s cap assembly, in the stowed configuration (Fig. 2) and dispensing configuration (Fig. 3):



Id. at Figs. 2, 3. According to Nakajima:

“The stopper body 1 has an annular rib 6 (see Fig. 2) on the underside, which is used to seal the mouth 9 of the container 7 by pressing the rib 6 against a mouth gasket 8 in the container 7. A storage recess 11 is provided inside the rib 6, and the mouthpiece 2 and suction hose 3 are stored in the storage recess 11. A vertical communication hole 12 is provided in the rear portion of the storage recess 11, and connection ports 13, 14 are provided in the upper and lower end portions.

Id. at ¶[0013].

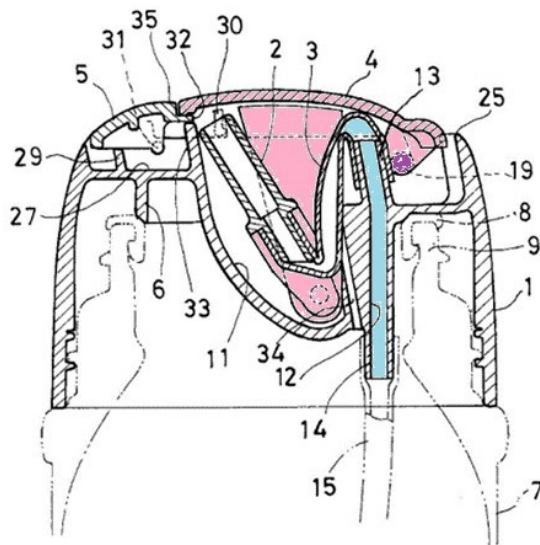
46. The mouthpiece and suction hose are pivotable between the stowed position and the dispensing position by virtue of their connection to “lid 4.” As described in Nakajima:

A pair of hinge shafts 19, 19 are provided on the left and right sides of the hinge portion 20 (see Fig. 1) in the rear end portion of the lid 4, and each hinge shaft 19 is rotatably fitted into each shaft receiving recess 17. The lid 4 covers the storage recess 11 and the top surface of the stopper body 1 surrounding the recess. A pair of leg pieces 21 and 21 are provided on the underside of the lid 4, and a protrusion 24 on the

arms 23 of the mouthpiece 2 is rotatably fitted into a hole 22 at the bottom end of each leg piece 21.

Id. at ¶[0016]. Opening and closing Nakajima's lid operates a manual on/off valve that allows (in the dispensing position) or restricts (in the stowed position) the flow of fluid through the cap assembly.

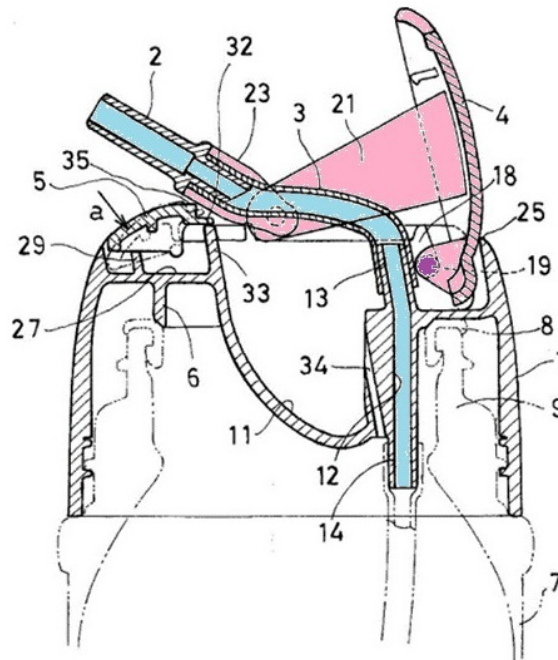
47. In the stowed position, as shown in Figure 2, "the mouthpiece 2 and the suction hose 3 are folded into the storage recess 11, and the lid 4 is engaged with the stopper body 1 to cover and close the storage recess 11. In this state, a portion of the bent suction hose 3 seals the air hole 34, preventing leakage of liquid inside the container 7." *Id.* at ¶[0022].



Id. at Fig. 2.

48. In the dispensing position, as shown in Figure 3, the lid is "pushed up and released by the restoring elasticity of the suction hose 3. As the lid 4 opens, the

mouthpiece 2 protrudes above the button 5 and the air hole 34 is unsealed to prevent depressurization of the interior of the container 7.” *Id.* at ¶[0023].



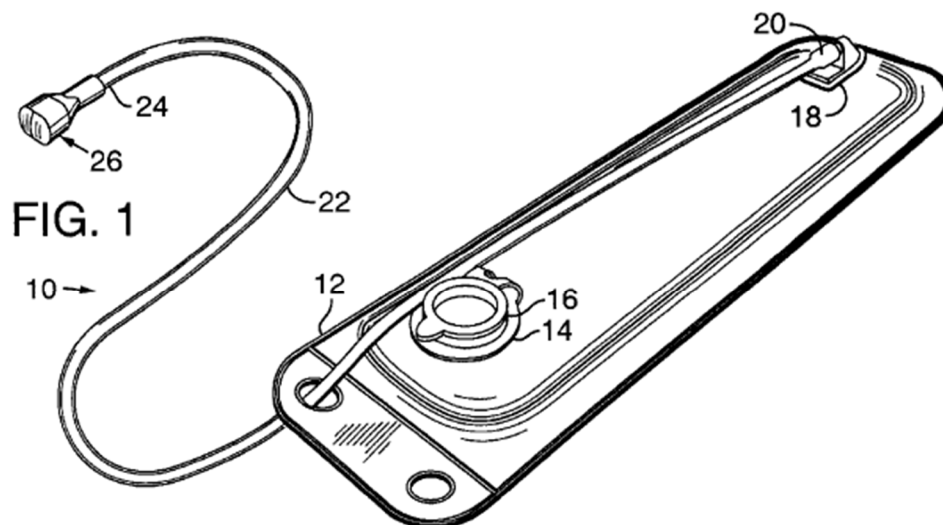
Id. at Fig. 3. In this position, fluid from the drink bottle can flow from the drink bottle, through the “communication hole 12” and the elastic “suction hose 3,” and to the user through a dispensing outlet on the mouthpiece. *See id.* at ¶[0014].

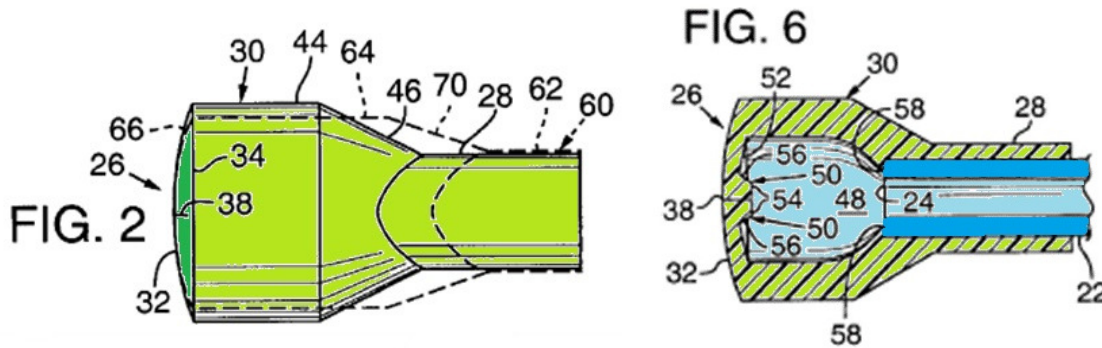
49. Nakajima’s lid also serves as a dust cover that protects the mouthpiece and suction hose from debris while in the stowed position. *Id.* at ¶[0004]. Likewise, the leg pieces on the underside of the lid serve as lateral guards that control the position of the mouthpiece in both the stowed and dispensing configurations.

B. Gardner

50. Gardner (Ex. 1005), which is titled “Personal Hydration System with an Improved Mouthpiece,” discloses a mouthpiece that “includes a neck that is adapted to be mounted on a supply tube to a hydration system and which is joined to a resilient head.” Ex. 1005, Abstract. “The head includes a dispensing face with a pair of lips that define a normally closed slit, through which fluid is dispensed from the mouthpiece” *Id.* The resilient mouthpiece of Gardner “is deformable to a dispensing position in which the lips are spread at least partially away from each other to allow fluid to be dispensed through the lips.” *Id.*

51. Figures 1, 2 and 6, which I have reproduced below, show exemplary embodiments of Gardner’s resilient mouthpiece.





Ex. 1005, Figs. 1, 2, 6. “Mouthpiece 26 includes a neck 28 which is connected to and in fluid communication with end 24 of hose 22. As shown in FIG. 6, neck 28 is fit over end 24 of hose 22 and forms a watertight seal. It should be noted that the mouthpiece can be slipped on and off the hose for cleaning or maintenance.” Ex. 1005, 3:14-19.

52. Although Gardner specifically discloses embodiments of the mouthpiece that are used in connection with hydration systems comprising bladders (as shown in Figure 1), a person of ordinary skill in the art would understand that Gardner's mouthpiece could be used in connection with a variety of liquid storage devices, including bladders, bottles, and the like. For example, Gardner notes: "Once in a dispensing position, the user may draw fluid through the mouthpiece, much like the user would draw upon a drinking straw. As discussed, this is referred to as the normal operating condition for using mouthpiece 26 and any attached hydration system." Ex. 1005, 6:28-32.

53. Gardner describes the structure of the mouthpiece as including “a head 30, which typically is of larger cross-section than neck 28 and which includes a dispensing face 32 through which fluid is selectively dispensed from the mouthpiece.” Ex. 1005, 3:20-23. According to Gardner, “it is desirable for the mouthpiece not to leak when in a closed position and to remain comfortably in a ready-to-use position in the user’s mouth, even when not being used to dispense fluids.” Ex. 1005, 1:41-44.

54. Gardner describes the operation of the mouthpiece as follows:

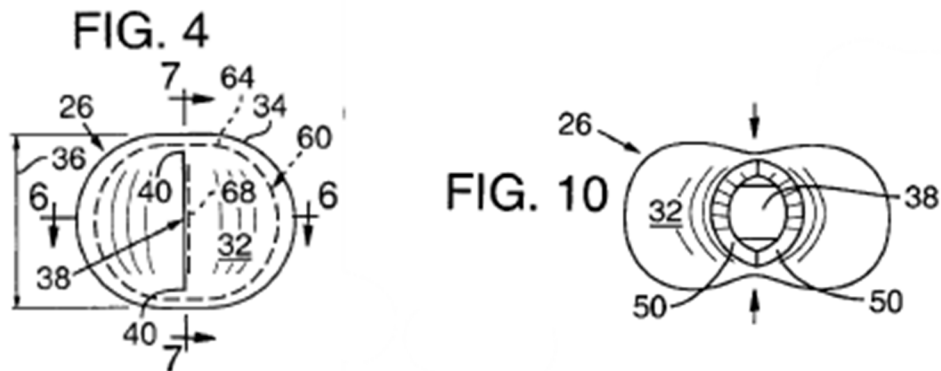
“From perimeter 34, head 30 includes a bite region 44 that extends generally normal to the plane of perimeter 34 and provides a surface upon which the user may apply a force, such as with the user’s teeth, to deform mouthpiece 26 to open slit 38 and enable a flow of fluid to be dispensed from the mouthpiece.”

Id. at 3:31-36. Gardner further describes:

Once positioned in the user’s mouth as discussed above, mouthpiece 26 can be deformed from its closed position to a dispensing position, shown in FIGS. 8-10, when a force is applied to the regions of bite region 44 generally adjacent ends 40 of slit 38. This compressive force is applied along the axes of the lips, as indicated generally with arrows in FIG. 10, and causes lips 50 to spread at least partially apart from each other to cause Slit 38 to form an opening, also referred to as a hydraulic orifice, through which fluid may be passed.

Ex. 1005, 6:12-21.

55. The operation of Gardner’s mouthpiece is shown in Figures 4 and 10, below:



Ex. 1005, Figs. 4, 10.

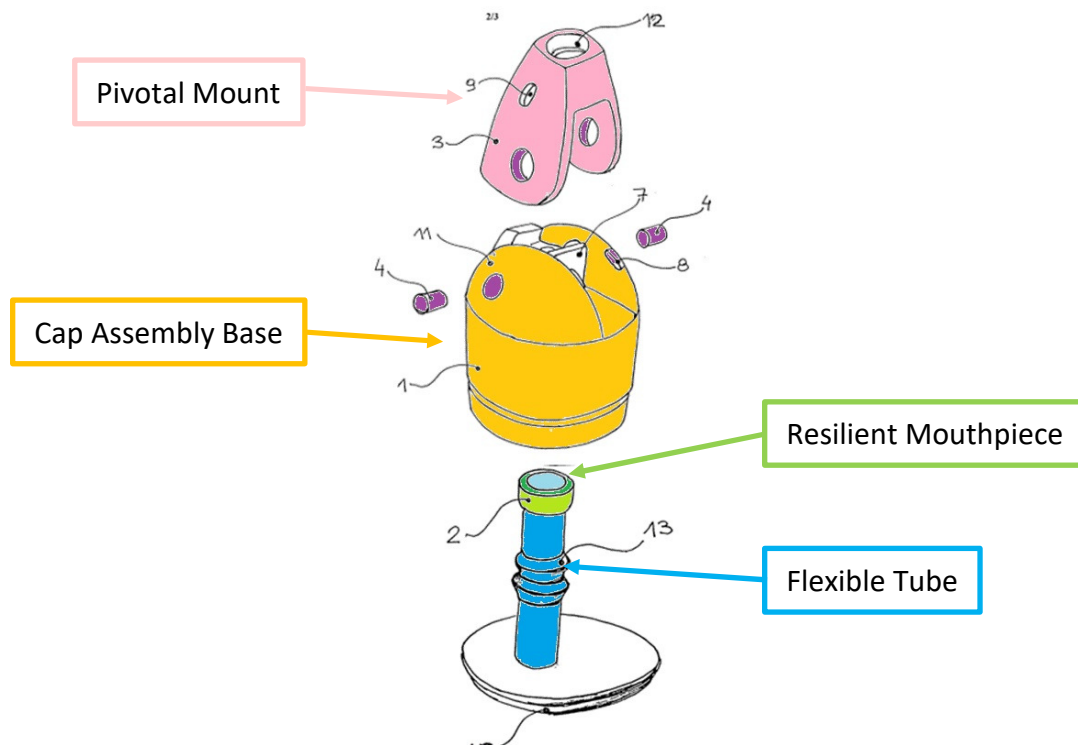
C. Ribarits

56. Ribarits (Ex. 1006), which is titled “Drinking Device,” discloses “a drinking device which enables a drink to be drunk in a pleasant, hygienic manner, and can be both opened and closed with one hand.” Ex. 1006, Abstract. The device includes “a drinking spout” that can be “pivoted at the top” of any common threaded cap assembly for a drink bottle. *See* Ex. 1006, 2.

57. The components and structure of the Ribarits device are identified as:

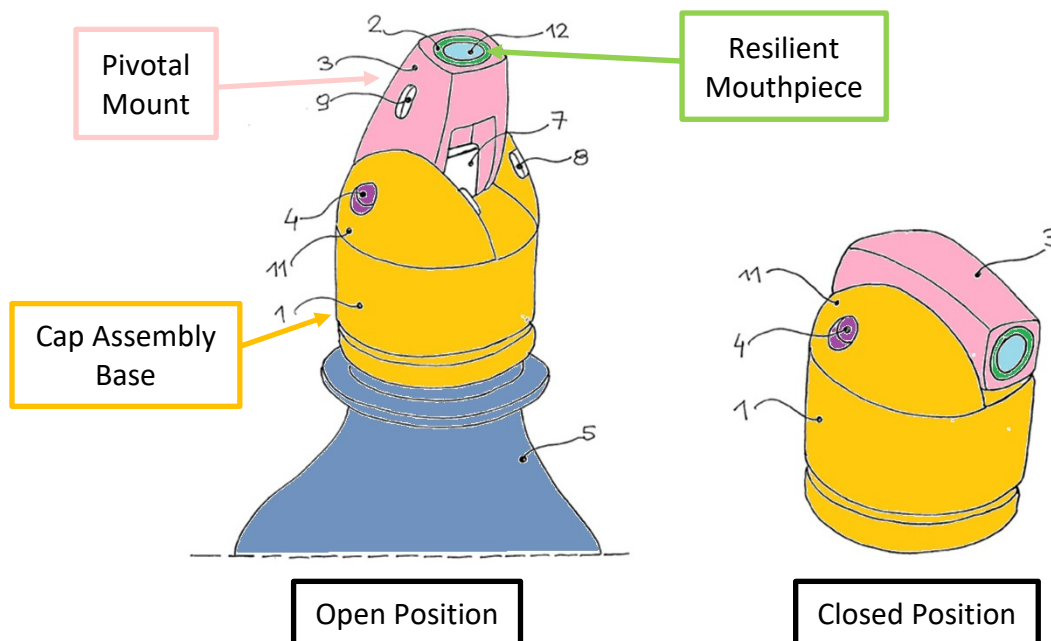
a closing cap (1), a sealed tubular element (2) inserted therein, and a drinking spout (3) which is fixed in the lateral parts (11) by two axial pins (4), wherein the sealed tubular element (2) is inserted into the drinking spout (3), characterized in that when the closing cap (1) is screwed onto the bottle (5), the required tightness is obtained by means of the sealing rings (10), and in that the knobs (8) applied to the lateral parts (11) engage in the recesses (9) on the drinking spout (3).

Ex. 1006, 3 (Claim 1). Figure 2 is an exploded view of the Ribarits device, which identifies the above-listed components:



Ex. 1006, Fig. 2.

58. The Ribarits device includes a “drinking spout” that pivots between an open position and a closed position, as shown in Figure 1 below:



Ex. 1006, Fig. 1.

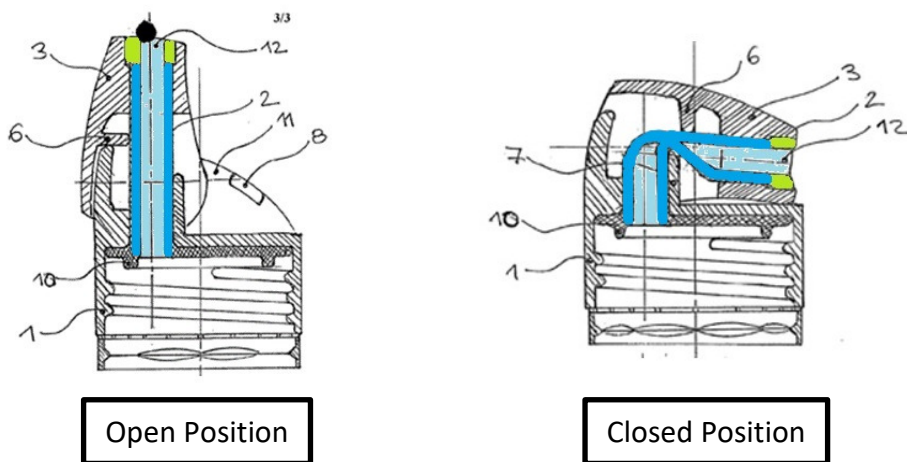
59. Ribarits describes the overall structure and function of the cap assembly as follows:

In the lateral parts placed at the top of the closing cap, the drinking spout is movably mounted by means of both axles. When the drinking spout is pivoted open, the elastic tube inserted therein is straightened and the opening is thus released. The liquid located in the bottle can now be withdrawn via the tube guided in the drinking spout, wherein the tightness is given by screwing the neck of the bottle onto the sealing part of this element.

If now the device is to be closed, by folding down the drinking spout, the tube is bent between the outlet opening of the closing cap and the accommodation in the drinking spout by means of the two webs, and the device is closed.

Ex. 1006, 2.

60. Figure 3, which I have reproduced below, shows cross-sectional views of the exemplary embodiment of the Ribarits cap assembly, in the open and closed positions:



Ex. 1006, Fig.3. As shown and described above, an elastic tube serves as a mouthpiece and fluid conduit for the user to draw fluid out of the drink container, through the cap assembly, and into the user's mouth.

61. The pivoting action of the drinking spout functions as a manual on/off valve that controls the flow of fluid through the elastic tube. In the open position (above, left), the drinking spout is pivoted away from the cap assembly base, opening the elastic tube and allowing fluid to flow from the drink container to the user. In the closed position, the drinking spout is pivoted down, causing the elastic tube to crimp within the cap assembly, thereby restricting the flow of fluid from the drink container to the user.

D. Panicci

62. Panicci (Ex. 1007), which is titled “Cup with Pivoting Straw,” discloses a “drinking cup and cover with straw assembly seated in the cover” with a “moveable straw” that is “pivotally and sealably attached” to “permit pivoting of the straw with respect to the cover.” Ex. 1007, Abstract.

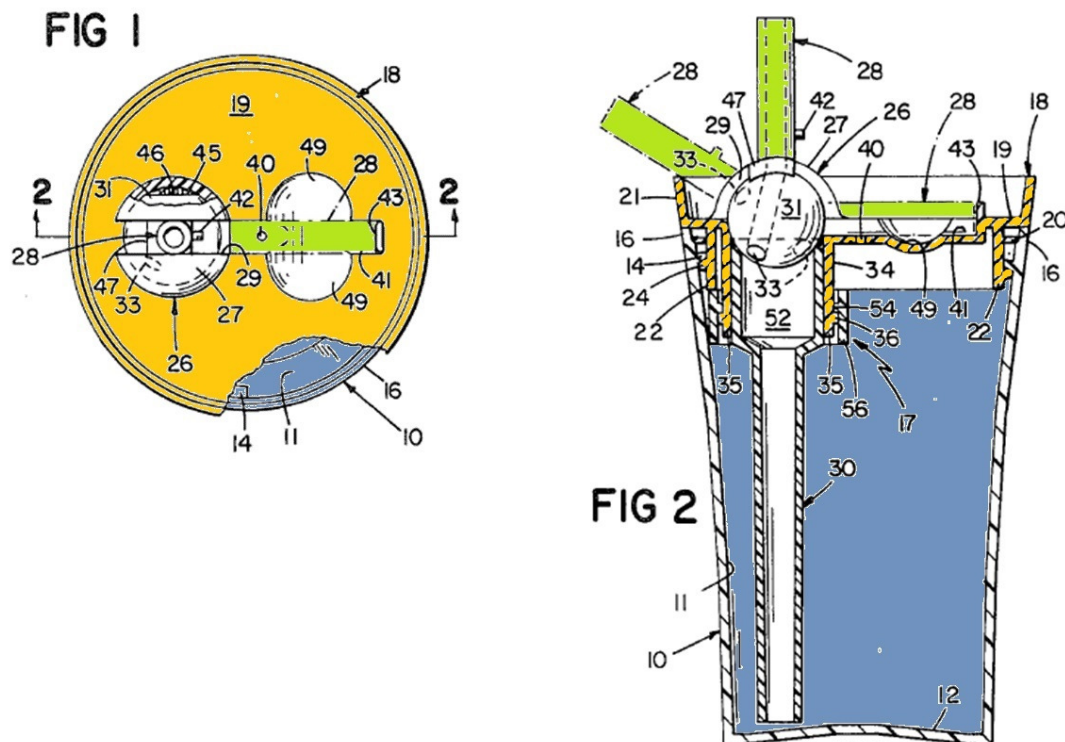
63. According to Panicci:

It is an object of the invention to provide a means for storing the external straw segment in a compact configuration that minimizes the opportunity for contamination of the straw or for spilling the contents

of the cup particularly during transport of the cup from one location to another.

Ex. 1007, 1:29-35.

A preferred embodiment of the Panicci invention is shown in Figures 1 and 2, which I have reproduced below:



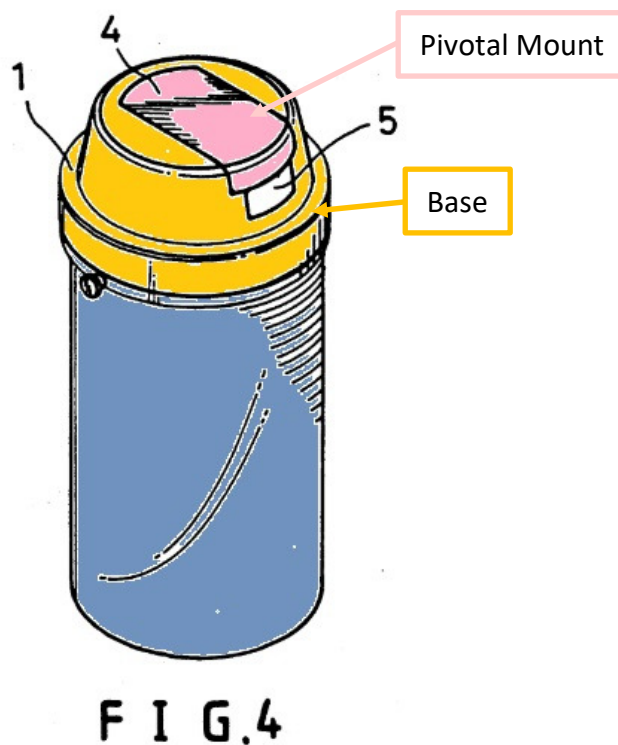
Ex. 1007, Figs. 1.2.

64. As shown in the above figures and described in Panicci, the “upper straw 28 extends through slot 29 and pivots in a vertical plane.” Ex. 1007, 3:23-24. In its closed position, the upper straw pivots into “a storage recess 41 in the plane of slot 29, sized to accommodate the upper tubular portion of straw member 28.” Ex. 1007, 3:35-37.

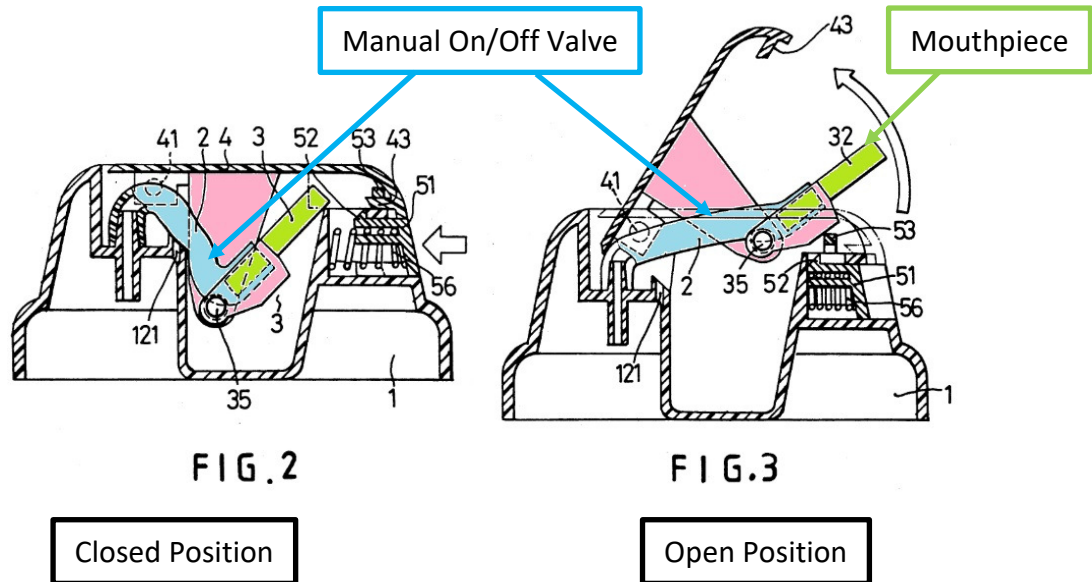
65. According to Panicci: “Tab 43 at the end of recess 41 is positioned to cover the upper end of straw segment 26 to avoid contamination of the straw.” Ex. 1007, 3:45-47. Thus, a person of ordinary skill in the art would understand “tab 43” to constitute a dust cover to prevent debris from entering the outlet of the straw when the device is not in use.

E. Hsu

66. Hsu (Ex. 1008), which is titled “Water Container Cap,” discloses a drink container with a removeable cap assembly that includes a base, a pivotal mount, a mouthpiece (“nipple”), and a manual on/off valve:



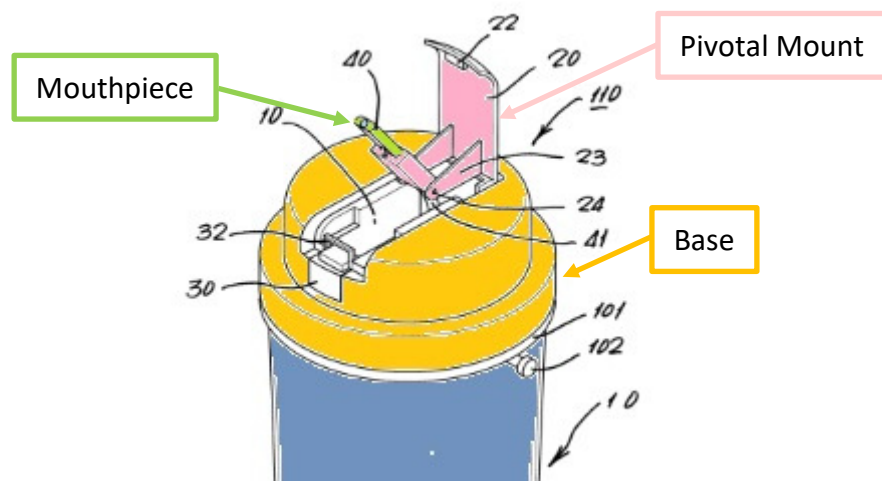
Ex. 1008, Fig. 4.



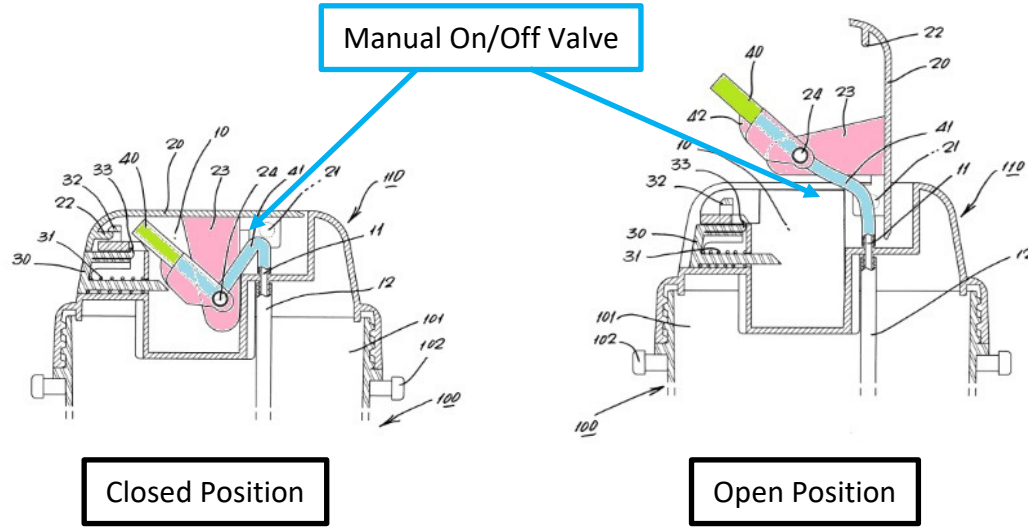
Id., Figs. 2, 3.

F. Park

67. Park, which is titled “Portable water bottle with a straw,” discloses a removeable cap assembly including a base, a pivotal mount, a resilient mouthpiece (“straw”), and a manual on/off valve:



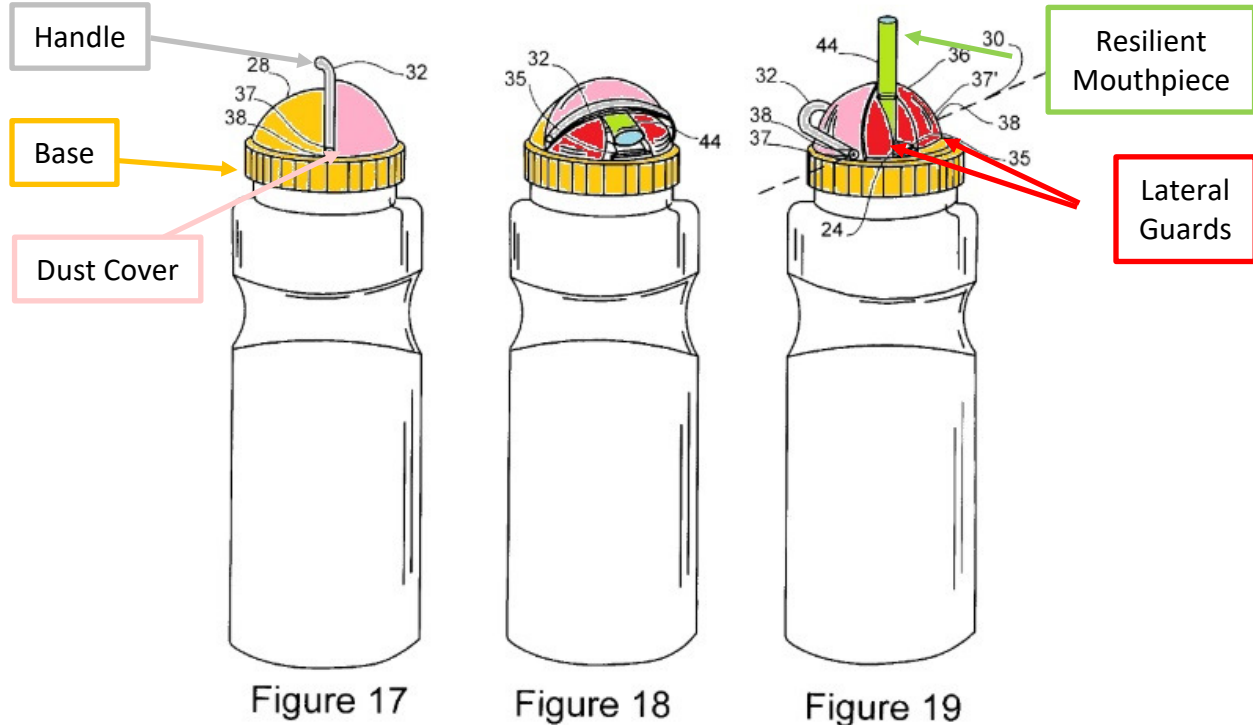
(Ex. 1009, Fig. 2).



(Ex. 1009, Figs. 2, 5, 6). Park also discloses a pair of lateral guards on opposite sides of the mouthpiece and a dust cover extending between the guards and extending across a portion of the outlet of the mouthpiece. (*Id.*)

G. Hughes

68. Hughes (Ex. 1010), which is titled “Automatic Valved Bottle Cap for use with Liquid Containers,” discloses a removable cap assembly with a pivoting mouthpiece, dust cover, lateral guards, and a carrying handle:



(Ex. 1010, Figs. 17-19). Hughes' mouthpiece is comprised of a flexible "drinking hose" that collapses when pivoted into a stowed configuration. (*Id.* at 9:45-53). In the stowed configuration, the mouthpiece is secured in a channel formed by a pair of lateral guards, which is, in turn, covered by a domed dust cover. (*Id.*)

IV. GROUND 1: CLAIMS 1, 3-5, 9-11, 13, 18 AND 19 WOULD HAVE BEEN OBVIOUS OVER NAKAJIMA IN VIEW OF THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART

69. As I explain below, Nakajima expressly discloses nearly all the elements of claims 1, 3-5, 9-11, 13, 18 and 19. To the extent Nakajima does not expressly disclose any element of claims 1, 3-5, 9-11, 13, 18 and 19, the claims would have been obvious over Nakajima in view of the knowledge of one skilled in

the art at the time of the '255 patent invention. Accordingly, in my opinion, each of claims 1, 3-5, 9-11, 13, 18 and 19 is obvious over Nakajima in view of the knowledge of a person of ordinary skill in the art.

A. Claim 1 is Obvious over Nakajima

70. I address below how Nakajima, in view of the knowledge of a person of ordinary skill in the art, renders obvious each element of claim 1.

1. Preamble: “A drink container”

71. The preamble recites a “drink container.” I understand that patent preambles are not always limiting. I have not been asked to render an opinion on whether the preamble of claim 1 is limiting. Regardless, as I explain below, Nakajima discloses “a drink container.”

72. For example, Nakajima discloses “a stopper with a mouthpiece for a water bottle or other liquid container.” (Ex. 1004, ¶[0001]). One skilled in the art would have understood that the “liquid container” in Nakajima is a drink container because Nakajima discloses that the “mouthpiece” of the container “communicates with the interior of the container” to allow a user “to drink the beverage inside.” (Ex. 1004, ¶[0002]).

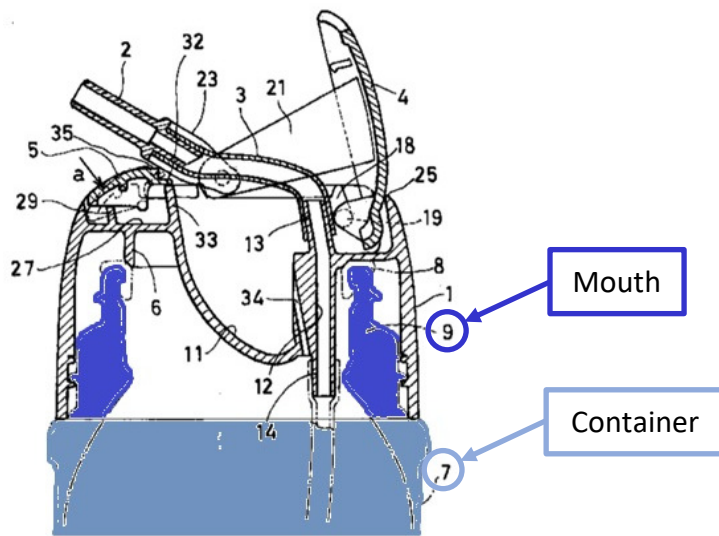
2. **1[a]: “a fluid container having a neck with an opening and having an internal compartment sized to hold a volume of potable drink fluid”**

73. Limitation 1[a] recites, “a fluid container having a neck with an opening and having an internal compartment sized to hold a volume of potable drink fluid.”

As I explain below, Nakajima discloses this limitation.

74. As noted above, Nakajima discloses “a stopper with a mouthpiece for a water bottle or other liquid container.” (Ex. 1004, ¶[0001]). One of skill in the art would have understood that the “liquid container” of Nakajima would include an internal compartment sized to hold a volume of potable drink fluid because Nakajima discloses that the “mouthpiece” of the stopper “communicates with the interior of the container” to allow a user “to drink the beverage inside.” (Ex. 1004, ¶[0002]).

75. Nakajima also discloses the “stopper body 1” is sealed against “the mouth 9 of the container 7.” (*Id.* at ¶[0013]). This is shown in annotated Figure 3 below:



(*Id.*, Fig. 3). One of skill in the art would have understood the “mouth 9” of the “container 7” to constitute a neck with an opening, as identified above.

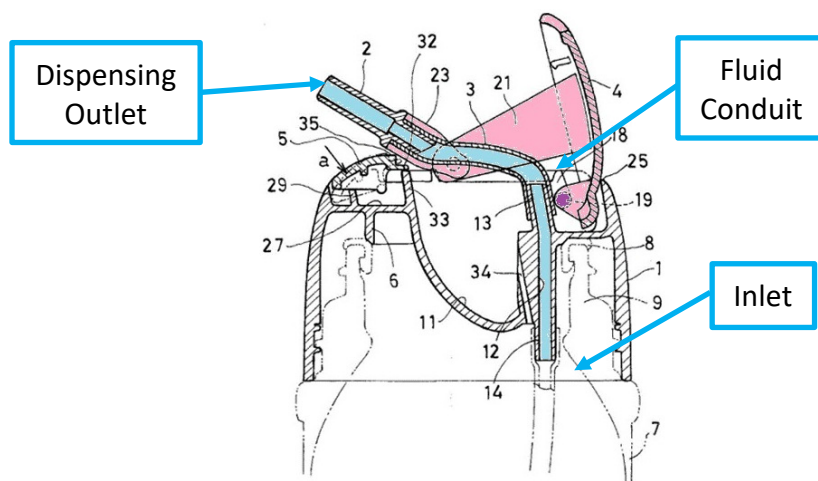
3. **1[b]: “a cap assembly removably coupled to the fluid container to cover the opening, wherein the cap assembly defines a fluid conduit for drink fluid to flow from the fluid container and through the cap assembly to a user, wherein the fluid conduit includes an inlet through which drink fluid from the fluid container may enter the fluid conduit, and a dispensing outlet through which drink fluid in the fluid conduit may be dispensed from the cap assembly to a user”**

76. Limitation 1[b] recites, “a cap assembly removably coupled to the fluid container to cover the opening, wherein the cap assembly defines a fluid conduit for drink fluid to flow from the fluid container and through the cap assembly to a user, wherein the fluid conduit includes an inlet through which drink fluid from the fluid container may enter the fluid conduit, and a dispensing outlet through which drink fluid in the fluid conduit may be dispensed from the cap assembly to a user.” As I

explain below, Nakajima discloses this limitation.

77. Nakajima discloses “stopper body 1” is removably coupled to the “container 7” to cover the “mouth 9” of the container. Ex. 1004, ¶¶[0012]-[0014]. Nakajima further discloses that “stopper body 1 has an annular rib 6 ... on the underside, which is used to seal the mouth 9 of the container 7 by pressing the rib 6 against a mouth gasket 8 in the container 7.” (Ex. 1004, ¶[0013]). Thus, one of skill in the art would have understood the “stopper body 1” of Nakajima to be a cap assembly that is removably coupled to Nakajima’s fluid container to cover the mouth, i.e. opening, of the container.

78. The cap assembly of Nakajima (i.e. the “stopper body”) includes a fluid conduit from the container to the user, which includes “a communication hole 12” connected via “connection port 13” to “a suction hose 3” and “a mouthpiece 2.” Ex. 1004, ¶¶[0012]-[0014]. This is shown in Figure 3 below:

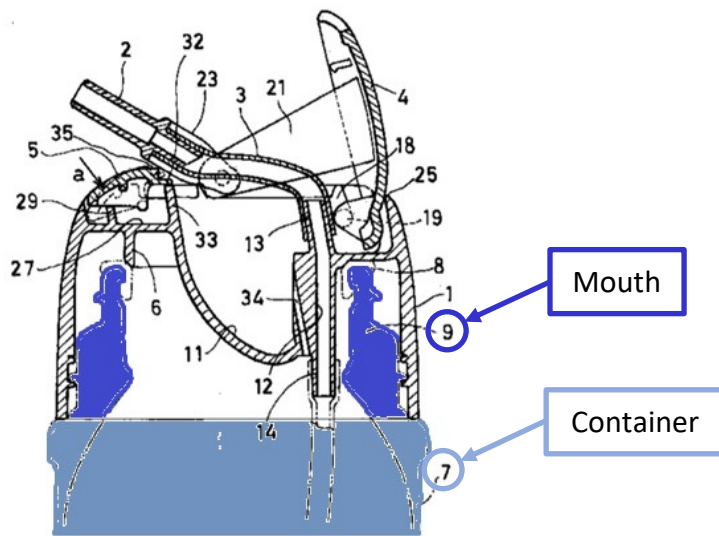


Ex. 1004, Fig. 3. As shown with the dashed line in the above figure, fluid enters the fluid conduit from the container via an inlet (“connection port 14), flows through the “suction hose 3,” and is dispensed from a dispensing outlet at the end of “mouthpiece 2.” Ex. 1004, ¶¶[0012]-[0014].

4. **1[b][1]: “a cap assembly base removably coupled to the neck of the fluid container, wherein the cap assembly base is configured to be selectively and repeatedly decoupled from and re-coupled to the neck of the fluid container”**

79. Limitation 1[b][1] recites “ a cap assembly base removably coupled to the neck of the fluid container, wherein the cap assembly base is configured to be selectively and repeatedly decoupled from and re-coupled to the neck of the fluid container.” As I explain below, Nakajima discloses this limitation.

80. As noted above, one of skill in the art would have understood the “stopper body 1” of Nakajima to constitute a cap assembly removably coupled to the “container 7.” As shown in Figure 3 of Nakajima, annotated below, one of skill in the art would have understood such removable coupling to be achieved through engagement and disengagement between a base portion of “stopper body 1” and the neck of the underlying liquid container.



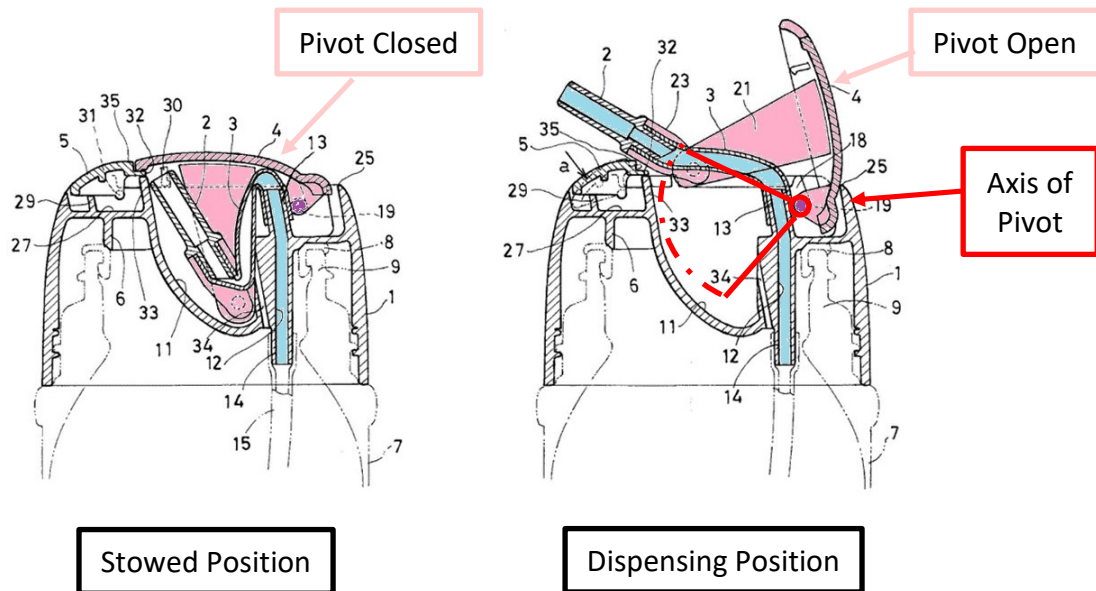
Ex. 1004, Fig. 3.

5. **1[b][2]: “a pivotal mount coupled to the cap assembly base for pivotal movement relative to the cap assembly base, the pivotal mount comprising a mount outlet, wherein the pivotal mount includes a pair of lateral projections, wherein the cap assembly base defines a pair of sockets into which the pair of lateral projections extend”**

81. Limitation 1[b][2] recites that the cap assembly comprises “a pivotal mount coupled to the cap assembly base for pivotal movement relative to the cap assembly base, the pivotal mount comprising a mount outlet, wherein the pivotal mount includes a pair of lateral projections, wherein the cap assembly base defines a pair of sockets into which the pair of lateral projections extend.” As I explain below, Nakajima discloses this limitation.

82. For example, Nakajima discloses two structures that pivot to form a “pivotal mount.” The first is “lid 4,” which is mounted to the cap assembly and

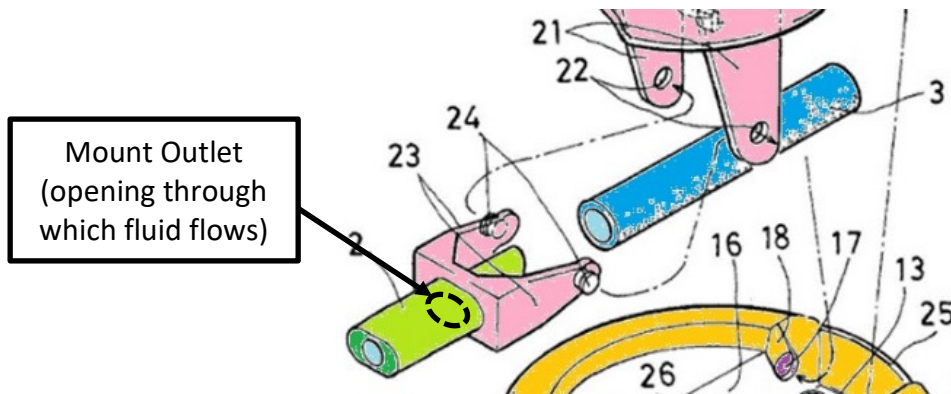
pivotable relative to the cap assembly base, as shown in Figure 3 below:



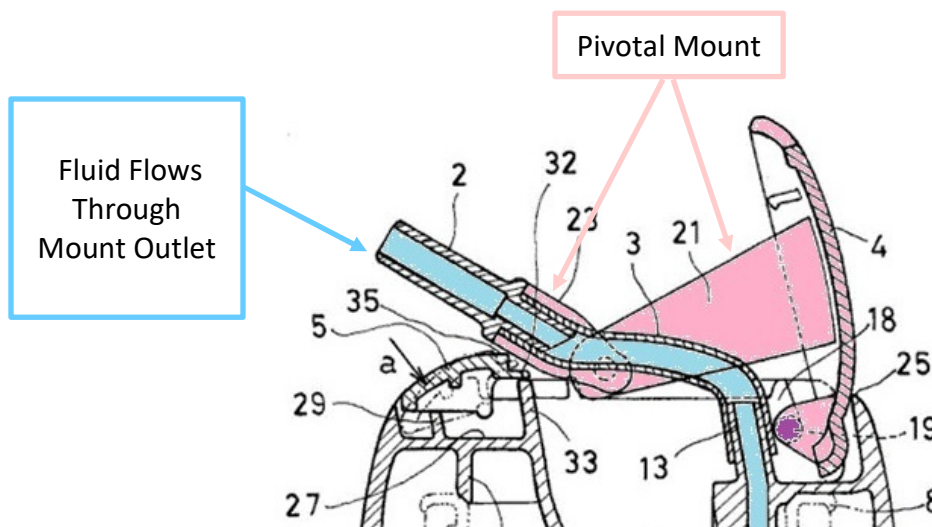
Ex. 1004, Figs. 2, 3. As shown above, “leg pieces 21” are fixed to the underside of the lid and pivot with the lid. The second structure of Nakajima’s pivotal mount is the “arms 23” on the “mouthpiece 2,” which are “rotatably fitted” to the “leg pieces 21.” *Id.*, ¶[0016]. The lid “is attached so as to open and close freely, and the mouthpiece moves up and down in conjunction with the opening and closing of the lid.” *Id.* at ¶[0003]. Thus, one of skill in the art would have understood the combination of Nakajima’s “lid 4,” having “leg pieces 21,” and the mouthpiece bracket “arms 23” of “mouthpiece 2” to constitute a “pivotal mount.”

83. As shown below, a bracket formed by the “arms 23” constitutes the portion of the pivotal mount that is fixed to the mouthpiece. The mouthpiece extends from the base of the bracket formed by “arms 23,” which includes a through hole

that forms part of the fluid conduit to allow fluid to flow from “suction hose 3,” through the bracket, and out through the dispensing end of “mouthpiece 2.”



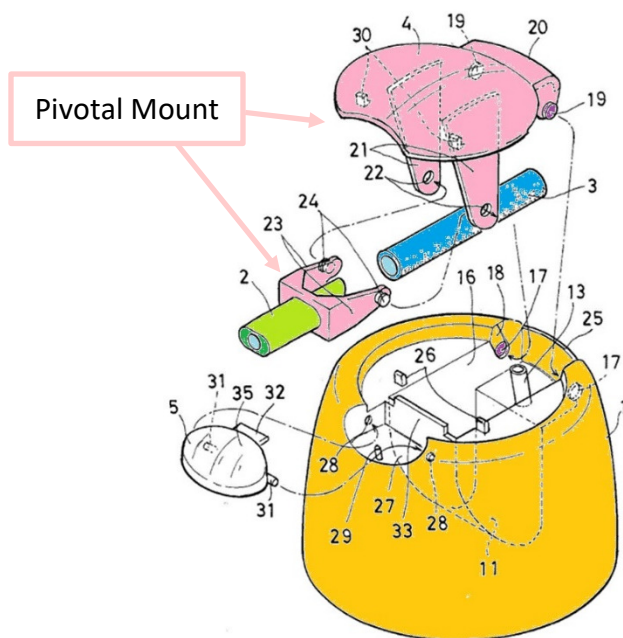
(Ex. 1004, Fig. 1).



(Ex. 1004, Fig. 3). A person of ordinary skill in the art would have understood the through hole in the bracket formed by “arms 23” to constitute a “mount outlet,” i.e. an outlet of the pivotal mount.

84. Nakajima further discloses the “lid is attached to the stopper body by fitting a pair of hinge shafts on the lid itself into shaft receiving recesses in the

stopper body, so that the lid can be opened and closed freely.” *Id.* at ¶[0004]. The “pair of hinge shafts 19” project laterally from the “hinge portion 20” (*Id.* at ¶[0015]) and are “rotatably fitted into” a corresponding pair of “shaft receiving recesses 17” in the cap assembly base (*Id.* at ¶[0016]). This is shown in annotated Figure 1 below:



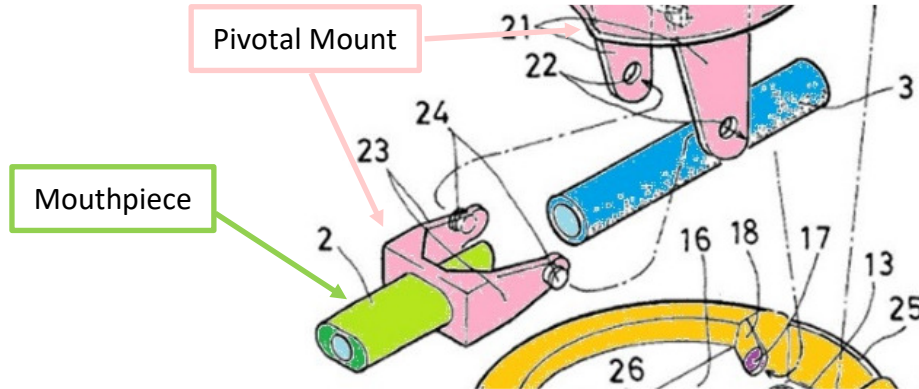
Id. at Fig. 1. Thus, one of skill in the art would have understood the hinge shafts and recesses to comprise a pair of lateral projections and sockets that define an axis of rotation of Nakajima’s pivotal mount.

6. **1[b][3]: “a resilient mouthpiece engaged with the mount outlet and removably coupled to the pivotal mount for pivotal movement with the pivotal mount relative to the cap assembly base”**

85. Limitation 1[b][3] recites “a resilient mouthpiece engaged with the

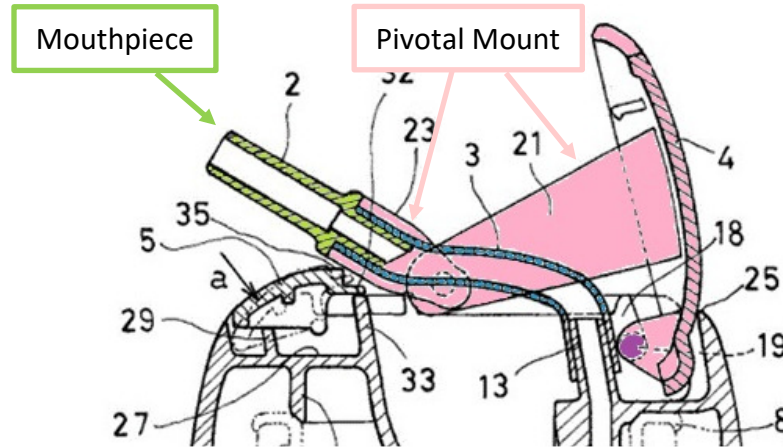
mount outlet and removably coupled to the pivotal mount for pivotal movement with the pivotal mount relative to the cap assembly base.” As I explain below, this limitation would have been obvious over Nakajima in view of the knowledge of a person of ordinary skill in the art.

86. Nakajima describes its “mouthpiece 2” and “arms 23” as two portions of a single component that is “rotatably fitted” to “leg pieces 21.” Ex. 1004, ¶[0016]. Thus, Nakajima does not disclose that the mouthpiece is ‘removably coupled’ to the portion of the pivotal mount formed by “arms 23.” However, in my opinion, it would have been obvious to a person of ordinary skill to modify Nakajima to achieve such a design. For example, a person of ordinary skill in the art would have recognized the desirability of constructing Nakajima’s “mouthpiece 2” and “arms 23” as two separate components, including (1) a tubular fluid conduit configured to engage with the user’s mouth, and (2) a bracket portion configured to pivot with the opening and closing of the cap assembly lid. The coloring I have applied to Figure 1 shows the “mouthpiece 2” and “arms 23” as two separate components:



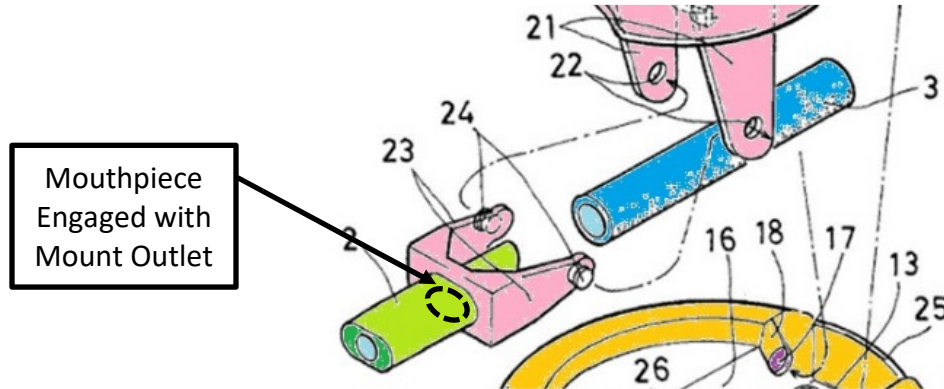
Ex. 1004, Fig. 1. In addition, a person of ordinary skill in the art would have understood that whether to use a single component mouthpiece and bracket, or a two component mouthpiece and bracket (as shown in my colored annotation above), would have constituted nothing more than a routine choice between two alternative design choices.

87. As the above figure makes clear, in a two-component configuration, the overall design of Nakajima’s mouthpiece and pivoting bracket (i.e. “arms 23”) would remain essentially unchanged. The only difference is that the mouthpiece would be built as a separate component that could be fitted through the bracket. This modification would not require any change to the design of the bracket formed by “arms 23.” I have colored and annotated Figure 3 below to show how the proposed modification of Nakajima’s “mouthpiece 2” and “arms 23” into a two-component configuration would have been readily apparent to a person of ordinary skill:

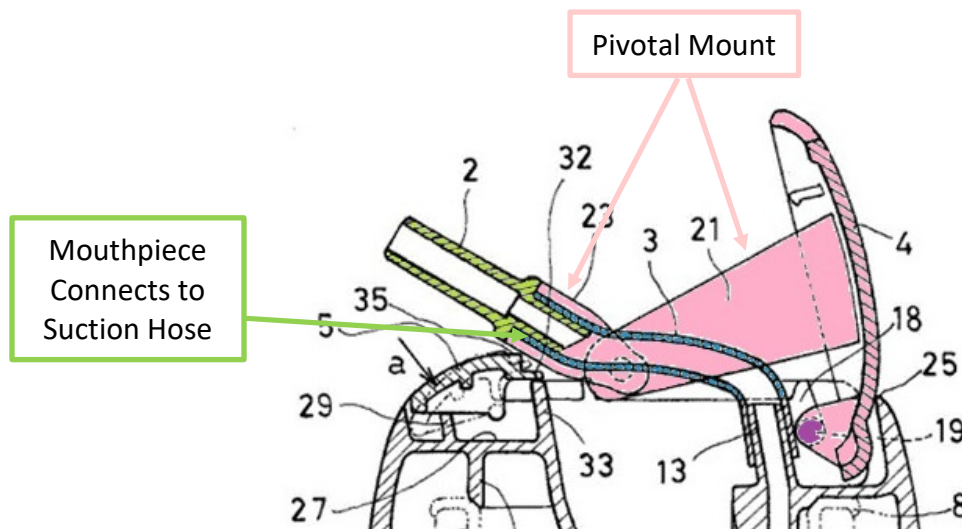


(Ex. 1004, Fig. 3). In the figure above, I have used green highlighting to show the structure of the mouthpiece in a two-component configuration. The figure clearly shows how a separate mouthpiece is inserted through the mount outlet of the “arms 23” to connect to “suction hose 3.” In view of Nakajima’s Figure 3, a person of ordinary skill would have readily understood how to modify Nakajima to construct a mouthpiece as a separate component that was removably coupled to the pivotal mount at the bracket formed by “arms 23.” And, because such a change would not require any significant alteration to the structure of Nakajima’s mouthpiece and pivotal mount, a person of ordinary skill in the art would have had a reasonable expectation of success in implementing the design.

88. In the two-component configuration, the mouthpiece is inserted through the mount outlet of the bracket portion of the pivotal mount:

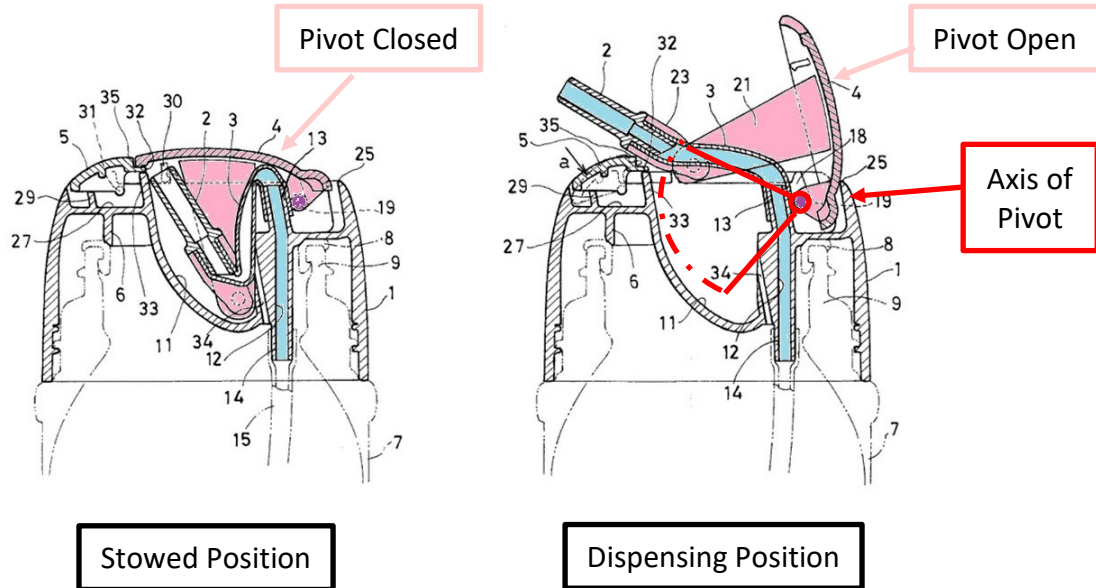


Ex. 1004, Fig. 1. Thus, a POSA would understand the mouthpiece to be “engaged with” the pivotal mount, as claimed. As shown below, the mouthpiece includes a projection on the opposite side of the bracket that engages with “suction hose 3” to form a fluid conduit:



Ex. 1004, Fig. 3.

89. Due to its engagement with the pivotal mount, Nakajima’s mouthpiece “moves up and down in conjunction with the opening and closing of the lid.” (*Id.*, ¶[0003]). The pivoting movement of the mouthpiece is shown below:



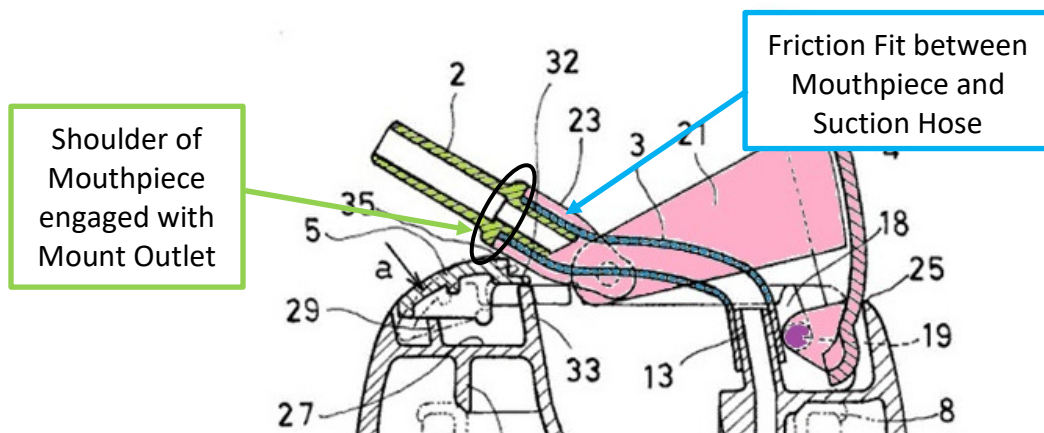
(*Id.*, Figs. 2-3).

90. A person of ordinary skill in the art would have been motivated to use a separate mouthpiece because it would allow the mouthpiece to be removed from the pivotal mount for cleaning, maintenance, or replacement.

91. In addition, a person of ordinary skill in the art would have recognized that there were various conventional means to removably couple the mouthpiece to the pivotal mount, including design features well-known to a person of ordinary skill at the time. Such design features would have included, for example, a ‘snap fit’ design comprising a shoulder or collar of the mouthpiece abutted against or otherwise engaged with the inner diameter of the mount outlet. An alternative well-known design feature would have included a ‘friction fit,’ wherein the mouthpiece was constructed from a more resilient material, as compared to the mounting bracket,

which was inserted through the inner diameter of the mount outlet, alone or in combination with a shoulder, to prevent control axial movement of the mouthpiece relative to the bracket. For reasons discussed below, it is my opinion that a person of ordinary skill would have been motivated to use resilient materials for Nakajima's mouthpiece, and this would have provided further motivation to form the mouthpiece as a separate component from the bracket of the pivotal mount.

92. I have colored and annotated Figure 3 below as an example of how a person of ordinary skill would have understood a removable mouthpiece to be fitted to the pivotal mount:



(Ex. 1004, Fig. 3). As shown above, a person of ordinary skill also would have understood that a removeable mouthpiece could be secured to “suction hose 3” using a simple friction fit between the inner and outer diameters of the mouthpiece and suction hose.

93. I note that Nakajima does not specify the material to be used for its

mouthpiece. However, in view of the knowledge of a person of ordinary skill in the art, a person of ordinary skill would have recognized the desirability of making Nakajima's mouthpiece from a variety of materials suitable for its purpose and construction. This would have included the resilient materials that were well-known and commonly used for the mouthpieces of drinking devices available at the time of the invention.

94. The use of resilient materials, such as plastic, rubber, latex, or other polymer materials, for drink container mouthpieces was routine and common at the time of the invention. For example, I recall that basic reusable water bottles routinely included resilient mouthpieces.

95. As discussed above, at the time of the invention, the prior art was replete with drinking devices with mouthpieces comprised of a variety of structures and materials. For example, Ribarits included a mouthpiece comprised of "latex or rubber," which a person of ordinary skill would have understood to be exemplary resilient materials. Ex. 1006, 2. Likewise, the Hughes mouthpiece was comprised of a flexible drinking hose. Ex. 1010, 9:45-51. More broadly, a POSA would have been aware of other prior art references directed to the mouthpieces of infant bottles or children's 'sippy' cups, which routinely utilized resilient materials to prevent damage from excessive biting or chewing and to improve the comfort of the infant's

or child's teeth and gums.

96. In addition, the '255 patent itself identifies several prior art patents directed to resilient mouthpieces, which it notes “may be selectively utilized (in whole or in part)” with the mouthpieces disclosed in the '255 patent. *See* Ex. 1001, 9:45-51 (identifying U.S. Patent Nos. 6,070,767 and 6,032,831). As I discussed above in my summary of U.S. Patent No. 6,070,767, which I refer to as the Gardner reference, that patent discloses resilient mouthpieces that can be used in a variety of hydration systems, including bladder-based systems or, as disclosed in Nakajima, the cap assembly of a bottle-based system. The resilient material of Gardner's mouthpiece allows it “to remain comfortably in a ready-to-use position in the user's mouth, even when not being used to dispense fluids.” Ex. 1005, 1:41-44.

97. Accordingly, it is my opinion that a person of ordinary skill in the art would have recognized the desirability of making Nakajima's mouthpiece from a resilient material, and that the choice of material would have constituted a routine design choice.

98. It is also my opinion that a person of ordinary skill would have been motivated to use a resilient material for Nakajima's mouthpiece for at least two reasons. First, as noted above, resilient mouthpieces were well-known to be gentler on a user's teeth and gums, and thus a person of ordinary skill would have recognized

that the use of a resilient mouthpiece in Nakajima would have improved user comfort and safety during use of the device.

99. Second, a person of ordinary skill would have recognized that the use of resilient materials for the Nakajima mouthpiece could aid in the mouthpiece resisting excessive forces applied by the user. In the context of mouthpieces, a well-known purpose for using resilient materials was to ensure that the mouthpiece did not permanently deform in response to compressive forces applied by the user's mouth, which could affect fluid flow.

100. A person of ordinary skill in the art also would have had a reasonable expectation of success in using a resilient material for the Nakajima mouthpiece for at least two reasons. First, as noted above, the prior art was replete with examples of resilient materials being used for the mouthpieces of drinking devices.

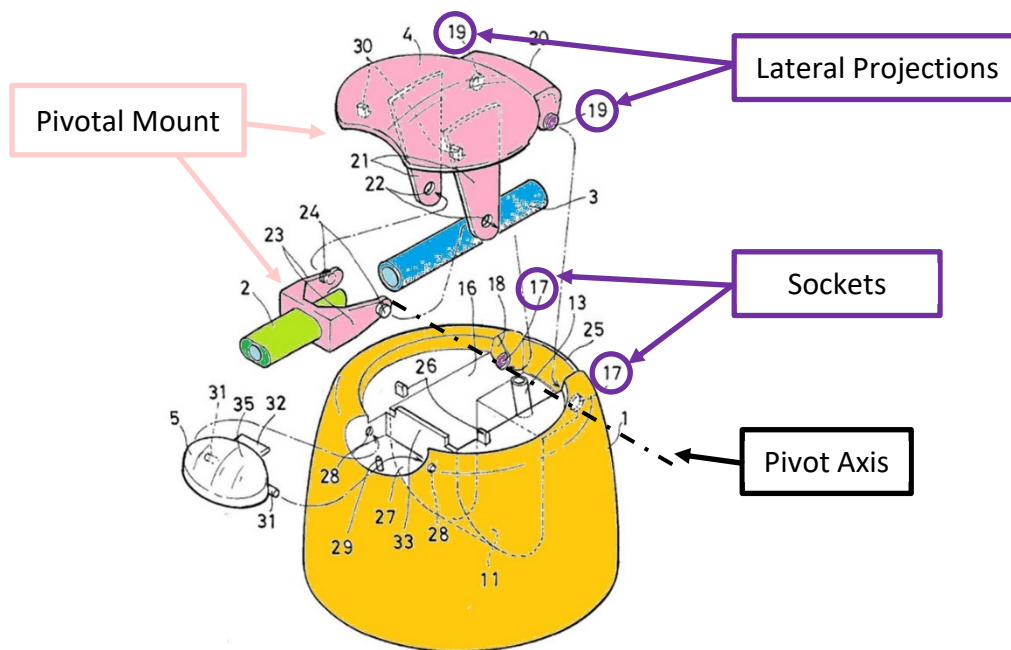
101. Second, a person of ordinary skill would have understood that common resilient materials used in mouthpieces, such as silicone (as in Gardner), rubber, or latex (as in Ribarits) could be molded and manufactured into the desired shape required for compatibility with Nakajima's pivotal mount.

7. **1[b][3][i]: “wherein the resilient mouthpiece is pivotal about an axis defined by the pair of lateral projections as the pair of lateral projections rotate within the pair of sockets”**

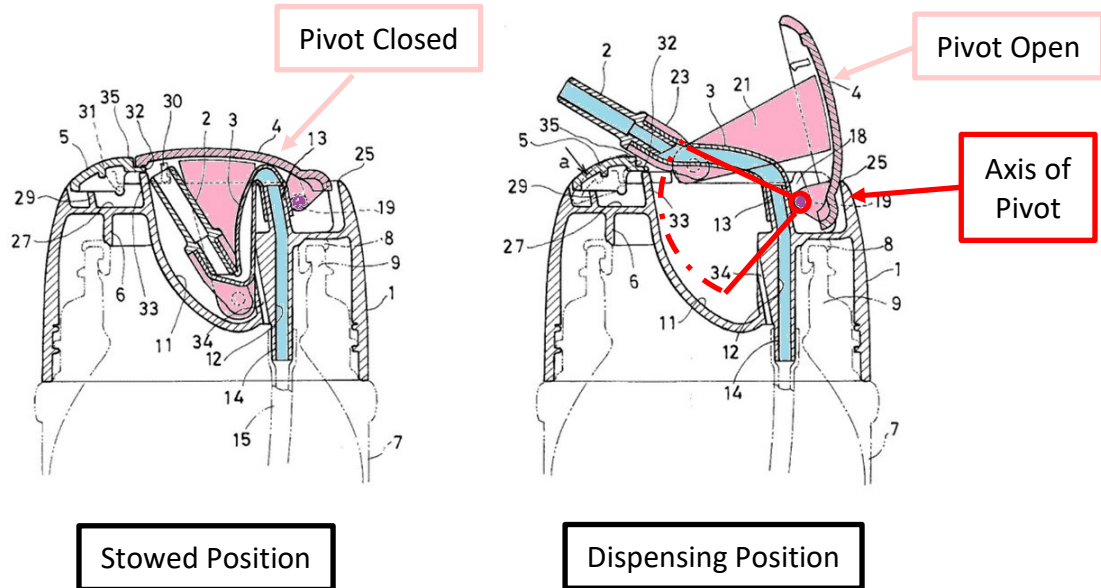
102. Limitation 1[b][3][i] recites “wherein the resilient mouthpiece is

pivotal about an axis defined by the pair of lateral projections as the pair of lateral projections rotate within the pair of sockets.” As I explain below, Nakajima discloses this limitation.

103. As noted above, Nakajima discloses a “pair of hinge shafts 19” that project laterally from the “hinge portion 20” of the “lid 4” and are “rotatably fitted into” a corresponding pair of “shaft receiving recesses 17” in the cap assembly base. (Ex. 1004, ¶¶[0015]-[0016]). Thus, the hinge shafts are a pair of lateral projections that rotate within a pair of sockets and thereby define an axis of rotation of the pivotal mount (i.e. the “lid 4”). This is shown in Figures 1-3 below:



Id. at Fig. 1.



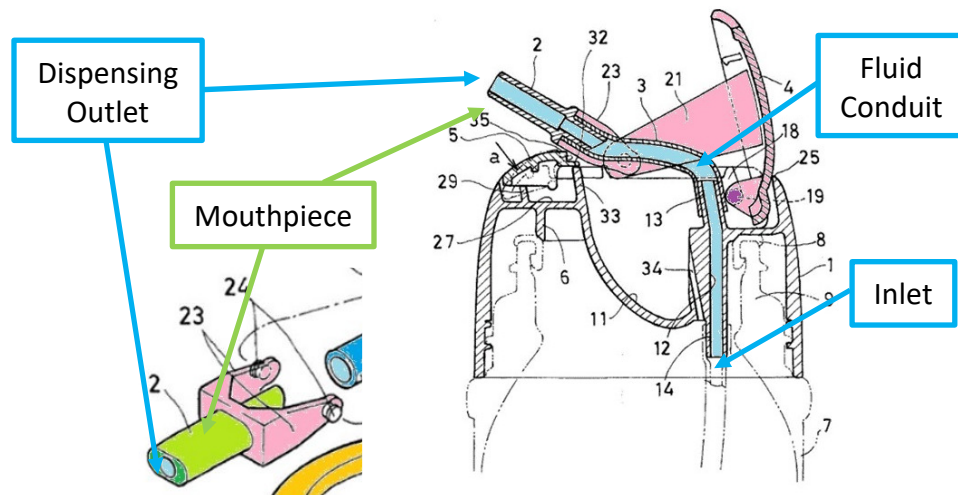
Id., Figs. 2-3. Thus, Nakajima’s mouthpiece pivots along the axis defined by the hinged connection between the pivotal mount and cap assembly base.

8. **1[b][3][ii]: “wherein the resilient mouthpiece defines a portion of the fluid conduit, including the dispensing outlet”**

104. Limitation 1[b][3][ii] recites “wherein the resilient mouthpiece defines a portion of the fluid conduit, including the dispensing outlet.” As I explain below, Nakajima discloses this limitation.

105. As noted above, Nakajima’s device includes a fluid conduit from the container to the user, which includes “a communication hole 12” connected via “connection port 13” to “a suction hose 3” and “a mouthpiece 2.” Ex. 1004, ¶¶[0012]-[0014]. As shown in the figure below, the mouthpiece of Nakajima defines the portion of the fluid conduit opposite the inlet from the liquid container, and includes the dispensing outlet from which a user may dispense liquid from the

container.



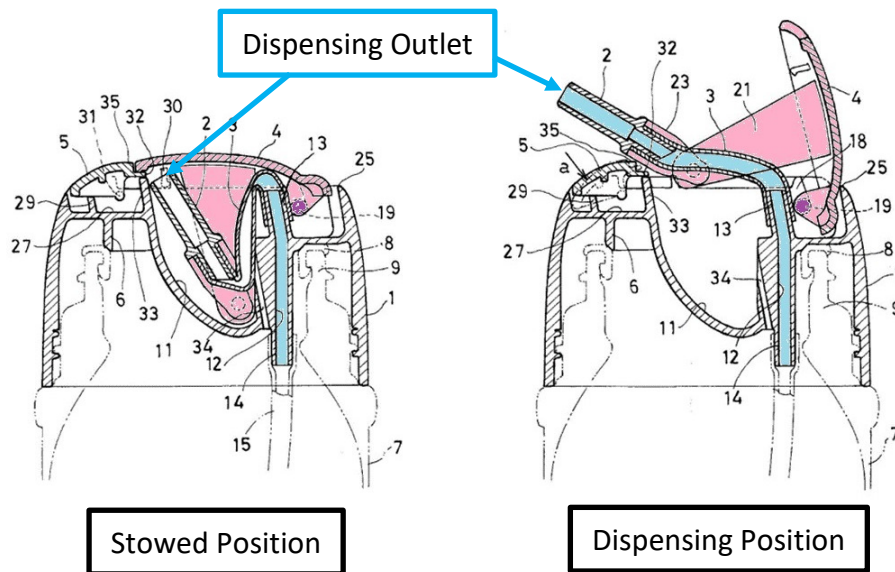
(Ex. 1004, Figs. 1, 3).

9. **1[b][3][iii]: “wherein the resilient mouthpiece and the pivotal mount are configured to be selectively pivoted between a stowed position and a dispensing position, and further in the dispensing position, the dispensing outlet is positioned further away from the cap assembly base than when the resilient mouthpiece and the pivotal mount are in the stowed position”**

106. Limitation 1[b][3][iii] recites “wherein the resilient mouthpiece and the pivotal mount are configured to be selectively pivoted between a stowed position and a dispensing position, and further in the dispensing position, the dispensing outlet is positioned further away from the cap assembly base than when the resilient mouthpiece and the pivotal mount are in the stowed position.” As I explain below, Nakajima discloses this limitation.

107. As noted above, the mouthpiece of Nakajima is mounted to the pivotal mount (i.e. “lid 4”) such that “the moves up and down in conjunction with the

opening and closing of the lid.” Ex. 1004, ¶[0003]. As shown in Figures 2 and 3 below, the mouthpiece pivots between a stowed position (Fig. 2) and a dispensing position (Fig. 3).



Ex. 1004, Figs. 2, 3. In the dispensing position (above, right), the dispensing outlet at the end of the mouthpiece is positioned further away from the cap assembly base (i.e. “stopper body 1”), as compared to the stowed position (above, left).

10. **1[b][3][iv]: “wherein the resilient mouthpiece is adapted to resiliently compress responsive to compressive forces applied to the resilient mouthpiece by a user’s teeth”**

108. Limitation 1[b][3][iv] recites “wherein the resilient mouthpiece is adapted to resiliently compress responsive to compressive forces applied to the resilient mouthpiece by a user's teeth.” For the same reasons discussed in connection with limitation 1[b][3][i] above, it is my opinion that this limitation is obvious over

Nakajima in view of the knowledge of a POSA.

109. I note that my opinion is consistent with the positions taken by Patent Owner in the co-pending litigation. There, Patent Owner’s infringement contentions confirm that this claim limitation requires only that the mouthpiece be made of a resilient material that does not permanently deform in response to compressive forces.

110. Patent Owner has asserted that Petitioner’s Owala Flip (For Kids) product includes a “resilient mouthpiece adapted to resiliently compress responsive to compressive forces,” as recited in this claim limitation. Patent Owner has relied on the annotated photographs below to map the accused product to this claim limitation:

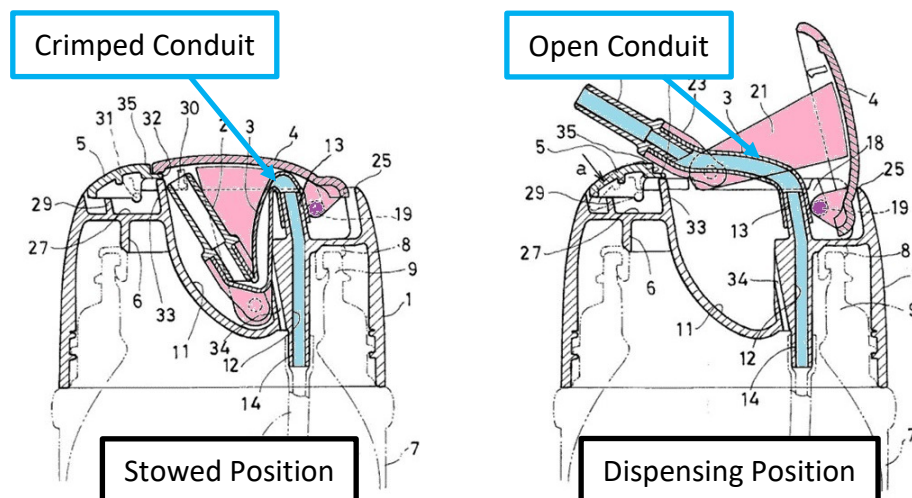


Ex. 1014, Claim Chart (Exhibit C-1) at 9). As shown in these photographs, Patent Owner contends that a “resilient mouthpiece” includes a mouthpiece that returns to its original shape after being compressed.

11. **1[b][4]: “a manual on/off valve having a closed configuration, in which the manual on/off valve obstructs the fluid conduit to restrict drink fluid from flowing between the inlet and the dispensing outlet, and an open configuration, in which the manual on/off valve permits drink fluid to flow through the fluid conduit from the inlet to the dispensing outlet”**

111. Limitation 1[b][4] recites “a manual on/off valve having a closed configuration, in which the manual on/off valve obstructs the fluid conduit to restrict drink fluid from flowing between the inlet and the dispensing outlet, and an open configuration, in which the manual on/off valve permits drink fluid to flow through the fluid conduit from the inlet to the dispensing outlet.” As I explain below, Nakajima discloses this limitation.

112. The manual on/off valve of Nakajima comprises the crimping and uncrimping functionality of the fluid conduit that occurs when the lid and mouthpiece pivot, thereby switching between the stowed position and dispensing position. This is shown in Figures 2 and 3 below.

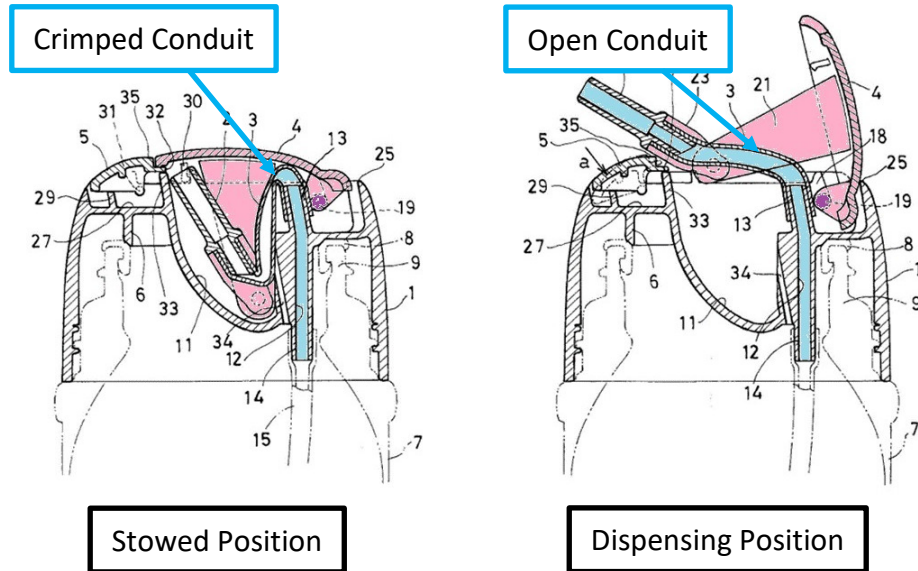


Ex. 1004, Figs. 2, 3.

12. **1[b][4][i]-[iii]: “wherein the manual on/off valve includes a flexible tube that defines a portion of the fluid conduit, wherein when the manual on/off valve is in the closed configuration, the tube is crimped to obstruct the flow of drink fluid through the fluid conduit, and wherein when the manual on/off valve is in the open configuration, the tube is not crimped and does not obstruct the flow of drink fluid through the fluid conduit”**

113. Limitations 1[b][4][i]-[iii] recite “wherein the manual on/off valve includes a flexible tube that defines a portion of the fluid conduit, wherein when the manual on/off valve is in the closed configuration, the tube is crimped to obstruct the flow of drink fluid through the fluid conduit, and wherein when the manual on/off valve is in the open configuration, the tube is not crimped and does not obstruct the flow of drink fluid through the fluid conduit.” As I explain below, Nakajima discloses these limitations.

114. As noted above, the manual on/off valve of Nakajima comprises the crimping functionality of the fluid conduit between the inlet and mouthpiece. The portion of the fluid conduit between the inlet and the mouthpiece is “suction hose 3,” which is a flexible, elastic tube that bends at two locations when the “lid 4” is closed. Ex. 1004, ¶¶[0014], [0018]. This is shown in Figures 2 and 3 below.



Ex. 1004, Figs. 2, 3.

115. According to Nakajima: “In the normal state, as shown in Fig. 2, the mouthpiece 2 and the suction hose 3 are folded into the storage recess 11, and the lid 4 is engaged with the stopper body 1 to cover and close the storage recess 11. In this state, a portion of the bent suction hose 3 seals the air hole 34, preventing leakage of liquid inside the container 7.” *Id.* at ¶[0022]. When the lid is opened, the elasticity of the “suction hose 3” causes it to unfold, thereby opening the fluid conduit and allowing liquid to be dispensed from the container. *See id.* at ¶[0023].

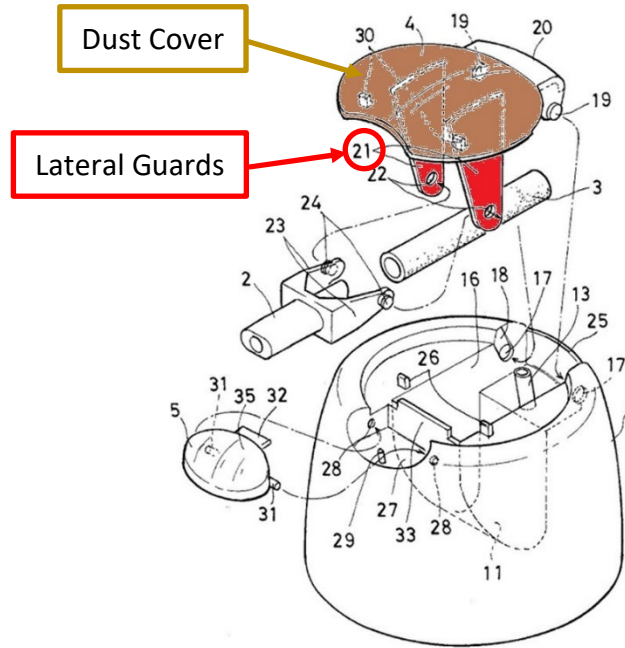
116. Accordingly, it is my opinion that Nakajima either discloses or renders obvious all the elements of claim 1. Thus, it is my opinion that claim 1 would have been obvious over Nakajima, in view of the knowledge of a person of ordinary skill in the art.

B. Claim 3 is Obvious over Nakajima

117. Claim 3 depends from claim 1, and thus incorporates the limitations of claim 1. As explained above, it is my opinion that Nakajima discloses and/or renders obvious each limitation of claim 1.

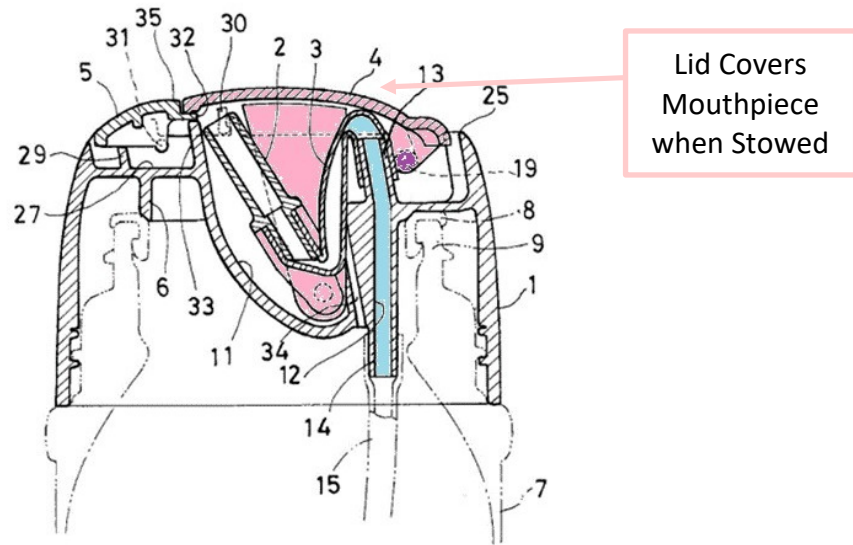
118. Claim 3 further recites, “wherein the cap assembly includes a pair of lateral guards that extend on opposed sides of the resilient mouthpiece when the resilient mouthpiece and the pivotal mount are in the stowed position, and further wherein the cap assembly includes a dust cover extending between the pair of lateral guards and positioned to protect the dispensing outlet of the resilient mouthpiece by extending across at least a portion of the dispensing outlet of the resilient mouthpiece when the resilient mouthpiece and the pivotal mount are in the stowed position.” As I explain below, Nakajima discloses these additional limitations.

119. Nakajima discloses a “pair of leg pieces 21 and 21 are provided on the underside of the lid 4.” Ex. 1004, ¶[0016]. As shown in annotated Figures 1 and 2 below, the leg pieces extend on opposed sides of “mouthpiece 2” when the mouthpiece and pivotal mount (i.e. “lid 4”) are in the stowed position.



(Ex. 1004, Fig. 1, ¶[0016]). Thus, a person of ordinary skill in the art would have understood the “pair of legs” on the underside of Nakajima’s pivotal mount to constitute a pair of lateral guards.

120. Nakajima also discloses: “The lid 4 covers the storage recess 11 and the top surface of the stopper body 1 surrounding the recess.” *Id.* at ¶[0016]. “When the lid 4 is closed, the suction hose 3 is bent at two upper and lower points and folded into the storage recess 11 together with the mouthpiece 2.” *Id.* at ¶[0018]. As shown in annotated Figure 2 above, Nakajima’s “lid 4” extends between the pair of lateral guards (i.e. “pair of legs 21”) and protects the dispensing outlet and mouthpiece when the pivotal mount is in the stowed position. Thus, a person of ordinary skill in the art would have understood Nakajima’s “lid 4” to constitute a dust cover.



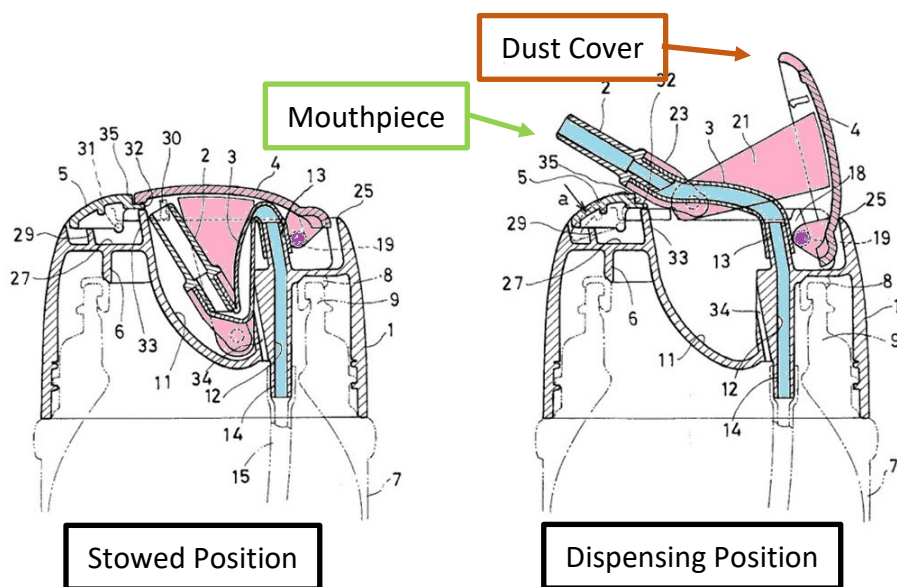
Ex. 1004, Fig. 3.

121. Accordingly, it is my opinion that Nakajima discloses the additional elements of claim 3. Thus, for the same reasons as discussed above in connection with claim 1, it is also my opinion that claim 3 would have been obvious over Nakajima, in view of the knowledge of a person of ordinary skill in the art.

C. Claim 4 is Obvious over Nakajima

122. Claim 4 depends from claim 3, and thus incorporates the limitations of claim 3. As explained above, it is my opinion that Nakajima discloses and/or renders obvious each limitation of claim 3. Claim 4 further recites, “wherein when the resilient mouthpiece is pivoted from the stowed position to the dispensing position, the resilient mouthpiece pivots away from the dust cover.” As I explain below, Nakajima discloses this additional limitation.

123. As shown in annotated Figures 2 and 3 below, Nakajima's mouthpiece pivots away from the dust cover (i.e. "lid 4") when the mouthpiece is pivoted from the stowed position (below, left) to the dispensing position (below, right).



Ex. 1004, Figs. 2, 3.

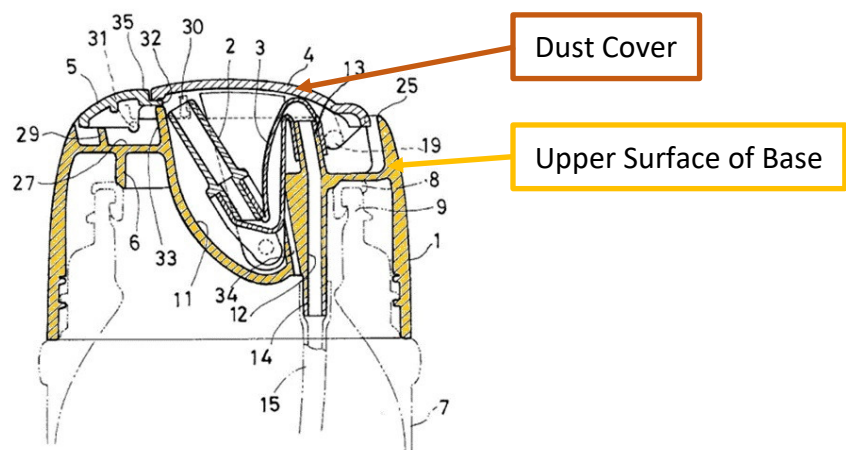
124. Accordingly, it is my opinion that Nakajima discloses the additional elements of claim 4. Thus, for the same reasons as discussed above in connection with claim 1, it is also my opinion that claim 4 would have been obvious over Nakajima, in view of the knowledge of a person of ordinary skill in the art.

D. Claim 5 is Obvious over Nakajima

125. Claim 5 depends from claim 3, and thus incorporates the limitations of claim 3. As explained above, it is my opinion that Nakajima discloses and/or renders

obvious each limitation of claim 3. Claim 5 further recites, “wherein the dust cover projects above an upper surface of the cap assembly base.” As I explain below, Nakajima discloses this additional limitation.

126. As shown in annotated Figures 2 and 3 below, Nakajima’s dust cover (i.e. “lid 4”) projects above an upper surface of the cap assembly base (i.e. “stopper body 1”) in both the stowed position (below, left) and dispensing position (below, right).



Ex. 1004, Figs. 2, 3.

127. Accordingly, it is my opinion that Nakajima discloses all the elements of claim 5. Thus, for the same reasons as discussed above in connection with claim 1, it is also my opinion that claim 5 would have been obvious over Nakajima, in view of the knowledge of a person of ordinary skill in the art.

E. Claim 9 is Obvious over Nakajima

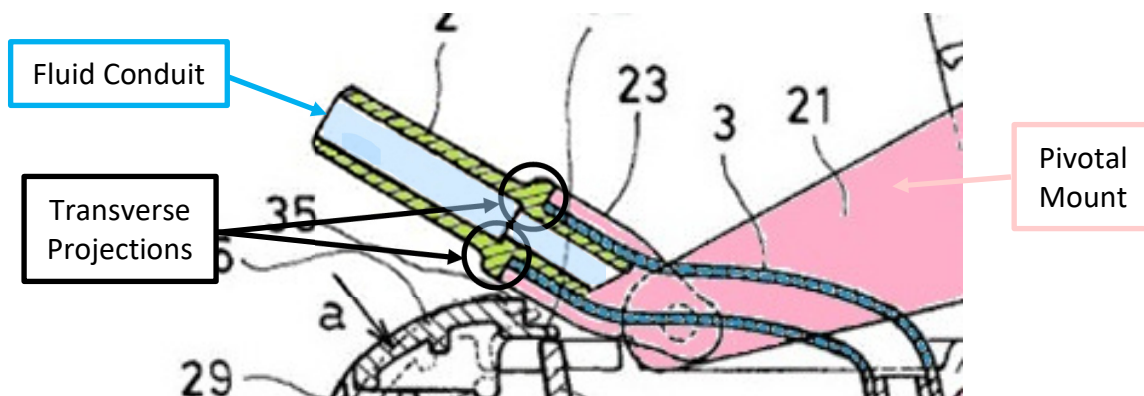
128. Claim 9 depends from claim 1, and thus incorporates the limitations of claim 1. As explained above, it is my opinion that Nakajima discloses and/or renders obvious each limitation of claim 1.

129. Claim 9 further recites, “wherein the resilient mouthpiece includes projections that extend generally transverse to the portion of the fluid conduit that extends through the resilient mouthpiece, and further wherein the projections engage an end region of the pivotal mount.” As I explain below, these additional limitations would have been obvious over Nakajima in view of the knowledge of a person of ordinary skill in the art.

130. For the reasons discussed in connection with limitations 1[b][3] above, it is my opinion that it would have been obvious to a person of ordinary skill in the art to modify Nakajima to include a separate mouthpiece removably coupled to the pivotal mount at “arms 23.” As also discussed above, in modifying Nakajima, a person of ordinary skill in the art would have been motivated to use a resilient material for the mouthpiece and would have recognized the desirability of using a shoulder, collar, or other friction fit design feature to removably couple the mouthpiece to the pivotal mount.

131. It is also my opinion that a person of ordinary skill in the art would have

recognized the desirability of designing the mouthpiece to include transverse projections that engage an end of the pivotal mount, thereby controlling rotational and axial movement of the mouthpiece relative to the pivotal mount. I have colored and annotated Figure 3 from Nakajima to illustrate an example of such a configuration that would have been readily apparent to a person of ordinary skill. In this example, the removable mouthpiece includes projections that extend transverse to the portion of the fluid conduit that extends through the mouthpiece and engage the pivotal mount:

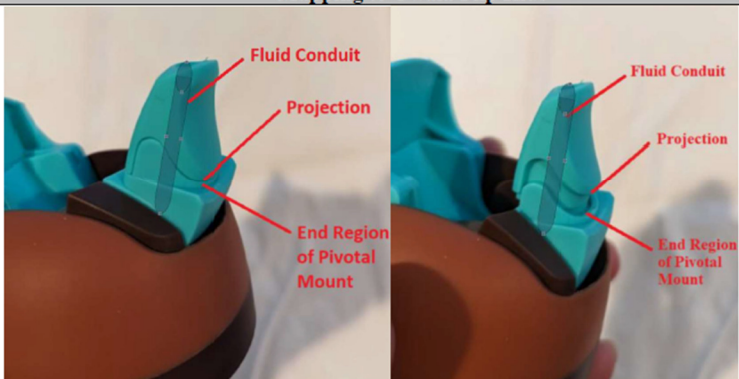


Ex. 1004, Fig. 3. The projections include both external projections and internal projections, which together form a set of shoulders abutting the suction hose and pivotal mount. In this way, the projections can be used to control lateral and transverse movement of the mouthpiece relative to the pivotal mount.

132. A person of ordinary skill in the art would have had a reasonable expectation of success including transverse projections on the mouthpiece that

engage an end of the pivotal mount. That is because doing so would have been a routine design choice between a finite number of well-known design features. For example, Gardner teaches the use of “stops” that “extend internally into the mouthpiece” to prevent the fluid conduit supply tube from being inserted into the mouthpiece more than a defined distance. (Ex. 1005, 4:27-30). Thus, modifying the removable mouthpiece to include transverse projections, including internal transverse projections, would have constituted nothing more than the use of a well-known technique to improve a known device in a predictable way.

133. In the above example, the projecting shoulder is circumferential, meaning that it extends around the entire diameter of the mouthpiece. In co-pending litigation, the Patent Owner’s infringement contentions confirm that a shoulder of this type constitutes “projections” for purposes of claim 9. For example, in its infringement contentions, Patent Owner relied on the following images to support its contention that Trove Brands’ Owala Flip (For Kids) product infringes claim 9:

Claim	Claim Language	Mapping to Owala Flip Kids	
9	The drink container of claim 1, wherein the resilient mouthpiece includes projections that extend generally transverse to the portion of the fluid conduit that extends through the resilient mouthpiece, and further wherein the projections engage an end region of the pivotal mount.		

Ex. 1013, 16. As shown above, Patent Owner contends that a single projection comprising a shoulder structure around the circumference of the mouthpiece that extends transverse to the fluid path practices claim 9.

134. Accordingly, for the same reasons as discussed above in connection with claim 1, it is also my opinion that claim 9 would have been obvious over Nakajima, in view of the knowledge of a person of ordinary skill in the art.

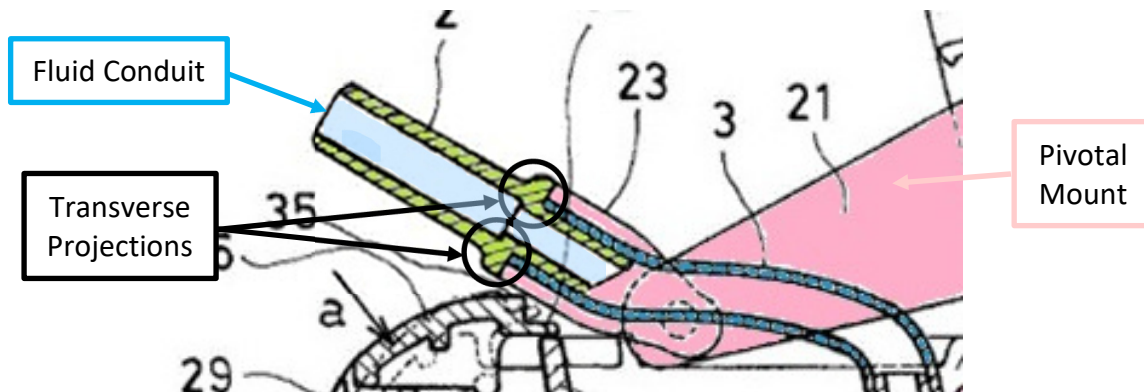
F. Claim 10 is Obvious over Nakajima

135. Claim 10 depends from claim 9, and thus incorporates the limitations of claim 9. As explained above, it is my opinion that claim 9 is obvious over Nakajima in view of the knowledge of a person of ordinary skill in the art.

136. Claim 10 further recites, “wherein the projections are internal projections.” As I explain below, this additional limitation is also obvious over Nakajima in view of the knowledge of a person of ordinary skill in the art.

137. Consistent with my discussion in connection with claim 9 above, where Nakajima’s mouthpiece was modified to be removably coupled to the pivotal mount, a person of ordinary skill would have recognized the desirability of using a shoulder, collar, or other friction fit structure to couple the mouthpiece to the pivotal mount. An example of such a configuration is illustrated below, wherein the mouthpiece includes projections that extend transverse to the portion of the fluid conduit that

extends through the mouthpiece and engage the pivotal mount:



(Ex. 1004, Fig. 3). The above example includes internal projections that form a shoulder abutting the pivotal mount and suction hose. In this way, the projections can be used to control lateral and transverse movement of the mouthpiece relative to the pivotal mount.

138. Accordingly, for the same reasons as discussed above in connection with claims 1 and 9, claim 10 would have been obvious over Nakajima, in view of the knowledge of a POSA.

G. Claim 11 is Obvious over Nakajima

139. Claim 11 depends from claim 1, and thus incorporates the limitations of claim 1. As explained above, it is my opinion that Nakajima discloses and/or renders obvious each limitation of claim 1.

140. Claim 11 further recites, “wherein the resilient mouthpiece is configured to be selectively removed from and recoupled to the pivotal mount.” For

the same reasons discussed above in connection with claim 1, which requires the mouthpiece to be “removably coupled” to the pivotal mount, a person of ordinary skill in the art would have understood Nakajima’s mouthpiece to be configured to be selectively removed from and recoupled to the pivotal mount.

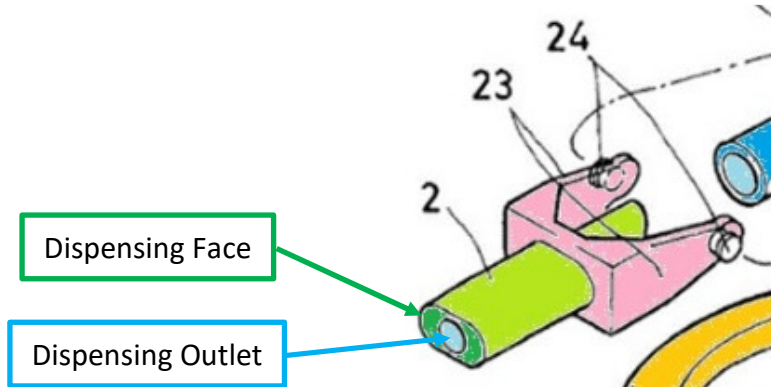
141. Accordingly, it is my opinion that Nakajima discloses all the elements of claim 11. Thus, for the same reasons as discussed above in connection with claim 1, it is also my opinion that claim 11 would have been obvious over Nakajima, in view of the knowledge of a person of ordinary skill in the art.

H. Claim 13 is Obvious over Nakajima

142. Claim 13 depends from claim 1, and thus incorporates the limitations of claim 1. As explained above, it is my opinion that Nakajima discloses and/or renders obvious each limitation of claim 1.

143. Claim 13 further recites, “wherein the resilient mouthpiece includes a dispensing face, and further wherein the dispensing outlet extends through the dispensing face of the resilient mouthpiece.” As I explain below, Nakajima discloses these additional limitations.

144. As shown in annotated Figure 1 below, which I have cropped and expanded for clarity, Nakajima’s mouthpiece includes a dispensing face, through which the dispensing outlet extends.



Ex. 1004, Fig. 1.

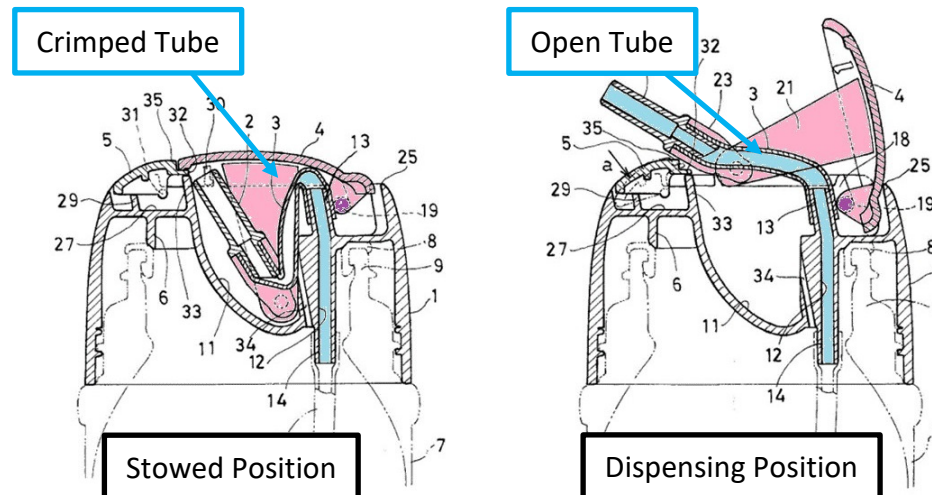
145. Accordingly, it is my opinion that Nakajima discloses all the elements of claim 13. Thus, for the same reasons as discussed above in connection with claim 1, it is also my opinion that claim 13 would have been obvious over Nakajima, in view of the knowledge of a person of ordinary skill in the art.

I. Claim 18 is Obvious over Nakajima

146. Claim 18 depends from claim 1, and thus incorporates the limitations of claim 1. As explained above, it is my opinion that Nakajima discloses and/or renders obvious each limitation of claim 1.

147. Claim 18 further recites, “wherein the pivotal mount is adapted to selectively engage the flexible tube to apply crimping forces thereto and thereby configure the manual on/off valve to the closed configuration as the pivotal mount is pivoted from the dispensing position to the stowed position.” As I explain below, Nakajima discloses this additional limitation.

148. As discussed above, Nakajima's pivotal mount engages the flexible tube to apply crimping forces thereto when pivoted into the stowed position:



Ex. 1004, Figs. 2-3.¶¶[0022]-[0023].

149. Accordingly, it is my opinion that Nakajima discloses the additional limitation of claim 18. Thus, for the same reasons as discussed above in connection with claim 1, it is also my opinion that claim 18 would have been obvious over Nakajima, in view of the knowledge of a person of ordinary skill in the art.

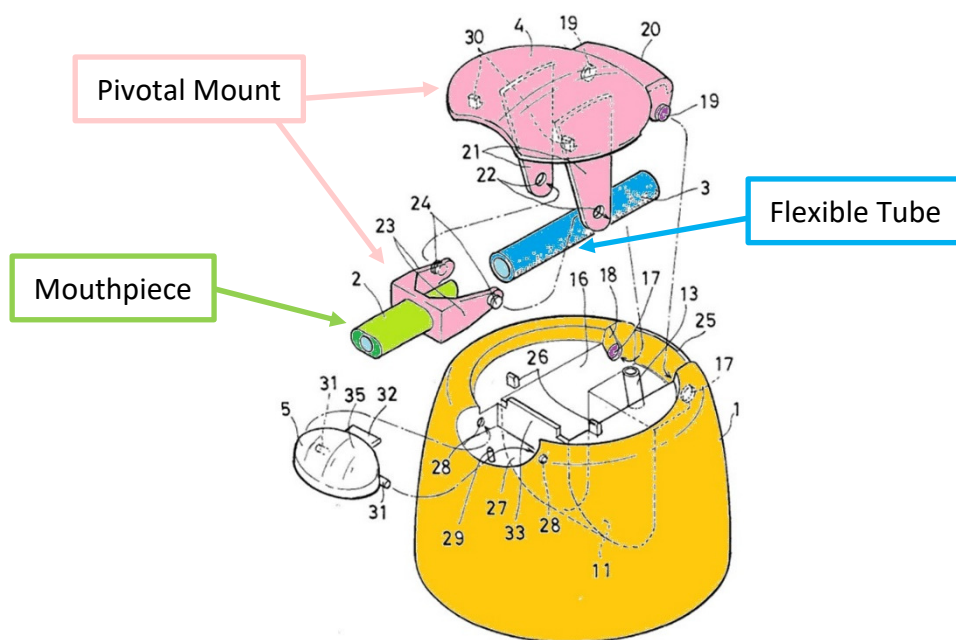
J. Claim 19 is Obvious over Nakajima

150. Claim 19 depends from claim 1, and thus incorporates the limitations of claim 1. As explained above, it is my opinion that Nakajima discloses and/or renders obvious each limitation of claim 1.

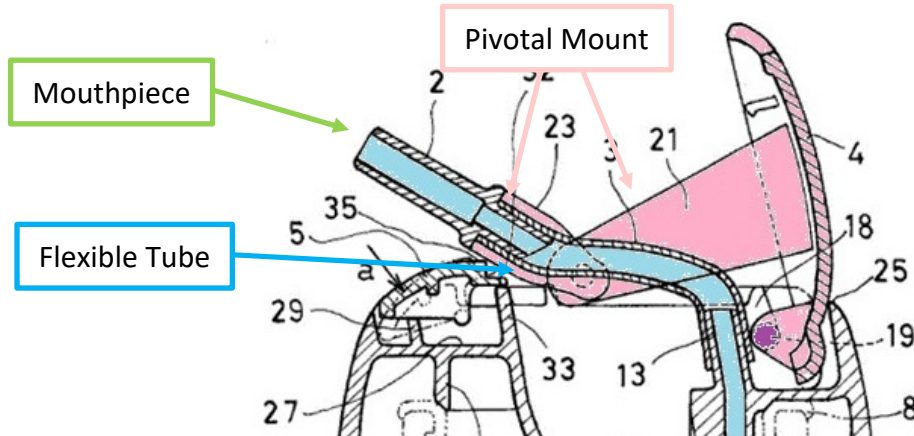
151. Claim 19 further recites, “wherein the flexible tube is secured to the

pivotal mount.” As I explain below, Nakajima discloses this additional limitation.

152. As discussed above in connection with limitations 1[b][4][i]-[iii], Nakajima’s manual on/off valve includes a flexible tube (i.e. “suction hose 3”). As shown in annotated Figure 3 below, the “suction hose 3” is secured to the pivotal mount (i.e. “lid 4”) through its connection to “mouthpiece 2,” which is in turn secured to the pivotal mount via the pair of “protrusion[s] 24” on its arms, which are fitted to the “leg pieces 21” of the pivotal mount. *See* Ex. 1004, ¶[0016].



Ex. 1004, Fig. 1.



(Ex. 1004, Fig. 3). Because the suction hose is secured to the mouthpiece and lid, the elasticity of the suction hose causes the lid to be pushed up and the mouthpiece to pivot to the dispensing position when the lid is opened by the user. *See id.* at ¶[0023].

153. Accordingly, it is my opinion that Nakajima discloses all the elements of claim 19. Thus, for the same reasons as discussed above in connection with claim 1, it is also my opinion that claim 19 would have been obvious over Nakajima, in view of the knowledge of a person of ordinary skill in the art.

V. GROUND 2: CLAIMS 12, AND 14-16 WOULD HAVE BEEN OBVIOUS OVER NAKAJIMA IN VIEW OF GARDNER

154. As explained in Ground 1 above, it is my opinion that Nakajima discloses and/or renders obvious all the elements of claims 1, 3-5, 9-11, 13, 18, and 19 of the '255 patent. Claims 12 and 14-16 are each directed to the features of a resilient mouthpiece with a bite-actuated valve. As set forth below, it is my opinion

that claims 12, and 14-16 are obvious over Nakajima, in view of Gardner.

155. In addition, to the extent that Nakajima, in view of the knowledge of a person of ordinary skill in the art, may not have been sufficient to render obvious any specific element of claims 1, 3-5, 9-11, 13, 18, and 19 of the '255 patent, it is also my opinion that those claims are nonetheless obvious over Nakajima, in view of Gardner, for the same reasons discussed above and further discussed below.

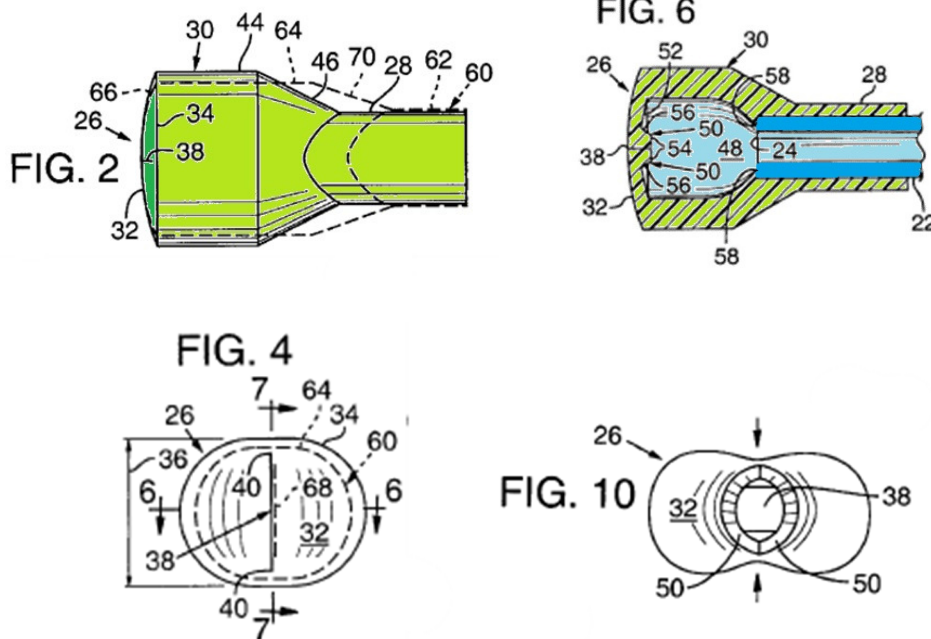
A. Claim 12 is Obvious over Nakajima in view of Gardner

156. Claim 12 depends from claim 11, and thus incorporates the limitations of claim 11. As explained above in Ground 1, it is my opinion that claim 11 is obvious over Nakajima, in view of the knowledge of a person of ordinary skill in the art.

157. Claim 12 further recites, “wherein the resilient mouthpiece includes a mouthpiece base with an end distal the dispensing outlet that has a contoured configuration that does not extend at a constant distance from the dispensing outlet, wherein the end of the resilient mouthpiece base includes a projecting region and a concave region, wherein the projecting region of the end of the mouthpiece base extends a greater distance away from the dispensing outlet than the concave region of the end of the mouthpiece base, and further wherein the pivotal mount is configured to engage the projecting region and the concave region of the mouthpiece

base to restrict rotation of the resilient mouthpiece relative to the pivotal mount.” As I explain below, these additional limitations are obvious over Nakajima, in view of Gardner.

158. Gardner discloses a mouthpiece that “includes a neck that is adapted to be mounted on a supply tube to a hydration system and which is joined to a resilient head.” Ex. 1005, Abstract. “The head includes a dispensing face with a pair of lips that define a normally closed slit, through which fluid is dispensed from the mouthpiece” *Id.* The resilient mouthpiece of Gardner “is deformable to a dispensing position in which the lips are spread at least partially away from each other to allow fluid to be dispensed through the lips.” *Id.*



(Ex. 1005, Figs. 2, 4, 6, 10).

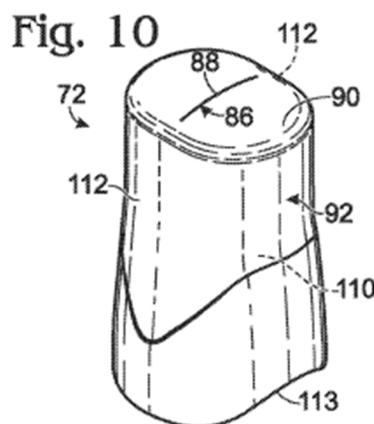
159. Gardner describes the bite-actuated operation of its resilient mouthpiece as follows:

From perimeter 34, head 30 includes a bite region 44 that extends generally normal to the plane of perimeter 34 and provides a surface upon which the user may apply a force, such as with the user's teeth, to deform mouthpiece 26 to open slit 38 and enable a flow of fluid to be dispensed from the mouthpiece.

Ex. 1005, 3:31-36.

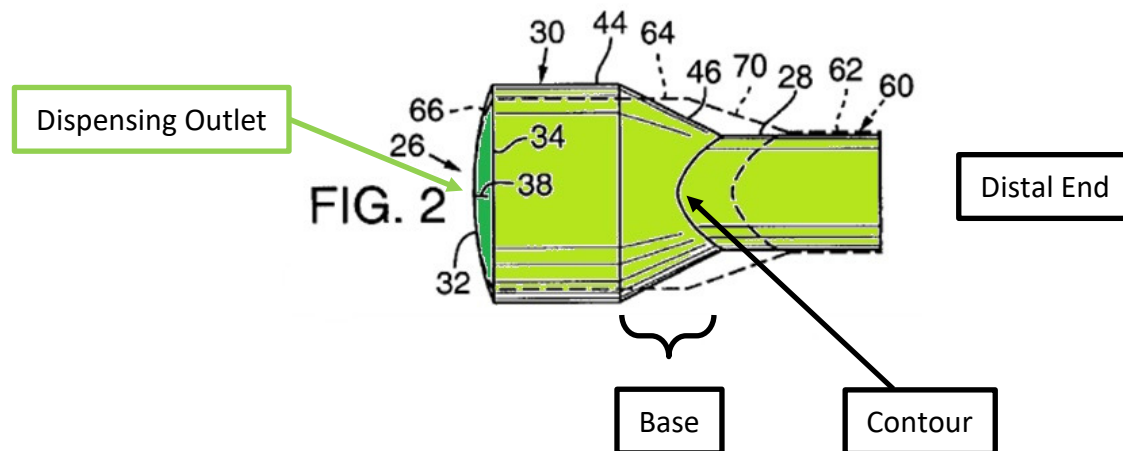
1. **Limitation 12[a]: “wherein the resilient mouthpiece includes a mouthpiece base with an end distal the dispensing outlet that has a contoured configuration that does not extend at a constant distance from the dispensing outlet”**

160. As an initial matter, I note that when describing the mouthpiece, the '255 patent uses the term “distal” to refer to the “base” of the mouthpiece, that is, the end of the mouthpiece that is opposite the “dispensing face.” Ex. 1001, 9:7-13. For example, the '255 patent identifies the “distal” portion of the mouthpiece as the end indicated by “113” in Figure 10, which I have reproduced below:



Ex. 1001, Fig. 10.

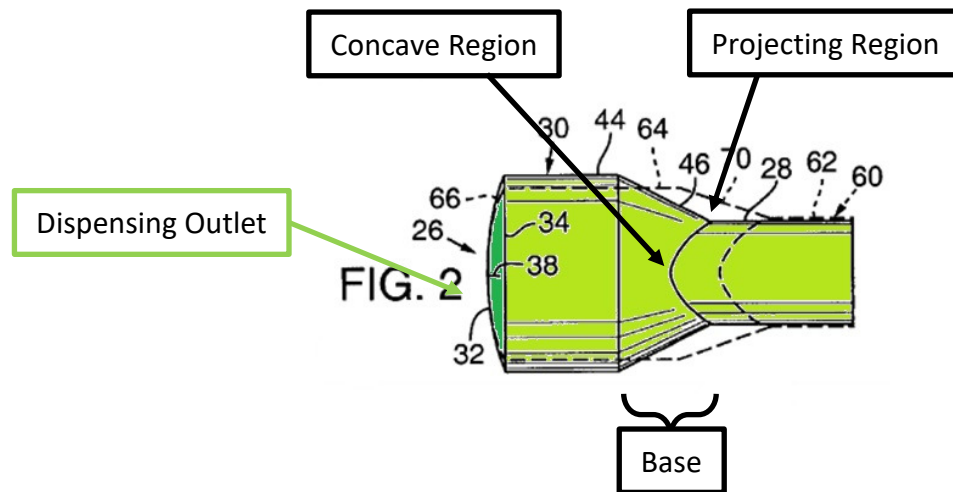
161. The resilient mouthpiece of Gardner includes a mouthpiece base that is distal to, i.e. opposite, the dispensing outlet and has a contoured configuration, as shown in Figures 1 and 4 below:



Ex. 1005, Fig. 2. Gardner describes its mouthpiece as having several distinct regions, including a “bite region 44,” “lip-receiving shoulder 46” and “neck 28.” The “lip-receiving shoulder 46” comprises the base of Gardner’s mouthpiece, and its contoured configuration does not extend at a constant distance from the dispensing outlet.

2. Limitation 12[b]: “wherein the end of the resilient mouthpiece base includes a projecting region and a concave region”

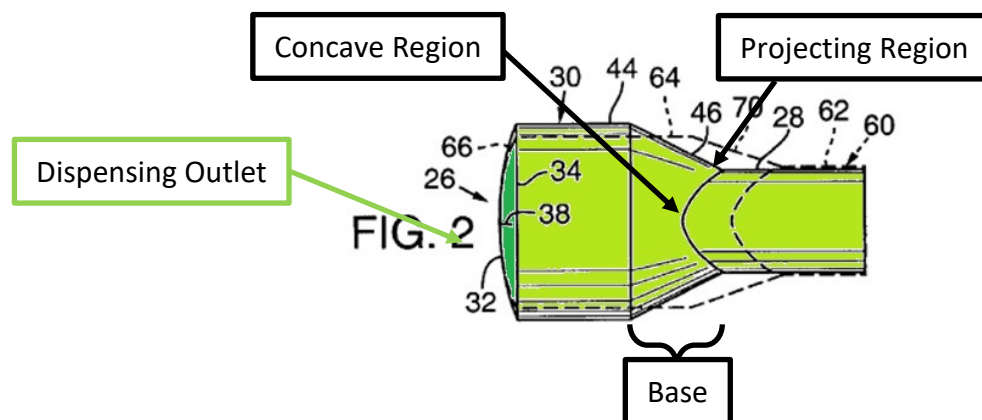
162. As shown in Figure 2, the base of Gardner’s resilient mouthpiece includes a projecting region (i.e. the “neck 28”) and a concave region (i.e. the “lip-receiving shoulder 46”):



Ex. 1005, Fig. 2.

3. **Limitation 12[c]: “wherein the projecting region of the end of the mouthpiece base extends a greater distance away from the dispensing outlet than the concave region of the end of the mouthpiece base”**

163. As shown in Figure 2, the projecting region of the end of Gardner’s resilient mouthpiece (i.e. the “neck 28”) extends further away from the dispensing outlet than the concave region (i.e. the “lip-receiving shoulder 46”):



Ex. 1005, Fig. 2.

4. **Limitation 12[d]: “further wherein the pivotal mount is configured to engage the projecting region and the concave region of the mouthpiece base to restrict rotation of the resilient mouthpiece relative to the pivotal mount”**

164. Gardner does not disclose a pivotal mount for its resilient mouthpiece. However, as discussed above in Ground 1, Nakajima discloses a mouthpiece and pivotal mount, and it would be obvious to a POSA to modify Nakajima to include a separate, resilient mouthpiece removably coupled to the pivotal mount. It is also my opinion that a person of ordinary skill in the art would have been motivated to combine the resilient, bite-actuated mouthpiece of Gardner with the Nakajima’s pivotal mount for several reasons.

165. First, as discussed in Ground 1 above, the use of resilient mouthpieces, including resilient, bite-actuated mouthpieces, was well-known at the time of the ’255 patent, as exemplified in the disclosures of Gardner, which the ’255 patent itself cites as prior art.

166. Second, it was equally well-known that a resilient, bite-actuated mouthpiece—such as the Gardner mouthpiece—would provide a secondary level of protection against inadvertent leakage of liquid from the container when the mouthpiece was in the dispensing position. As Gardner explains: “it is desirable for the mouthpiece not to leak when in a closed position” Ex. 1005, 1:41-42.

167. A person of ordinary skill would have understood that such a mouthpiece would provide complementary functionality with Nakajima's on/off valve. Whereas an on/off valve such as the one described in Nakajima will remain in a user-selected configuration until repositioned by the user, the bite-actuated mouthpiece of Gardner is biased to return to a closed position. Therefore, adding the bite-actuated mouthpiece of Gardner would provide the added benefit of preventing inadvertent leakage even when the on/off valve of Nakajima is in the 'on' position.

168. Third, a person of ordinary skill in the art would have understood that the modifying Nakajima to include the bite-actuated mouthpiece of Gardner would constitute nothing more than a simple substitution of one well-known element—Gardner's resilient, bite-actuated mouthpiece—for another well-known element—a resilient mouthpiece without a bite-actuated valve. Likewise, a person of ordinary skill in the art would have understood that the modification would constitute nothing more than the use of a well-known technique—use of resilient materials to create a comfortable, bite-actuated mouthpiece—to improve a known device—Nakajima's resilient mouthpiece—in a predictable way without negatively impacting the component's—or the overall device's—functionality.

169. A person of ordinary skill in the art would have had a reasonable

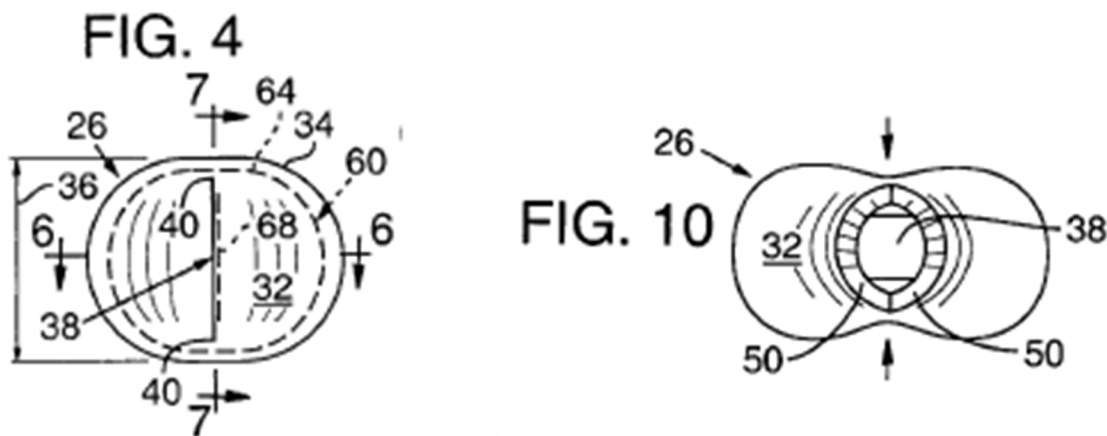
expectation of success in modifying Nakajima to use Gardner’s resilient, bite-actuated mouthpiece. That is because a person of ordinary skill in the art would have understood the desirability of either (1) manufacturing Gardner’s mouthpiece into a shape compatible with the pivotal mount disclosed in Nakajima, which could thus be readily exchanged for the Nakajima mouthpiece without sacrificing any aspect of the functionality of the Nakajima design, or (2) mounting Gardner’s mouthpiece on the end of Nakajima’s existing mouthpiece to improve the existing design. In either case, a person of ordinary skill would have recognized the desirability of fitting the Gardner mouthpiece over the flexible tube of Nakajima’s fluid conduit to form a watertight seal, as Gardner itself teaches. Ex. 1005, 3:11-19 (teaching “neck” of mouthpiece is fitted over fluid conduit to form a watertight seal, and “mouthpiece can be slipped on and off” for cleaning or maintenance).

170. For the reasons discussed below, it is also my opinion that in modifying Nakajima to include the Gardner mouthpiece, it would have been obvious to a person of ordinary skill in the art to configure the Gardner mouthpiece to engage Nakajima’s pivotal mount in such a way as to restrict rotation of the resilient mouthpiece relative to the pivotal mount.

171. First, as noted above, a person of ordinary skill in the art would have recognized that Gardner’s resilient, bite-actuated mouthpiece could be fitted to the

dispensing end of the Nakajima mouthpiece. Gardner teaches such a combination, noting that the “neck” of the mouthpiece is fitted over a fluid conduit to form a watertight seal, and that the “mouthpiece can be slipped on and off” for cleaning or maintenance. Ex. 1005, 3:11-19.

172. In doing so, it would have been obvious to a person of ordinary skill in the art to configure the resulting pivotal mount to engage the projecting region and the concave region of the mouthpiece base to restrict rotation of the resilient mouthpiece on the pivotal mount. This is because the bite-actuated mouthpiece of Gardner is directional, that is, it is intended to be compressed along only one axis to open the valve. This is shown in Figures 4 and 10, below:



Ex. 1005, Figs. 4, 10. According to Gardner:

Once positioned in the user's mouth as discussed above, mouthpiece 26 can be deformed from its closed position to a dispensing position, shown in FIGS. 8-10, when a force is applied to the regions of bite region 44 generally adjacent ends 40 of slit 38. This compressive force

is applied along the axes of the lips, as indicated generally with arrows in FIG. 10, and causes lips 50 to spread at least partially apart from each other to cause Slit 38 to form an opening, also referred to as a hydraulic orifice, through which fluid may be passed.

Ex. 1005, 6:12-21.

173. In view of these disclosures in Gardner, a person of ordinary skill in the art would have understood that applying a compressive bite force to the resilient mouthpiece in a direction perpendicular to the dispensing outlet slit would open the valve and thereby dispense fluid. A person of ordinary skill in the art would have also understood that applying a compressive bite force to the resilient mouthpiece in a direction parallel to the dispensing outlet slit would not cause the slit to open. Therefore, a person of ordinary skill in the art would have recognized the need to fix the mouthpiece orientation when combined with Nakajima's pivotal mount.

174. Accordingly, it is my opinion that claim 12 is obvious over Nakajima, in view of Gardner.

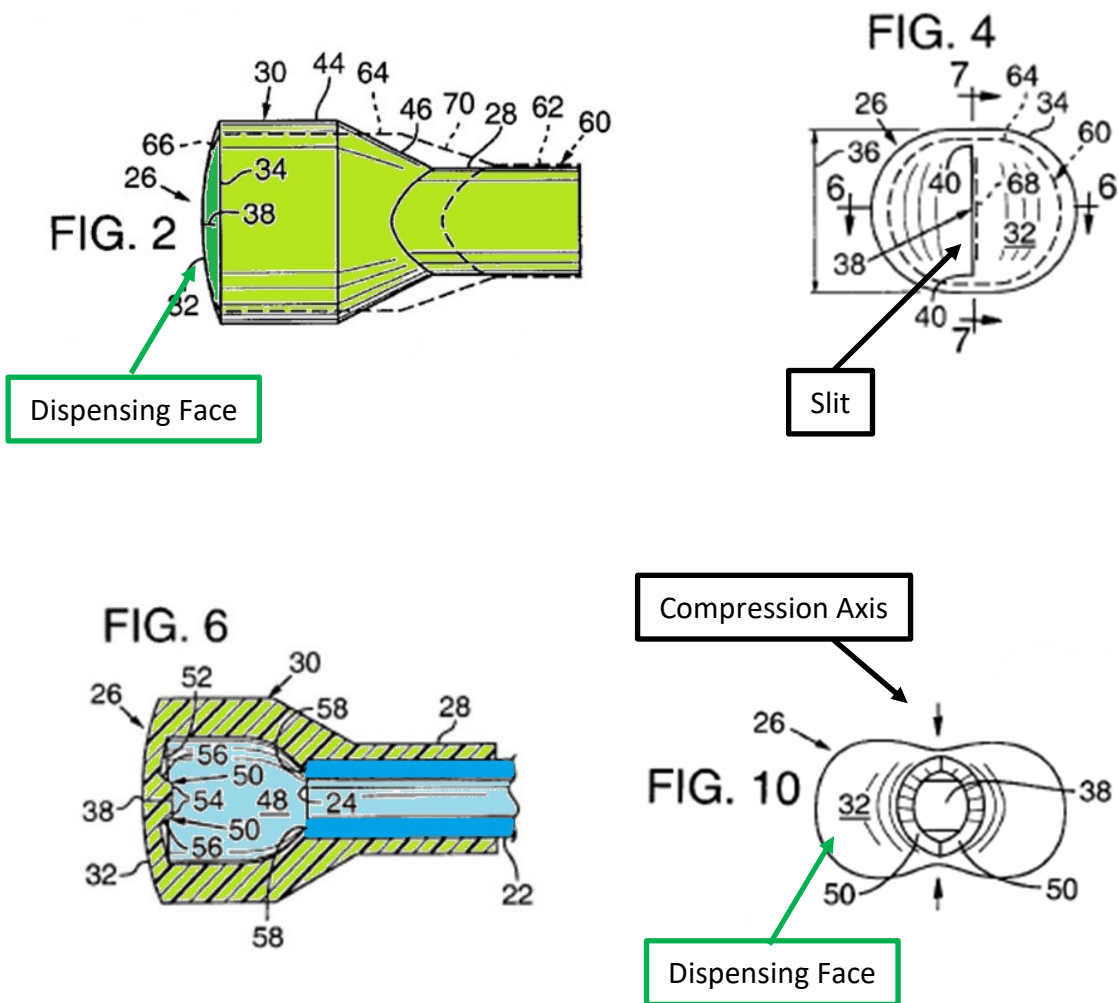
B. Claim 14 is Obvious over Nakajima in view of Gardner

175. Claim 14 depends from claim 13, and thus incorporates the limitations of claim 13. As explained above, it is my opinion that claim 13 is obvious over Nakajima in view of Gardner.

176. Claim 14 further recites, “wherein the dispensing outlet is defined by a slit that extends through the dispensing face of the resilient mouthpiece.” As

explained below, Gardner discloses this additional limitation. Thus, it is my opinion that claim 14 is obvious over Nakajima, in view of Gardner.

177. Gardner’s mouthpiece includes a “slit 38” that extends through a “dispensing face 32” of the mouthpiece, as shown below:



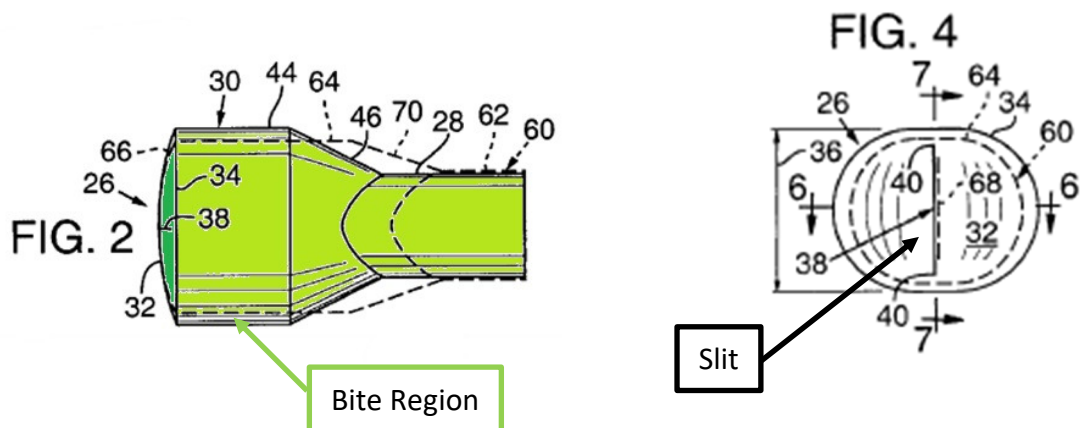
Ex. 1005, Figs. 2, 4, 6, 10.

C. Claim 15 is Obvious over Nakajima in view of Gardner

178. Claim 15 depends from claim 1, and thus incorporates the limitations of claim 1. As explained above, it is my opinion that claim 1 is obvious over Nakajima in view of the knowledge of a person of ordinary skill in the art.

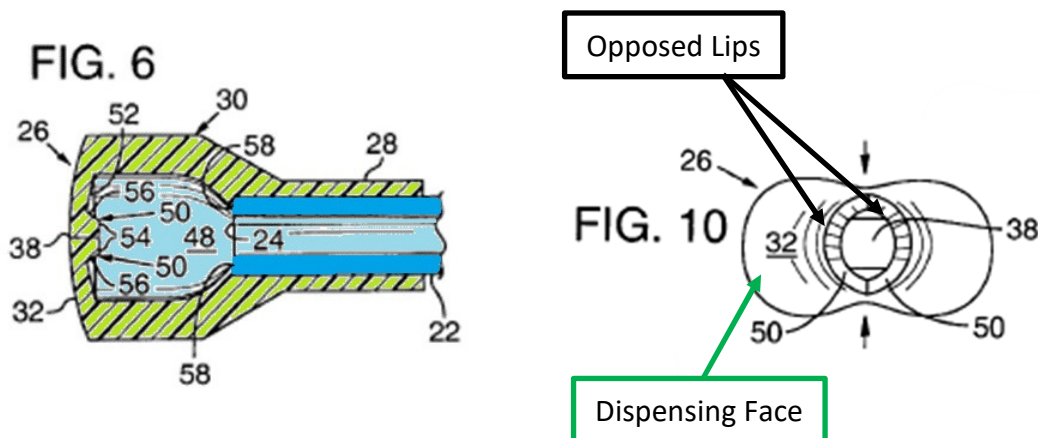
179. Claim 15 further recites, “wherein the resilient mouthpiece includes a dispensing face that defines the dispensing outlet, wherein the resilient mouthpiece includes opposed bite regions, wherein the dispensing face includes opposed lips between which the dispensing outlet is defined, and further wherein when a user applies compressive forces to the opposed bite regions, the lips are urged away from each other to enlarge the dispensing outlet.” As explained below, Gardner discloses this additional limitation.

180. Gardner’s mouthpiece includes a “bite region 44 generally adjacent ends 40 of slit 38,” as shown below:



Ex. 1005, Figs. 2, 4, 6:12-21. The “dispensing face 32” includes opposed “lips 50”

which define the dispensing outlet of the mouthpiece, as shown below:



Ex. 1005, Figs. 6, 10. As shown in Figure 10, a user applied compressive force to the bite region “causes lips 50 to spread at least partially apart ... to cause slit 38 to form an opening ... through which fluid may be passed.” Ex. 1005, 6:12-21.

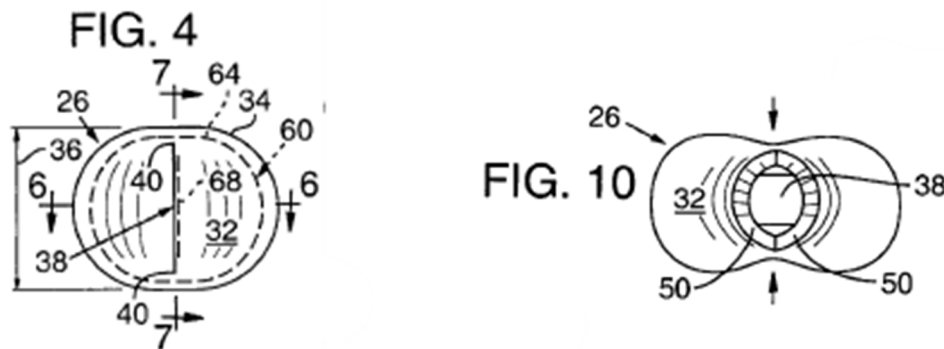
181. For the same reasons as discussed in connection with claim 12 above, it is my opinion that it would have been obvious to a person of ordinary skill in the art to combine the resilient, bite-actuated mouthpiece of Gardner with the pivotal mount of Nakajima. Thus, it is also my opinion that claim 15 is obvious over Nakajima, in view of Gardner.

D. Claim 16 is Obvious over Nakajima in view of Gardner

182. Claim 16 depends from claim 15, and thus incorporates the limitations of claim 15. As explained above, it is my opinion that claim 15 is obvious over Nakajima in view of Gardner.

183. Claim 16 further recites, “wherein the opposed lips seal against each other when the opposed bite regions are not urged toward each other.” As explained below, Gardner discloses this additional limitation.

184. As shown below, when the user’s compressive force is removed, “the resilient nature of ... the lips 50 causes the mouthpiece to return to its closed, non-dispensing position.” Ex. 1005, 6:32-35.



Ex. 1005, Figs. 4, 10. Thus, it is my opinion that claim 16 is obvious over Nakajima, in view of Gardner.

VI. GROUND 3: CLAIMS 1, 9, AND 11, 13, AND 17-19 WOULD HAVE BEEN OBVIOUS OVER RIBARITS IN VIEW OF THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART

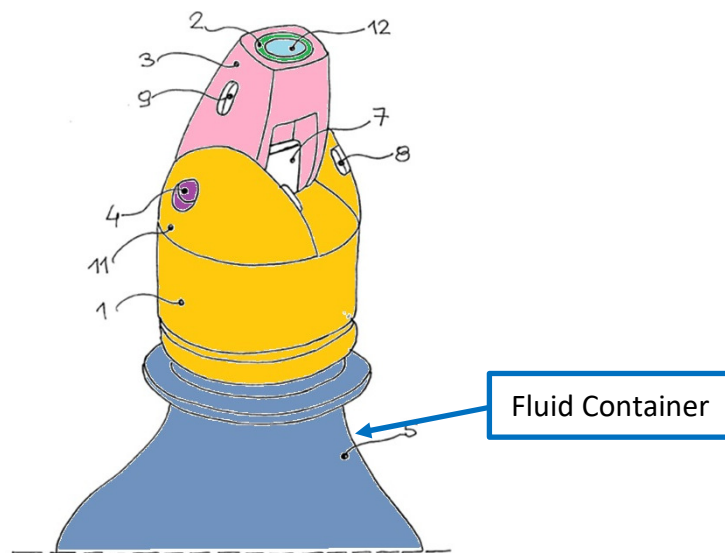
A. Claim 1 is Obvious over Ribarits in view of the Knowledge of a Person of Ordinary Skill in the Art

1. Preamble: “A drink container”

185. The preamble recites a “drink container.” I understand that patent preambles are not always limiting. I have not been asked to render an opinion on

whether the preamble of claim 1 is limiting. Regardless, as I explain below, Ribarits discloses “a drink container.”

186. Ribarits discloses “a drinking device which enables a drink to be drunk in a pleasant, hygienic manner, and can be both opened and closed with one hand.” (Ex. 1006, Abstract). Ribarits explains that the invention “relates to a device for comfortably drinking and portioning from the bottles common today.” (*Id.*, 1). The drink container of Ribarits is shown in Figure 1 below, as item 5:



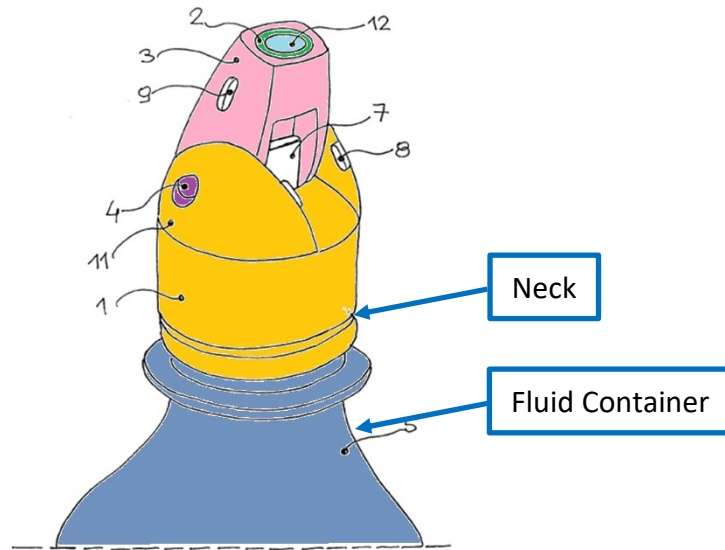
Ex. 1006, Fig. 1.

2. **1[a]: “a fluid container having a neck with an opening and having an internal compartment sized to hold a volume of potable drink fluid”**

187. Limitation 1[a] recites, “a fluid container having a neck with an opening and having an internal compartment sized to hold a volume of potable drink fluid.”

As I explain below, Ribarits discloses this limitation.

188. As shown in the annotated figure below, Ribarits discloses a bottle, i.e. a fluid container, having a neck with an opening:



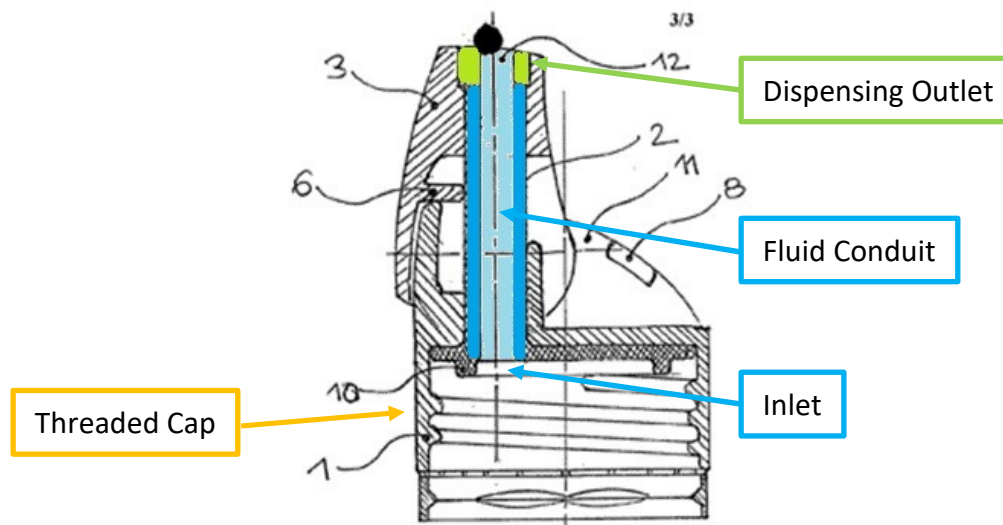
(Ex. 1006, Fig. 1). A person of ordinary skill in the art would have understood that the neck portion of the bottle would be an opening that attaches to a threaded cap with a drinking spout, and that the bottle would also have an internal compartment sized to hold a volume of drink liquid. These features would be necessary to drink from the bottle, which is the purpose of the Ribarits invention. (Ex. 1006, 2).

3. **1[b]: “a cap assembly removably coupled to the fluid container to cover the opening, wherein the cap assembly defines a fluid conduit for drink fluid to flow from the fluid container and through the cap assembly to a user, wherein the fluid conduit includes an inlet through which drink fluid from the fluid container may enter the fluid conduit, and a dispensing outlet**

through which drink fluid in the fluid conduit may be dispensed from the cap assembly to a user”

189. Limitation 1[b] recites, “a cap assembly removably coupled to the fluid container to cover the opening, wherein the cap assembly defines a fluid conduit for drink fluid to flow from the fluid container and through the cap assembly to a user, wherein the fluid conduit includes an inlet through which drink fluid from the fluid container may enter the fluid conduit, and a dispensing outlet through which drink fluid in the fluid conduit may be dispensed from the cap assembly to a user.” As I explain below, Ribarits discloses these limitations.

190. Ribarits discloses “a common closing cap provided with a thread” that “is screwed onto the bottle (5).” (Ex. 1006, 2-3).



Ex. 1006, Fig. 3. The cap contains an “elastic tube” having an inlet and a dispensing outlet. *Id.* at 2. A person of ordinary skill in the art would have understood the

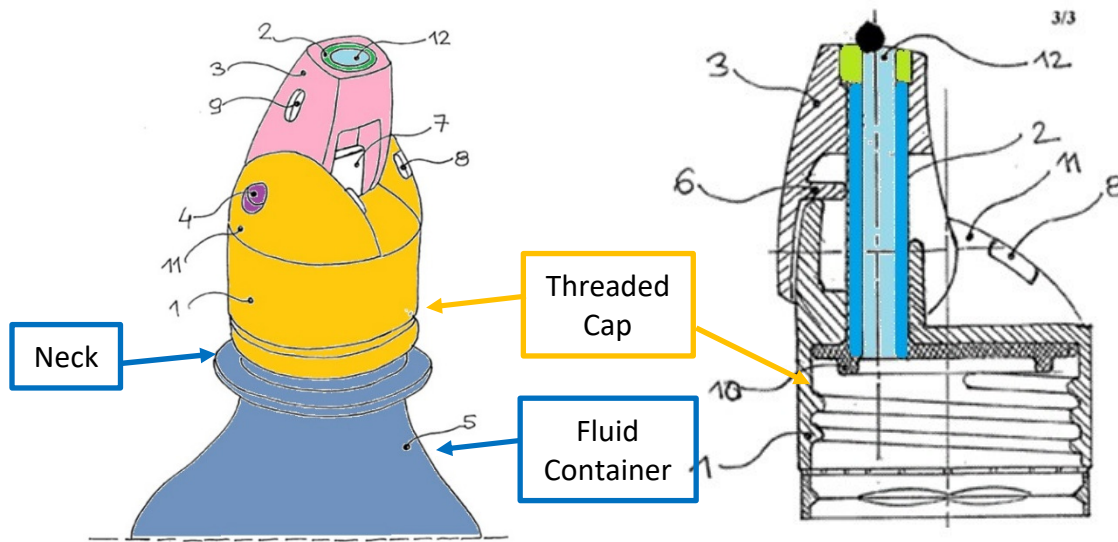
elastic tube to constitute a “fluid conduit.”

191. Ribarits also discloses: “When the drinking spout is pivoted open, the elastic tube inserted therein is straightened and the opening is thus released,” allowing liquid in the bottle to “be withdrawn via the tube guided in the drinking spout” *Id.*

4. **1[b][1]: “a cap assembly base removably coupled to the neck of the fluid container, wherein the cap assembly base is configured to be selectively and repeatedly decoupled from and re-coupled to the neck of the fluid container”**

192. Limitation 1[b][1] recites “a cap assembly base removably coupled to the neck of the fluid container, wherein the cap assembly base is configured to be selectively and repeatedly decoupled from and re-coupled to the neck of the fluid container.” As I explain below, Ribarits discloses this limitation.

193. The “drinking spout” of Ribarits is “pivoted at the top in a common closing cap provided with a thread.” Ex. 1006, 2. As shown below, the thread is located at the base of the closing cap, which is screwed onto a bottle:



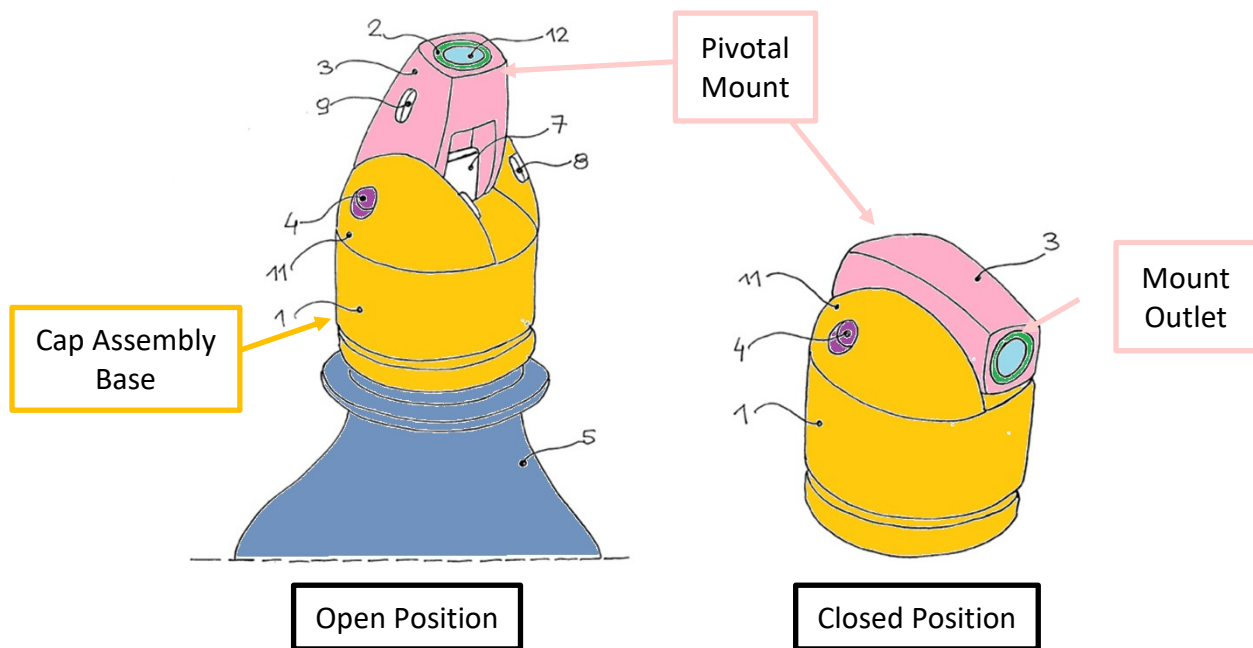
Ex. 1006, Figs. 1, 3. Ribarits further discloses the “closing cap can have various thread shapes and diameters and can also have other closing systems, such as bayonet catches or friction closures.” *Id.* at 3 (Claim 6). Thus, a person of ordinary skill in the art would have understood Ribarits to disclose a cap assembly that was removably coupled, via a threaded connection, to the neck of a fluid container.

5. **1[b][2]: “a pivotal mount coupled to the cap assembly base for pivotal movement relative to the cap assembly base, the pivotal mount comprising a mount outlet, wherein the pivotal mount includes a pair of lateral projections, wherein the cap assembly base defines a pair of sockets into which the pair of lateral projections extend”**

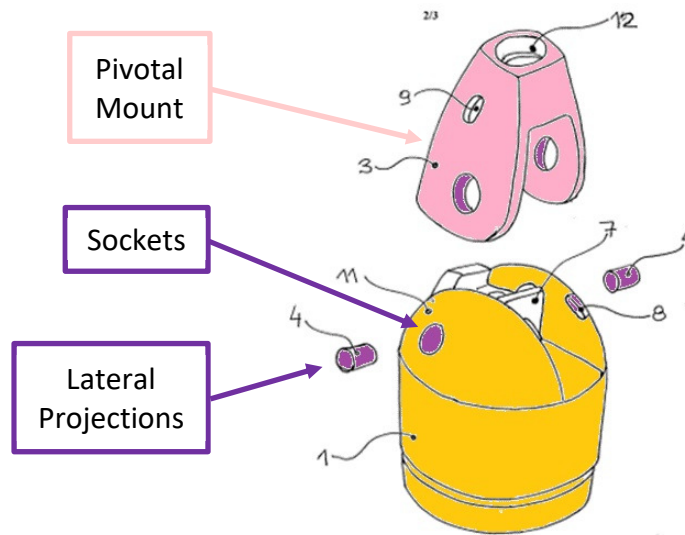
194. Limitation 1[b][2] recites that the cap assembly comprises “a pivotal mount coupled to the cap assembly base for pivotal movement relative to the cap assembly base, wherein the pivotal mount includes a pair of lateral projections, wherein the cap assembly base defines a pair of sockets into which the pair of lateral

projections extend.” As I explain below, Ribarits discloses this limitation.

195. Figure 1 of Ribarits shows how the “drinking spout” of Ribarits pivots relative to the cap assembly base between an open and closed position. Ribarits’ pivotal mount also includes a “mount outlet,” as shown below:



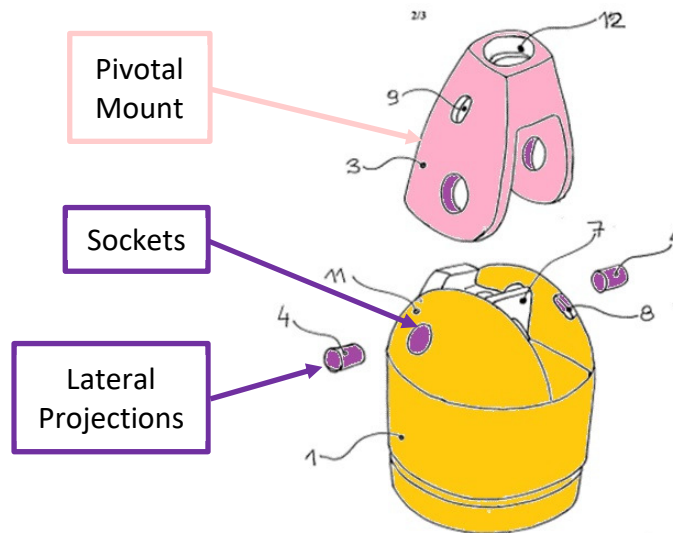
Ex. 1006, Fig. 1. Thus, a person of ordinary skill in the art would have understood the “drinking spout” of Ribarits to constitute a pivotal mount.



Ex. 1006, Fig. 2.

196. Ribarits also discloses the limitations: “wherein the pivotal mount includes a pair of lateral projections, wherein the cap assembly base defines a pair of sockets into which the pair of lateral projections extend.”

197. For example, Ribarits discloses the pivotal mount (i.e. “drinking spout”) is “fixed in the lateral parts” of the cap assembly “by two axial pins.” Ex. 1006, 3 (Claim 1). Ribarits also discloses: “The drinking spout is movably mounted by means of both axles.” *Id.* at 2. Thus, a person of ordinary skill in the art would have understood the pair of axial pins to constitute a pair of lateral projections on the pivotal mount (i.e. “drinking spout”). As shown below, the axial pins extend into and through a pair of sockets in the closure cap and engage corresponding sockets on the drinking spout to form a pivoting hinge for the drinking spout.



Ex. 1006, Fig. 2.

198. To the extent a person of ordinary skill in the art would not have understood Ribarits’ disclosure of axle pins to constitute a “pair of lateral projections,” it would have been obvious to include this feature in view of the knowledge of a person of ordinary skill in the art.

199. The concept of using lateral projections and corresponding sockets to connect two items so that they can pivot relative to one another was well-known at the time of invention, including in the relevant art. The prior art includes numerous examples of these types of pivoting, hinged connections in the context of reusable beverage containers like Ribarits. One such reference is Nakajima, which I discuss in detail in Grounds 1 and 2 above, and which include at least two pivoting hinge joints comprised of lateral projections rotatably fitted into corresponding sockets.

200. In view of this and similar prior art devices, a person of ordinary skill in the art would have readily understood that the axle pins of Ribarits could be substituted for lateral projections emanating directly from the drinking spout to form the pivotal mount.

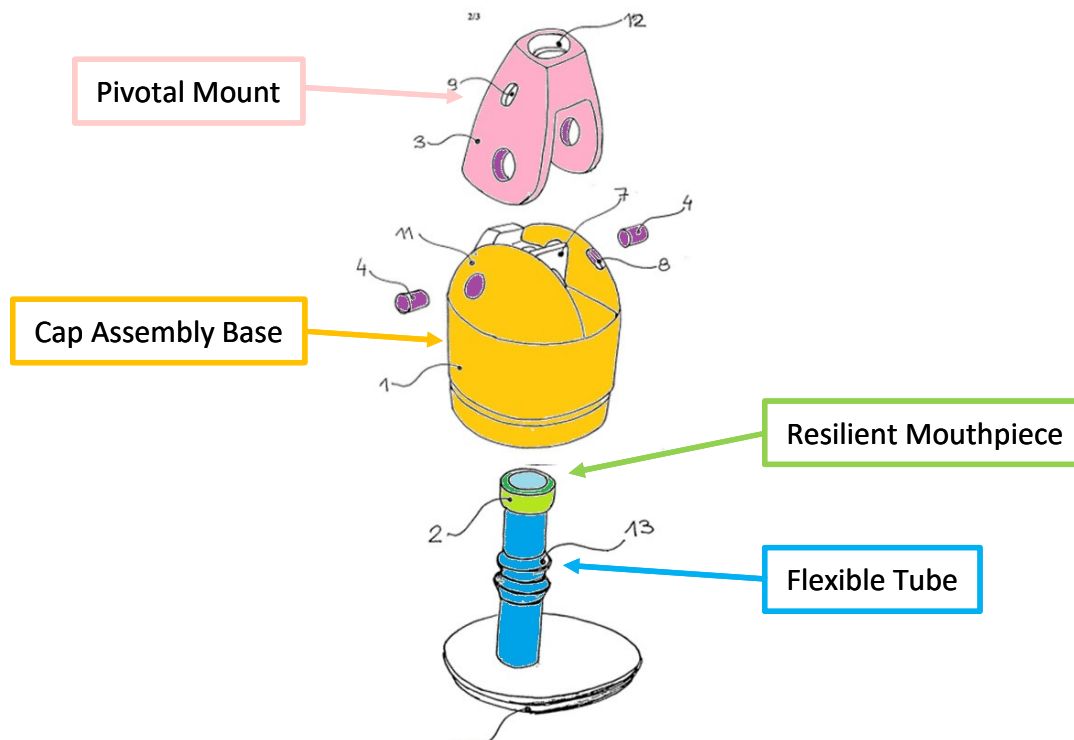
201. In addition, a person of ordinary skill in the art also would have been motivated to substitute Ribarits' axle pins for lateral projections emanating from the pivotal mount. That is because lateral projections would be integrated into the pivotal mount, and thus could be molded from a single piece of plastic. This would have been consistent with well-known methods at the time. In addition, use of a single molded piece would have been known to save manufacturing and assembly costs, as separate components would not be needed, resulting in fewer required molds. Moreover, substituting lateral projections would have also eliminated the process of inserting Ribartis' axle pins into the mating parts of the cap assembly base and pivotal mount, thereby simplifying product manufacture and assembly.

6. **1[b][3]: “a resilient mouthpiece engaged with the mount outlet and removably coupled to the pivotal mount for pivotal movement with the pivotal mount relative to the cap assembly base”**

202. Limitation 1[b][3] recites “ a resilient mouthpiece engaged with the mount outlet and removably coupled to the pivotal mount for pivotal movement with the pivotal mount relative to the cap assembly base.” As I explain below, Ribarits

discloses this limitation.

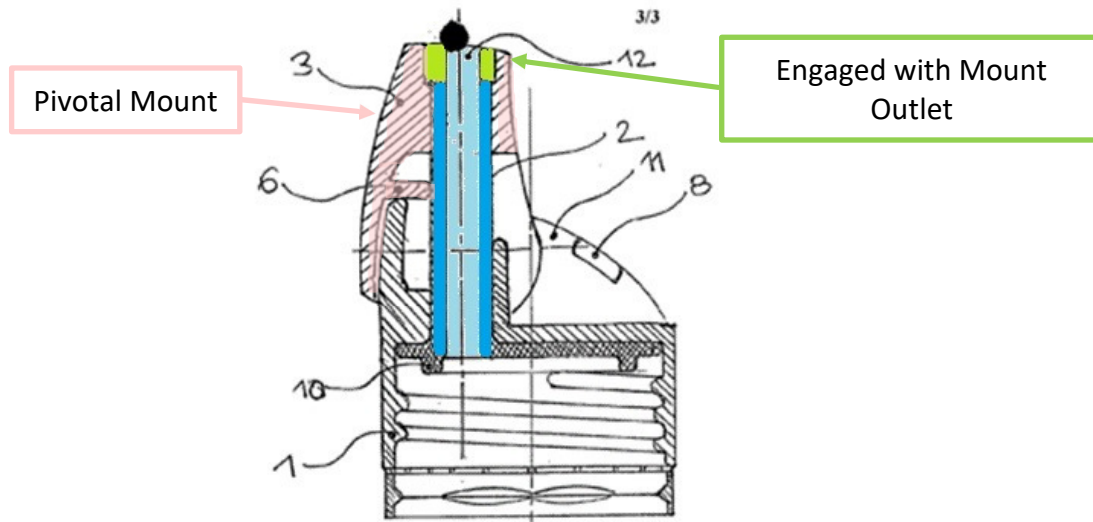
203. Ribarits discloses “a sealed tubular element of rubber or latex” that “is inserted” through the closing cap and into the pivoting drinking spout. Ex. 1006, 2. Rubber and latex are examples of resilient materials that were well-known to persons of ordinary skill in the art. As shown below, the mouthpiece is engaged to the mount outlet and thereby coupled to the pivotal mount at the dispensing outlet:



Ex. 1006, at Fig. 2. A person of ordinary skill in the art would have understood rubber and latex to be examples of resilient materials commonly used for the mouthpieces of drinking devices at the time of invention of the '255 patent.

204. As shown below, Ribarits' resilient mouthpiece is inserted through the

cap assembly base and engaged with the mount outlet at the dispensing outlet:

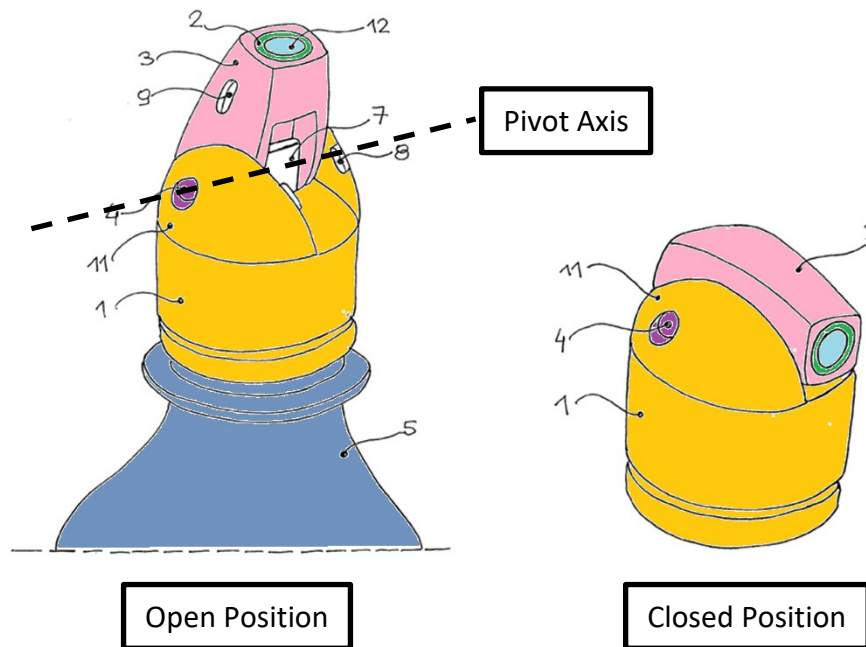


Ex. 1006, at Fig. 3.

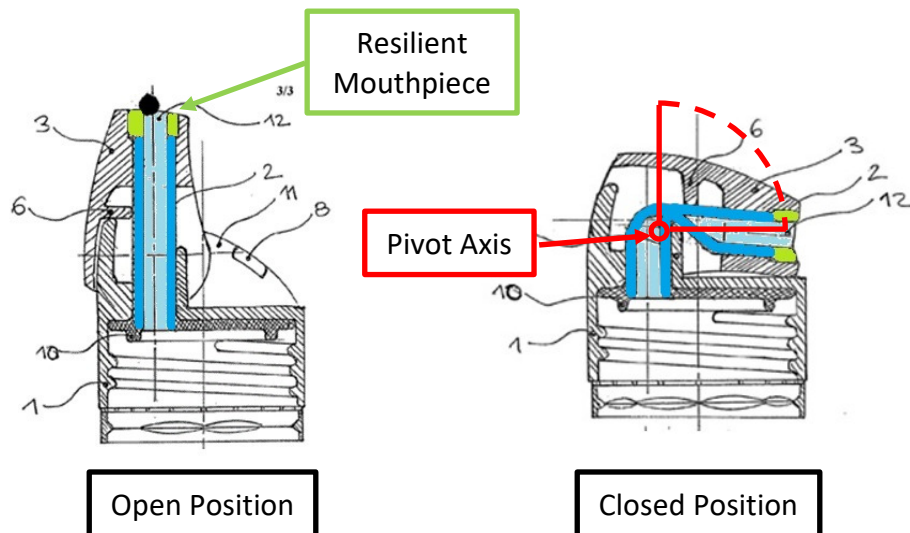
7. **1[b][3][i]: “wherein the resilient mouthpiece is pivotal about an axis defined by the pair of lateral projections as the pair of lateral projections rotate within the pair of sockets”**

205. Limitation 1[b][3][i] recites “wherein the resilient mouthpiece is pivotal about an axis defined by the pair of lateral projections as the pair of lateral projections rotate within the pair of sockets.” As I explain below, Ribarits discloses this limitation.

206. As shown in the annotated figures below, the sealed tubular element (i.e. resilient mouthpiece) of Ribarits is connected to and pivots with the drinking spout between an open position and a closed position about the axis defined by the axle pins (i.e. lateral projections) and sockets.



Ex. 1006, Fig. 1.

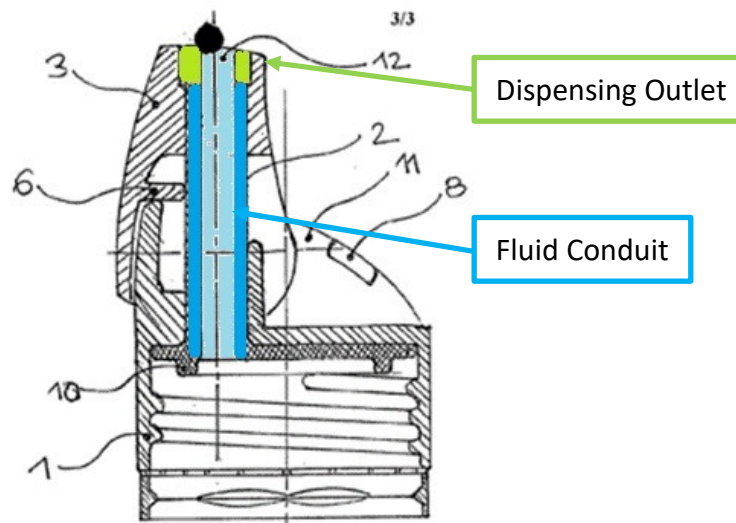


Ex. 1006, Fig. 3.

8. **1[b][3][ii]: “wherein the resilient mouthpiece defines a portion of the fluid conduit, including the dispensing outlet”**

207. Limitation 1[b][3][ii] recites “wherein the resilient mouthpiece defines a portion of the fluid conduit, including the dispensing outlet.” As I explain below, Ribarits discloses this limitation.

208. As shown in the annotated figure below, the sealed tubular element (i.e. resilient mouthpiece) of Ribarits defines a fluid conduit through the cap assembly and pivotal mount of the drinking spout, having an inlet at the cap assembly base and a dispensing outlet at the opposite end.

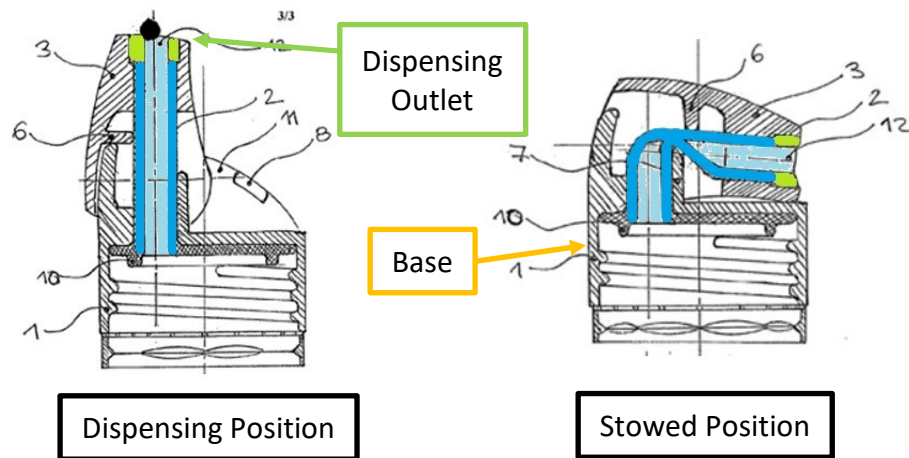


Ex. 1006, Fig. 3.

9. **1[b][3][iii]: “wherein the resilient mouthpiece and the pivotal mount are configured to be selectively pivoted between a stowed position and a dispensing position, and further in the dispensing position, the dispensing outlet is positioned further away from the cap assembly base than when the resilient mouthpiece and the pivotal mount are in the stowed position”**

209. Limitation 1[b][3][iii] recites “wherein the resilient mouthpiece and the pivotal mount are configured to be selectively pivoted between a stowed position and a dispensing position, and further in the dispensing position, the dispensing outlet is positioned further away from the cap assembly base than when the resilient mouthpiece and the pivotal mount are in the stowed position.” As I explain below, Ribarits discloses this limitation.

210. Ribarits discloses: “When the drinking spout is pivoted open, the elastic tube inserted therein is straightened and the opening is thus released.” Ex. 1006, 2. In this dispensing position, the “liquid located in the bottle can [] be withdrawn via the tube guided in the drinking spout” *Id.* The stowed position is achieved “[w]hen the drinking spout is pivoted closed,” whereby the “tube is bent between the outlet opening of the closing cap and the accommodation in the drinking spout” *Id.* This is shown in the annotated figures below:



Ex. 1006, Fig. 3.

211. As shown above, in the dispensing position, the dispensing outlet is positioned further away from the cap assembly base than in the stowed position.

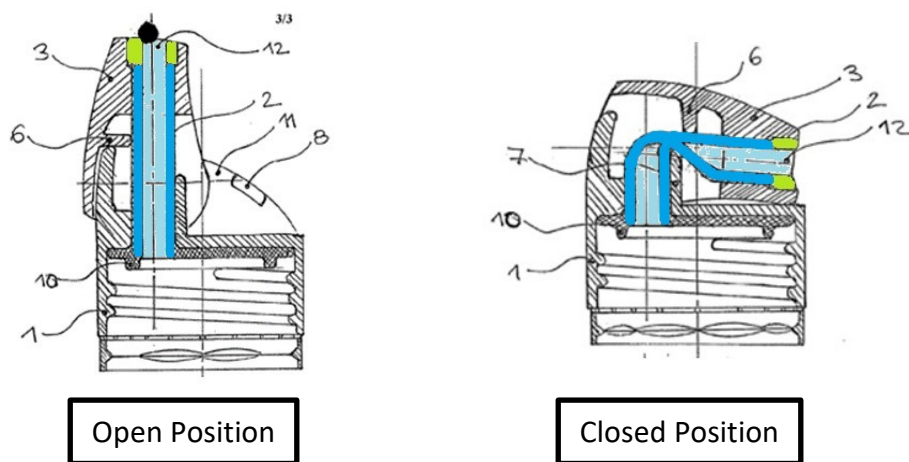
10. **1[b][3][iv]: “wherein the resilient mouthpiece is adapted to resiliently compress responsive to compressive forces applied to the resilient mouthpiece by a user’s teeth”**

212. Limitation 1[b][3][iv] recites “wherein the resilient mouthpiece is adapted to resiliently compress responsive to compressive forces applied to the resilient mouthpiece by a user's teeth.” It is my opinion that a person of ordinary skill in the art would have understood that rubber and latex are adapted to resiliently compress responsive to compressive forces, such as the compressive forces applied by a user’s teeth.

11. **1[b][4]: “a manual on/off valve having a closed configuration, in which the manual on/off valve obstructs the fluid conduit to restrict drink fluid from flowing between the inlet and the dispensing outlet, and an open configuration, in which the manual on/off valve permits drink fluid to flow through the fluid conduit from the inlet to the dispensing outlet”**

213. Limitation 1[b][4] recites “a manual on/off valve having a closed configuration, in which the manual on/off valve obstructs the fluid conduit to restrict drink fluid from flowing between the inlet and the dispensing outlet, and an open configuration, in which the manual on/off valve permits drink fluid to flow through the fluid conduit from the inlet to the dispensing outlet.” As I explain below, Ribarits discloses this limitation.

214. The sealed tubular element of Ribarits includes a manual on/off valve that obstructs fluid flow in a closed configuration, and permits fluid flow in an open configuration, as shown below:



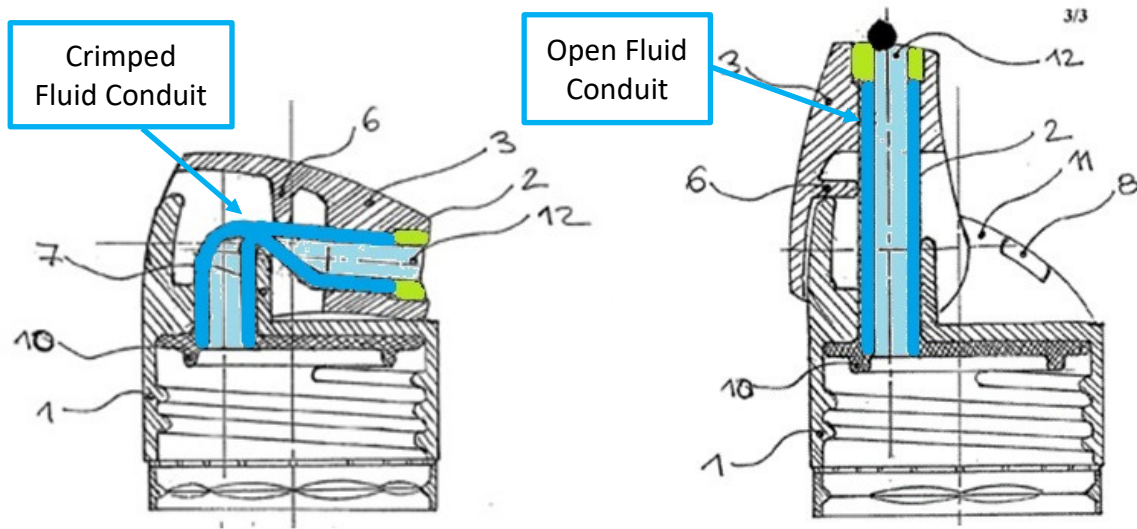
Ex. 1006, Fig. 3.

215. In the closed configuration (above, left), the sealed tubular element is crimped, thereby obstructed fluid flow through the fluid conduit. In the open configuration (above, right) the tubular element is uncrimped, thereby permitting fluid to flow through the fluid conduit of the sealed tubular element from the inlet at the cap assembly base to the dispensing outlet at the opposite end.

12. **1[b][4][i]-[iii]: “wherein the manual on/off valve includes a flexible tube that defines a portion of the fluid conduit, wherein when the manual on/off valve is in the closed configuration, the tube is crimped to obstruct the flow of drink fluid through the fluid conduit, and wherein when the manual on/off valve is in the open configuration, the tube is not crimped and does not obstruct the flow of drink fluid through the fluid conduit”**

216. Limitations 1[b][4][i]-[iii] recite “wherein the manual on/off valve includes a flexible tube that defines a portion of the fluid conduit, wherein when the manual on/off valve is in the closed configuration, the tube is crimped to obstruct the flow of drink fluid through the fluid conduit, and wherein when the manual on/off valve is in the open configuration, the tube is not crimped and does not obstruct the flow of drink fluid through the fluid conduit.” As I explain below, Ribarits discloses these limitations.

217. The manual on/off valve is comprised of a flexible tube, i.e. the central tube portion of the sealed tubular element, which defines the fluid conduit from the inlet to the dispensing outlet, as shown below.



Ex. 1006, Fig. 3.

218. The “tube section” of the sealed tubular element “has a bellow-shaped formation” located at the manual on/off valve which crimps in the closed configuration, thereby obstructing fluid flow through the fluid conduit. *Id.* at 3 (Claim 3); *see also id.* at 2 (“by folding down the drinking spout, the tube is bent between the outlet opening of the closing cap and the accommodation in the drinking spout by means of two webs, and the device is closed”).

219. Ribarits also discloses: “When the drinking spout is pivoted open, the elastic tube inserted therein is straightened and the opening is thus released,” as shown below. In this open configuration, the “liquid located in the bottle can now be withdrawn via the tube guided in the drinking spout” *Id.* at 2.

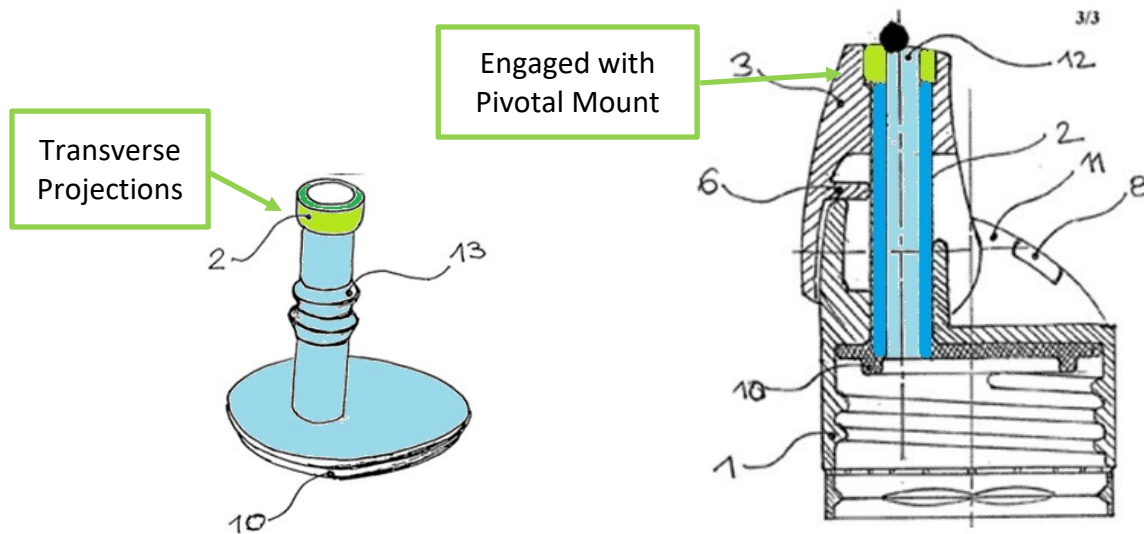
220. Accordingly, it is my opinion that claim 1 is obvious over Ribarits, in view of the knowledge of a person of ordinary skill in the art.

B. Claim 9 is Obvious over Ribarits

221. Claim 9 depends from claim 1, and thus incorporates the limitations of claim 1. As explained above, it is my opinion that claim 1 is obvious over Ribarits in view of the knowledge of a person of ordinary skill in the art.

222. Claim 9 further recites, “wherein the resilient mouthpiece includes projections that extend generally transverse to the portion of the fluid conduit that extends through the resilient mouthpiece, and further wherein the projections engage an end region of the pivotal mount.” As I explain below, Ribarits discloses these additional limitations.

223. The dispensing outlet of the sealed tubular element (i.e. resilient mouthpiece) comprises a circumferential projection that extends transverse to the fluid conduit and engages with the dispensing outlet of the drinking spout (i.e. pivotal mount), as shown below.



(Ex. 1006, Figs. 2, 3). In addition, for the same reasons discussed in paragraph 133 above, PO's infringement contentions in co-pending litigation confirm that a circumferential projection of the type on Ribarits' mouthpiece constitutes "projections" for purposes of claim 9.

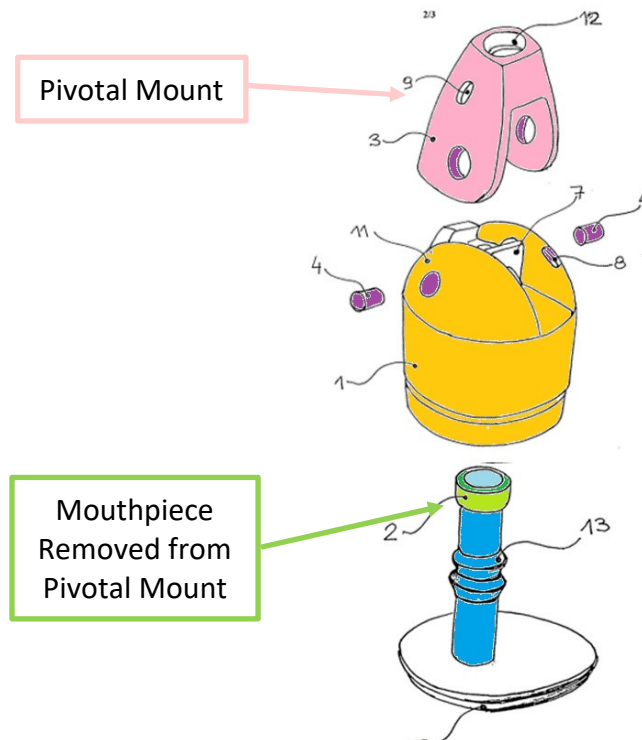
224. Accordingly, it is my opinion that Ribarits discloses the additional limitation of claim 9. Thus, for the same reasons as discussed above in connection with claim 1, it is my opinion that claim 9 would have been obvious over Ribarits, in view of the knowledge of a person of ordinary skill in the art.

C. Claim 11 is Obvious over Ribarits

225. Claim 11 depends from claim 1, and thus incorporates the limitations of claim 1. As explained above, it is my opinion that claim 1 is obvious over Ribarits in view of the knowledge of a person of ordinary skill in the art.

226. Claim 11 further recites, “wherein the resilient mouthpiece is configured to be selectively removed from and recoupled to the pivotal mount.” As I explain below, Ribarits discloses this additional limitation.

227. As shown in the annotated figure below, the sealed tubular element (i.e. resilient mouthpiece) of Ribarits is configured to be removed and reinserted into the drinking spout (i.e. pivotal mount):



Ex. 1006, Fig. 2. A person of ordinary skill in the art would have understood that removing the resilient mouthpiece (i.e. sealed tubular element) of Ribarits would be necessary to clean the fluid conduit, and thereby meet “all hygienic” requirements, consistent with one of the stated purposes of the Ribarits device. *See id.* at 2 (“It is

an object of the invention ... to suggest a drinking device which ... also meets all hygienic and aesthetic requirements.”).

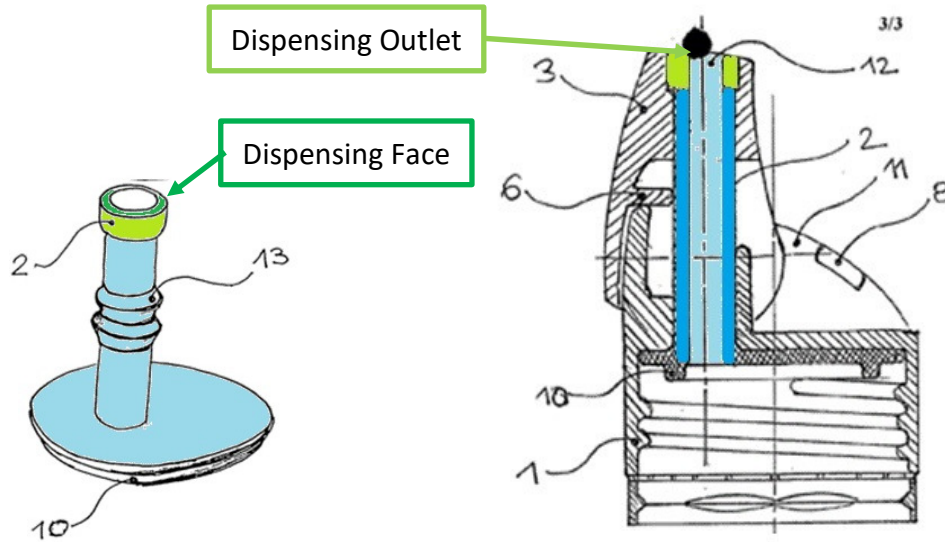
228. Accordingly, it is my opinion that Ribarits discloses the additional limitation of claim 11. Thus, for the same reasons as discussed above in connection with claim 1, it is my opinion that claim 11 would have been obvious over Ribarits, in view of the knowledge of a person of ordinary skill in the art.

D. Claim 13 is Obvious over Ribarits in view of Gardner

229. Claim 13 depends from claim 1, and thus incorporates the limitations of claim 1. As explained above, it is my opinion that Ribarits discloses and/or renders obvious each limitation of claim 1.

230. Claim 13 further recites, “wherein the resilient mouthpiece includes a dispensing face, and further wherein the dispensing outlet extends through the dispensing face of the resilient mouthpiece.” As I explain below, Ribarits discloses these additional limitations.

231. As shown in the annotated images below, the sealed tubular element (i.e. resilient mouthpiece) includes a dispensing face through which the dispensing outlet of the fluid conduit extends to allow fluid to be dispensed from the drinking spout:



Ex. 1006, Figs. 2, 3.

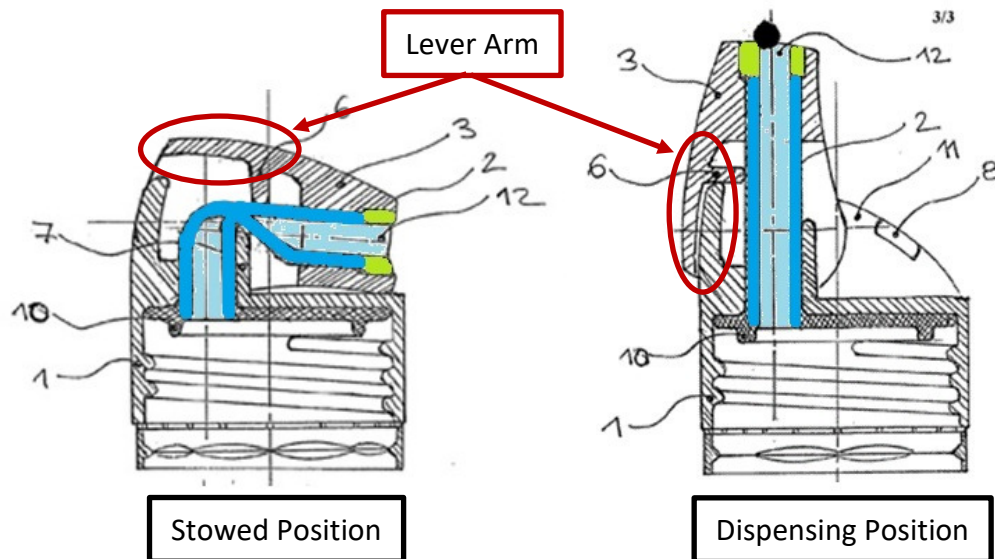
E. Claim 17 is Obvious over Ribarits

232. Claim 17 depends from claim 1, and thus incorporates the limitations of claim 1. As explained above, it is my opinion that Ribarits discloses and/or renders obvious each limitation of claim 1.

233. Claim 17 further recites, “wherein the pivotal mount further includes a projecting flange that extends away from a portion of the fluid conduit that extends through the pivotal mount, wherein the projecting flange provides a lever arm that is configured to be engaged by a user’s finger to pivot the pivotal mount from the stowed position to the dispensing position.” As explained below, Ribarits discloses this additional limitation.

234. As shown below, Ribarits’ pivotal mount includes a projecting lever

arm that engages a user's finger to pivot the mount to the dispensing position:



(Ex. 1006, Fig.3). As shown above, the lever arm extends away from the lower portion of the fluid conduit when the assembly is in the stowed position. Because the Ribarits device is intended to be opened with only one hand (Ex. 1006, 2), a person of ordinary skill in the art would have understood the user's thumb to engage the lever arm to pivot the drinking spout from the stowed position to the dispensing position.

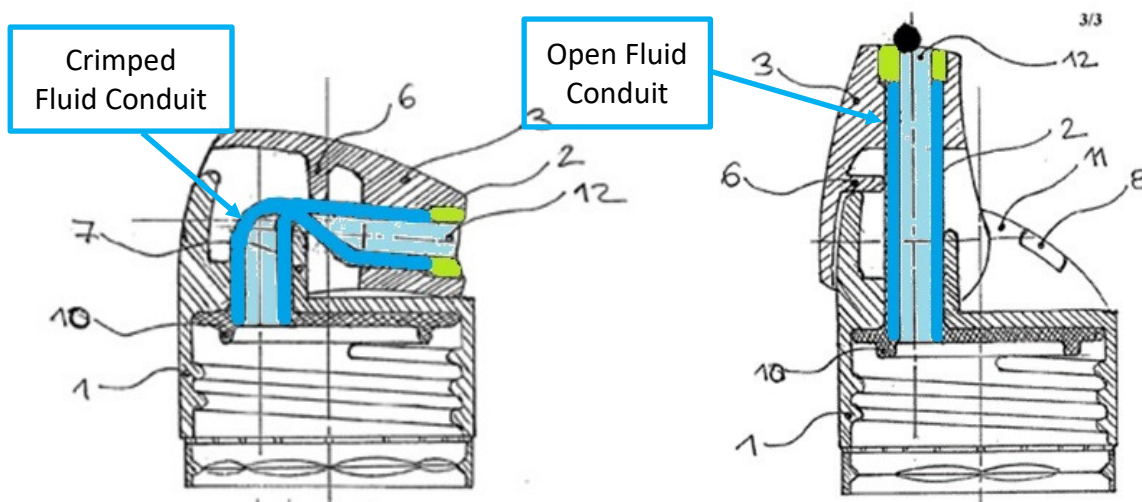
235. Because Ribarits discloses the additional limitations of claim 17, which depends from claim 1, it is also my opinion that claim 17 is obvious over Ribarits in view of Gardner.

F. Claim 18 is Obvious over Ribarits

236. Claim 18 depends from claim 1, and thus incorporates the limitations of claim 1. As explained above, it is my opinion that Ribarits discloses and/or renders obvious each limitation of claim 1.

237. Claim 18 further recites, “wherein the pivotal mount is adapted to selectively engage the flexible tube to apply crimping forces thereto and thereby configure the manual on/off valve to the closed configuration as the pivotal mount is pivoted from the dispensing position to the stowed position.” As I explained below, Ribarits discloses this additional limitation.

238. As discussed above, Ribarits’ pivotal mount engages the flexible tube to apply crimping forces thereto when pivoted into the stowed position:



Ex. 1006, Fig. 3.

239. Accordingly, it is also my opinion that claim 18 is obvious over Ribarits, in view of Gardner.

G. Claim 19 is Obvious over Ribarits

240. Claim 19 depends from claim 1, and thus incorporates the limitations of claim 1. As explained above, it is my opinion that Ribarits discloses and/or renders obvious each limitation of claim 1.

241. Claim 19 further recites, “wherein the flexible tube is secured to the pivotal mount.” As I explain below, Ribarits discloses this additional limitation.

242. As discussed above in connection with claim 9, the flexible tube portion of the resilient mouthpiece (i.e. sealed tubular element) is secured to the pivotal mount (i.e. drinking spout) via circumferential projections that engage with the dispensing outlet of the drinking spout.

243. Accordingly, it is my opinion that Ribarits discloses the additional limitation of claim 19. Thus, for the same reasons as discussed above in connection with claim 1, it is my opinion that claim 19 would have been obvious over Ribarits, in view of the knowledge of a person of ordinary skill in the art.

VII. GROUND 4: CLAIMS 2-7, AND 20-23 WOULD HAVE BEEN OBVIOUS OVER RIBARITS IN VIEW OF HUGHES AND/OR PANICCI

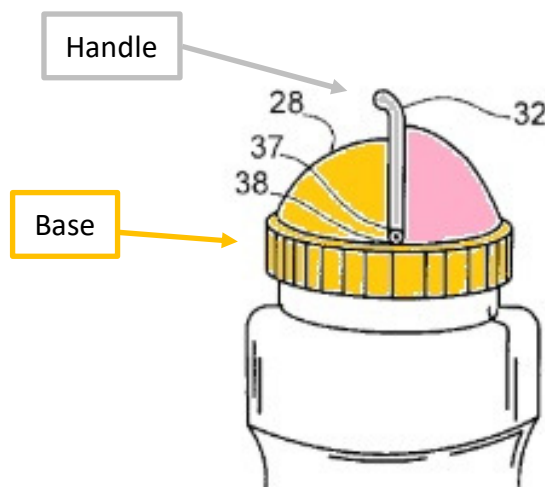
A. Claim 2 is Obvious over Ribarits in view of Hughes

244. Claim 2 depends from claim 1, and thus incorporates the limitations of

claim 1. As explained above in Ground 3, it is my opinion that claim 1 is obvious over Ribarits in view of the knowledge of a person of ordinary skill in the art.

245. Claim 2 further recites: “wherein the cap assembly base further comprises a handle that extends from the cap assembly base, and further wherein the handle is secured to the cap assembly base in a position that obstructs removal of the pair of lateral projections from the pair of sockets.” As I explain below, these additional limitations would have been obvious over Ribarits, in view of Hughes.

246. Hughes discloses a handle that extends from the cap assembly base:



Ex. 1010, Fig. 17. The handle in Hughes is secured to the cap assembly via a pair of axle pins that engage the cap assembly and allow for pivotal movement of the handle and cover. Ex. 1010, 4:63-5:4.

247. It would have been obvious to a person of ordinary skill in the art to add the handle of Hughes to the cap assembly of Ribarits to achieve the claimed

invention for several reasons. First, the use of carrying handles for fluid containers was commonplace at the time of the invention. Basic reusable water bottles, such as in Hughes, routinely included handles to facilitate carrying. Accordingly, a POSA would have recognized the desirability of adding a handle to the Ribarits cap assembly. Doing so would have constituted nothing more than a routine design choice for a POSA.

248. In addition, a person of ordinary skill would have been motivated to use add Hughes' handle to the Ribarits cap assembly for at least two reasons. First, as noted above, handles were well-known to facilitate carrying of a water bottle. Second, it was equally well-known to a person of ordinary skill that for liquid containers intended to hold cold beverages, the use of a handle would minimize the transfer of heat from the user's hand, and thereby ensure the contents of the container remained colder for longer.

249. In adding the Hughes handle to the Ribarits cap assembly, a POSA would have been motivated to secure the handle via the existing sockets in Ribarits' cap assembly base because doing so would not require any modification to the Ribarits design. In this configuration, as in Hughes, the handle could optionally be rotated into a carrying and a retracted position. Because such a configuration would cover the sockets in the Ribarits cap assembly base, it would have the added benefit

of obstructing removal of the pivotal mount from the cap assembly base at the point of connection between the lateral projections and sockets. Likewise, a POSA would have had a reasonable expectation of success in modifying Ribarits to include Hughes' handle because, as noted above, it could be accomplished in the same manner as in the Hughes device (i.e. by attaching the handle via sockets in the cap assembly base) and doing so would not require any change the design of the Ribarits cap assembly base.

250. Accordingly, claim 2 would have been obvious over Ribarits, in view of Hughes.

B. Claim 3 is Obvious over Ribarits in view of Panicci

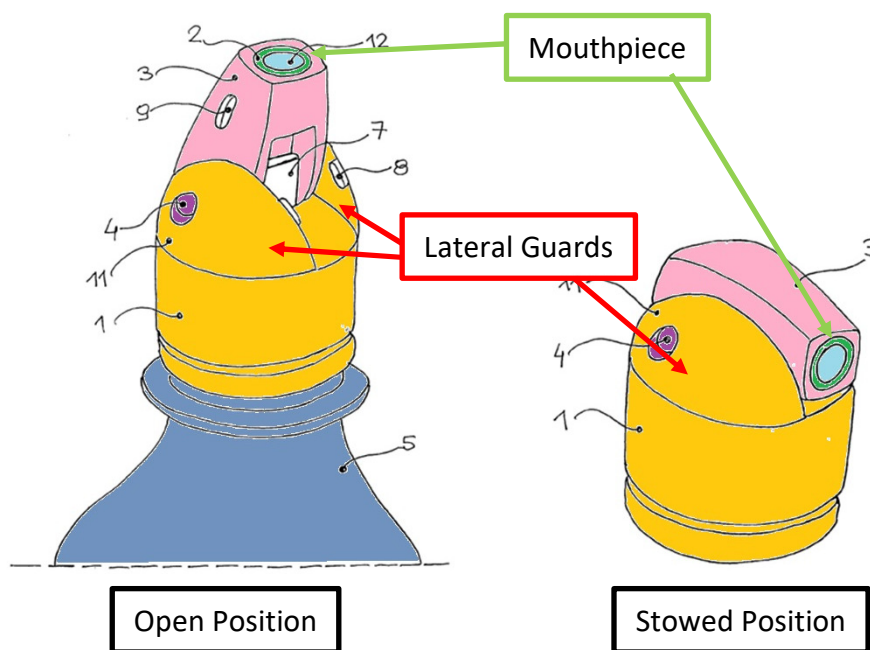
251. Claim 3 depends from claim 1, and thus incorporates the limitations of claim 1. As explained above in Ground 3 it is my opinion that claim 1 is obvious over Ribarits in view of the knowledge of a person of ordinary skill in the art.

252. Claim 3 further recites, “wherein the cap assembly includes a pair of lateral guards that extend on opposed sides of the resilient mouthpiece when the resilient mouthpiece and the pivotal mount are in the stowed position, and further wherein the cap assembly includes a dust cover extending between the pair of lateral guards and positioned to protect the dispensing outlet of the resilient mouthpiece by extending across at least a portion of the dispensing outlet of the resilient mouthpiece

when the resilient mouthpiece and the pivotal mount are in the stowed position.”

253. As explained below, Ribarits discloses the limitation: “wherein the cap assembly includes a pair of lateral guards that extend on opposed sides of the resilient mouthpiece when the resilient mouthpiece and the pivotal mount are in the stowed position.”

254. Ribarits’ cap assembly includes a pair of lateral guards on opposed sides of the mouthpiece, as shown below:

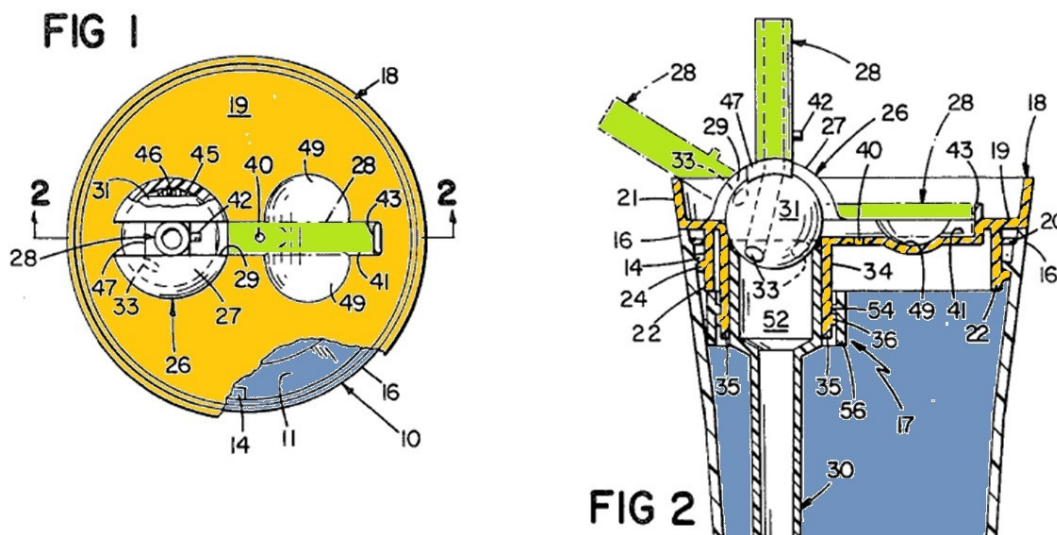


Ex. 1006, Fig. 1. When the pivotal mount is in the stowed position the pair of lateral guards on opposite sides of the pivotal mount.

255. Ribarits does not disclose “a dust cover extending between the pair of lateral guards and positioned to protect the dispensing.” However, in view of

Panicci, it would have been obvious to a POSA to modify Ribarits to include such a dust cover.

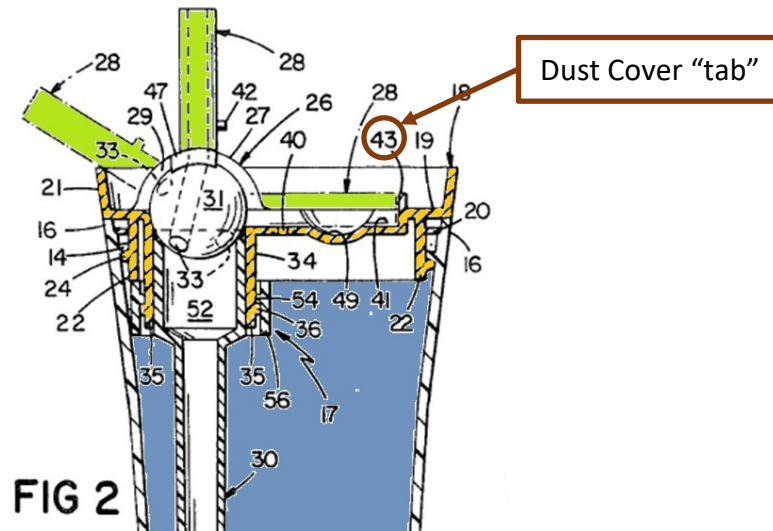
256. Panicci discloses the use of lateral guards and a dust cover extending between the lateral guards and positioned to protect the dispensing outlet of a resilient mouthpiece. For example, as shown in Figures 1 and 2 below, Panicci discloses: “upper straw 28 extends through slot 29 and pivots in a vertical plane.” Ex. 1007, 3:23-24.



Ex. 1007, Figs. 1, 2. The upper straw pivots into “a storage recess 41 in the plane of slot 29, sized to accommodate the upper tubular portion of straw member 28.” Ex. 1007, 3:35-37. “Tab 43 at the end of recess 41 is positioned to cover the upper end of straw segment 26 to avoid contamination of the straw.” Ex. 1007, 3:45-47.

257. A person of ordinary skill in the art would have understood the sides of the “storage recess 41” to constitute a pair of lateral guards that extend on opposed

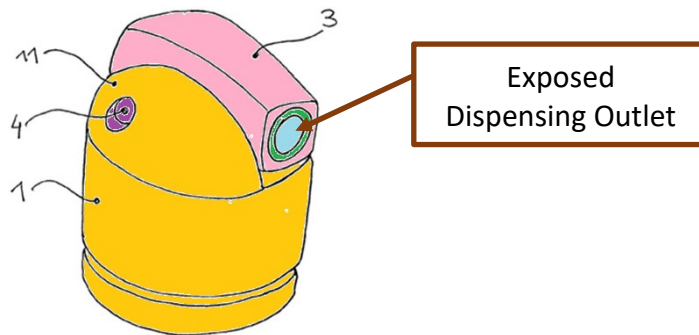
sides of the mouthpiece (i.e. the “upper straw 28”), and the “tab 43” to constitute a dust cover extending between the walls of the recess and positioned across the outlet of the mouthpiece when in the stowed position.



Ex. 1007, Fig. 2. A person of ordinary skill in the art would have been motivated to modify Ribarits to add a dust cover similar to Panicci’s ‘tab,’ to prevent unwanted contamination and/or fluid leakage for several reasons.

258. First, at the time of the invention of the ’255 Patent, the use of dust covers, both alone or in combination with lateral guards, such as in the Panicci device, was a well-known technique in the design of drink container closures with dispensing straws or mouthpieces.

259. Such a dust cover would be particularly suited to Ribarits because, as shown below, Ribarits’ dispensing outlet is exposed when in the stowed position:



Ex. 1006, Fig. 1.

260. A person of ordinary skill in the art would have been motivated to add a dust cover to protect Ribarits’ dispensing outlet to improve hygiene and reduce the risk of accidental leakage from the spout. Likewise, a person of ordinary skill in the art would have understood that the addition of a simple dust cover to the cap assembly base, in the form of a ‘tab’ structure similar to that of the Panicci device, would effectively cover the exposed end of the Ribarits spout to improve hygiene and prevent unwanted contamination and/or fluid leakage.

261. Panicci itself provides a motivation for making the proposed substitution. According to Panicci, one of the objects of its invention is “to provide a means for storing the external straw segment in a compact configuration that *minimizes the opportunity for contamination of the straw or for spilling the contents of the cup* particularly during transport of the cup from one location to another. Ex. 1007, 1:29-35 (emphasis added).

262. A person of ordinary skill in the art would have understood that such a

modification was nothing more than the application of a known technique (i.e. the use of dust covers to improve hygiene and prevent accidental leakage) to improve a known device (i.e. the Ribarits cap assembly) to yield predictable results (i.e. protection of a dispensing outlet from unwanted contamination or leakage).

263. Likewise, a person of ordinary skill would have understood the simple modification described above would constitute nothing more than the addition of a known prior art element (i.e. a dust cover) according to its established function (i.e. to cover an exposed surface) to obtain a predictable result (i.e. the protection of a dispensing outlet from unwanted contamination or leakage).

264. In view of the numerous prior art examples known at the time of the invention, a POSA would have had a reasonable expectation of success in implementing a dust cover to improve the Ribarits design. In addition, adding a dust cover to protect the exposed end of Ribarits dispensing outlet in the stowed configuration would not have required any rearrangement or modification of any of the other components of the Ribarits cap assembly.

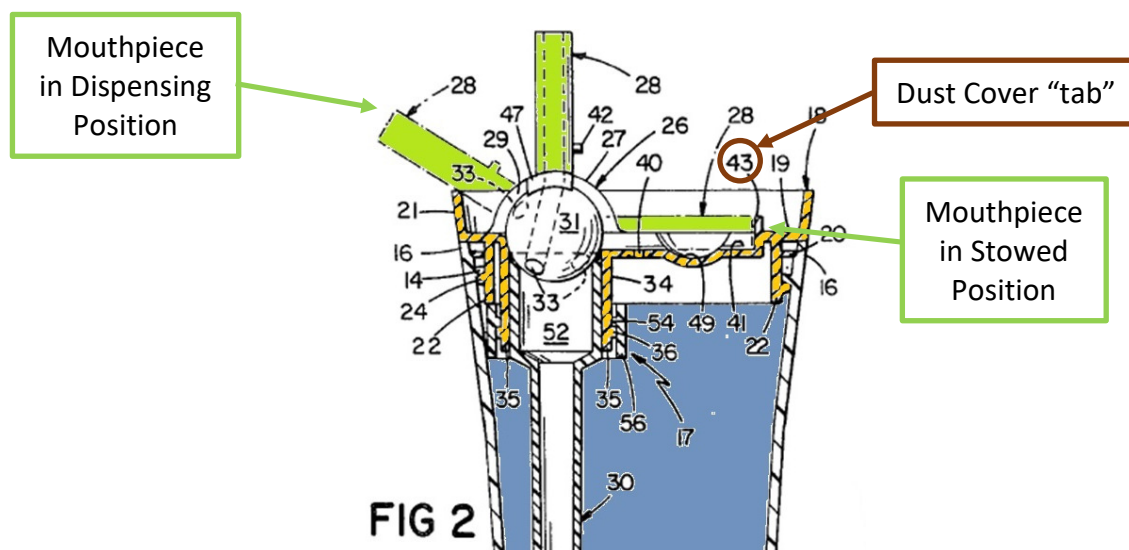
265. Accordingly, it is my opinion that claim 3 is obvious over Ribarits, in view of Panicci.

C. Claim 4 is Obvious over Ribarits in view of Panicci

266. Claim 4 depends from claim 3, and thus incorporates the limitations of claim 3. As explained above, it is my opinion that claim 3 is obvious over Ribarits in view of Panicci.

267. Claim 4 further recites, “wherein when the resilient mouthpiece is pivoted from the stowed position to the dispensing position, the resilient mouthpiece pivots away from the dust cover.” As I explain below, Panicci discloses this additional limitation.

268. As shown in Figure 2 of Panicci below, the mouthpiece (i.e. “upper straw 28”) pivots away from the dust cover (i.e. “tab 43”) when the straw moves from the stowed position to the dispensing position.



Ex. 1007, Fig. 2.

269. As discussed above, the mouthpiece of Ribarits pivots away from the cap assembly when moving from the stowed position to the dispensing position. Thus, when the dust cover of Panicci (i.e. “tab 43”) is combined with the cap assembly of Ribarits, as discussed in connection with claim 3 above, a person of ordinary skill in the art would have understood the mouthpiece of Ribarits to pivot away from the dust cover when moving from the stowed position to the dispensing position.

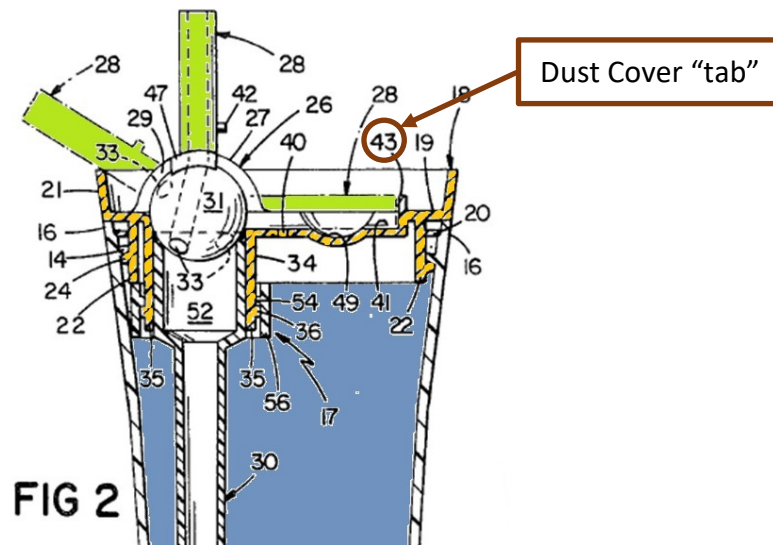
270. Accordingly, it is my opinion that claim 4 is obvious over Ribarits, in view of Panicci.

D. Claim 5 is Obvious over Ribarits in view of Gardner and Panicci

271. Claim 5 depends from claim 3, and thus incorporates the limitations of claim 3. As explained above, it is my opinion that claim 3 is obvious over Ribarits in view of Panicci.

272. Claim 5 further recites, “wherein the dust cover projects above an upper surface of the cap assembly base.” As I explain below, Panicci discloses this additional limitation.

273. As shown in Figure 2 of Panicci below, the dust cover (i.e. “tab 43”) projects above an upper surface of the base of the cap assembly:



Ex. 1007, Fig. 2.

274. As Panicci confirms, the “tab 43” is at “the end of recess 41” and “positioned to cover the upper end of straw segment 26” when the straw is stowed within the recess. A person of ordinary skill in the art would understand that the only way in which “tab 43” could cover the exposed end of the straw is if the “tab 43” extended above the lower surface of the recess. Likewise, a person of ordinary skill in the art would have understood the lower surface of “recess 41” to constitute an upper surface of the base of the Panicci cap assembly.

275. For the same reasons as those discussed above in connection with claim 3, a person of ordinary skill in the art would have been motivated to combine the dust cover of Panicci with the drinking spout of Ribarits to achieve the design claimed in the ’255 patent. Accordingly, it is my opinion that claim 5 is obvious

over Ribarits, in view of Panicci. And, for the same reasons discussed above, it is also my opinion that claim 5 would have been obvious over Ribarits, in view of Gardner, in further view of Panicci.

E. Claim 6 is Obvious over Ribarits in view of Panicci, in further view of Hughes

276. Claim 6 depends from claim 3, and thus incorporates the limitations of claim 3. As explained above, it is my opinion that claim 3 is obvious over Ribarits in view of Panicci.

277. Claim 6 further recites: “wherein the cap assembly further includes a handle that extends from the cap assembly base and includes the pair of lateral guards and the dust cover.” As I explain below, it is my opinion that the additional limitations of claim 6 would have been obvious to a POSA in further view of Hughes.

278. As discussed in connection with claim 2 above, it is my opinion that it would have been obvious to add Hughes’ handle to the Ribarits cap assembly. As discussed in connection with claim 3 above, it also my opinion that it would have been obvious to modify Ribarits to include the dust cover of Panicci. In making these modifications, it would have been equally obvious to a POSA to configure the handle to include both the lateral guards and the dust cover.

279. A person of ordinary skill would have been motivated to fix the position of the handle laterally on the edge of Ribarits' cap assembly base. That is because such a configuration would have been necessary to avoid interference between the handle and the pivoting movement of the pivotal mount, as well as interference between the handle and the mouthpiece in the dispensing position.

280. A person of ordinary skill also would have been motivated to include the lateral guards and dust cover as an integrated part of the handle. A POSA would have understood that the handle, guards, and dust cover could be molded together during the manufacturing process as an integrated component of the cap assembly base, thereby reducing manufacturing time and cost.

281. Accordingly, it is my opinion that claim 6 would have been obvious over Ribarits, in view of Panicci, in further view of Hughes.

F. Claim 7 is Obvious over Ribarits in view of Hughes

282. Claim 7 depends from claim 1 and thus incorporates the limitations of claim 1. As explained above, it is my opinion that claim 3 is obvious over Ribarits in view of the knowledge of a person of ordinary skill in the art.

283. Claim 7 further recites: "wherein the cap assembly further comprises a handle that extends in a fixed orientation from the cap assembly base and which defines at least a portion of a closed loop with an aperture through which a user's

finger may be inserted to carry the drink container.” As I explain below, it is my opinion that these additional limitations would have been obvious over Ribarits, in view of Hughes.

284. The Hughes handle, like any carrying handle commonly used in connection with fluid containers, includes an aperture to engage a user’s fingers. Ex. 1010, Fig. 17. For the reasons discussed in connection with claim 2 above, it is my opinion that it would have been obvious to add the handle of Hughes to the Ribarits cap assembly base. And, as discussed in connection with claim 6 above, it also my opinion that it would have been obvious to fix the orientation of the Hughes handle on the Ribarits cap assembly to avoid interference between the handle and the pivoting action of the pivotal mount.

285. Accordingly, it is my opinion that claim 7 would have been obvious over Ribarits, in view of Hughes.

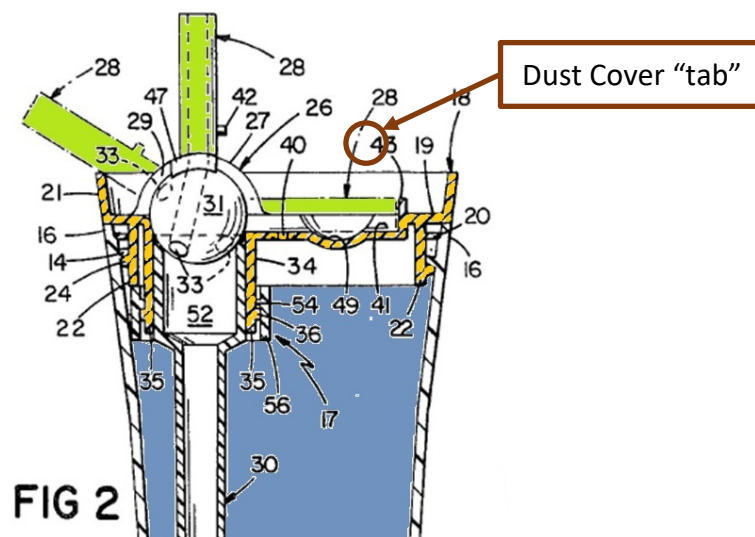
G. Claim 20 is Obvious over Ribarits in view of Panicci

286. Independent Claim 20 contains the limitations of independent claim 1 and one additional limitation: “a dust cover configured to at least partially cover the dispensing outlet when the mouthpiece and pivotal mount are in the stowed position, wherein the dust cover remains stationary when the mouthpiece and the pivotal mount are selectively pivoted between the stowed position and the dispensing

position.” Ex. 1002, 2:17-3:14.

287. For the same reasons discussed in Ground 3 above, it is my opinion that Ribarits either discloses or renders obvious the limitations of claim 1. As discussed below, it is my opinion that Panicci discloses the additional limitation of claim 20. Thus, for the same reasons discussed in connection with claim 3 above, it is my opinion that claim 20 would have been obvious over Ribarits, in view of Panicci.

288. Panicci discloses a “tab 43” that serves as a dust cover to protect the exposed end of a drinking straw when pivoted to a stowed position:



(Ex. 1007, Figs. 2). Panicci’s “tab” remains stationary at the position identified above, regardless of the position of the mouthpiece.

289. For the same reasons discussed above in claim 3, it is my opinion that a person of ordinary skill in the art would have been motivated to modify Ribarits to

add a dust cover similar to Panicci’s “tab.” Thus, it is my opinion that claim 20 is obvious of Ribarits, in view of Panicci.

H. Claim 21 is Obvious over Ribarits in view of Panicci and Hughes

290. Claim 21 depends from claim 20, and further recites: “wherein the cap assembly base further comprises a handle that extends from the cap assembly base, and further wherein the handle is secured to the cap assembly base in a position that obstructs removal of the pair of lateral projections from the pair of sockets.” This additional limitation is identical to that of claim 2. Accordingly, for the same reasons discussed above in connection with claim 2, it is my opinion that this limitation would have been obvious over Ribarits, in view of Hughes.

I. Claim 22 is Obvious over Ribarits in view of Panicci

291. Claim 22 depends from claim 20, and further recites, “wherein when the resilient mouthpiece is pivoted from the stowed position to the dispensing position, the resilient mouthpiece pivots away from the dust cover.” This limitation is identical to that of claim 4. Thus, for the same reasons discussed above in connection with claims 20 and 4, it is my opinion that claim 22 is obvious over Ribarits, in view of Panicci.

J. Claim 23 is Obvious over Ribarits in view of Panicci

292. Claim 23 depends from claim 20, and further recites, “wherein the resilient mouthpiece includes projections that extend generally transverse to the portion of the fluid conduit that extends through the resilient mouthpiece, and further wherein the projections engage an end region of the pivotal mount.” This limitation is identical to that of claim 9. Thus, for the same reasons discussed above in connection with claims 20 and 9, it is my opinion that claim 23 is obvious over Ribarits, in view of Panicci.

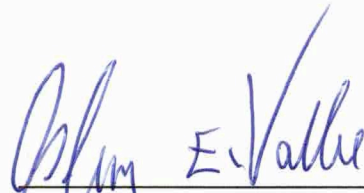
VIII. CONCLUSION

293. For the above reasons, it is my opinion that claims 1-7, and 9-23 of the '255 patent would have been obvious over the prior art.

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.

Dated: July 1, 2024

By:



Glenn Vallee, Ph.D., P.E.

Appendix A

Glenn E. Vallee, Ph.D., P.E.

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Westbrook, CT 06498

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EDUCATION

- Ph.D. May, 1995, University of Rhode Island, Kingston, RI
Major: Mechanical Engineering and Applied Mechanics
Thesis: "A Study of the Dynamic Mechanical Behavior of Elastomeric Materials Under Impact Loading"
- M.S. May, 1990, University of Rhode Island, Kingston, RI
Major: Mechanical Engineering and Applied Mechanics
Thesis: "A Study of the Effect of Geometry on the Mechanical Behavior of an Epichlorohydrin Elastomer Used as an Impact Absorber in Pneumatic Fastening Tools"
- B.S. May, 1985, University of Rhode Island, Kingston, RI
Major: Mechanical Engineering

ACADEMIC EXPERIENCE

Western New England University, Springfield, MA (August 2002 to present)

Chair, Department of Mechanical Engineering (July 2022 to present)

- Advises Dean as to staffing and other resource needs that are required for the effective delivery of the academic programs of the department. Successfully recruited five new faculty to the mechanical engineering department.
- Oversees the work of the faculty of the department (full-time, part-time, on-campus, and summer college) in courses, programs, majors, and the overall curriculum.
- In conjunction with the Dean's Office, schedules classes during Fall, Spring, and Summer semesters both on-campus and off-campus, day and evening, and assigns instructional duties to provide maximum strength in the curriculum.
- Evaluates departmental personnel. Writes formative and/or summative evaluations and rates the performance of each full-time faculty member of the Department except for Professional Educators (Professors of Practice) in the Department who have another immediate supervisor. Evaluations highlight faculty members strengths and areas that need improvement in accordance with the Criteria for Evaluation in the WNE Faculty Handbook.
- Assists the Dean in preparing and administering the budget (including preparation of grant proposals), and in allocating resources in the most effective way.
- Represents the Department to other units of the University, promotes the Department to prospective students, and coordinates faculty involvement in admission processes including active recruitment, open houses, and career days.
- Strives to improve the teaching performance, governance/University service/advising, and professional development, and scholarship of faculty in the department.
- Sets annual departmental goals and objectives, including curricular and program development. Reviews and updates the catalogue regularly.
- Ensures that the programs of the department meet the professional accreditation standards and provides the faculty with guidance and support in meeting the performance criteria of the program. Leads the accreditation effort and coordinates the preparation of documents to meet these objectives.
- Works with other colleges and departments in the University with respect to staffing, scheduling, and the coordination of academic offerings across the University.

Associate Professor of Mechanical Engineering (August 2002 to June 2022)

- Responsible for development of a curriculum of instruction for courses in solid mechanics, mechanical vibrations, materials science, mechanical design, experimental methods and New Product Development.
- Co-developed a Product Innovation and Development Center with the Colleges of Business and Law to secure corporate funding for the development of innovative new products, promote entrepreneurship, and commercialize student inventions.

- Obtained corporate sponsorship for over 40 senior projects and filed 6 utility and 9 provisional patents for product innovations.
- Served as Director of the Mechanical Testing Lab responsible for bringing state of the art experimental capabilities to the solid mechanics lab in the Mechanical Engineering department, thus providing capabilities for research in the areas of static and dynamic material behavior of elastomers and solids under high strain rates.
- Mechanical Engineering faculty advisor for more than 10 interdisciplinary team projects.
- Received the one of the highest teaching evaluation ratings from students in the School of Engineering over the past five years (4.6/5.0).
- Served as faculty liaison to the Mechanical Engineering Industrial Advisory Council.
- Secured resources from corporations for laboratory equipment totaling over \$35,000.
- Developed the biodiesel generation facility for sustainability at Western New England University.
- Coordinator for the approval of University Patent Filings for the College of Engineering.

Courses Taught:

Graduate Level: ME-619 Analytical and Experimental Stress Analysis*

Senior Level: ME-425 Design of Machine Elements
 ME-490 Mechanical Engineering Product Innovation and Development*
 - ME-423/BME-423/BUS 423 – Product Innovation and Development*
 ME-435 Senior Interdisciplinary Laboratory Project (Hybrid Electric Car)
 ME-427 Kinematics and Control of Electro-Mechanical Systems

Junior Level: ME-320 Mechanical Vibrations
 ME-312 Kinematics
 ME-309 Materials Science
 ME-314 Junior Interdisciplinary Laboratory Project (Product Innovation)*

Sophomore Level: ME-202 Statics
 ME-203 Dynamics
 ME-204/205 – Engineering Mechanics I and II
 ME-208 Mechanics of Materials

Freshman Level: ENGR-110 Computer Applications in Engineering (Labview, Matlab, MathCAD, Excel)

* course developed by Glenn Vallee

University of Rhode Island, Kingston, RI (September 1990 to January, 1998)

Adjunct Assistant Professor

- Responsible for development of a curriculum for instruction of senior level *Mechanical Systems Design* (Machine Design) and *Introduction to the Finite Element Method* courses, as well as the entry level *Basic Graphics* courses. Frequently incorporate real world, practical design projects into the curriculum.
- Member of the Industrial Advisory Board for the Department of Mechanical Engineering and Applied Mechanics.

Courses Taught at Other Institutions:

Community College of Rhode Island, Warwick, RI
 Mechanics of Materials, Dynamics, Statics, Mechanical Engineering Laboratory, Machine Design

New England Institute of Technology, Warwick, RI
 Engineering Economics, Electromechanical Devices, Engineering Materials

PROFESSIONAL EXPERIENCE

Remington Products Company, L.L.C., Bridgeport, CT (September 1997 to August 2002)

Director of Engineering and Quality Assurance, Worldwide

Directed activities of Design and Product Engineering, Quality Assurance and Manufacturing departments in the U.S., U.K. and Asia responsible for the design and development of international consumer products. Responsible for focusing new product engineering toward continuously improving customer satisfaction through improved product design, performance and quality.

- Co-authored the corporate New Product Development (NPD) process geared toward the design of electromechanical products having the highest quality which met or exceed consumer expectations. Integrated Computer Aided Engineering (CAE), Quality Assurance and consumer feedback into the design and development of international consumer products.

- Supervised the corporate laboratories (US and Hong Kong) and brought them up to UL, CSA and Demko regulatory standards. Responsible for developing all test protocols and methodologies for new product testing and qualification. Introduced electronic instrumentation techniques into the product qualification process, including strain gage techniques, photoelastic stress analysis, a variety of dynamic test methods and high-speed data acquisition and control. Responsible for supervising failure analysis of products involved in product liability litigation.
- Helped introduce solid modeling (Pro/E) and rapid prototyping to an engineering department which previously designed products using only 2D CAD (CADKey and AutoCAD). Integrated (and performed) Finite Element Analysis (FEA), Design of Experiments (DOE), Failure Mode and Effects Analysis (FMEA) and formal design reviews into the NPD process.
- Introduced modern Quality Assurance techniques into the company and brought the US factory to CGMP standards. Reorganized the entire QA department and all quality systems (including the Bridgeport manufacturing facility) to improve effectiveness. Integrated QA into the NPD process and directed input from QA, returned product analysis and consumer feedback into improved products, resulting in a 35% drop in product returns over three years.
- Helped create QA offices in both Hong Kong and mainland China in order to implement much of the QA function at supplier location, resulting in improved communications and more efficient corrective actions and lot dispositions. Reduced inspection costs by over 50% while reducing manufacturing defects by nearly 20%.
- Directed all corporate research activities with local Universities in order to incorporate new technologies into new products. Projects included the development of new surface finishes and cutting materials for shaving/hair trimming applications, and advanced thermal analyses in paraffin spas.
- Managed and provided leadership to business process improvement teams aimed at improving corporate processes and efficiencies. Analyzed data including trends, historical records, customer needs, cost of quality analysis and competitive intelligence while working with all levels and functions. Responsible for presenting quarterly reports to senior management on NPD activities Quality initiatives.
- Created and programmed an electronic engineering documentation system, replacing the previous paper system and streamlining information flow. Developed an international product performance database, enabling the sharing engineering documentation, test data, product returns data and customer feedback within the worldwide organization via the internet.

Stanley-Bostitch Company, East Greenwich, RI (October 1985 to September 1997)

Manager, Engineering Laboratories (June, 1995 to September, 1997)

Responsible for managing the largest Engineering Laboratory in the Stanley Works, supervising 18 employees. Coordinated testing and allocated resources to meet stringent scheduling requirements of Product Development, Manufacturing and Marketing departments.

- Developed and implemented standard test batteries and comprehensive test methods for all product testing.
- Introduced and programmed high speed data acquisition and control systems, increasing productivity by over 50%, while providing support to new product development and existing product lines.
- Coordinated physical expansion of laboratory by 40% to support testing of all new and existing products. Responsible for performing periodic quality audits on all major products.
- Coordinated research efforts as required to solve a wide range of design and manufacturing problems throughout the company.
- Principal Finite Element Analyst for company, and technical liaison to international segments of the corporation responsible for coordinating adherence to international safety standards.
- Company representative and technical expert in product liability litigation.

Product Design/Development Engineer (August 1987 to June 1995)

Responsible for guiding product development from concept through production in a highly competitive manufacturing environment. Extensive design and analysis experience using Unigraphics and AutoCAD CAD/CAM software and ABAQUS and ANSYS FEA software.

Test Engineer (August 1986 to August 1987)

Directed and conducted activities in the engineering lab to evaluate product performance. Extensive work in the areas of vibration testing and experimental stress analysis utilizing photo elastic coatings and strain gauge technology.

Technician (October 1985 to August 1986)

Conducted a wide range of testing in the engineering lab to evaluate product performance. Extensive work using a variety of electronic transducers and signal conditioning devices.

RESEARCH AREAS OF INTEREST

- Dynamic mechanical behavior of materials using experimental and Finite Element techniques
- Static and dynamic mechanical behavior of elastomeric materials
- Experimental verification techniques for Finite Element Analysis
- Finite Element Analysis and applications to design
- New product development process and methods used to reduce time to market as related to consumer and industrial products
- Unique methodologies for experimentally determining performance of consumer products and assessing consumer satisfaction.

PROFESSIONAL ACTIVITIES

Professional Societies

American Society of Mechanical Engineers

Tau Beta Pi Engineering Honor Society, Rhode Island Chapter

Pi Tau Sigma Engineering Honor Society, Rhode Island Chapter

CONSULTING

Patent Litigation – Technical Expert

Adduci, Mastriani & Schaumberg LLP, Washington, DC.

- Served as technical expert in an ITC patent non-infringement investigation related to **vaping devices (e-cigarettes)**, 2019.

Brooks Cushman P.C., Southfield, MI.

- Provided expert declarations and deposition testimony in patent infringement litigation related to **beveling miter saws**, 2022.

Burns & Levinson LLP, Boston, MA.

- Provided technical expertise and research services in patent litigation related to **attachments for firearms**, 2023.

Carlson Caspers Vandenburg & Lindquist, P.A., Minneapolis, MN.

- Provided expert declaration in patent invalidity and infringement litigation related to **tape measures with metal blades**, 2020.
- Served as a technical expert in a patent infringement litigation related to **drill bits**, 2023.

Fish & Richardson P.C., Wilmington, DE.

- Served as a technical expert in a patent infringement litigation related to **handheld power saws**, 2023.

Hinckley, Allen & Snyder LLP, Providence, RI.

- Provided expert declarations and deposition testimony in patent infringement litigation related to **spring powered desktop staplers**, 2018.

Hoffmann & Baron, LLP, Parsippany, NJ.

- Provided expert declarations and deposition testimony in patent non-infringement litigation related to a **toy car and tube track system**, 2019.

- Served as a technical expert in a patent dispute involving **firepits**, 2022.

Knobbe Martens, Irvine, CA.

- Provided expert opinions in IPR patent litigation related to **liquid drink containers**, 2024.

Latham & Watkins, LLP, New York, NY.

- Provided expert declaration related to patent infringement litigation related to **hand-held electric strapping machines**, 2022.

Lewis Brisbois Bisgaard & Smith LLP, Los Angeles, CA

- Served as technical expert in patent infringement litigation related to **magnetic eyelashes**, 2021.

McDermott Will & Emery LLP, Washington DC.

- Provided expert declarations related to patent invalidity and non-infringement, deposition testimony and hearing testimony before the ITC related to **gas spring powered nailers**, 2018.
- Provided expert declarations related to patent infringement litigation related to **powered nailers**, 2019.
- Provided expert declarations and deposition testimony related to an ITC Patent Modification proceeding related to **gas spring powered nailers**, 2020.

Meunier Carlin & Curfman LLC, Atlanta, GA.

- Provided expert declarations and deposition testimony in IPR patent litigation related to **hole saws**, 2016.
- Provided expert declarations in IPR patent litigation related to **children's play yards**, 2016.
- Provided expert declarations in IPR patent litigation related to **attachments for barbecue grills**, 2017.
- Provided expert declarations and deposition testimony in patent non-infringement litigation related to **inflatable air mattresses with integral pumps**, 2018.

Munck, Wilson and Mandala, LLP, Dallas, TX.

- Provided expert declarations and deposition testimony in patent infringement litigation related to **hand-held razors**, 2023.

Perkins Coie, San Diego, CA

- Provided expert declaration and deposition testimony in patent validity litigation related to **vacuum coolers**, 2021.

Polsinelli, LLC, Houston, TX.

- Provided expert declaration in IPR patent litigation related to **griddle cooking stations**, 2023.

Procopio, Cory, Hargreaves & Savitch, LLP, Palo Alto, CA.

- Provided expert declaration in a patent post grant review (PGR) related to **coil spring motors that fold curtains and blinds**, 2020.

Robins Kaplan, LLP, Boston, MA.

- Provided expert declaration in infringement patent litigation related to **vaping devices (e-cigarettes)**, 2020.

Squire Patton Boggs LLP (US), Cleveland OH.

- Provided expert declaration and deposition testimony in IPR patent litigation, and expert declarations in ITC and US Customs litigation related to **attachments for mobile devices**, 2018.
- Provided expert declarations in IPR patent litigation related to **cable glands**, 2018.
- Provided expert declaration and deposition testimony in a patent Ex Parte Reexamination related to **hover boards**, 2021.

Weil, Gotshal & Manges LLP, Washington, DC.

- Provided expert declarations and depositions in an ITC infringement investigation related to **vaping devices (e-cigarettes)**, 2023.

Wilson Sonsini Goodrich & Rosati, Seattle, WA.

- Provided expert declarations in patent interference litigation related to **apparatuses, systems, and methods for processing foodstuff**, 2019.
- Provided expert declarations in patent re examination litigation related to **patient controlled analgesic devices**, 2020.

Products Liability Litigation – Technical Expert

Conway Stoughton, L.L.C, West Hartford, CT.

- Provided expert reports and deposition testimony in product liability litigation related to a **cold/pressure therapy device**, 2017.
- Served as a technical expert in product liability litigation related to **extension ladders**, 2019.

Hitachi Koki USA, Norcross, GA.

- Provided expert reports and deposition testimony in product liability litigation related to **pneumatic nailers**. 2011 to present.
- Served as a technical expert in potential product liability litigation related to **beveling miter saws**, 2023.

Keyes and Donnellan, P.C., Springfield, MA.

- Provided deposition testimony in product liability litigation related to a **passenger van accident** with a fatality, 2009.

Makita Power Tools, La Mirada, CA.

- Provide services as a technical expert in potential product liability litigation related to **pneumatic nailers**, 2023.

Stanley/Black&Decker, New Britain, CT.

- Provided expert reports, deposition and trial testimony in product liability litigation related to **pneumatic nailers**, 2009 to present.

The TASA Group, Inc., Blue Bell, PA.

- Provide services as a technical expert in general product liability litigation related to **plumbing fittings, walking canes, acupuncture heat lamps, hammer drills and electric sanders**, 2015 to present.

Design, Analysis and Product Development

Bacou-Dalloz Eye and Face group, Smithfield, RI.

- Developed an engineering documentation system for experimental data and document control. August, 2006.

Chimney Works Company, Higganum, CT.

- Designed an alternate knuckle boom extension system for improved positioning of prefabricated concrete chimney sections, November, 2004.
- Performed a finite element stress analysis of a prefabricated concrete chimney chase to assess strength. April 2004.

Flow Design Inc., Springfield, MA.

- Design and development of surgical clips and clip applier used in cardio bypass surgery, April, 2007.
- Inspection and Testing of Titanium Vascular Clips, June, 2007.
- Tooling and Testing of Titanium Surgical Clips, August, 2007.

Hamilton Sundstrand Corporation, Windsor Locks, CT.

- Performed a finite element stress analysis of a titanium starter rotor used in jet engines, February, 2003.

The Hillman Group, Tempe, AZ.

- Perform numerical simulations to optimize deck screw performance, May, 2017.

Lenox Saw Company, East Longmeadow, MA.

- Developed a finite element model for simulation of band saw cutting. December, 2007.
- Developed improvements to band coil annealing processes using finite element analysis. February, 2008.
- Developed a numerical model for the prediction of the onset of crooked cutting. April, 2008.
- Developed a fully 3D finite element based methodology for the design of improved band saw cutting systems. October, 2010.

Shark/Ninja Co., Newton MA.

- Supervised engineering group in mainland China responsible for Finite element Analysis, 2016-2017.

Stanley Fastening Systems, East Greenwich, RI.

- Developed and fabricated a prototype of a CO₂ cartridge powered fastening tool June, 2004.
- Developed a dynamic material model for a nitrile elastomer used in impact bumpers in pneumatic fastening tools. November, 2004.
- Developed a dynamic load-deflection fixture for the experimental verification of dynamic FEA results. November, 2005.
- Designed an impact bumper for a small brad tool. January 2006.
- Developed an energy measuring device for pneumatic fastening tools based on the Split Hopkinson Pressure Bar Apparatus. August, 2006.

Utility Composites Inc., Round Rock, TX.

- Developed a hammer tacker for polymeric staples with integrated antennae, 2016. Patent granted for “Fastener Insertion System for Fasteners with Antennas”, US Patent No. 10,599,969, March 24, 2020.

RESEARCH/ CAPSTONE SENIOR DESIGN PROJECTS:

Consumer Products

- “Design of a Mechanically Self-Tightening Shoe”, Joseph Aberdale, 2021.
- “Development of an Affordable, Push Type Electric Golf Cart - Team A”, Daniel Buckson and Adam Razza, 2021.
- “Development of an Affordable, Push Type Electric Golf Cart - Team B”, Anthony Frati and Joshua Labonte, 2021.
- “Development of a PTSD Sleep Aid”, Luke Langelier and Rachel Brosnan, provisional patent filed, August 2019.
- “Design and Development of an Automated Ping Pong Server”, Dylan Moriarty and Nicholas Russo, 2019.
- “Design and Development of a Deflation-Proof Air Mattress”, Jaimie Lamacchia, 2019.
- “Design and Development of a Powered Eyeglass Cleaner”, Aleksander Calcagno, 2019.
- “Development of an Improved Guitar Bridge”, Christopher Carbonaro and Matt Schluckebier, 2019.
- “Comparison of Traditional and Polymer Constructed Point Shoes”, Nicole Powers, 2017.
- “Development of a Novel Snow Shovel”, Kevin Patterson, Shelbea Russel and Brett Schorr, 2017. Sponsored by Ergie Shovel, Inc., Springfield, MA.
- “Design of Safety Candle Topper”, Peter Kelley, 2016.
- “The Manufacture and Commercialization of Affordable Products for Goodwill Industries”, Shane Vitorino, 2015. Sponsored by Goodwill Industries, Springfield, MA.
- “Design of an Inflationless Basketball, Phase II”, Spencer Bracco, 2012. Sponsored by PSI 91 Co., Springfield, MA.
- “Design of a Revolutionary Two-Part Beverage Bottle”, Scott Carlson, 2012. Sponsored by Jesse Barbor, inventor.
- “Redesign and Fabrication of the Waterboy Water Purification System”, Mike Grinaski and Matt McCormack, 2012. Recipients of the College of Engineering award for the Design Solution with the Most Impact in a Global, Economic, Environmental and/or Societal Context. Results published in the Proceedings of the 2014 ASME IMECE in Montreal, Can., Nov. 2014. US Patent No. 9084949, July, 2015
- “Redesign and Fabrication of the Waterboy Water Purification System, Phase II”, Brian Hamel, 2012.

- “Design and Commercialization of the Sharp & Ready Knife Sharpening Shell”, Patrick McClain, 2012. Filed for a Provisional Patent, May 2012.
- “Design and Fabrication of a Heated Guide Fishing Pole”, Nick Moskwa, 2012. Filed for a Provisional Patent, May, 2012.
- “Development of an Inflationless Basketball”, Patrick Nadeau, 2012. Sponsored by PSI 91 Co., Springfield, MA.
- “Design and Fabrication of a Golf Laser Trainer”, Nick Taber, 2012. Sponsored by Ralph Thresher, inventor. Filed for a Provisional Patent, May 2012.
- “Development of a Combination Blade/Line Trimmer”, Michael Ferrarotti, 2011. Filed for a Provisional Patent, March 2011.
- “Development of an Autonomous Window Washing Robot”, Michael Lastrina, 2008. Entered in the ASME District A Design Competition, Professional, Student Professional Development Conference, CCSU, New Britain, CT, April 5, 2008.
- “The Development of an Energy Monitoring System for Athletic Training Sleds”, Sean Bramhall, 2007. Sponsored by SetPro Inc., Westbrook, CT.

DIY Products

- “Development of a Novel Bicycle Spoke Cutter and Rethreader”, Christian Thompson and Adam Vanasse, 2019.
- “Design of an Extruding Soldering Iron for Commercialization”, Matt Hahn and Nic DeMarco, 2018. Filed Provisional Patent 2019.
- “Design and Fabrication of a Recoil Reduction Device for Pneumatic Nailers, Ryan Begley, 2015. Sponsored by Stanley/Black&Decker, North Kingston, RI.
- “Design and Fabrication of a Recoil Reduction System for a Powder Actuated Nailer”, Jeffery Cooley, 2015. Sponsored by Stanley/Black&Decker, North Kingston, RI.
- “Reinventing One Handed Clamping”, Chad Bennet Bonn and Andrew Leoni, 2014. Sponsored by Irwin Tools, Charlotte, NC.
- “Design of a Hammer with Integrated Drill”, Andrew Egerton and Eric Buhl, 2014. US Patent No. 10,232,449B2, granted March, 2019.
- “Design and Fabrication of a Quick-Change Hole Saw Arbor”, Colby Conant, 2012. Sponsored by Lenox Saw Company, East Longmeadow, MA.
- “Design of a One Handed Power Driven Pipe Expander”, Danielle Lloyd, 2011. Sponsored by Lenox Saw Company, East Longmeadow, MA.
- “Design and Fabrication of a One-Handed Manual Pipe Swager”, Frank Neher, 2011. Sponsored by Lenox Saw Company, East Longmeadow, MA.
- “Redesign of a Tape Measure Housing Using Explicit Dynamic FEA”, Justin Marsh, 2011. Sponsored by Stanley/Black&Decker, New Britain, CT.
- “Development of a Double Capacity Pneumatic Nailer Magazine”, Mark Herdman, 2009. Sponsored by Stanley Fastening Systems, East Greenwich, RI.
- “Development of an Innovative Cordless Reciprocating Saw”, Christopher Leonard, 2008. Sponsored by Lenox Saw Company, East Longmeadow, MA.
- “Reduction of Recoil in Portable, Spring Loaded Fastening Tools”, Peter Fowler, 2008. Sponsored by Stanley Fastening Systems, East Greenwich, RI.
- “Design and Development of a Low Cost Stud Finder for Pneumatic Fastening Tools”, Kari Kisselbrack, 2006. Sponsored by Stanley Fastening Systems, East Greenwich, RI.
- “Development of a Feed System for a Non-Pneumatic Nailer”, Sean O’Claire. 2005. Sponsored by Stanley Fastening Systems, East Greenwich, RI.
- “Development of a Cycle Counter for a Pneumatic Fastening Tool”, Joe Sibilia, 2004. Sponsored by Stanley Fastening Systems, East Greenwich, RI.
- “Optimization of a Hammer Tacker Design”, Joe Bielin, 2004. Sponsored by Stanley Fastening Systems, East Greenwich, RI.
- “Development of a Drive Piston Retaining Device for a Pneumatic Fastening Tool”, Evan Weber, 2004. Sponsored by Stanley Fastening Systems, East Greenwich, RI.

Industrial Products

- “Design of an Energy Producing Floor Tile for Sustainability”, Thomas Gonzales, 2020.

- “Design of an Energy Harvesting Passive Energy Device”, Christopher Patenaude, 2020.
- “Design and Fabrication of A Dog Toy Making Machine”, Brandon Valesques, 2018. Sponsored by Goodwill of Springfield, MA.
- “Motorcycle Food Delivery System - Design of A Motorcycle Mount”, Eric Murphy, 2017. Sponsored by Acres Investments, SA, Lima Peru.
- “Motorcycle Food Delivery System - Design and Fabrication for Commercialization”, Jonathan Eheander, 2016. Sponsored by Acres Investments, SA, Lima Peru.
- “Design and Fabrication of a Tubing Straightener for HVAC Applications”, Ethan Freedman, 2016. Sponsored by Hilmor, Inc., East Longmeadow, MA.
- “Design and Fabrication of a Dog Toy Making Machine”, Brenna Dillner, 2016. Sponsored by Goodwill of Springfield, MA.
- “Motorcycle Food Delivery System”, Jean-Luc LaLiberte and Abigail Powers, 2016. Sponsored by Acres Investments, SA, Lima Peru.
- “Motorcycle Food Delivery System”, Ronald Foshay and Gregory Porter, 2015. Sponsored by Acres Investments, SA, Lima Peru.
- “Design & Integration of a Motorcycle Food Delivery System”, Andrew McManus and Michael Tranghese, 2015. Sponsored by Acres Investments, SA, Lima Peru.
- “Design and Fabrication of a Wireless Thermocouple Housing for HVAC Applications”, Alex Simms, 2015. Sponsored by Hilmor Inc., East Longmeadow, MA.
- “Improved Motorcycle Food Delivery System”, Connor Dion and Bruce Funteral, 2014. Sponsored by Acres Investments, SA, Lima, Peru.
- “Design of an Improved Fire Protection Fitting”, Marcus Pelleschi, 2014.
- “Design and Fabrication of a Secondary Power Generating Unit Used to Recycle Wasted Energy”, Leonardo Bartolomeo, 2012. Sponsored by the Nicolas Bartolomeo Co., Springfield, MA.
- “Development of a Push off Impact Pendulum for Carbide Tips”, Joe Bernard, 2010. Sponsored by Lenox Saw Company, East Longmeadow, MA.
- “Design and Fabrication of a Segmented Band Saw Blade Tester”, Kevin Motson, 2010. Sponsored by Lenox Saw Company, East Longmeadow, MA.
- “Redesign of a Fastening Tool Using Explicit Dynamic FEA”, Alex Racicot, 2010. Sponsored by Stanley Fastening Systems, East Greenwich, RI.
- “Development of a Robotic Saw Tester”, Edward Davis, 2009. Sponsored by Lenox Saw Company, East Longmeadow, MA.
- “Design and Fabrication of an Automated Withdrawal Fixture for Fastener Testing”, Ross Bennet-Bonn, 2009. Sponsored by Stanley Fastening Systems, East Greenwich, RI.
- “Design and Development of a System for Measuring the Overall Efficiency of a Compressor Nailer Fastening System”, Mike Oraziatti, 2007. Sponsored by Stanley Fastening Systems, East Greenwich, RI.
- “Development of a Portable Energy Measuring Device for Pneumatic Fastening Tools”, Seth Glaser, 2006. Sponsored by Stanley Fastening Systems, East Greenwich, RI.
- “Redesign of a Surgical Clip Applier”, Kevin Lutter, 2005. Sponsored by SK3 Corporation, Springfield, MA.
- “Measurement of Closeness of Shave Using Vibratory Techniques”, Lindsay Maguire, 2004. Sponsored by Remington Products Company, L.L.C., Bridgeport, CT.
- “Development of Alternate Methods for Dynamic Loading of Pneumatic Fastening Tools”, Dave White, 2004. Sponsored by Stanley Fastening Systems, East Greenwich, RI.

Vehicle Design

- “Development of a Four Wheel Drive SAE Mini Baja Vehicle”, Michael Greider, Nigel Baldwin and Austin Rendon, 2021.
- “Improvement of SAE Baja Drivetrain Performance”, Adam Lee, 2020.
- “Design of a Four Wheel Drive System for an SAE Mini Baja Vehicle”, Trent Gobel and Elijah Jean, 2020.
- “Design and Analysis of Stacked vs. Compound Epicyclic Gear Trains for Slow Speed Applications”, Samantha Flamand and Zachary Blanchard, 2020.
- “Development of a Four Wheel Drive System for an SAE Mini Baja Vehicle”, Peter Schultz, Ethan Pelley and Jeff Barthelette, 2020.
- “SAE Baja Vehicle - Sprag Clutch Differential and Gear Optimization”, Travis Armento, 2019.
- “SAE Baja Vehicle - Development of a Torsen Differential”, David Snee, 2019.

- “Design and Fabrication of a Jeep Wrangler Door Check Mechanism”, Ryan Heacox, 2016.
- “Design & Fabrication of a Low Cost Motorized Transportation Vehicle”, Tyler Partington, 2015.

General Research

- “Development of an Automated Loading System for the Mechanics of Materials Bridge Busting Competition”, Cole McGee and Hillary Naranjo-Majia, 2018.
- “Modeling Screw Withdrawal in Concrete Using Finite Element Analysis”, Russell Perry, 2018. Sponsored by The Hillman Group, Tempe, AZ.
- “Development of a Predictive Design Methodology for Structural Polymers Subjected to Long Term Loading”, Julie Jackson, 2012. Results published in the Proceedings of the 2012 ASME IMECE in Houston, TX, Nov. 2012. Sponsored by Stanley/Black&Decker, East Greenwich, RI.
- “Development of a Curved Hopkinson Bar for the Measurement of Impact Load and Energy Transmission”, Micah Bowen, 2011. Results published in the Proceedings of the 2011 ASME IMECE, Denver, CO, Nov. 2011.
- “Methodology for Material Selection in Product Design”, Andrew Labrie. 2011. Sponsored by Stanley/Black&Decker, New Britain, CT.
- “Finite Element Modeling of a Mortar Base Plate and Soil Interaction”, Kelley MacDonald, 2010. Sponsored by the United States Army—Cold Regions Research and Engineering Laboratory.
- “Design and Fabrication of a Small Engine Dynamometer”, Eric Perkins, 2010.
- “Development of a Sustainable Biodiesel Fuel Generation System – Phase 2”, Philip Casey, 2009.
- “Development of a Biodiesel Fuel Generation System”, James Pinsonneault, 2008. Won 3rd place in the ASME District A Student Professional Development Conference, Old Guard Oral Presentation Competition, CCSU, New Britain, CT, April 5, 2008.
- “Determination of the Static and Dynamic Mechanical Properties of a Microcellular Urethane (MCU) Used as an Impact Bumper in Pneumatic Nailers”, James Goulet, 2008. Sponsored by Stanley Fastening Systems, East Greenwich, RI.
- “Determination of Dynamic Mechanical Properties of Adhesives and Porcelains used for Dental Implants”, Tim Hickey, 2007. Sponsored by Beniot Family Dentistry, Old Saybrook, CT. Results presented at the 2010 ASEE Regional Conference, Boston, MA.
- “Design and Development of a Split Hopkinson Pressure Bar Apparatus for Tensile Loading”, Dave Mucciacciaro, 2007.
- “Design of a Specimen Heating System for Dynamic Material Testing”, Steven Army, 2006. Results published in the Proceedings of the 2006 ASME IMECE, Chicago, IL, Nov. 2006.
- “Design and Development of a Full Sized Charpy Impact Tester”, James Dutelle, 2006.
- “Design and Construction of a Torsion Testing Apparatus”, Robert Short 2006. Results published in the Proceedings of the ASEE New England Section 2006 Annual Conference.
- “Automation of a Rebound Pendulum”, Hung Truong, 2005.
- “Design of a Data Acquisition System for a Split Hopkinson Pressure Bar”, Steve Coduri, 2004.
- “A Study of the Effect of Corking a Baseball Bat on Hitting Performance”, Nate Soucy, 2004.
- “Determination of Dynamic Modulus of Elastomeric Materials Using Rebound Measurements”, Doug Almieda, 2004.
- “Determination of Material Properties at Very High Rates of Loading”, Richard Rose, 2003.
- “The Experimental and Analytical Determination of Stresses in Tennis Racquets”, Aaron Dinoto, 2003.
- “Analysis of Stress and Strain on Large Gas Pipes”, Gerry Guillmeister, 2003. Sponsored by Bay State Gas Company, West Springfield, MA.

PUBLICATIONS / PRESENTATIONS

Schoonmaker, M., Gettens, R., Vallee, G., “Building the Entrepreneurial Mindset Through Cross-Functional Innovation Teams”, Entrepreneurship Education and Pedagogy, Volume 3 Issue 1, January 2020, pp. 41-59.

Vallee, G. E., and Eheander, J., Development of a Motorcycle Food Delivery System from an International Perspective”, technical publication, presented at the ASME International Mechanical Engineering Congress and Exposition, Tampa, FL, November 2017, Paper no IMECE2017-70343.

Vallee, G. E., "Implementation of Multi-Year Product Innovation Projects", technical publication, presented at the ASME International Mechanical Engineering Congress and Exposition, Montreal, Canada, November, 2014. Paper No. IMECE2014-36443.

Jackson, J. R., and Vallee, G. E., "Development of a Predictive Design Methodology for Structural Polymers Subject to Long-Term Loadings", technical publication, ASME International Mechanical Engineering Congress and Exposition, Houston, TX, November, 2012. Paper No. IMECE2012-87912, pp. 389-396.

Vallee, G., and Bowen, M., "Development of a Curved Hopkinson Bar for Long Wavelength Impact Events", technical publication, presented at the ASME International Mechanical Engineering Congress and Exposition, Denver, CO, November, 2011. Paper No. IMECE2011-62914, pp. 707-715.

Vallee, G., and Benoit, R., "Translating Dental Performance into Engineering Science within a Senior Capstone Design Project", technical publication and presentation at the New England Regional Conference of the American Society of Engineering Educators, Boston, MA, May, 2010.

Vallee, G., Casey, P. and Pinsinneault, J., "An Interdisciplinary Laboratory Experience for Sustainability", technical publication presented at the ASME International Mechanical Engineering Congress and Exposition, Lake Buena Vista, FL, November, 2009. Paper No. IMECE2009-10389, pp. 325-334.

Vallee, G., "A Novel Course in Product Innovation", technical publication presented at the ASME International Mechanical Engineering Congress and Exposition, Boston, MA., November, 2008. Paper No. IMECE2008-66632, pp. 143-150.

Vallee, G. and Army, S., "Determination of the Temperature Dependent Dynamic Response of Elastomeric Materials Using the Split Hopkinson Pressure Bar", technical publication presented at the ASME International Mechanical Engineering Congress and Exposition, Chicago, Ill., November, 2006, Paper No. IMECE2006-13262, pp. 173-179.

Vallee, G., and Short, R., "Design and Development of an Economical Torsion Testing Machine", presented at the ASME New England Regional Conference, WPI, Worcester, MA, March, 2006.

Northrup, S, Vallee, G., and Moriarty, J., "A Successful Interdisciplinary Design Experience", Presented at the American Society of Engineering Educators Conference, Nashville, TN., June, 2003.

Vallee, G. E., and Shukla, A., "Static and Dynamic Response of Elastomeric Materials -An Insight Into the Design of Durable Elastomeric Components", International Journal of Engineering Design, Vol. 8, No. 3, August, 1997. Presented at the International Conference on Finite Element Analysis of Rubber and Rubber-Like Materials, University of Akron, Akron, Ohio, May 19-20, 1999.

Vallee, G. E., and Shukla, A., "A Study of Elastomeric Materials Using Finite Elements", ASME Journal Of Engineering Materials and Technology, Vol. 118, No. 4, October, 1996, pp. 503-508.

Vallee, G. E., and Shukla, A., "A Study of Elastomeric Materials Using Finite Elements", ASME Journal Of Engineering Materials and Technology, Vol. 118, No. 4, October, 1996, pp. 503-508. Presented at the International Conference on Finite Element Analysis of Rubber and Rubber-Like Materials, University of Akron, Akron, Ohio, March 20-21, 1997.

Vallee, G. E. and Shukla, A., "Development of a Dynamic Load-Deflection Apparatus for Elastomeric Materials", ASTM Journal of Testing and Evaluation, Vol. 23, No. 5, September, 1995, pp. 358-364.

GRANTS

"Woody Biomass Demonstration Project at Western New England College" Massachusetts Clean Energy Center, co-PI with Dr. S. Dini and Dr. A. Klimes, Western New England College, 2010. (\$74,000)

“Next Generation Wind Turbine”, Department of Energy Award No. DE-EE0003276, in conjunction with FloDesign Wind Turbine, LLC. One month summer salary to study structural dynamics of wind turbine support and control structure.

“Creation of a Product Development and Innovation Course”, National Collegiate Inventors and Innovators Alliance (NCIIA), co-PI with Dr. S. Schriener and Dr. J. McKeon, Western New England College, 2008. (\$25,000)

“Development of a New Computer-Aided Data Acquisition and Processing Course”, Western New England College, Faculty Development Grant, Spring, 2008. (\$1,500)

“Development of a Senior ME Design Elective Course in Product Innovation”, Western New England College, Faculty Development Grant, Fall, 2007. (\$1,500)

“Development of a Web Based Course in Applied Machine Design”, Western New England College, Research Grant, Summer, 2006. (\$3,000)

“Development of a Demonstration Kit for Enhanced Learning in Mechanics of Materials”, Western New England College, Faculty Development Grant, Spring, 2005. (\$2,000)

“A Study of the Dynamic Mechanical Properties of Elastomers Under Multiple Deformation Modes”, Western New England College, Research Grant, Summer, 2003. (\$3,000)

“Development of a Demonstration Kit for Enhanced Learning in Statics and Dynamics”, Western New England College, Faculty Development Grant, Spring, 2003. (\$1,875)

LICENSES / PATENTS

Registered as a Professional Engineer with the State of Rhode Island, lic. # 6765.

“Convertible Contact/Sequential Trip Trigger, US Patent No. 5,551,620, September 3, 1996.

“Convertible Contact/Sequential Trip Trigger with Double Actuation Prevention Structure”, US Patent No. 5,551,621, September 3, 1996.

“Portable Drill Bit Sharpener”, US Patent No. 8,690,643, April 8, 2014.

“Biopsy Spacer Device and Method of Operation”, US Patent No. 8,932,251, January 13, 2015.

“Water Purification System”, US Patent No. 9,084,949, July 21, 2015.

“Biopsy Spacer Device and Method of Operation”, US Patent No. 9,233,231, January 12, 2016.

“Flexible Electrical Power Strip”, US Patent No. 10,038,272, July 31, 2018.

“Combination Tool”, US Patent No. 10,232,449B2, March 19, 2019.

“Fastener Insertion System for Fasteners With Antennas”, US Patent No. 10,599,969, March 24, 2020.