IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of:	Keith G. Meggs, et al.	
U.S. Patent No.:	8,371,282	Attorney Docket No. 50745-0003IP1
Issue Date:	February 12, 2013	
Appl. Serial No.:	12/777,134	
Filing Date:	May 10, 2010	
Title:	SOFT-PROJECTILE LAUNCHING DEVICE	

In re Patent of:	Keith G. Meggs, et al.	
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Filing Date:	February 6, 2013	
Title:	SOFT-PROJECTILE LAUNCHING DEVICE	

In re Patent of:	Keith G. Meggs	
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Issue Date:	December 3, 2013	
Appl. Serial No.:	12/973,897	
Filing Date:	December 20, 2010	
Title:	SUPER ABSORBENT POLYMER PROJECTILE LAUNCHING DEVICE	

DECLARATION OF DR. BARRY MATTHEW KUDROWITZ REGARDING U.S. PATENT NOS. 8,371,282, 8,640,683, AND 8,596,255

SPIN MASTER 2015
Prime Time Toys et al. v. Spin Master, Inc.
IPR2023-01339

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I. INTRODUCTION

1. My name is Barry Matthew Kudrowitz. I have been asked to prepare this expert declaration ("Declaration") in relation to the Patent Owner Response briefs that I understand are being filed in these matters by Hasbro, Inc. ("Hasbro"), exclusive licensee of Spin Master, Inc. ("Spin Master"), owner of U.S. Patent Nos. 8,371,282, 8,640,683, and 8,596,255. I refer to Hasbro and Spin Master collectively as "Patent Owner." I understand that the '282, '683, and '255 Patents are challenged by Prime Time Toys LLC, Prime Time Toys Ltd., and Easebon Services Ltd. (collectively, "Petitioner") in *Inter Partes* Review Case Nos. IPR2023-01348, IPR2023-01339, and IPR2023-01461, respectively. I refer to the '282, '683, and '255 Patents collectively as "the Challenged Patents."

2. I have been asked by counsel for Patent Owner to provide my independent analysis of the Challenged Patents in light of the IPR challenges raised by Petitioner. Because these patents and Petitioner's challenges are similar in certain material respects, I have found it convenient to provide a single declaration that I understand will be filed in each of these three matters.

3. Note that I have previously offered expert testimony regarding the '282 and '683 Patents in a parallel proceeding in the United States International Trade Commission entitled *In the Matter of Certain Soft Projectile Launching Devices,*

Components Thereof, Ammunition, and Products Containing Same, Investigation No. 337-TA-1325.

4. I am being compensated my normal hourly rate based on my time spent on this matter. I will not receive any added compensation based on the outcome of any IPR or other proceeding involving the Challenged Patents.

5. My opinions and the bases for my opinions are set forth below.

6. I understand that Petitioner has proffered expert testimony in these IPR proceedings. I have reviewed this testimony and will address certain points of dispute below.

II. QUALIFICATIONS

7. I have summarized in this section my educational background, career, publications, and other relevant qualifications. My full curriculum vitae is attached to this expert report as Appendix 2.

8. I have a Ph.D. of Mechanical Engineering from the Massachusetts Institute of Technology (MIT). Prior to that, I received a Masters of Mechanical Engineering from MIT and a Bachelor of Science in Mechanical Engineering from the University of Central Florida, graduating Summa Cum Laude.

9. My Master's thesis, entitled An Exploration of Concepts for Projectile Toys, was specifically on the process of designing conceptual foam and water projectile toys. For this Master's work from 2004-2006, I worked with Hasbro, Inc.,

developing new technologies that could be used in Nerf brand and Super Soaker brand products. I am listed as an inventor on U.S. Patent No. 7,673,625, "Toy Projectile Launching Device," as a result of this work. This technology was implemented in the Nerf Atom Blaster toy, which was on the market in 2006 until it was discontinued after five years. I am also a listed inventor on an unrelated patent application for an Endoscopic Biopsy Needle Design.

10. I have developed a course called Toy Product Design, which I have taught for six years at the Massachusetts Institute of Technology (2005-2010) and nine years at the University of Minnesota (2011-2019). In this class, I teach a toy design process to students in engineering, design, and business disciplines. A different industry partner sponsors this course each year and students develop product concepts for that partner. Hasbro sponsored this course in 2008 when it was taught at MIT. I have not engaged in any collaborations or sponsored projects or courses with Hasbro since 2010.

11. I regularly speak nationally and internationally about creative product design and designing for play. My book entitled "Sparking Creativity: How Play and Humor Fuel Innovation and Design" was released in May 2023 through Routledge. I was the founding director of the Product Design Program at the University of Minnesota College of Design. I am currently a Professor and the Department Head

of Department of Design Innovation that includes Schools of Product Design, Apparel Design, Graphic Design, and Retail and Consumer Studies.

III. LEGAL PRINCIPLES OF OBVIOUSNESS

12. I am informed that Petitioner contends certain claims of the ’282, ’683, and ’255 Patents[1] are invalid as “obvious.”

13. I am informed that a patent claim is invalid for obviousness if the claimed invention would have been obvious at the time the invention was made to a person having ordinary skill in the art. The following factors are considered: (1) the scope and content of the prior art; (2) the differences between the art and the claims at issue; (3) the level of ordinary skill in the art at the time the invention of the asserted patent was made; and (4) objective indicia evidence relating to the obviousness question.

14. I see that the earliest claimed priority date of each of the Challenged Patents is May 10, 2010. For purposes of my obviousness analysis in this Declaration, I have considered May 10, 2010 as the date of the claimed invention (“Critical Date”) for the ’282 and ’683 Patents. I understand that the ’255 Patent is a continuation-in-part with a filing date of December 20, 2010, and I have considered December 20, 2010 as the Critical Date for the additional added material in the ’255

[1] I understand that claims 2–3, 5–15, 17, and 19–21 of the ’282 Patent are challenged as obvious; claims 4–9, 12, and 14 of the ’683 Patent are challenged as obvious; and claims 1–2, 13, and 15–20 of the ’255 Patent are challenged as obvious.

Patent. I understand from the parallel ITC investigation that there is evidence of prior invention such that certain claims may be entitled to a somewhat earlier Critical Date. Because an earlier Critical Date would not affect my opinions regarding the Peev or Spitballs art, I use the May 10, 2010 date for the ’282 and ’683 Patents and December 20, 2010 date for the ’255 Patent. My analyses and conclusions would still hold true even if the date of the alleged invention were somewhat earlier or later.

15. I am informed that to combine prior art references to show obviousness, a person of ordinary skill in the art, without knowledge of the claimed invention, or without the use of hindsight, must have been motivated to combine the prior art by, for example, some suggestion or teaching in the prior art, the knowledge of one of skill in the art, and/or the nature of the problem to be solved. In addition, I am informed that such a person must have had a reasonable expectation of success in doing so. It is appropriate to look to a variety of factors when evaluating reasons to combine references in an obviousness analysis, and that it is important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the alleged prior art elements in the manner claimed. A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was independently known in the prior art.

16. I am informed that it is impermissible to use the claimed invention itself as a blueprint for piecing together elements in the art. In other words, it is

impermissible to use hindsight reconstruction to pick and choose among disclosures in the prior art to reconstruct the claimed invention.

17. I am informed that a finding that a person of ordinary skill in the art would not be able to practice the invention without undue experimentation or unpredictable results can defeat a claim of obviousness.

18. I am informed that in evaluating whether patent claims are invalid as obvious, objective indicia relating to the obviousness question can be considered. I am informed that such objective indicia is not a closed fixed list, but can include factors such as commercial success, long-felt but unsolved needs, copying, praise, unexpected results, industry acceptance, failure of others, and skepticism by experts. I discuss various objective indicia regarding obviousness below in Section IX.

IV. MATERIALS CONSIDERED

19. My analyses set forth in this Declaration are based on my experience as a mechanical engineer and my work in the field designing toys, including projectile launchers, and other devices, systems, and products. As part of my independent analyses, I have considered the following: the background knowledge and technologies that were commonly known to persons of ordinary skill in the relevant field at the time of the Challenged Patents; my own knowledge and experiences gained from my work in the field; my experience in teaching and/or advising others in that subject; and my experience in working with others involved in the field. In

addition, I have reviewed the materials cited below in my report as well as the following publications and materials filed by Petitioner:

- Petition for *Inter Partes* Review of U.S. Patent No. 8,371,282 (Case No. IPR2023-01348)
- Petition for *Inter Partes* Review of U.S. Patent No. 8,640,683 (Case No. IPR2023-01339)
- Petition for *Inter Partes* Review of U.S. Patent No. 8,596,255 (Case No. IPR2023-01461)
- EX1001(01348): U.S. Patent No. 8,371,282 ("'282 Patent")
- EX1001(01339): U.S. Patent No. 8,640,683 ("'683 Patent")
- EX1001(01461): U.S. Patent No. 8,596,255 ("'255 Patent")
- EX1002: Publication Declaration of Nathanial E. Frank-White and ThinkGeek Spitballs Internet Archive Webpage ("Spitballs")
- EX1003: Bulgarian Patent No. BG110343 and translation ("Peev")
- EX1004: Transcript of Hearing in ITC Case 337-TA-1325
- EX1005: "Airsoft Guns: A Double-Edged Sword," Bleacher Report (2008)
- EX1016(01348): Declaration of Joel Delman
- EX1016(01339): Declaration of Joel Delman
- EX1016(01461): Declaration of Joel Delman
- EX1017(01348): Declaration of Mauren T.F. Reitman
- EX1017(01339): Declaration of Mauren T.F. Reitman
- EX1017(01461): Declaration of Mauren T.F. Reitman
- EX1018(01348): Prosecution History of U.S. Patent No. 8,371,282

- EX1018(01339): Prosecution History of U.S. Patent No. 8,640,683
- EX1018(01461): Prosecution History of U.S. Patent No. 8,596,255
- EX1019: California Senate Office of Research, May 2005 (Revised)
- EX1020: "Not Your Dad's BB Gun," Washington Post (2004)
- EX1022: Korean Patent Publication No. KR 20-2010-0004855 ("Kim")
- EX1023: "Spitballs Grow up to 200 times their original Size"
- EX1024: Screenshot of "Spitballs Grow up to 200 times their original Size," YouTube (2010)

20. Note that, with one exception, my citations to non-patent literature throughout this Declaration reference the absolute page number added to the exhibit (as opposed to the original pagination of the document). The one exception is EX1004, Transcript of Hearing in ITC Case 337-TA-1325, where I refer to the pagination in the native document for ease of cross-referencing with Petitions, which all use that convention. For patent literature, I've used the column/line numbers or paragraph numbers. Note also that, unless I've indicated otherwise, all emphasis (bold/italics/underline) in any quoted text are ones I have added.

V. PERSON OF ORDINARY SKILL IN THE ART

21. I understand that factors such as the education level of those working in the field, sophistication of the technology, types of problems encountered in the art, prior art solutions to those problems, and speed at which innovations are made may help establish the level of skill in the art. Here, I have considered these factors,

the technology at issue, and the types of problems encountered in the art, including prior blaster designs.

22. In the parallel ITC investigation, I opined that a person of ordinary skill in the art ("POSITA") at the time of the inventions of the Challenged Patents would have a bachelor's degree in mechanical engineering, industrial design, or equivalent, with at least one year of relevant experience designing projectile launching systems but would also be a member of a team, which would include a person with a bachelor's in materials science, chemistry, or equivalent (e.g., chemical engineering), or has at least one year experience working with materials for use in consumer products. For both, equivalent work experience may substitute for educational experience, and vice versa.

23. In that same parallel ITC investigation, Petitioner's expert, Mr. Delman, opined that a POSITA would be someone who (i) had a Bachelor's degree in Industrial Design or Mechanical Engineering or (ii) a toy designer with at least five years' experience designing toys (including launchers), with both of (i) and (ii) having access to a chemist knowledgeable regarding super absorbent polymers. I understand that Mr. Delman has maintained this opinion for these IPR proceedings.

24. As discussed above and in my Curriculum Vitae, I hold a bachelor's degree, master's degree, and a Ph.D in mechanical engineering. I have three years of experience in designing projectile launching systems, and have extensive toy

design experience, as explained above. Based on my education and experience, I believe that I am qualified to opine as to what a POSITA would have understood at the time of the inventions of the Challenged Patents in 2010.

25. In arriving at my opinions and conclusions in this report, I have considered the issues from the perspective of the hypothetical person of ordinary skill in the art at the time of the inventions of the Challenged Patents. My opinions do not change under either proposed definition of the POSITA. I further note that in the parallel ITC proceeding, the ALJ accepted both of these definitions as "appropriate for the level of ordinary skill in the art." EX2007 p.29.

VI. OVERVIEW OF CONCLUSIONS FORMED

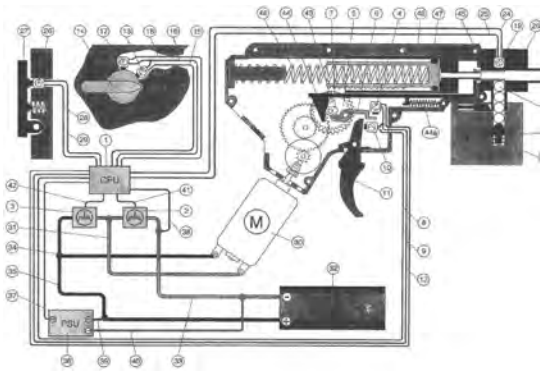
26. For the reasons described below, I conclude that a person of ordinary skill in the art would not have been motivated to pursue the Peev-Spitballs combination. Furthermore, the alleged objective indicia of obviousness related to all Challenged Patents do not show obviousness of the Challenged Claims, and there are objective indicia of non-obviousness that further demonstrate that '282 Patent claims 8, 19 and 20 and '683 Patent claims 5, 8, and 9 were not obvious at the time of their invention.

VII. THE PRIOR ART

A. Peev (EX1003)

27. Peev is about airsoft guns. More specifically, Peev is about electric airsoft guns, which are often called "Automatic Electric Guns" or "AEGs." EX1003 p.23, p.26; EX2016 p.15. "Electric airsoft guns [1] externally represent a copy of real firearms," and Peev's "task" was to make them even more gun-like, both operationally and functionally. EX1003 p.23, p.26 ("as close as possible to…the real firearm"). The inventor, Vladimir Peev, exhibiting his improved lifelike AEG is pictured below. I provide further descriptions of airsoft guns generally and Peev's specific design features in the subsections below.

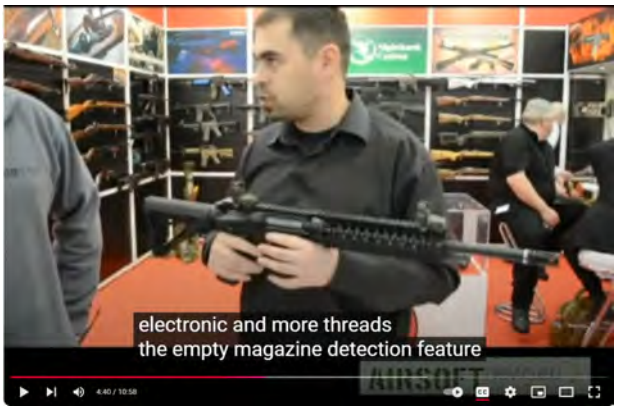
https://www.youtube.com/watch?v=EFajtlwUvys



EX1003 p.38 (Figure 1)

28. The LinkedIn page attributed to Vladamir Peev identifies him as the CEO of Airsoft Systems Ltd. *See* EX2017. Airsoft Systems Ltd. is a company "founded in 2008 in Bulgaria" with the goal of developing "a solution that will make every affordable priced AEG to p[er]form as, or even better than the most expensive Professional Training Weapons." EX2018. The company's website states that its

"products are patent protected," (EX2018), and one of its product manuals promotes a "patent pending, hop-up unit, that detects when the magazine is empty and cuts of[f] the fire, (EX2019 p.14). This empty-magazine detection feature is one of the key AEG improvements disclosed in the Peev patent (EX1003), as I will explain in Section VII.A.2. The still image of Vladamir Peev above is taken from a YouTube video that likewise identifies him as the CEO of Airsoft Systems Ltd. (see below, right) and confirms that the empty-magazine detection feature from the patent is included in the real-world product (see below, left).



https://www.youtube.com/watch?v=EFajtlwUvys

1. Key Concepts About Airsoft Guns

29. **Airsoft guns** are replica firearms "that shoot 'soft' plastic BBs." EX2016 p.6. Real firearms with corresponding airsoft replicas include the M1 carbine, a "light-weight, semi-automatic rifle," the AK-47, a "popular assault rifle" introduced in the 1940s, and the Beretta M9, "the standard U.S. Sidearm in 1985." EX2016 pp.55–60.

EX2020 p.1

EX2021 p.1

EX2022 p.1

EX2023 p.1

30. Airsoft guns are used in a variety of settings. Some people "buy them because airsoft guns provide a safe, low cost way to practice shooting skills." EX2016 p.3. Others buy airsoft guns "in order to take part in airsoft game[s]," which "are generally military simulations played by two teams either in indoor facilities or outdoors in a woodland setting." EX2016 p.3. "[A]irsoft replica guns are also used by both the police and military for training purposes, providing an easy and inexpensive alternative to other training methods." EX2016 p.6.

31. **<u>Airsoft ammunition</u>** typically comes in the form of spherical plastic objects called "pellets" or "BBs." EX2016 p.7. Historically, the terms "pellets" and "BBs" were used when referencing guns that shoot metal ammunition and,

accordingly, "airsoft ammunition was [originally] referred to as 'plastic pellets[.]'" EX2016 p.7. Over time, however, people in the airsoft community began to "use the word 'BBs' when they talk[ed] about the 6mm plastic pellets used in airsoft guns." EX2016 p.7. "Almost all airsoft guns use 6 millimeter plastic BBs, but there are different weights of airsoft BBs (.12 gram, .20 gram, .23 gram, .25 gram, etc.) and different types of guns work best with different weights." EX2016 p.11. "Most airsoft guns shoot 0.2 gram BBs at speeds from about 100 fps (feet per second) for a low-powered spring pistol up to around 500 fps or more for customized sniper rifles." EX2016 p.11.

32. **Automatic Electric Guns (AEGs)** are a particular class or type of airsoft gun. They "are powered by batteries and use an electric motor to drive a gear-piston system that actually fires the BBs. AEGs are the main weapon of choice for airsoft players due to a combination of range, rate of fire, number of rounds per battery charge, BB capacity and faithful duplication of actual firearms." EX2016 p.15. "AEG muzzle velocities average somewhere in the neighborhood of 300–350 fps and fire at around 500–700 rounds per minute." EX2016 p.15.

33. **Airsoft games** are typically simulated military skirmishes, patterned after prisoner rescues, capture the flag scenarios, or famous historic battles; thus, the shorthand term "milsim" or "MilSim." *See* EX2016 p.6, pp.30–32, p.42. Unlike paintball games, where players are marked with colored paint when hit, "[a]irsoft

games operate on the honor system and depend on players acknowledging on their own when they've been hit." EX2016 p.38. As one might expect, problems and conflicts arise in "instances when a player may not feel a BB hit." EX2016 p.40.

34. **Police and military training** is effective with airsoft guns for a variety of reasons. "The ammunition is inexpensive, and minimal protective gear is required to safely participate." EX2024 p.1. Moreover, between the precise replication of actual firearms and the impact force of the high-speed plastic ammunition, airsoft guns facilitate realistic "live-fire training with force-on-force scenarios." EX2025 p.11. As one author put it: "It's amazing how the stress of being hit by a plastic pellet motivates you to shoot on the move as opposed to standing in place." EX2025 p.11. By design, airsoft "feels real," so that trainees "still get the adrenaline dump" of live combat. EX2024 p.2. The point is to put them "under stress," so that they make their mistakes in training, not in the field. EX2024 p.2.

35. **Airsoft standards** were promulgated by ASTM International[2] in the mid-late 2000s, years before the Challenged Patents. Initially handled by a smaller task group, in 2008 ASTM formed a formal subcommittee dedicated to developing industry standards for airsoft guns. EX2027. Two of the early ASTM airsoft

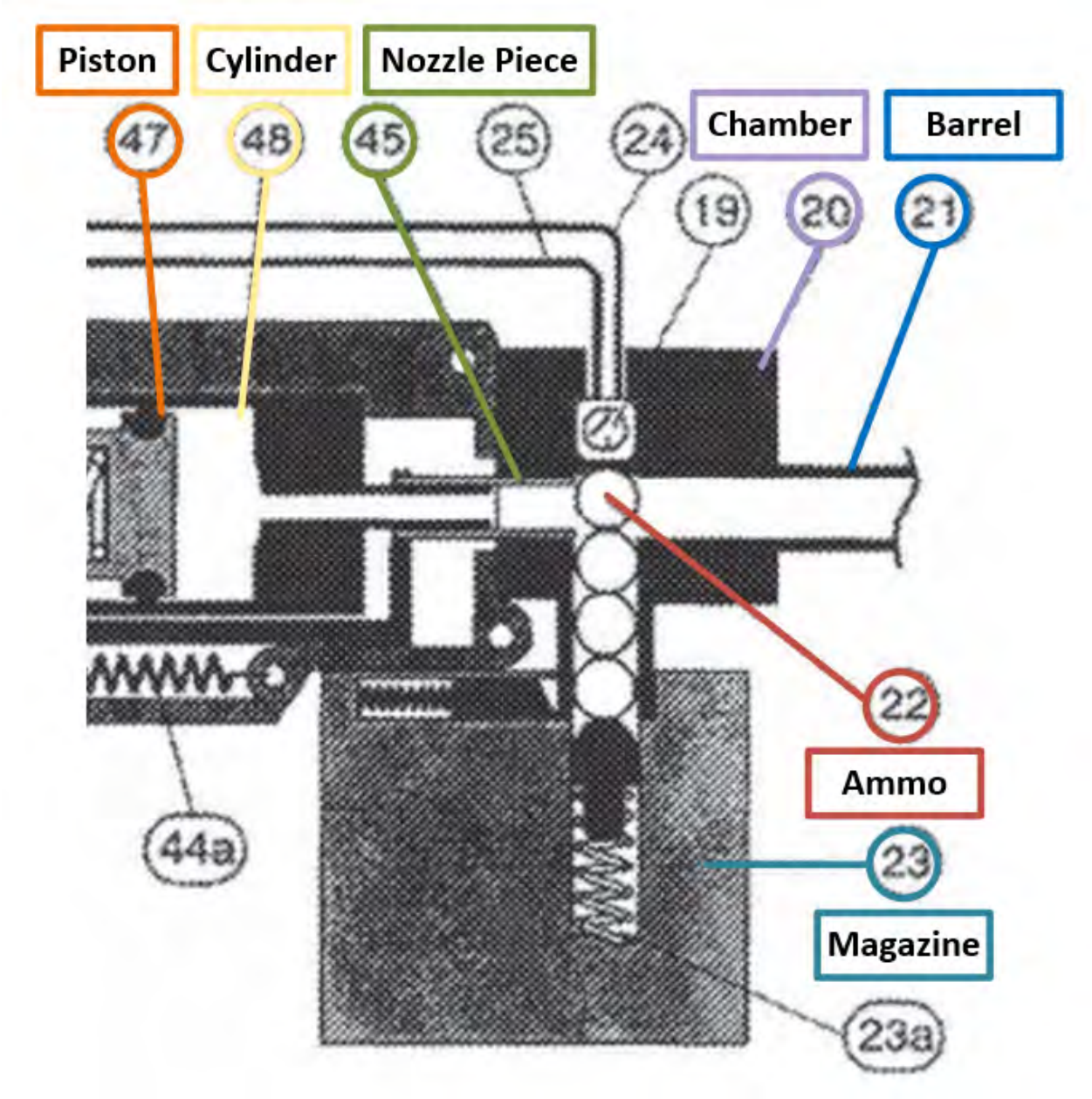
[2] Formed in 1898, ASTM International is a standards organization that develops consensus technical standards for a range of products and industries. EX2026.

standards were ASTM F2679–07 "Standard Specification for 6 mm Projectiles Used with Low Energy Air Guns" (EX2028) and ASTM F2748–08 "Standard Specification for Low Energy Air Guns (Less Than 1 Joule)" (EX2029). Both of these standards expressly address the type of "air guns…used in the sport common called airsoft." EX2029 p.1; EX2028 p.1 (similar). Under F2679–07, the standard definition of "suitable" airsoft ammunition is simple: "spherical, of 6 mm (.24 cal) diameter, non-metallic and non-liquid filled." EX2028 p.1.

2. Peev's Improvements to Conventional Electric Airsoft Guns

36. In many ways, Peev's gun functions like a conventional electric airsoft gun. I will explain the firing sequence disclosed in Peev with reference to Figures 1–3 below.

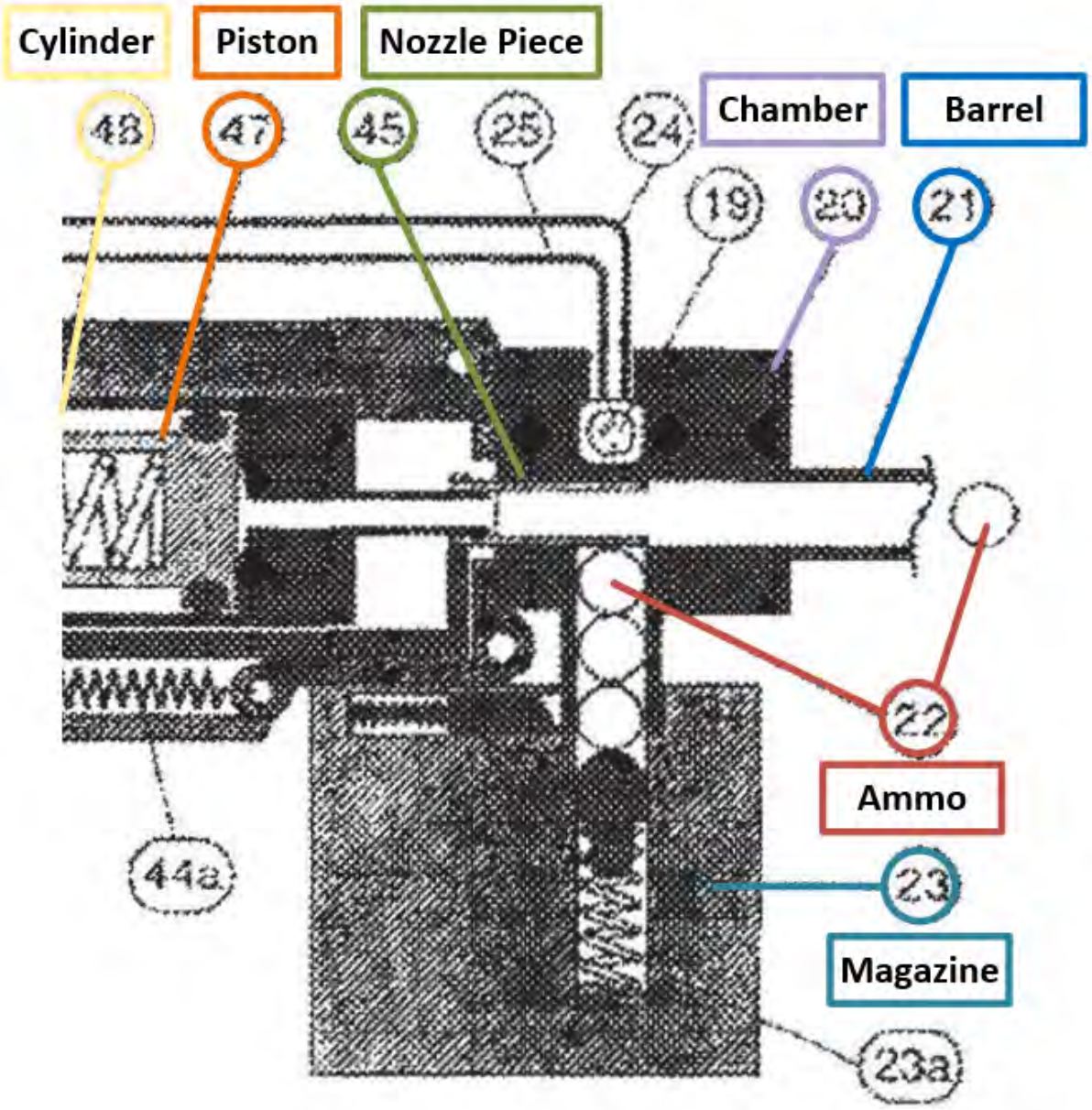
37. As shown in Figures 1–2, a motorized gear set pulls on both **[i]** a spring-loaded connecting plate 44 attached to a nozzle piece 45 and **[ii]** a spring-loaded piston 47. EX1003 pp.31–32. Rearward movement of the nozzle piece 45 allows a plastic airsoft ammunition round 22 to enter a chamber 20 behind the barrel 21 of the gun via a feedpath from the magazine 23. EX1003 pp.31–32. Rearward movement of the piston 47 allows air to fill a compression cylinder 48 behind the chamber 20. EX1003 pp.31–32.



EX1003 p.39 (Figure 2).

38. As shown in Figures 2–3, the gear set releases the connecting plate 44, which springs forward, causing the nozzle piece 45 to push the ammunition round 22 further into the chamber 20. EX1003 p.32. The gear set also releases the piston

47, which likewise springs forward, compressing the air in the compression cylinder 48 and forcing it through the nozzle piece 45. EX1003 p.32. The compressed air applies a firing force to the ammunition round 22, expelling it from the barrel 21. EX1003 p.32.

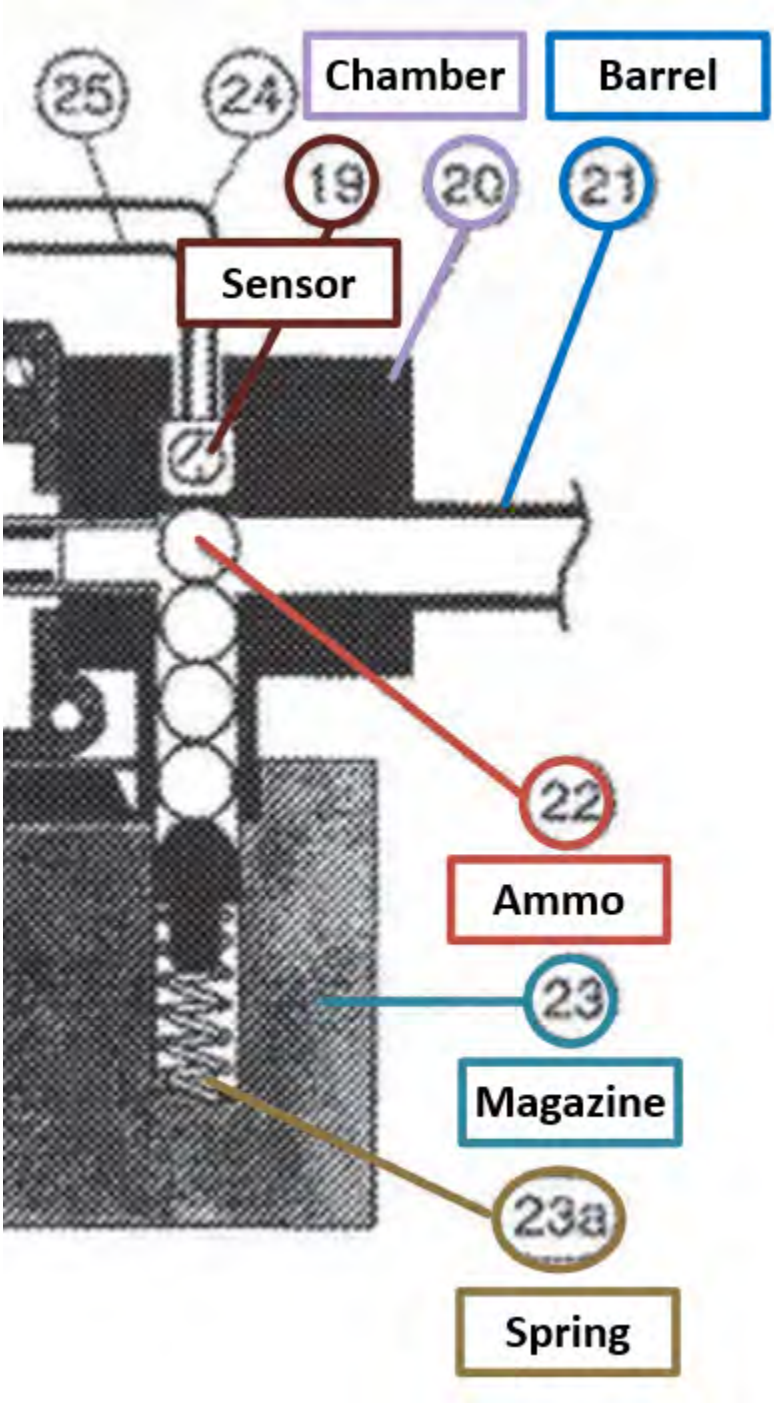


EX1003 p.40 (Figure 3).

39. What is unique about Peev's disclosure is that it identifies and remedies several problems with conventional electric airsoft guns that Vladamir Peev and his co-inventor identified and resolved. EX1003 pp.23–25. For example, Peev identifies a "major disadvantage" in that the conventional design of an electric airsoft gun "does not provide an indication that the magazine has run out of rounds," causing the gun to dry fire until the user "visually detect[s]" that no ammunition is flying out of the barrel. EX1003 p.25. Peev solves this problem by configuring the gun to cut power to the motorized gear set in response to detecting that the magazine is empty. EX1003 p.34. Here's how it works:

> When the [ammunition] 22 rests on the upper wall of the chamber 20, under the pressure of the [magazine] spring 23a, due to the fact that the [ammunition] is round, part of it penetrates the hole in the upper wall of the chamber 20 and presses the fifth sensor 19, thereby closing the circuit between the electrical conductors 24 and 25, sending a signal to the microcontroller 1 that there is a ball 22 in the magazine 23 (Fig. 2)…[if] the microcontroller 1 does not receive[] a signal from the fifth sensor 19…[it] means that the magazine 23 is empty.

EX1003 p.34. In effect, a plastic airsoft ammunition round 22 in the chamber 20 transfers a force from the spring 23a to the sensor 19, which confirms the presence of the ammunition and signals that the magazine 23 is not empty.



EX1003 p.39 (Figure 2 (annotated)).

40. The important point is that the plastic ammunition round in Peev's electric airsoft gun is subject to multiple distinct forces during a firing sequence—

[1] the mechanical force applied to the ammunition by the magazine spring; [2] the mechanical force applied by the sensor (in a direction opposing the spring force); [3] the mechanical force applied by the nozzle piece to push the ammunition forward in the chamber toward the barrel just before firing; and [4] the pneumatic force of the compressed air that fires the ammunition from the barrel.

B. Spitballs (EX1002)

41. The Spitballs reference includes what is purportedly a listing for a novelty polymer product in the "Science Toys" department of an online store called ThinkGeek.com. *See* EX1002 p.15. According to the Spitballs reference, once grown in water—e.g., "to about 0.6" in diameter"—the Spitballs polymers "are slimy and squishy." *Id*. p.15. "If you throw them gently, they will bounce. If you throw them hard enough, they will explode into mushy pieces." Thus, the slogan: "grow 'em and throw 'em." *Id*.

EX1002 p.21, p.18.

VIII. A POSITA WOULD NOT HAVE BEEN MOTIVATED TO PURSUE THE PEEV-SPITBALLS COMBINATION

A. A POSITA Would Have Known That Just Because the Polymer Balls Spitballs Teaches Are Softer Does Not Mean Such Polymers Would Make Safer Ammunition

42. Mr. Delman has taken the position that "[p]rior to 2010, Spitballs were softer projectiles…that could be used in place of the hard spherical plastic ammunition [of Peev] to address the injury problem" with airsoft guns. EX1016(01348) ¶77; EX1016(01339) ¶84; EX1016(01461) ¶75. According to Mr. Delman, using Spitballs as the ammunition for the kind of airsoft gun Peev teaches would make airsoft "safer." EX1016(01348) ¶82; EX1016(01339) ¶90; EX1016(01461) ¶81. I disagree that a POSITA would have jumped to Mr. Delman's conclusion.

43. A POSITA would have understood that just because one kind of ammunition is softer than another does not mean the softer ammunition is safer. Thinking from a POSITA's perspective, it is not difficult to provide examples that disprove Mr. Delman's overly reductive softer-means-safer logic.

44. One such example is a potato. Like airsoft guns, potato guns (or "potato cannons") were a well-known recreational projectile launcher at the time of the Challenged Patents. EX2116 p.1. It is common knowledge that potatoes consist primarily of water and a lesser amount of starch. Given their high water content, a POSITA would have appreciated that potatoes are softer than plastic airsoft rounds,

meaning the potatoes deform more easily under stress. And yet, when fired at equivalent speed, a POSITA would expect the potatoes to be more injurious than the airsoft rounds.

45. A report by the Physics Department of the United States Naval Academy described an incident where a student "accidently shot herself in the face" with a potato from a potato gun, and "[t]he shot fractured portions of her nasal, maxillary, and zygomatic bones (the 'eye socket')." EX2116 p.4. The airsoft injuries Mr. Delman alleges—"crack[ing] the skin" and "minor bleeding"—are trivial in comparison. EX1016(01348) ¶77 (quoting EX1005 p.3); EX1016(01339) ¶84 (same); EX1016(01461) ¶75 (same). So why does the softer potato gun ammunition have more potential to cause harm? Because the potato gun ammunition is much heavier than the lighter, albeit harder, airsoft ammunition. Where standard airsoft ammunition weights are a fraction of a gram, (EX2016 p.11), the Naval Academy report used "potatoes with masses ranging from 50 to 310 g," (EX2116 p.4).

46. Paintballs are another example that Mr. Delman's flawed softer-means-safer logic does not account for. Like potatoes, paintballs are another type of ammunition that is not considered safer than airsoft ammunition even though paintballs are softer.

47. Paintballs are hollow gelatin spheres filled with liquid paint that break apart on impact. ASTM's standard specification for paintball ammunition reflects this common knowledge:

> 3.1.3 *fill material, n*—liquid inside of a paintball.
>
> 3.1.4 *paintball, n*—spherical ball, with a diameter and weight as defined in Table 1, comprised of a shell and a fill, and designed to be expelled from a paintball marker.
>
> 3.1.5 *paintball marker, n*—device specifically designed to discharge paintballs which conforms to Specification F2272.
>
> 3.1.6 *shell*—rigid to semirigid material (generally of gelatin) that encapsulates the fill of a paintball.

EX2117 (ASTM F1979–10) p.1.

> 4.6 *Impact Breakage*—The impact breakage of the paintball shall be tested in accordance with Section 6. All ten of the paintballs that impact the target shall break upon impact.

EX2117 (ASTM F1979–10) p.2.

> **6. Paintball Impact Breakage Test**
>
> 6.1 *Scope*—This test method is intended to determine the ability of the paintballs to burst upon impact.
>
> 6.2 *Summary of Test Method*—This test method involves shooting paintballs from a paintgun at a target, within the parameters of this specification, to test for the breakage of the paintballs upon the target.

EX2117 (ASTM F1979–10) p.3.

48. Paintballs are softer than plastic airsoft rounds. That makes intuitive sense given that paintballs are made from gelatin and specifically designed to break part on impact. I have also confirmed this point non-quantitatively by handling the two types of ammunition. In short, I can break a paintball by applying modest pressure with my fingers, but I cannot break or even deform an airsoft ammunition round this way.

49. Paintballs are heavier than airsoft rounds. As noted in the Airsoft Question and Answer Book, airsoft ammunition typically comes in weights ranging from 0.12 g–0.25 g. EX2016 p.11. By comparison, paintballs can weigh anywhere from 0.9 g–3.5 g:

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TABLE 1 Common Calibers of Paintballs with Minimum and Maximum Diameter and Maximum Weight

	68 Caliber 18 mm	43 Caliber 11 mm	50 Caliber 13 mm	55 Caliber 14 mm	62 Caliber 16 mm
Min (mm) Diameter	16.500	10.430	12.130	13.340	15.000
Max (mm) Diameter	18.000	11.390	13.240	14.560	16.420
Min (in) Diameter	0.650	0.410	0.470	0.520	0.590
Max (in.) Diameter	0.709	0.448	0.521	0.573	0.646
Weight (g) Maximum	3.500	0.900	1.400	1.700	2.500
Weight (oz) Maximum	0.123	0.032	0.049	0.060	0.088

EX2117 (ASTM F1979–10) p.2.

50. Paintball guns, which use softer but also heavier ammunition, were not considered safer than airsoft guns at the time of the Challenged Patents. Contemporaneous literature shows that paintball guns could cause more harm than their airsoft counterparts. For example, the Airsoft Question and Answer Book observes that "paintballs…[are] going to hit harder in almost all cases." EX2016

p.9. This qualitative observation is supported by a quantitative analysis, as reported by a study titled "Nonpowder Firearm Injuries to Children Treated in Emergency Department." EX2118 p.1. Having examined data from the United States National Electronic Injury Surveillance System from 1990 through 2016, the authors of the study found that paintball guns (3.0%) accounted for five times the total reported injuries than airsoft guns (0.6%). EX2118 p.1. The authors also found that "[p]aintball gun-related injuries had the highest proportion of hospital admission (12.2%), followed by pellet guns (8.3%) and airsoft guns (7.0%)." EX2118 p.5. In short, the data shows that paintball-gun related injuries are <u>both</u> more common <u>and</u> more likely to result in hospitalization than airsoft gun-related injuries.

51. As stated in a 2005 report from the California Senate Office of Research—a document that Petitioner cites in each of the three IPR proceedings—"paintball guns…have sent a rising number of targeted victims to hospital emergency rooms." EX1019 p.9. The report does <u>not</u> make the same claim about airsoft, nor does it mention airsoft injuries of any kind. Instead, the report points out that "[t]he 'airsoft' gun is described by makers as a <u>low-impact device</u>." EX1019 p.9. Nevertheless, because this low-impact device bears a close resemblance to a real firearm, there are statutory requirements to adorn airsoft guns with "identifying color markings." EX1019 p.8.

52. Briefly, I find it notable that only Petitioner relies on this 2005 report from the California Senate Office of Research (EX1019) in these three IPR proceedings. Although Mr. Delman relied on this report in the parallel ITC investigation, he does not cite it in any of his three declarations submitted in these IPRs. Petitioner characterizes the report as a document that I cited, but it first came to my attention via Mr. Delman.

53. In any event, it is even more notable that Petitioner inaccurately characterizes the content of the report by suggesting it establishes an alleged "injury problem caused by airsoft gun ammunition." Pet.(01348) p.34 (citing EX1019 p.9); Pet.(01339) p.36 (same); Pet.(01461) p.35 (same). That is not what this report says at all. As its title suggests, the report is about pellet guns and BB guns, not airsoft:

> **Pellet Guns and BB Guns:**
> **Dangerous Playthings in the Open Market**

EX1019 p.1. The report only mentions "less powerful" airsoft and paintball guns as a brief aside:

> Besides pellet and BB guns examined at length in this report, two other kinds of NPGs have wide appeal but are less powerful and therefore do less harm—"airsoft" guns and paint ball guns. Other forms of air-powered shooting devices, such as Tasers, described below, are less commonly in general circulation.

EX1019 p.8; *see also* p.9 ("The remainder of this report concentrates on BB and pellet guns."). The sentence from the report that Petitioner quotes regarding

"damage to the human eye" and "penetration of skin and bone" is directed to a "gun discharging a pellet or BB," which, again, the report distinguishes from an airsoft gun. EX1019 p.9. This distinction is an important one: Pellet and BB guns typically use metal ammunition rounds, which are much heavier than comparatively lightweight plastic airsoft rounds.

> Various references largely agree that, at a minimum, damage to the human eye can occur from a gun discharging a pellet or BB at a muzzle velocity of 130 fps and that penetration of skin and bone can occur at 350 fps.[5] (See more at Death and Injury section below.) But muzzle velocities are higher in many compressed-air guns. The federal Centers for Disease Control and Prevention (CDC) says that of the 3.2 million NPGs sold annually in the United States, the muzzle

EX1019 p.9.

54. That heavier and softer ammunition like potatoes or paintballs can pose more injury risk than smaller and harder airsoft rounds is explained by basic principles of physics. It was well-known at the time of the Challenged Patents that the kinetic energy possessed by a projectile plays a prominent role in its capacity to injure someone. When a projectile impacts human tissue, there is a transfer of energy between the projectile and the tissue. Kinetic energy from the projectile transfers to the tissue, causing a physical disruption. If the extent of the tissue disruption is sufficient, the impact causes an injury.

55. Kinetic energy is determined using the formula $KE = 0.5 * m * V^2$, where "m" is the projectile's mass and "V" is the projectile's velocity. Kinetic energy is often expressed using an SI unit called a "Joule." Although velocity at the

point of impact is more reflective of the projectile's capacity to injure, impact velocity varies depending on the circumstances (e.g., drag forces, distance to the target, etc.). Accordingly, for ease of comparison, those skilled in the art would typically measure velocity at a point just beyond the muzzle of the projectile launching device. This velocity is often called "muzzle velocity" and the resulting kinetic energy calculation is often called "muzzle energy."

56. Contemporaneous literature confirms that a kinetic energy analysis was a conventional approach for evaluating safety of projectile launching devices of all sorts. For example, with reference to BB and pellet guns, the 2005 report from the California Senate Office of Research explains that "[m]ass and speed determine the penetrating/injury capacity of any projectile discharged from most guns made available to the public." EX1019 p.9. The report goes on to explain that pellet guns have less "capacity to injure" than, for example, a .45 caliber pistol because "the projectile weight and subsequent kinetic energy developed in the discharge of a pellet gun is substantially less":

> (In comparison to firearms, other factors determine striking power and capacity to injure. While the velocity of some pellet guns may equal or exceed, for example, the velocity of a .45 caliber pistol, the projectile weight and subsequent kinetic energy developed in the discharge of a pellet gun is substantially less than that of a .45 caliber firearm. Thus the force of impact and capacity to injure also is less from the discharge of a pellet gun than that of a .45 and other firearms.[10])

EX1019 p.10.

57. The Airsoft Question and Answer Book also uses kinetic energy to explain why paintballs are "going to hit harder in almost all cases." EX2016, p.9. The kinetic energy of an airsoft round is "considerably less than a paintball":

> **Do paintballs hit harder than airsoft BBs?**
> A typical paintball weighing about 3 grams and traveling at 300 feet per second will transfer about 12 joules of energy on impact, while most airsoft BBs transfer about 1 joule of energy - considerably less than a paintball. Of course if you're hit at close range by an airsoft BB traveling at higher speed (say 450 - 500 fps) there will be more energy transferred, but paintballs are so much more massive that they're going to hit harder in almost all cases.

EX2016, p.9.

58. Contemporaneous standard specifications from ASTM also referenced kinetic energy in the context of safety. For example, ASTM's Standard Specification for Low Energy Air Guns (F2748–8), which "covers low energy air guns…used in the sport commonly called airsoft" and is "intended to reduce the hazards associated with" such guns, includes an express requirement that "[a]ll low energy air guns must shoot at an <u>energy level under 1.0 joules</u> at the time of shipment." EX2029 p.2; *see also* p.3 ("Low energy air guns shall have a <u>muzzle energy of 1.0 joule or less</u>. Tests shall be conducted in accordance with 8.8.").

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chronograph, with sensing devices set 3 ft from the muzzle and otherwise in accordance with 8.7.4.

8.8 *Muzzle Energy Test:*

8.8.1 *Significance*—This method provides a procedure for determining the muzzle energy of a projectile expelled from a low energy air gun.

8.8.2 *Procedure:*

8.8.2.1 Conduct the velocity test in accordance with 8.7.

8.8.2.2 Using the maximum velocity of the low energy air gun, compute the muzzle energy, in Joules, as follows:

$$KE = 1/2\ MV^2 \quad (2)$$

where:

KE = muzzle energy,
M = mass of projectile expressed in kilos, and
V = velocity of projectile expressed in metres per second.

NOTE 2—Standards derived from NIST specifications.

9. Keywords

9.1 air soft; airsoft; LEAG projectile; low energy air gun

EX2029 p.6.

59. I understand that Petitioner's expert, Dr. Reitman, testified that the polymers described in Spitballs "grow to about 0.6" in diameter" and absorb a mass of water totaling "1.844 g." EX1017(01348) ¶70 (quoting EX1002 p.21); EX1017(01339) ¶66 (same); EX1017(01461) ¶67 (same). Lightweight airsoft ammunition rounds, by comparison, are just 0.12 g. *See* EX2016 p.11. Even neglecting the polymer mass of Spitballs, they are heavier than lightweight 0.12 g airsoft rounds by 1.72 g on water weight alone. In other words, the Spitballs polymers, while softer, are <u>more than 14 times heavier</u> than lightweight airsoft rounds. For example, using the formula KE = 0.5 * m * V^2 and assuming a constant muzzle velocity of 300 feet per second, a Spitball would have a muzzle velocity of 7.71 J compared to just 0.50 J for a lightweight airsoft round. Again, the Spitball would have <u>more than 14 times</u> as much muzzle energy as a lightweight 0.12 g airsoft round. A POSITA conducting this kind of basic muzzle energy analysis—a conventional, even industry standard technique at the time—would not have

concluded that the polymer balls that Spitballs teaches are a safer form of ammunition simply because they are softer than lightweight airsoft rounds.

60. I see that Petitioner quotes the following excerpt from my testimony in the parallel ITC investigation:

> Q. And a person of ordinary skill in the art would have known in 2009 that another way to make a projectile less likely to cause injury would be to make it softer, correct?
>
> A. I believe I testified to that.
>
> Q. So you agree that a ***person of ordinary skill in the art would have known in 2009*** that another way to make a projectile ***less likely to cause injury*** would be to ***make it softer***.
>
> A. ***That's another way to do it***.
>
> Ex. 1004, 531:25-532:9.

Pet.(01348) p.36; Pet.(01339) p.38–39 (same); Pet.(01461) p.37 (same).

61. To be clear, my "That's another way to do it" statement assumes everything else about "it" (the projectile in question) is being held constant. Switching materials, increasing weight, increasing density, changing the ammunition in ways to not be compatible with airsoft, etc., would change the question and the calculus. Petitioner has taken my quote out of context and wrongly used that testimony (for example) to suggest that Spitballs are safer than airsoft

ammunition simply because Spitballs are softer. For all the many reasons I've articulated here in this Declaration, that kind of softer-means-safer logic is overly reductive and wrong. I merely agreed with the commonsense proposition that making a given projectile softer would decrease its likelihood of causing an injury—"make it softer."

62. In sum, my testimony quoted above does not translate to the polymer balls that Spitballs teaches in the manner Petitioner appears to suggest. After all, Spitballs are not the equivalent of airsoft ammunition, only softer. As I have explained, Spitballs are massive compared to lightweight airsoft ammunition, and Spitballs will have a higher muzzle energy as a result. With a 15.24 mm (0.6 inch) diameter and a mass of 1.844 g, Spitballs more closely resemble 55 caliber paintballs (14 mm, 1.7 g) than airsoft ammunition (see below). And, again, paintballs were known to have more injury capacity than airsoft rounds. Just as a POSITA would not have looked to paintballs as a potential solution for making airsoft safer, the POSITA also would not have looked to the teachings of the Spitballs reference.

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Min (in) Diameter	0.650	0.410	0.470	0.520	0.590
Max (in.) Diameter	0.709	0.448	0.521	0.573	0.646
Weight (g) Maximum	3.500	0.900	1.400	1.700	2.500
Weight (oz) Maximum	0.123	0.032	0.049	0.060	0.088

EX2117 (ASTM F1979–10) p.2 (annotated).

B. A POSITA Focused on Safety Would Have Followed the Airsoft Safety Standards, Which Exclude the Polymer Balls That Spitballs Teaches

63. If, as Mr. Delman claims, a POSITA thought there was an injury problem with airsoft, such a person would have looked for a solution consistent with the applicable ASTM standard specifications. As I've mentioned (*see*, §VII.A.1), ASTM was a well-known standards organization at the time of the Challenged Patents in 2010. Although the standards are voluntary when initially promulgated by ASTM, they often become mandatory for engineers and designers to follow via statute, regulation, contract, or internal business codes or guidelines, as I know from personal experience in my design work. One field where the standards were mandatory by law is toy design, because ASTM's F963, the standard specification for toy safety, was expressly adopted by an act of Congress. *See* 15 U.S.C. 2056b (excerpt below). In any event, whether voluntary or mandatory, engineers and product designers routinely consulted and followed the applicable ASTM standards, particularly when the primary focus was safety.

> **§ 2056b. Mandatory toy safety standards**
>
> **(a) In general**
>
> Beginning 180 days after August 14, 2008, the provisions of ASTM International Standard F963–07 Consumer Safety Specifications for Toy Safety (ASTM F963), as it exists on August 14, 2008 (except for section 4.2 and Annex 4 or any provision that restates or incorporates an existing mandatory standard or ban promulgated by the Commission or by statute or any provision that restates or incorporates a regulation promulgated by the Food and Drug Administration or any statute administered by the Food and Drug Administration) shall be considered to be consumer product safety standards issued by the Commission under section 2058 of this title.

Consumer Product Safety Improvement Act of 2008 (15 U.S.C. 2056b)

64. At the time of the Challenged Patents in 2010, there were at least two voluntary ASTM airsoft standards: F2679–07 "Standard Specification for 6 mm Projectiles Used with Low Energy Air Guns," (EX2028), and F2748–08 "Standard Specification for Low Energy Air Guns (Less Than 1 Joule)," (EX2029). Given the notoriety, high regard, and widespread use of ASTM standards, it is my opinion that a POSITA focused on solving Mr. Delman's alleged injury problem with airsoft would have sought a solution in compliance with ASTM F2679–07 and F2748–08.

65. As its title suggests, ASTM F2679–07 "establishes requirements and characteristics of low energy airgun projectiles which help define whether a low energy airgun projectile is suitable for use in the sport commonly called airsoft, air soft, or soft air." EX2028 p.1. Per ASTM F2679–07, the standard definition for

"suitable" airsoft ammunition is "spherical, of 6 mm (.24 cal) diameter, non-metallic and non-liquid filled." EX2028 p.1.

> 3.1.2 *low energy air gun projectile, (LEAG projectile)*—is spherical, of 6 mm (.24 cal) diameter, non-metallic and non-liquid filled projectile to be used in a low energy air gun.

EX2028 p.1.

66. The Spitballs polymers do not meet the "non-liquid filled" aspect of this definition for "suitable" airsoft ammunition because they are filled with water when hydrated. *See* EX1002 p.21 ("Spitballs…will absorb water and grow up to 200 times their original size."). As such, it would have been counterintuitive, not obvious, to pursue the kind of polymer balls that Spitballs teaches as a type of airsoft ammunition. A mere ordinarily skilled person absent hindsight would not have gone against the grain in this fashion, even if they had adopted Mr. Delman's (flawed) softer-means-safer logic. Such a person would have confined their search for softer ammunition to the design space established by ASTM F2679–07, which reflects the airsoft industry's best practices. ASTM F2679–07 leaves open countless different materials and constructions that are softer than hard plastics—e.g., foam materials, sponge materials, pulp materials, soft plastics, soft rubbers, etc. The path of ordinary skill and ordinary creativity would have been to select one of these standards-compliant materials, not the Spitballs polymers. Foam, in particular, would have

been an obvious choice for a POSITA seeking ammunition softer than plastic airsoft rounds. Hasbro and others had been making foam ammunition for pneumatic blasters for years before the Challenged Patents. The kinds of absorbent polymers described in the Spitballs were obscure, by comparison, and would not have caught the eye of an ordinarily skilled person looking for routine and predictable design solutions that also met applicable ASTM standards.

67. Departing from ASTM F2679–07 makes even less sense when considering that Peev's "task" was to create an "improved" electric airsoft gun. EX1003 p.26, p.27 ("An advantage of the electric airsoft gun according to the invention is the improved performance[.]"). But if someone were to reconfigure the airsoft gun Peev teaches to fire out-of-spec liquid-filled ammunition, as contemplated by Mr. Delman's Peev-Spitballs combination, the result would be something the industry would not have considered to be an airsoft gun at all. Under ASTM F2748–08, the other airsoft standard specification, the definition of an "airsoft gun" is "a device specifically designed to expel a low energy air gun projectile," which, again, must be "non-metallic and non-liquid filled":

> 3.1.6 *low energy air gun (LEAG), n*—commonly referred to as airsoft gun or air soft gun, a device specifically designed to expel a low energy air gun projectile, by the release of energy by compressed air, compressed CO_2, mechanical springs, battery, or a combination thereof, at an energy level at 1.0 joule or lower.
>
> 3.1.7 *magazine, n*—device used in a low energy air gun to store projectiles.
>
> 3.1.8 *projectile (LEAG projectile), n*—spherical, commonly 6 mm (.24 cal), non-metallic and non-liquid filled projectile to be used in a low energy air gun, as specifically referred to in Specification F2679.

See EX2029 p.2.

68. If the goal was to improve airsoft guns, whether by making them safer, as Mr. Delman's claims, or enhancing their performance, as Peev sought to do, the solutions that would have been obvious to a POSITA were those within the realm of ASTM F2679–07 and ASTM F2748–08, which excludes the kind of liquid-filled polymers described in Spitballs.

C. A POSITA Would Not Have Viewed the Kind of Polymer Balls Described in Spitballs as Suitable Ammunition for an Electronic Airsoft Gun Like Peev's

69. As I have explained, Peev is about electric airsoft guns (or "automatic electric guns," "AEGs"). EX1003 p.23, p.26; EX2016 p.15. Not only do electric airsoft guns like Peev's resemble and operate like real firearms, they also "average somewhere in the neighborhood of 300–350 fps and fire at around 500–700 rounds

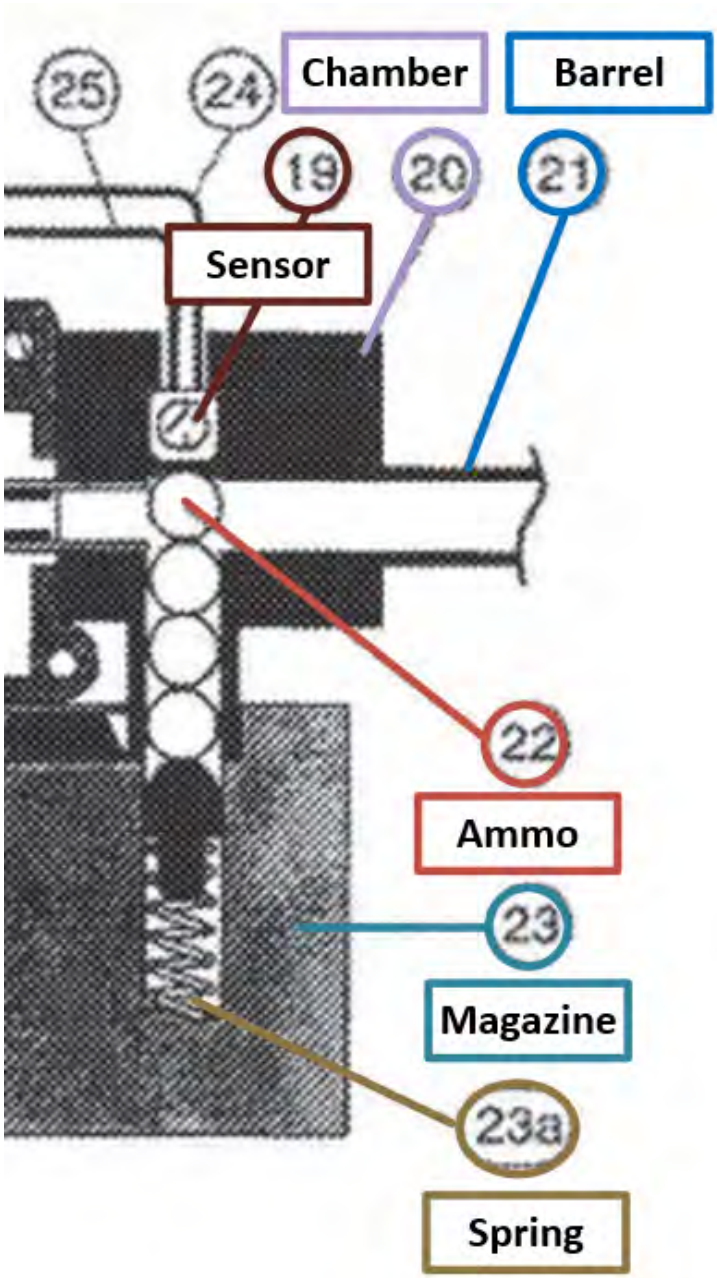
per minute." EX2016 p.15. Relatively speaking—in the context of airsoft—electric airsoft guns are high-powered devices.

70. A POSITA understanding that the kind gun Peev teaches is of the high-powered variety would have recognized that the kind polymer balls Spitballs teaches are not a suitable form of ammunition. Spitballs are designed and marketed as a toy for users age "3 and up"; and they break apart—"explode"—under the modest pressure of an impact when thrown by such a user. EX1002 p.21. The idea that this kind of "soft" and "squishy" projectile could withstand the compressive stresses from the firing forces applied by a high-powered electric airsoft gun is not realistic.

71. To reiterate my prior discussion at ¶¶36–38, during its firing sequence, Peev's gun first applies a mechanical force to the ammunition round when the spring-loaded connecting plate forces the nozzle piece to push the round forward into the firing chamber. Next, the gun applies a pneumatic force to the ammunition round when the compression cylinder forces air through the nozzle piece to expel the round from the barrel. A POSITA would not expect an object like Spitballs that easily explodes to withstand the compressive stresses applied by the mechanical and pneumatic forces applied by Peev's gun during a firing sequence.

72. In addition to the pneumatic and mechanical firing forces of a conventional electric airsoft gun, Peev's improved design stresses the ammunition even more. As I explained above at ¶¶39–40, Peev sought a cure to the "major

disadvantage" of prior electric airsoft guns that lacked an empty magazine indicator. EX1003 p.25-26. Peev's solution to this problem involves a mechanism that presses an airsoft round between a magazine spring (23a) and a contact sensor (19). EX1003 p.34.



EX1003 p.39 (Figure 2 (annotated)).

73. Pushing the airsoft round against the contact sensor with sufficient force closes an electrical circuit that confirms the magazine is still loaded. EX1003 p.34. For Peev's design to work, the ammunition must be capable of, not only withstanding the spring force, but also transferring the spring force to the sensor without breaking apart. In effect, Peev predicates his magazine sensor design on the hardness and strength of conventional plastic airsoft ammunition. The polymer balls that Spitballs teaches, by contrast, are soft, squishy, and break apart easily. A POSITA would have understood that all of these different forces applied to the ammunition round during the firing sequence provide opportunities for the soft/squishy polymers balls taught by Spitballs to break apart—i.e., "explode into mushy pieces"—and clog up the barrel of the gun. EX1002 p.21. Even if such soft/squishy polymer balls did not completely explode, a POSITA would have recognized that they could still leave behind residue and clog up the gun barrel over time. No POSITA would view the kind of hydrated polymer balls Spitballs teaches as a suitable replacement for conventional plastic airsoft ammunition, especially not in the kind of airsoft gun that Peev teaches, where the goal is to achieve "faster shot repeatability" and to avoid any potential "defect" that might otherwise cause a "decrease" is muzzle velocity. EX1003 p.25, p.28.

74. I understand Mr. Delman argues that a POSITA could modify Peev's gun to apply less force against the ammunition by "chang[ing] the spring pressure"

or "chang[ing] the size of the air compression chamber." EX1016(01348) ¶79; EX1016(01339) ¶87; EX1016(01461) ¶78. But I believe Mr. Delman is addressing the wrong question. It is my understanding that the relevant question for obviousness is what a POSITA would have been motivated to do, not what the POSITA merely could have done. This is what I meant in my testimony during the parallel ITC investigation when I said, "If someone was asked to do so, they would have the ability to do that." EX1004, 532:15-23. Here, again, Petitioner seems to misunderstand my testimony. While true that a POSITA could modify Peev's gun, my point is that Petitioner and Mr. Delman have not provided any legitimate reasons for why the POSITA would ever have been motivated to do so. Why would the POSITA downgrade Peev's gun in the way Mr. Delman suggests just to accommodate Spitballs, a type of projectile that is not within the scope of the applicable industry standards and offers no assured safety benefit? The POSITA would not do so.

75. I also understand that Mr. Delman argues "[b]ased on [his] discussions with Dr. Reitman," that "the gel strength may be adjusted to ensure that the SAP ammunition does not break apart when loaded into and launched from the barrel of the gun." EX1016(01348) ¶78; EX1016(01339) ¶86; EX1016(01461) ¶77. Even assuming that were true, it does not make Spitballs an obvious replacement for conventional airsoft ammunition in Peev's electric airsoft gun. It would not make

sense to an ordinary engineer or toy designer to take the extreme step of engaging a chemist like Dr. Reitman to modify the Spitballs polymers when doing so would not guarantee any safety benefit and would create a non-standards-compliant device. Additionally, I note that Mr. Delman only cursorily suggests increasing gel strength and does not address how that might be accomplished or what other consequences may arise from doing so. For example, I recall from the parallel ITC proceeding that SAP particles could be partially hydrated to increase their strength but doing so had the adverse effect of making them hard, not soft in the manner described by the Spitballs reference.

D. A POSITA Would Not Have Been Motivated to Make Airsoft Safer by Creating Softer Ammunition

76. I see that Mr. Delman refers to Peev's electric airsoft gun as a "toy." EX1016(01348) ¶82; EX1016(01339) ¶90; EX1016(01461) ¶81. I disagree with Mr. Delman on this point. But setting that dispute aside for the moment, I note that Mr. Delman's view of Peev's "toy gun" undercuts his position that the same device also has an "injury problem." EX1016(01348) ¶82, ¶77; EX1016(01339) ¶90, ¶85; EX1016(01461) ¶81, ¶76.

77. As I mentioned above at ¶63, ASTM F963–07 (Standard Consumer Safety Specifications for Toy Safety) was mandatory at the time of the Challenged Patent's in 2010. According to ASTM F963–07, toy projectile launchers used with "rigid projectile[s]" can have a kinetic energy no greater than "0.08 J," an

exceptionally low limit. EX2119 p.17. At a kinetic energy limit of 0.08 J, the maximum allowable speed for a 0.20 g plastic airsoft round is only about 91 feet per second (fps) or about 117 fps for a 0.12 g round.

78. Mr. Delman does not cite to any evidence of significant airsoft injuries at muzzle velocities in the 90–120 fps range. In fact, Mr. Delman's testimony in these IPRs only cites a single document in support of his claim that there was an "injury problem" with airsoft—a 2008 article from Bleacher Report (EX1005). *See* EX1016(01348) ¶¶76–77; EX1016(01339) ¶¶84–85; EX1016(01461) ¶¶75–76. According to the Bleacher Report article, "[a]irsoft guns can shoot these [plastic] rounds at velocities up to 450 feet per second," which "can be enough to crack the skin and cause minor bleeding." EX1005 pp.2–3. This 450 fps mark from the Bleacher Report article is considerably higher than the 117 fps limit for a 0.12 g airsoft round fired from a "toy" projectile launcher. Clearly, then, the Bleacher Report article is not talking about the kind of "toy gun" that Mr. Delman ascribes to Peev.

79. As I've mentioned, Petitioner cites additional documentation that Mr. Delman does not cite, including the 2005 report from the California Senate Office of Research (EX1019). This report says that "damage to the human eye" may occur "from a gun discharging a pellet or BB at a muzzle velocity of 130 fps." EX1019 p.9. Even this 130 fps mark is greater than the 117 fps limit for a 0.12 g airsoft round

fired from a "toy" projectile launcher. And besides, as I mentioned above, this 2005 report distinguishes "pellet and BB guns" from "two other kinds…have wide appeal but are less powerful and therefore do less harm—'airsoft' guns and paint ball guns." EX1019 p.8. In short, the 130 fps data point related to pellet and BB guns is not dispositive or even relevant for airsoft guns, which use much lighter ammunition.

80. In sum, there is no evidence that a "toy" airsoft gun would have had any sort of "injury problem" that would have inspired a POSITA to consider using the kind of polymer balls Spitballs teaches as replacement ammunition. Put differently, a POSITA—especially a "toy designer"—would not have thought a standards-compliant toy launcher was unsafe. Mr. Delman's position is unsupported.

81. Moving on, and contrary to Mr. Delman's view, in my opinion, Peev does not teach a toy. In fact, Peev's stated "task" was to create an electric airsoft gun that functions "as close as possible" to a "real firearm," up to and including an "automatic" firing mode. EX1003 p.22, p.26. The kind of gun Peev taught is one that "finds application in the sporting gun industry and is used for military simulations or training, or for entertainment in airsoft games." EX1003 p.22. It is a high-powered, military-grade projectile device designed for "faster shot repeatability" and to avoid any potential "defect" that might otherwise cause a "decrease" is muzzle velocity. EX1003 p.25, p.28.

82. Per my earlier discussion at ¶¶27–34, Peev's gun, like virtually all other high-powered airsoft guns, is meant to mimic "real firearm[s]." EX1003 p.26. Part of mimicking a real firearm is mimicking—to a lesser degree—the impact of an ammunition round, which is <u>necessary</u> for cooperative airsoft games and military/armed-forces training. For example, "[a]irsoft games operate on the honor system and depend on players acknowledging on their own when they've been hit." EX2016 p.38. Players cannot self-report hits using the honor system if the force of impact is too low to feel the hit through their clothing and gear. "[P]roblems" arise with the honor system in airsoft in "instances when a player may not feel a BB hit." EX2016 p.40. The players need tactile feedback from the force of impact. Removing the impact force—and the tactile feedback it provides—from airsoft would only make airsoft games worse.

83. Force of impact is also needed for military and armed-forces training. In this context, the potential to suffer a non-trivial amount of pain (e.g., felt through clothing/gear) from a hit is critical to simulate a live-fire environment and boost adrenaline levels. More than just tactile feedback, the impact force is necessary to promote a realistic combat environment. Again, as one author put it: "It's amazing how <u>the stress of being hit by a plastic pellet</u> motivates you to shoot on the move as opposed to standing in place." EX2025 p.11. By design, airsoft "feels real," so that trainees "still get the adrenaline dump" of live combat. EX2024p.2. The point is to

put them "under stress," so that they make their mistakes in training, not in the field. EX2024 p.2. Without the stress and adrenaline that comes with the expected pain and minor injury from being, the training would be less effective.

84. With airsoft, the speed and the force of impact are a feature, not a bug. Though there was some risk of minor injury, that risk was a fundamental part of airsoft and could be mitigated by taking reasonable precautions like wearing protective goggles/masks and extra layers of gear/clothing, which was common. Risk of minor injuries was not a design problem that a POSITA would have seen any need to solve in the context of an industry where the goal is to be "as close as possible to…[a] real firearm," (EX1003 p.26), and the force of impact is required for the kinds of war-like activities that involve users shooting at one another. If the design goal was to create a projectile launcher without injury risk, a POSITA would not have started with an airsoft gun like Peev's in the first place.

85. Besides, the POSITA would not have viewed the plastic ammunition used in airsoft guns as a significant injury vector at the time of the Challenged Patents. Mr. Delman and Petitioner have not produced any evidence suggesting as much. Going back to the Bleacher Report article Mr. Delman relies on, it is evident from that document that slight injuries like "crack[ing] the skin" and "minor bleeding" stem primarily from high muzzle velocities like "450 feet per second." EX1005 p.3. Accordingly, rather than attempting to create a brand new kind of

softer airsoft ammunition from Spitballs, a POSITA heeding Mr. Delman's Bleacher Report article and prioritizing safety above all else would have reduced the muzzle velocity of Peev's gun. Appreciating that kinetic energy has a squared relationship with velocity, the POSITA would have understood that even a relatively modest decrease in muzzle velocity would considerably reduce the capacity of Peev's gun to injure someone. The POSITA also would have known that to a lesser extent (i.e., proportionately), reducing the mass of the ammunition would reduce the kinetic energy and injury capacity. And as I mentioned before, the airsoft industry had already taken this step by providing lightweight airsoft rounds weighing as little as 0.12 g, more than 14 times less than hydrated Spitballs.

IX. OBJECTIVE INDICIA REGARDING OBVIOUSNESS

86. In forming my opinions, I also consider whether certain objective factors relate to the obviousness/non-obviousness of claims 8, 19, and 20 of the '282 Patent and claims 5, 8 and 9 of the '683 Patent ("Common Maya Practiced Claims"), as well as Petitioner's general arguments about objective factors with respect to all Challenged Claims (e.g., as to purported simultaneous invention).

A. Legal Standards Related to Objective Indicia of Nonobviousness

87. I understand that determining whether an invention is obvious from the prior art can require more than simply analyzing the differences between the prior art and the claimed invention: I have been instructed that the Supreme Court has

held one may also evaluate "objective indicia" also known as "secondary considerations" relating to obviousness/non-obviousness.

88. For example, I understand that objective factors may show that an invention was not obvious from the prior art. I have been instructed that at least one appeals court decision has noted that these factors "are often the most probative and determinative of the ultimate conclusion of obviousness or nonobviousness."

89. I understand that these objective indicia are not exhaustive, but can include evidence, when present in a case, regarding the following (and I address these below in my declaration):

a) industry praise of the invention;

b) commercial success of the invention (e.g., by a product that practices the invention), linked to the invention itself;

c) copying of the invention by competitors as opposed to independent development;

d) the invention replaces prior-art devices in the industry; (discussed in the context of commercial success below)

e) a long-felt unsatisfied need for the invention; (discussed in the context of industry praise below)

I am also aware of that objective indicia evidence, if present, may also include the following:

f) acquiescence by the industry to patent validity by honoring the patent through taking licenses or not infringing the patent, or both;

g) the invention obtains unexpected results to those persons skilled in the art; and

h) skepticism, disbelief in or incredulity on the part of those skilled in the art that the patentee's approach worked.

90. I understand that for objective indicia to be relevant to an obviousness analysis, there must be a "nexus" between any asserted objective indicia and the claimed invention. I discuss the nexus requirement in more detail below, as I discuss individual objective indicia.

B. Summary of Objective Indicia Opinions

91. In my opinion, objective indicia evidence exists as to the Xploderz sold by the Maya Group primarily in the 2011–2014 timeframe.

92. As set forth in more detail in this section, it is my opinion that there are objective indicia of non-obviousness that further demonstrate that Common Maya Practiced Claims ('282 Patent, claims 8, 19 and 20 and '683 Patent, claims 5, 8 and 9) are not obvious. Further, Petitioner's general arguments about objective factors supposedly showing obviousness with respect to all Challenged Claims (e.g., as to purported simultaneous invention) are not linked to the combined limitations of any of the Challenged Claims.

93. This portion of my analysis is additionally based on my expertise and understanding of the relevant technology, my inspection and testing of the produced physical exhibits in this case, testimony at the hearing in the ITC investigation, and the other depositions and documents cited or listed in this declaration.

C. Overview of the Xploderz Products

94. I have reviewed the history of the Maya Group as recounted by Mr. Oded Ben Ezer in his deposition in the ITC investigation and am generally familiar with the Xploderz blaster toys from my own expertise and review of documents in this case.

95. Back in late 2010/early 2011, the Maya Group launched a new "blaster" product line called Xploderz that fired soft ammunition called "Xploderz Ammo," also described as ammo with "H_2GROW" technology. *See* EX2032(Ben-Ezer Dep.) pp.280:2–21; *see also, e.g.*, EX2033(CPX-0035):

EX2033(CPX-0035)

96. The Xploderz products spawned multiple line extensions, including an original generation, X2 series, Blaster Pro series, X3 series, and a Firestorm series, as described below.

97. These Xploderz include the products in the charts that appear on the following pages, after this introductory explanation. In the charts, I group the

products into categories where the blaster device itself did not materially change for the purposes of my patent-practicing analysis below.

98. For example, the "XBlaster" is a pistol design that came in several variants. EX2032(Ben-Ezer Dep.) p.272:9–10. The "XBlaster 200" included approximately 200 rounds of ammunition. I understand from the deposition of the Maya Group witness, Mr. Oded Ben-Ezer, that a product called the "XBlaster 450" included a single XBlaster launcher and approximately 450 ammunition rounds, and a product called the "XBlaster 700" that includes a single XBlaster launcher and approximately 700 ammunition rounds. EX2032(Ben-Ezer Dep.) pp.272:3–273:20. I also understand from the deposition of Maya Group in the ITC investigation that the XBlaster launcher was also sold in a product called the "Face-Off 400" that includes two XBlasters and approximately 400 ammunition rounds. EX2032(Ben-Ezer Dep.) pp.272:3–273:20.

99. I also understand that for some products, the same product was sold under two Product Numbers to account for a very early design modification that added a "slider" to the initial launch products of the first generation of the blasters, but that some retailers continued to sell products under the old number. EX2032(Ben-Ezer Dep.) pp.258:13–265:6 & 274:4–275:4. Mr. Ben-Ezer testified that "to get the full sales of the [affected] product would you add the sales [from both numbers]." EX2032(Ben-Ezer Dep.) pp.274:22–275:4.

100. The Product Numbers in the chart below correspond to the product numbers on the products themselves, and for the products sold in 2011 and 2012, correspond to the "Master Item #" listed in EX2068(CX-0165C), which I understand from the deposition of the Maya Group corporate witness in the ITC investigation, is a spreadsheet that includes sales information for 2011 and 2012.

101. The Xploderz that I have been able to test physically (or where I have tested the same blaster packaged with a different quantity of ammunition) are marked below in bold. For the remaining items, I have reviewed images as noted below.

First Generation Blasters with Ammunition		
"XBlaster Products" [3]	45102 / 45202	**XBlaster 200 (aka Xploderz 200)**
	45103 / 45203	**Face-off 400 (two XBlaster 200s)**
	45111	**XBlaster 450 (Kohl's) (XBlaster 200 with 250 extra ammo)**
	45206	**XBlaster 700 (Big Lots) (XBlaster 200 with 500 extra ammo)**
"XStormer Products"	45104 / 45204	**XStormer 1000**
	45210	**XStormer 1000 with Bonus 500 Ammo**
"XRanger Products"	45105 /	**XRanger 2000 aka Long Ranger**

[3] As noted above, I understand from the testimony of Maya Group's witness, Oded Ben-Ezer, that the Face-Off was "two XBlasters in the pack." EX2032(Ben-Ezer Dep.) pp.153:4-16, 272:11-16. I understand further that "the XBlaster 450 [was] the same as the XBlaster 200 but with 250 more rounds of ammunition" and that the "XBlaster 700 [was] just an XBlaster 200 but with 500 additional rounds of ammunition." EX2032(Ben-Ezer Dep.) pp.273:8-20.

	45205	**2000**
"XGround Pounder Product"	45112	**XGround Pounder 2000**
"XBow Product"	45212	XBow 1500
"XMagnum Product"	45208	XMagnum 700 (6-pack)

Second Generation Blasters with Ammunition		
"X2 Invader Products"	46000	**X2 Invader 700**
	46001	**X2 Invader with 300 extra ammo**
	46015	**X2 Face-off 1400 (two X2 Invaders)**
"X2 Mauler Product"	46005	**X2 Mauler 1000**
"X2 Retaliator Product"	46010	**X2 Retaliator 2000**
"X2 XBow Product"	46020	X2 XBow 1500
"Night Fighterz Products"	46510	**Night Fighterz Gen-700**
	46520	Night Fighterz SuperGen-1000

Blaster Pro Generation Blasters with Ammunition		
"Blaster Pro Products"	49103	**Blaster Pro Pump Action 2500**
	49107	Blaster Pro Pump Action (Toys R Us)
	49104	**Blaster Pro Full Auto 5000**

Third Generation Blasters with Ammunition		
"X3 Products"[4]	46025	**X3 Invader**
	46035	**X3 Faceoff 2 pack (two X3 Invaders)**
	46040	**X3 Equalizer**
	45215	**X3 Sneak Attack**

Fourth Generation Blasters with Ammunition		
"Firestorm Products"[5]	45225	**Firestorm Series Stinger**

[4] I understand that there are additional X3 Products, including the X3 Retaliator, Punisher and Huntress and Night Figherz Gen-200 and Night Fighterz 2 Pack, that appear visually to be similar to other items I have inspected, but for which I have not been able to access physical samples. EX2032(Ben-Ezer Dep.) pp.180:3-6. I have listed the items that I have personally inspected, as I understand that more detailed item-level sales information for the Firestorm products is not available.

[5] I understand that there are additional Firestorm Products, including the Mayhem

	45235	**Firestorm Series Savage Shield**
	45240	**Firestorm Series Cobra Shield**
	45245	**Firestorm Series QuickDraw 2 Pack**
Ammunition Products		
"Ammo Products"	45101	**Ammo Refill Pack**
	45106	**Ammo Battle Pack 1000**
	45107	Ammo Pack 500 Ready to Use
	45114	**Ammo Depot 1000**
	45115	**Mega Pack 1500**
	46505	**Night Fighterz Refill 500**
	46525	**Night Fighterz Battle Blowout**
	45118	**Ammo Depot 1000 Red**
	45119	Ammo Depot 1000 Orange
	45120	**Ammo Refill 500 Red**
	45121	Ammo Refill 500
	45122	Ammo Refill 300
"Blaster Pro Ammo Products"	49101	Blaster Pro 2500 Ammo
	49102	**Blaster Pro 6000 Ammo**

1. First Generation Xploderz

102. I understand that the first Xploderz were launched at the tail end of 2010 for a Spring 2011 product release. EX2032(Ben-Ezer Dep.) pp.108:10–13, 112:20–113:2, 121:11–14, 258:13–259:1. I understand that one of the initial products released was known as the Xploderz XBlaster 200, pictured below in its original packaging, which included a projectile launcher, hydrated Xploderz ammunition, and extra dehydrated refills that could be hydrated using provided instructions to "Make your own Xploderz Ammo!". EX2033(CPX-0035).

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and Renegade. EX2032(Ben-Ezer Dep.) pp.185:16-186:1. I have listed the items that I have personally inspected, as I understand that more detailed item-level sales information for the Firestorm products is not available.

103. I understand that the XBlaster 200 product was produced in the ITC investigation and is identified as EX2089(CPX-0032) and EX2023(CPX-0035), and I have inspected these items (and each of the other physical Xploderz and Blaster Pro items produced in the ITC investigation):

EX2033(CPX-0035) (Front)

EX2033(CPX-0035) (Back)

104. Additional launch products included (presented left to right): the "XRanger 2000"; the "XStormer 1000"; the "Face Off 400" 2 Pack—including two XBlaster 200s; and ammunition refills—the "Battle Blowout" 1000 Xploderz Ammo Refill and the "Ammo Refill Pack" 500 Xploderz Ammo Refill.

EX2033(CPX-0035) (detail)

105. I understand that the XRanger 2000 was produced in the ITC investigation and is identified as EX2090(CPX-0037):

EX2090(CPX-0037)

106. I understand that the XStormer 1000 was produced in the ITC investigation and is identified as EX2091(CPX-0033):

EX2091(CPX-0033)

107. I understand that the Battle Blowout was produced in the ITC investigation and is identified as EX2065(CPX-0074):

EX2065(CPX-0074)

108. I understand that the Ammo Refill Pack was produced in the ITC investigation and is identified as EX2056(CPX-0044):

EX2056(CPX-0044)

109. I understand that the Maya Group launched additional Xploderz blasters later in 2011, including the XGround Pounder 2500. I understand that the

XGround Pounder 2500 was produced in the ITC investigation and is identified as EX2092(CPX-0047):

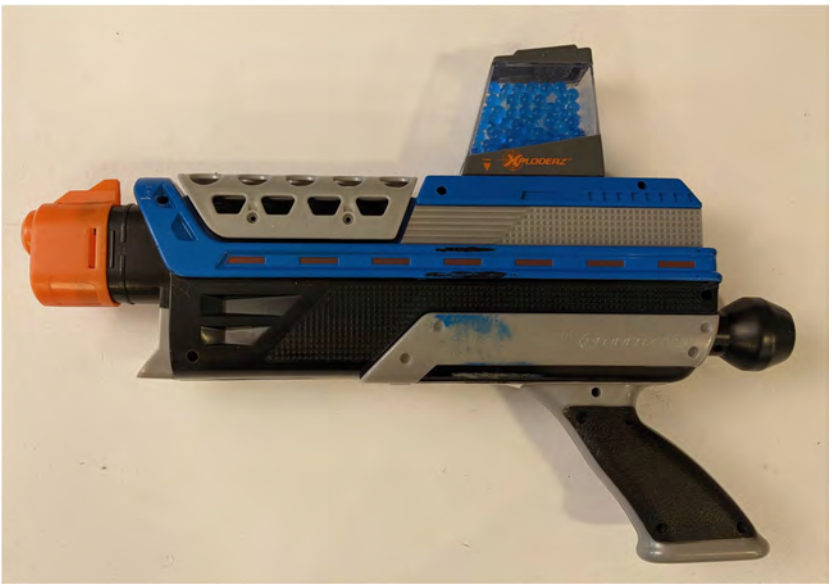
EX2092(CPX-0047)

2. Second Generation Xploderz

110. I understand that in late 2012, Maya Group introduced a second generation of blasters, the X2 series and Night Fighterz series (pictured below, EX2044(CX-552)):

EX2044(CX-552) (excerpt)

111. I understand that the X2 Invader 700 was produced in the ITC investigation and is identified as EX2094(CPX-0040).



EX2094(CPX-0040)

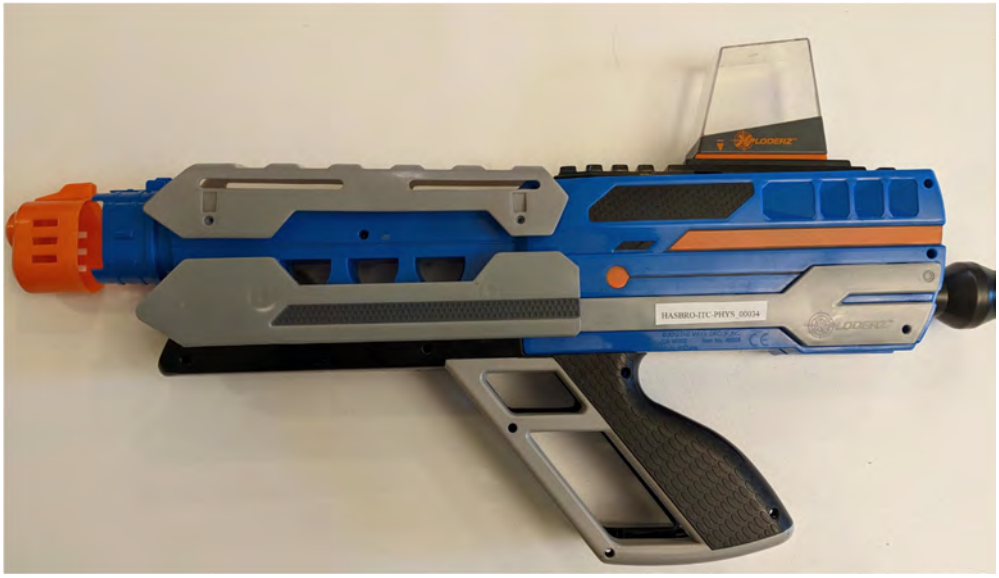
112. I understand a X2 Invader (same blaster) with 300 extra ammunition was produced in the ITC investigation and is identified as EX2095(CPX-0052):

EX2095(CPX-0052)

113. I understand that the X2 Face-off 1400 consisted of a kit of two X2 Invaders (same blaster), was produced in the ITC investigation and is identified as EX2096(CPX-0039):

EX2096(CPX-0039)

114. I understand that the X2 Mauler 1000 was produced in the ITC investigation and is identified as EX2097(CPX-0034):



EX2097(CPX-0034)

115. I understand that the X2 Retaliator 2000 was produced in the ITC investigation and is identified as EX2098(CPX-0048):

EX2098(CPX-0048)

3. Blaster Pro

116. I understand that for the holiday season of 2012, Maya Group also introduced the Blaster Pro Pump Action S2500, the Auto Fire E5000, and the Blaster Pro Ammo Pack. I understand that the Blaster Pro Pump Action S2500 was produced in the ITC investigation and is identified as EX2099(CPX-0059):

EX2099(CPX-0059)

117. I understand that the Blaster Pro Auto Fire E5000 was produced in the ITC investigation and is identified as EX2100(CPX-0060), EX2101(CPX-0061) and EX2062(CPX-0064):

EX2101(CPX-0061)

118. I understand that the Blaster Pro Ammo was produced in the ITC investigation and is identified as EX2061(CPX-0062):

EX2061(CPX-0062)

4. Third Generation Xploderz

119. I understand that for 2013, the Maya Group released a third generation of Xploderz including the X3 series. I understand that the Invader X3 was produced in the ITC investigation and is identified as EX2102(CPX-0067) and EX2103(CPX-0068):

EX2103(CPX-0068)

120. I understand that the Face Off X3 was produced in the ITC investigation and is identified as EX2104(CPX-0053), and that it is a kit of two Invader X3s:

EX2104(CPX-0053)

121. I understand that the Equalizer X3 was produced in the ITC investigation and is identified as EX2105(CPX-0054):

EX2105(CPX-0054)

122. I understand that the Sneak Attack X3 was produced in the ITC investigation and is identified as EX2106(CPX-0065):

EX2106(CPX-0065)

5. Fourth Generation Xploderz

123. I understand that for 2014, the Maya Group released the Firestorm series of Xploderz. I understand that the Firestorm Series Stinger was produced in the ITC investigation and is identified as EX2107(CPX-0073):

EX2107(CPX-0073)

124. I understand that the Firestorm Series Savage Shield was produced in the ITC investigation and is identified as EX2108(CPX-0066) and EX2093(CPX-0069):

EX2108(CPX-0066)

125. I understand that the Firestorm Series QuickDraw 2 Pack was produced in the ITC investigation and is identified as EX2109(CPX-0056):

EX2109(CPX-0056)

126. I understand that the Firestorm Cobra Shield was produced in the ITC investigation and is identified as EX2110(CPX-0057) and EX2111(CPX-0058):

EX2111(CPX-0058)

D. The Xploderz Practiced the Claimed Inventions

127. In Appendix 1 to my declaration, I show the practice by the Xploderz of the Common Maya Practiced Claims that were asserted in the ITC litigation. Each of the Xploderz products practiced claims 8, 19, and 20 of the ’282 Patent and claims 5, 8, and 9 of the ’683 Patent. As to claims 8 and 9 of the ’683 Patent (which were not presented at trial in the ITC, but which share the verbatim text of ’282 Patent claims 19 and 20), I show in my Appendix 1 where the verbatim language of these ’683 Patent claims (as well as the parent claim 7) is found in the Xploderz products via ’282 Patent claims 8, 19, and 20. I provide below a chart that shows the textual identity between the claim elements. My opinions as to ’282 claims 8, 19 and 20

apply directly as to '683 claims 8 and 9 (and parent claim 7) because the relevant language in these additional '683 claims is identical to what I have already considered. I further understand that as to '683 claim 9, there was a printing error that added some extra language at the end of that claim not presented by the applicant during prosecution, and that both Petitioner and Patent Owner's view is that the PTAB should consider the patentability of the claim without reference to the extraneous language. Pet.(01339) pp.51-52 ("The claims as submitted during prosecution did not have that extraneous language…and the only amendment made during prosecution did not add this language…. The PTAB should consider the patentability of the claim without reference to the extraneous language.").

Table Comparing '282 Claims 19 and 20 and '683 Claims 8 and 9 (with parent claims)

'282 Patent	'683 Patent
1. Ammunition configured for use with a projectile launcher comprising: a plurality of soft-projectiles having the same shape, each soft projectile being formed from hydrated super absorbent polymer.	1. A projectile launching system, comprising: ammunition comprising a plurality of substantially spherical soft-projectiles formed from hydrated super absorbent polymer; and a projectile launcher for launching the ammunition in free flight.
8. A projectile launcher including the ammunition of claim 1 disposed within a feed chamber of the projectile launcher, and wherein the projectile launcher is adapted to load a soft-projectile from the feed chamber to a firing position.	5. The system of claim 1, wherein the projectile launcher includes a feed chamber for loading the soft-projectiles within projectile launcher.
	7. The system of claim 5, wherein the projectile launcher is adapted to load the soft-projectiles
19. The projectile launcher of claim 8, further comprising: an air compression chamber; a piston disposed within and axially aligned	8. The system of claim 7, wherein the projectile launcher further comprises: an air compression chamber; a piston disposed within and axially aligned

with the air compression chamber; and a spring operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber.	with the air compression chamber; and a spring operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber.
20. The projectile launcher of claim 19, further comprising a smaller diameter tube in communication with the air compression chamber, and wherein a biasing force of the spring is sufficient to cause the piston to move from the cocked position to the rest position to force air from the air compression chamber into the smaller diameter tube and cause a soft-projectile located at the firing position to accelerate and be launched from the projectile launcher.	9. The projectile system of claim 8, wherein the projectile launcher further comprises a smaller diameter tube in communication with the air compression chamber, and wherein a biasing force of the spring is sufficient to cause the piston to move from the cocked position to the rest position to force air from the air compression chamber into the smaller diameter tube and cause a soft-projectile located at the firing position to accelerate and be launched from the projectile launcher. from the feed chamber to a firing position of the projectile launcher.

Table Comparing '282 Claims 19 and 20 and '683 Claims 8 and 9 (without parent claims)

'282 Patent	'683 Patent
19. The projectile launcher of claim 8, further comprising: an air compression chamber; a piston disposed within and axially aligned with the air compression chamber; and a spring operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber.	8. The system of claim 7, wherein the projectile launcher further comprises: an air compression chamber; a piston disposed within and axially aligned with the air compression chamber; and a spring operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber.
20. The projectile launcher of claim 19, further comprising a smaller diameter tube in communication with the air compression chamber, and wherein a biasing force of the spring is sufficient to cause the piston to move from the cocked position to the rest position to force air from the air compression chamber into the smaller diameter tube and cause a soft-projectile located at the firing position to accelerate and be launched from the projectile launcher.	9. The projectile system of claim 8, wherein the projectile launcher further comprises a smaller diameter tube in communication with the air compression chamber, and wherein a biasing force of the spring is sufficient to cause the piston to move from the cocked position to the rest position to force air from the air compression chamber into the smaller diameter tube and cause a soft-projectile located at the firing position to accelerate and be launched from the projectile launcher. from the feed chamber to a firing position of the projectile launcher.

E. Industry Praise

1. Additional Legal Standards Relating to Industry Praise

128. I understand that industry praise is an objective indicator that a patented invention is not obvious.

129. I understand that evidence of industry praise need not take any particular form. What matters is that the evidence shows a recognition in the industry of the patented invention's significance and value. Exemplary sources of industry praise include (but are not limited to) statements made and/or awards given by industry publications, journals, organizations, trade associations, commentators, and competitors.

130. I understand that the evidence of industry praise must have "nexus" to the patented invention. In this context, "nexus" means that the industry praise is derived from products that practice the invention, and that the invention is the impetus behind the industry praise.

2. Xploderz Received Industry Praise With Nexus to the Invention

(i) Industry Praise and Recognition of Xploderz

131. The Xploderz were praised and celebrated with nexus to the inventions described in the Common Maya Practiced Claims, as described below.

132. For example, reviewing one of the first generation products, an article in the Wall Street Journal noted, "With an **astounding 100-foot range**, the XGround Pounder shoots **squishy blue gel balls that break apart on impact . . . made from a super-absorbent polymer** [that are] **safe** to scatter around your backyard… [T]o fire, you pull and release a **spring-loaded lever**." EX2112(CX-1853) p.4. Another review, from Popular Science, listed the Xploderz X2 Retaliator among "[a] dozen good ideas in gear" and explained that "**with a range of 100 feet,** the Retaliator 2000 **shoots farther than all other toy guns** … the marble-size bullets … made of a gel-like polymer, whiz through the air like BBs," but "**[g]etting shot won't hurt"** because **"[t]hey disintegrate upon contact.**" EX2087(CX-1408). The 100-foot range that was fittingly praised as "astounding" relates to the improved ballistics achieved and enabled by the inventions claimed as noted below.

133. Characterizations of the ammunition as "safe," such that "getting shot won't hurt," relates to the fact that hydrated SAPs are "squishy" and "break apart on impact" when used as directed and fired from the Xploderz blasters. According to the asserted patent, and I agree, these characteristics distinguish the as-claimed SAP ammunition used with the as-claimed projectile launcher device from air soft and paint ball guns.

> <u>One object of the present patent document is to provide an alternative soft-projectile launching system to those presently on the market.</u>

'282 Patent at 1:64–66; *see also* '683 Patent at 2:3–5.

> The super absorbent polymer projectile launching toys and/or weaponry described herein may increase the user experience as compared to foam-based projectile toys, yet they remain safe for children to use.

'282 Patent at 3:3–6; *see also* '683 Patent at 3:10–13.

> [O]nce hydrated, the unique properties that SAP's exhibit give the soft-projectiles several advantages over current projectile materials such as paint balls, plastics, and foams. For example, hydrated SAP projectiles can maintain their shape under modest pressure. The ability of SAP projectiles to maintain their shape allows them to be projected with a reasonable force and velocity without breaking apart. However, under excessive pressure, hydrated SAP projectiles will break down and lose their shape. Because SAP projectiles break down under excessive pressure, the force at impact is spread over a much wider surface area, thus reducing the likelihood of injury.

'282 Patent at 3:50–61; *see also* '683 Patent at 3:59–4:3.

134. Xploderz also received formal award recognition from others in the industry. As one example, the "Xploderz XBlaster 200" was voted in as a finalist in the "Outdoor Toy of the Year" category of the Toy Industry Association's "2012 Toy of the Year Awards" (TOTY). EX2088(CX-1177). As another example, "Xploderz, a new toy line from The Maya Group, won Best Overall Toy Item at the recent ToysRUs Canada Spring Vendor Show." EX2045(CX-1179). As yet another example, Xploderz were named a Best New Toy of 2011 by the British Toy and Hobby Association during the London Toy Fair. EX2042(CX-518).

(ii) Nexus of Industry Praise to Xploderz

135. The industry praise has a nexus to the Common Maya Practiced Claims. For example, statements praising the distance, including the "**astounding 100-foot range** [with] **squishy blue gel balls that break apart on impact . . . made from a super-absorbent polymer** [wherein] to fire, you pull and release a **spring-loaded lever**" (EX2112(CX-1853) p.2) ties to the invention itself and the "astounding" result achievable by the invention. As Popular Science noted, a praised benefit brought about by the Xploderz firing mechanism with the ammunition was a 100-foot distance that was **"farther than all other toy guns."** EX2087(CX-1408) pp.1-2.

136. This praise is directly tied to the invention. The impetus behind praise directed to "squishy blue gel balls that break apart on impact . . . made from a super-absorbent polymer" reflects the invention's "plurality of soft-projectiles having the same shape, each soft projectile being formed from hydrated super absorbent polymer" that are "disposed within a feed chamber of the projectile launcher, and wherein the projectile launcher is adapted to load a soft-projectile from the feed chamber to a firing position" so that they can fired from the blaster ('282 claim 8; alternatively described as "the projectile launcher includes a feed chamber for loading the soft-projectiles within projectile launcher" ('683 claim 5)) using the mechanism described in '282 claims 19 and 20, and '683 claims 8 and 9.

137. Further, the "astounding" distance is the result of the increased force acting on this particular type of SAP ammunition, including as described in the Common Maya Practiced Claims. For example, claim 20 (which depends on 19) of the '282 Patent and claim 9 (which depends on 8) of the '683 Patent give the most detail:

> a smaller diameter tube in communication with the air compression chamber, and wherein a biasing force of the spring is sufficient to cause the piston to move from the cocked position to the rest position to force air from the air compression chamber into the smaller diameter tube and cause a soft-projectile located at the firing position to accelerate and be launched from the projectile launcher" ('282 claim 20 & '683 claim 9 (extraneous words removed; see ¶127)

138. In particular, the Xploderz mechanism forced air through the smaller diameter tube, increasing the air pressure and distance by which the hydrated SAP projectile was projected. This is explicitly described in the specification as well:

> The change in the diameter of the air compression chamber 31 from the plunger cylinder 19, which comprises a tube of a relatively larger diameter, to a smaller diameter tube 27 will cause, during use of the device, a rapid increase in the velocity of the air flow in correlation with the conservation of energy and Bernoulli's principle. Consequently, the rapid air flow is forced down the length of the smaller tube 27 until it escapes out the front of the projection device 10.

'282 Patent at 6:30–45; *see also* '683 Patent at 6:47–59. That is, the praised and claimed configuration of the Xploderz blaster, as reflected in the claim language, led to the industry praise.

139. The impetus behind praise directed to mechanism, including the "astounding 100-foot range [from] pull[ing] and releas[ing] a spring-loaded lever spring-loaded lever" (EX2112(CX-1853) p.2) also reflects the inventions' "piston disposed within and axially aligned with the air compression chamber; and a spring operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber" to create an air pressure that operates on the SAP ammunition ('282 claim 19; and similar language describing the invention in '282 claim 20). The impetus behind praise directed to "astounding" distance including the "astounding 100-foot range," (EX2112(CX-1853) p.2) and that the Xploderz "shoots farther than all other toy guns" (EX2087(CX-1408) pp.1–2) reflects the inventions' combination of the unique super-absorbent polymer ammunition with the claimed launching mechanism. As the patents noted, the properties of SAP projectiles "allows them to be projected with a reasonable force and velocity without breaking apart" [e.g., '282 at 3:54–56, '683 3:63–65:], and the as-claimed mechanism was the manner in which the Xploderz blasters did that.

140. Similarly, the impetus behind the awards were the claimed features. I myself was a judge for the "Outdoor Toy of the Year" category in the 2012 TOTY (EX2088(CX-1177)), when the "Xploderz XBlaster 200" was voted in as a finalist in the "Outdoor Toy of the Year". The criteria for judging that year were (1) creativity, originality and innovation, (2) design and promotion, (3) excellence of

product, and (4) marketplace acceptance. In my opinion, the selection as a TOTY "Outdoor Toy of the Year" finalist goes to the fact that Xploderz XBlaster 200 was the first invention of spherical super absorbent polymer ammunition in an air gun blaster toy. This is reflected in the '282 Patent claims 8, 19, and 20 and '683 Patent claims 5, 8 and 9. It was the advantages that stem from the inventions captured in these claims that distinguished Xploderz over the many other toy blasters in the market at the time, and these advantages are what would have inspired the praise and awards that Xploderz received.

F. Commercial Success

1. Additional Legal Standards Relating to Commercial Success

141. I understand that commercial success of the product that practices the patented invention may provide evidence supporting the inference that an invention is not obvious.

142. For the nexus requirement to be met, I understand that commercial success must be causally related to the invention itself. That is, the asserted commercial success of the product must be due to the merits of the claimed invention, and not to other factors such as the patentee's dominant position in the market, or advertising or packaging unrelated to the patented features.

143. I also understand that it is not necessary, however, that the patented invention be solely responsible for the commercial success, in order for this factor to be given weight appropriate to the evidence, along with other pertinent factors.

144. Further, I understand that a patentee need not show that all possible embodiments with the claims were successfully commercialized in order to rely on the success in the marketplace of the embodiment that was commercialized. That is, a company need not sell every conceivable embodiment of the claims in order to rely upon evidence of commercial success, so long as what was sold was within the scope of the claims.

145. I also understand that if the commercial success is due to something already known, then nonobviousness is not shown. For example, if the commercial success is due to an unclaimed feature of the patent-practicing device or if what creates the commercial success was known in the prior art, the success is not pertinent.

146. On the flip side, I also understand that commercial success of an patent-practicing product is not a requirement for patent validity. That is, while the commercial success of a invention-practicing product can be evidence of the non-obviousness of that invention, it is not a prerequisite for validity.

2. Commercial Success of the Xploderz Products

147. It is my opinion that the Xploderz were commercially successful and that this commercial success has a nexus to at least claims 8, 19, and 20 of the ’282 Patent and claims 5, 8 and 9 of the ’683 Patent. In forming my opinions, I have reviewed the sales data for 2011 and 2012 for the Xploderz myself, and I have reviewed the ITC trial testimony of Lynn Rosenblum, an expert in the toy industry with prior experience in toy marketing and sales, to confirm my understanding of the Maya Group sales data in the context of the toy industry.

(i) My Review of Maya Group Product Sales Data

148. I have reviewed sales data information that I understand was produced by the Maya Group in this case that cover Maya Group sales for 2011 and 2012. EX2068(CX-0165C). I also understand from the deposition of Maya Group’s corporate witness in the ITC investigation, Mr. Oded Ben-Ezer, that [redacted]. *See, e.g.*, EX2032(Ben-Ezer Dep.) pp.147:1–148:2, 266:18–268:3. I will refer to this sales report EX2068(CX-0165C) as “the Maya Sales Report.” The Maya Sales Report reports over $35 MM and over 3.7 MM units from the relevant product lines

to retailers in the first full two years. EX2068(CX-0165C).[6] Retailers for the Maya Group blasters included Amazon, Kmart, Target, Toys R Us, and Walmart EX2068(CX-0165C).

149. I have reviewed Ms. Lynn Rosenblum's testimony relating to this data, as well as Section IX.A of Ms. Rosenblum's report that she submitted in the ITC investigation. In particular, for 2011 data, the blasters that I have been able to test physically to confirm practice of the claims '282 Patent 8, 19, 20 and '683 Patent claims 5, 8 and 9 (or where I have tested the same blaster packaged with a different quantity of ammunition) are marked below in bold. For the remaining non-bold items, I have reviewed images of the blasters.

[6] I understand from reading the ITC investigation deposition of Maya Group's Oded Ben-Ezer that Maya overall made approximately $50MM million from the sales of the Xploderz blasters and ammunition, EX2032(Ben-Ezer Dep.) pp.275:11-14. I have focused my analysis on the first two years since that is the most detailed data that is available from the Maya Group, but also believe that continued sales and line extensions in later years are also supportive of commercial success, which is described further below and in trial testimony and expert report of Ms. Rosenblum that she submitted in the ITC investigation. EX2046 §XI.A.5.

2011 Sales – Xploderz Product Line, Blaster Products		
Master Item No.	**Item Description**	[redacted]
45102	**Xploderz 200**	
45103	**Face-off 400**	
45104	**XStormer 1000**	
45105	**Long Ranger 2,000**	
45110	Sidewinder 1000 w/Bonus 500	
45111	**Xblaster 450 Kohl's**	
45112	**XGround Pounder 2000**	
45113	Xploder Pump Action 575 4 pack TRU	
45202	**XBlaster 200**	
45203	**Face-Off 400**	
45204	**XSTORMER 1000**	
45205	**XRanger 2000**	
45206	**XBlaster 700 (Big Lots)**	
45208	XMAGNUM 700 6-Pack	
45210	**XStormer 1000 w/ Bonus 500 Ammo**	
45212	XBOW 1500	
	Total (bolded only)	
	Total (all)	

(generated from EX2068(CX-0165C))

150. Similarly, for the 2012 sales data:

2012 Sales – Xploderz Product Lin	
Master Item No.	**Item Description**
45102	**Xploderz 200**
45103	**Face-off 400**
45104	**XStormer 1000**
45105	**Long Ranger 2,000**
45111	**Xblaster 450 Kohl's**
45112	**XGround Pounder 2000**
45113	Xploder Pump Action 575 4 pack TRU
45202	**XBlaster 200**
45203	**Face-Off 400**
45204	**XSTORMER 1000**
45205	**XRanger 2000**
45208	XMAGNUM 700 6-Pack
45211	XMAGNUM TARGET STRIKE 2000
45212	XBOW 1500
46000	**X2 Invader**
46001	**X2 Invader w/300 extra ammo (Kohl's)**
46005	**X2 Mauler**
46010	**X2 Retaliator**
46015	**X2 Face-off 1400**
46020	Xploderz X2 X Bow
46510	**Night Fighterz Gen-700**
46520	Night Fighterz SuperGen-1000
Total Xploderz (bolded)	
Total Xploderz (all)	
2012 Sales – Blaster Pro Product Line	
49103	**Blaster Pro Pump Action 2500**
49104	**Blaster Pro Full Auto 5000**
49107	Blaster Pro Pump Action (TRU)
Total Blaster Pro (bolded)	

Total Blaster Pro (all)	[redacted]
Xploderz (including Blaster Pro) Grand Totals (bolded)	
Xploderz (including Blaster Pro) Grand Totals (all)	

151. In other words, the totals for the two years, 2011 and 2012, of patent-practicing products was [redacted], and for the products that I was able to check the internal mechanism as laid out above, the total [redacted]. Based on my review of the pictures of the products that I was not able to inspect personally, I believe that the mechanism inside the blasters was likely the same as the other blasters in that generation of product for the reasons I lay out above, but in any case, the [redacted] represents a conservative estimate of sales.

152. Further, I note from the above data that the bestselling items for 2011 were the XBlaster related products (SKUs 45102, 45103, 45111, 45202, 45203, 45206), for which Maya sold a total [redacted] when counting the dual-packs as two blasters) for a total extended price (wholesale) of [redacted]

153. Further, I note from the above data that the bestselling items for 2012 were the X2 Invader related products (SKUs 46000, 46001, and 46015), for which

Maya Group sold a total [redacted] when counting the dual-packs as two blasters) for a total extended price (wholesale) [redacted]

154. My opinion is that these numbers as raw data represent a commercial success, but I also understand that it is helpful to place these numbers in context, which I do next. I also note that the Maya Group witness considered these sales to be a commercial success, EX2032(Ben-Ezer Dep.) p.285:8–19.

[redacted]

(ii) My Comparison with Nerf Data

155. One way to illustrate the remarkable commercial success of the Xploderz is to compare their sales with those of Hasbro's market dominant NERF® brand. I understand from the ITC investigation deposition transcript of John Tomulonis, the Senior Director of Global Brand Strategy and Marketing for NERF®, [redacted] Thus,

an indicator of commercial success would be if the Xploderz sold at rates comparable to NERF® blaster products.

156. To understand the sales of Hasbro's NERF® brand, I considered EX2043(CX-0531C), a Microsoft Excel spreadsheet that Hasbro produced in the ITC investigation. From my review of the transcript of Hasbro's employee Dan Bairos, the Director of Global Brand Finance, I understand that EX2043(CX-0531C) is a [redacted] EX2115 (Bairos Dep.) pp.67:3–70:10; *see also id*. p.17:12–16. I will refer to EX2043(CX-0531C) as the "2010–2012 Hasbro [redacted]."

[redacted]

158. In 2011, Maya Group's most popular Xploderz blaster was the XBlaster. As I noted above, Maya Group sold a total [redacted] of the XBlaster related products (SKUs 45102, 45103, 45111, 45202, 45203, 45206), for a total extended price (wholsale) [redacted] As shown below, this would have placed the XBlaster [redacted] of non-closeout NERF® products. *Compare* EX2068(CX-0165C) *with* EX2043(CX-0531C).

[redacted] To determine where the XBlaster would have placed in the context of non-closeout NERF® products, [redacted]

[redacted]

EX2043(CX-0531C) (annotated)

160. As shown above, the XBlaster would have slot between the NERF® product with [redacted] sales volume [redacted] and the NERF® product [redacted] sales volume [redacted] Thus, Maya Group's XBlaster would have [redacted] NERF® items.

161. Even when isolating the various XBlaster products individually, the commercial success of these products in comparison to NERF®'s products is clear. For example, [redacted] (SKU 45202) alone in 2011 would have [redacted] NERF® products sold in 2011. *Compare* EX2068(CX-0165C) *with* EX2043(CX-0531C).

162. The XRanger 2000 (45105 and 45205) [redacted], and would have ranked [redacted] sold of the XStormer 1000 (SKUs 45104 and 45204) in 2011 would have [redacted]

163. In 2012, the Xploderz [redacted] to NERF® products. Conducting the same analysis as above on the 2012 data set[7] from the 2010–2012 Hasbro [redacted], the X2 Invader (SKUs 4600,46001, and 46015) would have [redacted]

164. The commercial success of the Xploderz in comparison to NERF® products is particularly impressive because, based on my review of the deposition transcript of Maya Group's corporate representative in the ITC investigation, Mr. Oded Ben-Ezer, Maya Group had no prior brand name recognition for the Xploderz, and was essentially building its blaster sales from scratch. *See, e.g.*, EX2032(Ben-Ezer Dep.) pp.18:17–24:13.

(iii) Additional Metrics

165. Additional metrics show commercial success of the Xploderz:

- The line extensions for the Xploderz products;
- Maya Group's market penetration as a startup company with no prior brand name recognition;

[7] The 2012 data set of the 2010-2012 Hasbro [redacted]

- The fact that the Xploderz products spawned an entirely new product category, i.e., blasters that shoot super-absorbent polymer ammunition.

166. Regarding line extensions, as discussed above, the Xploderz yielded multiple line extensions, including the X2, Night Fighterz, Blaster Pro, X3, and Firestorm. This is a factor signaling that the Xploderz were commercially successful. EX1004 pp.566:7–568:9; *see also* EX2046 §IX.A.5. A line extension signals that the manufacturer believed that the original products were commercially successful enough to invest in the additional cost necessary to release the extension products. EX1004 pp.566:7–568:9*; see also* EX2046 §IX.A.5. Here, Maya Group extended the Xploderz lines multiple times, which is a signal that the Xploderz were a commercial success. EX1004 pp. 566:7–568:9; *see also* EX2046 §IX.A.5.

167. The length of a product's lifecycle is also another strong indicator of commercial success. EX1004 pp.566:5–568:9; EX2046 ¶¶147–154. Toys typically face the expectation of a shortened product life cycle—sometimes less than a year. EX2046 ¶¶147–154. It is a strong sign of commercial success that Maya Group created a toy brand with a strong product life cycle that lasted approximately 4 years and maintained the ability to reintroduce line extensions for years to come is considered. EX2046 ¶¶147–154; EX1004 pp.566:5–568:9; *see also* EX2032(Ben-Ezer Dep.) pp.285:13–19 ("[redacted]

[redacted]

168. Regarding market penetration, I calculated that Maya Group captured 3.2%–3.4% of the blaster market share in 2011, [redacted] of the blaster market share in 2012. I performed these calculations by calculating Maya Group's sales as a percentage of the total market gross sales estimates of the blaster market in 2011–2012. *See also* EX2046 ¶¶119–133.

[redacted]

170. Based on these estimated percentages [redacted] it is possible to estimate the size of the total market, and thus Maya Group's market penetration. In 2011, the NERF® gross worldwide sales [redacted]

171. I understand from Mr. Bairos's deposition transcript that in the 2010–2012 Hasbro [redacted]

[redacted]

EX2043(CX-0531C) (excerpt including [redacted]

173. [redacted] Maya Group's sales on the Xploderz were [redacted] the Xploderz blasters, *see* ¶¶ 149-151 above, plus [redacted] Xploderz ammo, *see* EX2068(CX-0165C), resulting in [redacted] sales. *See generally* EX2046 ¶ 100. [redacted] Maya captured 3.2%–3.4% of the blaster market share in 2011.

[redacted]

EX2043(CX-0531C) (excerpt including [redacted])

175. Using the same analysis as above (*see* ¶¶169–173) and [redacted] Meanwhile, Maya Group's sales on the Xploderz were [redacted] the Xploderz blasters, *see* ¶¶ 149-151, plus [redacted] the Xploderz ammo, *see* EX2068(CX-0165C), resulting in

[redacted] Maya's market share grew [redacted] the blaster market share in 2012.

176. This market penetration is remarkable, particularly given Hasbro's market dominance. EX2046 ¶¶132–133; EX2070(Tomulonis Dep.) pp.126:16–20. Maya Group was a new entrant to a competitive market without any brand recognition. EX2046 ¶¶132–133. The market penetration was successful especially given that the vast majority of new toys fails to launch, and given most startup toy companies (of which Maya Group was one) fail. *Id.*

177. Maya Group's 3.2[redacted] market share is particularly impressive when considering market shares in other industries. For example, in the fast food industry, McDonalds dominates at 43.8% market share, but the comparatively small percentages of Wendy's (2.8%) and Papa John's (3.4%) does not mean that Wendy's and Papa Johns are not a commercial success (*see* EX2046 ¶133). In the 2021 U.S. automobile market, for example, market shares range from 2.7% to 10.5%, and the lower percentage share BMW (at 2.7%) or Kia (at 3.6%) do not mean that the products are not commercially successful (see EX2046 ¶133).

178. Regarding the creation of a new product category, it is highly unusual for a product to continue selling at a high rate for many years without any interruption. EX1004 pp.566:7–568:9; EX2046 ¶¶167, 169–170. Here, Maya

Group went away from the Xploderz product lines after about four years, but the success of those products resulted in a second wave of gel ball blasters years later, including by the Petitioner in this case. EX2046 ¶167. In other words, the commercial success of success of the Xploderz product lines resulted in the creation of an entirely new product category, i.e., blasters that shoot gel balls, which is a product category that Petitioner entered many years after the initial success of the Xploderz product lines. EX1004 pp.568:10–569:3; EX2046 ¶¶167, 169–170.

179. It is unusual for a product to be so commercially successful that it creates an entirely new product category. EX2046 ¶¶167, 169–170; EX1004 pp.568:10–569:3. This is in part due to difficulties such as a lack of brand awareness or recognition, retail placement issues, and overcoming the fear that consumers can face when they have never seen a product before. EX2046 ¶¶169–173. The fact that Maya Group was able to overcome these hurdles is a testament to its commercial success. EX2046 ¶¶169–173.

(iv) Mr. Brawer's Testimony

180. The testimony of co-inventor Ron Brawer (from the ITC investigation) confirms that Xploderz were a commercial success when launched, and that in fact Xploderz were Target's #1 selling toy for boys when launched. EX2067(Brawer Dep.) pp.299:8–300:4:

> Q. How did the Xploderz perform for Target
> as it relates to their boy toy product line?

> **A. Upon initial launch, it was a huge hit.**
>
> **Q. Do you remember whether there was a certain ranking associated with the Xploderz product among the Target group of boy toy products?**
>
> A. So what I can recall is a lunch with the buyer for our product line who had worked with us frankly to do the recall and the quarantine. So we weren't necessarily best of friends. And we came in after we had put the product on the shelf just prior to Easter and launched the advertising, and from what I recall, **he said we were the number 1 selling boy toy in the spring.**
>
> Q. What was your reaction to being told that your Xploderz product was the number 1 selling boy toy product for Target that spring?
>
> **A. Elation.**

181. Mr. Brawer also provided additional testimony regarding the level of returns of the Xploderz, and his testimony does not change my opinion that the Xploderz were commercially successful. *See* EX2067(Brawer Dep.) pp.69:11–74:17. Mr. Brawer testified that returns constituted a "small percentage of total sales." *Id*. p.73:6–9. When asked if retailers had concerns about the products or had too many returns of the products, Mr. Brawer testified that there was not such a problem. *Id.* p.209:15–19.

182. Mr. Brawer also provided additional testimony about a small recall that happened at the start of 2011 prior to consumer sales. As to the size of that recall of

initially produced products, Mr. Brawer testified that the recall happened in the first 30 days of the product launch in 2011 (a small period compared to the many-years run of the Maya Group products), and involved "10, 20 thousand, not more than that," wherein the first run of blasters had to be changed due to a performance problem, EX2067(Brawer Dep.) pp.69:11–74:17. Such a recall size was a "fairly small percentage of total sales," *id.* p.73:7–9, compared to the millions of patent-practicing blasters that were sold overall, as I detailed above. This recall as described by Mr. Brawer does not affect the majority of the 2011 sales date, or any of the 2012 sales data *Id.* p.74:2–4 ("It was the initial shipment to very specific retailers.").

183. After the initial problem in early 2011, Mr. Brawer could not recall ever "having to take any product back" from retailers. EX2067(Brawer Dep.) pp.209:20–210:7.

184. Even taking the effects of such a recall or the returns identified above out of the sales numbers, the sales numbers that I describe above continue to show commercial success.

185. In sum, Mr. Brawer's testimony about being the #1 boys toy when launched at Target, and his testimony about the small number of recalls and returns continues to support by opinion that the patent-practicing Xploderz were a commercial success.

(v) The Commercial Success of the Xploderz Has a Nexus to the Claimed Inventions

186. The Xploderz were all (in informal terms) blasters that stored a plurality of spherical hydrated SAP ammunition in a feed chamber, and that loaded the ammunition into a firing position from that chamber and then launched the ammunition using the blasters' specific spring-based air pressure firing mechanisms. This invention is reflected in greater detail in the Common Maya Practiced Claims, and in my opinion, the commercial success of these products was directly due to the claimed inventions.

187. As context, prior to the launch of Maya Group's Xploderz in 2011, no other toy manufacturer had made such a blaster that practiced the claimed invention. In contrast, there were many blasters available on the market that were designed differently or used different ammunition, such as by using foam darts, discs, plastic balls, or other types of projectile. This is consistent with the testimony of Maya Group's corporate witness in the ITC investigation, Oded Ben-Ezer, testifying about the launch in the beginning of 2011 EX2032(Ben-Ezer Dep.) pp.287:12–289:1):

188. Moreover, I understand from my review of the transcript of Hasbro's employee [redacted]

189. Against these headwinds, the Maya Group broke into the blaster market with no prior blaster product (essentially a startup) and obtained ~$16M of sales in the first and second year, as outlined above. In my opinion, the impetus of the commercial success enjoyed by the Xploderz was the practice of the Common Maya Practiced Claims, which gave the blaster products their competitive advantage in the marketplace. In other words, the Xploderz succeeded commercially because of—and as a direct result of—the inventions as claimed by claims 8, 19, and 20 of the '282 Patent and claims 5, 8 and 9 of the '683 Patent. As Maya Group's Oded Ben-Ezer testified about the launch of Xploderz (EX2032(Ben-Ezer Dep.) pp.287:18–289:1):

1 [redacted]

[redacted]

190. One commercial advantage obtained by the Xploderz was based on the inventors' discovery that SAPs have unique material properties that facilitate a distinctive and improved blaster play experience when launched with the as-claimed blaster. This was an important commercial selling point of the blaster, and was advertised as the H2GrOw technology, and was a reason the product was attractive to consumers. This is reflected in the testimony by Maya Group's corporate witness in the ITC investigation. EX2032(Ben-Ezer Dep.) pp.288:19–21 ("[T]he ammo itself was cool. It was something new."). The goal of the invention, as the patent described, was to create a novel blaster-ammunition combination that was an alternative to what existed in prior art systems:

> One object of the present patent document is to provide <u>an alternative soft-projectile launching system</u> to those presently on the market.

’282 Patent at 1:64–66; *see also* ’683 Patent at 2:3–5.

> The super absorbent polymer projectile launching toys and/or weaponry described herein may increase the user experience as compared to foam-based projectile toys, yet they remain safe for children to use.

’282 Patent at 3:3–6; *see also* ’683 Patent at 3:10–14.

> [O]nce hydrated, the unique properties that SAP’s [sic] exhibit give the soft-projectiles several advantages over current projectile materials such as paint balls, plastics, and foams. For example, hydrated SAP projectiles can maintain their shape under modest pressure. The ability of SAP projectiles to maintain their shape allows them to be projected with a reasonable force and velocity without breaking apart. However, under excessive pressure, hydrated SAP projectiles will break down and lose their shape. Because SAP projectiles break down under excessive pressure, the force at impact is spread over a much wider surface area, thus reducing the likelihood of injury.

’282 Patent at 3:50–61; *see also* ’683 Patent at 3:59–4:3.

> SAP projectiles can also be designed to break down at different pressures based on their composition. This allows them to be tailored to have specific qualities as soft-projectiles.

’282 Patent at 3:62–65; *see also* ’683 Patent at 4:4–7.

191. As explained in the ’282 and ’683 Patents (including the excerpts above) Maya’s blaster products that embodied the Common Maya Practiced Claims have distinct advantages over blasters that use foam or foam-like materials, such as the blasters in Hasbro’s NERF product lines. While “relatively safe to project or launch,” the properties of foam materials “have some significant drawbacks when used as projectiles for projectile launching toys.” ’282 Patent at 1:42–46; ’683

Patent at 1:49–53. For example, because these low-density foam projectiles "are light, they are highly susceptible to air forces when trying to project them through the air in free flight," which causes them "to rapidly slow after firing and easily curve off line." '282 Patent at 1:46–55; '683 Patent at 1:53–62. Like foam ammunition, the claimed SAP ammunition used by the Xploderz is "soft" and "reduc[es] the likelihood of injury." '282 Patent at 3:58–61; '683 Patent at 3:67–4:3. And yet, the soft SAP ammunition, which has higher density than foam, does not suffer the same deficiencies as foam in terms of its ballistic characteristics. '282 Patent at 1:42–46; '683 Patent at 1:49–53. When launched by an air-powered launcher in the manner claimed, SAP ammunition flies faster, farther, and straighter than the foam ammunition used in the 2010–2012 timeframe. This is reflected in the testimony by Maya Group's witness in the ITC investigation as to the goals of the invention. EX2032(Ben-Ezer Dep.) pp.287:22–288:22 [redacted]").

192. Another commercial advantage obtained by the Xploderz as a direct result of employing the claimed inventions is that the ammunition rounds are the same shape in a manner that could be easily loaded in the blaster from a feed chamber, including by taking advantage of their ability to roll into place, and be

propelled by the air pressure of the blaster mechanism. *See* '282 Patent cl. 1 ("a plurality of soft-projectiles having **the same shape**"), cl. 8 ("A projectile launcher including the ammunition of claim 1 disposed within a feed chamber of the projectile launcher, and wherein the projectile launcher is **adapted to load a soft-projectile from the feed chamber to a firing position**."), cls. 19 and 20 (reciting "**air compression chamber**" arranged within projectile launcher); '683 Patent cl. 5 ("wherein the projectile launcher includes **a feed chamber** for loading the soft-projectiles within projectile launcher."); cls. 8 and 9 (reciting "**air compression chamber**" arranged within projectile launcher);. The shape in conjunction with the feed chamber allows for SAP ammunition rounds to be stored onboard the launcher and loaded for firing with minimal actions by the user. *Id.* The rounds are then fed into the firing position from the feed chamber. *Id.* Importantly, the user does not need to manipulate individual ammunition rounds by hand to store them in the feed chamber or load them into the firing position. By contrast, with most (if not all) existing toy blasters on the market in the 2010–2012 timeframe, the user had to handle the rounds one at a time to store and/or had limited ammunition on the blaster. For example, the Xploderz XBlaster 200 could hold over 70 hydrated SAP ammunition rounds in its feed chamber, while comparable foam blasters often held a few dozen or far less. As Maya Group's witness in the ITC investigation testified (EX2032(Ben-Ezer Dep.) pp.288:6–13): "[redacted]

[redacted]." The feed mechanism and the loading from same was an advertised selling point of the blasters ("More Ammo; clip holds 70 rounds") and ("Quickly reload and shoot") and ("outlast the competition").

193. Yet another commercial advantage gained by the Xploderz as a result of the Common Maya Practiced Claims was a significant distance advantage from the blaster mechanism, which was a major selling point of the blasters, including in advertising: ("more distance: up to 85 feet") and ("More power.") The combination of the SAP ammo with the specific Xploderz firing mechanism allowed the ammunition to travel much farther than prior art blasters on the market, and as noted above, was praised repeatedly in reviews, including as I noted above. Again, this is reflected in the testimony by Maya Group's witness as to the goals of the invention. EX2032(Ben-Ezer Dep.) pp.287:22–288:22 ("[redacted]).

194. In particular, the design of the Xploderz mechanism was to have an "air compression chamber" ('282 Patent cls. 19, 20 & '683 Patent cls. 8, 9), where "a spring operatively arranged to bias [a] piston toward a rest position from a cocked

position within the air compression chamber" ('282 Patent cl. 19 & '683 Patent cl. 8), causing "the piston to move from the cocked position to the rest position to force air from the air compression chamber into the smaller diameter tube and cause a soft-projectile located at the firing position to accelerate and be launched from the projectile launcher" ('282 Patent cl. 20 & '683 Patent cl. 9) at a great distance. This design—the combination of the blaster mechanism as-claimed and the ammunition as-claimed—did not exist on any other prior art blaster.

195. When the first line of Xploderz launched in 2010–2011, the toy blaster market was dominated by launchers that used foam ammunition, with NERF's products [redacted] of the blaster market share. EX2070(Tomulonis Dep.) p.126:16–20. Toy blasters like the Xploderz did not exist previously in the marketplace. To my knowledge, spherical SAPs had never been used as ammunition fired by a launcher with a pneumatic device like the one defined by the claimed inventions and embodied by the Xploderz. The synergy of the hydrated SAP ammunition in a launcher designed to hold, load, and launch such ammunition is what was the product differentiator between the Xploderz and foam blasters like the NERF products, and was the reason to purchase such products, and was borne out in the sales. *See* EX2032(Ben-Ezer Dep.) pp.287:18–289:1 (describing the advantages of the Xploderz at launch "[redacted]."); 285:13–19 ("[redacted]

[redacted]

[redacted]

[redacted]

[redacted]”).

196. It is also clear that the Maya Group perceived the claimed features as product differentiators in a market saturated by foam blasters. Accordingly, the Maya Group touted some of the above-mentioned benefits enabled by the Common Maya Practiced Claims in its advertising, including directly on the product packaging:

EX2033(CPX-0035) (Front)—Annotated

EX2033(CPX-0035) (Back)—Annotated

197. In addition to on-package advertising, the Maya Group emphasized and visualized the benefits achieved by the claimed inventions in commercials. For example, the Maya Group's commercials highlighted the "Xploderz state-of-the-art blasters ***fused with*** H_2GROW ammo that you can grow." The "state-of-the-art blasters" refer to the launchers defined by Common Maya Practiced Claims and the "H_2grOw ammo" refers to the hydrated SAP ammunition required in those claims.

EX2085(CX-0167)

198. Consistent with my prior discussion above, the commercials highlighted enhanced ballistics ("more distance: up to 85 feet"), larger ammunition capacity ("more ammo; clip holds 70 rounds), and easy loading/firing ("Xploderz: Quickly reload and shoot"), the punchline being that these characteristics lead to "more fun" with Xploderz than with other blasters.

199. Thus, the Maya Group's advertising supports my independent conclusion that the features recited in Common Maya Practiced Claims distinguished the Xploderz over existing blasters and drove the commercial success of the Xploderz.

200. The testimony of co-inventor Ron Brawer (from the ITC investigation) confirms that the commercial success of the Xploderz had a nexus to the claimed inventions. Mr. Brawer's testimony confirms that the patent-practicing Xploderz products were the first such blasters on the market, and that the commercial success was linked to the merits of the patent claims:

> **Q. And even though it may have been known to use air pressure or mechanical air pressure systems to launch various projectiles by the year 2000, nobody in the industry applied that technique to launch SAPs until the Maya Group did in 2011; correct?**
>
> **A. Correct. … Correct, never.**
>
> Q. When the Maya Group released the Xploderz product in 2011, how did the firing range of that product compare to the other Blaster

> products in the market?
>
> A. We were double the range, if not more.
>
> **Q. How did your ability to achieve double the firing range of your competitor's products impact your sales?**
>
> **A. I believe that's what was driving consumers to want Xploderz. Positively.**

EX2067(Brawer Dep.) pp.297:7–298:10.

201. Further, Mr. Brawer testified about what target consumers liked about Xploderz as expressed in "focus groups" and was asked about one such focus group report dated May 27, 2010 (a few days after the initial filing of the patent), where in focus groups, boys preferred the Xploderz blasters (then tested as Blasterz) with its greater distance and more ammunition over comparison products including from Nerf. *See, e.g.*, EX2007 p.78; EX2067(Brawer Dep.) pp.265:2–266:12.

> Q. And then there's a sentence underneath that says, **"The most important features are 'shoots twice as far' as comparable products (i.e., Nerf) and 'Can hold 100 rounds in the magazine.'"**
> Do you see that?
>
> A. Yes, I do.
>
> Q. **What is this sentence referring to?**
>
> **A. The two features that the children like the most of this new concept in Blasterz is the distance that they can shoot and the amount of ammunition that they can hold**.

> …
> Q. **What was the characteristic of the Blasterz prototype that became the Xploderz product that contributed to that important feature of being able to shoot twice as far as comparable products like NERF?**
>
> A. **A different ammunition system**.
>
> Q. What was that different ammunition system?
>
> A. Oh, yeah, **so it was the fact that you were shooting SAPs** versus foam.

202. While Mr. Brawer did not recall the mechanism of competitive NERF products to make a comparison, he did testify that the Xploderz blasters—i.e., blasters that implemented the as-claimed projectile launcher with the as-claimed ammunition—achieved twice as far a distance as any Nerf blaster on the market. EX2007 p.78; EX2067(Brawer Dep.) pp.266:13–267:6:

> **Q. Was there anything about the actual mechanism for launching of the SAPs that also contributed to the Xploderz product being able to shoot twice as far as comparable products?**
>
> A. I can't answer that with any certainty. So it was -- you know, **I don't know enough about how NERF products work** to be able to say how different their air power system was to ours. **But what I can tell you is that the result of shooting ours was that we got twice as far with our ammunition.**
>
> Q. And in your mind, **the use of the SAPs as the ammunition was part of what enabled the**

> **Xploderz products to shoot twice as far as comparable NERF products?**
>
> **A. It was by far the most important thing**.

203. Mr. Brawer also testified about the increased capacity in the as-claimed blasters with the as-claimed ammunition. EX2067(Brawer Dep.) pp.267:2–268:8:

> Q. There's a second bullet here that says, "**Holds More Rounds in the Magazine**!" Do you see that?
>
> A. Yes, I do.
>
> Q. And what is this reference to being able to hold more rounds in the magazine a reference to?
>
> A. Well, if you were to take 70 rounds and develop them for shooting in the Xploderz/Blasterz product, it was a container smaller than a soda can. And if you were to try and take 70 rounds of foam darts, you would be running around with something the size of a shoebox. **And so the physical quality of the SAP as an ammunition, because it was much smaller, allowed for you to easily maneuver and hold and carry with you a much larger number of rounds of ammunition.**
>
> **Q. So, again, this use of the SAPs as the ammunition was part of what enabled the Xploderz products to hold more rounds in the magazine, which is one of the most important features in this focus group study? …**
>
> **A. Yes.**

204. The Maya Group also highlighted the air-powered launching mechanism and linked it to distance, calling it a "Power Arm" that would "pull back the spring." EX2067(Brawer Dep.) p.262:10–13 ("**You control the distance** and power behind the Blasterz guns. Pull the Blasterz **Air-Power arm back and release**. Fire over and over."). As Mr. Brawer explained:

> Q. "You control the distance and power behind the Blasterz guns. Pull the Blasterz Air-Power arm back, aim and release. Fire over and over."
> Do you see that?
>
> A. Yes, I do.
>
> Q. Does that text describe the firing mechanism that was ultimately used in the first generation of the Xploderz product?
>
> A. Pretty much, yes.
>
> Q. And the reference there to the "power arm," what is that referring to, to your recollection?
>
> A. It would be the plunger or however you want to describe it, the element of the product that you had to pull back in order to draw in air and pull back the spring.

EX2067(Brawer Dep.) p.262:10–263:4.

205. Mr. Brawer also testified about the advertising of the Xploderz blasters, and how the Maya Group highlighted the benefits of the patent-practicing products in their advertising and product packaging. EX2067(Brawer Dep.) pp.57:2–59:2

(discussing the "major benefits of our blasters"), 274:11–275:9 ("Q. Is it fair to say that all of the features of the product that you used to create excitement in your TV advertising were directly linked to the use of SAPs as ammunition in your projectile launcher? A. Absolutely.").

206. Mr. Brawer testified that the major features shown the consumer were distance and the amount of ammunition. EX2067(Brawer Dep.) pp.62:12–64:4, 63:1–63:15, 274:11–17 ("Q. What were the features of the Xploderz product line that you promoted in the TV advertising to start to grow that brand awareness? A. [D]istance was by far the number 1, the fact that we shot farther. The amount of ammo that we could carry.").

207. Mr. Brawer's statements about the distance ties to the invention and the "what was driving consumers to want Xploderz" achievable by the invention. The "double the firing range" distance (and similar testimony that I note above) was the result of the Xploderz blaster's "power arm" mechanism acting on the Xploderz SAP ammo ("the result of shooting ours was that we got twice as far with our ammunition")—i.e., the as-claims projectile launcher with the as-claimed SAP ammunition, including as described in '282 claims 19 and 20 & '683 claims 8 and 9. This testimony reflects the merits of the invention's "piston disposed within and axially aligned with the air compression chamber; and a spring operatively arranged to bias the piston toward a rest position from a cocked position within the air

compression chamber" to create an air pressure that operates on the SAP ammunition ('282 claim 19 / '683 claim 8; and similar language describing the inventions in '282 claim 20 / '683 claim 9).

208. Further, Mr. Brawer's statements, including e.g., his belief that "use of the SAPs as the ammunition was part of what enabled the Xploderz products to hold more rounds in the magazine, which is one of the most important features in this focus group study" and explanation of the advantages of "develop[ing] [rounds] for shooting in the Xploderz/Blasterz product" to allow them to "[f]ire over and over," reflects the merits of the invention's "plurality of soft-projectiles having the same shape, each soft projectile being formed from hydrated super absorbent polymer" that are "disposed within a feed chamber of the projectile launcher, and wherein the projectile launcher is adapted to load a soft-projectile from the feed chamber to a firing position" so that they can fired from the blaster ('282 claim 8; alternatively described as "the projectile launcher includes a feed chamber for loading the soft-projectiles within projectile launcher" ('683 claim 5)) using the mechanism described in '282 claims 19 and 20 & '683 claims 8 and 9.

209. As Mr. Brawer testified, "I think you're asking me how many toy companies sold SAP projectile launchers prior to Maya Group? Q. That's right. A. None." EX2067(Brawer Dep.) p.297:11–22. *See also id.* p.298:1–7. Mr. Brawer's testimony supports my opinion that the Maya Group was selling a unique product to

the market that was to practice the patent claims, and supports my views in my Rebuttal Report including the objective indicia of non-obviousness as to ’282 claims 8, 19, and 20, as well as ’683 claims 5, 8, and 9.

210. To the extent that Petitioner may argue that Mr. Brawer testified that use of SAPs alone irrespective of the projectile launcher drove sales of the Xploderz, I would disagree. Mr. Brawer was consistently describing the success of the Xploderz blasters firing the Xploderz ammunition—i.e., a device that practiced the as-claimed projectile launcher with the as-claimed SAPs. When asked whether there was “anything about the actual mechanism for launching of the SAPs that also contributed to the Xploderz product being able to shoot twice as far as comparable products,” Mr. Brawer responded that the distance Maya’s products achieved was by the combination of the Xploderz blaster with the Xploderz ammo. EX2067(Brawer Dep.) p.266:3–12 (“the result of shooting ours was that we got twice as far with our ammunition.”). Mr. Brawer further testified that before the Maya Group Products, no one had used mechanical air pressure to launch SAPs. *See* EX2067(Brawer Dep.) pp.297:7–298:21 (agreeing that “even though it may have been known to use air pressure or mechanical air pressure systems to launch various projectiles by the year 2000, nobody in the industry applied that technique to launch SAPs until the Maya Group did in 2011.”). Mr. Brawer’s testimony supports my opinion that the combination of the blaster mechanism as-claimed and the

ammunition as-claimed, did not exist on any other prior art blaster and is what led to greater firing distance and (in line with Mr. Brawer's testimony) drove sales.

211. To the extent that Petitioner may rely on the testimony of Mr. Brawer to argue that Maya did not market to target consumers, or that consumers praised Xploderz, in the words of the precise patent language claimed, I disagree that these are the relevant questions. There is a nexus between the evidence of the case and the merits of the claimed invention: The fact is that the Xploderz *did* have the as-claimed firing mechanism with the as-claimed ammunition that created the distance advantages, and *did* have the magazine combined with the SAP ammunition that created the capacity advantages, and the Xploderz *did* combine the as-claimed ammunition with the as-claimed projectile launcher, to be the first such SAP round blaster on the market. Mr. Brawer's testimony supports my opinions that the purchase-driving features of the Maya patent practicing products derived from the merits of the patented invention.

212. Nexus is further shown by the failure of others to commercialize toy products that projected SAP material but lacked the claimed inventions. For example, prior to the '282 and '683 Patents, Petitioner released a product called Goo Shooters that was a blaster that fired "goo" allegedly made of super absorbent polymer prior to the creation of the Xploderz invention.

213. The Goo Shooters did not practice the ’282 and ’683 Patents, including because they shot “blobs” of goo, and not, e.g., “a plurality of soft-projectiles having the same shape” (’282 claim 1) or “a plurality of substantially spherical soft-projectiles formed from hydrated super absorbent polymer (’683 claim 1), as Petitioner’s witness Francis Chia testified, EX2069(Chia Dep.) pp.109:21–110:4.

[redacted]

See also EX2069(Chia Dep.) pp.100:20–101:2:

[redacted]

214. This product did not practice the ’282 and ’683 Patents, and was also a failure in the marketplace, and was discontinued. EX2069(Chia Dep.) pp.107:21–108:9:

[redacted]

[redacted]

215. It was not until much later that when Petitioner decided to make an SAP blaster, Petitioner used Xploderz [redacted] in designing its product:

[redacted]

EX2069(Chia Dep.) p.91:1–18.

[redacted]

EX2069(Chia Dep.) p.97:4–19.

(vi) Arguable Unclaimed Features of Xploderz, or Unrelated Aspects Were Not the Impetus of Their Commercial Success

216. To the extent that Petitioner argues that the Xploderz contain unclaimed features that drove commercial success, I do not agree. The Xploderz essentially are the inventions recited the Common Maya Practiced Claims. The blaster devices with SAP ammunition practice the broadest claims, and the most narrow claim (e.g., ’282 claim 20 & ’683 claim 9) describes the Xploderz such that the Xploderzare the patented invention. Further, any allegedly unclaimed features across the blasters in my opinion are insignificant features insofar as it relates to the commercial success of the products, as noted below.

217. But to the extent that Petitioner argues that the Xploderz also contain some peripheral features that are not recited in the Common Maya Practiced Claims, those peripheral features have a relatively low level of significance compared to claimed features. Unlike the Common Maya Practiced Claims, these unclaimed features were not critical to the commercial success of the Xploderz.

218. As I explained above, the first Xploderz product line launched in 2011 and maintained the form factor of the launcher housing is the shape of a handheld weapon—namely, a gun—and the color scheme is bright blue and orange.

EX2033(CPX-0035) (Front)

219. The "toy" color scheme distinguishes the blaster product as a toy and not a real weapon. The gun shape and "toy" color scheme were ubiquitous in the 2010–2012 timeframe and did not distinguish the Xploderz from competitor products. Like Xploderz, most competitor blaster products had a weapon-like form factor paired with bright colors that signified them as toys. In my opinion, these

features did not differentiate Xploderz over competitor products and were not the drivers of commercial success, especially in a saturated market. Further, different Maya blasters had form factors shaped and sized to mimic different types of weapons, had slightly different ammunition carrying capacities, and slightly different firing distances, and changed the colors over the years. The "common" feature—the reason to embrace the product in the first place—was as described above the use of the as-claimed hydrated SAP ammunition with the as-claimed projectile launcher device. The fact that Maya Group rotated through these various unclaimed features [redacted], EX2032(Ben-Ezer Dep.) pp.228:21–232:15) confirms that these variations were not critical and were not driving commercial success of the Xploderz blasters overall.

220. Further, each blaster of the first generation Xploderz product line includes a manual loading mechanism.

EX2033(CPX-0035) (Front)

221. In my opinion, a manual loading step complicates the firing process and slows down the rate of fire, and I note that second generation product line removed this element. That fact, and that the first generation of Xploderz and that the second generation of Xploderz obtained similar commercial success supports my conclusion that this slider mechanism did not drive the commercial success of the product.

222. Similarly, the Xploderz product line included non-advertised internal safety mechanisms that prevent non-ammunition from being inserted in the blaster, such as by loading and firing objects other than the intended hydrated SAP ammunition rounds. The safety mechanisms made the products more complicated to use and less user-friendly, and were dropped in later versions of the product, and

in my view were not the drivers of commercial success. What was advertised instead was the safety of the ammunition, which was the hydrated super-absorbent polymer that required and recited in the claims.

223. Further, it is my opinion that the Xploderz did not enjoy a competitive advantage from commercial and economic factors unrelated to the practice of the '282 Patent.

224. First, Maya Group did not have a market position advantage, and in fact had quite the opposite. As I mentioned above, the Maya Group was relaunched as a toy company in mid-2009, less than two years before the official launch of Xploderz in 2011. Before Xploderz, Maya Group had no blaster product, such that the Xploderz brand was not known. The Maya Group faced additional headwinds from the fact that the blaster category of toys was heavily saturated with foam blasters, most of which were manufactured by industry giant Hasbro.

225. As noted above, Maya focused its marketing and advertising efforts on the patented claims, which were the aspects of the blaster that differentiated the product in the marketplace as noted above, EX2032(Ben-Ezer Dep.) p.100:1–19:

1 [redacted]

226. Mr. Ben-Ezer testified further that "

EX2032(Ben-Ezer Dep.) pp.104:12–106:6. And that is what the Maya Group advertised, including as noted above. As Mr. Bez-Ezer testified,

EX2032(Ben-Ezer Dep.) pp.103:18–104:2.

227. Moreover, I also find it significant that Maya's commercial success was in spite of problems that it had in perfecting its blasters. That is, Maya Group's

witness in the ITC investigation, Mr. Ben-Ezer, testified that [redacted] EX2032(Ben-Ezer Dep.) pp.176:9–177:15. And as noted below, Petitioner in the deposition of Mr. Ben-Ezer presented alleged negative reviews of the products. But despite the criticism and any challenges, the product was still [redacted]" due to, in Mr. Ben-Ezer's words what was [redacted] the blasters, as compared to what was known in the prior art. EX2032(Ben-Ezer Dep.) p.287:18–289:1. The fact that the products were successful with millions of dollars of sales despite Petitioner's arguments that they had shortcomings indicates how the market embraced the novel concept as claimed in the patents.

228. Mr. Brawer's testimony confirms my review of the Xploderz blasters that the common denominator across the blasters was practice of the Common Maya Practiced Claims. *See* EX2067(Brawer Dep.) pp.80:12–81:4 (stating that the Xploderz products were not "significantly different" from "the first generation of Xploderz to the generation that was being sold by the end of the product's lifetime" and that "I don't believe we fundamentally changed how the product worked in terms of, you know, compressed air.") To the extent that Petitioner would point to variability in the product line (e.g., blasters with shields, or a different color scheme, or "glow-in-the-dark ammunition", *see id.* pp.117:1–130:18, 135:16–139:2, 143:10–

148:21, 155:12–156:4), there is no evidence that such minor variations drove the commercial success of the Xploderz products.

229. To the extent that Petitioner would argue that marketing, advertising, or packaging—and not the claimed features—drove commercial success, I disagree. Mr. Brawer testified that Maya advertised the key features of the Xploderz in terms that the consumer would understand, and which in my opinion go to the heart of the merits of the claimed invention. *See, e.g.*, EX2067(Brawer Dep.) pp.56:2–22, 97:10–100:3. This testimony is consistent with my opinion that in its advertising and product packaging the Maya Group touted the benefits enabled by practicing the Common Maya Practiced Claims. Mr. Brawer further testified that all of the features of the product that Maya Group used to create excitement in its TV advertising were "directly linked to the use of SAPs as ammunition" in the Maya Group Products. EX2067(Brawer Dep.) pp.274:11–275:9. Mr. Brawer confirmed that the Maya Group's commercials highlighted increased distance and larger ammunition capacity, which are two benefits of practicing the Common Maya Practiced Claims. EX2067(Brawer Dep.) pp.62:12–64:4, 63:1–63:15, 274:11–17 ("Q. What were the features of the Xploderz product line that you promoted in the TV advertising to start to grow that brand awareness? A. [D]istance was by far the number 1, the fact that we shot farther. The amount of ammo that we could carry.").

230. My opinions regarding commercial success are also unchanged by Mr. Brawer's testimony that prior sales of Orbeez, Mr. Brawer's "contacts with buyers at retailers," or his "sales experience" helped Maya Group "place the new products" in stores. *Id*. pp.50:14–55:6. Getting the Maya Group Products "placed in stores" or distributed to retailers is not ultimately what made the Maya Group Products commercially successful in the dollar and volume quantities of units sold as I laid out in my Rebuttal report, and Mr. Brawer never said otherwise: the blaster product itself needed to sell. EX2067(Brawer Dep.) pp.270:1–18 ("I do want to say, in the end it's the consumer that decides."). As I explained above, the Maya Group Products sold extremely well because of the patented technology. The impressive sales of the Maya Group Products is even more remarkable when viewed in context of Mr. Brawer's testimony that, despite having previously sold Orbeez, the Maya Group had no meaningful brand recognition at the time the Xploderz were first placed in stores, and these blasters were sold as a "new brand" and not under the existing Orbeez name, such that target consumers at the start "wouldn't have known us at all." EX2067(Brawer Dep.) pp.272:4–275:12.

> Q. How much brand awareness was there for the Maya Group among boys 5 to 12 prior to the release of your Xploderz product line?
>
> A. So much like Hasbro or Mattel, Maya Group was never a promoted concept to kids or to the consumer. I don't even know if today there's

any kids who know what Maya Group is. So we only -- all our energy was focused on presenting our brands. So at the time, the Maya Group's biggest brand was Orbeez. And we may have been known for Orbeez amongst kids that age, in particular girls. **But girls don't even know what Maya Group is. No one outside of the profession knows what Maya Group is**.

Q. Would it be fair to say that for a boy standing in that 24-foot-long Blaster aisle at Target who's looking to select a product to purchase and they see this new Xploderz product side by side with a NERF product, is it fair to say that you're competing not only against the merits of the product itself, but also against the market awareness of the NERF brand in trying to convince that boy to purchase your product instead of the NERF product?

A. Absolutely. The child -- I think if you're asking -- the child knows NERF in most cases. I would imagine -- they call it a Q score. Your brand awareness among your target consumer was probably very high in NERF -- not probably -- it was very high in NERF. Boys, by the time they're 7, 8, 9 years old, are familiar with NERF. **As a new brand in that section, they wouldn't have known us at all**. And you're overwhelmed. I mean, you might have 18 -- of that 24-feet, 20 of it or 18 of it might be NERF, and you might have three or four boxes on the shelf. So how do you make those three or four boxes seem meaningful against a sea of NERF?

EX2067(Brawer Dep.) pp.272:4–273:19.

231. Mr. Brawer's testified about alleged features of certain Xploderz blasters, including the "tripod" stand of the XRanger 2000; the "glow-in-the-dark ammunition"; the "crossbow" design form of the X2 Long Bow 1500; the ability of the barrel in the Sneak Attack X3 to "turn 90 degrees"; the "Select-a-Shot" feature in the X3 blasters; the "girl[-oriented] aesthetic" of the Huntress blaster, and the "shield" in the Cobra Shield blaster. EX2067(Brawer Dep.) pp.117:1–130:18, 135:16–139:2, 143:10–148:21, 155:12–156:4. To the extent that Petitioner may argue that these alleged features were the impetus of the commercial success of the Maya Group Products, I disagree. Mr. Brawer never testified that these features were a primary driver of the commercial success of the Maya Group Products. Instead, Mr. Brawer agreed that "the primary driver of demand was the long distance capability" enabled by practicing the Common Maya Practiced Claims. *See* EX2067(Brawer Dep.) pp.291:20–293:20. Indeed, Mr. Brawer testified that the use of SAPs as ammunition was "the foundation of the line." *Id.* p.293:16–20.

232. Mr. Brawer confirmed that Xploderz was "absolutely" competing against the NERF brand, and that to distinguish its blasters, Maya focused on communicating to the consumer the increased distance and ammo enabled by the patent-practicing Xploderz blasters as compared to other blasters in the market, i.e., "distance was by far the number 1, the fact that we shot farther. The amount of ammo we could carry." EX2067(Brawer Dep.) pp.272:18–273:19. Mr. Brawer also

confirmed that "all of the features of the product that [Maya] used to create excitement in [Maya's] TV advertising were directly linked to the use of SAPs as ammunition in [the Xploderz] projectile launcher." EX2067(Brawer Dep.) pp.272:18–273:19.

233. Further, Mr. Brawer confirmed that Xploderz was commercially successful despite not using features like a trigger or stored energy or automatic fire that was present in Maya Group's other blasters in the Blaster Pro line. Indeed, a difference between the Xploderz products and Blaster Pro products was that, unlike the Xploderz products, the Blaster Pro line included blasters that used a trigger, relied on stored energy, and provided automatic fire. EX2067(Brawer Dep.) p.158:6–11. But Mr. Brawer testified that to the best of his recollection, at the time he left Maya Group in 2014 the Blaster Pro products had not outsold the Xploderz products. *Id*. pp.158:6–160:7. Thus, the evidence does not show that the use of a trigger, stored energy, or automatic fire was driving Blaster Pro sales over the use of the patented features. Rather, it was the common thread between the Blaster Pro and Xploderz products that led to the success of these products, *i.e.*, the combination of the blaster mechanism as-claimed and the ammunition as-claimed.

234. Further, the competitive Nerf options discussed in the focus group discussed by Mr. Brawer also had triggers and other unclaimed features. For example, "[w]hen pit against comparable Nerf products, nearly every child preferred

Blasterz"; a comparative example given was the Nerf Deploy CS-6. EX2067(Brawer Dep.) pp.269:8–270:7. From my own review of videos depicting the Nerf Deploy CS-6 from 2010 (*e.g.*, https://www.youtube.com/watch?v=fX7AV7p9spY), the Nerf Deploy CS-6 includes a trigger for the user to fire a round, and had other unclaimed features, including color and shape differences. This further supports my view that what distinguished the Xploderz in the marketplace were the patented features that I have discussed above.

G. Petitioner's Alleged Simultaneous Invention Evidence Lacks Key Claim Features

235. I understand that Petitioner identifies two alleged simultaneous inventions: (1) KR20-2010-0004855 ("Kim," EX1022); and (2) a YouTube video showing Spitballs posted by a user named Vat19 ("Vat19," EX1023). *See* Pet.(01348) pp.57–60; Pet.(01339) pp.57–60; Pet.(01461) pp.53–56. Having reviewed Petitioner's evidence, I disagree that it shows simultaneous invention of any challenged claim.[8]

236. Starting with Kim (EX1022), this Korean patent document does not disclose hydrated super absorbent polymers (SAPs), a requirement of every claim at

[8] Again, I understand that claims 2–3, 5–15, 17, and 19–21 of the '282 Patent are challenged as obvious; claims 4–9, 12, and 14 of the '683 Patent are challenged as obvious; and claims 1–2, 13, and 15–20 of the '255 Patent are challenged as obvious.

issue in the Challenged Patents. Kim merely discloses a "gel" projectile and makes no mention at all of SAPs. Additionally, the "gel or gel material" Kim envisioned is some sort of "a cleaning substance," (EX1022 p.8 (claim 1)), which is quite different from SAPs.

237. Nevertheless, Petitioner says "Kim broadly covers all gel materials." Pet.(01348) p.58; Pet.(01339) p.58; Pet.(01461) p.54. I disagree. First, Kim never says "all gel materials." That characterization by Petitioner has no basis in Kim's text, and it makes little sense that Kim's generic identification of a "gel" could somehow disclose all of the many different types of gels in the world.[9] Additionally, it is unreasonable to suggest that a POSITA could have somehow gleaned the Challenged Patents' hydrated SAPs from Kim's sparse disclosure a "gel or gel material" formed from a "cleaning substance." Kim does not mention hydrating his disclosed gel, and I am not aware of any record evidence linking SAPs to substances used for cleaning in the manner Kim describes.

238. I do not see how Kim can be said to have invented the same inventions simultaneously with the inventors of the Challenged Patents if Kim did not even disclose the idea of SAP ammunition. If anything, the fact someone like Kim

[9] To illustrate, in my work involving culinary applications of rheology, I have encountered many different types of gels based on different types of polymers, e.g., polysaccharides, protein, gum, starch, mucilage, pectin, alginin, agar, carrageenan, etc. And this is just one narrow example. Numerous other types of gels are used in other applications and contexts.

considering a "gel or gel material" for use as "toy bullets," (EX1022 p.8 ([0001], p.9 [0003]), still did not arrive at the notion of SAP ammunition supports that the Challenged Claims were, indeed, nonobvious.

239. As for the Vat19 reference (EX1023), that video only shows a Spitball being blown out of a tube (see below).

EX1024. Even assuming for sake of argument that Spitballs are made from SAPs, Vat19 is still missing many other claim elements of the Challenged Patents, including the projectile launcher limitations of a feed chamber, a magazine, a barrel, or a firing mechanism, just to name a few. And, in fact, Petitioner does not allege that Vat19 includes the combined limitations of any claim at issue in the Challenged Patents. Again, I do not see how Vat19 can be said to have invented the same inventions simultaneously with the inventors of the Challenged Patents without disclosing all of the claimed features. If combining the as-claimed SAP ammunition

with the as-claimed projectile launchers was so obvious and easy to accomplish, surely the Vat19 video would have demonstrated that technology. But it does not.

X. CONCLUSION

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

Executed this 6th day of December, 2024.

Barry Matthew Kudrowitz

APPENDIX 1

[redacted]

UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.

Before The Honorable MaryJoan McNamara
Administrative Law Judge

In The Matter Of CERTAIN SOFT PROJECTILE LAUNCHING DEVICES, COMPONENTS THEREOF, AMMUNITION, AND PRODUCTS CONTAINING SAME	Inv. No. 337-TA-1325

APPENDIX 1
TO THE REBUTTAL EXPERT REPORT OF DR. BARRY MATTHEW KUDROWITZ
REGARDING U.S. PATENT NOS. 8,371,282 AND 8,640,683

[redacted]

1. In this appendix to my rebuttal expert report, I set forward my opinions relating to the practice of asserted patent claims by third party products, which is relevant to my opinions about "objective indicia of non-obviousness" in response to the opening report of Mr. Joel Delman.

2. As explained below, it is my opinion that Xploderz products satisfy each and every limitation of claims 8, 19, and 20 of the '282 patent, and claims 1, 5, and 11 of the '683 patent. In addition, I also show how this product practices the "parent" '282 patent claim 1. In addition, second generation and later of the Xploderz practice claim 14 of the '282 patent, and the Blaster Pro practice all of those claims and claim 6 of the '683 patent.

3. As I noted in my main report, the blasters that I have been able to test physically (or where I have tested the same blaster packaged with a different quantity of ammunition) are marked below in bold. For the remaining items, I have reviewed images and website materials as noted below.

First Generation Blasters with Ammunition		
"XBlaster Products" [1]	45102 / 45202	**XBlaster 200 (aka Xploderz 200)**
	45103 / 45203	**Face-off 400 (two XBlaster 200s)**
	45111	**XBlaster 450 (Kohl's)** **(XBlaster 200 with 250 extra ammo)**
	45206	**XBlaster 700 (Big Lots)** **(XBlaster 200 with 500 extra ammo)**
"XStormer Products"	45104 / 45204	**XStormer 1000**
	45210	**XStormer 1000 with Bonus 500 Ammo**
"XRanger Products"	45105 / 45205	**XRanger 2000 aka Long Ranger 2000**
"XGround Pounder Product"	45112	**XGround Pounder 2000**
"XBow Product"	45212	XBow 1500

[1] As noted above, I understand from the testimony of Maya Group's witness, Oded Ben-Ezer, that the Face-Off was "two XBlasters in the pack." Ben-Ezer Dep. 153:4-16, 272:11-16. I understand further that "the XBlaster 450 [was] the same as the XBlaster 200 but with 250 more rounds of ammunition" and that the "XBlaster 700 [was] just an XBlaster 200 but with 500 additional rounds of ammunition." Ben-Ezer Dep. 273:8-20.

[redacted]

"XMagnum Product"	45208	XMagnum 700 (6-pack)

Second Generation Blasters with Ammunition		
"X2 Invader Products"	46000	**X2 Invader 700**
	46001	**X2 Invader with 300 extra ammo**
	46015	**X2 Face-off 1400 (two X2 Invaders)**
"X2 Mauler Product"	46005	**X2 Mauler 1000**
"X2 Retaliator Product"	46010	**X2 Retaliator 2000**
"X2 XBow Product"	46020	X2 XBow 1500
"Night Fighterz Products"	46510	**Night Fighterz Gen-700**
	46520	Night Fighterz SuperGen-1000

Blaster Pro Blasters with Ammunition		
"Blaster Pro Products"[2]	49103	**Blaster Pro Pump Action 2500**
	49107	Blaster Pro Pump Action (Toys R Us)
	49104	**Blaster Pro Full Auto 5000**

Third Generation Blasters with Ammunition		
"X3 Products"[3]	46025	**X3 Invader**
	46035	**X3 Faceoff 2 pack (two X3 Invaders)**
	46040	**X3 Equalizer**
	45215	**X3 Sneak Attack**

Fourth Generation Blasters with Ammunition		
"Firestorm Products"[4]	45225	**Firestorm Series Stinger**

[2] While I chart the Blaster Pro Full Auto below, I inspected and confirmed that the Pump Action 2500 uses a spring-piston mechanism and SAP ammunition.

[3] I understand that there are additional X3 Products, including the X3 Retaliator, Punisher and Huntress and Night Fighertz Gen-200 and Night Fighterz 2 Pack, that appear visually to be similar to other items I have inspected, but for which I have not been able to access physical samples. HASBRO-ITC-00111599; Ben-Ezer Dep. 180:3-6. I have listed the items that I have personally inspected. While I chart the X3 Invader below, I inspected and confirmed that the Equalizer and Sneak Attack use the same internal mechanism spring-piston mechanism and SAP ammunition.

[4] I understand that there are additional Firestorm Products, including the Mayhem and Renegade. HASBRO-ITC-00111620; Ben-Ezer Dep. 185:16-186:1. I have listed the items that I have

[redacted]

	45235	**Firestorm Series Savage Shield**
	45240	**Firestorm Series Cobra Shield**
	45245	**Firestorm Series QuickDraw 2 Pack**
Ammunition Products		
"Ammo Products"	45101	**Ammo Refill Pack**
	45106	**Ammo Battle Pack 1000**
	45107	Ammo Pack 500 Ready to Use
	45114	**Ammo Depot 1000**
	45115	**Mega Pack 1500**
	46505	**Night Fighterz Refill 500**
	46525	**Night Fighterz Battle Blowout**
	45118	**Ammo Depot 1000 Red**
	45119	Ammo Depot 1000 Orange
	45120	**Ammo Refill 500 Red**
	45121	Ammo Refill 500
	45122	Ammo Refill 300
"Blaster Pro Ammo Products"	49101	Blaster Pro 2500 Ammo
	49102	**Blaster Pro 6000 Ammo**

4. Indeed, the internals of the blasters remained remarkably consistent across the product line. Further, the internals of the first generation of Xploderz blaster (e.g., XBlaster) largely resembles Figure 2 of the patent.

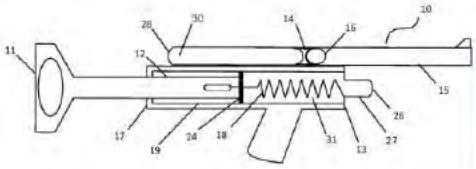


FIG. 2

HASBRO-ITC-00001088; HASBRO-ITC-PHYS_00036; HASBRO-ITC-PHYS_00073

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personally inspected. While I chart the Firestorm Stinger below, I inspected and confirmed that the Savage Shield, Cobra Shield, and QuickDraw 2 Pack use the same internal mechanism spring-piston mechanism and SAP ammunition.

[redacted]

A. '282 Patent

a) Claim 1: Ammunition configured for use with a projectile launcher comprising: a plurality of soft-projectiles having the same shape, each soft projectile being formed from hydrated super absorbent polymer.

i. Claim 1[pre]: Ammunition configured for use with a projectile launcher comprising:

5. I first note there is a claim construction dispute regarding this term as I discuss in my opening report and as reflected below. As I discuss in my opening report earlier, the outcome of this dispute does not change my opinion.

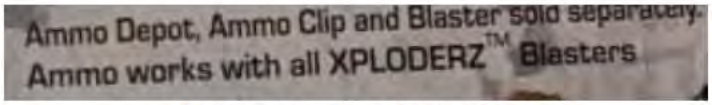
Complainants' Construction	Respondents' Construction	Staff's Construction
"ammunition configured for use with a projectile launcher"		
Limiting	Preamble of claim 1 is not limiting as to claims 6, 8, 13, 14, 15, 17, 19, 20, and 21 Preamble of claim 1 is limiting for dependent claim 3	Limiting

6. Both Xploderz Ammo and Blaster Pro Ammo (including the Ammo Products and Blaster Pro Ammo Products, as well as the ammunition that comes with each of the Xploderz and Blaster Pro blasters) is ammunition configured for use with a projectile launcher. Xploderz Ammo is designed to be used with, sold with, and used with the Xploderz blasters. Similarly, the Blaster Pro Ammo is designed to be used with, sold with, and used with the Blaster Pro blasters.[5] For example, the Xploderz Ammo states that "Ammo works with all XPLODERZ™ Blasters." *See,*

[5] All the the Ammo products (e.g., refills) has directions stating the ammo is intended to be used in the Xploderz and Blaster Pro products that practice '282 and '683 patent claims as laid out herein.

[redacted]

e.g., HASBRO-ITC-PHYS_00044; *see also* HASBRO-ITC-PHYS_00041-HASBRO-ITC-PHYS_00043; HASBRO-ITC-PHYS_00055; HASBRO-ITC-PHYS_00062; HASBRO-ITC-PHYS_00074; see also HASBRO-ITC-PHYS_00032-69; HASBRO-ITC-PHYS_00072-74. Similarly, warning labels on the products "caution[ed]" to "use only ammo designed for this product." *See, e.g.*, HASBRO-ITC-PHYS_00044 & *id.* Similarly, the Blaster Pro instructions included the caution to "use only ammo designed for this product." HASBRO-ITC-PHYS_00062, 64.



HASBRO-ITC-PHYS_00044

HASBRO-ITC-PHYS_00035 (extract)

HASBRO-ITC-PHYS_00042 (extract)

7. The Xploderz blasters and Blaster Pro blasters are all projectile launchers, and specifically launch (respectively) the Xploderz and Blaster Pro ammunition:

First Generation Blasters with Ammunition

[redacted]

"XBlaster Products"	 HASBRO-ITC-PHYS 00032, 35, 36
"XStormer Products"	 HASBRO-ITC-PHYS 00033, 38
"XRanger Products"	 HASBRO-ITC-PHYS 00037
"XGround Pounder Product"	 HASBRO-ITC-PHYS 00047

[redacted]

"XBow Product"	 HASBRO-ITC-00111616
"XMagnum Product"	 HASBRO-ITC-00111616

Second Generation Blasters with Ammunition	
"X2 Invader Products"	 HASBRO-ITC-PHYS_00040; *see also* HASBRO-ITC-PHYS_00052, 39.

[redacted]

"X2 Mauler Product"	 HASBRO-ITC-PHYS_00034; *see also* HASBRO-ITC-PHYS_00063.
"X2 Retaliator Product"	 HASBRO-ITC-PHYS_00048.
"X2 XBow Product"	 HASBRO-ITC-00111618
"Night Fighterz Products"	 HASBRO-ITC-PHYS_00049; *see also* HASBRO-ITC-PHYS_00050, 51.

[redacted]

Third Generation Blasters with Ammunition	
"X3 Products"	 HASBRO-ITC-PHYS_00067; *see also* HASBRO-ITC-PHYS_00053, 54, 65, 68.

Fourth Generation Blasters with Ammunition	
"Firestorm Products"	 HASBRO-ITC-PHYS_00073; *see also* HASBRO-ITC-PHYS_00056, 57, 58, 66, 69.

Blaster Pro Blasters with Ammunition	
"Blaster Pro Products"	 HASBRO-ITC-00111578 HASBRO-ITC-PHYS_00061; see also HASBRO-ITC-PHYS_00059, 60, 61,

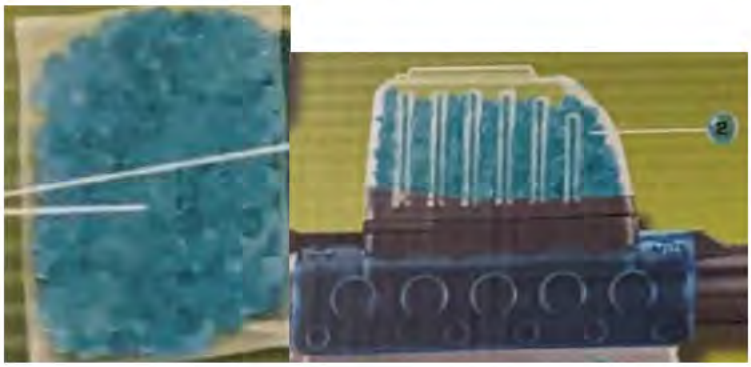
[redacted]

	64, 62.

i. ii. Claim 1[a]: a plurality of soft-projectiles having the same shape

8. Further, the Xploderz Ammunition and Blaster Pro Ammunition are, when used in hydrated form or when hydrated as instructed, a plurality of soft-projectiles with the same shape, i.e., spherical when hydrated. See HASBRO-ITC-PHYS_00044; see also HASBRO-ITC-PHYS_00041-HASBRO-ITC-PHYS_00043; HASBRO-ITC-PHYS_00055; HASBRO-ITC-PHYS_00062; HASBRO-ITC-PHYS_00074:

HASBRO-ITC-PHYS_00035 (extracts)



[redacted]

HASBRO-ITC-PHYS_00064 (extracts)

HASBRO-ITC-PHYS_00062 (extract)

9. For example, the Xploderz and Blaster Pro blasters shipped with a plurality of ammunition and ammunition clip. Ben-Ezer Dep. at 281:6-8. The ammo clip that is part of the the XBlaster 200, for example, holds approximately 75 rounds as pictured above, a plurality. HASBRO-ITC_PHYS_00035. The ammo clip used on the Blaster Pro Products holds approximately 175 rounds, a plurality. HASBRO-ITC-PHYS_00064.

10. When hydrated, the Xploderz and Blaster Pro ammunition become soft-projectiles. They are soft to the touch and break apart upon impact, *see* HASBRO-ITC-00111584 (website for Xploderz describing the ammutiion as "soft enough to disintegrate on impact"); HASBRO-ITC-PHYS_00064 (text on package saying Blaster Pro "ammo disintegrates on impact!").

11. From my own review of the instructions and hydration of Xploderz and Blaster Pro rounds produced in this case, I further confirm that as the packaging indicates, the ammunition consists of a plurality of soft-projectiles having the same shape. See, e.g., HASBRO-ITC-PHYS_00041, HASBRO-ITC-PHYS_42, HASBRO-ITC-PHYS_43, HASBRO-ITC-PHYS_44, HASBRO-ITC-PHYS_45, HASBRO-ITC-PHYS_46, HASBRO-ITC-PHYS_55, HASBRO-ITC-PHYS_62.

[redacted]

i. iii. Claim 1[b]: each soft projectile being formed from hydrated super absorbent polymer.

12. I note there is a claim construction dispute regarding this term as reflected below. As I noted earlier, the outcome of this dispute for any proposal where a construction is actually offered does not change my opinion.

Complainants' Construction	Respondents' Construction	Staff's Construction
"super absorbent polymer"		
Plain and ordinary meaning, i.e., "polymer that can absorb an extremely large amount of liquid relative to its own mass"	PTT and SplatRBall: No construction necessary; term of art known to those skilled in the art at the time of the alleged invention Gel Blaster: Indefinite	No construction necessary; term of art known to those skilled in the art at the time of the alleged invention

13. As noted below, each of the Xploderz Products and Blaster Pro Products included hydrated ammunition and/or ammunition with instructions directing the user to hydrate ammunition, and in doing so, satisfy the limitation of soft-projectiles are formed from hydrated super absorbent polymer. *See, e.g.*, HASBRO-ITC-00111575-HASBRO-ITC-00111582; HASBRO-ITC-00111584; HASBRO-ITC-00111595-HASBRO-ITC-00111601; HASBRO-ITC-00111610-HASBRO-ITC-00111624. See also, e.g., HASBRO-ITC-PHYS_00032-HASBRO-ITC-PHYS_00069, 72-74 (exemplary physical exhibits). As noted below, ammunition in the dehydrated state must be hydrated before firing from the blaster (otherwise they are too small to fire), according the instructions on the website and enclosed with the blasters. The hydration process involves soaking the SAP ammunition in water, such that "water is absorbed into the spaces between the molecules." HASBRO-ITC-00111582; Ben-Ezer Dep. at 280:2-21.

[redacted]

14. For example, the "FAQ" section of the website for the Xploderz Products (HASBRO-ITC-00111582) stated that "the ammo is a superabsorbent polymer" and the website (HASBRO-ITC-00111584) and Xploderz Products gave instructions to hydrate the ammo:

- **How does Xploderz Ammo grow?**
  - The ammo is a superabsorbent polymer. It consists of many cross-linked molecules bonded together. Water is absorbed into the spaces between the molecules.

HASBRO-ITC-00111582 (extract, highlighting added)

Make your own Xploderz Ammo in two ways:

In the Ammo Clip (Available with XBlaster 200 and Face Off 400)

Watch how to grow your ammo in the Ammo Clip here:

In the Ammo Depot (Available with XStormer 1000 and XRanger 2000)

HASBRO-ITC-00111584 (extract)

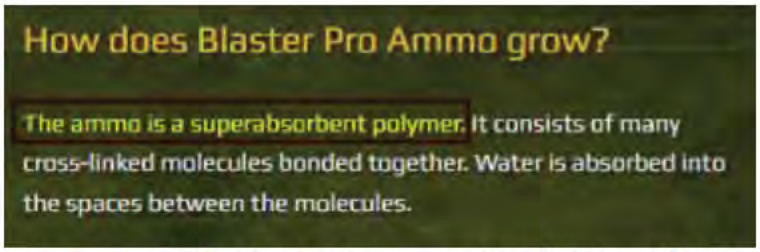
HASBRO-ITC-PHYS_00035 (extract)

15. The corporate witness of the Maya Group, Mr. Oded Ben-Ezer, also testified that

[redacted]

16. all Xploderz ammo was made of super absorbent polymer, "including all the different colors of the ammo" for all Xploderz products. Ben-Ezer Dep. at 280:2-281:8.

17. Similarly, The "FAQ" section of the website for the Blaster Pro products (HASBRO-ITC-00111578) stated that "the ammo is a superabsorbent polymer" and the Products similarly gave instructions to hydrate the ammo:



HASBRO-ITC-00111578 (extract, highlighting added)

HASBRO-ITC-PHYS_00064; *see also* HASBRO-ITC-PHYS_00062.

18. Further, I understand Dr. Fuller also investigated whether the Xploderz and Blaster Pro ammunition are made of hydrated super absorbent polymer when hydrated as instructed. Based on Dr. Fuller's investigation, I further understand the Xploderz Ammunition and Blaster Pro Ammunition are formed from hydrated super absorbent polymer and further rely on Dr. Fuller's rebuttal report. Fuller Rebuttal Rpt. at § V. In particular, Dr. Fuller found that the dehydrated Xploderz and Blaster Pro Ammunition could absorb well in excess of 10 times the amount of water relative to their own mass when the instructions were followed, thereby satisfying the limitation of "each soft projectile being formed from hydrated super absorbent polymer."

[redacted]

b) **Claim 4: The ammunition of claim 1, wherein the soft-projectiles are substantially spherical.**

c) **Claim 6: The ammunition of claim 4, wherein the soft-projectiles have a diameter greater than about 4 mm and less than about 9 mm.**

19. I address these claims together. Each of the Blaster Pro Ammo Products and Blaster Pro Products comprise the ammunition of claim 1 and 4, wherein the soft-projectiles used in the Blaster Pro devices is substantially spherical when hydrated:

HASBRO-ITC-PHYS_00064 (extracts)

HASBRO-ITC-PHYS_00062 (extract)

20. I further note that the Blaster Pro rounds are advertised to be 8mm on the box.

HASBRO-ITC-PHYS-00064

[redacted]

21. Further, I understand Dr. Fuller also investigated whether the Blaster Pro ammunition has a diameter greater than about 4 mm and less than about 9 mm when hydrated as instructed. Based on Dr. Fuller's investigation, I further understand the Blaster Pro Ammunition does, and further rely on Dr. Fuller's rebuttal report. Fuller Rebuttal Rpt. at § V.

d) Claim 8: A projectile launcher including the ammunition of claim 1 disposed within a feed chamber of the projectile launcher, and wherein the projectile launcher is adapted to load a soft-projectile from the feed chamber to a firing position.

22. I have inspected the items described above and confirmed that each of the Xploderz blasters and the Blaster Pro blasters comprises a projectile launcher including the ammunition of claim 1 disposed within a feed chamber of the projectile launcher, and wherein the projectile launcher is adapted to load a soft-projectile from the feed chamber to a firing position.

23. Each of the Xploderz and Blaster Pro Ammo products are intended to be disposed within the feed chamber of the respective projectile launcher. E.g.:

HASBRO-ITC-PHYS_00042. *See also* HASBRO-ITC-PHYS_00044, HASBRO-ITC-PHYS_00074, HASBRO-ITC-PHYS_00043, HASBRO-ITC-PHYS_00041, HASBRO-ITC-PHYS_00046, HASBRO-ITC-PHYS_00045, HASBRO-ITC-PHYS_00055; HASBRO-ITC-PHYS_00032-69; HASBRO-ITC-PHYS_00072-74.

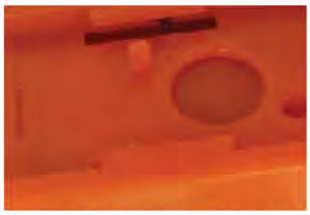
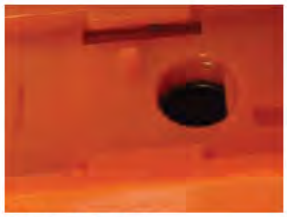
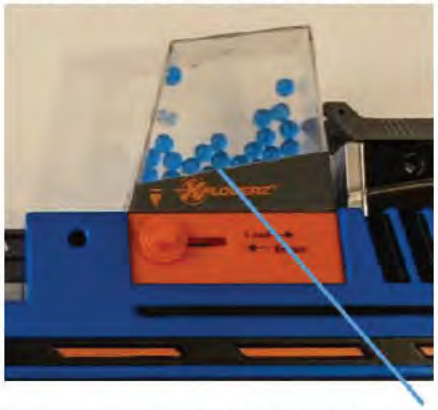
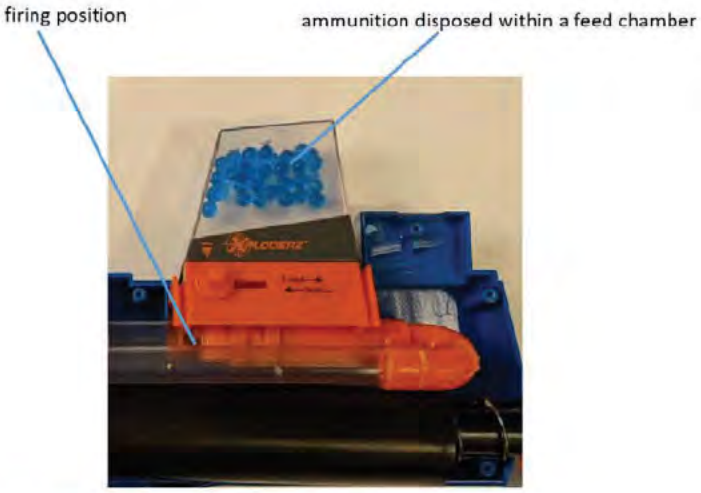
[redacted]

HASBRO-ITC-00111578; *See also* HASBRO-ITC-PHYS_00059-61, 64.

24. Each of the Xploderz and Blaster Pro blaster products comes with ammunition and instructions to place the ammunition of claim 1 within a feed chamber of the projectile launcher. HASBRO-ITC-PHYS_00032-69; HASBRO-ITC-PHYS_00072-74. Further, each Xplozerz and Blaster Pro blaster is adapted to load a soft-projectile from the feed chamber to a firing position, so that it may be launched; after the loading, the soft-projectile is located at the firing position ready for firing, including as shown below.

First Generation Blasters with Ammunition	
"XBlaster Products"	 the ammunition is disposed within a feed chamber of the projectile launcher feed chamber firing position

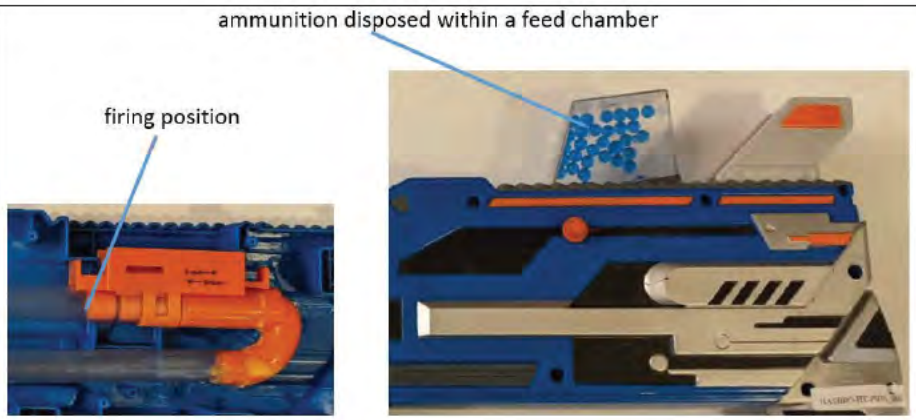
[redacted]

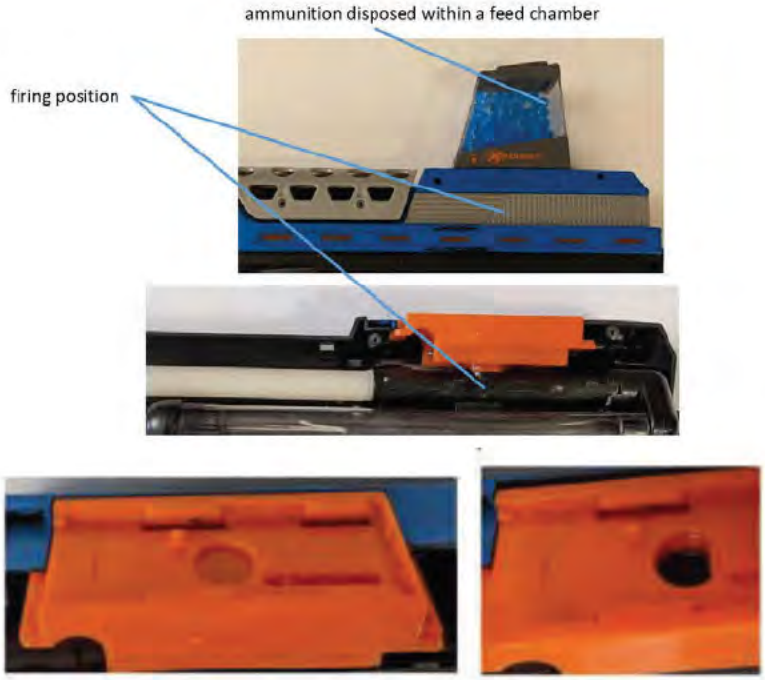
	    HASBRO-ITC-PHYS 00032, 35, 36
"XStormer Products"	 the ammunition is disposed within a feed chamber of the projectile launcher 

[redacted]

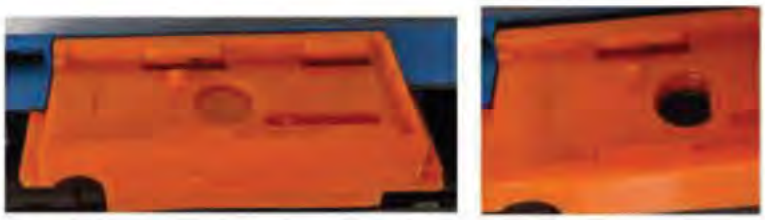
	HASBRO-ITC-PHYS_00038; *see also* HASBRO-ITC-PHYS_00033.
"XRanger Products"	 the ammunition is disposed within a feed chamber of the projectile launcher firing position ammunition disposed within a feed chamber HASBRO-ITC-PHYS_00037
"XGround Pounder Product"	 the ammunition is disposed within a feed chamber of the projectile launcher

[redacted]

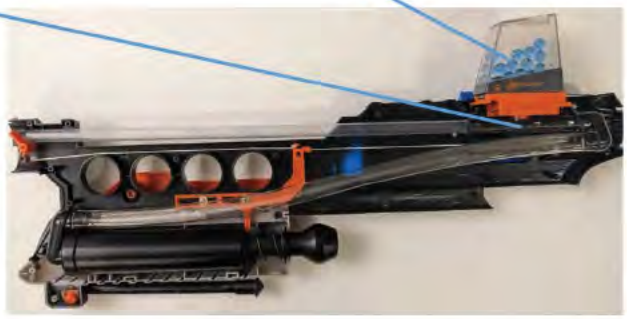
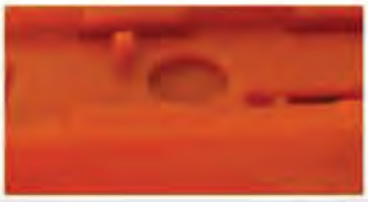
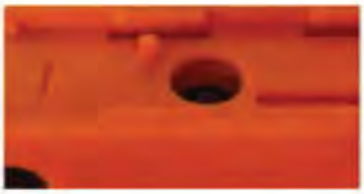
	 HASBRO-ITC-PHYS 00047

Second Generation Blasters with Ammunition	
"X2 Invader Products"	 the ammunition is disposed within a feed chamber of the projectile launcher 

[redacted]

	HASBRO-ITC-PHYS_00040; see also HASBRO-ITC-PHYS_00052, 39.
"X2 Mauler Product"	 the ammunition is disposed within a feed chamber of the projectile launcher  HASBRO-ITC-PHYS_00034; *see also* HASBRO-ITC-PHYS_00063.

[redacted]

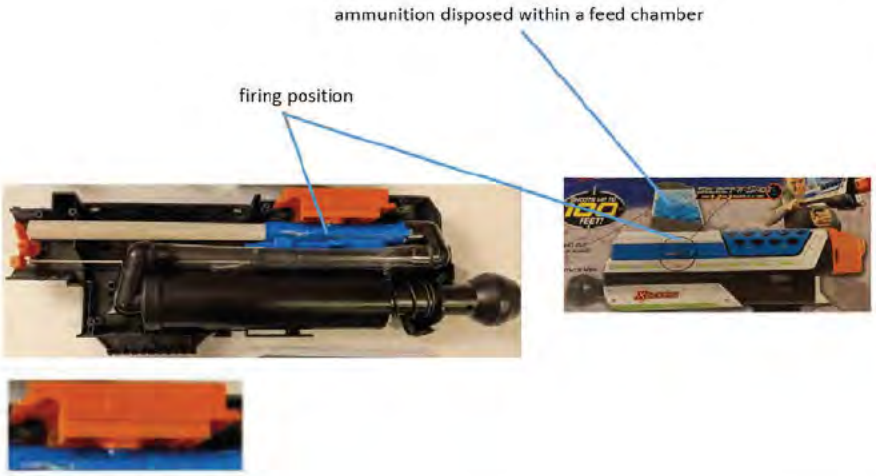
"X2 Retaliator Product"	 the ammunition is disposed within a feed chamber of the projectile launcher ammunition disposed within a feed chamber firing position    HASBRO-ITC-PHYS_00048.
"Night Fighterz Products"	 the ammunition is disposed within a feed chamber of the projectile launcher

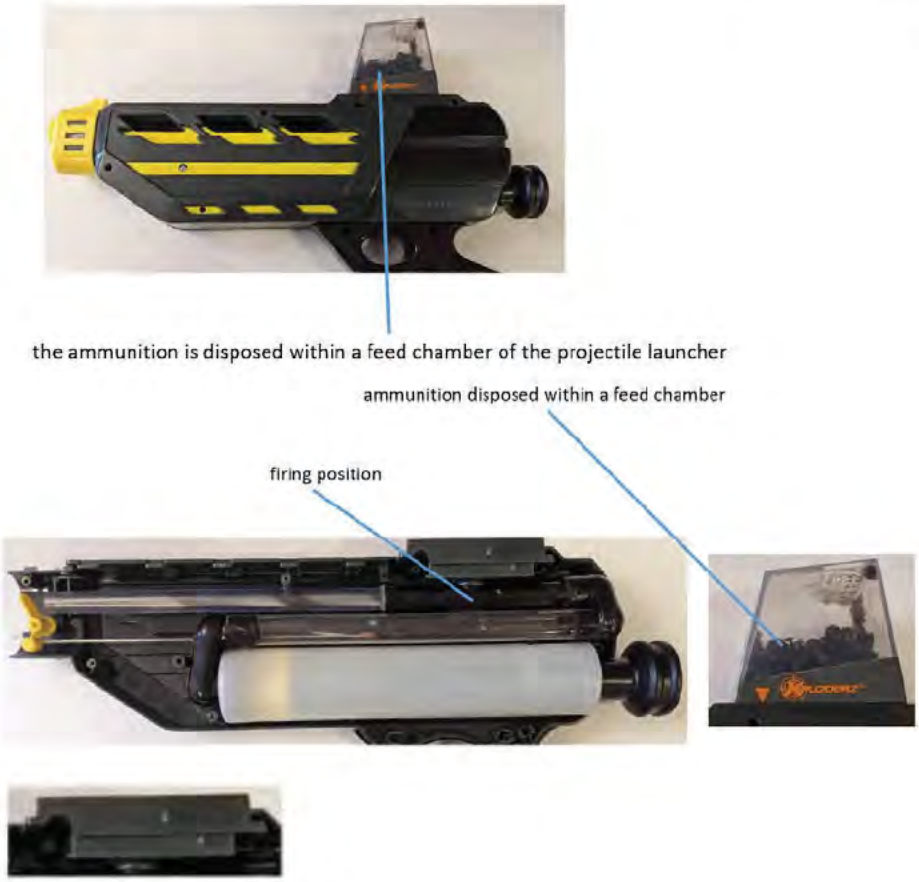
[redacted]

	 HASBRO-ITC-PHYS_00049; *see also* HASBRO-ITC-PHYS_00050, 51.

Third Generation Blasters with Ammunition	
"X3 Products"	 the ammunition is disposed within a feed chamber of the projectile launcher

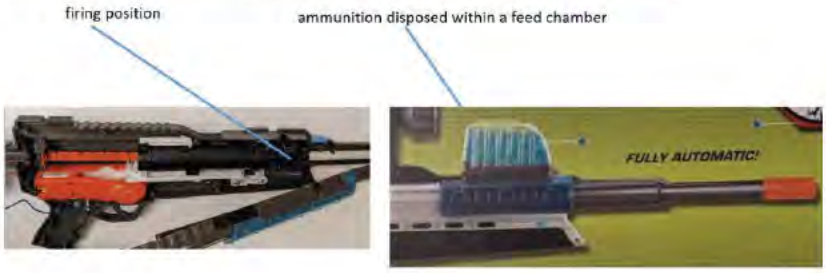
[redacted]

	 HASBRO-ITC-PHYS_00067; *see also* HASBRO-ITC-PHYS_00053, 54, 65, 68.

Fourth Generation Blasters with Ammunition	
"Firestorm Products"	

[redacted]

	HASBRO-ITC-PHYS_00073; *see also* HASBRO-ITC-PHYS_00056, 57, 58, 66, 69.

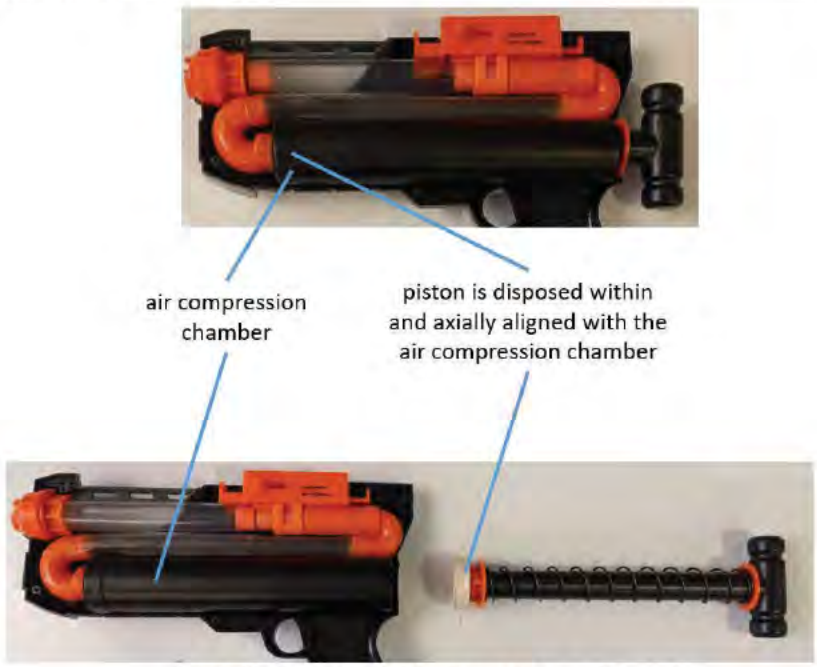
Blaster Pro Blasters with Ammunition	
"Blaster Pro Products"	 HASBRO-ITC-00111578  HASBRO-ITC-PHYS_00061; *see also* HASBRO-ITC-PHYS_00059, 60, 61, 64, 62.

e) Claim 19: The projectile launcher of claim 8, further comprising: an air compression chamber; a piston disposed within and axially aligned with the air compression chamber; and a spring operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber.

25. I have inspected the items described above and confirmed that each of the Xploderz blasters and the Blaster Pro blasters further comprising: an air compression chamber; a piston disposed within and axially aligned with the air compression chamber; and a spring operatively

[redacted]

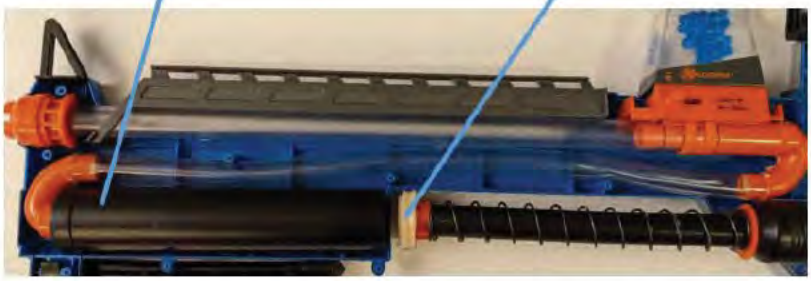
arranged to bias the piston toward a rest position from a cocked position within the air compression chamber, as depicted below. Each of the Xploderz products has the same essential design practicing this claim, wherein the piston extended in a cocked position (with compressed spring) is biased toward a rest position within the air compression chamber in order to launch the soft projectile:

First Generation Blasters with Ammunition	
"XBlaster Products"	 *(partially disassembled to show piston and spring)*

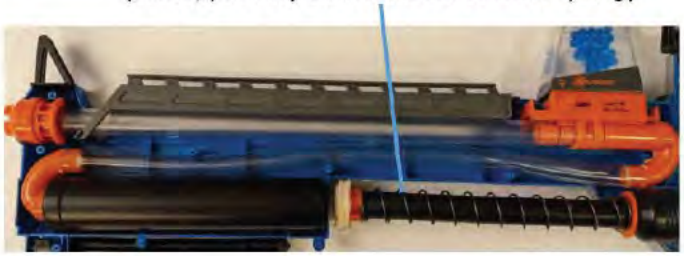
[redacted]

	  spring (*enclosed in housing above*) operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber (*below, partially disassembled to show spring*) HASBRO-ITC-PHYS 00032, 35, 36
"XStormer Products"	 air compression chamber piston (*hidden above*) is disposed within and axially aligned with the air compression chamber (*partially disassembled to show piston and spring*)

[redacted]

	  spring (*enclosed in housing above*) operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber (*below, partially disassembled to show spring*) HASBRO-ITC-PHYS 00038; *see also* HASBRO-ITC-PHYS 00033.
"XRanger Products"	 air compression chamber piston (*hidden above*) is disposed within and axially aligned with the air compression chamber  (*partially disassembled to show piston and spring*)

[redacted]

	  spring (*enclosed in housing above*) operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber (*below, partially disassembled to show spring*)  HASBRO-ITC-PHYS_00037
"XGround Pounder Product"	 air compression chamber piston (*hidden above*) is disposed within and axially aligned with the air compression chamber (*partially disassembled to show piston and spring*)

[redacted]

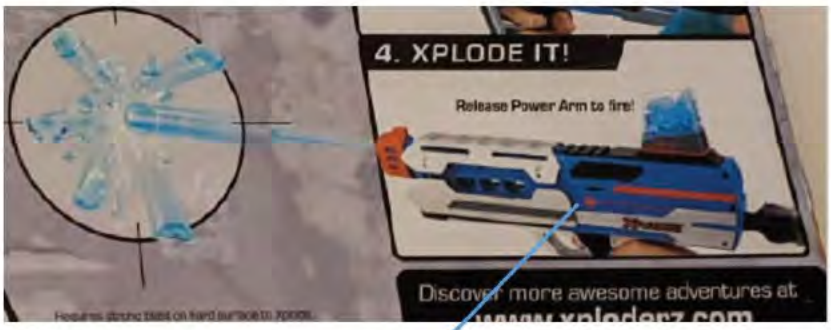
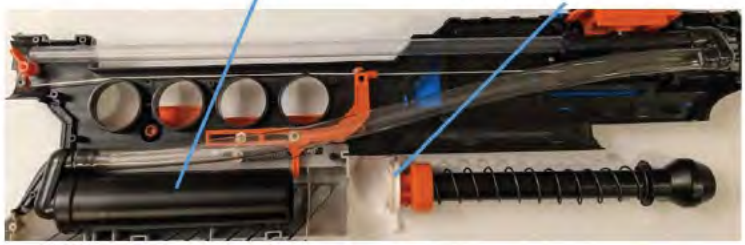
	  spring (*enclosed in housing above*) operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber (*below, partially disassembled to show spring*) HASBRO-ITC-PHYS 00047

Second Generation Blasters with Ammunition	
"X2 Invader Products"	 air compression chamber piston (*hidden above*) is disposed within and axially aligned with the air compression chamber (*partially disassembled to show piston and spring*)

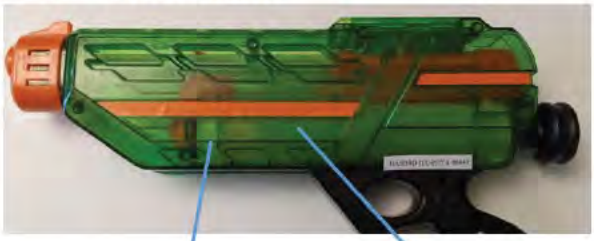
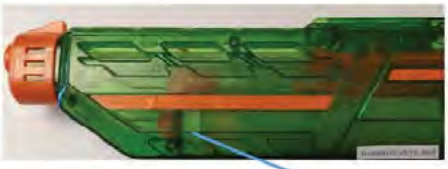
[redacted]

	  spring (*enclosed in housing above*) operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber (*below, partially disassembled to show spring*) HASBRO-ITC-PHYS_00040; *see also* HASBRO-ITC-PHYS_00052, 39.
"X2 Mauler Product"	 air compression chamber piston (*hidden above*) is disposed within and axially aligned with the air compression chamber (*partially disassembled to show piston and spring*)

[redacted]

	 spring (*enclosed in housing above*) operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber (*below, partially disassembled to show spring*) HASBRO-ITC-PHYS_00034; *see also* HASBRO-ITC-PHYS_00063.
"X2 Retaliator Product"	 air compression chamber piston (*hidden above*) is disposed within and axially aligned with the air compression chamber  (*partially disassembled to show piston and spring*)

[redacted]

	  spring (*enclosed in housing above*) operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber (*below, partially disassembled to show spring*) HASBRO-ITC-PHYS 00048.
"Night Fighterz Products"	 piston is disposed within and axially aligned with the air compression chamber air compression chamber  spring (*enclosed in housing above*) operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber (*below, partially disassembled to show spring*) (*backlit to show spring*)

[redacted]

	HASBRO-ITC-PHYS_00049; *see also* HASBRO-ITC-PHYS_00050, 51.

Third Generation Blasters with Ammunition	
"X3 Products"	 air compression chamber piston (*hidden above*) is disposed within and axially aligned with the air compression chamber (*partially disassembled to show piston and spring*) spring (*enclosed in housing above*) operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber (*below, partially disassembled to show spring*) HASBRO-ITC-PHYS_00067; *see also* HASBRO-ITC-PHYS_00053, 54, 65, 68.

[redacted]

Fourth Generation Blasters with Ammunition	
"Firestorm Products"	 air compression chamber piston (*hidden above*) is disposed within and axially aligned with the air compression chamber (*partially disassembled to show spring*) spring (*enclosed in housing above*) operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber (*below, partially disassembled to show spring*) HASBRO-ITC-PHYS_00073; *see also* HASBRO-ITC-PHYS_00056, 57, 58, 66, 69.

[redacted]

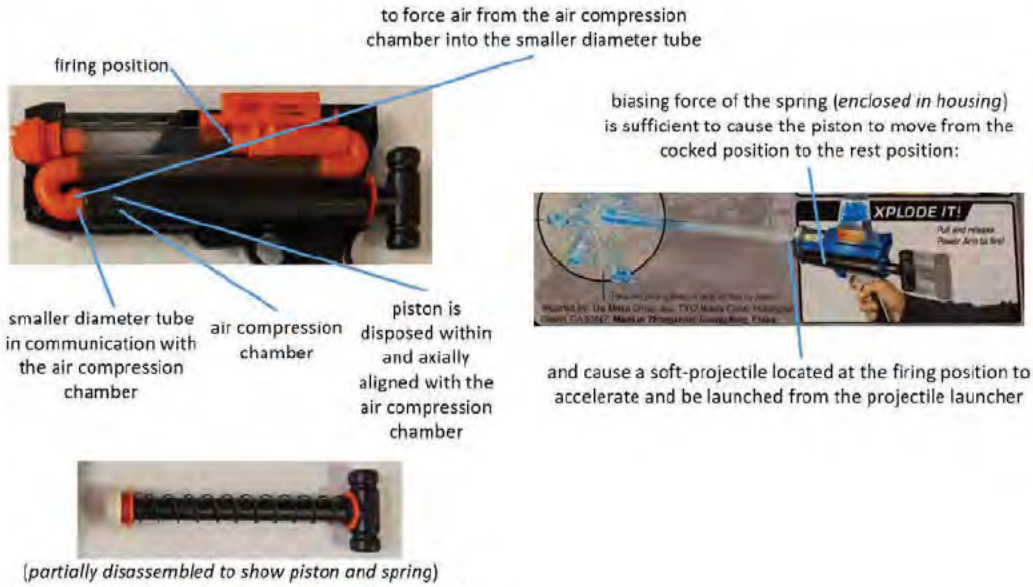
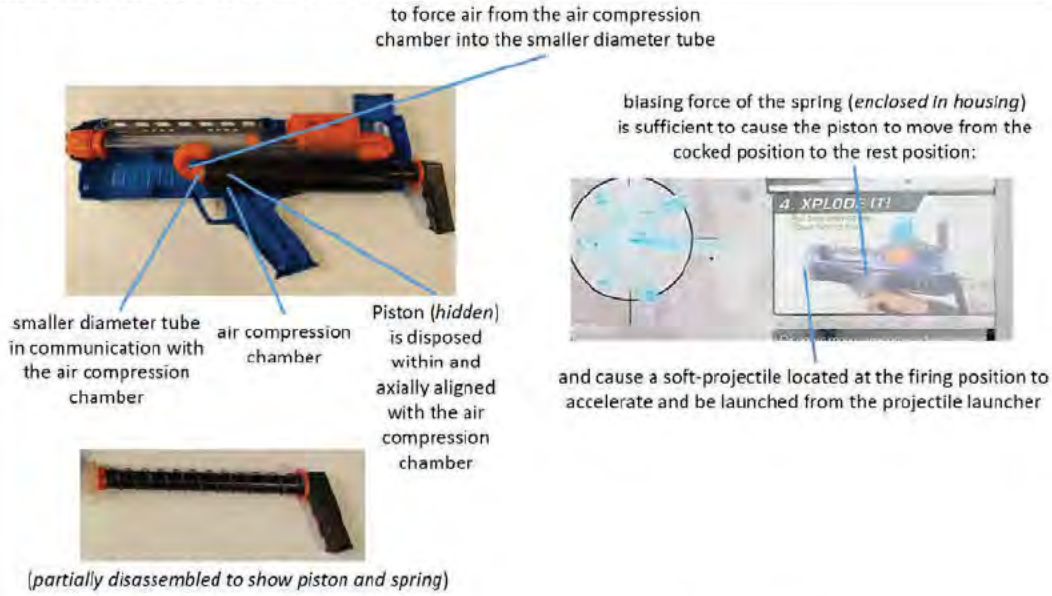
Blaster Pro Blasters with Ammunition	
"Blaster Pro Products"	 spring (*enclosed in housing above*) operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber (*below, partially disassembled to show spring*) HASBRO-ITC-PHYS_00061; *see also* HASBRO-ITC-PHYS_00059, 60, 61, 64, 62.

f) Claim 20: The projectile launcher of claim 19, further comprising a smaller diameter tube in communication with the air compression chamber, and wherein a biasing force of the spring is sufficient to cause the piston to move from the cocked position to the rest position to force air from the air compression chamber into the smaller diameter tube and cause a soft-projectile located at the firing position to accelerate and be launched from the projectile launcher.

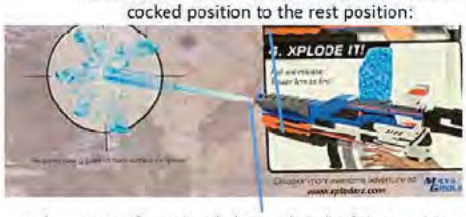
26. I have inspected the items described above and confirmed that each of the Xploderz blasters and the Blaster Pro blasters further comprising a smaller diameter tube in communication with the air compression chamber, and wherein a biasing force of the spring is sufficient to cause the piston to move from the cocked position to the rest position to force air from the air

[redacted]

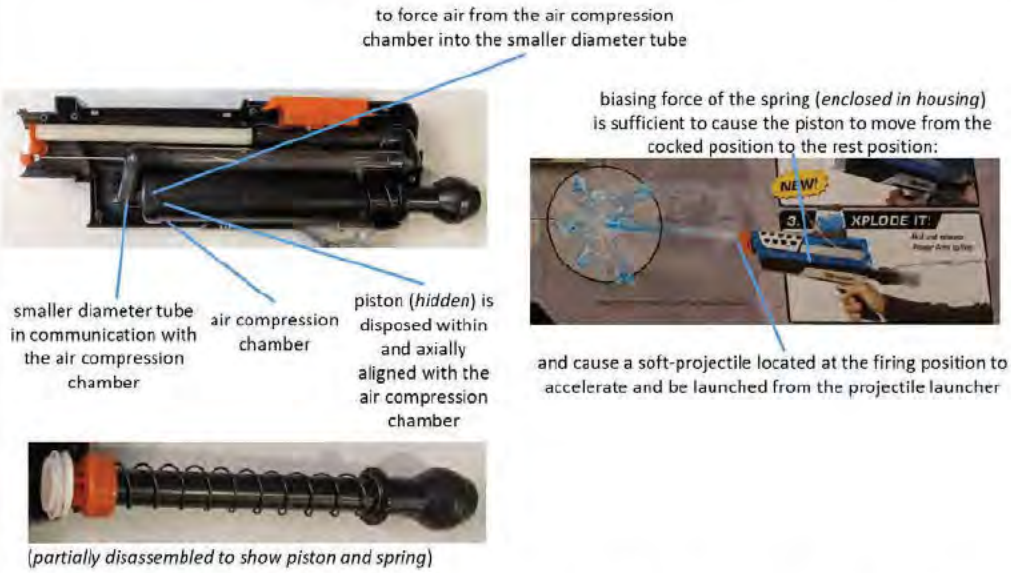
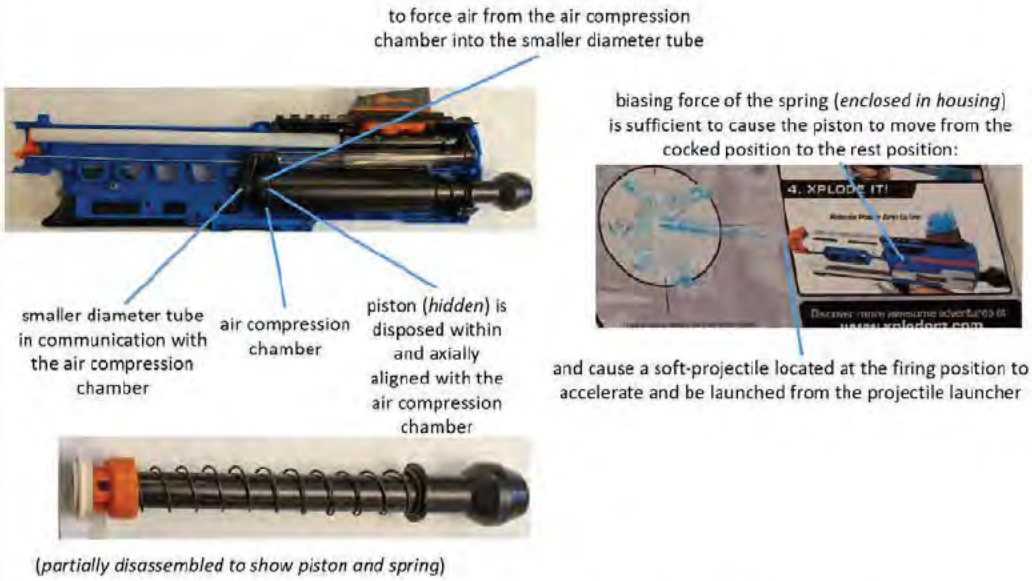
compression chamber into the smaller diameter tube and cause a soft-projectile located at the firing position to accelerate and be launched from the projectile launcher.

First Generation Blasters with Ammunition	
"XBlaster Products"	 HASBRO-ITC-PHYS 00032, 35, 36
"XStormer Products"	 HASBRO-ITC-PHYS 00038; *see also* HASBRO-ITC-PHYS 00033.

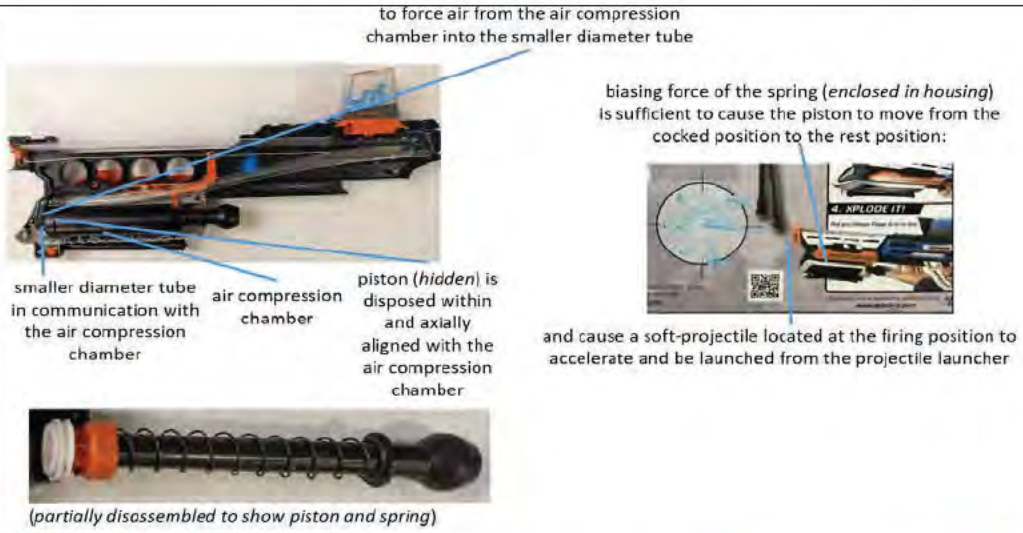
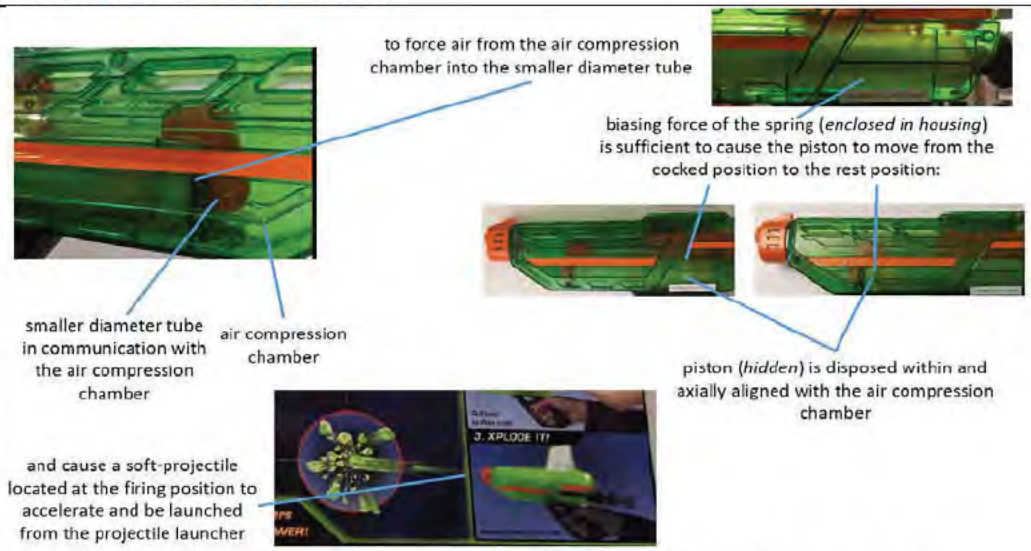
[redacted]

"XRanger Products"	to force air from the air compression chamber into the smaller diameter tube biasing force of the spring (*enclosed in housing*) is sufficient to cause the piston to move from the cocked position to the rest position: smaller diameter tube in communication with the air compression chamber air compression chamber piston (*hidden*) is disposed within and axially aligned with the air compression chamber and cause a soft-projectile located at the firing position to accelerate and be launched from the projectile launcher (*partially disassembled to show piston and spring*) HASBRO-ITC-PHYS_00037
"XGround Pounder Product"	to force air from the air compression chamber into the smaller diameter tube biasing force of the spring (*enclosed in housing*) is sufficient to cause the piston to move from the cocked position to the rest position:  smaller diameter tube in communication with the air compression chamber air compression chamber piston (*hidden*) is disposed within and axially aligned with the air compression chamber and cause a soft-projectile located at the firing position to accelerate and be launched from the projectile launcher (*partially disassembled to show piston and spring*) HASBRO-ITC-PHYS_00047

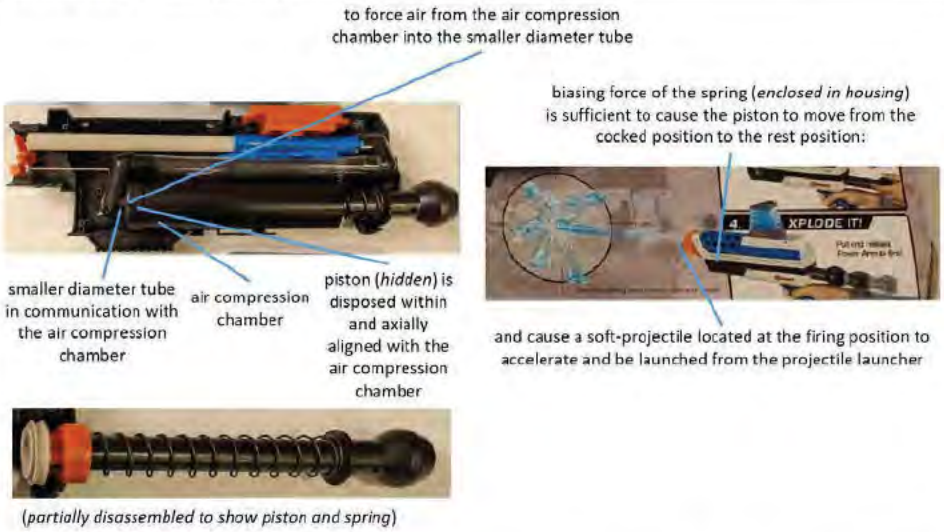
[redacted]

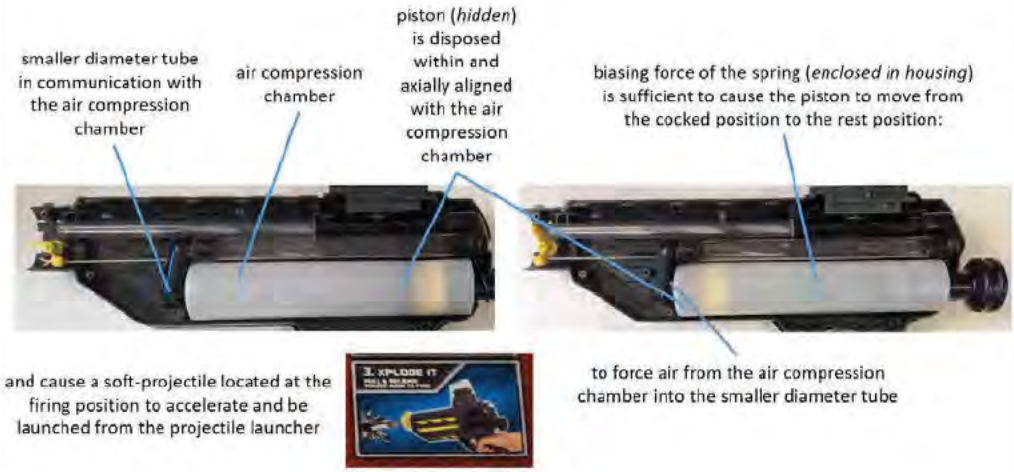
Second Generation Blasters with Ammunition	
"X2 Invader Products"	 HASBRO-ITC-PHYS_00040; *see also* HASBRO-ITC-PHYS_00052, 39.
"X2 Mauler Product"	 HASBRO-ITC-PHYS_00034; *see also* HASBRO-ITC-PHYS_00063.

[redacted]

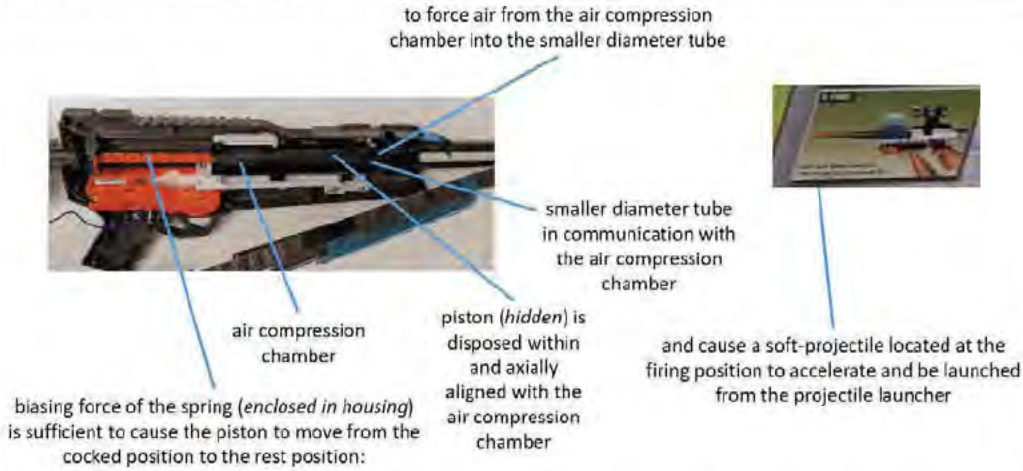
"X2 Retaliator Product"	 HASBRO-ITC-PHYS_00048.
"Night Fighterz Products"	 HASBRO-ITC-PHYS_00049; *see also* HASBRO-ITC-PHYS_00050, 51.

[redacted]

Third Generation Blasters with Ammunition	
"X3 Products"	 HASBRO-ITC-PHYS_00067; *see also* HASBRO-ITC-PHYS_00053, 54, 65, 68.

Fourth Generation Blasters with Ammunition	
"Firestorm Products"	 HASBRO-ITC-PHYS_00073; *see also* HASBRO-ITC-PHYS_00056, 57, 58, 66, 69.

[redacted]

Blaster Pro Blasters with Ammunition	
"Blaster Pro Products"	 HASBRO-ITC-PHYS_00061; *see also* HASBRO-ITC-PHYS_00059, 60, 61, 64, 62.

B. '683 Patent

a) Claim 1: A projectile launching system, comprising: ammunition comprising a plurality of substantially spherical soft-projectiles formed from hydrated super absorbent polymer; and a projectile launcher for launching the ammunition in free flight.

27. I note there is a claim construction dispute regarding this term as reflected below. As I noted earlier, the outcome of this dispute for any proposal where a construction is actually offered does not change my opinion.

Complainants' Construction	Respondents' Construction	Staff's Construction
"super absorbent polymer"		
Plain and ordinary meaning, i.e., "polymer that can absorb an extremely large amount of liquid relative to its own mass"	PTT and SplatRBall: No construction necessary; term of art known to those skilled in the art at the time of the alleged invention Gel Blaster: Indefinite	No construction necessary; term of art known to those skilled in the art at the time of the alleged invention

[redacted]

2. I have inspected the items described above and confirmed that each of the Xploderz blasters satisfy this claim. The Xploderz and Blaster Pro Products are a projectile launching system, comprising: ammunition comprising a plurality of substantially spherical soft-projectiles formed from hydrated super absorbent polymer; and a projectile launcher for launching the ammunition in free flight. Each of the blasters comes with a projectile launcher device designed for use with the super absorbent polymer. Each of the blasters also comes with hydrated and unhydrated SAP rounds. *See, e.g.*, HASBRO-ITC-00111575-HASBRO-ITC-00111582; HASBRO-ITC-00111584; HASBRO-ITC-00111595-HASBRO-ITC-00111601; HASBRO-ITC-00111610-HASBRO-ITC-00111624. *See also, e.g.*, HASBRO-ITC-PHYS_00032- HASBRO-ITC-PHYS_00069, 72-74.

28. As noted below, each of the Xploderz Products and Blaster Pro Products included hydrated spherical ammunition and/or ammunition with instructions directing the user to hydrate ammunition, and in doing so, satisfy the limitation of soft-projectiles are formed from hydrated super absorbent polymer. *See, e.g.*, HASBRO-ITC-00111575-HASBRO-ITC-00111582; HASBRO-ITC-00111584; HASBRO-ITC-00111595-HASBRO-ITC-00111601; HASBRO-ITC-00111610-HASBRO-ITC-00111624. *See also, e.g.*, HASBRO-ITC-PHYS_00032-HASBRO-ITC-PHYS_00069, 72-74 (exemplary physical exhibits). As noted below, ammunition in the dehydrated state must be hydrated before firing from the blaster (otherwise they are too small to fire), according the instructions on the website and enclosed with the blasters. The hydration process involves soaking the SAP ammunition in water, such that "water is absorbed into the spaces between the molecules." HASBRO-ITC-00111582; Ben-Ezer Dep. at 280:2-21.

29. For example, the "FAQ" section of the website for the Xploderz Products (HASBRO-ITC-00111582) stated that "the ammo is a superabsorbent polymer" and the website (HASBRO-ITC-00111584) and Xploderz Products gave instructions to hydrate the ammo:

[redacted]

- **How does Xploderz Ammo grow?**
  - The ammo is a superabsorbent polymer. It consists of many cross-linked molecules bonded together. Water is absorbed into the spaces between the molecules.

HASBRO-ITC-00111582 (extract, highlighting added)

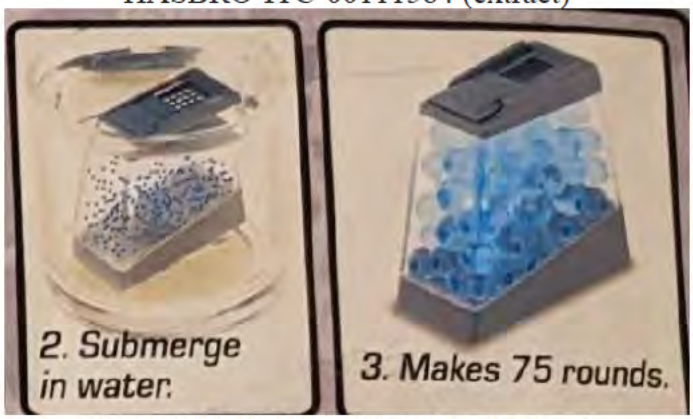
Make your own Xploderz Ammo in two ways:

In the Ammo Clip (Available with XBlaster 200 and Face Off 400)

Watch how to grow your ammo in the Ammo Clip here:

In the Ammo Depot (Available with XStormer 1000 and XRanger 2000)

HASBRO-ITC-00111584 (extract)

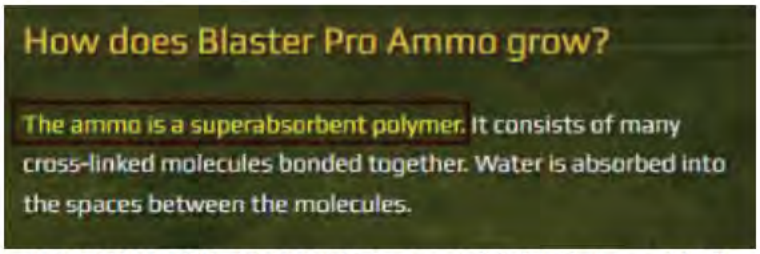


HASBRO-ITC-PHYS_00035 (extract)

30. The corporate witness of the Maya Group, Mr. Oded Ben-Ezer, also testified that all Xploderz ammo was made of super absorbent polymer, "including all the different colors of the ammo" for all Xploderz products. Ben-Ezer Dep. at 280:2-281:8.

[redacted]

31. Similarly, The "FAQ" section of the website for the Blaster Pro products (HASBRO-ITC-00111578) stated that "the ammo is a superabsorbent polymer" and the Products similarly gave instructions to hydrate the ammo:



HASBRO-ITC-00111578 (extract, highlighting added)

HASBRO-ITC-PHYS_00064; *see also* HASBRO-ITC-PHYS_00062.

32. Further, I understand Dr. Fuller also investigated whether the Xploderz and Blaster Pro ammunition are made of hydrated super absorbent polymer when hydrated as instructed. Based on Dr. Fuller's investigation, I further understand the Xploderz Ammunition and Blaster Pro Ammunition are formed from hydrated super absorbent polymer and further rely on Dr. Fuller's renbuttal report. Fuller Rebuttal Rpt. at § VII.C. In particular, Dr. Fuller found that the dehydrated Xploderz and Blaster Pro Ammunition could absorb well in excess of 10 times the amount of water relative to their own mass when the instructions were followed, thereby satisfying the limitation of "ammunition comprising a plurality of substantially spherical soft-projectiles formed from hydrated super absorbent polymer."

[redacted]

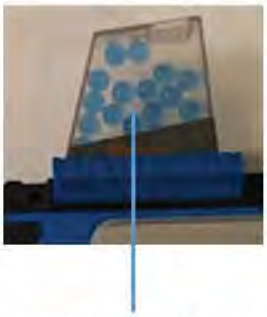
33. Each of the Xploderz and Blaster Pro products further comprised a projectile launching system comprising a projectile launcher for launching the ammunition in free flight, as the contents of each contained both ready-to-fire SAP ammunition and dehydrated ammunition with instructions for making more, along with the compatible blaster:

First Generation Blasters with Ammunition	
"XBlaster Products"	 substantially spherical soft-projectiles formed from hydrated super absorbent polymer

[redacted]

	 HASBRO-ITC-PHYS 00032, 35, 36
"XStormer Products"	

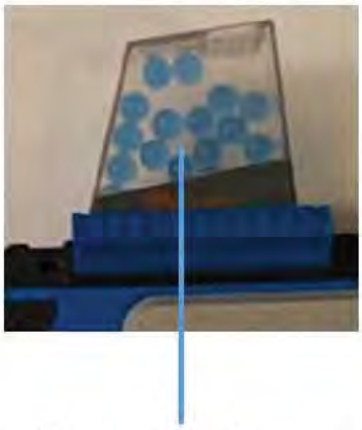
[redacted]

	 substantially spherical soft-projectiles formed from hydrated super absorbent polymer HASBRO-ITC-PHYS 00038; *see also* HASBRO-ITC-PHYS 00033.
"XRanger Products"	 substantially spherical soft-projectiles formed from hydrated super absorbent polymer HASBRO-ITC-PHYS 00037
"XGround Pounder Product"	 HASBRO-ITC-PHYS 00047

[redacted]

Second Generation Blasters with Ammunition	
"X2 Invader Products"	 substantially spherical soft-projectiles formed from hydrated super absorbent polymer HASBRO-ITC-PHYS_00040; *see also* HASBRO-ITC-PHYS_00052, 39.
"X2 Mauler Product"	 substantially spherical soft-projectiles formed from hydrated super absorbent polymer

[redacted]

	HASBRO-ITC-PHYS_00034; *see also* HASBRO-ITC-PHYS_00063.
"X2 Retaliator Product"	 substantially spherical soft-projectiles formed from hydrated super absorbent polymer HASBRO-ITC-PHYS_00048.

[redacted]

"Night Fighterz Products"	 substantially spherical soft-projectiles formed from hydrated super absorbent polymer HASBRO-ITC-PHYS_00049; *see also* HASBRO-ITC-PHYS_00050, 51.

[redacted]

Third Generation Blasters with Ammunition	
"X3 Products"	 substantially spherical soft-projectiles formed from hydrated super absorbent polymer HASBRO-ITC-PHYS_00067; *see also* HASBRO-ITC-PHYS_00053, 54, 65, 68.

Fourth Generation Blasters with Ammunition

[redacted]

"Firestorm Products"	 substantially spherical soft-projectiles formed from hydrated super absorbent polymer HASBRO-ITC-PHYS_00073; *see also* HASBRO-ITC-PHYS_00056, 57, 58, 66, 69.

Blaster Pro Blasters with Ammunition

[redacted]

"Blaster Pro Products"	 HASBRO-ITC-00111578 HASBRO-ITC-PHYS_00061; *see also* HASBRO-ITC-PHYS_00059, 60, 61, 64, 62.

b) Claim 5: The system of claim 1, wherein the projectile launcher includes a feed chamber for loading the soft-projectiles within projectile launcher.

34. I have inspected the items described above and confirmed that each of the Xploderz and Blaster Pro blasters satisfy this claim. The projectile launcher in each blaster includes a feed chamber for loading the soft-projectiles within projectile launcher for the reasons discussed above in ¶¶ 20-22 (discussion of the Maya Group Products for claim 8 of the'282 patent).

[redacted]

c) Claim 11: The system of claim 1, wherein the projectile launcher is designed to use air pressure to launch the soft-projectiles.

35. I have inspected the items described above and confirmed that each of the Xploderz blasters satisfy this claim.

36. I have inspected the items described above and confirmed that each of the Xploderz and Blaster Pro blasters satisfy this claim. The projectile launcher in each blaster is designed to use air pressure and uses such air pressure to launch the soft-projectiles for the reasons discussed above in ¶ 24 (discussion of the Maya Group Products for claim 20 of the'282 patent).

d) Claim 14: The system of claim 1, wherein the projectile launcher comprises a firing mechanism that directly applies a force to the ammunition.

37. I note there is a claim construction dispute regarding this term as reflected below. As I noted earlier, the outcome of this dispute does not change my opinion

Complainants' Construction	Respondents' Construction	Staff's Construction
"a firing mechanism that directly applies a force to a soft-projectile"		
Plain and ordinary meaning, i.e. "a firing mechanism that directly applies a force to a soft-projectile"	"a firing mechanism that directly applies a force to a soft-projectile (not via an intermediary)"	Plain and ordinary meaning

38. The Second Generation and later Xploderz blasters, as well as the Blaster Pro blasters, satisfies this claim.

Second Generation Blasters with Ammunition	
"X2 Invader Products"	

[redacted]

	 firing mechanism directly applies a force to a soft-projectile located in the firing position (*located in housing as indicated*) to launch the soft-projectile from the projectile launcher in free flight HASBRO-ITC-PHYS_00040; *see also* HASBRO-ITC-PHYS_00052, 39.
"X2 Mauler Product"	 firing mechanism directly applies a force to a soft-projectile located in the firing position (*located in housing as indicated*) to launch the soft-projectile from the projectile launcher in free flight HASBRO-ITC-PHYS_00034; *see also* HASBRO-ITC-PHYS_00063.
"X2 Retaliator Product"	 firing mechanism directly applies a force to a soft-projectile located in the firing position (*located in housing as indicated*) to launch the soft-projectile from the projectile launcher in free flight

[redacted]

	HASBRO-ITC-PHYS 00048.
"Night Fighterz Products"	 to launch the soft-projectile from the projectile launcher in free flight firing mechanism directly applies a force to a soft-projectile located in the firing position (*located in housing as indicated*) HASBRO-ITC-PHYS 00049; *see also* HASBRO-ITC-PHYS 00050, 51.

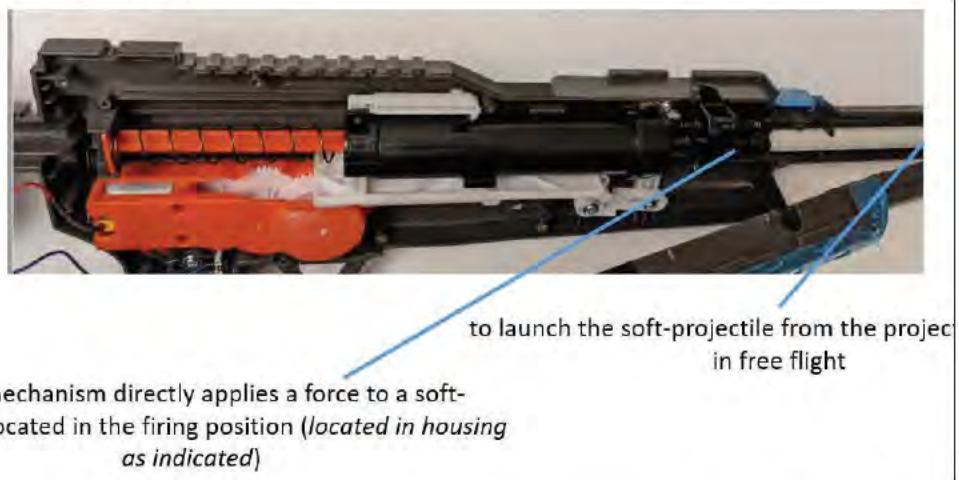
Third Generation Blasters with Ammunition	
"X3 Products"	 to launch the soft-projectile from the projectile launcher in free flight firing mechanism directly applies a force to a soft-projectile located in the firing position (*located in housing as indicated*) HASBRO-ITC-PHYS_00067; *see also* HASBRO-ITC-PHYS_00053, 54, 65, 68.

Fourth Generation Blasters with Ammunition

[redacted]

"Firestorm Products"	 firing mechanism directly applies a force to a soft-projectile located in the firing position (*located in housing as indicated*) to launch the soft-projectile from the projectile launcher in free flight HASBRO-ITC-PHYS_00073; *see also* HASBRO-ITC-PHYS_00056, 57, 58, 66, 69.

[redacted]

Blaster Pro Blasters with Ammunition	
"Blaster Pro Products"	 HASBRO-ITC-PHYS_00061; *see also* HASBRO-ITC-PHYS_00059, 60, 61, 64, 62.

C. Vapor

39. Further, I have reviewed the testimony by Maya Group's witness, Oded Ben-Ezer, about copying the Razor USA LLC company that launched the Vapor Atlas 250 that copied the Xploderz patented features. Ben-Ezer Tr. 239:8-241:5.

40. As I note in my opening report, it is my opinion that the Vapor Atlas 250 products satisfy each and every limitation of claims 8, 19, and 20 of the '282 patent, and claims 1, 5, and 11 and 14 of the '683 patent. In addition, I also show how this product practices the "parent" '282 patent claim 1. I have compared the Atlas 250 produced in HASBRO-ITC-PHYS_00070 and 71 and confirmed that the blasters are identical within those packages.

41. First, the Vapor Atlas 250 includes "ammunition configured for use with a projectile launcher comprising: a plurality of soft-projectiles having the same shape, each soft projectile being formed from hydrated super absorbent polymer." ('282 claim 1). The Vapor Atlas 250 also includes "a plurality of substantially spherical soft-projectiles formed from hydrated super absorbent polymer." (part of '683 claim 1)

[redacted]

HASBRO-ITC-PHYS_00071

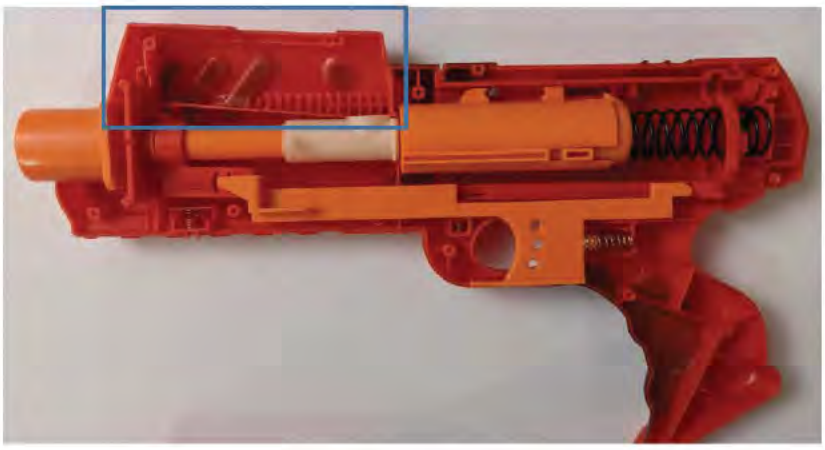
42. I understand Dr. Fuller also investigated whether the Vapor Ammo is made of hydrated super absorbent polymer. Based on Dr. Fuller's investigation, I further understand the Vapor Ammo is formed from hydrated super absorbent polymer and further rely on Dr. Fuller's rebuttal report. Fuller Rebuttal Rpt. at § V. In particular, Dr. Fuller found that the dehydrated Vapor Ammo could absorb well in excess of 10 times the amount of water relative to their own mass when the instructions were followed, thereby satisfying the limitation of "each soft projectile being formed from hydrated super absorbent polymer."

43. The Vapor Atlas 250 also is "[a] projectile launching system, comprising: ammunition comprising a plurality of substantially spherical soft-projectiles formed from hydrated super absorbent polymer; and a projectile launcher for launching the ammunition in free flight." ('683 claim 1). The package includes both the blaster and the ammunition, and dpicts a user firing the SAP ammunition in free flight, which I also confirmed is how the blaster operates:

[redacted]

HASBRO-ITC-PHYS_00071

44. The Vapor Atlas 250 also includes "[a] projectile launcher including the ammunition of ['282 patent] claim 1 disposed within a feed chamber of the projectile launcher, and wherein the projectile launcher is adapted to load a soft-projectile from the feed chamber to a firing position" ('282 claim 8), and is "[t]he system of ['683 claim 1], wherein the projectile launcher includes a feed chamber for loading the soft-projectiles within projectile launcher." The feed chamber is internal to the blaster:



HASBRO-ITC-PHYS_00071

[redacted]

45. The Vapor Atlas 250 projectile launcher also includes an air compression chamber, a piston disposed within and axially aligned with the air compression chamber; and a spring operatively arranged to bias the piston toward a rest position from a cocked position within the air compression chamber, ('282 claim 19). The Vapor Atlas 250 works by sliding the top of the device back to put the spring into a cocked position, which is then released to a rest position by depressing the trigger. Disassembling the blaster, the spring is visble in the lower right of the picture; the white piston in the bottom middle is axially aligned and (when not disassembled) disposed with the air compression chamber in the lower left:

HASBRO-ITC-PHYS_00071

46. Further, the Vapor Atlas 250 launcher further comprising a smaller diameter tube in communication with the air compression chamber, as shown in the picture above. ('282 claim 20). More specifically, the small tube in the bottom left of the image above is attached to the air compression chamber. The biasing force of the black spring is sufficient to cause the piston (bottom middle) to move from the cocked position to the rest position to force air from the air compression chamber into the smaller diameter tube and cause a soft-projectile located at the firing

[redacted]

position to accelerate and be launched from the projectile launcher, satisfying the remainder of ('282 claim 20).

47. In doing so, the Vapor Atlas 250 launcher "is designed to use air pressure to launch the soft-projectiles" ('683 claim 11) and also satisfies the claim limitation of "[t]he system of claim 1, wherein the projectile launcher comprises a firing mechanism that directly applies a force to the ammunition." ('683 claim 14) The firing mechanism generates the air pressure using the piston compressing air in the air compression chamber, which then by operation of the air through the smaller diameter tube, causes the projectile SAP to accelerate down the barrel and exit the blaster in free flight.

APPENDIX 2

Barry Matthew Kudrowitz

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Primary Research Interests

Creativity Perception, Evaluation, and Teaching:

- How Play and Humor Fuel Innovation
- Idea Generation Methods and Tools
- Concept Presentation, Representation, and Pitching
- Creativity Testing

Design in Food:

- Reducing Food/Farm Waste
- Children's Vegetable Consumption
- Creative Methods of Chefs

Education

PhD, Mechanical Engineering, Massachusetts Institute of Technology (MIT), 2010
Dissertation: *HaHa and Aha! Creativity, Idea Generation, Improvisational Humor, and Product Design*
Advisor: Dr. David Wallace

Exchange Student (*i.e.,* Free Mover), Industrial Design Engineering, TU Delft, Netherlands, 2006

MS, Mechanical Engineering, Massachusetts Institute of Technology (MIT), 2006
Thesis: *An Exploration of Concepts for Projectile Toys*
Advisor: Dr. David Wallace

BS, Summa Cum Laude, Mechanical Engineering, University of Central Florida, 2004
Thesis: *The Application of Pneumatic Capsule Pipelines in Conjunction with Linear Induction Motors towards the Enhancement of the Thrill Ride Industry*

Academic Positions Held

University of Minnesota, Minneapolis, MN, USA

2022-present	Department Head: Graphic Design, Product Design, Apparel Design, & Retail Merchandising
2022-present	Professor with tenure, Product Design
2017-2022	Associate Professor with tenure, Product Design
2011-2017	Assistant Professor, Product Design
2011-present	Director of the Product Design Program *Product Design Bachelor of Science* *Undergraduate Product Design Minor* *Graduate Product Design Minor (2011-2018)*
2014-present	Affiliate Member, Human Factors and Ergonomics Graduate Faculty
2011-2018	Affiliate Member, Mechanical Engineering Graduate Faculty

Philadelphia University, Philadelphia, PA, USA

2011-2013	Fellow, College of Design Engineering and Commerce

Awards

Research

B. Kudrowitz. (2016-2018). *McKnight Land-Grant Professorship.* University of Minnesota.
Highly competitive two-year award designed to advance the careers of exceptional junior faculty

B. Kudrowitz. (Fall 2018). *CDES Competitive Sabbatical Leave.* TU Delft, Netherlands.
Drafted book manuscript and developed curriculum for food design course

Teaching

B. Kudrowitz. (2020). *Horace T. Morse University of Minnesota Alumni Association Award for Outstanding Contributions to Undergraduate Education.* University of Minnesota.
Awarded annually to a small group of professors who reflect the University's emphasis on the importance of high-quality undergraduate education

B. Kudrowitz. (2015). *Outstanding Teaching Award*. College of Design, University of Minnesota.

B. Kudrowitz. (2015). *Founder's Day Teaching Awar*d. Carlson School of Management, University of Minnesota.

Scholarship

Publications

For *both* journal publications and conference proceedings, the first author is typically the individual who made a more substantial contribution to the research and/or writing, and the last author represents the principal investigator and research supervisor. Publications in which the principal investigator is *also* the first author/primary contributor are marked with an onset *asterisk.

For *both* journal publications and conference proceedings, I often advise and coauthor papers with students. Graduate student co-authors are indicated as author [G] and undergraduate student co-authors are indicated as author [U].

Refereed & Peer Reviewed Journal Publications

Kwon. J.[G] & Kudrowitz, B. (in review). Concept Evaluation Dilemma: Presentation Effect on Product Concept Evaluation in the New Product Development Process. *Journal of Mechanical Design*.

Hwang, S.[G], Alfalah, S.[G], Kwon, J.[G] & Kudrowitz, B. (2021). Familiarity Trumps Playfulness: Exploring Children's Preferences for Playful Design of Vegetables. *International Journal of Food Design*. *Download*: https://doi.org/10.1386/ijfd_00009_1

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Download: https://doi.org/10.1007/s10798-020-09598-7

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Download: https://doi.org/10.1017/S0890060418000100

Leeds, A.[U] & **Kudrowitz, B.** (2018). Mapping Idea Space: Exploring Divergent Thinking through Mind Mapping. *International Journal of Design Creativity and Innovation*. 7(1-2), 16-29. *Download: https://www.tandfonline.com/doi/abs/10.1080/21650349.2018.1463178*

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*__Kudrowitz, B.__, Te, P.[U], & Wallace, D. (2012). The Influence of Sketch Quality on Perception of Product-Idea Creativity. *Artificial Intelligence for Engineering Design and Manufacturing: Special Issue on Sketching*. 26(3), 267-279. *Most downloaded of AI EDAM 2012. Download: http://dl.acm.org/citation.cfm?id=2349427*

*__Kudrowitz, B.__ & Wallace, D. (2012). Assessing the Quality of Ideas from Prolific, Early-Stage Product Ideation. *Journal of Engineering Design: Special Issue on Design Creativity*. 24(2), 120-139. *Download: http://www.tandfonline.com/doi/abs/10.1080/09544828.2012.676633*

Ludden, G., **Kudrowitz, B.**, Schifferstein, H., & Hekkert, P. (2012). Surprise and Humor in Product Design. *Humor: The International Journal of Humor*. 25(3), 285–309. *Download: http://doc.utwente.nl/81647/*

Kudrowitz, B. & Wallace, D. (2010). The Play Pyramid: A Play Classification and Ideation Tool for Toy Design. *The Journal of Arts and Technology. 3(1),* 36-56. *Download: http://www.inderscience.com/info/inarticle.php?artid=30492*

Books/Book Chapters

Kudrowitz, B. (2022). How Play and Humor Spark Creative Design and Innovation. Routledge.

Kudrowitz, B., Rush, M., & Johnson, K. (2021). Community of Practice in Design Education. Reviewed contribution for *Collegial Design: Thinking and Making at a Community-Engaged University*. Modern Press

Kudrowitz, B. (2021). Designing Developmentally Appropriate Toys. In D. Bergen (Ed), *The Handbook to Developmentally Appropriate Toys*. Rowman & Littlefield.

Kudrowitz, B. (2014). Emerging Technology in Toy Design. In J. Follett (Ed), *Designing for Emerging Technologies*. (237-254) O'Reilly Media. *Download: http://shop.oreilly.com/product/0636920030676.do*

Refereed and Peer Reviewed Conference Papers

For conference proceedings, the specific author(s) that presented the work at the conference are indicated with an <u>underline</u>.

<u>Hwang, S.</u>[G] & **Kudrowitz, B.** (2021). When is a Potato too Ugly? Understanding the Complexity of Aesthetics in Produce towards the Reduction of Food Waste. *IASDR 2020 [With Design]. (word count: 4252)*

*<u>__Kudrowitz, B.__</u> & Davel, R.[U] (2021). First Impressions Matter (Maybe More than Prior Design Experience): The Predictive Power of Soft-Skills on Student Performance in a Team-Based Design Course. *IASDR 2020 [With Design]. (word count: 5964)*

<u>Hwang, S.</u>[G], Alfalah, S.[G], Kwon, J.[G] & **Kudrowitz, B.** (2021, August). Playful Design and Children's (dis)Liking of Plant-Based Vegetable Food Products. *Creative Tastebuds. (word count: 5208)*

<u>Kwon, J.</u>[G] & **Kudrowitz, B.** (2019, July). The Creative Cookie Challenge: The Impact of Creativity, Typicality, and Aesthetics on Consumer's Choice. *Southern Oregon University Creativity Conference,* 2019. *(word count: 5590)*

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Download: https://doi.org/10.1115/DETC2017-67261

Wang, X. [G] & Kudrowitz B. (2016, November). Language Ability in Creativity Assessment. Proceedings of the *Fourth International Conference on Design Creativity (4th ICDC).* Atlanta, GA. *(word count: 4127)*
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*Kudrowitz, B., Free, A. [U] & Hough, L. (2016, November). Identification of Personality and Cognitive Indicators of Creative Potential. Proceedings of the *Fourth International Conference on Design Creativity (4th ICDC).* Atlanta, GA. *(word count: 4264)*
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***Kudrowitz, B.**, Alfalah, S. [G], & Dippo, C. [U] (2016, September). The Mary Poppins Effect: Exploring a Relationship Between Playfulness and Creativity with the Alternative Uses Test. *International Conference on Design and Emotion*. Amsterdam, Netherlands. *(word count: 4119)*
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Alfalah, S. [G], Kudrowitz, B., & Vickers, Z. (2015, November). Playful Design and Children's (dis)Liking of Vegetables. Proceedings of the *Second International Conference on Food Design.* New York, NY. *(word count: 5469)*
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Pilgrim-Rukavina, N. [U] & **Kudrowitz, B.** (2015, November). Exploring the Effects of Warm-up Games, Criticism and Group Discussion on Brainstorming Productivity. *IASDR InterPlay 2015*. Brisbane, Australia. *(word count: 3697)*
Download: http://iasdr2015.com/wp-content/uploads/2015/11/IASDR_Proceedings_Final_Reduced.pdf

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Download: http://proceedings.asmedigitalcollection.asme.org/proceeding.aspx?articleid=1830520

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Download More Recent Publication: http://dl.acm.org/citation.cfm?id=2349427

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Design and Emotion. Chicago. *Nominated for Best Paper. (word count: 5032)*
Download: http://www.designandemotion.org/library/page/viewDoc/127

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Download: http://proceedings.asmedigitalcollection.asme.org/proceeding.aspx?articleid=1612353

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*Gutowski, T., Taplett, A., **Kudrowitz, B**, *et al*. (2008, May). Environmental Lifestyle Analysis (ELSA). *IEEE International Symposium on Electronics and the Environment.* San Francisco, USA. *(word count: 2589) Download: http://web.mit.edu/ebm/www/Publications/ELSA%20IEEE%202008.pdf*

Refereed and Peer Reviewed Conference Posters

Tran, K. [U], **Kudrowitz, B.** & Koutstaal, W. (2019, August). When Value Adds Value: Assessing the Predictive Power of Creative Test Dimensions for a Real-World Design Challenge. *American Psychological Association 2019 Convention*. Chicago, IL.

Tran, K. [U], **Kudrowitz, B.** & Koutstaal, W. (2019, September). Boosting real-world creative problem-solving. *International Convention of Psychological Science (ICPS*). Paris, France.

Tran, K. [U], **Kudrowitz, B.** & Koutstaal, W. (2018). What Cognitive and Personality Factors Predict Creative Performance on a Real-World Design Challenge? *Association for Psychological Science 30th Annual Convention.* San Francisco, CA.

Invited Non-Refereed Publications

Kudrowitz, B. (2020). [Review of the book *Enhancing Brain Development in Infants and Young Children: Strategies for Caregivers and Educators,* by D. Bergen, L. Lee, C. DiCarlo, & G. Burnett]. Teachers College Press. New York.

Kudrowitz, B. (2014). Toy Product Design. In the Toy Association of India (Ed). *Toys of Tomorrow (16)*. The Toy Association of India Seminar Booklet.

Kudrowitz, B. (2013). How (some) board games can help us be (more) innovative. In C. McCarthy and T. Rawson (Eds.). *Insights Magazine,* Vol 7 (12-16). Innovation Learning Network.

Funding ($3,373,400)

Research Grants – External ($1,701,000)

Kudrowitz, B. (PI). (Spring 2022). Haagen-Dazs Packaging Innovation. *General Mills.* Amount: $46,000.

Kudrowitz, B. (PI). (2015). Maker Space Research and Development. *Private Gift.* Amount: $50,000.

Engel, S. (PI), Lim, K., Olman, C., Sullivan, J., Thomas, K., He, B. (Co-PIs). Kudrowitz, B., *et al* (Co-I). (2011-2012). Acquisition of a 3.0 Tesla MRI system. *National Science Foundation (NSF): Infrastructure Investment Initiative (I3*). Total Amount: $1,499,000.

Kudrowitz, B. (PI). (2011-2012). Design for Manufacture of Toy Car Accessories. *Manhattan Toy.* Amount: $6000.

Wallace D. (PI), Kudrowitz, B. (I), & Fienup, W. (I). (2008-2010). Funding for Conceptual Toy Design Research. *Hasbro*. Amount: $100,000.

Research Grants – Internal ($228,800)

Kudrowitz, B. (PI). (2019-2022). "Waste" Produce Product Design. *Minnesota Agricultural Experiment Station Projects.* Supports partial salary and graduate research assistant each year.

Kudrowitz, B. (PI). (2016-2018). Understanding and Facilitating Creativity. *McKnight Land-Grant Professorship.* Amount: $50,000.

Kudrowitz, B. (PI). (2016-2017). El Bulli Foundation Research in Food Design. *UMN Imagine Grant.* Amount: $5000.

Yarosh, L. (Co-PI), Terveen, L. (Co-PI), Dunne, L. (Co-PI), & Kudrowitz, B. (Co-PI). (2015-2016). Physical Computing and the Internet of Things. *Institute of Advanced Study Research and Creative Collaborative*. Total Amount: $9643

Kudrowitz, B. (Co-PI), Vickers, Z. (Co-PI) and Reicks, M. (I). (2013-2014). Exploring playful, creative design as a means of increasing children's vegetable consumption. *Healthy Foods, Healthy Lives (HFHL) Institute.* Amount: $49,550.

Kudrowitz, B (PI). (2012-2014). Food and Design. *UMN College of Design Research and Outreach*. Amount: $24,747.

Haglund, K. (PI) and Kudrowitz, B (I). (2012-2013). Efficient Windows Collaborative. *UMN Deans' Investment Award*. Amount: $10,000.

Teaching Grants and Teaching Donations – External ($1,425,600)

Kudrowitz, B. (PI). (Spring 2022). Product Innovation Lab In-kind Materials Sponsorship. *PLANtoys.*

Kudrowitz, B. (PI). (Spring 2021). Product Innovation Lab Sponsorship. *General Mills.* Amount: $68,900.

Kudrowitz, B., Lauff, C., & Naderi, E. (Spring 2021). Capstone 2 Sponsorship. *Anderson Windows.* Amount: $10,000.

Kudrowitz, B. & Naderi, E. (PI). (Spring 2021). Studio 2 Sponsorship. *3M*. Amount: $35,000.

Kudrowitz, B. (PI). (Spring 2020). Product Innovation Lab Sponsorship. *3M.* Amount: $35,000.

Kudrowitz, B. (PI). (Spring 2019). Toy Product Design Sponsorship. *GEMS*. Amount: $25,000.

Kudrowitz, B. (PI). (Spring 2017). Toy Product Design Course Sponsorship. *Target*. Amount: $55,000.

Kudrowitz, B. (PI). (2016). Accelerating the Product Design Program. *Private Gift*. Amount: $1,000,000.

Kudrowitz, B. (PI). (Fall 2016). Design and Food Sponsorship. *General Mills.* Amount: $30,000.

Kudrowitz, B. (PI). (Spring 2016). Toy Product Design Materials. *Stratasys*. Amount: $20,000.

Kudrowitz, B. (PI). (Fall 2015). Creativity, Idea Generation, and Innovation Sponsorship. *General Mills*. Amount: $21,747.

Kudrowitz, B. (PI). (Spring 2015). Toy Product Design Sponsorship. *Landscape Structures*. Amount: $55,000.

Kudrowitz, B. (PI). (Spring 2014). Toy Product Design Sponsorship. *Private Gift.* Amount: $25,000.

Kudrowitz, B. (PI). (Spring 2012). Toy Product Design Sponsorship. *Manhattan Toy*. Amount: $20,000.

Groenke, K. (PI), Anderson, L (I), Swackhamer, M. (I), Kudrowitz, B. (I), Bretheim, S. (I), and Miller, T. (I). (2011). Equipment Donation for the Digital Fabrication Lab: "Uprint" 3D Printer and Materials. *Stratasys*. Amount: $50,000 (donation value).

Kudrowitz, B. (Co-PI) and Wallace, D. (Co-PI). (2008). Toy Product Design (MIT) Materials. *Hasbro*. Amount: $10,000.

Teaching Grants – Internal ($10,000)

Kudrowitz, B. (PI). (2014). Sketch Off: Equipment for an Annual Improvisation Drawing Event. *UMN Imagine Grant.* Amount: $5000.

Kudrowitz, B. (PI). (2012-2013). Teaching Design Principles with Food. *UMN Imagine Grant*. Amount: $5000.

Other Grants ($8,000)

Kudrowitz, B. (PI). (Spring 2013). Undergraduate Research Conference NCUR2015. *UMN NCUR Travel Grant*. Amount: $5000.

Kudrowitz, B. (PI). (Spring 2013). Undergraduate Research Conference NCUR2013. *UMN NCUR Travel Grant*. Amount: $1000.

Jensen, M. (PI), B. Kudrowitz (contractor). (2012). Learning Together: Healthy Students, Healthy Communities. *UMN UCARE*. Amount: $1000.

Kudrowitz, B. (PI). (2011). World Conference on Design Research. *UMN GPS Alliance International Travel Grant*. Amount: $1000.

Intellectual Property

Utility Patents

Fienup. W., Kudrowitz, B., & Wallace, D. (2010). Toy Projectile Launching Device. *US Patent Number 7,673,625*. Washington, DC: U.S. Patent and Trademark Office.

Design Patents

Kudrowitz, B. & Orr, J. (2017). Bottle Clip. *US Design Patent Number D781,710.* Washington, DC: U.S. Patent and Trademark Office.

Patent Applications

Figueredo, S., Fienup, W., Kudrowitz, B., Wronski, J., Slocum, A., & Brugge, W. (2008). Biopsy Needle. *US Patent Application Number US20080300507.* Washington, DC: U.S. Patent and Trademark Office.

Invited Presentations

I am regularly asked to share my research and theories with industry and academia outside of traditional conference venues. At these engagements, the organizers are often interested in sparking innovation and my talks provide a playful and engaging experience that is reinforced with academic rigor and data. In addition to presentations, I am asked to provide learning workshops, which are listed later in the CV under Teaching.

The range of venues listed below speaks to the versatility and applicability of my scholarship to a variety of fields and venues including medical devices, public libraries, culinary institutes, pharmaceutical companies, brand agencies, art and science museums, and the federal reserve. There are also many presentations at academic institutes across a variety of colleges of engineering, design, business, and humanities.

I indicated **"Keynote"** presentations in bold for events in which there were multiple invited speakers, and my presentations were at the closing or opening of the events specifically intended to set the overall tone for the event.

Presentations are divided into international, national, and regional. Regional presentations are those given within Minnesota. A few regional presentations happen to be national events that were coincidentally hosted in Minnesota. These few are marked with an onset *asterisk in the regional section.

International

Kudrowitz, B. (2021, May 20). How Play and Humor Help Us Innovate. *Judge Business School, University of Cambridge*. England.

Kudrowitz, B. (2018, October 31). How Play and Humor Help Us Innovate. *Twente University*. Netherlands.

Kudrowitz, B. (2018, October 25). Food Senses. *TU Delft.* Netherlands.

Kudrowitz, B. (2018, October 4). Textural Manipulation of Food. *TU Delft.* Netherlands.

Kudrowitz, B. (2018, March 16). How Play and Humor Fuel Innovation. *Google Japan.* Tokyo, Japan.

Kudrowitz, B. (2017, March 4). Play and Creativity in the Classroom. **Keynote** *for the 4th Educational Technology Summit*. Istanbul, Turkey.

Kudrowitz, B. (2016, July 28). How Play and Humor Fuel Innovation. *Kobe Design University.* Kobe, Japan.

Kudrowitz, B. (2015, August 12). Creative Methods in Modernist Cuisine. *University of Twente.* Enschede, Netherlands.

Kudrowitz, B. (2012, June 23). How Play and Humor Help Us Innovate. *BMW Guggenheim Lab.* Berlin, Germany.

Kudrowitz, B. (2011, April 18). Designing Discovery-Enriched Curriculum. *City University*. Hong Kong.

Kudrowitz, B. (2010, June 21-25). Creative Toy Design and Engineering: Lecture Series*. The Hong Kong Institute of Vocational Education (IVE).* Hong Kong.

Kudrowitz, B. (2009, May 14). Design for Play. Play for Design. **Keynote** for the *International Conference on Toys and Children's Products.* Alicante, Spain.

Kudrowitz, B. (2008, May 16). Gathering Ideas: Product Design and Innovation. *Design Cork Seminar.* Lisbon, Portugal.

Kudrowitz, B. (2011, March 14). Increasing Creativity and Fluency in Product Design Idea Generation. *MIT, Mechanical Engineering*. Cambridge, MA.

National

Kudrowitz, B. (2019, November 7). How Play and Humor Fuel Innovation. **Keynote** for *CIFT: Center for Innovation Food Technology Member Appreciation.* Culinary Vegetable Institute, Milan, OH.

Kudrowitz, B. (2019, May 21). Radical Innovation is Scary. *Eli Lilly and Company.* Indianapolis, IN.

Kudrowitz, B. (2019, May 21). How Play and Humor Fuel Innovation. *Eli Lilly and Company.* Indianapolis, IN.

Kudrowitz, B. (2017, April 21). How Humor Can Fuel Innovation. *Spencer Museum of Art at The University of Kansas*. Lawrence, KS.

Kudrowitz, B. (2016, December 1). How Play and Humor Fuel Innovation. *Indiana University.* Bloomington, IN.

Kudrowitz, B. (2016, December 1). Radical Innovation is Scary. *Indiana University.* Bloomington, IN.

Kudrowitz, B. (2016, October 17). Play and Creativity in the Classroom. **Keynote** for the *Association of Educational Communications and Technology*. Las Vegas, NV.

Kudrowitz, B. (2016, May 11). Radical Innovation is Scary. **Keynote** for the *Innovation Learning Network*. Berkeley, CA.

Kudrowitz, B. (2016, February 26). How Play and Humor Fuel Innovation. *Miami University.* Oxford, OH.

Kudrowitz, B. (2015, May 27). Facilitating Creativity Through Humor and Play. *University of Oregon.* Corvallis, OR.

Kudrowitz, B. (2015, May 27). Creative Methods in Modernist Cuisine. *University of Oregon.* Corvallis, OR.

Kudrowitz, B. (2014, October 23). The Importance of Play and Humor in Creative Design. *Georgia Tech.* Atlanta, GA.

Kudrowitz, B. (2013, November 27). How Play and Humor Fuel Innovation. *University of Texas A&M, Mechanical Engineering Department.* College Station, TX.

Kudrowitz, B. (2013, September 13). How Play and Humor Fuel Innovation. *University of Illinois, Champaign Urbana. Colleges of Engineering and Art and Design*. Champaign, IL.

Kudrowitz, B. (2013, January 15). The Importance of Play and Humor in Creative Design Practice. *War Memorial Hospital*. Sault Ste. Marie, MI.

Kudrowitz, B. (2012, Nov 27). The Importance of Play and Humor in Creative Design Practice. *Retail Green*. Phoenix, AZ.

Kudrowitz, B. (2012, May 15). The Importance of Play & Humor in Creative Design Practice. *Innovation Learning Network.* Detroit, MI.

Kudrowitz, B. (2012, March 26). Play, Humor and Creativity. *Vanderbilt University.* Nashville, TN.

Kudrowitz, B. (2011, May 19). Play, Humor and Creativity. *Philadelphia University.* Philadelphia, PA.

Kudrowitz, B. (2010, May 18-19). Real Toys for an Increasing Virtual World. *Sandbox Summit: iPlay, YouPlay, WiiPlay.* MIT, Cambridge, MA.

Kudrowitz, B. (2010, March 10). Fueling Design Innovation: Relationships Between Creativity, Humor and Play. *MIT Media Lab.* Cambridge, MA.

Regional / Minnesota

Kudrowitz, B. (2021, September 29). How Play and Humor Fuel Innovation. *CPC Global Tech Summit*. Minneapolis, MN.

*Kudrowitz, B. (2021, March 26). Radical Innovation is Scary. *National Organization for Business and Engineering (NOBE) National Conference.* Minneapolis, MN.

Kudrowitz, B. (2020, December 3). Greased Lightning: How Play and Humor Fuel Innovation. *College of Continuing and Professional Studies: Headliners Forum.* Minneapolis, MN.

Kudrowitz, B. (2020, February 5). Radical Innovation is Scary. *Manufacturers Alliance: Product Development Peer Group.* Golden Valley, MN.

*Kudrowitz, B. (2020, 2018, 2016, 2014). Culinary Applications of Rheology. *Rheology Measurements Short Course*. Minneapolis, MN.

*Kudrowitz, B. (2019, October 10). How Play and Humor Fuel Innovation. *Federal Reserve*. Minneapolis, MN.

Kudrowitz, B. (2019, September 27). How Play and Humor Fuel Innovation. *Sala Architects Retreat*. Minneapolis, MN.

Kudrowitz, B. (2017, October 10). Play and Creativity. **Keynote** for *East Central Regional Library Staff Day*. Braham, MN.

Kudrowitz, B. (2017, September 28). How Play Fuels Innovation. *Minnesota Children's Museum Adults @ Play*. St. Paul, MN.

Kudrowitz, B. (2017, September 14). Play and Creativity in the Classroom. *Institute of Child Development Colloquium Series*. Minneapolis, MN.

Kudrowitz, B. (2017, June 6). Radical Innovation is Scary. **Keynote** for *3M Adhesives Symposium*. St. Paul, MN.

Kudrowitz, B. (2017, February 23). Radical Innovation is Scary. **Keynote** for *Smiths Medical Patent Award Dinner*. Minneapolis, MN.

Kudrowitz, B. (2016, September 27). Design Thinking: Tools for Enhancing Creativity In and Out of the Classroom. **Keynote** for the *Rasmussen College 2016 Academic Symposium*. Bloomington, MN.

*Kudrowitz, B. (2015, October 27). How Play and Humor Fuel Innovation. **Keynote** for the *Big 10 Housing Conference*. Minneapolis, NN.

Kudrowitz, B. (2015, October 20). Creativity and Innovation. **Keynote** for *Boston Scientific: Sustaining Engineering Summit*. Maple Grove, MN.

Kudrowitz, B. (2015, September 19). Food and Design. *Minneapolis Institute of Art.* Minneapolis, MN.

Kudrowitz, B. (2015, August 6). Everyday Superpowers. *Science Museum of Minnesota*. St. Paul. MN.

Kudrowitz, B. (2015, July 16). Radical Ideas Today Will Be Commonplace Tomorrow. *Fast Horse*. Minneapolis, MN.

*Kudrowitz, B. (2015, June 25). Radical Ideas Today Will Be Commonplace Tomorrow. **Keynote** for *Creative Mornings.* Weisman Art Museum, Minneapolis, MN.

Kudrowitz, B. (2015, May 11). Creativity, Play, and Improvisation. **Keynote** for the *Minnesota Library Association Institute for Leadership Excellence*. Sugar Lake, MN.

Kudrowitz, B. (2015, March 28). Facilitating Creativity through Humor and Play. *Society of Women Engineers Minnesota Section Spring Seminar*. Boston Scientific, Maple Grove, MN.

Kudrowitz, B. (2015, March 12). Facilitating Creativity through Humor and Play. **Keynote** for the *UMN John Tate Academic Advising Conference.* Minneapolis, MN.

Kudrowitz, B. (2015, March 10). An Introduction to Design Thinking. *Boston Scientific Campus Visit*. Minneapolis, MN.

Kudrowitz, B. (2015, February 18). *Fueling Innovation at the University of Minnesota*. *UMN Foundation Board of Trustees Meeting.* Minneapolis, MN.

Kudrowitz, B. (2014, November 17). Creative Design: Harnessing the Power of Play. *College of Continuing Education, UMN.* Minneapolis, MN.

Kudrowitz, B. (2014, November 6). Creative Methods of Chefs. **Keynote** for *HEIB Home Economists in Business Meeting*. Land O'Lakes, Arden Hills, MN.

Kudrowitz, B. (2014, October 27). Problem Finding and User Needs. **Keynote** for *Minitex CALD Day*. St. Cloud, MN.

Kudrowitz, B. (2014, October 16). Why Technical Leaders Should Embrace Playfulness and Humor. *Technical Speaking Leadership in Action Conference*. University of Minnesota, Minneapolis, MN.

Kudrowitz, B. (2014, October 2). How Humor can Fuel Innovation. **Keynote** for *Minneapolis Idea eXchange.* Minneapolis, MN.

Kudrowitz, B. (2014, September 12). The Importance of Play and Humor for Creative Design. *Medical Devices Center*. Minneapolis MN.

Kudrowitz, B. (2014, July 29). Inspiring Creativity Through Play and Humor. *Minitex Staff Day.* St. Paul, MN.

Kudrowitz, B. (2014, July 15). The Importance of Play and Humor in Creative Design. *Capstone Publishing.* Edina, MN.

Kudrowitz, B. (2014, June 24). Using Play and Humor for Innovation and Collaboration. *Collegis Education.* Edina, MN.

Kudrowitz, B. (2014, May 13-14). Ha Ha and Aha! Play and Humor in Design. *SEE CHANGE Conference*. Minneapolis, MN.

Kudrowitz, B. (2014, April 27). How Humor Can Fuel Innovation. *TEDx UMN.* University of Minnesota, Minneapolis, MN.

Kudrowitz, B. (2014, April 25). Seinfeldian Design: Observation and Problem Finding. **Keynote** for *the Minnesota Library Association Institute for Leadership Excellence*. Minnesota Landscape Arboretum, Chaska, MN.

Kudrowitz, B. (2014, April 15). Where Creativity Comes From. *Boston Scientific*. Minneapolis, MN.

Kudrowitz, B. (2014, April 5). Play, Humor and Creativity. *Mahtomedi Engineering Open House*. Mahtomedi, MN.

Kudrowitz, B. (2014, March 12). The Creative Methods of Chefs. *Architecture Catalyst Series.* University of Minnesota, Minneapolis, MN.

*Kudrowitz, B. (2013, November 15). Inspiring Creativity through Humor and Play. *American Institute of Architects (AIA) 79th Annual Convention & Exposition*. Minneapolis Convention Center, MN.

Kudrowitz, B. (2013, August 29). The Importance of Play. **Keynote** for the *2013 University of Minnesota Convocation*. Minneapolis, MN.

Kudrowitz, B. (2013, June 26). How Play and Humor Help Us Innovate. *11th Annual Society of Concurrent Product Development (SCPD) Conference*. 3M, St. Paul, MN.

Kudrowitz, B. (2013, May 15). The Importance of Play and Humor in the Creative Design Process. *Product Development and Management Association (PDMA-MN*). Blaine, MN.

Kudrowitz, B. (2013, March 8). The Importance of Play and Humor in Creative Design Practice. *Target Women's Business Council Event.* Target Headquarters, Minneapolis, MN.

Kudrowitz, B. (2013, January 25). How Play and Humor Help us Innovate. **Keynote** for *Medtronic Inventor Award Luncheon.* Mounds View, MN.

Kudrowitz, B. (2012, October 10). The Importance of Play and Humor in Creative Design Practice. *American Society of Mechanical Engineers (ASME)*. Plymouth, MN.

Kudrowitz, B. (2012, August 16). A Playful Product Design Process. *3M Tech Forum*. Lake Elmo, MN.

Kudrowitz, B. (2012, March 2). The Importance of Play and Humor in Creative Design Practice. *3M Tech Forum.* St. Paul, MN.

Kudrowitz, B. (2012, February 20). The Importance of Play and Humor in Creative Design Practice. *Target Engineer Week.* Target Headquarters, Minneapolis, MN.

Kudrowitz, B. (2012, February 17). Creativity and Leadership. *2011-2012 President's Emerging Leaders Program*. St. Paul, MN.

Kudrowitz, B. (2012, Jan 13). The Importance of Play and Humor in Creative Design Practice. *Mayo Clinic, Systems Engineering and Operations Research Collaborative*. Rochester, MN.

Kudrowitz, B. (2011, December 8). Play and Creative Design. *The Works, Science and Engineering Museum.* Bloomington, MN.

Kudrowitz, B. (2011, December 8). Play, Humor and Creativity*. Pixel Farm Digital.* Minneapolis, MN.

Kudrowitz, B. (2011, May 25). Play, Humor and Creativity. *Logic Product Design*. Minneapolis, MN.

Kudrowitz, B. (2011, April 14). Design of a Nerf Blaster in 7 Minutes. *Design in 7.* University of Minnesota, Minneapolis, MN.

Kudrowitz, B. (2011, March 31). A Playful Product Design Process. *Design Intersections Symposium.* Minneapolis, MN.

Kudrowitz, B. (2010, September 17). The Humor of Innovation. *Making, Selling, Buying, Using: Emerging Issues in Product Design*. Minneapolis, MN.

Invited Works

Kudrowitz, B. (2015). Thinking on Paper, Leonardo da Vinci's Codex Leicester. *Minneapolis Institute of Art (MIA)*. Minneapolis, MN.
Guest curator for an exhibit on sketching, notebooks, and invention - featuring Leonardo DaVinci's Codex Leicester. More information available online: https://new.artsmia.org/davinci-codex/

Kudrowitz B., & Fienup, W. (2013). Oreo Separating Machine #2. *Widen + Kennedy*.
Juried and Invited creation of a machine that disassembles OREO cookies for an internet advertisement campaign garnering over 2 million views. The original campaign has been removed, but a news article/video can be accessed here: *https://www.youtube.com/watch?v=Ellmty1RtBY*

B. Kudrowitz, Nelson, C., Poetter, A., & Maxwell-Parish, A. (2012). Motorworks Ramp and Garage. *Manhattan Toy*. Minneapolis, MN.
Designing conceptual toy car accessories for the Motorworks brand. One design was produced and sold for three years through Manhattan Toy.

Juried Works

Kudrowitz B., & Anderson, T. (2014-2019). Putt Pong. *Walker Art Center*. Minneapolis, MN.
Jury-selected, Artist-Designed Mini Golf Hole. A recurring exhibit for six years.

Kudrowitz B., Fienup, W. & Wallace, D. (2006). Nerf® Atom Blaster®. *Hasbro*. Pawtucket, RI.
Nerf and Supersoaker concept development. Atom Blaster on the market for five years.

Kudrowitz B., Jewell S., Crumlin, E., Vechakul, J., Hatton, C., & Tomczak, M. (2006). Elevator Simulator. *5-Wits Entertainment.* Washington DC.
Design of special effects for the Operation Spy experience at the International Spy Museum.

Kudrowitz B., & Fienup, W. (2005). The Catsup Crapper, AuTomato or Ketchup Robot. *MIT Unuseless Competition.* Cambridge, MA.
An anthropomorphic ketchup-dispensing robot and related videos featured on numerous websites and television shows such as *The Martha Stewart Show* (2008) and *Conan* (2011).

Teaching

University of Minnesota, Courses Developed and Taught

Creative Design Methods (PDES 2701)
3 Credits, Fall 2011-2017, 2019-present, typical enrollment: 100
Introduction to early-stage design processes
http://product.design.umn.edu/courses/pdes2701/

Concept Sketching (PDES 2702)
3 Credits, Fall 2011-2014, typical enrollment: 80
Introduction to freehand sketching and rendering for communication of conceptual product design
http://product.design.umn.edu/courses/pdes2702/

Product Innovation Lab (PDES 3711/5711)
4 Credits, Spring 2020-present, typical enrollment: 60
Project-based, community of practice that introduces product design process with cross-functional teams

Toy Product Design (PDES 3711/5711)
4 Credits, Spring 2011-2019, typical enrollment: 90
Project-based, community of practice that introduces product design process through toy design
http://product.design.umn.edu/courses/pdes3711/

Food and Design (DES 3715)
4 Credits, Fall 2013, 2014, 2016, typical enrollment: 35
Co-taught with local chefs, students learn a variety of design theories and tools through a food medium
http://food.design.umn.edu

Creativity, Idea Generation, and Innovation (PDES 5701)
3 Credits, Fall 2011-2017, typical enrollment: 20
Graduate introduction to creative design methods and theories

Product Design in Hong Kong (PDES 3197)
2 Credits, J Term 2019
Study abroad in Hong Kong/China

First Year Experience (CSE 1001)
1 Credit, Fall 2014
Introduction to design for freshmen in CSE

Project Based Inquiry (CSE 1002): Product Development and Production
1 Credit, J Term 2015
Study abroad in Hong Kong/China to tour toy manufacturing industry

Architecture as Catalyst (ARCH 5110): Modernist Cuisine
1 Credit, Spring 2014
Applying design principles to food with local chefs

Architecture as Catalyst (ARCH 5110): Old School Toys, New School Tools
1 Credit, Spring 2013
Developed prototypes of Weisman Art Museum themed puzzle block toy

University of Minnesota, Courses Developed for Others to Teach

User-Centered Design Studio (PDES 5701)
3 Credits, Spring 2022
Graduate experience in user-centered product design and development process

Design Visualization (PDES 5702)
3 Credits, Fall 2022
Graduate introduction to concept visualization techniques

Prototyping Methods (PDES 5703)
4 Credits, Fall 2022
Graduate introduction to traditional and digitally interactive prototyping tools and techniques

Computer-Aided Design 2: Surface Modeling and Rendering (PDES 3714)
3 Credits, Spring 2020-present
Advanced CAD skills in making high quality organic-form digital models

Improvisation for Design (DES 1002)
3 Credits, Spring 2019-2021
Foundations of improvisation as applied to a variety of design skills

Product Design Studio 1 (PDES 2771)
4 Credits, Fall 2017-presesnt
The first studio for undergraduate majors focusing on form development, model making, and user research

Product Design Studio 2 (PDES 2772)
4 Credits, Spring 2018-present
The second studio for undergraduate majors focusing on technical design skills and manufacturing

Product Design Studio 3 (PDES 3771)
4 Credits, Fall 2018-present
The third studio for undergraduate majors focusing on service design and user experience

Capstone Research Studio (PDES 4701W)
4 Credits, Fall 2016-present
The first capstone studio experience for undergraduate majors focusing on early-stage design, problem finding and definition

Capstone Design Studio (PDES 4702W)
4 Credits, Spring 2017-present
The second capstone studio experience for undergraduate majors focusing on detailed design, manufacturing, market needs

Concept Visualization and Presentation 1 (PDES 2703)
3 Credits, Spring 2015-present
Expanding on visualization techniques taught in concept sketching with a focus on presenting new ideas

Concept Visualization and Presentation 2 (PDES 2704)
3 Credits, Fall 2016-present
Expanding on visualization techniques taught in PDES 2703 with a focus on digital skills

Designing for Manufacture (PDES 3706/5706)
4 Credits, Spring 2015-present
Hands-on introduction to a variety of tools and methods for designing manufactured goods

The History and Future of Product Design (PDES 3705/5705)
3 Credits, Spring 2014-present
Examining the history, evolution, and trajectory of modern industrial/product design

Designing Characters, Worlds, and Immersive Experiences (DES 3160)
3 Credits, Fall 2013
Using characters and worlds as a means to develop immersive environments

Computer-Aided Design 1: Solid Modeling and Rendering (PDES 3704/5704)
4 Credits, Fall/Spring 2013-present
Introduction to making high quality digital models of existing and conceptual objects

Product Form and Model Making (PDES 3703/2777)
2-4 Credits, Fall/Spring 2012-present
Introduction to 3-dimensional form for product aesthetics and usability

MIT, Department of Mechanical Engineering

Toy Product Design (2.00b)
Co-Creator and Course Instructor, 2005-2010
Project-based course that introduces undergraduates to product design process and techniques

Product Engineering Processes (2.009)
Lab Instructor and Teaching Assistant, 2005-2010
Mechanical engineering capstone undergraduate product design process course

Product Design (2.744)
Teaching Assistant, 2006, 2008
Graduate project-based course emphasizing user experience, product form, and human factors

Short Courses Developed for Industry

3M, The Art of Enhanced Communication
8 Week course, 2012-2013
Drawing and visualization skills for engineers and scientists

3M, Tools for Innovation
7 Week course, 2013-2014
A hands-on idea generation and development class for designers and engineers

Minneapolis Institute of Art, Game Design
5-Day course, 2013
Consulting and co-teaching a week-long game design class for elementary school children

Invited Workshops

Similar to invited presentations listed in the Scholarship section, I am also invited to lead hands-on workshops in which participants are guided through a series of design activities supported by my research. The goal of these workshops is for participants to learn how to use these methods and techniques in their fields. The range of venues listed below speaks to the versatility and applicability of my teaching to a variety of fields and disciplines including medical professionals, educators, librarians, engineers, designers, consultants, scientists, artists, and a professional baseball team. Workshops are divided into international, national, and regional. Regional presentations are those given within Minnesota.

International

Kudrowitz, B. (2018, October 16). Improvisation for Idea Generation. *TU Delft Industrial Design Engineering*. Delft, Netherlands.

Kudrowitz, B. (2017, March 4). A Hands-on Introduction to a Creative Design Process. *4th Educational Technology Summit.* Istanbul, Turkey.

Kudrowitz, B. (2016, July 28). Improvisation for Idea Generation. *Kobe Design University*. Kobe, Japan.

Kudrowitz, B. (2015, August 11-12). Food and Design. *University of Twente.* Enschede, Netherlands.

Kudrowitz, B. (2010, June 21-25). Toy Product Design Process. *The Hong Kong Institute of Vocational Education (IVE*). Hong Kong.

Kudrowitz, B. (2011, April 19-20). Ideating Discovery-Enriched Curriculum. *City University of Hong Kong*. Hong Kong.

Kudrowitz, B. (2012, June 23). Idea Generation Through Improvisation. *BMW Guggenheim Lab.* Berlin, Germany.

National

Kudrowitz, B. (2018, December 13). A Hands-on Introduction to a Creative Design Process. *elnk*. Billerica, MA.

Kudrowitz, B. (2017, April 21). Improvisation for Innovation. *Spencer Museum of Art at The University of Kansas*. Lawrence, KS.

Kudrowitz, B. (2016, December 1). Design Thinking: Tools for Enhancing Creativity In and Out of the Classroom. *Indiana University.* Bloomington, IN.

Kudrowitz, B. (2016, May 12). An Introverted, Team-Based Idea Generation Method. *Innovation Learning Network.* Berkeley, CA.

Kudrowitz, B. (2016, May 11). Improvisation for Innovation. *Innovation Learning Network.* Berkeley, CA.

Kudrowitz, B. (2015, May 28). A Hands-on Introduction to a Creative Product Design Process. *University of Oregon.* Corvallis, OR.

Kudrowitz, B. (2014, August 1). Design & Prototyping with Technology. *Architecture & Design Education Network*. Cranbrook, MI.

Kudrowitz, B. (2013, October 9). Blue Sky Idea Generation for Fluid Power Storage. *NSF Center for Compact and Efficient Fluid Power (CCEFP) Annual Meeting and ASME/Bath Symposium on Fluid Power and Motion Control.* Sarasota, FL.

Kudrowitz, B. (2013, January 16-17). A Hands-on Introduction to a Creative Product Design Process. *War Memorial Hospital*. Sault Ste. Marie, MI.

Kudrowitz, B. (2012. August 31). A Humorous, Playful Brainstorming Process. *Curb Center Creative Practice Bootcamp at Vanderbilt.* Nashville, TN.

Kudrowitz, B. (2012, May 16). A Hands-on Introduction to a Creative Design Process. *Innovation Learning Network.* Detroit, MI.

Kudrowitz, B. (2011, January 28). Play and Idea Generation. *Mechanical Engineering at Purdue University*. West Lafayette, IN.

Regional / Minnesota

Kudrowitz, B. (2021, December 16). 1-2-4-All Idea Generation. *Temple Israel*. Minneapolis, MN.

Kudrowitz, B. (2021, September 30). A Hands-on Introduction to a Creative Design Process. *CPC Global Tech Summit*. Minneapolis, MN.

Kudrowitz, B. (2019, April 23). A Hands-on Introduction to a Creative Design Process. *The Minnesota Twins, Brand Experience and Innovation*. Minneapolis, MN.

Kudrowitz, B. (2017, October 13). A Hands-on Introduction to a Creative Design Process. *Deloitte Consulting*. Minneapolis, MN.

Kudrowitz, B. (2017, June 22). A Hands-on Introduction to a Creative Design Process. *3M: Made by You*. St. Paul, MN.

Kudrowitz, B. (2016, June 23). Blue Sky and Structured Idea Generation. *Boston Scientific*. Maple Grove, MN.

Kudrowitz, B. (2015, December 14). Designing with Vegetables. *Minneapolis Institute of Art.* Minneapolis, MN.

Kudrowitz, B. (2015, July 7). A Hands-on Introduction to a Creative Design Process. *NSF EngrTEAMS.* St. Paul, MN.

Kudrowitz, B. (2015, May 14). A Hands-on Introduction to a Creative Product Design Process. *Milestone AV*. Eden Prairie, MN.

Kudrowitz, B. (2014, October 27). Creative Product Design Process. *Minitex CALD Day*. St. Cloud, MN.

Kudrowitz, B. (2014, June 12). Ideation Workshop: Blue Sky Idea Generation. *Minnesota User Experience Professional Association (UXPA)*. Minneapolis, MN.

Kudrowitz, B. (2012-2019, Fall). Brainstorming for Medical Devices. *Design of Medical Devices Conference*. Minneapolis, MN.

Kudrowitz, B. (2013, November 22). Abbreviated Hands-On Introduction to Creative Idea Generation. *Vascular Solutions.* Maple Grove, MN.

Kudrowitz, B. (2013, October 14). Transforming Education with Design Thinking. *Forum on the Sustainability of Higher Education.* Minneapolis, MN.

Kudrowitz, B. (2013, July 22). Improvisation for Innovation. *Boston Scientific, Young Leadership Association*. Maple Grove, MN.

Kudrowitz, B. (2013, May 22). Structured Ideation. *ATK*. Minneapolis, MN.

Kudrowitz, B. (2013, May 21). A Creative Product Design Process. *ATK*. Minneapolis, MN.

Kudrowitz, B. (2013, May 16). Idea Generation Through Improvisation. *Minnesota Library Association: Institute for Leadership Excellence*. Breezy Point, MN.

Kudrowitz, B. (2013, February 1). Improvisation for Idea Generation. *University of Minnesota Communicators Forum*. Minneapolis, MN.

Kudrowitz, B. (2013, January 8). A Hands-on Introduction to a Creative Product Design Process. *Starkey.* Eden Prairie, MN.

Kudrowitz, B. (2012, December 6). Improv and Idea Generation for the Classroom. *Design Lab for Educators.* Minneapolis, MN.

Kudrowitz, B. (2012, November 15). Future of Target Store Experience. *Target*. Minneapolis, MN.

Kudrowitz, B. (2012, June 18). Improvisation for Idea Generation. *Walker Art Center, Kitchen Lab*. Minneapolis, MN.

Kudrowitz, B. (2012, April 25-27). Mash-Up: Transforming Education with Design Thinking. *Council of Educational Facility Planners International, Midwest Regional Conference*. Minneapolis, MN.

Kudrowitz, B. (2012, March 6). Innovation and Brainstorming. *3M Skin/Wound Care Division*. St. Paul, MN.

Kudrowitz, B. (2012, January 13). Improv and Idea Generation. *Mayo Clinic, Center for Innovation.* Rochester, MN.

Kudrowitz, B. (2011, July 14). Play, Humor and Creativity. *Creative Kid Stuff Corporate.* Minneapolis, MN.

Kudrowitz, B. (2011, May 18). Play, Humor and Creativity. *3M*. St. Paul, MN.

Guest Lectures, UMN

Kudrowitz, B. (2012, 2015-2020). Sketch Your Ideas! *College of Design Welcome Week/College Day.* Minneapolis, MN.

Kudrowitz, B. (2019). Radial Innovation Is Scary. *DES 1000, Design @ MN.* Minneapolis, MN.

Kudrowitz, B. (2019-2020). An Introduction to Toy Design Process. *Philosophy, Conceptual Art, and LEGOs, Honors Nexus*. Minneapolis, MN.

Kudrowitz, B. (2019). Opportunity Finding, Latent Needs, Inspiration, & Trends. *ANTH 4121 Business Anthropology.* Minneapolis, MN.

Kudrowitz, B. (2014-2019). Product Design. *MGMT 3010 Introduction to Entrepreneurship*. Minneapolis, MN.

Kudrowitz, B. (2011-2019). Creativity and Ideation. *MATS 4400 Senior Design Project.* Minneapolis, MN.

Kudrowitz, B. (2012-2019). The Importance of Play and Humor in Creative Design Practice. *DES 1101W Design Thinking*. St. Paul, MN.

Kudrowitz, B. (2014-2018). Design of Nerf Blaster. *ME 2011 Engineering Design*. Minneapolis, MN.

Kudrowitz, B. (2017). Basics of Sketching. *ME 2011 Introduction to Engineering.* Minneapolis, MN.

Kudrowitz, B. (2016-2017). Introduction to Product Design. *DES 1001 Introducing the College of Design.* Minneapolis, MN.

Kudrowitz, B. (2014-2016). Blue Sky Idea Generation. *Architecture Graduate Orientation. St. John's University*. St. Joseph, MN.

Kudrowitz, B. (2013, 2015-2016). How Play and Humor Fuel Innovation. *DES 1000 Design @ MN.* Minneapolis, MN.

Kudrowitz, B. (2014-2015). The Importance of Play and Humor in Creative Design Practice. *ARCH 1281 Design Fundamentals 1.* Minneapolis, MN.

Kudrowitz, B. (2011-2015). A Humorous, Playful Brainstorming Process. *ME 8221 New Product Design and Business Development.* Minneapolis, MN.

Kudrowitz, B. (2012-2015). A Hand-on Introduction to a Creative Design Process. *ME 4054W Design Projects*. Minneapolis, MN.

Kudrowitz, B. (2015). A Hand-on Introduction to a Creative Design Process. *UMN Graduate School*. Minneapolis, MN.

Kudrowitz, B. (2015). Blue Sky Idea Generation. *IDES 4608 Interior Design Thesis Studio*. St. Paul, MN.

Kudrowitz, B. (2014). Engineering for Design. *ARCH 3250 Farm Tech.* Minneapolis, MN.

Kudrowitz, B. (2014). Design of Food. *DES 3141 Technology, Design and Society.* Minneapolis, MN.

Kudrowitz, B. (2012). The Importance of Play and Humor in Creative Design Practice. *DHA Lunch Meeting.* St. Paul, MN.

Kudrowitz, B. (2012). Sketch Your Ideas! *University of Minnesota Backstage Pass: An Event for National Merit Semifinalists.* Minneapolis, MN.

Kudrowitz, B. (2011-2012). Opportunity Finding, Observation, and Ethnography. *Kin 3505 Human-Centered Design*. Minneapolis, MN.

Kudrowitz, B. (2011). Design of Nerf Blaster. *PSY 1905 Psychology of Design*. Minneapolis, MN.

Kudrowitz, B. (2011). Play, Humor, and Creativity. *DES 1111 Creative Problem Solving.* Minneapolis, MN.

Kudrowitz, B. (2011). Play. *LA 8205 Urban Form Options Studio.* Minneapolis, MN.

Kudrowitz, B. (2011). Product Design Interaction. *GDES 2385W Design and Factors of Human Perception.* St. Paul, MN.

Advising

Until 2020, product design did not have a graduate degree option at the University of Minnesota, so *all* of my graduate advising was that of students in other graduate programs at the University (specifically in the Human Factors and Ergonomics graduate program, and the Graphic Design track in the Design graduate program). The graduate degree option in product design, and M.S. Plan C, started in Fall 2020. As my expertise can be applied to a wide range of disciplines, I also served on graduate committees in graphic design, interior design, food science, biomedical engineering, mechanical engineering, computer science, psychology, apparel design, and architecture. I have advised undergraduate student research in product design since 2011.

University of Minnesota – Ph.D. Advisor

Sunmin (May) Hwang, Human Factors and Ergonomics, PhD, 2019-present

Thesis Title: *Toward Design Solutions for Food Waste: Analysis of the Relationship Between Aesthetics of Produce and Consumer Behavior*

Jieun (Misa) Kwon, Human Factors and Ergonomics, PhD, 2016-2019

Thesis Title: *Pitch Perfect: The Investigation of Presentation Quality Effect on Product Evaluation During Product Idea Pitching*

Teddy Russell, Human Factors and Ergonomics, PhD, 2016-2019

Thesis Title: *Interactive Ideation: Online Team-Based Idea Generation versus Traditional Brainstorming*

Dara Gruber, Human Factors and Ergonomics, PhD, 2014-2017

Thesis Title: *The Effects of Mid-range Visual Anthropomorphism on Human Trust and Performance Using a Navigation-based Automated Decision Aid*

University of Minnesota – M.S. Advisor

Frances Jedrzejewski, Human Factors and Ergonomics, MS, 2017-2018
Teddy Russell, Human Factors and Ergonomics, MS, 2015-2016
Xinyi Wang, Design-Graphic Design track, MS, 2014-2016

University of Minnesota – Ph.D. Committee Member

Elizabeth Stretch, STEM Education, PhD, 2018-present
Tasneem Kabli, Design-Graphic Design track, PhD, 2018-2021
Khanh Hoa Vo, Design-Interior Design track, PhD, 2017-2021
Sarah Alfalah, Design-Graphic Design track, PhD, 2014-2018
Joungyun Choi, Design-Graphic Design track, PhD, 2015-2018
William Lendway, Food Science, PhD, 2015-2017
Shivaram Poigai, Biomedical Engineering, PhD, 2014- 2017
Cory Schaffhausen, Mechanical Engineering PhD, 2012-2015
Shawn Wilhelm, Mechanical Engineering PhD, 2012-2014
David Schroeder, Computer Science PhD, 2013-2014
Brett Jackson, Computer Science PhD, 2012-2014
Lane Phillips, Computer Science, PhD, 2011-2012

University of Minnesota – Master's Committee Member

Khue Tran, Psychology, MS, 2018-2020
Jasper Adamek-Bowers, Mechanical Engineering, MSME, 2015-2020
Kathryn Jacobs, Psychology, MS, 2016-2019
Kenya Mejia, Mechanical Engineering, MS, 2016-2017

Mary Ellen Burglund, Design-Apparel Studies track, MS, 2015-2016
Drew Blom, Design-Graphic Design track, MFA, 2014-2016
Emily Marti, Design-Graphic Design track, MFA, 2012-2015
Ellen Schofield, Design-Graphic Design track, MFA, 2012-2013
Mark Meredith, Mechanical Engineering, MS, 2014-2015
Shelley Thurk, Mechanical Engineering, MS, 2014-2015
William Besser, Mechanical Engineering, MS, 2012-2014
Sachin Bijadi, Mechanical Engineering, MS, 2013-2014
Jon Hjaltason, Mechanical Engineering, MS, 2012-2013
Arya (Made) Adiartha, Architecture MS, 2012-2013
Brenton Steinmann, Mechanical Engineering, MS, 2012-2013
Evan Leingang, Mechanical Engineering, MS, 2012-2013
Kasey Grim, Mechanical Engineering MS, 2013
Andrew Carlson, Mechanical Engineering, MS, 2012
Mat Waddell, Mechanical Engineering, MS, 2012
Travis Burkstrand, Design-Graphic Design track, MA, 2014-2014

MIT – Ph.D. Committee Member

Geoff Tsai, Mechanical Engineering, PhD, 2014-2016

Kobe Design University – Ph.D. Committee Member

Sara Hojjat, Industrial Design, PhD, 2016

University of Minnesota – Graduate Directed Study Advisor

Drew Blum, Design-Graphic Design track, MFA, 2016
James Cosper, Design-Graphic Design track, PhD, 2011
Andrew Carlson, Mechanical Engineering, MS, 2012

University of Minnesota – Graduate Project Advisor (unrelated to thesis or research)

Dustin Schipper, Architecture, MArch, 2015
Michael Silvestrini, Architecture, MArch, 2014
Emily Stover, Landscape Architecture, MLA, 2012
Krishna Natarajan, Computer Science, MS, 2012

University of Minnesota – Undergraduate Student Research Advisor

I have worked with a number of undergraduate students on research projects. Some projects were for their honors theses, many were through the competitive undergraduate research program (UROP), and others were hired as undergraduate research assistants. The UROP provides funding for students to work on a research project with a faculty member at the University. Students who were awarded UROP funding and worked with me as their advisor are indicated below. Students who completed an honors thesis under my advisement are also indicated below. Students without a UROP or honors notation were hired as undergraduate research assistants.

Brooke Bratrud, Product Design, BS, 2021 – Honors Thesis

Abbey Erwin, Psychology, BS, 2021 – Honors Thesis

Rachel Davel, Product Design, BS, 2021 - **UROP**

Lily Ho, Inter-College Program, BS, 2019 - **UROP**

Khue Tran, Psychology, BS, 2018

Alex Cummins, Food Science, BS, 2016 – Honors Thesis
Luke Bromback, Mechanical Engineering, BS, 2016 - **UROP**
Paul Esslinger, Joshue Yue, & Ian Wright (team) Mechanical Engineering, BS, 2016 - **UROP**
Thomas Sievers, Mechanical Engineering, BS, 2016 - Honors Thesis
Alex Leeds, Inter-College Program, BS, 2015
Aaron Free, Computer Science, BS, 2015 - **UROP**
Josh Halverson, Mechanical Engineering, BS, 2015
Alexander Schmies, Mechanical Engineering, BS, 2015 - **UROP**
Evelina Knodel, Architecture, BS, 2014
Krystianna Johnson, Inter-College Program, BS, 2014 - **UROP**
Nel Pilgrim-Rukavina, Applied Economics, BS, 2014
Jacob Haug, Technical and Scientific Communication, BS, 2014
Maria Brosofske-Wires, Inter-College Program, BS, 2014
Daniel Rezekulov, Mechanical Engineering, BS, 2014
Austin Granger, Computer Science, BS, 2014
Katrina Mutuc, Mechanical Engineering, BS, 2014 - **UROP**
Micah Lindstrom, Mechanical Engineering, BS, 2014 - **UROP**
Arthur Oxborough, Retail Merchandising, BS, 2012 - **UROP**
Catie Jo Pidel, Inter-College Program, BS, 2013 - **UROP**
Caitlin Dippo, Architecture, BDA, 2014 - **UROP**
Alex Hambrock, Mechanical Engineering, BS, 2013 - **UROP**
Amy Marcus, Communication, BS, 2013 - **UROP**
Matthew Munson, Inter-College Program, BS, 2013
Conner Murphy, Graphic Design, BS, 2012
Lucas Keading, Electrical Engineering, BS, 2012 - Honors Thesis

University of Minnesota – Undergraduate Student Project-Based Directed Study Advisor

Ross Neumann, Inter-College Program, BS, 2015
Zachary Fadness, Mechanical Engineering, BS, 2015
Michael Rosplock, Mechanical Engineering, BS, 2014
Conner Cowling, Computer Science, BS, 2012
Andrew Maxwell Parish, Mechanical Engineering, BS, 2011
Colin Nelson, Mechanical Engineering, BS, 2011
Adam Poetter, Bio-Product Engineering/Architecture, BS, 2011
Jesse Purvey, Mechanical Engineering, BS, 2011

University of Minnesota – Student Club Faculty Advisor

Product Design Minnesota (IDSA Student Chapter), 2015-present
Design U, 2015-2019
Innovation Association, 2013-2014

Dissemination of Undergraduate Student Research and Course Work

Conference Presentations

Dippo, C. & **Kudrowitz, B.** (2015). Elaboration in Creativity Tests. *NCUR National Conference of Undergraduate Research.* Spokane, WA.

Pilgrim-Rukavina, N. & **Kudrowitz, B.** (2015). Exploring the Effects of Warm-up Games, Criticism and Group Discussion on Brainstorming Productivity. *National Conference of Undergraduate Research.* Spokane, WA.

Johnson, K. & **Kudrowitz, B.** (2015). A Relationship between Physical Construction Play as Children and Adult Creativity Scores. *National Conference of Undergraduate Research*. Spokane, WA.

Dippo, C. & **Kudrowitz, B.** (2013). Evaluating the Alternative Uses Test of Creativity. *National Conference of Undergraduate Research*. UW La Crosse, WI.

Invited Museum Exhibitions

Student work from my classes have been featured in exhibits, often in the context of celebrating the class itself.

America's Monsters, Superheroes and Villains. *Goldstein Museum of Design*. St. Paul, MN. 2015-2016
Display of Student Work from PDES 3711 Toy Product Design

Soap Factory 25th^{t} Anniversary Party. *Soap Factory.* Minneapolis, MN. 2015
Food Design Catering with Students from PDES 3715 Design and Food

Tune Toy. *The Works Museum*. Bloomington, MN. 2012-2013
Student Designed Exhibit Based on Classwork in PDES 3711 Toy Product Design

Toy Product Design. *MIT Museum*. Cambridge, MA. 2008-2010
Exhibit of Toy Product Design History and Student Work

Toys and Games: More than Amusement. *Revolving Museum*. Lowell, MA. 2008
Exhibit of History of Toy Product Design Class and Student Work

Class Events

The courses I teach include a grand finale in which students present their work to industry, peers, families and the community. These events are unlike typical final presentations in a classroom setting. These events are ticketed theatrical productions with 200-300 attendees, lighting, music, theming, pre-show entertainment, and waiting lists for seats.

PLAYsentations. Student designed products with theatrical performance. UMN and MIT.
Final event for PDES 3711 Toy Product Design / Product Innovation Lab (iLab)
2005-Present

Walleye Tank. New product pitch competition in the style of "Shark Tank". UMN
Final event for PDES 2701 Creative Design Methods
2012-Present

Eat Design. Student designed food experiences. UMN
Final event for PDES 3715 Design and Food
2013-2017

Sketch-Off. Improvisation design sketching show. UMN
Final event for PDES 2702 Concept Sketching
2012-2016

Service

Discipline-Related (External)

Journal Editor

Associate Editor, International Journal of Food Design, 2014-Present

Journal Editorial/Conference Boards

International Journal of Design Creativity and Innovation (IJDCI), 2019-present
International Food Design and Food Studies Conference, 2017
International Conference on Design Creativity, 2016, 2017
International Food Design Conference, 2014

Conference Session Chair/Coordinator

ASME Design Theory and Methodology (DTM) Conference Review Coordinator and Session Chair, 2017
International Conference on Design Creativity Session Chair, 2016

Journal/Conference/Grant Reviewer

2023 ITRA Prize for Outstanding Toy Research Award Committee
Design Studies, 2021
International Journal of Gastronomy and Food Science, 2021
International Journal of Child-Computer Interaction, 2021
ASME Design Theory and Methodology, 2012-2017, 2021
International Journal of Design Creativity and Innovation, 2013-2015, 2019-present
ASME Journal of Mechanical Design, 2017, 2019-2021
Technology & Innovation: Journal of the National Academy of Inventors, 2018
The Design Journal, 2017
Artificial Intelligence for Engineering Design, Analysis and Manufacturing (AIEDAM), 2017
International Conference on Design Creativity, 2012, 2016, 2017
International Journal of Design, 2016
Design and Emotion Conference, 2014, 2016
Human Technology Journal, 2015
The ACM Conference on Human Factors in Computing Systems (CHI), 2014
Journal of Engineering Design, 2013-2014
Natural Sciences and Engineering Research Council of Canada, Chair in Design Engineering Committee, Toronto, 2013

Faculty Reviews

Department of Product Design, University of Oregon, 2020
Faculty promotion from Assistant to Associate w/ Tenure

Professional Advisory Board Membership

Leonardo's Basement, MSP Workshop, Advisory Board, 2014-2018
Stratasys Education Customer Advisory Board (eCab), 2018
WAM Weisman Art Museum, Colleagues Advisory Board, 2011-2016
YOXO, Toy Company, Advisory Board, 2012-2016
Minnesota Children's Museum, STEM Advisory Board, 2014

CogCubed, Cognitive Toy Start-Up, Advisory Board, 2013-2015

Professional Competition Judge

Dog Fashion Show, Minneapolis, 2017
Toy of the Year Awards (*i.e.,* TOTY), New York, 2011-2015
FIRST Robotics, Minneapolis, 2011

Governance (UMN)

Several roles listed below are of major significance in both time and impact, specifically: chairing the Collegiate Structures Working Group, chairing the Faculty Assembly and Faculty Leadership Committee, chairing a University Innovation Center committee, and directing the Product Design Program. These items are marked with an asterisk*.

University of Minnesota

Member, McKnight Land-Grant Professorship Review Committee, 2021
*Chair, Innovation Center Committee, 2014-2015

College of Design

*Chair, Collegiate Structures Working Group, 2020-present
*Chair, Faculty Assembly and Faculty Leadership Committee, 2019-2021
Member, Kusske Design Initiative - Material Library and Maker Space Working Group, 2021
Member, CDES Interdisciplinary Design Committee, 2012-present
Member, CDES Dean Review Committee, 2021
Member, CDES Fabrication Shop Technician Search Committee, 2016
Member, CDES Dean Search Committee, 2015
Member, Committee for Change, 2015
Member, UROP Review Committee, 2012-2013
Member, College of Design Lectures Committee, 2011-2012

Department of Design, Housing and Apparel

*Director, Product Design Program, 2011-present
Chair, Product Design Faculty Search Committee, 2015, 2016, 2017
Member, Product Design Faculty Search Committee, 2012-2014, 2019, 2020
Member, DHA Curriculum Committee, 2011-2018, 2021
Member, MNDrive Product Design Faculty Search Committee, 2014

Professional Consulting

Patent Litigation Expert Consulting

The following cases involve utility patent infringement/invalidity. The process of being selected as an expert for a case is highly competitive. The work involves applying my research expertise in product design/toy design to legal cases involving patents. My experiences with these cases have informed my teaching to better prepare students in protecting their own intellectual property.

Radio Flyer v American Plastic Toys, 2019-2020
Retained by Barnes & Thornburg, LLP
Representing Radio Flyer, Plaintiff

Choirock v Spin Master, 2019-2020
Retained by Vinson & Elkins LLP, San Francisco
Representing Choirock, Defendant
3 Declarations, 1 Deposition

Pop Sockets LLC v. Quest USA Corp. et al, 2019-2020
Retained by Marshall, Gerstein and Borun LLP, Chicago
Representing Pop Sockets, Plaintiff
1 Declaration

Mattel v Spin Master, 2018-2019
Retained by Andrew Kurth Kenyon LLP, Washington DC
Representing Mattel, Defendant
3 Declarations

Mattel v Spin Master, 2017-2019
Retained by Norton Rose Fulbright Canada LLP
Representing Mattel, Defendant
1 Declaration

Tinnus Enterprises LLC & Zuru LTD, LLC vs Telebrands Corp. 2015-2019
Retained by Dunlap, Bennett & Ludwig
Representing Tinnus/Zuru, Plaintiffs
15 Declarations, 11 Depositions, 2 Court Hearings, 1 Jury Trial
**Successfully defended validity of two US patents (9,315,282 and 9,242,749)*

Product Design Consulting

Ideas to Go. Minneapolis, MN. 2021
Food/Beverage Product Expert Review

Tricam Industries. Eden Prairie, MN. 2013
Gardening Product Idea Generation

Ideas to Go. Minneapolis, MN. 2013
Dog Toys Expert Review

Design Squad, PBS. Boston, MA. 2006
Prototyping musical instruments for Design Squad Season 1, Episode 2: *Rock On*

5 Wits Interactive Entertainment. Boston, MA. 2005
Storyboarding, set design, and animatronics for interactive *"Tomb"* show in Boston

Professional Memberships

Industrial Designers Society of America (IDSA), 2011-present
American Society of Mechanical Engineers (ASME), 2004-2005, 2012-2018
Design and Emotion Society, 2014-2016
International Food Design Society, 2012-2015

Outreach - Media Exposure

Television/Film/Radio (UMN)

"Four local toymakers to support this holiday season." *Good Day.* Fox 9 News. November 1, 2021

"Toy ideas to surprise and impress this December." *Good Day.* Fox 9 News. November 1, 2021

"A riff on creativity, design and toys." *All in the Mind with Sana Qadar.* ABS Radio National. April 5, 2020.

"New Product Design Degree at University of Minnesota Creating Innovators" *Eyewitness News*. KSTP Channel 5. October 11, 2016.

"Local 3-D Printing Company Stratasys Unveils New Factory." *Eyewitness News*. KSTP Channel 5. August 24, 2016.

"The Art of Food Design and 'Tasting with Our Eyes." *MPR News with Tom Weber.* MPR. January 20, 2016.

"U of M Students Mix Apples and Design." *Eyewitness News*. KSTP Channel 5. October 15, 2014.

"University of Minnesota Students Take Culinary Arts to the Next Level." *Eyewitness News*. KSTP Channel 5. November 28, 2013.

"Twister Inventor Dies in MN." *Fox 9 News*. July 11, 2013.

"Food, Space and 3D printing." *John Hines.* WCCO. May 23, 2013.

Jeanne Moos. "How to Separate Your Oreo." *The Situation Room.* CNN News. March 12, 2013.

"U of M Oreo Splitter." *Fox 9 News*. Friday March 1, 2013.

"Design professor & toy lover Barry Kudrowitz talks toys, creativity, and why play matters." *The Roadhouse*. WTIP North Shore Community Radio 90.7 FM. November 30, 2012.

"Musical Toy Story." *Daily Planet.* Discovery Canada. January 18, 2012.

"Good Question: What Toys Will Be Hot for the Holidays?" *Channel 4 News*. CBS Local. WCCO. September 20, 2011.

"Transformers 2 – Deleted Scene." *Conan*. TBS. June 28, 2011.

"Food: Episode 2." *Off the Air*. Cartoon Network's Adult Swim. May 25, 2011.

"Creating Toys for Credit at U of M" *M.A. Rosko on Fox 9 News*. May 11, 2011.

Television/Film/Radio (MIT)

"Star Wars – Deleted Scene." *Conan*. TBS. January 11, 2011.

"Barry Kudrowitz: Brainstorming in the MIT Toy Lab." *Imagine It! 2*. DVD. Infinite Loop Media LLC. July 2009.

"Unuseless Inventions." *Martha Stewart Show.* Fine Living Channel. February 15th, 2008.

"Rock On: Episode 2." *Design Squad*. PBS. 2007.

"Archimedes Death Ray: Episode 46." *MythBusters*. Discovery Channel. January 25, 2006.

Magazine (UMN)

Matthew Kitchen. "The Unexpected Case for Tough Toys." *Fatherly*. October 2017.

Meleah Maynard. "Just Wondering." *Minnesota Magazine*. Spring 2016.

Meleah Maynard. "Toy Story." *Legacy*: Alumni Magazine Cover story. Fall 2014.

Quinton Skinner. "Prof's Food Design Class Really Cooks." *Minnesota Monthly.* March 2014.

Jacqueline Detwiler. "Best Buys." *Hemispheres Inflight Magazine.* November 2011.

Ledetta Wossen. "Toy Boy." *MADE Magazine*. Issue 2. Profile Feature. 2011.

Magazine (MIT)

John. B. Carnett. “PopSci's 25 Most Awesome College Labs 2011.” *Popular Science.* August 2011.

Thomas Grose. “Hot Courses.” American Society for Engineering Education *(ASEE) PRISM*. Summer 2011.

Rena Marie Pacella. “Mind-Blowing College Labs." *Popular Science.* September 2010.

Paul McMorrow. “Good Bostonian: Barry Kudrowitz, Product Designer." *Boston’s Weekly Dig*. August 2007.

Etienne Benson. “Toy Stories.” Association for Psychological Science *Observer*. December 2006.

Paul McMorrow. “Bringing Cambridge What it Badly Needs: A Death Ray.” *Boston’s Weekly Dig*. October 19, 2005.

“20 Coolest People in Orlando.” *Axis Magazine*. November 2004.

Newspaper (UMN)

Richard Chin. “Out of toilet paper? We've got some solutions and some precautions.” *Star Tribune*. March 31, 2020.

John Ewoldt. “Minneapolis-based Manhattan Toy keeps on truckin' but without Groovy Girls,” *Star Tribune*. December 14, 2019.

Jake Steinberg. “The Danger Zone: new UMN class hopes to spark creativity with improv.” *Minnesota Daily.* January 27, 2019.

Matthew Kitchen. “You Too Can Own James Bond’s Aston Martin—Some Assembly Required.” *Wall Street Journal*. November 2018.

Kelly Michele Guerotto. “Kids’ Play Kitchens That Adults Might Actually Envy.” *The Wall Street Journal*. April 11, 2018.

Thom Johnson. “Improv Doodling as Sport.” *Minnesota Daily.* October 17, 2013.

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